

History of this document

Rev. No.:	Date:	Description of change:
00	8/24/2017	Initial version based on software release 2017.06.xx (build no 2017.06.143)
01	10/4/2017	Updated to software release 2017.06.xx (build no 2017.06.155)
02	2/28/2018	Updated to software release 2017.06.xx (build no 2017.06.198)
06	7/11/2018	Updated to software release 2018.02.xx (build no 2018.02.186)
08	20/09/2018	Updated to software release 2018.10.xx (build no 2018.10.17)
10	10/22/2018	Updated to software release 2018.11.xx (build no 2018.11.48)
11	1/8/2019	Updated to software release 2019.01.xx (build no 2019.01.52)
12	2/21/2019	Updated to software release 2019.02.xx (build no 2019.02.29)
13	2/27/2019	Updated to software release 2019.01.xx (build no 2019.01.90)
14	7/2/2019	Updated to software release 2019.05.xx (build no 2019.05.49)
15	7/4/2019	Updated to software release 2019.06.xx (build no 2019.06.26)
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17	12/9/2019	Updated to software release 2019.15.xx (build no 2019.15.14)
18	5/5/2020	Updated to software release 2020.06.xx (build no 2020.06.41)
20	9/15/2020	Updated to software release 2020.06.xx (build no 2020.06.84)

General

This list contains supervision descriptions for all Mk3A/B/E turbine(s) with VMP Global™ software. Not all supervisions, however, is applicable for all variants within this range of turbines. This means you can find supervision descriptions for supervisions which cannot be reported by given turbine variants.

Related Documentation

0001-2180: Guide for Alarm and Warning List

Supervision Descriptions

This section contains a list of (1201) supervision descriptions.

No: 30	SupervisionID 704	Name FatalErrorRebootSx	
Log text	Internal sublogic error		
Subsystem name	Watchdog		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopFast
- Allowed attempts	4	- Max time disconnect	0.9 second
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	60 second	Category	Manufacturer

Criteria:

The purpose of this alarm is to report that the turbine had an unscheduled reboot. So the restart was not commanded from Toolkit3 and it was not a griddrop. It will occur in case of a software watchdog crash.

No: 74	SupervisionID 464	Name PitchPosMeasAExceedLimitSx	
Log text	PitchA pos:__.__° vel:__.__°/s		
Subsystem name	PiSP		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	1 minute	Category	Manufacturer

Criteria:

This supervision monitors the valid pitch position measurements of blade A

An alarm is reported if follwing conditions are met continously for
PiSP_PitchMeasError_ErrorTime sec:

1. **PiSP_PitchMeasError_ActivityLevel** = 2
2. Turbine is not in service
3. **PiSP_PitchPosMeasAExceedLimits** is true

No: 75	SupervisionID 465	Name PitchPosMeasBExceedLimitSx
Log text	PitchB pos:__.__° vel:__.__°/s	
Subsystem name	PiSP	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	1 minute	Category Manufacturer

Criteria:

This supervision monitors the valid pitch position measurements of blade B

An alarm is reported if follwing conditions are met continously for
PiSP_PitchMeasError_ErrorTime sec:

1. **PiSP_PitchMeasError_ActivityLevel** = 2
2. Turbine is not in service
3. **PiSP_PitchPosMeasBExceedLimits** is true

No: 76	SupervisionID 466	Name PitchPosMeasCExceedLimitSx
Log text	PitchC pos:__.__° vel:__.__°/s	
Subsystem name	PiSP	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	1 minute	Category Manufacturer

Criteria:

This supervision monitors the valid pitch position measurements of blade C

An alarm is reported if follwing conditions are met continously for
PiSP_PitchMeasError_ErrorTime sec:

1. **PiSP_PitchMeasError_ActivityLevel** = 2
2. Turbine is not in service
3. **PiSP_PitchPosMeasCExceedLimits** is true

No: 79	SupervisionID 211	Name MaximumYawErrorSx
Log text	Max. Yaw error: ____._°	
Subsystem name	SV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Environmental

Criteria:
Yaw error greater than 25 deg. (MaxYawErrorDegPx) and wind speed greater than 15 m/s (MinYawErrWindSpeedPx).
The yaw error is averaged with a time constant of 50 sec. (RealWDirThauPx).
Turbine is stopped temporarily for yawing and restarts afterwards.

Parameter found for VMP Global TM:
/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/TargetParameters/MaximumYawError/MaxYaw_YawErrorPoint1Px
/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/TargetParameters/MaximumYawError/MaxYaw_WindPoint3Px
x
/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/TargetParameters/MaximumYawError/MaxYaw_YawErrorPoint3Px
/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/TargetParameters/MaximumYawError/MaxYaw_WindSpdFilterTauPx
/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/TargetParameters/MaximumYawError/MaxYaw_YawErrorFilterTauPx
/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/TargetParameters/MaximumYawError/MaxYaw_MinWindSpdActivePx
/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/TargetParameters/MaximumYawError/MaxYaw_MinGenSpdActivePx

No: 81	SupervisionID 377	Name PitchPosBDeviationToRefSx
Log text	Pitch B ref:__.__°, Act.:__.__°	
Subsystem name	PiSV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors whether pitch position follows the pitch reference during normal operation of the turbine.

This alarm is activated if the following conditions are met for more than ****Dev_Time**** seconds,

- 1. ****Dev_ActivityLevel**** is True
- 2. ****SafetyPitchActive**** is False
- 3. ****PitchBladeBAngle**** is less than ****Dev_MaxPitchRef****
- 4. The absolute value of the pitch deviation is above the threshold ****Dev_MaxError**** + ****Dev_MaxPitchDevAddDWG****
This pitch deviation is calculated as the difference between of two signals ****PiRM_PitchPosRefB**** and ****PitchBladeBAngle****,
where the signal ****PiRM_PitchPosRefB**** is low pass filtered with a time constant of ****Dev_PitchTimeConst****.

The parameter ****Dev_MaxPitchDevAddDWG**** is added as a part of the threshold if ****Dev_DWGAddPitchEnable**** is true & **DWG_StateB** > 1.

Otherwise it takes zero value. The DWG activity computation also includes a hysteresis time of ****Dev_DWGTimeHyst****.

No: 82	SupervisionID 381	Name PitchPosCDeviationToRefSx	
Log text	Pitch C ref:__.__°, Act.:__.__°		
Subsystem name	PiSV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This supervision monitors whether pitch position follows the pitch reference during normal operation of the turbine.

This alarm is activated if the following conditions are met for more than ****Dev_Time**** seconds,

1. ****Dev_ActivityLevel**** is True
2. ****SafetyPitchActive**** is False
3. ****PitchBladeCAngle**** is less than ****Dev_MaxPitchRef****
4. The absolute value of the pitch deviation is above the threshold ****Dev_MaxError**** + ****Dev_MaxPitchDevAddDWG****

This pitch deviation is calculated as the difference between of two signals ****PiRM_PitchPosRefC**** and ****PitchBladeCAngle****,
where the signal **PiRM_PitchPosRefA** is low pass filtered with a time constant of ****Dev_PitchTimeConst****.

The parameter ****Dev_MaxPitchDevAddDWG**** is added as a part of the threshold if ****Dev_DWGAddPitchEnable**** is true & **DWG_StateC** > 1.

Otherwise it takes zero value. The DWG activity computation also includes a hysteresis time of ****Dev_DWGTimeHyst****.

No: 85	SupervisionID 379	Name PitchBValveStdHighSx	
Log text	B CtrlV.STD__.___V B CtrlV__.___V		
Subsystem name	PiSV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This supervision monitors the standard deviation of valve position reference.

The supervision is enabled if the following conditions are met:

1. ****ValveStd_ActivityLevel**** = 2
2. ****SafetyPitchActive**** is False

The alarm is activated if the following additional condition is met:

****PiSV_ValvePosRefBStd**** > ****ValveStd_Limit****

****PiSV_ValvePosRefBStd**** is calculated as the RMS value of ****PitchProportionalValveBOutputRes****.

Log text: ""

No: 86	SupervisionID 383	Name PitchCValveStdHighSx	
Log text	C CtrlV.STD__._V C CtrlV__._V		
Subsystem name	PiSV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This supervision monitors the standard deviation of valve position reference.

The supervision is enabled if the following conditions are met:

- 1. ****ValveStd_ActivityLevel**** = 2
- 2. ****SafetyPitchActive**** is False

The alarm is activated if the following additional condition is met:

****PiSV_ValvePosRefCStd**** > ****ValveStd_Limit****

****PiSV_ValvePosRefCStd**** is calculated as the RMS value of ****PitchProportionalValveCOutputRes****.

Log text: ""

No: 87	SupervisionID 371	Name PitchPosDeviationBetweenABCSx
Log text	Pitch dev. min:__.__° max:__.__°	
Subsystem name	PiSV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision monitors the deviation between pitch positions A, B and C. An alarm is raised if the maximum deviation between the blades exceeds a predefined threshold.

The supervision is enabled if the following conditions are met:

- 1. ****DevABC_ActivityLevel**** = 2
- 2. ****SafetyPitchActive**** is False
- 3. Absolute value of ****ProdCtrl.SP_RotorSpdEst**** > ****DevABC_MinRotSpd****

The alarm is activated if the following additional conditions are met:

- 1. The maximum pitch deviation is greater than ****DevABC_MaxPitchDev****, if ****DevABC_DWGAddPitchEnable**** = 0
- 2. The maximum pitch deviation is greater than the sum of ****DevABC_MaxPitchDev**** and ****DevABC_MaxPitchDevAddDWG****, if ****DevABC_DWGAddPitchEnable**** = 1 and Dynamic Wind Guard (DWG) is active
- 3. Either condition 1 or 2 is active for at least ****DevABC_MaxTime**** sec

The maximum pitch deviation is calculated as:

- 1. The three individual pitch references, ****PiRM_PitchPosRefA****, ****PiRM_PitchPosRefB**** and ****PiRM_PitchPosRefC**** are low pass filtered with a time constant ****DevABC_PitchTimeConst****.
- 2. The pitch error between these filtered references and the corresponding measured pitch positions, ****PitchBladeAAngle****, ****PitchBladeBAngle**** and ****PitchBladeCAngle****, are found for each blade.
- 3. The maximum pitch deviation is then calculated as the difference between max pitch error, ****PiSV_PitchPosMaxError****, and min pitch error, ****PiSV_PitchPosMinError****, among the three blades.

Dynamic Wind Guard (DWG) is considered active if either **DWG_StateA**, **DWG_StateB** or **DWG_StateC** is True. Subject to a hysteresis time of ****DevABC_DWGTimeHyst**** sec.

Log text: "Pitch dev. min:__.__° max:__.__°"

No: 88	SupervisionID 3010	Name HydrOilTempLowSx
Log text	Hydr. temperature low: ____°C	
Subsystem name	HydraulicStation	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	1 minute	Category Manufacturer

Criteria:

The alarm indicates that the hydraulic oil temperature drops below a certain limit.

The alarm is raised if the hydraulic oil temperature (**HydrOilTemp**) drops below the limit given by the parameter **OilTempLowLimit** for more than the time interval given by the parameter **OilTempLowTime**.

The alarm is only monitored if the following conditions are met:

1. **HydrMainState** is either BuildupInitialPressure or NormalOperation

The alarm is auto acknowledged if the hydraulic oil temperature (**HydrOilTemp**) rises above above OilTempHighLimit.

No: 88	SupervisionID 3010	Name HydrOilTempLowSx
Log text	Hydr. temperature low: ____°C	
Subsystem name	HydraulicStation	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	1 minute	Category Manufacturer

Criteria:

The alarm indicates that the hydraulic oil temperature drops below a certain limit.

The alarm is raised if the hydraulic oil temperature (**HydrOilTemp**) drops below the limit given by the parameter **OilTempLowLimit** for more than the time interval given by the parameter **OilTempLowTime**.

The alarm is only monitored if the following conditions are met:

1. **HydrOilTemp** is above the temperature given by the parameter **BuildPressMinTemp**.
2. Hydraulic system is not in Hub In Safe Mode (**HydrSystemInHubSafeModeRequest** = false).

The alarm is auto acknowledged if the hydraulic oil temperature (**HydrOilTemp**) rises above above OilTempHighLimit.

No: 100	SupervisionID 2400	Name TooManyAutoAcksSx
Log text	Too many auto-restarts:_____	
Subsystem name	TurbineStateMonitoring	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 9 second
- Time window	<n/a>	- Max time eliminate 10 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This alarm is reported whenever an alarm has reached its configured limit of possible auto acknowledgments. This is to notify clients (e.g. Scada) that the alarm in question has gone from being auto acknowledgable to being manually acknowledgable.

This alarm can be acknowledged once the cause have been cleared.

No: 117	SupervisionID 467	Name GeneratorSpeedHighInLowWindSx
Log text	Anemom.error:__. _m/s, ____._ RPM	
Subsystem name	SV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	1 minute	Category Manufacturer

Criteria:

When the speed exceeds 900 o/oo (TestAnemometerRMPx) of syncrone speed ($120 * \text{GridFreq} / \text{NomGen1SpeedPx}$), it is checked that the wind sensor measures more than 0.1 m/s (TestAnemometerWindPx).

Parameters found in VMP Global TM:

/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/GeneratorSpeedHighInLowWind/LowWindGen_ProdCtrl_Syn
cGenSpdPx

/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/GeneratorSpeedHighInLowWind/LowWindGen_LowWindSpdLi
mitPx

/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/

No: 118	SupervisionID 468	Name PowerHighInLowWindSx
Log text	Anemom.error:__. _m/s, ____._ kW	
Subsystem name	SV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 1 hour
- Time window	<n/a>	- Max time eliminate 1 hour
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

When the power exceeds 950 o/oo (AnePowerTestPwrLimitPx) of nominal power (PowerNominelPx) it is checked, that the ultrasonic wind sensor shows at least 8.0 m/s (AnePowerTestSpeedLimitPx). The power and wind speed is attenuated exponential with the time constant 30 sec. (AnePowerTestThauPx).

Parameters found in VMP Global TM:

/Turbine/ProdCtrl/SV/PowerHighInLowWind/LowWindPow_PowerFiltTauPx

/Turbine/ProdCtrl/SV/PowerHighInLowWind/LowWindPow_LowWindSpdLimitPx

/Turbine/ProdCtrl/SV/PowerHighInLowWind/LowWindPow_ProdCtrl_NomPowPx

/Turbine/ProdCtrl/SV/PowerHighInLowWind/LowWindPow_HighPowLimitFactorPx

No: 120	SupervisionID 111	Name LowCurrL1Sx	
Log text	Low curr.L1:____A,Others:____A		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	1 minute	Category	Utility

Criteria:

Grid Current supervision.

The alarm is raised if phase 1 current is significant lower (LowCurrHyst,LowCurrLim) than the mean value of the line current for a certain time (LowCurrTime)

The alarm is first checked when the mean current is above a check limit (LowCurrCheckLimit)

Par1: Measured RMS current [A]

Par2: Measured Mean Current [A]

No: 121	SupervisionID 112	Name LowCurrL2Sx	
Log text	Low curr.L2:____A,Others:____A		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	1 minute	Category	Utility

Criteria:

Grid Current supervision.

The alarm is raised if phase 2 current is significant lower (LowCurrHyst,LowCurrLim) than the mean value of the line current for a certain time (LowCurrTime)

The alarm is first checked when the mean current is above a check limit (LowCurrCheckLimit)

Par1: Measured RMS current [A]

Par2: Measured Mean Current [A]

No: 122	SupervisionID 113	Name LowCurrL3Sx	
Log text	Low curr.L3:____A,Others:____A		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	1 minute	Category	Utility

Criteria:

Grid Current supervision.

The alarm is raised if phase 3 current is significant lower (LowCurrHyst,LowCurrLim) than the mean value of the line current for a certain time (LowCurrTime)

The alarm is first checked when the mean current is above a check limit (LowCurrCheckLimit)

Par1: Measured RMS current [A]

Par2: Measured Mean Current [A]

No: 123	SupervisionID 98	Name HighOverCurrGen0Sx
Log text	High curr Gen0 L_: ____ A	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type Emergency
- Allowed attempts	3	- Max time disconnect 0 second
- Time window	1 hour	- Max time eliminate 0 second
- Stabilize period	1 second	Category Manufacturer

Criteria:

This supervision monitors the grid RMS currents depending on connected state.

The supervision is reported if one of the grid currents: ****IGrid1Rms10sec****, ****IGrid2Rms10sec****, ****IGrid3Rms10sec**** rises above the threshold parameter ****ExtrHighCurrLim**** for the time given in parameter: ****ExtrHighCurrTime****. The parameter: ****ExtrHighCurrHyst**** determines a hysteresis limit. The criteria for **_not_** reporting the supervisions is that the grid currents must fall below the hysteresis limit within the timeout period.

The limit (****ExtrHighCurrLim****) and hysteresis (****ExtrHighCurrHyst****) parameters are given as per unit value relative to the nominal current for the turbine. The nominal current depends on the connected state, ****StarDeltaCtrlState**** of the generator.

The nominal current parameter (****NomCurrGen****) is selected based on current generator mode.

HighOverCurrGen supervision for unconnected generator. This supervision is only active when the signal: **StarDeltaCtrlState** has the value: **ConnectOff**.

The supervision is reported if one of the grid currents ****CurrentPhase1****, ****CurrentPhase2****, ****CurrentPhase3**** rises above the threshold parameter ****ExtrHighCurrLim**** for the time given in parameter ****ExtrHighCurrTime****.

The parameter ****ExtrHighCurrHyst**** determines a hysteresis limit. The criteria for **_not_** reporting the supervisions is that the grid currents must fall below the hysteresis limit within the timeout period.

HighOverCurrGen supervision is active for unconnected generator.

No: 124	SupervisionID 99	Name HighOverCurrGen1Sx	
Log text	Extr.high curr.Gen1 L_: ____ A		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	1 second	Category	Manufacturer

Criteria:

This supervision monitors the grid RMS currents depending on connected state.

The supervision is reported if one of the grid currents: ****IGrid1Rms10sec****, ****IGrid2Rms10sec****, ****IGrid3Rms10sec**** rises above the threshold parameter ****ExtrHighCurrLim**** for the time given in parameter: ****ExtrHighCurrTime****. The parameter: ****ExtrHighCurrHyst**** determines a hysteresis limit. The criteria for **_not_** reporting the supervisions is that the grid currents must fall below the hysteresis limit within the timeout period.

The limit (****ExtrHighCurrLim****) and hysteresis (****ExtrHighCurrHyst****) parameters are given as per unit value relative to the nominal current for the turbine. The nominal current depends on the connected state, ****StarDeltaCtrlState**** of the generator.

The nominal current parameter (****NomCurrGen****) is selected based on current generator mode.

HighOverCurrGen supervision for delta connected generator. This supervision is only active when the signal: **StarDeltaCtrlState** has the value: **ConnectDelta**.

The supervision is reported if one of the grid currents ****CurrentPhase1****, ****CurrentPhase2****, ****CurrentPhase3**** rises above the threshold parameter ****ExtrHighCurrLim**** for the time given in parameter ****ExtrHighCurrTime****.

The parameter ****ExtrHighCurrHyst**** determines a hysteresis limit. The criteria for **_not_** reporting the supervisions is that the grid currents must fall below the hysteresis limit within the timeout period.

HighOverCurrGen supervision is active when generator is connected.

No: 126	SupervisionID 82	Name ExtrHighVoltSx
Log text	Extr. high volt. L_: ____ V	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	5	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Utility

Criteria:

The grid voltage has exceeded certain grid voltage limits.

Alarm condition: One of the grid voltage ****VoltagePhasel****, ****VoltagePhase2**** or ****VoltagePhase3**** exceed the limit given by (****NominalVoltage**** x (1 + ****ExtrHighVoltLim****)) and still exceed the limit given by (****NominalVoltage**** x (1 + ****ExtrHighVoltHyst****)) after the time given by ****ExtrHighVoltTime**** has passed.
The supervision use signals with a higher sample rate then ****VoltagePhasel****, ****VoltagePhase2**** and ****VoltagePhase3****. The supervision will therefor be able to be raised even though the signals seems ok.

Par1= Phase number (1,2 or 3)

Par2= Phase Voltage RMS [Volt]

No: 127	SupervisionID 83	Name ExtrLowVoltSx
Log text	Extr. low voltage L_: ____V	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	5	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Utility

Criteria:

The grid voltage has exceeded certain grid voltage limits.

Alarm condition: One of the grid voltage ****VoltagePhasel****, ****VoltagePhase2**** or ****VoltagePhase3**** exceed the limit given by (****NominalVoltage**** x (1 - ****ExtrLowVoltLim****)) and still exceed the limit given by (****NominalVoltage**** x (1 - ****ExtrLowVoltHyst****)) after the time given by ****ExtrLowVoltTime**** has passed.
The supervision use signals with a higher sample rate then ****VoltagePhasel****, ****VoltagePhase2**** and ****VoltagePhase3****. The supervision will therefor be able to be raised even though the signals seems ok.

Par1= Phase number (1,2 or 3)

Par2= Phase Voltage RMS [Volt]

No: 130	SupervisionID 117	Name MaxPowGenSx	
Log text	Max power Gen_: ____._ kW		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopFast
- Allowed attempts	3	- Max time disconnect	0.9 second
- Time window	3600 second	- Max time eliminate	1 hour
- Stabilize period	1 second	Category	Manufacturer

Criteria:

If the grid power (calculated by using phase voltages UL1,UL2,UL3 and line currents IL1,IL2,IL3) is above:

Unconnected generator:

If (grid power > (**MaxPowLim** * **NomPowGen0**)) for longer than **MaxPowTime** second the turbine is stopped.

Connected generator:

If (grid power > (**MaxPowLim** * **NomPowGen1**)) for longer than **MaxPowTime** seconds the turbine is stopped.

Par1: State (0 unconnected generator, 1 connected generator)

Par2: Grid power (W)

Possible causes:

- * Currents are not measured correctly by the converter (check that all currents (LscCurrentPhase,MscCurrentPhase) from the converter are almost equal when the turbine is producing power)
- * If the currents in one converter module are not measured this can lead to this alarm
- * Sensor errors

No: 131	SupervisionID 119	Name NegPowGenSx	
Log text	Negative power Gen_: ____._ kW		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopFast
- Allowed attempts	3	- Max time disconnect	0.9 second
- Time window	3600 second	- Max time eliminate	1 hour
- Stabilize period	1 second	Category	Manufacturer

Criteria:

The generator power has exceeded the negative power limit.

The generator power **GeneratorPower** has exceeded the negative power limit **NegPowGenLim** and still exceed the limit given by **NegPowGenHyst** after the time given by **NegPowGenTime** has passed.

No: 132

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 110

Leak current ____A

CubePower

Alarm

Auto

2

86400 second

60 second

Name LeakCurrSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopSlow

3 second

9 second

Manufacturer

The alarm is raised if the leak current (Phasel+2+3 AC current) increases above the trip threshold (LeakCurrLim, LeakCurrHyst) for long enough time (LeakCurrTime) for the timer to run out.

Filtering parameter (LeakCurrThau).

No: 134

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 107

High voltage L_: ____ V

CubePower

Alarm

Auto

5

1 hour

60 second

Name HighVoltSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopFast

0.9 second

1 hour

Utility

The grid voltage has exceeded certain grid voltage limits.

Alarm condition: One of the grid voltage ****VoltagePhasel****, ****VoltagePhase2**** or ****VoltagePhase3**** exceed the limit given by (****NominalVoltage**** x (1 + ****HighVoltLim****)) and still exceed the limit given by (****NominalVoltage**** x (1 + ****HighVoltHyst****)) after the time given by ****HighVoltTime**** has passed.

The supervision use signals with a higher sample rate then ****VoltagePhasel****, ****VoltagePhase2**** and ****VoltagePhase3****. The supervision will therefor be able to be raised even though the signals seems ok.

Par1= Phase number (1,2 or 3)

Par2= Phase Voltage RMS [Volt]

No: 135	SupervisionID 116	Name LowVoltSx	
Log text	Low voltage L_: ____ V		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	5	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Utility

Criteria:

The grid voltage has exceeded certain grid voltage limits.

Alarm condition: One of the grid voltage ****VoltagePhase1****, ****VoltagePhase2**** or ****VoltagePhase3**** exceed the limit given by (****NominalVoltage**** x (1 - ****LowVoltLim****)) and still exceed the limit given by (****NominalVoltage**** x (1 - ****LowVoltHyst****)) after the time given by ****LowVoltTime**** has passed.

The supervision use signals with a higher sample rate then ****VoltagePhase1****, ****VoltagePhase2**** and ****VoltagePhase3****. The supervision will therefor be able to be raised even though the signals seems ok.

Par1= Phase number (1,2 or 3)

Par2= Phase Voltage RMS [Volt]

No: 136

SupervisionID 40

Name AsymCurrL1Sx

Log text

Asym.currL1:____A,Others:____A

Subsystem name

CubePower

Type

Alarm

Timeout

<n/a>

Acknowledgement

Auto

Shutdown type

StopSlow

- **Allowed attempts**

3

- **Max time disconnect**

3 second

- **Time window**

1 hour

- **Max time eliminate**

9 second

- **Stabilize period**

1 minute

Category

Utility

Criteria:

Monitors that the grid current of a given phase is symmetric within a certain limit relative to the other phase currents.

This supervision is a generic description that represents the asymmetric grid current supervisions in the converter. Every supervision has different limits and times so that different level of asymmetric current is allowed depending on in which mode the generator is connected.

If Generator 1 is connected the limit parameter is ****AsymCurrLimGen1****, and the hysteresis is ****AsymCurrHystGen1****.

If Generator 2 is connected the limit parameter is ****AsymCurrLimGen2****, and the hysteresis is ****AsymCurrHystGen2****.

****AsymCurrTime**** is used for both generator connections.

-- Supervision Criteria --

The supervision continuously monitors the phase RMS grid current on all three phases:

****CurrentPhase1****,

****CurrentPhase2**** and ****CurrentPhase3****. If the current of one of these phases is outside the limit,

a timer is started. For the supervision to be reported the current must not be within the hysteresis

limit until the timer reaches the timeout. If the current drops/rises to be within the hysteresis limit

during the running period of the timer, the supervision is not reported and the timer is reset.

Asymmetrical current is only checked when the 3 phase mean current level is above:

****AsymCurrCheck**** times NomCurrGen0 in unconnected.

****AsymCurrCheck**** times NomCurrGen1 in Generator 1.

****AsymCurrCheck**** times NomCurrGen2 in Generator 2.

This alarm is raised when the RMS grid current for phase 1 is asymmetrical compared to the mean RMS current

Par1: Current phase (L1=1) [A]

Par2: Mean current [A]

No: 137

SupervisionID 42

Name AsymCurrL2Sx

Log text

Asym.currL2:____A,Others:____A

Subsystem name

CubePower

Type

Alarm

Timeout

<n/a>

Acknowledgement

Auto

Shutdown type

StopSlow

- **Allowed attempts**

3

- **Max time disconnect**

3 second

- **Time window**

1 hour

- **Max time eliminate**

9 second

- **Stabilize period**

1 minute

Category

Utility

Criteria:

Monitors that the grid current of a given phase is symmetric within a certain limit relative to the other phase currents.

This supervision is a generic description that represents the asymmetric grid current supervisions in the converter. Every supervision has different limits and times so that different level of asymmetric current is allowed depending on in which mode the generator is connected.

If Generator 1 is connected the limit parameter is ****AsymCurrLimGen1****, and the hysteresis is ****AsymCurrHystGen1****.

If Generator 2 is connected the limit parameter is ****AsymCurrLimGen2****, and the hysteresis is ****AsymCurrHystGen2****.

****AsymCurrTime**** is used for both generator connections.

-- Supervision Criteria --

The supervision continuously monitors the phase RMS grid current on all three phases:

****CurrentPhase1****,

****CurrentPhase2**** and ****CurrentPhase3****. If the current of one of these phases is outside the limit,

a timer is started. For the supervision to be reported the current must not be within the hysteresis

limit until the timer reaches the timeout. If the current drops/rises to be within the hysteresis limit

during the running period of the timer, the supervision is not reported and the timer is reset.

Asymmetrical current is only checked when the 3 phase mean current level is above:

****AsymCurrCheck**** times NomCurrGen0 in unconnected.

****AsymCurrCheck**** times NomCurrGen1 in Generator 1.

****AsymCurrCheck**** times NomCurrGen2 in Generator 2.

This alarm is raised when the RMS grid current for phase 2 is asymmetrical compared to the mean RMS current

Par1: Current phase (L1=1) [A]

Par2: Mean current [A]

No: 138

SupervisionID 43

Name AsymCurrL3Sx

Log text

Asym.currL3:____A,Others:____A

Subsystem name

CubePower

Type

Alarm

Timeout

<n/a>

Acknowledgement

Auto

Shutdown type

StopSlow

- **Allowed attempts**

3

- **Max time disconnect**

3 second

- **Time window**

1 hour

- **Max time eliminate**

9 second

- **Stabilize period**

1 minute

Category

Utility

Criteria:

Monitors that the grid current of a given phase is symmetric within a certain limit relative to the other phase currents.

This supervision is a generic description that represents the asymmetric grid current supervisions in the converter. Every supervision has different limits and times so that different level of asymmetric current is allowed depending on in which mode the generator is connected.

If Generator 1 is connected the limit parameter is ****AsymCurrLimGen1****, and the hysteresis is ****AsymCurrHystGen1****.

If Generator 2 is connected the limit parameter is ****AsymCurrLimGen2****, and the hysteresis is ****AsymCurrHystGen2****.

****AsymCurrTime**** is used for both generator connections.

-- Supervision Criteria --

The supervision continuously monitors the phase RMS grid current on all three phases:

****CurrentPhase1****,

****CurrentPhase2**** and ****CurrentPhase3****. If the current of one of these phases is outside the limit,

a timer is started. For the supervision to be reported the current must not be within the hysteresis

limit until the timer reaches the timeout. If the current drops/rises to be within the hysteresis limit

during the running period of the timer, the supervision is not reported and the timer is reset.

Asymmetrical current is only checked when the 3 phase mean current level is above:

****AsymCurrCheck**** times NomCurrGen0 in unconnected.

****AsymCurrCheck**** times NomCurrGen1 in Generator 1.

****AsymCurrCheck**** times NomCurrGen2 in Generator 2.

This alarm is raised when the RMS grid current for phase 3 is asymmetrical compared to the mean RMS current

Par1: Current phase (L3=3) [A]

Par2: Mean current [A]

No: 139	SupervisionID 44	Name AsymVoltL1Sx
Log text	Asym.voltL1:____V,Others:____V	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	5	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	10 second	Category Utility

Criteria:
Monitors that the grid voltage of a given phase is symmetric within a certain limit relative to the other phase voltages.

This supervision is a generic description that represents the asymmetric grid voltage supervisions in the converter. Every supervision has different limits and times so that different level of asymmetric voltage is allowed depending on in which mode the generator is connected.

If Generator 1 is connected the limit parameter is ****AsymVoltLimGen1****, and the hysteresis is ****AsymVoltHystGen1****.
If Generator 2 is connected the limit parameter is ****AsymVoltLimGen2****, and the hysteresis is ****AsymVoltHystGen2****.

****AsymVoltTime**** is used for both generator connections.

-- Supervision Criteria --
The supervision continuously monitors the phase zero RMS grid voltage on all three phases: ****VoltagePhase1****, ****VoltagePhase2**** and ****VoltagePhase3****. If the voltage of one of these phases is outside the limit, a timer is started. For the supervision to be reported the voltage must not be within the hysteresis limit until the timer reaches the timeout. If the voltage drops/rises to be within the hysteresis limit during the running period of the timer, the supervision is not reported and the timer is reset.

This alarm is raised when the RMS grid voltage for phase 1 is asymmetrical compared to the mean RMS voltage
Par1: Voltage phase (L1=1) [V]
Par2: Mean voltage [V]

No: 140	SupervisionID 45	Name AsymVoltL2Sx	
Log text	Asym.voltL2:____V,Others:____V		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	5	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	10 second	Category	Utility

Criteria:
Monitors that the grid voltage of a given phase is symmetric within a certain limit relative to the other phase voltages.

This supervision is a generic description that represents the asymmetric grid voltage supervisions in the converter. Every supervision has different limits and times so that different level of asymmetric voltage is allowed depending on in which mode the generator is connected.

If Generator 1 is connected the limit parameter is ****AsymVoltLimGen1****, and the hysteresis is ****AsymVoltHystGen1****.
If Generator 2 is connected the limit parameter is ****AsymVoltLimGen2****, and the hysteresis is ****AsymVoltHystGen2****.

****AsymVoltTime**** is used for both generator connections.

-- Supervision Criteria --
The supervision continuously monitors the phase zero RMS grid voltage on all three phases: ****VoltagePhase1****, ****VoltagePhase2**** and ****VoltagePhase3****. If the voltage of one of these phases is outside the limit, a timer is started. For the supervision to be reported the voltage must not be within the hysteresis limit until the timer reaches the timeout. If the voltage drops/rises to be within the hysteresis limit during the running period of the timer, the supervision is not reported and the timer is reset.

This alarm is raised when the RMS grid voltage for phase 2 is asymmetrical compared to the mean RMS voltage
Par1: Voltage phase (L2=2) [V]
Par2: Mean voltage [V]

No: 141	SupervisionID 46	Name AsymVoltL3Sx	
Log text	Asym.voltL3:____V,Others:____V		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	5	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	10 second	Category	Utility

Criteria:
Monitors that the grid voltage of a given phase is symmetric within a certain limit relative to the other phase voltages.

This supervision is a generic description that represents the asymmetric grid voltage supervisions in the converter. Every supervision has different limits and times so that different level of asymmetric voltage is allowed depending on in which mode the generator is connected.

If Generator 1 is connected the limit parameter is ****AsymVoltLimGen1****, and the hysteresis is ****AsymVoltHystGen1****.
If Generator 2 is connected the limit parameter is ****AsymVoltLimGen2****, and the hysteresis is ****AsymVoltHystGen2****.

****AsymVoltTime**** is used for both generator connections.

-- Supervision Criteria --
The supervision continuously monitors the phase zero RMS grid voltage on all three phases: ****VoltagePhase1****, ****VoltagePhase2**** and ****VoltagePhase3****. If the voltage of one of these phases is outside the limit, a timer is started. For the supervision to be reported the voltage must not be within the hysteresis limit until the timer reaches the timeout. If the voltage drops/rises to be within the hysteresis limit during the running period of the timer, the supervision is not reported and the timer is reset.

This alarm is raised when the RMS grid voltage for phase 3 is asymmetrical compared to the mean RMS voltage
Par1: Voltage phase (L3=3) [V]
Par2: Mean voltage [V]

No: 142	SupervisionID 120	Name OverCurrGen1Sx	
Log text	High curr Gen1 L_: ____ A		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

The alarm is raised if the delta connected generator combined stator + converter current exceeds the trip threshold long enough to make the timer run out.

No: 144	SupervisionID 210	Name WindSpeedHighSlowSx	
Log text	High windspeed: __. _ m/s		
Subsystem name	SV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseFast
- Allowed attempts	Unlimited	- Max time disconnect	8 second
- Time window	<n/a>	- Max time eliminate	1 hour
- Stabilize period	1 minute	Category	Environmental

Criteria:

The purpose of this supervision is to shutdown the turbine and avoid start-up when the wind speed is too high.

This must be done to avoid high loads on the turbine at high wind speeds. A climate dependent cutout wind speed can be defined and used instead of the standard setting.

An alarm is raised if the following conditions are met:

1. ****WindSpdHighSlow_ActivityLevel**** = 2
2. A filtered wind speed signal is above a certain wind speed limit for a certain time as defined below.

The wind speed limit and time are specified as follows:

a. The wind speed signal ****WindMeasurement.WindSpeed**** is filtered through a lowpass filter with time constant ****WindSpdHigh_WindSpdFiltTauSlow****.

b. The filtered wind speed signal is input to a square filter whose output defines the state of the supervision. The square filter has the following parameters:

```

* HighHyst      = **WindSpdHigh\_CutoutWindSpd** +
**WindSpdHighSlow\_CutoutWindSpdOffset**          if
**WindSpdHigh\_ClimateDependentCutoutEnable** = 0
    HighHyst      = **WindSpdHigh\_ClimateDependentCutoutWindSpd** +
**WindSpdHighSlow\_CutoutWindSpdOffset**          if
**WindSpdHigh\_ClimateDependentCutoutEnable** = 1
    * LowHyst      = HighHyst - **WindSpdHighSlow\_Hyst**
    * HighHystTime = **WindSpdHighSlow\_HighHystTime**
    * LowHystTime  = **WindSpdHighSlow\_LowHystTime**

```

The filtered wind speed SV_WindSpdHigh_WindSpdSlowFilt should be logged as:

Log text: "High wind speed: __. _ m/s"

No: 146	SupervisionID 315	Name EnvironmentTempTooLowSx
Log text	Ambient temperature low: ____°C	
Subsystem name	Environment	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseFast
- Allowed attempts	Unlimited	- Max time disconnect 8 second
- Time window	<n/a>	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Environmental

Criteria:

This supervision reports an alarm if the environment temperature (physical signal *****Turbine.GlobalIceDetection.EnvironmentTemp****) drops below limit **(**EnvironmentLowTempLimit**)**. The alarm can be acknowledged if the environment temperature exceeds limit **(**EnvironmentLowTempLimit**)** plus the given hysteresis **(**EnvironmentLowTempHyst**)**.

No: 147	SupervisionID 631	Name GearboxOilInletTempTooHighSx
Log text	High gear temp:____°C/air:____°C	
Subsystem name	Gearbox	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 60 second
- Time window	24 hour	- Max time eliminate 60 second
- Stabilize period	10 minute	Category Manufacturer

Criteria:

This alarm indicates that the gear oil temperature at the inlet to the gearbox is too high. If the oil is too hot, the gearbox will not be lubricated sufficiently.

Most likely caused by problems with the gear oil water cooling circuit.

The alarm is raised if the ****GearboxOilInletTemp**** is above ****GearOilInletTooWarmLimit****.

The alarm is auto acknowledged when ****GearboxOilInletTemp**** is less than ****GearOilInletTooWarmLimit****.

No: 149	SupervisionID 448	Name TransformerHighTempSx	
Log text	High temperature T53: ____°C L_		
Subsystem name	Transformer		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	9 second
- Time window	86400 second	- Max time eliminate	10 second
- Stabilize period	600 second	Category	Manufacturer

Criteria:

This alarm is reported if the transformer temperature is high.
The temperature of all three transformer phases (**IO.TransformerL1Temp**, **IO.TransformerL2Temp**, **IO.TransformerL3Temp**) is monitored, and the highest temperature of all three phases is calculated as a signal **TransformerMaxPhaseTemp**.

This alarm is reported if **TransformerMaxPhaseTemp** exceeds the high limit, given by the parameter **HighTempLimit**, for time longer than parameter **HighTempTime**.

The alarm can be acknowledged when **TransformerMaxPhaseTemp** is below the value given by the parameter **HighTempLimit** minus hysteresis given by the parameter **HighTempHyst**.

No: 153	SupervisionID 209	Name GeneratorSpeedHighSx	
Log text	Max generator RPM: ____._ RPM		
Subsystem name	SV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This supervision monitors **GeneratorTachoSpeed** (measured on the high speed side) and reacts when it exceeds an upper limit value.

An alarm is issued if following conditions are met:

1. GenSpd_ActivityLevel = 2
2. **AGO_AGOActive** is false
3. **GeneratorTachoSpeed** is greater than the **SV_NoDerateOverSpdLimit** for **SV_GenSpdHigh_HighHystTime** seconds

No: 154	SupervisionID 212	Name RotorSpeedHighSx	
Log text	Max rotor RPM: __._ RPM		
Subsystem name	SV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This supervision monitors ****IO.RotorTachoSpeed**** and reacts when it exceeds an upper limit value.

An alarm is issued if following conditions are met:

1. ****RotorSpd_ActivityLevel**** = 2
2. ****AGO_AGOActive**** is false
3. ****IO.RotorTachoSpeed**** is greater than ****RotorSpd_HighHystSqrFilt**** for more than ****RotorSpd_HighHystTimeSqrFilt**** sec

No: 156	SupervisionID 206	Name TowerVibrationHighSx	
Log text	Chock sensor triggered:____._RPM		
Subsystem name	SV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Local	Shutdown type	StopSlow
- Allowed attempts	<n/a>	- Max time disconnect	3 second
- Time window	<n/a>	- Max time eliminate	9 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This supervision monitors the vibration of tower by means of the shock sensor which is an on/off sensor.

This alarm monitors the same as the tower acceleration in X/Y direction, but since this supervision do

not have any filtering of the signals this supervision will often be triggered first in extreme events where the turbine experience a vibration shock.

This alarm can be caused by a person accidentally bumping into the shock sensor while doing service in the nacelle.

However, If this supervision is triggered during production it must be taken very seriously. Can be caused my severe mass imbalance which could come from a broken blade.

An alarm is reported if following conditions are met:

1. ****TowVib_ActivityLevel**** = 2
2. **SafetyPitchActive** is false
3. **ShockSensorOK** is false

No: 157	SupervisionID 208	Name GeneratorSpeedHighInShutdownSx
Log text	Gen.RPM: ____._ RPM, OpSt<Run	
Subsystem name	SV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

Generator-RPM is higher than 500 o/oo (GenRPMOpStNotRunLimitPx) of NominalGenRPM.
Monitored in pause and stop, but not in the first 30 seconds (GenRPMOpStNotRunTimerValPx)
plus the time regulating down after change from run.

Parameter for VMP Global TM:

/Turbine/ProdCtrl/turbine/ProdCtrl/SV/TargetParameters/
GeneratorSpeedHighInShutdown/GenSpdSh_StartGenSpdEvalTimeOffsetPx
/Turbine/ProdCtrl/turbine/ProdCtrl/SV/TargetParameters/
GeneratorSpeedHighInShutdown/GenSpdSh_StartGenSpdEvalTimeMinPx

No: 158	SupervisionID 312	Name GearboxRatioFaultSx
Log text	Rotor:____.RPM, Gen.:____._ RPM	
Subsystem name	TurbineSensorMonitoring	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm indicates that the measured generator and rotor speeds do not match and is a sanity check for the speed sensor readings.

Most likely caused by a faulty rotor or generator speed sensor.

The alarm is only monitored if one of the 1 second averaged generator or rotor speeds are above a configured percentage of the nominal speeds:
i.e. ****FilteredGeneratorSpeed**** greater than ****NominalGenRPM**** *
****SpeedRatioMinGenRPMRatio****
or ****FilteredRotorSpeed**** greater than ****NominalGenRPM**** / ****GearRatio**** *
****SpeedRatioMinRotorRPMRatio****

The alarm is raised if the 1 second averaged generator and rotor speeds does not match within a configured limit for a specified period - i.e.
The absolute value of (****FilteredRotorSpeed**** - ****FilteredGeneratorSpeed**** / ****GearRatio****) is greater than (****SpeedRatioToleranceRatio**** * ****NominalGenRPM**** / ****GearRatio****) for more than ****SpeedRatioFaultTime****.

The alarm can be acknowledged if the 1 second averaged generator and rotor speeds match again or is below the required minimum limits.

No: 165	SupervisionID 3008	Name HydrOilLevelLowSx	
Log text	Low oil-level, hydraulic		
Subsystem name	HydraulicStation		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	1	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

The alarm indicates low hydraulic oil level in the tank.

The alarm is raised if the signal ****IO.HydrOilLevelOk**** is false for more than the time interval given by the parameter ****OilLevelLowDelay****.

The alarm will be acknowledged automatically if the signal ****IO.HydrOilLevelOk**** changes to true.

No: 165	SupervisionID 3008	Name HydrOilLevelLowSx	
Log text	Low oil-level, hydraulic		
Subsystem name	HydraulicStation		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	1	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

The alarm indicates low hydraulic oil level in the tank.

The alarm is raised if the signal ****IO.HydrOilLevelOk**** is false for more than the time interval given by the parameter ****OilLevelLowDelay****.

The alarm will be acknowledged automatically if the signal ****IO.HydrOilLevelOk**** changes to true.

No: 171	SupervisionID 214	Name ConverterConnectFailSx	
Log text	Max no of pitchconnect cmd		
Subsystem name	PSC		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	1 hour
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	60 second	Category	Manufacturer

Criteria:

The purpose of this supervision is to avoid too many consecutive grid connection attempts from the turbine.

This alarm is activated if the following conditions are met within ****PSC_ConvConnectFail_MinTimeSpan**** seconds

1. ****PSC_ConvConnectFail_ActivityLevel**** = 2
2. ****GeneratorCommand**** value is connect
3. ****Converter.ConverterMainState**** is not in state connected

No: 174	SupervisionID 608	Name PositiveFeedbackSx	
Log text	Feedback = _,:Hydraulicmotor		
Subsystem name	HydraulicStation		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	30 second	Category	Manufacturer

Criteria:

The alarm/warning is raised when it is detected that a contactor does not open when the output is deactivated.

The alarm/warning is raised if the signal ****IO.HydrOfflinePumpContactorClosed**** does not change to false within the time given in the parameter ****FeedbackTime**** after the signal ****IO.HydrOfflinePumpStart**** is changing from true to false.

The alarm/warning is monitored only when the status of the ****IO.HydrOfflinePumpStart**** and the ****IO.HydrOfflinePumpContactorClosed**** are valid.

The motor is stopped when the positive feedback fault warning/alarm is reported.

No: 174	SupervisionID 609	Name NegativeFeedbackSx	
Log text	Feedback = _,:Hydraulicmotor		
Subsystem name	HydraulicStation		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	30 second	Category	Manufacturer

Criteria:

The alarm/warning is raised when it is detected that a contactor does not close when the output is activated.

The alarm/warning is raised if the signal ****IO.HydrOfflinePumpContactorClosed**** does not change to true within the time given in the parameter ****FeedbackTime**** after the signal ****IO.HydrOfflinePumpStart**** is changing from false to true.

The alarm/warning is monitored only when the status of the ****IO.HydrOfflinePumpStart**** and the ****IO.HydrOfflinePumpContactorClosed**** are valid.

No: 176	SupervisionID 435	Name WindDirectionSignalFaultSx	
Log text	Error on all wind sensors		
Subsystem name	PSC		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	5	- Max time disconnect	1 hour
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	1 minute	Category	Manufacturer

Criteria:

This supervision checks the validity of wind direction measurement.

An alarm is activated if following conditions are met:

1. ****PSC_WindDirFault_ActivityLevel**** = 2
2. ****PSC_WindDirRelSignalValid**** is false for more than ****PSC_WindDirFault_InvalidSignalTimeLimit**** seconds

No: 176	SupervisionID 450	Name WindSpeedSignalFaultSx	
Log text	Error on all wind sensors		
Subsystem name	PSC		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	5	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This supervision checks the validity of wind speed measurement.

An alarm is raised if following conditions are met:

1. ****PSC_WindFault_ActivityLevel**** = 2
2. ****PSC_WindSpdSignalValid**** goes low for more than ****PSC_WindFault_InvalidSignalTimeLimit**** seconds

No: 187	SupervisionID 443	Name EmcPitchingPressureLowSx	
Log text	External 24 V power supply		
Subsystem name	PiSV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	1 minute	Category	Manufacturer

Criteria:

This supervision monitors if the hydraulic energy for EMC pitching becomes critically low and then initiate a shutdown by emergency valves.

The hydraulic energy for EMC pitching is measured by a pressure switch on the emergency accumulators.

The supervision is triggered when following conditions are met continuously for

****EmcPressLow_TimeOut**** seconds.

1. ****EmcPressLow_ActivityLevel**** = 2
2. ****SafetyPitchActive**** is false
3. ****PitchHydrSupplyReady**** is true
4. ****IO.HydrExternal24VOK**** signal is false

No: 190	SupervisionID 373	Name PitchPosADeviationToRefSx
Log text	Pitch A ref:__.__°, Act.:__.__°	
Subsystem name	PiSV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors whether pitch position follows the pitch reference during normal operation of the turbine.

This alarm is activated if the following conditions are met for more than ****Dev_Time**** seconds

1. ****Dev_ActivityLevel**** is True
 2. ****SafetyPitchActive**** is False
 3. ****PitchBladeAAngle**** is less than ****Dev_MaxPitchRef****
 4. The absolute value of the pitch deviation is above the threshold ****Dev_MaxError**** + ****Dev_MaxPitchDevAddDWG****
- This pitch deviation is calculated as the difference between of two signals ****PiRM_PitchPosRefA**** and ****PitchBladeAAngle****,
where the signal ****PiRM_PitchPosRefA**** is low pass filtered with a time constant of ****Dev_PitchTimeConst****.

The parameter ****Dev_MaxPitchDevAddDWG**** is added as a part of the threshold if ****Dev_DWGAddPitchEnable**** is true & DWG_StateA > 1

Otherwise it takes zero value. The DWG activity computation also includes a hysteresis time of ****Dev_DWGTimeHyst****.

No: 192	SupervisionID 375	Name PitchAValveStdHighSx
Log text	A CtrlV.STD__.___V A CtrlV__.___V	
Subsystem name	PiSV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors the standard deviation of valve position reference.

The supervision is enabled if the following conditions are met:

1. ****ValveStd_ActivityLevel**** = 2
2. ****SafetyPitchActive**** is False

The alarm is activated if the following additional condition is met:
****PiSV_ValvePosRefAStd**** > ****ValveStd_Limit****

****PiSV_ValvePosRefAStd**** is calculated as the RMS value of ****PitchProportionalValveAOutputRes****.

Log text: ""

No: 193	SupervisionID 470	Name PowerStdHighSx	
Log text	PowerSTD _____.kW MEAN _____.kW		
Subsystem name	SV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	1 hour
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	1 minute	Category	Manufacturer

Criteria:

This supervision monitors the variation of power around the reference. The supervision triggers only if PowStd_PowMean is above ****PowStd_PowMeanLimit**** and PowStd_PowStd is above ****PowStd_PowStdLimit**** evaluated over a period of cPowStd_BufferSize(Normally 30s). The power signal used for evaluation is ****Converter.GridPower****.

This alarm is activated if the following conditions are met:

1. ****PowStd_ActivityLevel**** = 2
2. ****Converter.GridFaultRideThrough**** = 0 (LVRT not active) for more than ****PowStd_MinTimeSpanLVRT**** seconds
3. ****PoRS_FRBActive**** = 0 Fast run back not active
5. ****SV_PowStd_PowMean**** is above ****PowStd_PowMeanLimit**** and ****SV_PowStd_PowStd**** is above ****PowStd_PowStdLimit****

No: 194	SupervisionID 372	Name PitchPosASStopLowSx	
Log text	Pitch A too low: _____.° < _____.°		
Subsystem name	PiSV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	StopSlow
- Allowed attempts	<n/a>	- Max time disconnect	3 second
- Time window	<n/a>	- Max time eliminate	9 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This supervision is used during Stop shutdowns to verify that the pitch angle reach a specified value within a specified time period.

The supervision is enabled if the following conditions are met:

1. ****Stop_ActivityLevel**** = 2
2. ****SafetyPitchActive**** is True

The alarm is activated if the following additional condition is met:
****PitchBladeAAngle**** is less than ****Stop_PitchWhenStop**** after waiting for ****Stop_MaxPitchErrorTime**** sec since being enabled

Log text: "Pitch too low: _____.° < _____.°, i.e. pitch to low at pitch system A."

No: 195	SupervisionID 469	Name PowerDeviationFromRefFastSx
Log text	PowerError ____._ kW	
Subsystem name	SV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	1 minute	Category Manufacturer

Criteria:

This supervision monitors the deviation between ****PowerReference**** and ****Converter.GridPower**** during production. The difference between these signals is filtered using the time constant ****PowDevFast_PowErrorFiltTau**** and compared to the tolerance ****PowDevFast_PowErrorLimitPct**** * ****MaxPowerSetpoint****.

This alarm is activated if the following conditions are met:

1. ****PowDevFast_ActivityLevel**** = 2
2. ****Converter.GridFaultRideThrough**** = 0 (LVRT not active) for more than ****PowDev_MinTimeSpanLVRT**** seconds
3. ****PoRS_FRBActive**** = 0
4. ****ProductionControllerMainState**** = 6 (eProdCtrlMainState_Production)
5. The absolute value of the filtered power deviation is greater than ****PowDevFast_PowErrorLimitPct**** * ****MaxPowerSetpoint****

No: 196	SupervisionID 478	Name GeneratorSpeedHighInAGOSx
Log text	Max generator RPM: ____._ RPM	
Subsystem name	SV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

The generator RPM is found higher than **MaxGenRPMRatioPx** o/oo of **NominalGenRPM** in 200 msec. (**MaxGenRPMTimePx**).

Parameter for VMP Global TM:

/Turbine/ProdCtrl/SV/GeneratorSpeedHighInAGO/GenSpdHighAGO_HighHystSqrFiltAGOPx
/Turbine/ProdCtrl/SV/GeneratorSpeedHighInAGO/GenSpdHighAGO_HighHystTimeSqrFiltAGOPx

No: 202	SupervisionID 86	Name Freq1Sx	
Log text	Frequency error 1: ____ Hz		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	5	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	10 second	Category	Utility

Criteria:

This alarm is raised if the frequency is below or above a certain limit.

Par1: Frequency [Hz]

Par2: Parameter Limit value [pu]. Multiply with rated frequency to get value in Hz.

This alarm is raised if Grid voltage Frequency is above the threshold calculated $(1+**HighFreq1Lim**)**NominalFreq**$ and the time is longer than **HighFreq1ErrorTime**, or the threshold calculated is below $(1-**LowFreq1Lim**)**NominalFreq**$ and the time is longer than **LowFreq1ErrorTime**.

No: 203	SupervisionID 87	Name Freq2Sx	
Log text	Frequency error 2: ____ Hz		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	5	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	10 second	Category	Utility

Criteria:

This alarm is raised if the frequency is below or above a certain limit.

Par1: Frequency [Hz]

Par2: Parameter Limit value [pu]. Multiply with rated frequency to get value in Hz.

This alarm is raised if Grid voltage Frequency is above the threshold calculated $(1+**HighFreq2Lim**)**NominalFreq**$ and the time is longer than **HighFreq1ErrorTime**, or the threshold calculated is below $(1-**LowFreq2Lim**)**NominalFreq**$ and the time is longer than **LowFreq1ErrorTime**.

No: 204	SupervisionID 88	Name Freq3Sx	
Log text	Frequency error 3: ____ Hz		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	5	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	10 second	Category	Utility

Criteria:

This alarm is raised if the frequency is below or above a certain limit.

Par1: Frequency [Hz]

Par2: Parameter Limit value [pu]. Multiply with rated frequency to get value in Hz.

This alarm is raised if Grid voltage Frequency is above the threshold calculated $(1+**HighFreq3Lim**)**NominalFreq**$ and the time is longer than HighFreq1ErrorTime, or the threshold calculated is below $(1-**LowFreq3Lim**)**NominalFreq**$ and the time is longer than LowFreq1ErrorTime.

No: 205	SupervisionID 89	Name Freq4Sx	
Log text	Frequency error 4: ____ Hz		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	5	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	10 second	Category	Utility

Criteria:

This alarm is raised if the frequency is below or above a certain limit.

Par1: Frequency [Hz]

Par2: Parameter Limit value [pu]. Multiply with rated frequency to get value in Hz.

This alarm is raised if Grid voltage Frequency is above the threshold calculated $(1+**HighFreq4Lim**)**NominalFreq**$ and the time is longer than HighFreq1ErrorTime, or the threshold calculated is below $(1-**LowFreq4Lim**)**NominalFreq**$ and the time is longer than LowFreq1ErrorTime.

No: 216	SupervisionID 358	Name HydrOilLeakageInHubSx	
Log text	Oil leakage in Hub		
Subsystem name	PitchBlock		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

The alarm indicates if there is an oil leakage in the hub.

The signal ****IO.HydrOilLeakageHubSensorOk**** is only monitored if the parameter ****HydrSuperviseOilLeakageInHub**** is true.

The alarm is raised if one of the following conditions are met:

1. The signal ****IO.HydrOilLeakageHubSensorOk**** is FALSE for ****HydrOilLeakageDetectedTime****
2. There has been too many leakage counts (****HydrPressControlMaxCount****) within a certain time (****HydrOilLeakageInHubMaxWindowTime****). To avoid false leakage counts, leakage can only be detected once within a certain timeframe (****HydrOilLeakageInHubStabilizePeriod****).

This means, even though In_HydrOilLeakageHubSensorOk goes FALSE a number of times within the same timeframe, the leakage count will only be increased by 1.

The alarm can be automatically acknowledged if the signal ****IO.HydrOilLeakageHubSensorOk**** is true for ****HydrOilNoLeakageDetectedTime****.

No: 232	SupervisionID 403	Name WatchdogRebootSx	
Log text	WatchdogReboot		
Subsystem name	Watchdog		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopFast
- Allowed attempts	4	- Max time disconnect	0.9 second
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	60 second	Category	Manufacturer

Criteria:

A controlled shut-down and reboot - requested from a remote client (Toolkit).

The purpose of this alarm is to report undefined shutdown reason.

No: 296	SupervisionID 203	Name TowerOscillationsXDirectionHighSx
Log text	Tow. acc. X, Alarm: __. __ m/s^2	
Subsystem name	SV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors the Tower oscillations in sidewise direction (lateral) during normal operation and reacts when the oscillation exceeds the limit value.

This alarm is activated if the following conditions are met:

1. ****TowOscX_ActivityLevel**** = 2
2. When the **SP_TowAccXdirRMS** is greater than the upper threshold. The threshold value is calculated as follows:
 - a. by interpolation between ****TowOscX_WindSpd0ToAcc**** and ****TowOscX_WindSpd5ToAcc**** , if 0 m/s < ****WindMeasurement.WindSpeed**** <= 5 m/s
 - b. by interpolation between ****TowOscX_WindSpd5ToAcc**** and ****TowOscX_WindSpd10ToAcc**** , if 5 m/s < ****WindMeasurement.WindSpeed**** <= 10 m/s
 - c. by interpolation between ****TowOscX_WindSpd10ToAcc**** and ****TowOscX_WindSpd15ToAcc**** , if 10 m/s < ****WindMeasurement.WindSpeed**** <= 15 m/s
 - d. by interpolation between ****TowOscX_WindSpd15ToAcc**** and ****TowOscX_WindSpd20ToAcc**** , if 15 m/s < ****WindMeasurement.WindSpeed**** <= 20 m/s
 - e. by interpolation between ****TowOscX_WindSpd20ToAcc**** and ****TowOscX_WindSpd25ToAcc**** , if 20 m/s < ****WindMeasurement.WindSpeed**** <= 25 m/s
 - f. by interpolation between ****TowOscX_WindSpd25ToAcc**** and ****TowOscX_WindSpd30ToAcc**** , if 25 m/s < ****WindMeasurement.WindSpeed**** <= 30 m/s

The ****WindMeasurement.WindSpeed**** is filtered by a low pass filter with time constant ****TowOscX_WindSpdFiltTau**** before interpolation

No: 297	SupervisionID 204	Name TowerOscillationsYDirectionHighSx
Log text	Tow. acc. Y, Alarm: __. __ m/s^2	
Subsystem name	SV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors the Tower oscillations in thrust wise direction (back and forth) during normal operation and reacts when the oscillation exceeds the limit value.

This alarm is activated if the following conditions are met:

1. ****TowOscY_ActivityLevel**** = 2
2. ****AGO_AGOActive**** is false
3. When the **SP_TowAccYdirRMS** is greater than the upper threshold. The threshold value is calculated as follows:
 - a. by interpolation between ****TowOscY_WindSpd0ToAcc**** and ****TowOscY_WindSpd5ToAcc**** , if 0 m/s < ****WindMeasurement.WindSpeed**** <= 5 m/s
 - b. by interpolation between ****TowOscY_WindSpd5ToAcc**** and ****TowOscY_WindSpd10ToAcc**** , if 5 m/s < ****WindMeasurement.WindSpeed**** <= 10 m/s
 - c. by interpolation between ****TowOscY_WindSpd10ToAcc**** and ****TowOscY_WindSpd15ToAcc**** , if 10 m/s < ****WindMeasurement.WindSpeed**** <= 15 m/s
 - d. by interpolation between ****TowOscY_WindSpd15ToAcc**** and ****TowOscY_WindSpd20ToAcc**** , if 15 m/s < ****WindMeasurement.WindSpeed**** <= 20 m/s
 - e. by interpolation between ****TowOscY_WindSpd20ToAcc**** and ****TowOscY_WindSpd25ToAcc**** , if 20 m/s < ****WindMeasurement.WindSpeed**** <= 25 m/s
 - f. by interpolation between ****TowOscY_WindSpd25ToAcc**** and ****TowOscY_WindSpd30ToAcc**** , if 25 m/s < ****WindMeasurement.WindSpeed**** <= 30 m/s

The ****WindMeasurement.WindSpeed**** is filtered by a low pass filter with time constant ****TowOscY_WindSpdFiltTau**** before interpolation

No: 309	SupervisionID 549	Name RemotePauseSx
Log text	Pause over RCS __	
Subsystem name	vmp_emulator	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type Run
- Allowed attempts	Unlimited	- Max time disconnect 10000 second
- Time window	<n/a>	- Max time eliminate 10000 second
- Stabilize period	1 second	Category Owner

Criteria:

The Turbine is put into PAUSE by a remote control system.

No: 309	SupervisionID 2751	Name RemoteFastPauseSx
Log text	Pause over RCS ____	
Subsystem name	vmp_emulator	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseFast
- Allowed attempts	Unlimited	- Max time disconnect 8 second
- Time window	<n/a>	- Max time eliminate 1 hour
- Stabilize period	1 second	Category Owner

Criteria:

The Turbine is put into PAUSE by a remote control system.

No: 313	SupervisionID 314	Name EnvironmentTempTooHighSx
Log text	Ambient temperature high: ____°C	
Subsystem name	Environment	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect 15 second
- Time window	<n/a>	- Max time eliminate 45 second
- Stabilize period	60 second	Category Environmental

Criteria:

This alarm indicate that the environment temperature is too high.

This alarm appears if the environment temperature (signal ****Turbine.GlobalIceDetection.EnvironmentTemp****) exceeds the limit set in the parameter ****EnvironmentHighTempLimit****.

This alarm is acknowledged if the environment temperature drops below the limit set in the parameter ****EnvironmentHighTempLimit**** with the hysteresis set in the parameter ****EnvironmentHighTempHyst****.

No: 315	SupervisionID 41	Name ExtrExtrLowVoltSx
Log text	ExEx low voltage L_: ____V	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	5	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Utility

Criteria:

The grid voltage has exceeded certain grid voltage limits.

Alarm condition: One of the grid voltage ****VoltagePhasel****, ****VoltagePhase2**** or ****VoltagePhase3**** exceed the limit given by (****NominalVoltage**** x (1 - ****ExtrExtrLowVoltLim****)) and still exceed the limit given by (****NominalVoltage**** x (1 - ****ExtrExtrLowVoltHyst****)) after the time given by ****ExtrExtrLowVoltTime**** has passed.

The supervision use signals with a higher sample rate then ****VoltagePhasel****, ****VoltagePhase2**** and ****VoltagePhase3****. The supervision will therefor be able to be raised even though the signals seems ok.

Par1= Phase number (1,2 or 3)

Par2= Phase Voltage RMS [Volt]

No: 329

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

SupervisionID 2694

DC Overvolt: ____ V state ____

CubePower

Alarm

Auto

3

3600 second

60 second

Name HighDCVoltageSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopFast

0.9 second

1 hour

Manufacturer

Criteria:
The alarm is raised if the DC link voltage increases above the trip threshold.

No: 330

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

SupervisionID 78

Ext. high DC voltage ____ V

CubePower

Alarm

Auto

3

1 hour

60 second

Name ExtHighDCVoltSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopFast

0.9 second

1 hour

Manufacturer

Criteria:
The alarm is raised when the DC Link voltage exceeds a certain limit.

Par1: DC Link voltage
Par2: -

Alarm condition: The DC Link voltage ****DCLinkVoltage**** exceeds a certain limit which is determined by the HW defence line on the VPC board.
The alarm is only reported if the DC Link is charged.

The alarm is raised when the DC Link voltage exceeds a certain limit (****UDC1_High_Threshold**** / ****UDC2_High_Threshold****). There is 2 DC voltage sensors in the systems but only 1 is enable at the time.
The Par1 indicates which DC voltage sensor is using for the current measurement:
1 = the DC voltage sensor of the AUX_1 connector is using
2 = the DC voltage sensor of the AUX_2 connector is using

Par1: DC Link voltage sensor [1/2]
Par2: N/A

No: 332	SupervisionID 80	Name ExtLowDCVoltSx	
Log text	Ext. low DC voltage	_____ V	
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopFast
- Allowed attempts	3	- Max time disconnect	0.9 second
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	60 second	Category	Manufacturer

Criteria:

The alarm is raised when the DC Link voltage goes below a certain limit.

Par1: DC Link voltage

Par2: -

Alarm condition: The DC Link voltage ****DCLinkVoltage**** goes below a certain limit which is determined by the HW defence line on the VPC board.

The alarm is only reported if the DC Link is charged.

The alarm is raised when the DC Link voltage is below a certain limit (****UDC1_Low_Threshold**/**UDC2_Low_Threshold****). There is 2 DC voltage sensors in the systems but only 1 is enable at the time.

The Par1 indicates which DC voltage sensor is using for the current measurement:

1 = the DC voltage sensor of the AUX_1 connector is using

2 = the DC voltage sensor of the AUX_2 connector is using

Par1: DC Link voltage sensor [1/2]

Par2: N/A

No: 342	SupervisionID 72	Name EncoderHWErrSx	
Log text	Encoder hardware error		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopFast
- Allowed attempts	3	- Max time disconnect	0.9 second
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	1 second	Category	Manufacturer

Criteria:

This alarm monitors the encoder cable connection.

Causes for this alarm can be:

- Damaged encoder cable
- Encoder connector in adapter board is not properly mounted
- Encoder connector between adapter board (CT-420) and VPC (CT-440) is not properly mounted

No: 343	SupervisionID 73	Name EncoderSigErrSx	
Log text	Encoder signal error _:_____		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopFast
- Allowed attempts	3	- Max time disconnect	0.9 second
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	1 second	Category	Manufacturer
Criteria:			
This alarm monitors the encoder signal quality.			
This includes extra reset pulses and extra encoder pulses (**NO_ENC_PULSES**, **MAX_NO_EXTRA_ENC_PULSES**).			
If an unacceptable reset pulse or an excessive generator acceleration is detected from the encoder the alarm will activate (**MAX_OMEGAM_ENC_CHANGE**).			
Error Par1=0: Missing reset pulse; Error Par2=**GAMMAcount_Enc** (Encoder count)			
Error Par1=1: Excessive acceleration or extra reset pulse; Error Par2=**OMEGAM_ENC_HPF_ABS_1MS** (Encoder acceleration in rad/s)			
Causes for this alarm can be damaged encoder hardware or high noise levels on encoder cable.			
ENC_SUPERV_ENABLED is used for enable or disable of the alarm.			

No: 356	SupervisionID 207	Name ExtremeYawErrorSx	
Log text	Extreme yawerror __. _m/s __. _°		
Subsystem name	SV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	5	- Max time disconnect	1 hour
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	60 second	Category	Environmental

Criteria:

This supervision monitors the relative yaw error to prevent extreme yaw loads.

An alarm is raised if following conditions are met

1. ****ExYaw_ActivityLevel**** = 2
2. ****Converter.ConverterMainState**** is connected
3. ****SP_RotorSpdEst**** is greater than ****ExYaw_MinRotSpdActive****
4. **PSC_OprCmdMain** is equal to 'AutoCmd'
5. Filtered ****WindMeasurement.WindDirRel**** is greater than the alarm limit.

The alarm limit is calculated based on current valid ****WindMeasurement.WindSpeed**** filtered with time constant ****ExYaw_WindSpdFiltTau**** and linear interpolated on the curve whose x- axis is defined by

****ExYaw_WindPoint1****, ****ExYaw_WindPoint2****, ****ExYaw_WindPoint3**** and y-axis is defined by ****ExYaw_YawErrorPoint1****, ****ExYaw_YawErrorPoint2****, ****ExYaw_YawErrorPoint3****.

The validity of wind speed is decided if ****PSC_WindSpdSignalValid**** is true else old valid wind speed is used for calculation.

The filtered ****WindMeasurement.WindDirRel**** is calculated by a circular exponential discrete filter with time constant ****ExYaw_YawErrorFiltTau****

and its validity is checked if ****PSC_WindDirRelSignalValid**** is true else old valid wind direction relative is used for filtering.

No: 368	SupervisionID 518	Name IceDetectorSensorErrorSx	
Log text	Ice sensor error		
Subsystem name	IceDetector		
Type	Warning	Timeout	<disabled>
Acknowledgement	Remote	Shutdown type	<n/a>
- Allowed attempts	<n/a>	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

Internal error Labko ice-sensor. S866 low for more than 5 sec. (IceSensorDelayPx)

No: 375	SupervisionID 519	Name DeIceSafetyStopSx	
Log text	Ice safety stop Auto Ack		
Subsystem name	IceDetector		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	4	- Max time disconnect	15 second
- Time window	1 hour	- Max time eliminate	45 second
- Stabilize period	60 second	Category	Environmental

Criteria:

If **IceSafetyStopPx** = 1 and there is a probability of ice building up on the blades (acc. to err. no. 371-374), the turbine is paused and this error is logged.

No: 401	SupervisionID 426	Name SmokeDetectorSmokeDetectedSx	
Log text	Smoke detected		
Subsystem name	SmokeDetector		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Local	Shutdown type	StopSlow
- Allowed attempts	<n/a>	- Max time disconnect	3 second
- Time window	<n/a>	- Max time eliminate	9 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This alarm indicates that the smoke detection system has detected smoke.

This alarm is raised when the smoke detection system reports that it has detected smoke (ASDSmokeDetectedReportSupervision is true - OBS: Add signal).

This alarm can be acknowledged if the smoke detection system no longer is detecting smoke (ASDSmokeDetectedReportSupervision is false - OBS: Add signal).

No: 401	SupervisionID 426	Name SmokeDetectorSmokeDetectedSx	
Log text	Smoke detected		
Subsystem name	SmokeDetector		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Local	Shutdown type	StopSlow
- Allowed attempts	<n/a>	- Max time disconnect	3 second
- Time window	<n/a>	- Max time eliminate	9 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This alarm indicates that the Smoke Detector System has detected smoke.

This alarm is raised when the Fire Protection System is in operating mode (**IO.FireProtectionInOperatingMode** is true) for **StartupTime** and the System is not in maintenance (**IO.FireProtectionInMaintenanceMode** is false) and the smoke has been detected (**IO.FireProtectionSmokeDetected** is true).

This alarm can be acknowledged if the signal **IO.FireProtectionSmokeDetected** turns false.

No: 414	SupervisionID 374	Name PitchSpeedASStopLowHighSx
Log text	PistonAVel:__. _m/s,Ang:__. _°	
Subsystem name	PiSV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision monitors piston speed when emergency valves are active and raises an alarm when piston speed is out of the specified interval.

The supervision is enabled if the following conditions are met:

1. ****SpdStop_ActivityLevel**** = 2
2. ****SafetyPitchActive**** is True for more than ****SpdStop_EMCDelay**** sec
3. ****PitchBladeAAngle**** < ****PiSV_PitchPosMaxLim****
4. ****PiSP.PiSP_PistonMeasA_Valid**** is True

The alarm is activated if the following additional conditions are met:

1. ****PiSP_PistonASpd**** > ****SpdStop_HighLimit**** OR ****PiSP_PistonASpd**** < ****SpdStop_LowLimit****
2. Condition 1 is met for more than ****SpdStop_LimitTime**** sec

Log text (VOT): "EMCValv. Piston Speed A vel.:__. _°/s ,vel.:__. _m/s"

Log text (VDC): "EMCValv. Pitch A vel.:__. _°/s"

No: 415	SupervisionID 378	Name PitchSpeedBStopLowHighSx
Log text	PistonBVel:__. _m/s,Ang:__. _°	
Subsystem name	PiSV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision monitors piston speed when emergency valves are active and raises an alarm when piston speed is out of the specified interval.

The supervision is enabled if the following conditions are met:

1. ****SpdStop_ActivityLevel**** = 2
2. ****SafetyPitchActive**** is True for more than ****SpdStop_EMCDelay**** sec
3. ****PitchBladeBAngle**** < ****PiSV_PitchPosMaxLim****
4. ****PiSP.PiSP_PistonMeasB_Valid**** is True

The alarm is activated if the following additional conditions are met:

1. ****PiSP_PistonBSpd**** > ****SpdStop_HighLimit**** OR ****PiSP_PistonBSpd**** < ****SpdStop_LowLimit****
2. Condition 1 is met for more than ****SpdStop_LimitTime**** sec

Log text (VOT): "EMCValv. Piston Speed B vel.:__. _°/s ,vel.:__. _m/s"

Log text (VDC): "EMCValv. Pitch B vel.:__. _°/s"

No: 416	SupervisionID 382	Name PitchSpeedCStopLowHighSx
Log text	PistonCVel:__. _m/s,Ang:__. _°	
Subsystem name	PiSV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision monitors piston speed when emergency valves are active and raises an alarm when piston speed is out of the specified interval.

The supervision is enabled if the following conditions are met:

- 1. ****SpdStop_ActivityLevel**** = 2
- 2. ****SafetyPitchActive**** is True for more than ****SpdStop_EMCDelay**** sec
- 3. ****PitchBladeCAngle**** < ****PiSV_PitchPosMaxLim****
- 4. ****PiSP.PiSP_PistonMeasC_Valid**** is True

The alarm is activated if the following additional conditions are met:

- 1. ****PiSP_PistonCSpd**** > ****SpdStop_HighLimit**** OR ****PiSP_PistonCSpd**** < ****SpdStop_LowLimit****
- 2. Condition 1 is met for more than ****SpdStop_LimitTime**** sec

Log text (VOT): "EMCValv. Piston Speed C vel.:__. _°/s ,vel.:__. _m/s"
Log text (VDC): "EMCValv. Pitch C vel.:__. _°/s"

No: 417	SupervisionID 370	Name PitchPosStopDeviationBetweenABCSx
Log text	EMCV. Pitch min:__.__°max:__.__°	
Subsystem name	PiSV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision monitors the deviation between pitch angles in all three pitch systems when the emergency valves are active and triggers an alarm when the deviation exceeds a specified limit.

The supervision is enabled if the following conditions are met:

- 1. ****StopABC_ActivityLevel**** = 2
- 2. ****SafetyPitchActive**** is True
- 3. PiSP.PiSP_PistonMeasA_Valid, PiSP.PiSP_PistonMeasB_Valid and PiSP.PiSP_PistonMeasC_Valid are all True

The alarm is activated if the following additional conditions are met:

- 1. ****PiSV_PitchPosMax**** is less than the the sum of ****StopABC_PitchOffset**** and the stored ****PiSV_PitchPosMax**** from when ****SafetyPitchActive**** became True, or less than ****StopABC_MaxPitch**** whichever is lower
- 2. Maximum deviation (****PiSV_PitchPosMax**** - ****PiSV_PitchPosMin****) is greater than ****StopABC_MaxDev****
- 3. Both condition 1 and 2 have been met for more than ****StopABC_MaxDevTime**** sec

Log text: "EMCV. Pitch min:__.__°max:__.__ °"

No: 430	SupervisionID 213	Name DriveTrainOscillationHighSx
Log text	Transm. osc. ____ RPM, ____ m/s	
Subsystem name	SV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseFast
- Allowed attempts	3	- Max time disconnect 8 second
- Time window	60 minute	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors excessive oscillations in the drive train.

An alarm is reported if following conditions are met continuously for
****DrvTrn_OscTripStartTime**** sec:

1. ****DrvTrn_ActivityLevel**** = 2
2. RotorSpd > DrvTrn_MinRotorSpd
3. ****AGO_AGOActive**** is false
4. SafetyPitchActive is false
5. Filtered ****GeneratorTachoSpeed**** is greater than the alarm limit

The above alarm limit is calculated based on current ****WindMeasurement.WindSpeed**** filtered with time constant ****DrvTrn_WindSpdFiltTau**** and interpolated on the curve whose x- axis is defined by ****DrvTrn_WindSpdPoint1****, ****DrvTrn_WindSpdPoint2****, ****DrvTrn_WindSpdPoint3****, ****DrvTrn_WindSpdPoint4**** and y-axis is defined by ****DrvTrn_MaxOscPoint1****, ****DrvTrn_MaxOscPoint2****, ****DrvTrn_MaxOscPoint3****, ****DrvTrn_MaxOscPoint4****.

The filtered ****GeneratorTachoSpeed**** is calculated first by passing ****GeneratorTachoSpeed**** through discrete second order high pass filter with cutoff frequency ****DrvTrn_GenSpdOscHpCutoffFreq****. Then this high pass filtered gen speed is squared, low pass filtered with time constant ****DrvTrn_GenSpdOscFiltTau****, and finally the square root is taken.

No: 444	SupervisionID 650	Name EMFAccumulatorBOilPressLowSx
Log text	EMF Acc _ Press Low, ____ bar	
Subsystem name	PiSV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	1 minute	Category Manufacturer

Criteria:

This supervision monitors if the EMF accumulator pressure in pitch block B gets too low

This alarm is activated if the following conditions are met for more than
****PitchBlockLowPress_Timeout**** sec

1. ****PitchBlockLowPress_ActivityLevel**** = 2
2. ****SafetyPitchActive**** is false
3. ****PiSP_EMFAccumulatorPressB**** is below ****PitchBlockLowPress_PressLimit****
if the turbine is in service then the threshold will be subtracted with ****PitchBlockLowPress_ServicePressHyst****
when the feature Dynamic Wind Guard is active for Blade B (**DWG_StateB** > 0) the threshold will be subtracted with ****PitchBlockLowPress_DWGActive_PressHyst****

No: 444	SupervisionID 649	Name EMFAccumulatorAOilPressLowSx	
Log text	EMF Acc _ Press Low, ____._ bar		
Subsystem name	PiSV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	1 minute	Category	Manufacturer

Criteria:

This supervision monitors if the EMF accumulator pressure in pitch block A gets too low

This alarm is activated if the following conditions are met for more than
****PitchBlockLowPress_Timeout**** sec

1. ****PitchBlockLowPress_ActivityLevel**** = 2
2. ****SafetyPitchActive**** is false
3. ****PiSP_EMFAccumulatorPressA**** is below ****PitchBlockLowPress_PressLimit****
if the turbine is in service then the threshold will be subtracted with
****PitchBlockLowPress_ServicePressHyst****
when the feature Dynamic Wind Guard is active for Blade A (DWG_StateA > 0) the
threshold will be subtracted with ****PitchBlockLowPress_DWGActive_PressHyst****

No: 444	SupervisionID 651	Name EMFAccumulatorCOilPressLowSx	
Log text	EMF Acc _ Press Low, ____._ bar		
Subsystem name	PiSV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	1 minute	Category	Manufacturer

Criteria:

This supervision monitors if the EMF accumulator pressure in pitch block C gets too low

This alarm is activated if the following conditions are met for more than
****PitchBlockLowPress_Timeout**** sec

1. ****PitchBlockLowPress_ActivityLevel**** = 2
2. ****SafetyPitchActive**** is false
3. ****PiSP_EMFAccumulatorPressC**** is below ****PitchBlockLowPress_PressLimit****
if the turbine is in service then the threshold will be subtracted with
****PitchBlockLowPress_ServicePressHyst****
when the feature Dynamic Wind Guard is active for Blade C (DWG_StateC > 0) the
threshold will be subtracted with ****PitchBlockLowPress_DWGActive_PressHyst****

No: 447	SupervisionID 662	Name TransformerHighTempDerateInColdEnvironmentSx
Log text	Trafo Temp Diff	
Subsystem name	Transformer	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:
Derate, which is activated due to too high transformer temperature, is active in Cold environment. The environment is Cold when the environment temperature is below certain value, which is dependent on the turbine type.

No: 447	SupervisionID 663	Name TransformerPhaseTempDiffHighSx
Log text	Trafo Temp Diff	
Subsystem name	Transformer	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:
The difference between the maximum and the minimum temperature of the transformer phases is above the limit for the predefined time.

No: 448	SupervisionID 2752	Name RemoteSlowStopSx
Log text	Remote Stop	
Subsystem name	vmp_emulator	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Utility

Criteria:
Alarm raised when remote user request slow stop, to enable stopping the turbine in a controlled manner.

No: 460	SupervisionID 2834	Name DiscSupervTimeoutSx
Log text	Generator Disc timeout	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

The converter has not properly disconnected within the specified time.

This alarm is raised if the MSC application state machine during a disconnect attempt fails to disconnect within a timeout (**DISCONNECT_MAX_TIME**)

Par1 : Disconnect timeout [s].

Par2 : N/A

No: 462	SupervisionID 2837	Name VPCIntSwErrDiscSx
Log text	VPC board IntSW Disc __:__	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the converter software enters a state which is not allowed, and the error results in a disconnect of the generator.

No: 464	SupervisionID 2839	Name VPCIntSwErrDischarSx
Log text	VPC board IntSW DCharge __:__	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the converter software enters a state which is not allowed, and the error results in a discharge of the converter.

No: 467	SupervisionID 2840	Name VPCIntSwErrStopSx
Log text	VPC board IntSW Stop __:__	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the converter software enters a state which is not allowed, and the error results in a stop of the converter.

No: 469	SupervisionID 2841	Name StopFailedSx	
Log text	StopCmd failed. __:__		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopFast
- Allowed attempts	3	- Max time disconnect	0.9 second
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is raised if the converter is unable to open all relevant contactors to complete a stop within a timeout (**Stopping_Supervision_Time**).

No: 604	SupervisionID 404	Name RemoteRebootSx	
Log text	Remote Reboot		
Subsystem name	Watchdog		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect	1 hour
- Time window	<n/a>	- Max time eliminate	1 hour
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

The purpose of this alarm is to report an toolkit or firedrake initiated shutdown.

No: 691	SupervisionID 584	Name StatusSignalWarningSx	
Log text	SignalError. _____, _____		
Subsystem name	StatusSignalSupervision		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This warning is raised on failure of any Status Signal in Application - Framework.

No: 693	SupervisionID 586	Name StatusSignalAlarmWithSlowShutdownSx	
Log text	SignalError-PAUSE _____, _____		
Subsystem name	StatusSignalSupervision		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseFast
- Allowed attempts	3	- Max time disconnect	8 second
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

This alarm is raised when at least one physical signal attached to it becomes invalid. Please use Toolkit3's IO system overview investigate the signal status. The supervision log will contain the first signal that became invalid. If entire CAN nodes goes unavailable only 1 signal will be in the log. In these cases Toolkit3 will give a better overview.

No: 695	SupervisionID 587	Name StatusSignalAlarmWithFastShutdownSx
Log text	SignalError-EMERG _____, _____	
Subsystem name	StatusSignalSupervision	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopFast
- Allowed attempts	<n/a>	- Max time disconnect 0.9 second
- Time window	<n/a>	- Max time eliminate 1 hour
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This alarm is raised on failure of any Status Signal in Application - Framework. The turbine will shutdown fast.

No: 703	SupervisionID 135	Name VoltageDipExcSx
Log text	RT Dip exc.lim.: ____%: _____e-2s	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	5	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Utility

Criteria:

The grid voltage has been too low for too long time. A voltage dip (reduction in grid voltage) exceeded what the turbine is allowing.

The alarm ensure that the turbine is stopped if the grid voltage is too low for too long time. It is partly to protect the turbine, but also to protect the grid and disconnect if the grid conditions are abnormal.

4 parameters (RTt1Px[s], RTUgrid1Px[pu] and RTt2Px[s], RTUgrid2Px[pu]) describes a voltage versus time curve

These specifies the minimum allowed grid voltage to a given time after the grid dip has started.

If the voltage drop is below this curve, either because the voltage becomes too low or the duration is too long, this supervision is reported and the turbine is stopped.

The protection function is using the lowest voltage from 4 inputs (3 phase voltages and the positive sequence voltage) which it compares with a preset curve from (RTt1Px[s], RTUgrid1Px[pu]) and (RTt2Px[s], RTUgrid2Px[pu])

Par1 : Minimum Voltage detected [%]

Par2 : Duration [s]

No: 803	SupervisionID 230	Name GeneratorSpeedSignalFaultSx
Log text	GenRpm error measurem. ____rpm	
Subsystem name	PSC	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

The generator RPM measurement system has an error.
The error is reported if the acceleration in GenRPM is higer than MaxAccGenRpmPx for a period exceeding MaxTimeMaxAccGenRpmPx

No: 852	SupervisionID 81	Name ExtrExtrHighVoltSx
Log text	Extr Extr high volt. L_: ____ V	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	5	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Utility

Criteria:

The grid voltage has exceeded certain grid voltage limits.

Alarm condition: One of the grid voltage ****VoltagePhase1****, ****VoltagePhase2**** or ****VoltagePhase3**** exceed the limit given by (****NominalVoltage**** x (1 + ****ExtrExtrHighVoltLim****)) and still exceed the limit given by (****NominalVoltage**** x (1 + ****ExtrExtrHighVoltHyst****)) after the time given by ****ExtrExtrHighVoltTime**** has passed.
The supervision use signals with a higher sample rate then ****VoltagePhase1****, ****VoltagePhase2**** and ****VoltagePhase3****. The supervision will therefor be able to be raised even though the signals seems ok.

Par1= Phase number (1,2 or 3)

Par2= Phase Voltage RMS [Volt]

No: 891	SupervisionID 2747	Name YawGearProtectionSx
Log text	Yaw prot.___.__m/s2 Wdir____. _°	
Subsystem name	SV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	5	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	5 minute	Category Environmental

Criteria:

Turbulence level has been too high. If the turbulence level (m/s^2 RMS)has been above YawProtecAlarm_x_m_sPx the error is triggered.

No: 894	SupervisionID 552	Name HeatingGearBearingsAndGearOilSx	
Log text	Heating nacelle and gear oil		
Subsystem name	Gearbox		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	0 second	Category	Environmental

Criteria:

This alarm is indicating that the turbine is not producing power while the gear oil and gear bearings are being heated by means of derated rotations or derated power production.

This is not an ordinary alarm. The alarm does not stop the turbine. Rather it is raised if the turbine stops producing power while heating the gear and is auto acknowledged as soon as the turbine produces power again or the heating procedure has completed. The alarm is only used by SCADA and is there for statistical purposes only.

The alarm is raised if the following conditions all are met:

1. The command to the turbine has been Production for some time - i.e. ****OperationManager.MainTurbineCommandOutput**** has been ProductionCmd for more than ****ProductionDelayTime****.
2. The turbine is derated due to cold gear oil or cold gear bearings - i.e. ****ColdGearOilDerateActive**** or ****ColdGearBearingsDerateActive**** is true.
3. The turbine state is Production or PendingProduction - i.e. ****OperationManager.MainTurbineState**** is Production or PendingProduction.
4. The converter state is different from Connected - i.e. ****Converter.ConverterState**** different from Connected.

The alarm is auto acknowledged if any one of the conditions above is not met anymore.

The alarm is monitored only if the parameter ****HeatingGearSupervisionEnable**** is configured as "true".

No: 897	SupervisionID 553	Name HydrBlockColdSx	
Log text	Heating valve block (pause)		
Subsystem name	HydraulicStation		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	Run
- Allowed attempts	5	- Max time disconnect	10000 second
- Time window	1 second	- Max time eliminate	10000 second
- Stabilize period	1 second	Category	Environmental

Criteria:

The alarm indicates that the hydraulic oil is cold during hydraulic startup procedure.

No: 899	SupervisionID 409	Name HighGridVoltageSx
Log text	Grid volt above stop lim ____%	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	5	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	10 second	Category Utility

Criteria:

The grid voltage has exceeded the grid voltage limit.

This supervision is a Fast Overvoltage Protection that instantly trips the turbine if the grid voltage goes above the ****HighGridVoltage**** limit.

This supervision monitors that the grid space voltages (calculated from instantaneous ****VoltagePhase1****, ****VoltagePhase2**** and ****VoltagePhase3****) does not go above ****HighGridVoltage**** relative to the ****UL_NOM**** ss.

Par1 : Measured space Voltage in percent [%]

Par2 : State of the converter

The voltage signal are low pass filtered (TiUSqrAmpPeak_fil) to get the desired behavior.

No: 900	SupervisionID 550	Name ManualPauseSx
Log text	Pause pressed on keyboard	
Subsystem name	vmp_emulator	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type Run
- Allowed attempts	5	- Max time disconnect 10000 second
- Time window	1 second	- Max time eliminate 10000 second
- Stabilize period	1 second	Category Manufacturer

Criteria:

Press PAUSE on keyboard

No: 910	SupervisionID 431	Name TowerAccXDirectionSignalFaultSx
Log text	Tow. acc. X Fault:__.__ m/s^2	
Subsystem name	TAF	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervises the validity of the tower acceleration signal in X-direction.

An alarm is reported if follwing conditions are met:

1. ****TowAccXFault_ActivityLevel**** = 2
2. Validity of ****IO.TowerAccelerationXDirection**** signal is different from 1 for more than ****TowAccXFault_InvalidSignalTimeLimit**** sec

No: 911	SupervisionID 432	Name TowerAccYDirectionSignalFaultSx	
Log text	Tow. acc. Y Fault:___.___ m/s^2		
Subsystem name	TAF		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	1 hour
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This supervises the validity of the tower acceleration signal in Y-direction.

An alarm is reported if follwing conditions are met:

1. **TowAccYFault_ActivityLevel** = 2
2. Validity of IO.TowerAccelerationYDirection signal is different from 1 for more than **TowAccYFault_InvalidSignalTimeLimit** sec

No: 913	SupervisionID 405	Name PauseSlowTimeoutSx	
Log text	Shutdown timeout Pause Slow		
Subsystem name	PSC		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseFast
- Allowed attempts	3	- Max time disconnect	8 second
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is reported if the PauseSlow shutdown times out.

An alarm is reported if following conditions are met:

1. **PSC_PauseSlow_ActivityLevel** = 2
2. Shutdown by PauseSlow (**PSC_ShutDownState** = 4) takes longer than **PSC_PauseSlow_Timeout** time

No: 914	SupervisionID 406	Name PauseFastTimeoutSx	
Log text	Shutdown timeout Pause Fast		
Subsystem name	PSC		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is reported if the PauseFast shutdown times out.

An alarm is reported if following conditions are met:

1. **PSC_PauseFast_ActivityLevel** = 2
2. Shutdown by PauseFast (**PSC_ShutDownState** = 3) takes longer than **PSC_PauseFast_Timeout** time

No: 915	SupervisionID 407	Name StopSlowTimeoutSx	
Log text	Shutdown timeout Stop Slow		
Subsystem name	PSC		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopFast
- Allowed attempts	3	- Max time disconnect	0,9 second
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is reported if the StopSlow shutdown times out.

An alarm is reported if following conditions are met:

1. **PSC_StopSlow_ActivityLevel** = 2
2. Shutdown by StopSlow (**PSC_ShutDownState** = 2) takes longer than **PSC_StopSlow_Timeout** time.

No: 916	SupervisionID 408	Name StopFastTimeoutSx	
Log text	Shutdown timeout Stop Fast		
Subsystem name	PSC		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	Emergency
- Allowed attempts	3	- Max time disconnect	0 second
- Time window	1 hour	- Max time eliminate	0 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is reported if the StopFast shutdown times out

An alarm is reported if following conditions are met:

1. **PSC_StopFast_ActivityLevel** = 2
2. Shutdown by StopFast (**PSC_ShutDownState** = 1) takes longer than **PSC_StopFast_Timeout** time

No: 928	SupervisionID 2737	Name DisconnectAtHighFreqSx	
Log text	Disconnect High Freq ____ Hz		
Subsystem name	SV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	9 second
- Time window	24 hour	- Max time eliminate	10 second
- Stabilize period	1 minute	Category	Utility

Criteria:

Some grid codes require that the turbines disconnect in case of extreme over-frequencies on the grid. This limit could be set lower than the frequency limit for the converter and therefore this supervision aims at supporting this specific grid code requirements. The over frequency error

limit is given by:

(VCP: /Turbine/ProdCtrl/SV/DisconnectAtHighFreq/FreqHigh_FreqRefPx)

No: 931	SupervisionID 2761	Name ArcLightDetectedSx	
Log text	Arc light detected		
Subsystem name	ArcLightDetector		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Local	Shutdown type	Emergency
- Allowed attempts	<n/a>	- Max time disconnect	0 second
- Time window	<n/a>	- Max time eliminate	0 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

If an Arc is detected, relay K175 is activated. The relay sends the primary trip signal to the high voltage breaker (F60).

The controller also sends a trip signal to F60 as a backup

No: 958	SupervisionID 590	Name YawLubricationErrorSx	
Log text	Yaw Lubrication Failed		
Subsystem name	YawLubrication		
Type	Warning	Timeout	90 day
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect	1 hour
- Time window	<n/a>	- Max time eliminate	1 hour
- Stabilize period	10 second	Category	Manufacturer

Criteria:

This warning is raised if the yaw lubrication pump is not working properly.

When the pump is running, the signal from the grease distribution block (proximity switch)

must change within the specified time given by ****ProximitySwitchTimeout****.

If the proximity switch signal does not change within the specified time, it can indicate one of the following problems:

- * there is no grease in the reservoir
- * the distribution system is not functioning correctly

Proximity switch from pump 1 is ****IO.YawLubrProximitySwitchOn****

No: 959	SupervisionID 3508	Name IdleAfterGridDropSx	
Log text	pause after grid drop		
Subsystem name	ProductionManager		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect	9 second
- Time window	<n/a>	- Max time eliminate	10 second
- Stabilize period	<n/a>	Category	Utility

Criteria:

The turbine will remain in Pause state after grid power outage, until this alarm has been acknowledged manually by the operator. This is an option to be used for sites with special grid conditions, where turbines are not allowed to reconnect automatically when the grid voltage has been restored.

No: 973	SupervisionID 668	Name MainShaftBearingRETempTooHighSx
Log text	High temp RE main bear:____°C	
Subsystem name	MainShaft	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 9 second
- Time window	<n/a>	- Max time eliminate 10 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:
Active if Mainshaft-RotorEnd temperature is above MainShaftBearingREHighTempLimitPx (80)

No: 974	SupervisionID 669	Name MainShaftBearingNRETempTooHighSx
Log text	High temp NRE main bear:____°C	
Subsystem name	MainShaft	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 9 second
- Time window	<n/a>	- Max time eliminate 10 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:
Active if Mainshaft-NonRotorEnd temperature is above MainShaftBearingNREHighTempLimitPx (80)

No: 985	SupervisionID 596	Name TowerAccYDirectionSignalDeadSx
Log text	TowerAccY SignalDead __m/s^2	
Subsystem name	TAF	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Manufacturer

Criteria:
This supervision monitors the quality of the tower acceleration in Y-direction. If this signal is dead the turbine will shutdown

No: 986	SupervisionID 597	Name TowerAccYDirectionZeroCrossSx	
Log text	TowerAccY NoZeroCross __m/s^2		
Subsystem name	TAF		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	9 second
- Time window	1 hour	- Max time eliminate	10 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This supervises the quality of the tower acceleration signal in Y-direction by monitoring if the signal performs zero crossings (oscillating around zero).

This supervision can be used since the tower of a turbine always is expected to be oscillating a little back and forth, hereby giving acceleratings and de-accelerations in both directions.

An alarm is triggered if fowlloing conditions are met:

1. ****TowAccYZeroCross_ActivityLevel**** = 2
2. ****PowerReference**** is greater than the product of ****TowAccYZeroCross_EnablePowerRatio**** and ****TowAccYZeroCross_Pnom****
3. ****IO.TowerAccelerationYDirection**** does not change its sign (no zero crossing) for a period defined by ****TowAccYZeroCross_NoTowCyclesToTrig**** divided by ****TowerNaturalFrequency****
4. Maximum & minimum value of ****IO.TowerAccelerationYDirection**** is outside the band defined by (+,-) ****TowAccYZeroCross_TrigMinAmpl****

No: 1709	SupervisionID 709	Name TYC_ConstLoadSignalADetectedSx	
Log text	TYC Const Load Sig A Detected		
Subsystem name	TYC		
Type	Warning	Timeout	0,5 year
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	1 hour
- Time window	6 hour	- Max time eliminate	1 hour
- Stabilize period	0 second	Category	Manufacturer

Criteria:

This supervision monitors the load sensor signal for blade A and raise an error flag, if a dead signal is detected from the load sensor

This alarm is activated if the following conditions are met

1. ****TYC_ConstLoadSignal_EnableSV**** = 1
2. ****ProdCtrl.SP_RotorSpdEst**** is greater than ****TYC_ConstLoadSignal_MinRotSpdForLog**** rpm
3. Current value of ****BladeLoadA**** is constant for ****TYC_ConstLoadSignal_Revolutions**** rotor revolutions

No: 1710	SupervisionID 710	Name TYC_ConstLoadSignalBDetectedSx
Log text	TYC Const Load Sig B Detected	
Subsystem name	TYC	
Type	Warning	Timeout 0,5 year
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	6 hour	- Max time eliminate 1 hour
- Stabilize period	0 second	Category Manufacturer

Criteria:

This supervision monitors the load sensor signal for blade B and raise an error flag, if a dead signal is detected from the load sensor

This alarm is activated if the following conditions are met

1. ****TYC_ConstLoadSignal_EnableSV**** = 1
2. ****ProdCtrl.SP_RotorSpdEst**** is greater than ****TYC_ConstLoadSignal_MinRotSpdForLog**** rpm
3. Current value of ****BladeLoadB**** is constant for ****TYC_ConstLoadSignal_Revolutions**** rotor revolutions

No: 1711	SupervisionID 711	Name TYC_ConstLoadSignalCDetectedSx
Log text	TYC Const Load Sig C Detected	
Subsystem name	TYC	
Type	Warning	Timeout 0,5 year
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	6 hour	- Max time eliminate 1 hour
- Stabilize period	0 second	Category Manufacturer

Criteria:

This supervision monitors the load sensor signal for blade C and raise an error flag, if a dead signal is detected from the load sensor

This alarm is activated if the following conditions are met

1. ****TYC_ConstLoadSignal_EnableSV**** = 1
2. ****ProdCtrl.SP_RotorSpdEst**** is greater than ****TYC_ConstLoadSignal_MinRotSpdForLog**** rpm
3. Current value of ****BladeLoadC**** is constant for ****TYC_ConstLoadSignal_Revolutions**** rotor revolutions

No: 1712	SupervisionID 712	Name TYC_GainHystErrorDetectedSx
Log text	TYC Gain Hyst Err Detected	
Subsystem name	TYC	
Type	Warning	Timeout 0,5 year
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	6 hour	- Max time eliminate 1 hour
- Stabilize period	0 second	Category Manufacturer

Criteria:
This supervision monitors the quality of blade load signals by detecting if the blade load signals has very different standard deviations
A warning is triggered if the following conditions are met:

1. ****TYC_GainHyst_EnableSV**** = 1
2. ****Turbine.ProdCtrl.SP_RotorSpdEst**** is greater than ****TYC_GainHyst_MinRotSpdForLog****
3. StdMinMaxRatio is continuously less than a wind speed dependent limit for ****TYC_GainHyst_PotentialFaultTimeout**** seconds

StdMinMaxRatio is calculated as the ratio of the minimum and maximum standard deviation of the three flapwise root moment signals (****BladeLoadA****, ****BladeLoadB****, ****BladeLoadC****)
highpass filtered with cutoff frequency ****TYC_GainHyst_LoadSignalHpFiltFreq****. The standard deviation estimates are saturated to a minimum value of ****TYC_GainHyst_MinBladeLoadStd****.

The standard deviation is calculated for each flapwise root moment with a window length of ****TYC_GainHyst_LoadWindowTime****.

The limit for StdMinMaxRatio is calculated based on the average wind speed and interpolated using a curve having x-axis defined by points [****TYC_GainHyst_WindPoint1****, ****TYC_GainHyst_WindPoint2****, ****TYC_GainHyst_WindPoint3****]
and y-axis defined by [****TYC_GainHyst_StdRatioLimit1****, ****TYC_GainHyst_StdRatioLimit2****, ****TYC_GainHyst_StdRatioLimit3****].

The wind speed ****WindMeasurement.WindSpeed**** is averaged with a window length of ****TYC_GainHyst_WindWindowTime****.

The warning is cleared if:
- ****Turbine.ProdCtrl.SP_RotorSpdEst**** drops below ****TYC_GainHyst_MinRotSpdForLog****
or
- StdMinMaxRatio becomes greater than the current limit plus a hysteresis parameter ****TYC_GainHyst_StdRatioHyst****.

No: 1715	SupervisionID 715	Name LoadSensorStatusErrorASx	
Log text	TYC Load Sensor Status A Err		
Subsystem name	PiSP		
Type	Warning	Timeout	0,5 year
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	1 hour
- Time window	6 hour	- Max time eliminate	1 hour
- Stabilize period	0 second	Category	Manufacturer

Criteria:

This supervision monitors the status of blade load sensor A

An alarm is activated if status signal of ****BladeLoadA**** is false (0)

No: 1716	SupervisionID 716	Name LoadSensorStatusErrorBSx	
Log text	TYC Load Sensor Status B Err		
Subsystem name	PiSP		
Type	Warning	Timeout	0,5 year
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	1 hour
- Time window	6 hour	- Max time eliminate	1 hour
- Stabilize period	0 second	Category	Manufacturer

Criteria:

This supervision monitors the status of blade load sensor B

An alarm is activated if status signal of ****BladeLoadB**** is false (0)

No: 1717	SupervisionID 717	Name LoadSensorStatusErrorCSx	
Log text	TYC Load Sensor Status C Err		
Subsystem name	PiSP		
Type	Warning	Timeout	0,5 year
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	1 hour
- Time window	6 hour	- Max time eliminate	1 hour
- Stabilize period	0 second	Category	Manufacturer

Criteria:

This supervision monitors the status of blade load sensor C

An alarm is activated if status signal of ****BladeLoadC**** is false (0)

No: 1718	SupervisionID 718	Name AzimuthSensorStatusErrorSx
Log text	TYC Azim Sensor Status Err	
Subsystem name	PiSP	
Type	Warning	Timeout 0,5 year
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	6 hour	- Max time eliminate 1 hour
- Stabilize period	0 second	Category Manufacturer

Criteria:

This supervision monitors the RotorSpeed value and status of the RotorAzimuthAngle.

This alarm is activated if the timer reaches PiSP_SensorFault_AzimuthTimeout.

The timer will start when any of the following conditions are met;

1. Status of ****IO.RotorAzimuthAngle**** signal is invalid
2. RotorSpeed value is lesser than PiSP_SensorFault_MinRotorSpeed

No: 1719	SupervisionID 719	Name LoadSensorCalibrationErrorSx
Log text	TYC Load Sensor Calib Err	
Subsystem name	PiSP	
Type	Warning	Timeout 0,5 year
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	6 hour	- Max time eliminate 1 hour
- Stabilize period	0 second	Category Manufacturer

Criteria:

This supervision monitors the status of blade load sensor C

An alarm is activated if PiSP_BladeLoadSensorCalibrationOk is false (0)

No: 1721	SupervisionID 721	Name TYC_RotorAzimuthErrorDetectedSx	
Log text	TYC Rotor Azim Err Detected		
Subsystem name	TYC		
Type	Warning	Timeout	0,5 year
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	1 hour
- Time window	6 hour	- Max time eliminate	1 hour
- Stabilize period	15 minute	Category	Manufacturer

Criteria:

This supervision monitors errors in the azimuth angle measurement.

This alarm is activated if the following conditions are met

1. ****TYC_AziError_EnableSV**** = 1
2. ****ProdCtrl.SP_GenSpdFiltDrvTrnBs**** is greater than ****TYC_RotorAziErr_MinRotSpdForLog**** rpm
3. Status signal of ****IO.RotorAzimuthAngle**** is valid
4. The difference between measured ****IO.RotorAzimuthAngle**** and estimated rotor azimuth angle is greater than ****TYC_AziError_AzimuthErrorLimit****
the rotor azimuth is estimated based on ****IO.RotorTachoSpeed**** and previous sample of ****IO.RotorAzimuthAngle****
Estimated rotor azimuth = previous sample of ****IO.RotorAzimuthAngle**** +
0.6****IO.RotorTachoSpeed****

The alarm is deactivated if the difference between measured ****IO.RotorAzimuthAngle**** and estimated rotor azimuth angle is within

****TYC_AziError_AzimuthErrorLimit**** for ****TYC_RotorAzimuthErrFreeLimit**** complete rotation of rotor.

No: 2006	SupervisionID 606	Name ThermoFaultSx	
Log text	Thermoerror hydraulicmotor		
Subsystem name	HydraulicStation		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	9 second
- Time window	1 hour	- Max time eliminate	10 second
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.HydrOfflinePumpOverloaded**** is true.

The motor is stopped when the thermo fault warning/alarm is reported.

No: 2661	SupervisionID 661	Name TransformerExtremeHighTempSx
Log text	TransTempExtHigh:Ph_Temp____°C	
Subsystem name	Transformer	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type Emergency
- Allowed attempts	<n/a>	- Max time disconnect 0 second
- Time window	<n/a>	- Max time eliminate 0 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

The highest temperature of all three phases in transformer has been above the extreeme high limit for predefined time.

No: 2668	SupervisionID 665	Name AuxTransformerHighTemperatureSx
Log text	AuxTransformer Temp High ____°C	
Subsystem name	AuxTransformer	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect 60 second
- Time window	<n/a>	- Max time eliminate 60 second
- Stabilize period	1 second	Category Manufacturer

Criteria:

This alarm indicates that the temperature inside the auxiliary transformer exceeds a certain limit.

This alarm is raised if the temperature inside the auxiliary transformer

****IO.AuxTransformerTemp**** exceeds the limit given by the parameter

****HighTemperatureLimit****.

The alarm is auto acknowledged if the auxiliary temperature ****IO.AuxTransformerTemp**** becomes less than ****HighTemperatureLimit**** minus hysteresis ****HighTemperatureHyst****.

No: 2669	SupervisionID 652	Name OfflineFilterDifferentialPressureHighSx
Log text	OfflineFilt High Press __. _bar	
Subsystem name	GearboxOfflineFilter	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:

This warning is raised if the pressure drop across the gear oil offline filter is high, indicating a clogged filter.

The warning is raised if OfflineFilterDiffPressure is above OfflineFilterHighPressure for a period longer than OfflineFilterHighPressureTime.

The warning is only monitored if all the following conditions are met:

1. ****IO.GearboxGravityTankLowFlowActivate**** is true, indicating that the oil is flowing to the gravity tank at normal speed.
2. ****GearboxMainTankOilTemp**** is above OfflineFilterHighPressureTemp

The warning can be acknowledged if OfflineFilterDiffPressure drops below OfflineFilterHighPressure or one of the conditions above is not met.

No: 2670	SupervisionID 653	Name OfflineFilterDifferentialPressureLowSx	
Log text	OfflineFilt Low Press __._bar		
Subsystem name	GearboxOfflineFilter		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	30 second	Category	Manufacturer

Criteria:

This warning is raised if the pressure drop across the gear oil offline filter is too low, indicating a faulty or missing filter.

The warning is raised if OfflineFilterDiffPressure is above OfflineFilterLowPressure for a period longer than OfflineFilterLowPressureTime.

The warning is only monitored if all the following conditions are met:

1. ****IO.GearboxGravityTankLowFlowActivate**** is true, indicating that the oil is flowing to the gravity tank at normal speed.
2. ****GearboxMainTankOilTemp**** is above OfflineFilterLowPressureMinTemp and below OfflineFilterLowPressureMaxTemp

The warning can be acknowledged if OfflineFilterDiffPressure is above OfflineFilterLowPressure or one of the conditions above is not met.

No: 2672	SupervisionID 655	Name OfflineFilterDifferentialPressureTooHighSx	
Log text	OfflineFiltPressTooHigh__._bar		
Subsystem name	GearboxOfflineFilter		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect	1 hour
- Time window	<n/a>	- Max time eliminate	1 hour
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This alarm is raised if the pressure drop across the gear oil offline filter is too high, indicating a clogged filter.

No: 2673	SupervisionID 679	Name OverspeedGuardActivatedSx	
Log text	Overspeed Guard Activated		
Subsystem name	OverspeedGuard		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	StopSlow
- Allowed attempts	<n/a>	- Max time disconnect	3 second
- Time window	<n/a>	- Max time eliminate	9 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This alarm indicates that the overspeed guard has triggered the safety system.

The alarm is reported if the virtual signal from the safety system

****IO.OverspeedDetected**** changes to true.

The alarm can be acknowledged if the signal ****IO.OverspeedDetected**** changes to false.

Note: The alarm must be acknowledged twice.

When the alarm is no longer reported a safety system reset is initiated.

No: 2674	SupervisionID 675	Name UPSBatteryErrorSx
Log text	UPS Battery Error	
Subsystem name	UPS	
Type	Warning	Timeout 60 hour
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect 60 second
- Time window	<n/a>	- Max time eliminate 60 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

The warning is reported if the UPS battery status is not OK.

The warning is reported when the signal ****IO.UPSBatteryOk**** changes to 0 (false).

The IO.UPSBatteryLow is monitored only if the parameter ****UPSBatteryOkEnabled**** is (1) true.

No: 2676	SupervisionID 677	Name UPSErrorSx
Log text	UPS Error	
Subsystem name	UPS	
Type	Warning	Timeout 30 second
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect 9 second
- Time window	<n/a>	- Max time eliminate 10 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

There is error on the UPS.

No: 2677	SupervisionID 698	Name PositiveFeedbackSx
Log text	YawCW Pos Fb	
Subsystem name	YawMotor	
Type	Warning	Timeout 0.5 year
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	2	- Max time disconnect 60 second
- Time window	60 minute	- Max time eliminate 60 second
- Stabilize period	0 second	Category Manufacturer

Criteria:

This warning is triggered if the contactor feedback(s) in CW direction for any yaw motor is on/high for a given time period, while the motor(s) should not be yawing in CW direction.

No: 2678	SupervisionID 699	Name NegativeFeedbackSx
Log text	YawCW Neg Fb	
Subsystem name	YawMotor	
Type	Warning	Timeout 0.5 year
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	2	- Max time disconnect 60 second
- Time window	60 minute	- Max time eliminate 60 second
- Stabilize period	0 second	Category Manufacturer

Criteria:
The alarm/warning is raised when it is detected that a contactor does not close when the output is activated.

The alarm/warning is raised if the signal ****IO.YawMotorsCWContactorClosed**** does not change to true within the time given in the parameter ****FeedbackTime**** after the signal ****IO.YawMotorsCWStart**** is changing from false to true.

The alarm/warning is monitored only when the status of the ****IO.YawMotorsCWStart**** and the ****IO.YawMotorsCWContactorClosed**** are valid.

The alarm is raised if the signal Feedback Signal (****IO.YawMotorsCWContactorClosed****) does not change to true within the time given in the parameter ****FeedbackTime**** after the OutputSignal (****IO.YawMotorsCWStart****) is changing from false to true.

This alarm will be active only if the number of Yaw Motors (****NoOfMotors****) is 4 or 6.

No: 2679	SupervisionID 700	Name FeedbackSignalInvalidSx
Log text	YawCW Signal Err	
Subsystem name	YawMotor	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	4	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:
This warning is triggered if the status signal for any yaw motor contactor feedback(s) in CW direction becomes unavailable.

No: 2680	SupervisionID 701	Name PositiveFeedbackSx
Log text	YawCCW Pos Fb	
Subsystem name	YawMotor	
Type	Warning	Timeout 0.5 year
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	2	- Max time disconnect 60 second
- Time window	60 minute	- Max time eliminate 60 second
- Stabilize period	0 second	Category Manufacturer

Criteria:
This warning is triggered if the contactor feedback(s) in CCW direction for any yaw motor is on/high for a given time period, while the motor(s) should not be yawing in CCW direction.

No: 2681**SupervisionID** 702**Name** NegativeFeedbackSx**Log text**

YawCCW Neg Fb

Subsystem name

YawMotor

Type

Warning

Acknowledgement

Auto

Timeout

0.5 year

Shutdown type

PauseSlow

- Allowed attempts

2

- Max time disconnect

60 second

- Time window

60 minute

- Max time eliminate

60 second

- Stabilize period

0 second

Category

Manufacturer

Criteria:

The alarm/warning is raised when it is detected that a contactor does not close when the output is activated.

The alarm/warning is raised if the signal ****IO.YawMotorsCCWContactorClosed**** does not change to true within the time given in the parameter ****FeedbackTime**** after the signal ****IO.YawMotorsCCWStart**** is changing from false to true.

The alarm/warning is monitored only when the status of the ****IO.YawMotorsCCWStart**** and the ****IO.YawMotorsCCWContactorClosed**** are valid.

The alarm is raised if the signal Feedback Signal (****IO.YawMotorsCCWContactorClosed****) does not change to true within the time given in the parameter ****FeedbackTime**** after the OutputSignal (****IO.YawMotorsCCWStart****) is changing from false to true.

This alarm will be active only if the number of Yaw Motors (****NoOfMotors****) is 6 or 8.

No: 2682**SupervisionID** 703**Name** FeedbackSignalInvalidSx**Log text**

YawCCW Signal Err

Subsystem name

YawMotor

Type

Warning

Timeout

<disabled>

Acknowledgement

Auto

Shutdown type

<n/a>

- Allowed attempts

4

- Max time disconnect

<n/a>

- Time window

1 hour

- Max time eliminate

<n/a>

- Stabilize period

60 second

Category

Manufacturer

Criteria:

This warning is triggered if the status signal for any yaw motor contactor feedback(s) in CCW direction becomes unavailable.

No: 2683

Log text Yaw Thermo 1 Fault
Subsystem name YawMotorVariant3
Type Warning
Acknowledgement Auto
- **Allowed attempts** 1
- **Time window** 1 hour
- **Stabilize period** 0 second

Criteria:

The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.YawMotor1Overloaded**** is true.

This warning indicated that the thermo has tripped and no Yawing is allowed in either clockwise or anti klokwise directions.

This warning is raised when the thermo protection feedback of Yaw Motor 1 is active.

This warning is monitored only if the number of Yaw motors (****NoOfMotors****) is either 6 or 8.

No: 2684

Log text Yaw Thermo 2 Fault
Subsystem name YawMotorVariant3
Type Warning
Acknowledgement Auto
- **Allowed attempts** 1
- **Time window** 1 hour
- **Stabilize period** 0 second

Criteria:

The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.YawMotor2Overloaded**** is true.

This warning indicated that the thermo has tripped and no Yawing is allowed in either clockwise or anti klokwise directions.

This warning is raised when the thermo protection feedback of Yaw Motor 2 is active.

This warning is monitored only if the number of Yaw motors (****NoOfMotors****) is either 6 or 8.

SupervisionID 682**Name** ThermoFaultSx

Timeout 0,5 hour
Shutdown type PauseSlow
- **Max time disconnect** 60 second
- **Max time eliminate** 60 second
Category Manufacturer

SupervisionID 683**Name** ThermoFaultSx

Timeout 0,5 hour
Shutdown type PauseSlow
- **Max time disconnect** 60 second
- **Max time eliminate** 60 second
Category Manufacturer

No: 2685

Log text Yaw Thermo 3 Fault
Subsystem name YawMotorVariant3
Type Warning
Acknowledgement Auto
- **Allowed attempts** 1
- **Time window** 1 hour
- **Stabilize period** 0 second

Criteria:

The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.YawMotor3Overloaded**** is true.

This warning indicated that the thermo has tripped and no Yawing is allowed in either clockwise or anti klokwise directions.

This warning is raised when the thermo protection feedback of Yaw Motor 3 is active.

This warning is monitored only if the number of Yaw motors (****NoOfMotors****) is either 6 or 8.

No: 2686

Log text Yaw Thermo 4 Fault
Subsystem name YawMotorVariant3
Type Warning
Acknowledgement Auto
- **Allowed attempts** 1
- **Time window** 1 hour
- **Stabilize period** 0 second

Criteria:

The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.YawMotor4Overloaded**** is true.

This warning indicated that the thermo has tripped and no Yawing is allowed in either clockwise or anti klokwise directions.

This warning is raised when the thermo protection feedback of Yaw Motor 4 is active.

This warning is monitored only if the number of Yaw motors (****NoOfMotors****) is either 6 or 8.

SupervisionID 684**Name** ThermoFaultSx

Timeout 0,5 hour
Shutdown type PauseSlow
- **Max time disconnect** 60 second
- **Max time eliminate** 60 second
Category Manufacturer

SupervisionID 685**Name** ThermoFaultSx

Timeout 0,5 hour
Shutdown type PauseSlow
- **Max time disconnect** 60 second
- **Max time eliminate** 60 second
Category Manufacturer

No: 2687

Log text Yaw Thermo 5 Fault
Subsystem name YawMotorVariant3
Type Warning
Acknowledgement Auto
- **Allowed attempts** 1
- **Time window** 1 hour
- **Stabilize period** 0 second

Criteria:

The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.YawMotor5Overloaded**** is true.

This warning indicated that the thermo has tripped and no Yawing is allowed in either clockwise or anti klokwise directions.

This warning is raised when the thermo protection feedback of Yaw Motor 5 is active.

This warning is monitored only if the number of Yaw motors (****NoOfMotors****) is either 6 or 8.

No: 2688

Log text Yaw Thermo 6 Fault
Subsystem name YawMotorVariant3
Type Warning
Acknowledgement Auto
- **Allowed attempts** 1
- **Time window** 1 hour
- **Stabilize period** 0 second

Criteria:

The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.YawMotor6Overloaded**** is true.

This warning indicated that the thermo has tripped and no Yawing is allowed in either clockwise or anti klokwise directions.

This warning is raised when the thermo protection feedback of Yaw Motor 6 is active.

This warning is monitored only if the number of Yaw motors (****NoOfMotors****) is either 6 or 8.

SupervisionID 686**Name** ThermoFaultSx

Timeout 0,5 hour
Shutdown type PauseSlow
- **Max time disconnect** 60 second
- **Max time eliminate** 60 second
Category Manufacturer

SupervisionID 687**Name** ThermoFaultSx

Timeout 0,5 hour
Shutdown type PauseSlow
- **Max time disconnect** 60 second
- **Max time eliminate** 60 second
Category Manufacturer

No: 2689	SupervisionID 688	Name ThermoFaultSx
Log text	Yaw Thermo 7 Fault	
Subsystem name	YawMotorVariant3	
Type	Warning	Timeout 0,5 hour
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	1	- Max time disconnect 60 second
- Time window	1 hour	- Max time eliminate 60 second
- Stabilize period	0 second	Category Manufacturer

Criteria:
The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.YawMotor7Overloaded**** is true.

This warning indicated that the thermo has tripped and no Yawing is allowed in either clockwise or anti klokwise directions.

This warning is raised when the thermo protection feedback of Yaw Motor 7 is active.

This warning is monitored only if the number of Yaw motors (****NoOfMotors****) is 8.

No: 2690	SupervisionID 689	Name ThermoFaultSx
Log text	Yaw Thermo 8 Fault	
Subsystem name	YawMotorVariant3	
Type	Warning	Timeout 0,5 hour
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	1	- Max time disconnect 60 second
- Time window	1 hour	- Max time eliminate 60 second
- Stabilize period	0 second	Category Manufacturer

Criteria:
The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.YawMotor8Overloaded**** is true.

This warning indicated that the thermo has tripped and no Yawing is allowed in either clockwise or anti klokwise directions.

This warning is raised when the thermo protection feedback of Yaw Motor 8 is active.

This warning is monitored only if the number of Yaw motors (****NoOfMotors****) is 8.

No: 2691	SupervisionID 690	Name ThermoSignalInvalidSx
Log text	Yaw Thermo 1 Signal Err	
Subsystem name	YawMotor	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:
This warning is triggered if the status signal for yaw motor 1 thermo feedback becomes unavailable.

<u>No: 2692</u>	SupervisionID 691	Name ThermoSignalInvalidSx
Log text	Yaw Thermo 2 Signal Err	
Subsystem name	YawMotor	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:
This warning is triggered if the status signal for yaw motor 2 thermo feedback becomes unavailable.

<u>No: 2693</u>	SupervisionID 692	Name ThermoSignalInvalidSx
Log text	Yaw Thermo 3 Signal Err	
Subsystem name	YawMotor	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:
This warning is triggered if the status signal for yaw motor 3 thermo feedback becomes unavailable.

<u>No: 2694</u>	SupervisionID 693	Name ThermoSignalInvalidSx
Log text	Yaw Thermo 4 Signal Err	
Subsystem name	YawMotor	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:
This warning is triggered if the status signal for yaw motor 4 thermo feedback becomes unavailable.

<u>No: 2695</u>	SupervisionID 694	Name ThermoSignalInvalidSx
Log text	Yaw Thermo 5 Signal Err	
Subsystem name	YawMotor	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:
This warning is triggered if the status signal for yaw motor 5 thermo feedback becomes unavailable.

No: 2696	SupervisionID 695	Name ThermoSignalInvalidSx
Log text	Yaw Thermo 6 Signal Err	
Subsystem name	YawMotor	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:

This warning is triggered if the status signal for yaw motor 6 thermo feedback becomes unavailable.

No: 2697	SupervisionID 696	Name ThermoSignalInvalidSx
Log text	Yaw Thermo 7 Signal Err	
Subsystem name	YawMotor	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:

This warning is triggered if the status signal for yaw motor 7 thermo feedback becomes unavailable.

No: 2698	SupervisionID 697	Name ThermoSignalInvalidSx
Log text	Yaw Thermo 8 Signal Err	
Subsystem name	YawMotor	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:

This warning is triggered if the status signal for yaw motor 8 thermo feedback becomes unavailable.

No: 2699	SupervisionID 681	Name YawCircuitBreakerFeedbackFaultSx
Log text	Yaw Circuitbreaker Fb Err	
Subsystem name	YawMotor	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	1	- Max time disconnect 60 second
- Time window	60 minute	- Max time eliminate 60 second
- Stabilize period	0 second	Category Manufacturer

Criteria:

This alarm is triggered if the yaw motor circuit breaker is opened at any time.

No: 2857	SupervisionID 2857	Name GearOilBypassPressureHighSx
Log text	BypsPressHigh:___°C,___l/min	
Subsystem name	GearboxInlineFilter	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	4	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:
This warning is raised if the gear oil pump pressure is high, indicating a faulty/clogged bypass.

No: 2858	SupervisionID 2858	Name GearOilBypassPressureTooHighSx
Log text	BypsPressTooHigh___°C,___l/min	
Subsystem name	GearboxInlineFilter	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 9 second
- Time window	<n/a>	- Max time eliminate 10 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:
This alarm is raised if the gear oil pump pressure is too high, indicating a faulty/clogged bypass.

No: 2859	SupervisionID 2859	Name InlineFilterDifferentialPressureHighSx
Log text	DiffPressHigh___°C,___l/min	
Subsystem name	GearboxInlineFilter	
Type	Warning	Timeout 10 day
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	1	- Max time disconnect 15 second
- Time window	3600 second	- Max time eliminate 45 second
- Stabilize period	60 second	Category Manufacturer

Criteria:
This warning is raised if the pressure drop across the gear oil inline filter is high, indicating a clogged filter.

No: 2860	SupervisionID 2860	Name InlineFilterDifferentialPressureTooHighSx
Log text	DiffPressTooHigh___°C,___l/min	
Subsystem name	GearboxInlineFilter	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 15 second
- Time window	<n/a>	- Max time eliminate 45 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:
This alarm is raised if the pressure drop across the gear oil inline filter is too high, indicating a clogged filter.

No: 2861

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

SupervisionID 2861

InlDiffPressLow:___°C,___l/min

GearboxInlineFilter

Warning

Auto

3

1 hour

30 second

Name InlineFilterDifferentialPressureLowSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<disabled>

<n/a>

<n/a>

<n/a>

Manufacturer

Criteria:
This warning is raised if the pressure drop across the gear oil inline filter is too low, indicating a faulty or missing filter.

No: 2863

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

SupervisionID 2863

ConvWaterCoolPressLow___.__bar

ConverterGeneratorWaterCooling

Alarm

Auto

5

1 hour

10 minute

Name ConvGenWaterCoolingPumpPressLowSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopSlow

3 second

9 second

Manufacturer

Criteria:
The alarm indicates that the converter and generator water cooling pump pressure drops below a certain limit.

The alarm is raised if the converter and generator water cooling pump pressure (**IO.ConvGenWaterCoolingPumpPress**) drops below the minimum pressure specified by the parameter **PumpPressMin**, for more than the time interval given by the parameter **PumpPresTime**.

This alarm is only monitored if the following conditions are met:

1. The converter and generator water cooling pump is running (**IO.ConvGenWaterCoolingPumpContactorClosed** is true).
2. The converter is charged (**Converter.ConverterState** equals either ConvDcOn, Connecting, Disconnecting, Connected or ConvRunDown).

The alarm is auto acknowledged, if the converter and generator water cooling pump pressure is equal or above the parameter **PumpPressMin**.

No: 2864	SupervisionID 2864	Name ConvGenWaterCoolingWaterLevelLowSx	
Log text	ConvWaterCoolWatLevelLow_____1		
Subsystem name	ConverterGeneratorWaterCooling		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

The warning indicates low converter and generator water level in the expansion tank.

****TankSensorType**** equals "PressureSensor":

The warning is raised if the ****ConvGenWaterCoolingWaterLevel**** drops below the minimum pressure specified by the parameter ****TankLevel1****, for more than the time interval given by the parameter ****TankLevelStableTime****.

This warning is auto acknowledged if ****ConvGenWaterCoolingWaterLevel**** is equal or above the parameter ****TankLevel1****.

No: 2864	SupervisionID 2864	Name ConvGenWaterCoolingWaterLevelLowSx	
Log text	ConvWaterCoolWatLevelLow_____1		
Subsystem name	ConverterGeneratorWaterCooling		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

The warning indicates low converter and generator water level in the expansion tank.

This warning is auto acknowledged if ****ConvGenWaterCoolingWaterLevel**** is equal or above the parameter ****TankLevel1**+**TankLevelHyst****.

No: 2872	SupervisionID 2872	Name BrakeApplyValve1CBActivatedSx	
Log text	BrakeApplyValve1CBActivated		
Subsystem name	Brake		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

The warning indicates that the circuit breaker to the brake apply valve 1 is opened.

The warning is raised when the circuit breaker to the brake apply valve 1 is opened (****IO.BrakeApplyValve1CBOK**** = false), due to an error on this valve.
The brake can still be applied when this warning is raised.

The warning is auto acknowledged when the connection is re-established / the circuit breaker is closed (****IO.BrakeApplyValve1CBOK**** = true).

No: 2873	SupervisionID 2873	Name BrakeApplyValve2CBActivatedSx
Log text	BrakeApplyValve2CBActivated	
Subsystem name	Brake	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

The warning indicates that the circuit breaker to the brake apply valve 2 is opened.

The warning is raised when the circuit breaker to the brake apply valve 2 is opened (**IO.BrakeApplyValve2CBOk** = false), due to an error on this valve.
The brake can still be applied when this warning is raised.

The warning is auto acknowledged when the connection is re-established / the circuit breaker is closed (**IO.BrakeApplyValve2CBOk** = true).

No: 2874	SupervisionID 2874	Name BrakeDrainValveCBActivatedSx
Log text	BrakeDrainValveCBActivated	
Subsystem name	Brake	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

The warning indicates that the circuit breaker to the brake drain valve is opened.

The warning is raised when the circuit breaker to the brake drain valve is opened (**IO.BrakeDrainValveCBOk** = false), due to an error on this valve.
If the circuit breaker to the brake drain valve is opened the brake can not be released.

The warning is auto acknowledged when the connection is re-established / the circuit breaker is closed (**IO.BrakeDrainValveCBOk** = true).

No: 2875	SupervisionID 2875	Name BrakeAccumulatorPressLowSx	
Log text	BrakeAccumulatorPressLow___bar		
Subsystem name	Brake		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

The warning indicates that the Brake Accumulator Pressure drops below a certain limit.

The warning is raised if the Brake Accumulator Pressure (**IO.BrakeAccumulatorPress**) drops below the minimum pressure specified by the parameter
****AccumulatorPressureLimitBrakeReleased**** (used when the brake is released) or
****AccumulatorPressureLimitBrakeApplied**** (used when the brake is applied),
for more than the time interval given by the parameter ****PressureSupervisionTime****.

The warning is only monitored if no brake test is in progress (****BrakeTestInProgress**** is false).

The warning is auto acknowledged, if the Brake Accumulator Pressure is above the
****AccumulatorPressureLimitBrakeReleased**** + ****AccumulatorPressureHyst**** (used when the brake is released) or
****AccumulatorPressureLimitBrakeApplied**** + ****AccumulatorPressureHyst**** (used when the brake is applied).

No: 2876	SupervisionID 2876	Name BrakeAccumulatorPressLowManInNacelleSx	
Log text	BrakeAccPressLowManInNac___bar		
Subsystem name	Brake		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect	60 second
- Time window	<n/a>	- Max time eliminate	60 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

The alarm indicates that the Brake Accumulator Pressure drops below a certain limit, when there is personnel in the nacelle.

The alarm is raised if the Brake Accumulator Pressure (**IO.BrakeAccumulatorPress**) drops below the minimum pressure specified by the parameter
****AccumulatorPressureLimitBrakeReleased**** (used when the brake is released) or
****AccumulatorPressureLimitBrakeApplied**** (used when the brake is applied),
for more than the time interval given by the parameter ****PressureSupervisionTime****.

The alarm is only monitored if no brake test is in progress (****BrakeTestInProgress**** is false), and there is personnel in the nacelle (****OperationManager.PointOfOperation**** is LocalNacelle).

The alarm is auto acknowledged, if the Brake Accumulator Pressure is above the
****AccumulatorPressureLimitBrakeReleased**** + ****AccumulatorPressureHyst**** (used when the brake is released) or
****AccumulatorPressureLimitBrakeApplied**** + ****AccumulatorPressureHyst**** (used when the brake is applied).

No: 2877	SupervisionID 2877	Name BrakeHotLowBrakePressureSx
Log text	BrakeHotLowBrakePressure__bar	
Subsystem name	Brake	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

The alarm indicates that the brake temperature is too high when the brake pressure is below a certain limit.

The alarm is raised if the brake temperature is too high (**IO.BrakeThermistorOK** is false) and the brake pressure (**IO.BrakePress**) is below or equal to the limit given by the parameter **ThermistorPressureLimit**.

The alarm can be acknowledged if the brake temperature is normal (**IO.BrakeThermistorOK** is true).

No: 2878	SupervisionID 2878	Name BrakeHotHighBrakePressureSx
Log text	BrakeHotHighBrakePress__bar	
Subsystem name	Brake	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

The alarm indicates that the brake temperature is too high when the brake pressure is above a certain limit.

The alarm is raised if the brake temperature is too high (**IO.BrakeThermistorOK** is false) and the brake pressure (**IO.BrakePress**) is above the limit given by the parameter **ThermistorPressureLimit**.

The alarm can be acknowledged if the brake temperature is normal (**IO.BrakeThermistorOK** is true).

No: 2879	SupervisionID 2879	Name BrakeWornSx
Log text	Brake Worn	
Subsystem name	Brake	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 15 second
- Time window	<n/a>	- Max time eliminate 45 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This alarm is raised if the brake is worn.

The alarm is raised if **IO.BrakeWearIndicatorOK** is false.

The alarm can be acknowledged when **IO.BrakeWearIndicatorOK** turns true.

No: 2887 **SupervisionID** 2887 **Name** PFB_ValveAFaultSx
Log text PitA Sys: ___bar Aside: ___bar
Subsystem name PFB
Type Warning **Timeout** 20 day
Acknowledgement Local **Shutdown type** PauseSlow
- **Allowed attempts** <n/a> - **Max time disconnect** 1 hour
- **Time window** <n/a> - **Max time eliminate** 1 hour
- **Stabilize period** <n/a> **Category** Manufacturer

Criteria:

This supervision monitors the health of pitch force boost valve A

No: 2888 **SupervisionID** 2888 **Name** PFB_ValveBFaultSx
Log text PitB Sys: ___bar Aside: ___bar
Subsystem name PFB
Type Warning **Timeout** 20 day
Acknowledgement Local **Shutdown type** PauseSlow
- **Allowed attempts** <n/a> - **Max time disconnect** 1 hour
- **Time window** <n/a> - **Max time eliminate** 1 hour
- **Stabilize period** <n/a> **Category** Manufacturer

Criteria:

This supervision monitors the health of pitch force boost valve B

No: 2889 **SupervisionID** 2889 **Name** PFB_ValveCFaultSx
Log text PitC Sys: ___bar Aside: ___bar
Subsystem name PFB
Type Warning **Timeout** 20 day
Acknowledgement Local **Shutdown type** PauseSlow
- **Allowed attempts** <n/a> - **Max time disconnect** 1 hour
- **Time window** <n/a> - **Max time eliminate** 1 hour
- **Stabilize period** <n/a> **Category** Manufacturer

Criteria:

This supervision monitors the health of pitch force boost valve C

No: 2890 **SupervisionID** 2890 **Name** VibrationShockSensorActivatedSx
Log text VibrShockAct X __. __Y __. __m/s^2
Subsystem name VibrationShockSensor
Type Alarm **Timeout** <n/a>
Acknowledgement Local **Shutdown type** StopSlow
- **Allowed attempts** <n/a> - **Max time disconnect** 3 second
- **Time window** <n/a> - **Max time eliminate** 9 second
- **Stabilize period** <n/a> **Category** Manufacturer

Criteria:

The vibration shock sensor has been activated, Safety system will activate E-Pitch and PowerStop.

This alarm appears if the signal ****IO.VibrationShockSensorActivated**** is true.

This alarm can be acknowledged if the signal ****IO.VibrationShockSensorActivated**** turns false.

No: 2892	SupervisionID 2892	Name PitchBlockManifoldAOilPressDiffHighSx
Log text	PB OilDiffHigh Main___ A___bar	
Subsystem name	PitchBlock	
Type	Warning	Timeout 7 day
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	5 second	Category Manufacturer

Criteria:

This warning indicates that the difference between the hydraulic main oil pressure and the hydraulic manifold A oil pressure exceeds a certain limit.

The warning is raised if the difference between ****IO.PitchBlockManifoldAOilPress**** and ****IO.HydrMainOilPress**** is above the limit given by the parameter ****OilPressDiffMax****, for more than the time interval given by the parameter ****OilPressDiffTime****.

This warning is only monitored if the following conditions are met:

- 1. Main turbine state is Production.
- 2. ****IO.HydrMainOilPress**** is above the limit given by the parameter ****OilPressDiffMainPressMin****.
- 3. Hydraulic pressure is being build up.
- 4. Accumulator Drain Valves are closed.

The warning is auto acknowledged if the difference between ****IO.PitchBlockManifoldAOilPress**** and ****IO.HydrMainOilPress**** drops below the parameter ****OilPressDiffMax****.

The warning will be converted to an alarm after 7 days.

No: 2893	SupervisionID 2893	Name PitchBlockManifoldBOilPressDiffHighSx
Log text	PB OilDiffHigh Main___ B___bar	
Subsystem name	PitchBlock	
Type	Warning	Timeout 7 day
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	5 second	Category Manufacturer

Criteria:

This warning indicates that the difference between the hydraulic main oil pressure and the hydraulic manifold B oil pressure exceeds a certain limit.

The warning is raised if the difference between ****IO.PitchBlockManifoldBOilPress**** and ****IO.HydrMainOilPress**** is above the limit given by the parameter ****OilPressDiffMax****, for more than the time interval given by the parameter ****OilPressDiffTime****.

This warning is only monitored if the following conditions are met:

- 1. Main turbine state is Production.
- 2. ****IO.HydrMainOilPress**** is above the limit given by the parameter ****OilPressDiffMainPressMin****.
- 3. Hydraulic pressure is being build up.
- 4. Accumulator Drain Valves are closed.

The warning is auto acknowledged if the difference between ****IO.PitchBlockManifoldBOilPress**** and ****IO.HydrMainOilPress**** drops below the parameter ****OilPressDiffMax****.

The warning will be converted to an alarm after 7 days.

No: 2894	SupervisionID 2894	Name PitchBlockManifoldCOilPressDiffHighSx	
Log text	PB OilDiffHigh Main___ C___bar		
Subsystem name	PitchBlock		
Type	Warning	Timeout	7 day
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	9 second
- Time window	1 hour	- Max time eliminate	10 second
- Stabilize period	5 second	Category	Manufacturer

Criteria:

This warning indicates that the difference between the hydraulic main oil pressure and the hydraulic manifold C oil pressure exceeds a certain limit.

The warning is raised if the difference between ****IO.PitchBlockManifoldCOilPress**** and ****IO.HydrMainOilPress**** is above the limit given by the parameter ****OilPressDiffMax****, for more than the time interval given by the parameter ****OilPressDiffTime****.

This warning is only monitored if the following conditions are met:

1. Main turbine state is Production.
2. ****IO.HydrMainOilPress**** is above the limit given by the parameter ****OilPressDiffMainPressMin****.
3. Hydraulic pressure is being build up.
4. Accumulator Drain Valves are closed.

The warning is auto acknowledged if the difference between ****IO.PitchBlockManifoldCOilPress**** and ****IO.HydrMainOilPress**** drops below the parameter ****OilPressDiffMax****.

The warning will be converted to an alarm after 7 days.

No: 2896	SupervisionID 2896	Name PFB_NumActDiff_ValveAHighActSx	
Log text	PitA: PFB max: ___ min:___		
Subsystem name	PFB		
Type	Warning	Timeout	<disabled>
Acknowledgement	Remote	Shutdown type	<n/a>
- Allowed attempts	<n/a>	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This supervision monitors the difference in the number of activations between Pitch Force Boost valve A, ****PFB_ValveANumAct****, and the minimum number of activations for any of the PFB valves A,B,C, ****PFB_ValveABCMinNumAct****.

If this difference exceeds the limit, **PFB_NumActDiff_MaxNumPx**, a warning is raised.

No: 2897 **SupervisionID** 2897 **Name** PFB_NumActDiff_ValveBHighActSx

Log text	PitB: PFB max: ____ min:____		
Subsystem name	PFB		
Type	Warning	Timeout	<disabled>
Acknowledgement	Remote	Shutdown type	<n/a>
- Allowed attempts	<n/a>	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This supervision monitors the difference in the number of activations between Pitch Force Boost valve B, ****PFB_ValveBNumAct****, and the minimum number of activations for any of the PFB valves A,B,C, ****PFB_ValveABCMinNumAct****.

If this difference exceeds the limit, PFB_NumActDiff_MaxNumPx, a warning is raised.

No: 2898 **SupervisionID** 2898 **Name** PFB_NumActDiff_ValveCHighActSx

Log text	PitC: PFB max: ____ min:____		
Subsystem name	PFB		
Type	Warning	Timeout	<disabled>
Acknowledgement	Remote	Shutdown type	<n/a>
- Allowed attempts	<n/a>	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This supervision monitors the difference in the number of activations between Pitch Force Boost valve C, ****PFB_ValveCNumAct****, and the minimum number of activations for any of the PFB valves A,B,C, ****PFB_ValveABCMinNumAct****.

If this difference exceeds the limit, PFB_NumActDiff_MaxNumPx, a warning is raised.

No: 2902 **SupervisionID** 2902 **Name** BL_NotLockedASx

Log text	PitA Not lock C: ____ W:____		
Subsystem name	BL		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

The supervision raises a warning if the turbine asks to unlock blade A and the blade then is found to not being locked

No: 2903 **SupervisionID** 2903 **Name** BL_NotLockedBSx

Log text	PitB Not lock C: ____ W:____		
Subsystem name	BL		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

The supervision raises a warning if the turbine asks to unlock blade B and the blade then is found to not being locked

No: 2904

SupervisionID	2904	Name	BL_NotLockedCSx
Log text	PitC Not lock C: __.__ W:__.__		
Subsystem name	BL		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

The supervision raises a warning if the turbine asks to unlock blade C and the blade then is found to not being locked

No: 2905

SupervisionID	2905	Name	BL_UnlockWarningASx
Log text	Pitch A BL unlock WarningN= __		
Subsystem name	BL		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

The purpose of this supervision is to supervise the blade A unlock procedure and raises warning if number of unlock attempts exceed the maximum attempts defined

No: 2906

SupervisionID	2906	Name	BL_UnlockWarningBSx
Log text	Pitch B BL unlock WarningN= __		
Subsystem name	BL		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

The purpose of this supervision is to supervise the blade B unlock procedure and raises warning if number of unlock attempts exceed the maximum attempts defined

No: 2907

SupervisionID	2907	Name	BL_UnlockWarningCSx
Log text	Pitch C BL unlock WarningN= __		
Subsystem name	BL		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

The purpose of this supervision is to supervise the blade C unlock procedure and raises warning if number of unlock attempts exceed the maximum attempts defined

No: 2908	SupervisionID 2908	Name BL_UnlockErrorASx
Log text	Pitch A BL unlock alarm N= ____	
Subsystem name	BL	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision monitors the number of blade unlocking attempts and reacts when it exceeds the maximum attempt.

This alarm is activated if the the following conditions are met:

1. ****ProdCtrl.PSC_UnlockBlades**** = 1
2. ****BL_UBA_ActivityLevel**** = 2
3. Number of blade unlock attempts for blade A exceeds the upper threshold, ****BL_UBA_MaxAttempts****

Blade unlock functionality should be able to unlock the blade from 90 degrees and place the blade in the idle position (****BL_IdlePitchPos****), ready for operation. The pitch control signal is saturated by ****BL_PropValveLimit**** to avoid damaging the pawl and the wedge during the unlock sequence.

Unlocking of blades is performed by the following steps:

1. Reset the counter for unlock attempts for blade A to zero.
2. If needed, the precise end stop position is established by increasing the pitch reference and detect when the blade stops.
- 3 The detected end stop position is validated and if found outside limits, the procedure is re-initiated and the unlock attempts counter is incremented
4. Pitching the blade A towards ****BL_IdlePitchPos****.
5. Check if the pitch movement is limited by width of the pawl hole of the wedge for ****BL_StoppedTime**** seconds.
6. If the pitch movement indicates that the pitch is still locked, the blade A will move back and forth and thereby try to open the lock. ****BL_IdlePitchPos**** and ****BL_HigherLimit**** are used as pitch references.
7. Increase the number of blade unlock attempts for blade A by 1.
8. When **PitchBladeBAngle** <= ****BL_PositiveEndStop**** - ****BL_BladeLockWidth****, the pitch rate is increased to ****BL_PitchRateFast**** from ****BL_PitchRate****..
9. Check the blade A is in ****BL_IdlePitchPos**** position, indicates that blade A lock is ready for unlocking.
10. If the blade A has not unlocked, then repeat from step 5 until the blade A is unlocked.

Unlock the blades by actuating the hydraulic pawl, **BladeLockValveOpen**, when all three Blade Locks are ready.

No: 2909	SupervisionID 2909	Name BL_UnlockErrorBSx
Log text	Pitch B BL unlock alarm N= ____	
Subsystem name	BL	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision monitors the number of blade unlocking attempts and reacts when it exceeds the maximum attempts.

This alarm is activated if the the following conditions are all met,

- 1. ****ProdCtrl.PSC_UnlockBlades**** = 1
- 2. ****BL_UBA_ActivityLevel**** = 2
- 3. Number of blade unlock attempts for blade B exceeds the upper threshold, ****BL_UBA_MaxAttempts****

Blade unlock functionality should be able to unlock the blade from 90 degrees and place the blade in the idle position (****BL_IdlePitchPos****), ready for operation. The pitch control signal is saturated by ****BL_PropValveLimit**** to avoid damaging the pawl and the wedge during the unlock sequence.

Unlocking of blades is performed by the following steps:

- 1. Reset the counter for unlock attempts for blade B to zero.
- 2. Pitching the blade towards ****BL_IdlePitchPos****.
- 3. Check if the pitch movement is limited by width of the pawl hole of the wedge for ****BL_StoppedTime**** seconds.
- 4. If the pitch movement indicates that the pitch is still locked, the blade will move back and forth and thereby try to open the lock. ****BL_IdlePitchPos**** and ****BL_HigherLimit**** are used as pitch references.
- 5. Increase the number of blade unlock attempts for blade B by 1.
- 6. When ****PitchBladeBAngle**** <= ****BL_PositiveEndStop**** - ****BL_BladeLockWidth****, the pitch rate is increased to ****BL_PitchRateFast**** from ****BL_PitchRate****.
- 7. Check the blade is in ****BL_IdlePitchPos**** position, indicates that blade B lock is ready for unlocking.
- 8. If the blade has not unlocked, then repeat from step 3 until the blade is unlocked.

Unlock the blades by actuating the hydraulic pawl, **BladeLockValveOpen**, when all three Blade Locks are ready.

No: 2910	SupervisionID 2910	Name BL_UnlockErrorCSx
Log text	Pitch C BL unlock alarm N= ____	
Subsystem name	BL	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision monitors the number of blade unlocking attempts and reacts when it exceeds the maximum attempt.

This alarm is activated if the the following conditions are met:

1. **ProdCtrl.PSC_UnlockBlades** = 1
2. **BL_UBA_ActivityLevel** = 2
3. Number of blade unlock attempts for blade C exceeds the upper threshold, **BL_UBA_MaxAttempts**

Blade unlock functionality should be able to unlock the blade from 90 degrees and place the blade in the idle position (**BL_IdlePitchPos**), ready for operation. The pitch control signal is saturated by **BL_PropValveLimit** to avoid damaging the pawl and the wedge during the unlock sequence.

Unlocking of blades is performed by the following steps:

1. Reset the counter for unlock attempts for blade C to zero.
2. Pitching the blade C towards **BL_IdlePitchPos**.
3. Check if the pitch movement is limited by width of the pawl hole of the wedge for **BL_StoppedTime** seconds.
4. If the pitch movement indicates that the pitch is still locked, the blade C will move back and forth and thereby try to open the lock. **BL_IdlePitchPos** and **BL_HigherLimit** are used as pitch references.
5. Increase the number of blade unlock attempts for blade C by 1.
6. When PitchBladeBAngle <= **BL_PositiveEndStop** - **BL_BladeLockWidth**, the pitch rate is increased to **BL_PitchRateFast** from **BL_PitchRate**.
7. Check the blade C is in **BL_IdlePitchPos** position, indicates that blade C lock is ready for unlocking.
8. If the blade C has not unlocked, then repeat from step 3 until the blade C is unlocked.

Unlock the blades by actuating the hydraulic pawl, BladeLockValveOpen, when all three Blade Locks are ready.

No: 2920	SupervisionID 2920	Name GravityTankValveFlowFaultSx
Log text	GearLubrGravityTankFault	
Subsystem name	GearboxLubrication	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This warning is raised if the feedback from the pilot pressure controlled valve is indicating that oil is not flowing to the gravity tank when supposed to do so.

No: 2922	SupervisionID 2922	Name GravityTankDrySumpLevelNotReachedSx
Log text	DrySump Lev G:___1 M:___1	
Subsystem name	GearboxLubrication	
Type	Warning	Timeout 24 hour
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This warning is indicating that the gear oil level in the gravity tank does not rise as expected when gear oil is pumped into the gravity tank.

Most likely caused by a failing 3-way valve or gear oil pump.

The warning is only monitored if the gearbox oil sump state is supposed to be changing to dry sump (i.e. oil is pumped into the gravity tank) and the oil flow is adequate:

1. ****IO.GearboxGravityTankLowFlowActivate**** is equal to true or ****IO.GearboxGravityTankHighFlowActivate**** is equal to true.
2. ****ExpectedGearOilFlow**** is greater than ****DrySumpLevelFlowLimit****.

The warning is raised if the gravity tank oil level ****GravityTankOilLevel**** does not rise above the limit ****GravityTankDrySumpLevel**** within the time ****DrySumpDelayTime****.

The warning can be acknowledged when ****GravityTankOilLevel**** changes above ****GravityTankDrySumpLevel****.

No: 2923	SupervisionID 2923	Name GravityTankWetSumpLevelNotReachedSx
Log text	WetSump Lev G:___1 M:___1	
Subsystem name	GearboxLubrication	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	24 hour	- Max time eliminate 10 second
- Stabilize period	0 second	Category Manufacturer

Criteria:

This alarm is indicating that the gear oil level in the gravity tank does not fall as expected when gear oil is drained from the gravity tank.

Most likely caused by a failing 3-way valve.

The alarm is only monitored if the gearbox oil sump state is supposed to be changing to wet sump (i.e. oil is drained from the gravity tank):

****IO.GearboxGravityTankLowFlowActivate**** and ****IO.GearboxGravityTankHighFlowActivate**** are both equal to false.

The alarm is raised if the gravity tank oil level ****GravityTankOilLevel**** does not fall below the limit ****GravityTankWetSumpLevel**** within the time ****WetSumpDelayTime****.

The alarm is auto acknowledged when ****GravityTankOilLevel**** changes below ****GravityTankWetSumpLevel****.

No: 2924	SupervisionID 2924	Name GearboxDripTrayLeakageLevel1Sx
Log text	GearLeak:MainTankVol____.____m^3	
Subsystem name	GearboxLubrication	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:
This warning is indicating that the level of fluids in the drip tray below the gearbox assembly has reached the warning (lower) level.

Most likely caused by gear oil or other fluids leaking into the drip tray below the gearbox assembly.

The warning is raised if ****IO.GearboxDripTrayLevel1OK**** is equal to false for more than the time specified by ****GearboxDripTrayLevelTimeout****.
The alarm GearboxDripTrayLeakageLevel2 is monitoring the alarm (higher) level of fluids in the drip tray.

The warning can be acknowledged when ****IO.GearboxDripTrayLevel1OK**** is equal to true.

No: 2925	SupervisionID 2925	Name GearboxDripTrayLeakageLevel2Sx
Log text	Gear Leak: Flow ____ 1/min	
Subsystem name	GearboxLubrication	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Manufacturer

Criteria:
This alarm is indicating that the level of fluids in the drip tray below the gearbox assembly has reached the alarm (highest) level.

Most likely caused by oil or other fluids leaking into the drip tray below the gearbox assembly.

The alarm is raised if ****IO.GearboxDripTrayLevel2OK**** is equal to false for more than the time specified by ****GearboxDripTrayLevelTimeout****.
The warning GearboxDripTrayLeakageLevel1 is monitoring the warning (lower) level of fluids in the drip tray.

Once the alarm is raised an estimate on the flow rate of the leak is calculated (****GearboxDripTrayLeakageFlow****) and logged together with the alarm.

The alarm can be acknowledged when ****IO.GearboxDripTrayLevel2OK**** is equal to true.

No: 2926	SupervisionID 2926	Name GearOilContaminatedDrainASx
Log text	Gear Oil Contaminated Drain A	
Subsystem name	GearboxLubrication	
Type	Warning	Timeout 7 day
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This warning is indicating if the the gear oil is contaminated. The associated contamination sensor is located in DrainA of the gearbox.

Most likely caused by excessive wear in the gearbox.

The warning is raised if the ****IO.GearboxOilContaminationDrainAOK**** is false for the period specified by ****GearOilContaminationTimeout****.

The warning can be acknowledged if ****IO.GearboxOilContaminationDrainAOK**** is true.

No: 2927	SupervisionID 2927	Name GearOilContaminatedDrainBSx
Log text	Gear Oil Contaminated Drain B	
Subsystem name	GearboxLubrication	
Type	Warning	Timeout 7 day
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This warning is indicating if the the gear oil is contaminated. The associated contamination sensor is located in DrainB of the gearbox.

Most likely caused by excessive wear in the gearbox.

The warning is raised if the ****IO.GearboxOilContaminationDrainBOK**** is false for the period specified by ****GearOilContaminationTimeout****.

The warning can be acknowledged if ****IO.GearboxOilContaminationDrainBOK**** is true.

No: 2928	SupervisionID 2928	Name GearOilContaminatedDrainCSx
Log text	Gear Oil Contaminated Drain C	
Subsystem name	GearboxLubrication	
Type	Warning	Timeout 7 day
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This warning is indicating if the the gear oil is contaminated. The associated contamination sensor is located in DrainC of the gearbox.

Most likely caused by excessive wear in the gearbox.

The warning is raised if the ****IO.GearboxOilContaminationDrainCOK**** is false for the period specified by ****GearOilContaminationTimeout****.

The warning can be acknowledged if ****IO.GearboxOilContaminationDrainCOK**** is true.

No: 2929	SupervisionID 2929	Name GearOilLevelLowSx
Log text	GearboxOilLevelHigh M:____1	
Subsystem name	GearboxLubrication	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	5	- Max time disconnect 9 second
- Time window	24 hour	- Max time eliminate 10 second
- Stabilize period	0 second	Category Manufacturer

Criteria:

This alarm is indicating that too much gear oil is missing in the oil tanks during normal operation (dynamical conditions).

Most likely caused by missing gear oil in the system or too much gear oil in the gearbox.

The alarm is only monitored if the gear oil temperature is above a minimum limit: I.e. ****GearboxMainTankOilTemp**** is higher than ****GearOilDynamicalLevelTemperatureLimit****.

The alarm is raised if the combined gear oil volumes present in the main and gravity tanks are below the minimum limit for too long time: I.e. if ****MainTankOilVolume**** + ****GravityTankOilVolume**** is less than ****TempCompensatedTotalGearOilVolume**** - ****MaxAllowedMissingDynamicGearOilVolume**** for more than the time ****GearboxOilLevelHighTime****.

When the alarm is raised, it will trigger a check of the static gear oil levels at turbine stand still to evaluate the actual gear oil levels:

1. When the generator speed ****GeneratorTachoSpeed**** is below ****GearOilLevelGeneratorSpeedLimit**** the gear oil pump is stopped.
2. When the turbine and gear oil pump has been stopped for the time specified by ****StaticGearOilLevelCheckDelayTime**** a static gear oil level check is performed.

The alarm is auto acknowledged when the check for static gear oil level has been performed or if the gear oil temperature condition is not met anymore.

No: 2931	SupervisionID 2931	Name GearOilLevelTooLowSx
Log text	GearOilLevelTooLow M:____1	
Subsystem name	GearboxLubrication	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 9 second
- Time window	<n/a>	- Max time eliminate 10 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This alarm is indicating that too much gear oil is missing in the gear oil tanks (static conditions).

Most likely caused by missing gear oil in the system and a refill is required.

The alarm is only monitored if the dynamic gear oil level alarm have been raised and the gear oil temperature is above a minimum limit:

I.e. GearOilLevelLow is reported and ****GearboxMainTankOilTemp**** is higher than ****GearOilStaticLevelTemperatureLimit****.

The alarm is monitored once one of the dynamical gear oil level alarms has caused the turbine and gear oil pump to stop, and it has been standing still for the time period ****StaticGearOilLevelCheckDelayTime****.

The alarm is raised if the combined gear oil volumes present in the main and gravity tanks are below the minimum limit for too long time:

I.e. if ****MainTankOilVolume**** + ****GravityTankOilVolume**** is less than ****TempCompensatedTotalGearOilVolume**** - ****MaxAllowedMissingStaticGearOilVolume**** for more than the time ****GearOilLevelTooLowTime****.

The alarm can be acknowledged when the gear oil levels are within limits again or the gear oil temperature condition is not met anymore.

No: 2932	SupervisionID 2932	Name GearOilLevelTooHighSx
Log text	GearOilLevelTooHigh M:____1	
Subsystem name	GearboxLubrication	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 9 second
- Time window	<n/a>	- Max time eliminate 10 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This alarm is indicating that too much gear oil is present in the gear oil tanks (static conditions).

Most likely caused by too much gear oil in the system and draining is required.

The alarm is only monitored if the dynamic gear oil level alarm has been raised and the gear oil temperature is above a minimum limit:
I.e. GearOilLevelLow is reported and ****GearboxMainTankOilTemp**** is higher than ****GearOilStaticLevelTemperatureLimit****.
The alarm is monitored once GearOilLevelLow has caused the turbine and gear oil pump to stop, and it has been standing still for the time period ****StaticGearOilLevelCheckDelayTime****.

The alarm is raised if the combined gear oil volumes present in the main and gravity tanks are above the maximum limit for too long time:
I.e. if ****MainTankOilVolume**** + ****GravityTankOilVolume**** is greater than ****TempCompensatedTotalGearOilVolume**** + ****MaxAllowedExtraStaticGearOilVolume**** for more than the time ****GearOilLevelTooHighTime****.

The alarm can be acknowledged when the gear oil levels are within limits again or the gear oil temperature condition is not met anymore.

No: 2933	SupervisionID 2933	Name GearOilTemperatureHighSx
Log text	GearOilTempHigh ____°C	
Subsystem name	GearboxLubrication	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	4	- Max time disconnect 9 second
- Time window	24 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is indicating that the gear oil temperature measured in the main oil tank is above the maximum limit.

The alarm is raised if ****GearboxMainTankOilTemp**** is above the maximum limit specified by ****GearOilHighTemperature**** for a time period of ****GearOilTemperatureTime****.

The alarm is auto acknowledged when ****GearboxMainTankOilTemp**** drops below ****GearOilHighTemperature****.

No: 2934	SupervisionID 2934	Name GearboxGearOilInletPressureLowSx	
Log text	GearOilInletPressLow _._ bar		
Subsystem name	GearboxLubrication		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	9 second
- Time window	1 hour	- Max time eliminate	10 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is indicating that the gear oil inlet pressure is too low to ensure sufficient lubrication of the gearbox.

It may be caused by a faulty gear oil pump or frequency drive.

The alarm is only monitored if ****FilteredGeneratorSpeed**** is above ****StopOilPumpGeneratorSpeedLimit****
The alarm is raised if the gear oil inlet pressure (****IO.GearboxOilInletPress****) is less than the alarm limit (****GearOilInletPressureMinLimit****) for the period specified by ****SuperviseOilInletPressureTimeout****.

The alarm can be acknowledged when the gear oil inlet pressure (****IO.GearboxOilInletPress****) is above the alarm limit (****GearOilInletPressureMinLimit****) or if the conditions above are not met.

No: 2939	SupervisionID 2939	Name GearOilHeaterPositiveFeedbackSx	
Log text	Feedback = _,:GearOilHeater		
Subsystem name	GearboxLubrication		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	30 second	Category	Manufacturer

Criteria:

This warning is raised when it is detected that the oil heater contactor does not open when the output is deactivated.

Only relevant if the gear oil heater is installed (****GearOilHeaterInstalled**** is true).
The warning is reported if the heater is off (****IO.GearboxOilHeaterOn**** is false) and the heater feedback remains on (****IO.GearboxOilHeaterContactorClosed**** is true) for more than ****GearOilHeaterFeedbackTime****.

The warning can be acknowledged when the feedback matches the output.

No: 2940	SupervisionID 2940	Name GearOilHeaterNegativeFeedbackSx
Log text	Feedback = __, :GearOilHeater	
Subsystem name	GearboxLubrication	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:

This warning is raised when it is detected that the oil heater contactor does not close when the output is activated.

Only relevant if the gear oil heater is installed (**GearOilHeaterInstalled** is true). The warning is reported if the heater is on (**IO.GearboxOilHeaterOn** is true) and the heater feedback remains off (**IO.GearboxOilHeaterContactorClosed** is false) for more than **GearOilHeaterFeedbackTime**.

The warning can be acknowledged when the feedback matches the output.

No: 2948	SupervisionID 2948	Name GeneratorWarmDeratePowerInColdEnvironmentSx
Log text	GenWarmPhaseTmp:Min__Max__ °C	
Subsystem name	Generator	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This warning is raised if the turbine production is derated due to high generator phase temperatures when the environment temperature is low. Only monitored if derate method 1 is used.

No: 2949	SupervisionID 2949	Name GeneratorLowPhaseTempSx
Log text	GenLowPhaseTemp:Min__Max__ °C	
Subsystem name	Generator	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseFast
- Allowed attempts	3	- Max time disconnect 8 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	10 minute	Category Manufacturer

Criteria:

This alarm is indicating that one or more of the generator phase (winding) temperatures has dropped below the minimum limit.

The alarm is raised when **GeneratorMinPhaseTemp** remains below the minimum limit specified by **PhaseMinTemp** for the time period **PhaseMinTempTime**.

The alarm is auto acknowledged when **GeneratorMinPhaseTemp** has been above **PhaseMinTemp** for the time period **PhaseMinTempTime**.

No: 2950	SupervisionID 2950	Name GeneratorHighPhaseTempSx
Log text	GenHighPhaseTemp:Min__Max__°C	
Subsystem name	Generator	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	10 minute	Category Manufacturer

Criteria:

This alarm is indicating that one or more generator phase (winding) temperatures has risen above the maximum limit.

Most likely caused by insufficient cooling.

* Normally the alarm is raised if the maximum phase temperature of the generator ****GeneratorMaxPhaseTemp**** is above the maximum limit ****PhaseMaxTemp**** for longer than the time ****PhaseMaxTempTime****.

* However, if derate method2 is enabled (i.e ****PowerDerateMethod**** equal to Method2), extended settings are used:

1. The alarm is raised if ****GeneratorMaxPhaseTemp**** is above the extended limit ****PhaseMaxTemp**** + ****PhaseMaxTempExtendedMargin****.

2. Or if ****GeneratorMaxPhaseTemp**** is above the normal limit ****PhaseMaxTemp**** for a period longer than ****PhaseMaxTempExceededTime****.

The alarm is auto acknowledged when ****GeneratorMaxPhaseTemp**** is below ****PhaseMaxTemp**** for the time period specified by ****PhaseMaxTempTime****.

No: 2951	SupervisionID 2951	Name GeneratorLowBearingTempSx
Log text	GenLowBearTemp:DE__NonDE__°C	
Subsystem name	Generator	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	10 minute	Category Manufacturer

Criteria:

This alarm is indicating if one or both generator bearing temperatures has dropped below the minimum limit.

The alarm is raised if ****GeneratorMinBearingTemp**** remains below the the minimum limit ****BearingMinTemp**** for the time period ****BearingMinTempTime****.

The alarm is auto acknowledged once the ****GeneratorMinBearingTemp**** has been above ****BearingMinTemp**** for the time period ****BearingMinTempTime****.

No: 2952 **SupervisionID** 2952 **Name** GeneratorHighBearingTempSx
Log text GenHighBearTemp:DE__NonDE__°C
Subsystem name Generator
Type Alarm **Timeout** <n/a>
Acknowledgement Remote **Shutdown type** StopSlow
- **Allowed attempts** <n/a> - **Max time disconnect** 3 second
- **Time window** <n/a> - **Max time eliminate** 9 second
- **Stabilize period** <n/a> **Category** Manufacturer
Criteria:
This alarm is indicating that one or both generator bearing temperatures has risen above the maximum limit.

The alarm is raised when the ****GeneratorMaxBearingTemp**** remains above the max limit ****BearingMaxTemp**** for the time period ****BearingMaxTempTime****.

This alarm is only monitored if the turbine is not power derated due to high generator phase temperatures using derate method 2.
If the turbine is power derated due to high generator phase temperatures using derate method 2 - i.e. ****PowerDerateActiveGateOutput**** is true and ****PowerDerateMethod**** is set to Method2 - GeneratorBearingTempTooHighWhileDerating is monitored instead.

The alarm is auto acknowledged when ****GeneratorMaxBearingTemp**** remains below ****BearingMaxTemp**** for the time period ****BearingMaxTempTime****.

No: 2953 **SupervisionID** 2953 **Name** PowerSupplyFrequencyLowSx
Log text PowerSupplyLowFreq: Min__ Hz
Subsystem name PowerSupply
Type Alarm **Timeout** <n/a>
Acknowledgement Auto **Shutdown type** PauseSlow
- **Allowed attempts** 3 - **Max time disconnect** 9 second
- **Time window** 1 hour - **Max time eliminate** 10 second
- **Stabilize period** 60 second **Category** Utility
Criteria:
This alarm indicates that the frequency is too low.

This alarm is reported if ****Converter.SecFrequency**** drops below ****PowerSupplyLowFrequencyLimit**** for longer than the time interval given by ****PowerSupplyLowFrequencyTimeout****.

No: 2953 **SupervisionID** 2953 **Name** PowerSupplyFrequencyLowSx
Log text PowerSupplyLowFreq: Min__ Hz
Subsystem name PowerSupply
Type Alarm **Timeout** <n/a>
Acknowledgement Auto **Shutdown type** PauseSlow
- **Allowed attempts** 3 - **Max time disconnect** 9 second
- **Time window** 1 hour - **Max time eliminate** 10 second
- **Stabilize period** 60 second **Category** Utility
Criteria:
This alarm indicates that the frequency is too low.

This alarm is reported if ****Converter.SecFrequency**** drops below ****PowerSupplyLowFrequencyLimit**** for longer than the time interval given by ****PowerSupplyLowFrequencyTimeout****.

No: 2954	SupervisionID 2954	Name PowerSupplyFrequencyHighSx
Log text	PowerSupplyHighFreq: Max____ Hz	
Subsystem name	PowerSupply	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Utility

Criteria:

This alarm indicates that the frequency is too high.

This alarm is reported if ****Converter.SecFrequency**** exceeds ****PowerSupplyHighFrequencyLimit**** for longer than the time interval given by ****PowerSupplyHighFrequencyTimeout****.

No: 2954	SupervisionID 2954	Name PowerSupplyFrequencyHighSx
Log text	PowerSupplyHighFreq: Max____ Hz	
Subsystem name	PowerSupply	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Utility

Criteria:

This alarm indicates that the frequency is too high.

This alarm is reported if ****Converter.SecFrequency**** exceeds ****PowerSupplyHighFrequencyLimit**** for longer than the time interval given by ****PowerSupplyHighFrequencyTimeout****.

No: 2956	SupervisionID 2956	Name PowerSupplyACVoltageLowSx
Log text	SupplyError: Min ____V phase_	
Subsystem name	PowerSupply	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Utility

Criteria:

This alarm indicates that the voltage is too low.

This alarm is reported if either ****Converter.SecVoltagePhase1****, ****Converter.SecVoltagePhase2**** or ****Converter.SecVoltagePhase3**** drops below ****PowerSupplyLowVoltageLimit**** for longer than the time interval given by ****PowerSupplyLowVoltageTimeout****.

No: 2956	SupervisionID 2956	Name PowerSupplyACVoltageLowSx
Log text	SupplyError: Min ____ V phase_	
Subsystem name	PowerSupply	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Utility

Criteria:

This alarm indicates that the voltage is too low.

This alarm is reported if either ****Converter.SecVoltagePhase1****, ****Converter.SecVoltagePhase2**** or ****Converter.SecVoltagePhase3**** drops below ****PowerSupplyLowVoltageLimit**** for longer than the time interval given by ****PowerSupplyLowVoltageTimeout****.

No: 2957	SupervisionID 2957	Name UPSDC1BatteryErrorSx
Log text	UPS DC1 Battery Error	
Subsystem name	UPS	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	1 minute	Category Manufacturer

Criteria:

There is error on the DC UPS 1 Battery.

No: 2958	SupervisionID 2958	Name UPSDC2BatteryErrorSx
Log text	UPS DC2 Battery Error	
Subsystem name	UPS	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	1 minute	Category Manufacturer

Criteria:

There is error on the DC UPS 2 Battery.

No: 2959	SupervisionID 2959	Name UPSDCPowerSupplyMissingSx
Log text	UPS DC Power Supply Missing	
Subsystem name	UPS	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	1 minute	Category Manufacturer

Criteria:

The power supply from DC UPS is missing.

No: 2960	SupervisionID 2960	Name UPSDC1ErrorSx
Log text	UPS DC1 Error	
Subsystem name	UPS	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	1 minute	Category Manufacturer

Criteria:

There is error on the DC UPS 1.

No: 2961	SupervisionID 2961	Name UPSDC2ErrorSx
Log text	UPS DC2 Error	
Subsystem name	UPS	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	1 minute	Category Manufacturer

Criteria:

There is error on the DC UPS 2.

No: 2967	SupervisionID 2967	Name PowerSupplyACVoltageHighSx
Log text	SupplyError: Max ____V phase_	
Subsystem name	PowerSupply	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Utility

Criteria:

This alarm indicates that the voltage is too high.

This alarm is reported if either ****Converter.SecVoltagePhase1****, ****Converter.SecVoltagePhase2**** or ****Converter.SecVoltagePhase3**** exceeds ****PowerSupplyHighVoltageLimit**** for longer than the time interval given by ****PowerSupplyHighVoltageTimeout****.

No: 2967	SupervisionID 2967	Name PowerSupplyACVoltageHighSx
Log text	SupplyError: Max ____V phase_	
Subsystem name	PowerSupply	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Utility

Criteria:

This alarm indicates that the voltage is too high.

This alarm is reported if either ****Converter.SecVoltagePhase1****, ****Converter.SecVoltagePhase2**** or ****Converter.SecVoltagePhase3**** exceeds ****PowerSupplyHighVoltageLimit**** for longer than the time interval given by ****PowerSupplyHighVoltageTimeout****.

No: 2980	SupervisionID 2980	Name MainBearingLubrErrorSx
Log text	MainBearLubrErr: NacTemp____°C	
Subsystem name	MainBearingLubrication	
Type	Warning	Timeout 3 day
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect 60 second
- Time window	<n/a>	- Max time eliminate 60 second
- Stabilize period	10 second	Category Manufacturer

Criteria:

This warning is raised if the proximity switch input from the grease distributor does not toggle as expected during a lubrication sequence. Can be caused by missing grease or a faulty/clogged lubrication system.

No: 2981	SupervisionID 2981	Name MainBearingLubrReservoirLevelLowSx
Log text	MainBearLubrReservoirLevelLow	
Subsystem name	MainBearingLubrication	
Type	Warning	Timeout 90 day
Acknowledgement	Local	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 60 second
- Time window	<n/a>	- Max time eliminate 60 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This warning is raised if the grease level in the main bearing lubrication system is too low.

No: 2984	SupervisionID 2984	Name GearHydrWaterCoolingPumpPressLowSx
Log text	GearHydrWatPumpPressLow____bar	
Subsystem name	GearHydraulicWaterCooling	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	5	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	10 minute	Category Manufacturer

Criteria:

The alarm indicates that the gear oil and hydraulic oil water cooling pump pressure drops below a certain limit.

The alarm is raised if the gear oil and hydraulic oil water cooling pump pressure (**IO.GearHydrWaterCoolingPumpPress**) drops below the minimum pressure specified by the parameter **PumpPressMin**, for more than the time interval given by the parameter **PumpPressTime**.

This alarm is only monitored if the gear oil and hydraulic oil water cooling pump is running (**IO.GearHydrWaterCoolingPumpStart** is true).

The alarm is auto acknowledged, if the gear oil and hydraulic oil water cooling pump pressure is equal or above the parameter **PumpPressMin**.

No: 2985	SupervisionID 2985	Name GearHydrWaterCoolingWaterLevelLowSx
Log text	GearHydrWatPumpLevelLow___m^3	
Subsystem name	GearHydraulicWaterCooling	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	10 minute	Category Manufacturer

Criteria:

The warning indicates low GearHydraulic water level in the expansion tank.

****TankSensorType**** equals "PressureSensor" or "LevelSensor":

The warning is raised if the ****GearHydrWaterCoolingWaterLevel**** drops below the minimum pressure specified by the parameter ****TankLevel1****, for more than the time interval given by the parameter ****TankLevelStableTime****.

This warning is auto acknowledged if ****GearHydrWaterCoolingWaterLevel**** is equal or above the parameter ****TankLevel1****.

No: 2986	SupervisionID 2986	Name OneSpeedMotorSignalInvalidSx
Log text	GearHydWaterPumpSignalInvalid	
Subsystem name	GearHydraulicWaterCooling	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:

This warning is raised if the status of the gear hydarulic water cooling pump output signal is invalid.

No: 2987	SupervisionID 2987	Name ThermoFaultSx
Log text	GearHydWaterPumpThermoError	
Subsystem name	GearHydraulicWaterCooling	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	10 minute	Category Manufacturer

Criteria:

The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.GearHydrWaterCoolingPumpOverloaded**** is true.

The motor is stopped when the thermo fault warning/alarm is reported.

No: 2988**SupervisionID** 2988**Name** ThermoSignalInvalidSx**Log text**

GearHydWaterPumpThermoInvalid

Subsystem name

GearHydraulicWaterCooling

Type

Alarm

Timeout

<n/a>

Acknowledgement

Auto

Shutdown type

PauseSlow

- Allowed attempts

3

- Max time disconnect

9 second

- Time window

1 hour

- Max time eliminate

10 second

- Stabilize period

10 minute

Category

Manufacturer

Criteria:

This alarm is raised if the status of the gear hydarulic water cooling pump thermo signal is invalid.

No: 2989**SupervisionID** 2989**Name** PositiveFeedbackSx**Log text**

GearHydWaterPumpPositiveFB

Subsystem name

GearHydraulicWaterCooling

Type

Warning

Timeout

<disabled>

Acknowledgement

Auto

Shutdown type

<n/a>

- Allowed attempts

3

- Max time disconnect

<n/a>

- Time window

1 hour

- Max time eliminate

<n/a>

- Stabilize period

10 minute

Category

Manufacturer

Criteria:

This warning is raised when it is detected that the gear hydraulic water cooling pump is running when the output is deactivated.

No: 2990**SupervisionID** 2990**Name** NegativeFeedbackSx**Log text**

GearHydWaterPumpNegativeFB

Subsystem name

GearHydraulicWaterCooling

Type

Alarm

Timeout

<n/a>

Acknowledgement

Auto

Shutdown type

PauseSlow

- Allowed attempts

3

- Max time disconnect

9 second

- Time window

1 hour

- Max time eliminate

10 second

- Stabilize period

10 minute

Category

Manufacturer

Criteria:

The alarm/warning is raised when it is detected that a contactor does not close when the output is activated.

The alarm/warning is raised if the signal ****IO.GearHydrWaterCoolingPumpContactorClosed**** does not change to true within the time given in the parameter ****FeedbackTime**** after the signal ****IO.GearHydrWaterCoolingPumpStart**** is changing from false to true.

The alarm/warning is monitored only when the status of the ****IO.GearHydrWaterCoolingPumpStart**** and the ****IO.GearHydrWaterCoolingPumpContactorClosed**** are valid.

No: 2991	SupervisionID 2991	Name FeedbackSignalInvalidSx	
Log text	GearHydWaterPumpFBInvalid		
Subsystem name	GearHydraulicWaterCooling		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	30 second	Category	Manufacturer

Criteria:

This warning is raised if the status of the gear hydarulic water cooling pump feedback signal is invalid.

No: 2993	SupervisionID 2993	Name ThermoFaultSx	
Log text	HydrHighPressPump1ThermoErr__		
Subsystem name	HydraulicStation		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	2 minute	Category	Manufacturer

Criteria:

The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.HydrHighPressPump1Overloaded**** is true.

The motor is stopped when the thermo fault warning/alarm is reported.

No: 2993	SupervisionID 2993	Name ThermoFaultSx	
Log text	HydrHighPressPump1ThermoErr__		
Subsystem name	HydraulicStation		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	2 minute	Category	Manufacturer

Criteria:

The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.HydrHighPressPump1Overloaded**** is true.

The motor is stopped when the thermo fault warning/alarm is reported.

No: 2994	SupervisionID 2994	Name ThermoFaultSx	
Log text	HydrHighPressPump2ThermoErr__		
Subsystem name	HydraulicStation		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	2 minute	Category	Manufacturer

Criteria:
The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.HydrHighPressPump2Overloaded**** is true.

The motor is stopped when the thermo fault warning/alarm is reported.

No: 2994	SupervisionID 2994	Name ThermoFaultSx	
Log text	HydrHighPressPump2ThermoErr__		
Subsystem name	HydraulicStation		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	2 minute	Category	Manufacturer

Criteria:
The alarm/warning is raised when the thermo signal of an electrical motor indicates it is overloaded.

The alarm/warning is raised when thermo signal ****IO.HydrHighPressPump2Overloaded**** is true.

The motor is stopped when the thermo fault warning/alarm is reported.

No: 2995	SupervisionID 2995	Name HydrHighPressPumpsNotFunctionalSx	
Log text	HydrHighPressPumpNotFunctional		
Subsystem name	HydraulicStation		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	StopSlow
- Allowed attempts	<n/a>	- Max time disconnect	3 second
- Time window	<n/a>	- Max time eliminate	9 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:
This alarm is raised if one or more active supervisions on both pump 1 and pump 2 are present at the same time.

No: 3003	SupervisionID 3003	Name HydrMainPressLowSx
Log text	HydrMainPressLow:____bar____°C	
Subsystem name	HydraulicStation	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	2 hour	- Max time eliminate 9 second
- Stabilize period	10 minute	Category Manufacturer

Criteria:

The alarm indicates that the Hydraulic Main Oil Pressure drops below a certain limit.

The alarm is raised if the Hydraulic Main Oil Pressure (**IO.HydrMainOilPress**) drops below the LOWER_LIMIT for more than the time interval given by the parameter **MainOilPressLowTime**.

If increased hydraulic pressure request from other subsystem or for a period (given by **MainOilPressLow2KeepTime**) after a increased hydraulic pressure request from other subsystem:
LOWER_LIMIT is given by the parameter **MainOilPressLowLimit2**

If no increased hydraulic pressure request from other subsystem (normal operation):
LOWER_LIMIT is given by the parameter **MainOilPressLow**

This alarm is only monitored if the following conditions are met:

- 1. Hydraulic oil is heated and initial pressure has been build up (**PitchHydrSupplyReady**).
- 2. Safety circuit is closed and power supply is OK (**HydrPowerSupplyOK**).
- 3. No active alarms/warnings from the hydraulic system (**HydrPressureControlOk**).

The alarm is auto acknowledged, if the Hydraulic Main Oil Pressure is equal or above the parameter **MainOilPressLow**.

No: 3003**SupervisionID** 3003**Name** HydrMainPressLowSx**Log text**

HydrMainPressLow:____bar____°C

Subsystem name

HydraulicStation

Type

Alarm

Timeout

<n/a>

Acknowledgement

Auto

Shutdown type

StopSlow

- Allowed attempts

3

- Max time disconnect

3 second

- Time window

2 hour

- Max time eliminate

9 second

- Stabilize period

10 minute

Category

Manufacturer

Criteria:

The alarm indicates that the Hydraulic Main Oil Pressure drops below a certain limit.

The alarm is raised if the Hydraulic Main Oil Pressure (**IO.HydrMainOilPress**) drops below the LOWER_LIMIT for more than the time interval given by the parameter **MainOilPressLowTime**.

If increased hydraulic pressure request from other subsystem or for a period (given by **MainOilPressLow2KeepTime**) after a increased hydraulic pressure request from other subsystem:

LOWER_LIMIT is given by the parameter **MainOilPressLowLimit2**

If no increased hydraulic pressure request from other subsystem (normal operation):
LOWER_LIMIT is given by the parameter **MainOilPressLow**

This alarm is only monitored if the following conditions are met:

1. Hydraulic oil is heated and initial pressure has been build up (**PitchHydrSupplyReady**).
2. Safety circuit is closed and power supply is OK (**HydrPowerSupplyOK**).
3. No active alarms/warnings from the hydraulic system (**HydrPressureControlOk**).

The alarm is auto acknowledged, if the Hydraulic Main Oil Pressure is equal or above the parameter **MainOilPressLow**.

No: 3004**SupervisionID** 3004**Name** HydrMainPressHighSx**Log text**

HydrMainPressHigh:____bar____°C

Subsystem name

HydraulicStation

Type

Alarm

Timeout

<n/a>

Acknowledgement

Remote

Shutdown type

PauseSlow

- Allowed attempts

<n/a>

- Max time disconnect

9 second

- Time window

<n/a>

- Max time eliminate

10 second

- Stabilize period

<n/a>

Category

Manufacturer

Criteria:

This alarm is raised if the hydraulic main pressure is above a certain limit. This limit depends on if the Hub In Safe Mode state is active or not.

This alarm supervises the main Hydraulic pressure and indicates that the pressure is high.

This alarm is raised if **IO.HydrMainOilPress** is greater than **MainOilPressHigh** in the time **MainOilPressHighTime**.

This alarm can be acknowledged if **IO.HydrMainOilPress** is less than **MainOilPressHigh**.

No: 3004	SupervisionID 3004	Name HydrMainPressHighSx	
Log text	HydrMainPressHigh:____bar____°C		
Subsystem name	HydraulicStation		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect	9 second
- Time window	<n/a>	- Max time eliminate	10 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This alarm is raised if the hydraulic main pressure is above a certain limit. This limit depends on if the Hub In Safe Mode state is active or not.

This alarm supervises the main Hydraulic pressure and indicates that the pressure is high.

This alarm is raised if ****IO.HydrMainOilPress**** is greater than ****MainOilPressHigh**** in the time ****MainOilPressHighTime****.

This alarm can be acknowledged if ****IO.HydrMainOilPress**** is less than ****MainOilPressHigh****.

No: 3005	SupervisionID 3005	Name HydrInitialPressureMissingSx	
Log text	HydrInitPressMissing____bar____°C		
Subsystem name	HydraulicStation		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	1	- Max time disconnect	3 second
- Time window	3600 second	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

The alarm indicates that it has taken too long time to build up initial hydraulic pressure, which might indicate an oil leakage or a failing hydraulic component.

The alarm is raised if it has taken more than the time, given in the parameter ****BuildInitialPressMaxTime****, to build up initial hydraulic pressure (****IO.HydrMainOilPress**** > ****InitialPressLimit****) and heating is not active (****IO.HydrHeatingValveOpen**** is false) after one of the following events:

1. The turbine has been in state 'Stopped'.
2. Safety circuit has been opened
3. Active alarm from the hydraulic system.
4. Emergency feathering.

The alarm is a one-shot and can be acknowledged immediatly after reporting.

No: 3005	SupervisionID 3005	Name HydrInitialPressureMissingSx	
Log text	HydrInitPressMissing___bar___°C		
Subsystem name	HydraulicStation		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	1	- Max time disconnect	3 second
- Time window	3600 second	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

The alarm indicates that it has taken too long time to build up initial hydraulic pressure, which might indicate an oil leakage or a failing hydraulic component.

The alarm is raised if it has taken more than the time, given in the parameter ****BuildInitialPressMaxTime****, to build up initial hydraulic pressure (****IO.HydrMainOilPress**** > ****InitialPressLimit****) and heating is not active (****IO.HydrHeatingValveOpen**** is false) after one of the following events:

1. The turbine has been in state 'Stopped'.
2. Safety circuit has been opened
3. Active alarm from the hydraulic system.
4. Emergency feathering.

The alarm is a one-shot and can be acknowledged immediatly after reporting.

No: 3009	SupervisionID 3009	Name HydrOilTempHighSx	
Log text	HydrOilTempHigh___°C		
Subsystem name	HydraulicStation		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	9 second
- Time window	1 hour	- Max time eliminate	10 second
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

The alarm indicates that the hydraulic oil temperature exceeds a certain limit.

The alarm is raised if the hydraulic oil temperature (****HydrOilTemp****) exceeds the limit given by the parameter ****OilTempHighLimit**** for more than the time interval given by the parameter ****OilTempHighTime****.

The alarm is auto acknowledged, if the hydraulic oil temperature (****HydrOilTemp****) becomes less than ****OilTempHighLimit**** - ****OilTempHighHyst****.

No: 3009

Log text HydrOilTempHigh____°C
Subsystem name HydraulicStation
Type Alarm
Acknowledgement Auto
- **Allowed attempts** 3
- **Time window** 1 hour
- **Stabilize period** 10 minute

Criteria:

The alarm indicates that the hydraulic oil temperature exceeds a certain limit.

The alarm is raised if the hydraulic oil temperature (**HydrOilTemp**) exceeds the limit given by the parameter **OilTempHighLimit** for more than the time interval given by the parameter **OilTempHighTime**.

The alarm is auto acknowledged, if the hydraulic oil temperature (**HydrOilTemp**) becomes less than **OilTempHighLimit** - **OilTempHighHyst**.

No: 3012

SupervisionID 3012	Name NegativeFeedbackSx
Log text HydrHighPressPump1NegFBError	
Subsystem name HydraulicStation	
Type Warning	Timeout <disabled>
Acknowledgement Auto	Shutdown type <n/a>
- Allowed attempts 3	- Max time disconnect <n/a>
- Time window 1 hour	- Max time eliminate <n/a>
- Stabilize period 2 minute	Category Manufacturer

Criteria:

The alarm/warning is raised when it is detected that a contactor does not close when the output is activated.

The alarm/warning is raised if the signal **IO.HydrHighPressPump1ContactorClosed** does not change to true within the time given in the parameter **HydrHighPressPump1Object.Feedback.FeedbackTime** after the signal **IO.HydrHighPressPump1Start** is changing from false to true.

The alarm/warning is monitored only when the status of the **IO.HydrHighPressPump1Start** and the **IO.HydrHighPressPump1ContactorClosed** are valid.

No: 3012	SupervisionID 3012	Name NegativeFeedbackSx
Log text	HydrHighPressPump1NegFBError	
Subsystem name	HydraulicStation	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	2 minute	Category Manufacturer

Criteria:

The alarm/warning is raised when it is detected that a contactor does not close when the output is activated.

The alarm/warning is raised if the signal ****IO.HydrHighPressPump1ContactorClosed**** does not change to true within the time given in the parameter ****HydrHighPressPump1Object.Feedback.FeedbackTime**** after the signal ****IO.HydrHighPressPump1Start**** is changing from false to true.

The alarm/warning is monitored only when the status of the ****IO.HydrHighPressPump1Start**** and the ****IO.HydrHighPressPump1ContactorClosed**** are valid.

No: 3013	SupervisionID 3013	Name PositiveFeedbackSx
Log text	HydrHighPressPump1PosFBError	
Subsystem name	HydraulicStation	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	2 minute	Category Manufacturer

Criteria:

The alarm/warning is raised when it is detected that a contactor does not open when the output is deactivated.

The alarm/warning is raised if the signal ****IO.HydrHighPressPump1ContactorClosed**** does not change to false within the time given in the parameter ****HydrHighPressPump1Object.Feedback.FeedbackTime**** after the signal ****IO.HydrHighPressPump1Start**** is changing from true to false.

The alarm/warning is monitored only when the status of the ****IO.HydrHighPressPump1Start**** and the ****IO.HydrHighPressPump1ContactorClosed**** are valid.

The motor is stopped when the positive feedback fault warning/alarm is reported.

No: 3013	SupervisionID 3013	Name PositiveFeedbackSx	
Log text	HydrHighPressPump1PosFBError		
Subsystem name	HydraulicStation		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	2 minute	Category	Manufacturer

Criteria:

The alarm/warning is raised when it is detected that a contactor does not open when the output is deactivated.

The alarm/warning is raised if the signal ****IO.HydrHighPressPump1ContactorClosed**** does not change to false within the time given in the parameter ****HydrHighPressPump1Object.Feedback.FeedbackTime**** after the signal ****IO.HydrHighPressPump1Start**** is changing from true to false.

The alarm/warning is monitored only when the status of the ****IO.HydrHighPressPump1Start**** and the ****IO.HydrHighPressPump1ContactorClosed**** are valid.

The motor is stopped when the positive feedback fault warning/alarm is reported.

No: 3014	SupervisionID 3014	Name NegativeFeedbackSx	
Log text	HydrHighPressPump2NegFBError		
Subsystem name	HydraulicStation		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	2 minute	Category	Manufacturer

Criteria:

The alarm/warning is raised when it is detected that a contactor does not close when the output is activated.

The alarm/warning is raised if the signal ****IO.HydrHighPressPump2ContactorClosed**** does not change to true within the time given in the parameter ****HydrHighPressPump2Object.Feedback.FeedbackTime**** after the signal ****IO.HydrHighPressPump2Start**** is changing from false to true.

The alarm/warning is monitored only when the status of the ****IO.HydrHighPressPump2Start**** and the ****IO.HydrHighPressPump2ContactorClosed**** are valid.

No: 3014	SupervisionID 3014	Name NegativeFeedbackSx	
Log text	HydrHighPressPump2NegFBError		
Subsystem name	HydraulicStation		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	2 minute	Category	Manufacturer

Criteria:

The alarm/warning is raised when it is detected that a contactor does not close when the output is activated.

The alarm/warning is raised if the signal ****IO.HydrHighPressPump2ContactorClosed**** does not change to true within the time given in the parameter

****HydrHighPressPump2Object.Feedback.FeedbackTime**** after the signal

****IO.HydrHighPressPump2Start**** is changing from false to true.

The alarm/warning is monitored only when the status of the ****IO.HydrHighPressPump2Start**** and the ****IO.HydrHighPressPump2ContactorClosed**** are valid.

No: 3015	SupervisionID 3015	Name PositiveFeedbackSx	
Log text	HydrHighPressPump2PosFBError		
Subsystem name	HydraulicStation		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	2 minute	Category	Manufacturer

Criteria:

The alarm/warning is raised when it is detected that a contactor does not open when the output is deactivated.

The alarm/warning is raised if the signal ****IO.HydrHighPressPump2ContactorClosed**** does not change to false within the time given in the parameter

****HydrHighPressPump2Object.Feedback.FeedbackTime**** after the signal

****IO.HydrHighPressPump2Start**** is changing from true to false.

The alarm/warning is monitored only when the status of the ****IO.HydrHighPressPump2Start**** and the ****IO.HydrHighPressPump2ContactorClosed**** are valid.

The motor is stopped when the positive feedback fault warning/alarm is reported.

No: 3015	SupervisionID 3015	Name PositiveFeedbackSx	
Log text	HydrHighPressPump2PosFBError		
Subsystem name	HydraulicStation		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	2 minute	Category	Manufacturer

Criteria:

The alarm/warning is raised when it is detected that a contactor does not open when the output is deactivated.

The alarm/warning is raised if the signal ****IO.HydrHighPressPump2ContactorClosed**** does not change to false within the time given in the parameter ****HydrHighPressPump2Object.Feedback.FeedbackTime**** after the signal ****IO.HydrHighPressPump2Start**** is changing from true to false.

The alarm/warning is monitored only when the status of the ****IO.HydrHighPressPump2Start**** and the ****IO.HydrHighPressPump2ContactorClosed**** are valid.

The motor is stopped when the positive feedback fault warning/alarm is reported.

No: 3017	SupervisionID 3017	Name LaPMMSafeModeInvalidWindDirSx	
Log text	Load/PowerMode invalid winddir		
Subsystem name	ProductionManager		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	5	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

Nacelle Position signal is invalid and safemode is selected until warning has been acknowledged. Compare the value in picture 1.C with geographical north to verify if Nacelle Position must be reset.

No: 3018	SupervisionID 3018	Name LaPMMSafeModeInvalidConfigSx
Log text	Load/PowerMode invalid config.	
Subsystem name	ProductionManager	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:

The warning can be triggered by the following 3 reasons and safemode will be activated when dynamic setting is configured:

- 1) If Load & PowerModes is enabled and no wind sectors and default configurations are used:
I.e ****LaPMMEEnabled**** is true, ****WindSectorsUsed**** is 0, ****PartialLoadDefaultMode**** is 0 and ****FullLoadDefaultMode**** is 0.
- 2) If there is an overlap between 2 Load & Power Modes sectors. I.e. the direction range from ****WindSector1.SectorAngleBegin**** to ****WindSector1.SectorAngleEnd**** must only be covered by one sector.
- 3) If ****WindSector1.SectorAngleBegin**** is different from ****WindSector1.SectorAngleEnd**** for e.g. sector 1 and all the following 3 modes are set to 0 for the same sector:
 1. ****WindSector1.PartialLoadMode**** = 0
 2. ****WindSector1.FullLoadLowWindMode**** = 0
 3. ****WindSector1.FullLoadHighWindMode**** = 0
- The warnings arguments are invalid sector number and related sector configuration.
- The warning can be acknowledged when the parameters are reconfigured to remove the issues above.
- WindSector1 is used as an example for above parameters.

No: 3020	SupervisionID 3020	Name GroundControllerProcessorBatteryCapacityLowSx
Log text	GndControllerProcessorBattLow	
Subsystem name	FrameworkHealthMonitoring	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:

This alarm is raised if Ground Controller Processor Battery status is in error.

No: 3021	SupervisionID 3021	Name HubControllerProcessorBatteryCapacityLowSx
Log text	HubControllerProcessorBattLow	
Subsystem name	FrameworkHealthMonitoring	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:

This alarm is raised if Hub Controller Processor Battery status is in error.

No: 3025	SupervisionID	Name	GroundControllerArcNetReceiver1LightErrorSx
	3025		
Log text	GndArcNetRec1LightErr____.____dBm		
Subsystem name	FrameworkHealthMonitoring		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 1 light.

For the ground controller.

No: 3026	SupervisionID	Name	GroundControllerArcNetReceiver2LightErrorSx
	3026		
Log text	GndArcNetRec2LightErr____.____dBm		
Subsystem name	FrameworkHealthMonitoring		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 2 light.

For the ground controller.

No: 3027	SupervisionID	Name	GroundControllerArcNetReceiver3LightErrorSx
	3027		
Log text	GndArcNetRec3LightErr____.____dBm		
Subsystem name	FrameworkHealthMonitoring		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 3 light.

For the ground controller.

No: 3028	SupervisionID	Name	GroundControllerArcNetReceiver4LightErrorSx
	3028		
Log text	GndArcNetRec4LightErr____.dBm		
Subsystem name	FrameworkHealthMonitoring		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 4 light.

For the ground controller.

No: 3029	SupervisionID	Name	GroundControllerArcNetReceiver5LightErrorSx
	3029		
Log text	GndArcNetRec5LightErr____.dBm		
Subsystem name	FrameworkHealthMonitoring		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 5 light.

For the ground controller.

No: 3030	SupervisionID	Name	NacelleControllerArcNetReceiver1LightErrorSx
	3030		
Log text	NacArcNetRec1LightErr____.dBm		
Subsystem name	FrameworkHealthMonitoring		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 1 light.

For the nacelle controller.

No: 3031	SupervisionID	Name
	3031	NacelleControllerArcNetReceiver2LightErrorSx
Log text	NacArcNetRec2LightErr____.dBm	
Subsystem name	FrameworkHealthMonitoring	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 2 light.

For the nacelle controller.

No: 3032	SupervisionID	Name
	3032	NacelleControllerArcNetReceiver3LightErrorSx
Log text	NacArcNetRec3LightErr____.dBm	
Subsystem name	FrameworkHealthMonitoring	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 3 light.

For the nacelle controller.

No: 3033	SupervisionID	Name
	3033	NacelleControllerArcNetReceiver4LightErrorSx
Log text	NacArcNetRec4LightErr____.dBm	
Subsystem name	FrameworkHealthMonitoring	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 4 light.

For the nacelle controller.

No: 3034	SupervisionID 3034	Name NacelleControllerArcNetReceiver5LightErrorSx
Log text	NacArcNetRec5LightErr____.____dBm	
Subsystem name	FrameworkHealthMonitoring	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 5 light.

For the nacelle controller.

No: 3035	SupervisionID 3035	Name HubControllerArcNetReceiver1LightErrorSx
Log text	HubArcNetRec1LightErr____.____dBm	
Subsystem name	FrameworkHealthMonitoring	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 1 light.

For the hub controller.

No: 3036	SupervisionID 3036	Name HubControllerArcNetReceiver2LightErrorSx
Log text	HubArcNetRec2LightErr____.____dBm	
Subsystem name	FrameworkHealthMonitoring	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 2 light.

For the hub controller.

No: 3037	SupervisionID 3037	Name HubControllerArcNetReceiver3LightErrorSx	
Log text	HubArcNetRec3LightErr____.____dBm		
Subsystem name	FrameworkHealthMonitoring		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 3 light.

For the hub controller.

No: 3038	SupervisionID 3038	Name HubControllerArcNetReceiver4LightErrorSx	
Log text	HubArcNetRec4LightErr____.____dBm		
Subsystem name	FrameworkHealthMonitoring		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 4 light.

For the hub controller.

No: 3039	SupervisionID 3039	Name HubControllerArcNetReceiver5LightErrorSx	
Log text	HubArcNetRec5LightErr____.____dBm		
Subsystem name	FrameworkHealthMonitoring		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 5 light.

For the hub controller.

No: 3040	SupervisionID	Name	ConverterControllerArcNetReceiver3LightErrorSx3040
Log text	ConvArcNetRc3LightErr____.____dBm		
Subsystem name	FrameworkHealthMonitoring		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer
Criteria:			

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 3 light.

For the converter controller.

No: 3041	SupervisionID	Name	ConverterControllerArcNetReceiver4LightErrorSx3041
Log text	ConvArcNetRc4LightErr____.____dBm		
Subsystem name	FrameworkHealthMonitoring		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer
Criteria:			

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 4 light.

For the converter controller.

No: 3042	SupervisionID	Name	AccTestInitialPressureMissingSx3042
Log text	AccTestInitPressMissing____bar		
Subsystem name	BrakeTestFunction		
Type	Warning	Timeout	7 hour
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	4	- Max time disconnect	15 second
- Time window	1 hour	- Max time eliminate	45 second
- Stabilize period	60 second	Category	Manufacturer
Criteria:			

This warning is raised if the brake accumulator pressure remains below the certain pressure limit after predefined time, when starting accumulator test, which is one of the brake tests. The accumulator test is aborted if this situation occurs.

No: 3043	SupervisionID 3043	Name BrakeAccumulatorTestMinTimeFailedSx
Log text	BrakeAccTestMinTimeErr____sec	
Subsystem name	BrakeTestFunction	
Type	Warning	Timeout 7 hour
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	4	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This warning is raised if the brake accumulator is emptied during the accumulator faster than the minimum specified time. The reason for this can be that the accumulator bladder is defect.

No: 3044	SupervisionID 3044	Name BrakeAccumulatorTestMaxTimeFailedSx
Log text	BrakeAccTestMaxTimeErr____sec	
Subsystem name	BrakeTestFunction	
Type	Warning	Timeout 7 hour
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	4	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This warning is raised if the brake accumulator is emptied during the accumulator test for the time longer than the maximum specified time. It can occur if there is failure on one of the brake valves (brake apply valve 1, brake apply valve 2 and/or brake drain valve).

No: 3045	SupervisionID 3045	Name BrakeApplyValve1FailedSx
Log text	BrakeApplyValve1ErrPress____bar	
Subsystem name	BrakeTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	1 second	Category Manufacturer

Criteria:

This alarm is raised if the brake apply valve 1 is functioning faulty during the brake test function.

No: 3046	SupervisionID 3046	Name BrakeDrainValveFailedSx
Log text	BrakeDrainValveFailed	
Subsystem name	BrakeTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	1 second	Category Manufacturer

Criteria:

This alarm is raised if the brake drain valve is functioning faulty during the brake test function.

No: 3047	SupervisionID 3047	Name DrainTestInitialPressureMissingSx
Log text	DrainTestInitialPressMissing	
Subsystem name	BrakeTestFunction	
Type	Warning	Timeout 7 hour
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	4	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This warning is raised if the brake accumulator pressure remains below the certain pressure limit after the predefined time, when starting brake drain valve test, which is one of the brake tests. The brake drain valve test is aborted if this situation occurs.

No: 3048	SupervisionID 3048	Name BrakeApplyValve2FailedSx
Log text	BrakeApplyValve2ErrPress___bar	
Subsystem name	BrakeTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	1 second	Category Manufacturer

Criteria:

This alarm is raised if the the brake apply valve 2 is functioning faulty during the brake test function.

No: 3095	SupervisionID 3095	Name BrakeAccumulatorPressTooHighSx
Log text	BrakeAccPressTooHigh___bar	
Subsystem name	Brake	
Type	Warning	Timeout 1209600 second
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	4	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This warning indicates that the Brake Accumulator Pressure exceeds a certain limit.

The warning is raised if the Brake Accumulator Pressure (**IO.BrakeAccumulatorPress**) exceeds the limit given by the parameter **BrakeAccumulatorPressureMaxLimit**, for more than the time interval given by the parameter **PressureSupervisionTime**.

The warning is automatically acknowledged when **IO.BrakeAccumulatorPress** becomes less than **BrakeAccumulatorPressureMaxLimit** - **BrakeAccumulatorPressureMaxLimitHyst**.

No: 3096	SupervisionID 3096	Name BrakePressureTooHighSx	
Log text	BrakePressureTooHigh___bar		
Subsystem name	Brake		
Type	Warning	Timeout	7 hour
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	4	- Max time disconnect	15 second
- Time window	1 hour	- Max time eliminate	45 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

The warning indicates that the Brake Pressure exceeds a certain limit.

The warning is raised if the Brake Pressure (**IO.BrakePress**) exceeds the limit given by the parameter **BrakePressureHigh**, for more than the time interval given by the parameter **PressureSupervisionTime**.

The warning is automatically acknowledged when the Brake Pressure (**IO.BrakePress**) becomes less than **BrakePressureHigh** - **BrakePressureHighHyst**.

No: 3099	SupervisionID 3099	Name BrakeAppliedInProductionStateSx	
Log text	BrakeAppliedInProduction		
Subsystem name	Brake		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect	15 second
- Time window	<n/a>	- Max time eliminate	45 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This alarm is raised if the brake is applied when the turbine is in or entering production.

The alarm is raised if the brake is applied either by the turbine control system or the safety system (**IO.SafetySystemBrakeApplied**), when the turbine is in or entering production (**OperationManager.MainTurbineCommandOutput** is production).

The alarm can be acknowledged if the brake is released or the **OperationManager.MainTurbineCommandOutput** is not production.

No: 3120	SupervisionID 3120	Name ValidateEmergencyPitchVelocityAFailSx	
Log text	PtchValAErr,VeloclyA____.mm/s		
Subsystem name	PitchValvesTestFunction		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	15 second
- Time window	1 hour	- Max time eliminate	45 second
- Stabilize period	5 second	Category	Manufacturer

Criteria:

This alarm is raised if the validation of the emergency pitch valve A is failed when running emergency pitch valves test function

No: 3121	SupervisionID 3121	Name ValidateEmergencyPitchVelocityBFailSx
Log text	PtchValBErr,VelocytB____.mm/s	
Subsystem name	PitchValvesTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	5 second	Category Manufacturer

Criteria:

This alarm is raised if the validation of the emergency pitch valve B is failed when running emergency pitch valves test function

No: 3122	SupervisionID 3122	Name ValidateEmergencyPitchVelocityCFailSx
Log text	PtchValCErr,VelocytC____.mm/s	
Subsystem name	PitchValvesTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	5 second	Category Manufacturer

Criteria:

This alarm is raised if the validation of the emergency pitch valve C is failed when running emergency pitch valves test function

No: 3123	SupervisionID 3123	Name ValidateEmergencyPitchVelocityDifferenceExceedSx
Log text	PitchVelocityDiffExceed____mm/s	
Subsystem name	PitchValvesTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	5 second	Category Manufacturer

Criteria:

This alarm is raised if the difference between the maximum and minimum of all three velocities (for blade A, B or C) is above the difference limit, when running the emergency pitch valves test function. This alarm is one-shot alarm, i.e. it can be acknowledged immediately and they are not reported until next time the automatic test detects the failure.

No: 3126	SupervisionID 3126	Name PitchValvesTestEMCFlushTestFailureSx
Log text	FlushTestErr;EMCPilot____bar	
Subsystem name	PitchValvesTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	1 second	Category Manufacturer

Criteria:

This alarm is raised if the EMC pilot pressure is above the maximum limit during the Flush EMC Pilot Line Test.

No: 3127	SupervisionID 3127	Name PitchValvesTestEMCValveFailureSx
Log text	HydrPress__bar;EMCPilot__bar	
Subsystem name	PitchValvesTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	1 second	Category Manufacturer

Criteria:

This alarm is raised if there is the failure on the pilot valve during the EMC Pilot Valves Test.

No: 3128	SupervisionID 3128	Name PitchValvesTestEMCValveIncorrectPressSx
Log text	HydrPress__bar;EMCPilot__bar	
Subsystem name	PitchValvesTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	1 second	Category Manufacturer

Criteria:

This alarm is raised if the defference between the hydraulic main oil pressure and the pitch block EMC pilot pressure is above the EMC valves pilot pressure tollerance during the EMC Pilot Valves Test.

No: 3129	SupervisionID 3129	Name PitchValvesTestDODPValveFailureSx
Log text	DODP Valve Failure	
Subsystem name	PitchValvesTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	1 second	Category Manufacturer

Criteria:

The alarm indicates that the Hydraulic Main Oil Pressure has not dropped below a certain limit within a given time, when running the DODP Valve Test.

The alarm is raised if the Hydraulic Main Oil Pressure (**IO.HydrMainOilPress**) has not dropped **DODPPressDrop** within **DODPTimeout** time.

The alarm is an one-shot supervision and can be acknowledged immediately.

No: 3132	SupervisionID 3132	Name HighIMSCSx
Log text	HighIMSC L__,MaxCurr____A	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors if a current in a generator phase is above limit.

This supervision monitors if the instantaneous currents in each winding-set of the generator is above limit (IMSC_HIGH_ModulePx * NoOfActivePowerModulesPerWinding1).

Par1 : Generator winding-set(1=Winding1, 2=Winding2).Generator Phase(1=Phase1, 2=Phase2, 3=Phase3)

Par2 : Maximum generator phase current [A] in winding-set

Alarm condition: If one of the generator phase currents is higher than the (IMSC_HIGH_ModulePx * NoOfActivePowerModulesPerWinding1) the supervision is reported.

This alarm could happen due to a noise spike in the cables.

If the alarm is seen only once then the turbine can be restarted.

if the alarm is seen several times during a limited timespan the alarm should be analysed further.

No: 3134	SupervisionID 3134	Name GenSpeedOutsideCtrlLimitSx
Log text	GenSpeedOutLimLw/Hi:_, ____rpm	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors the generator speed.

Alarm condition: The alarm is raised if the generator SPEED detected by the encoder goes outside the limits specified by the parameters **SPEED_LOW** and **SPEED_HIGH**.

The alarm is only sent if the System_state is above state Charged.

Par1 : Limit passed (0 = low limit, 1 = high limit)

Par2 : Generator speed

No: 3135	SupervisionID 3135	Name SynchronizationTimeoutSx
Log text	Sync time out____s,SyncState____	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the converter during a connect attempt fails to synchronize with the generator. Parameters consist of software related signals. Par1 : Synchronization parameter. Par2 : Main MSC State

This alarm is raised if the converter during a connect attempt fails to synchronize with the generator.
Parameters consist of software related signals. Par1 : Synchronization parameter. Par2 : Main MSC State

No: 3136	SupervisionID 3136	Name ConnectTransitionTimeoutSx
Log text	ConnTransTimeOut____s,MSState____	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the converter during a connecting attempt fails to change to the connected state within a timeout. Parameters consist of software related signals.

Par1 : Transition parameter.

Par2 : Main MSC State

No: 3138	SupervisionID 3138	Name DisConnectTransitionTimeoutSx
Log text	DiscTransPrm____s,MainMSCState_	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the converter during a disconnect attempt fails to disconnect within a timeout.

Parameters consist of software related signals. Par1 : Disconnect Transition parameter.
Par2 : Main MSC State

This alarm is raised in 2 cases:

- if the MSC control state machine during a disconnect attempt fails to disconnect within a timeout (**DISCONNECT_TRANS_TIME**).
 - if the MSC control state machine during a connecting attempt fails to connect within a timeout (**DISCONNECT_TRANS_TIME**).
- Parameters consist of software related signals.

Par1 : Disconnect Transition timeout.
Par2 : Main MSC State

No: 3141	SupervisionID 3141	Name HighILSCSx
Log text	HighILSC,L_,MaxLSCCurr____A	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors if a current in a line side converter phase is above limit.

This supervision monitors if a current in a line side converter phase is above limit.

Par1 : Phase [1=L1,2=L2,3=L3]
Par2 : Maximum line side converter phase current [A]

Alarm condition: If one of the line side converter phase currents has exceeded the limit given by the parameter **ILSC_HIGH_Module** the supervision is reported. Par1 displays which phase and par2 gives the peak phase current

This alarm could happen due to a noise spike in the cables.
If the alarm is seen only once then the turbine can be restarted.
if the alarm is seen several times during a limited timespan the alarm should be analysed further.

No: 3150	SupervisionID 3150	Name GridPhaseSequenceErrSx
Log text	GridPhaseSeqErr,Par1____ Par2__	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type Emergency
- Allowed attempts	3	- Max time disconnect 0 second
- Time window	1 hour	- Max time eliminate 0 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the grid voltage phase sequence is not correct. Par1 : Grid frequency (Hz)

This alarm is raised if the grid voltage phase sequence is not correct.

Par1 : Grid frequency (Hz)

No: 3152	SupervisionID 3152	Name GridFilterFuseErrSx
Log text	GridFiltFuseErr,___kVar,Val:_	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision is raised if the reactive power absorbed by the grid filter is lower than expected.

Prior to charging the converter the grid filter is activated and only if the reactive power absorbed by the grid filter is sufficiently high the turbine is allowed to run. Auxiliary equipment being connected or disconnected during the measurement process can interfere with the measurement and give rare false alarms.

This supervision is raised if the reactive power absorbed by the grid filter is lower than expected.

Prior to charging the converter the grid filter is activated and only if the reactive power absorbed by the grid filter is sufficiently high the turbine is allowed to run. Auxiliary equipment being connected or disconnected during the measurement process can interfere with the measurement and give rare false alarms.

Par1: Difference in reactive power (QL) absorbed by the Gridfilter and expected absorbtion [kVAr]

Par2: Minimum limit of reactive power for the check to pass [kVAr]

Alarm condition:

The Alarm occurs when the calculated reactive power consumption from the gridfilter capacitors are less than the expected minimum reactive power consumption. The reactive power is calculated based on capacitance of gridfilter (C_GridFilter_Module), if the measured reactive power (QL) < (Q_Gridfilter_LowFactor)*nominal QL, then the error wil occur. it will do the measurement in GridFilterFuseCheckTime amount of time.

Possible causes:

- * One or more grid filter fuses are blown.
- * Contactors to the filters are not working or not wired correct.
- * Defect capacitors (each capacitor should absorb approximate 30kVA(50Hz) and 35kVAr (60Hz)) at rated voltage and the turbine has 6 caps leading to a total Q of 180kVAr (50Hz) and 210 kVAr (60Hz).
- * If the phase sequence on the voltages (UL1,UL2,UL3) and currents (IL1,IL2,IL3) are not correct the measured reactive power will not be correct and the error can be reported. Only relevant during first run-up of the turbine.
Check connection from the current transducers to the tru-board and from the tru-board to the VPC (CT-460).
- * The value of reactive power must be positive, if it is negative, then either phase sequence is wrong or wiring on the current transducer / TRU board is switched.

No: 3154	SupervisionID 3154	Name DischargeSupervTimeoutSx
Log text	DischargeSupvTimeout____s	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the DC Link is not discharged within a timeout. Par1 : Timeout (s)

This alarm is raised if a progress of a DC link is not discharged within a specified timeout (**Discharge_Max_Time**).

Par1 : Timeout [s]

Par2 : N/A

No: 3155	SupervisionID 3155	Name RundownTimeoutSx
Log text	RundownTimeout____s,____RPM	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if a rundown of the produced power is not completed within the rundown timeout.

Par1 : Rundown timeout (s)

Par2 : N/A

No: 3157	SupervisionID 3157	Name DisconnectPowerTooHighSx
Log text	DisconnPowHi:____kW Lim:____kW	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision is raised if a disconnect is commanded while the power is too high.

This supervision is raised if a disconnect is commanded while the producing power is too high.

Par1: Actual power produced when the disconnect was commanded [W]

Par2: Disconnect power level limit [W]

Alarm condition: If a disconnect is commanded when the produced power is higher than the parameters (**MAX_DISC_POWER_LIMIT*****PL_NOM**) then the supervision is reported.

No: 3159 **SupervisionID** 3159 **Name** VPCIntSwErrRunDownSx
Log text VPCIntSWErr:Par1____Par2____
Subsystem name CubePower
Type Alarm **Timeout** <n/a>
Acknowledgement Auto **Shutdown type** StopSlow
- **Allowed attempts** 3 - **Max time disconnect** 3 second
- **Time window** 1 hour - **Max time eliminate** 9 second
- **Stabilize period** 60 second **Category** Manufacturer
Criteria:
This Alarm is raised in case of an internal software error causing a Rundown sequence in the converter software

This Alarm is raised if there is an internal software error during a rundown sequence in the converter software

No: 3160 **SupervisionID** 3160 **Name** ExtHighIMSCSx
Log text ExtHighIMSC,ConvMod_,Par2____
Subsystem name CubePower
Type Alarm **Timeout** <n/a>
Acknowledgement Auto **Shutdown type** StopFast
- **Allowed attempts** 3 - **Max time disconnect** 0.9 second
- **Time window** 1 hour - **Max time eliminate** 1 hour
- **Stabilize period** 60 second **Category** Manufacturer
Criteria:
This alarm is raised if the Controller board (CT440) has detected a high generator current in a PSC power module

Par1: PSC Power module [01/02/03/04]
Par2: Phase [L1=1,L2=2,L3=3]

No: 3162 **SupervisionID** 3162 **Name** ExtHighILSCSx
Log text ExtHighILSC,ConvMod_,Par2____
Subsystem name CubePower
Type Alarm **Timeout** <n/a>
Acknowledgement Auto **Shutdown type** StopFast
- **Allowed attempts** 3 - **Max time disconnect** 0.9 second
- **Time window** 1 hour - **Max time eliminate** 1 hour
- **Stabilize period** 60 second **Category** Manufacturer
Criteria:
This alarm monitors if a current in the line side of a PSC power module is above limit

Par1: PSC Power module [01/02/03/04]
Par2: Phase [L1=1,L2=2,L3=3]

Alarm Condition: If one of the grid side currents is above the parameter PSC_CurrentPhase_Threshold.
The alarm is triggered by the power modules hardware protection.

This alarm could happen due to a noise spike in the cables.
If the alarm is seen only once then the turbine can be restarted.
if the alarm is seen several times during a limited timespan the alarm should be analysed further.

No: 3174	SupervisionID 3174	Name TransformerHighCoreTempSx
Log text	TransformerHighCoreTemp	
Subsystem name	Transformer	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseFast
- Allowed attempts	<n/a>	- Max time disconnect 8 second
- Time window	<n/a>	- Max time eliminate 1 hour
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

The highest core temperature of all three phases in transformer has been above the high limit for predefined time. When this alarm is reported, after certain time (when the generator speed has been below certain limit for the predefined time) the high voltage circuit breaker is opened.

No: 3175	SupervisionID 3175	Name HydrOilTempExtremeHighSx
Log text	HydrOilExtremeHighTemp_____°C	
Subsystem name	HydraulicStation	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

The alarm indicates that the hydraulic oil temperature exceeds a certain limit.

The alarm is raised if the hydraulic oil temperature (**HydrOilTemp**) exceeds the limit given by the parameter **OilTempExtremeHighLimit** for more than the time interval given by the parameter **OilTempExtremeHighTime**.

The alarm can be acknowledged if the hydraulic oil temperature (**HydrOilTemp**) becomes less than **OilTempExtremeHighLimit** - **OilTempExtremeHighHyst**.

No: 3175	SupervisionID 3175	Name HydrOilTempExtremeHighSx
Log text	HydrOilExtremeHighTemp_____°C	
Subsystem name	HydraulicStation	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

The alarm indicates that the hydraulic oil temperature exceeds a certain limit.

The alarm is raised if the hydraulic oil temperature (**HydrOilTemp**) exceeds the limit given by the parameter **OilTempExtremeHighLimit** for more than the time interval given by the parameter **OilTempExtremeHighTime**.

The alarm can be acknowledged if the hydraulic oil temperature (**HydrOilTemp**) becomes less than **OilTempExtremeHighLimit** - **OilTempExtremeHighHyst**.

No: 3186	SupervisionID 3186	Name CableTwistProtectionStopReachedSx
Log text	CTStopReached:Code____,CT_____°	
Subsystem name	YawPositionVariant3	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

The purpose of this alarm is to supervise if the turbine has yawed to end stop.

This alarm appears if cable twist protection stop is reached (**IO.CableTwistProtectionStopReached** is true) and the status of IO.SafetySystemProtocolDataStatus is valid.

This alarm can be acknowledged if **IO.CableTwistProtectionStopReached** turns false.

No: 3228	SupervisionID 3228	Name SignalInvalidSx
Log text	HydHighPressPump1SignalInvalid	
Subsystem name	HydraulicStation	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:

This warning is raised if the hydraulic high pressure pump 1 output signal status is invalid.

No: 3228	SupervisionID 3228	Name OneSpeedMotorSignalInvalidSx
Log text	HydHighPressPump1SignalInvalid	
Subsystem name	HydraulicStation	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:

This warning is raised if the hydraulic high pressure pump 1 output signal status is invalid.

No: 3229	SupervisionID 3229	Name ThermoSignalInvalidSx
Log text	HighPressPump1ThermoInvalid	
Subsystem name	HydraulicStation	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	2 minute	Category Manufacturer

Criteria:

This warning is raised if the hydraulic high pressure pump 1 thermo signal status is invalid.

No: 3230	SupervisionID 3230	Name FeedbackSignalInvalidSx
Log text	HighPressPump1FeedbackInvalid	
Subsystem name	HydraulicStation	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	2 minute	Category Manufacturer

Criteria:
This warning is raised if the hydraulic high pressure pump 1 feedback signal status is invalid.

No: 3230	SupervisionID 3230	Name FeedbackSignalInvalidSx
Log text	HighPressPump1FeedbackInvalid	
Subsystem name	HydraulicStation	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	2 minute	Category Manufacturer

Criteria:
This warning is raised if the hydraulic high pressure pump 1 feedback signal status is invalid.

No: 3231	SupervisionID 3231	Name OneSpeedMotorSignalInvalidSx
Log text	HydHighPressPump2SignalInvalid	
Subsystem name	HydraulicStation	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:
This warning is raised if the hydraulic high pressure pump 2 output signal status is invalid.

No: 3231	SupervisionID 3231	Name SignalInvalidSx
Log text	HydHighPressPump2SignalInvalid	
Subsystem name	HydraulicStation	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:
This warning is raised if the hydraulic high pressure pump 2 output signal status is invalid.

No: 3232	SupervisionID 3232	Name ThermoSignalInvalidSx
Log text	HighPressPump2ThermoInvalid	
Subsystem name	HydraulicStation	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	2 minute	Category Manufacturer

Criteria:
This warning is raised if the hydraulic high pressure pump 2 thermo signal status is invalid.

No: 3232	SupervisionID 3232	Name ThermoSignalInvalidSx
Log text	HighPressPump2ThermoInvalid	
Subsystem name	HydraulicStation	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	2 minute	Category Manufacturer

Criteria:
This warning is raised if the hydraulic high pressure pump 2 thermo signal status is invalid.

No: 3233	SupervisionID 3233	Name FeedbackSignalInvalidSx
Log text	HighPressPump2FeedbackInvalid	
Subsystem name	HydraulicStation	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	2 minute	Category Manufacturer

Criteria:
This warning is raised if the hydraulic high pressure pump 2 feedback signal status is invalid.

No: 3233	SupervisionID 3233	Name FeedbackSignalInvalidSx
Log text	HighPressPump2FeedbackInvalid	
Subsystem name	HydraulicStation	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	2 minute	Category Manufacturer

Criteria:
This warning is raised if the hydraulic high pressure pump 2 feedback signal status is invalid.

No: 3234	SupervisionID 3234	Name PitchAccuTestAccuFailureSx
Log text	PitchAccumulatorTestAccFailed	
Subsystem name	HydraulicTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	2	- Max time disconnect 15 second
- Time window	3600 second	- Max time eliminate 45 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the failure on one of the pitch accumulators (system or manifold) is discovered during the pitch accumulator test.

No: 3235	SupervisionID 3235	Name PitchAccuTestSystemAccuFailedSx
Log text	PitchAccTestSysAccFail,Time__s	
Subsystem name	HydraulicTestFunction	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	4	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	1 second	Category Manufacturer

Criteria:

This warning is raised if the failure on the pitch system accumulator is discovered during the pitch accumulator test, i.e. the accumulator bladder can be defect.

No: 3236	SupervisionID 3236	Name PitchAccuTestSystemDrainValveFailedSx
Log text	PitchSystDrainValveFail____bar	
Subsystem name	HydraulicTestFunction	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	4	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	1 second	Category Manufacturer

Criteria:

This warning is raised if the failure on the pitch system drain valve is discovered during the pitch accumulator test.

No: 3237	SupervisionID 3237	Name PitchAccuTestManifoldAAccuFailedSx
Log text	PitchManifAAccFailed,Time__s	
Subsystem name	HydraulicTestFunction	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	4	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	1 second	Category Manufacturer

Criteria:

This warning is raised if the failure on the pitch manifold A accumulator is discovered during the pitch accumulator test, i.e. tha accumulator bladder can be defect.

No: 3238 **SupervisionID** 3238 **Name** PitchAccuTestManifoldADrainValveFailedSx
3238
Log text PitchManifADrainVlvFail____bar
Subsystem name HydraulicTestFunction
Type Warning **Timeout** <disabled>
Acknowledgement Auto **Shutdown type** <n/a>
- **Allowed attempts** 4 - **Max time disconnect** <n/a>
- **Time window** 1 hour - **Max time eliminate** <n/a>
- **Stabilize period** 1 second **Category** Manufacturer
Criteria:
This warning is raised if the failure on the pitch manifold A drain valve is discovered during the pitch accumulator test.

No: 3239 **SupervisionID** 3239 **Name** PitchAccuTestManifoldBAccuFailedSx
3239
Log text PitchManifBAccFailed,Time____s
Subsystem name HydraulicTestFunction
Type Warning **Timeout** <disabled>
Acknowledgement Auto **Shutdown type** <n/a>
- **Allowed attempts** 4 - **Max time disconnect** <n/a>
- **Time window** 1 hour - **Max time eliminate** <n/a>
- **Stabilize period** 1 second **Category** Manufacturer
Criteria:
This warning is raised if the failure on the pitch manifold B accumulator is discovered during the pitch accumulator test, i.e. tha accumulator bladder can be defect.

No: 3240 **SupervisionID** 3240 **Name** PitchAccuTestManifoldBDrainValveFailedSx
3240
Log text PitchManifBDrainVlvFail____bar
Subsystem name HydraulicTestFunction
Type Warning **Timeout** <disabled>
Acknowledgement Auto **Shutdown type** <n/a>
- **Allowed attempts** 4 - **Max time disconnect** <n/a>
- **Time window** 1 hour - **Max time eliminate** <n/a>
- **Stabilize period** 1 second **Category** Manufacturer
Criteria:
This warning is raised if the failure on the pitch manifold B drain valve is discovered during the pitch accumulator test.

No: 3241 **SupervisionID** 3241 **Name** PitchAccuTestManifoldCAccuFailedSx
3241
Log text PitchManifCAccFailed,Time____s
Subsystem name HydraulicTestFunction
Type Warning **Timeout** <disabled>
Acknowledgement Auto **Shutdown type** <n/a>
- **Allowed attempts** 4 - **Max time disconnect** <n/a>
- **Time window** 1 hour - **Max time eliminate** <n/a>
- **Stabilize period** 1 second **Category** Manufacturer
Criteria:
This warning is raised if the failure on the pitch manifold C accumulator is discovered during the pitch accumulator test, i.e. tha accumulator bladder can be defect.

No: 3242 **SupervisionID** 3242 **Name** PitchAccuTestManifoldCDrainValveFailedSx
Log text PitchManifCDrainVlvFail____bar
Subsystem name HydraulicTestFunction
Type Warning **Timeout** <disabled>
Acknowledgement Auto **Shutdown type** <n/a>
- Allowed attempts 4 - Max time disconnect <n/a>
- Time window 1 hour - Max time eliminate <n/a>
- Stabilize period 1 second **Category** Manufacturer
Criteria:
This warning is raised if the failure on the pitch manifold C drain valve is discovered during the pitch accumulator test.

No: 3243 **SupervisionID** 3243 **Name** OneSpeedMotorSignalInvalidSx
Log text ConvGenWatCoolPumpSignInvalid
Subsystem name ConverterGeneratorWaterCooling
Type Warning **Timeout** <disabled>
Acknowledgement Auto **Shutdown type** <n/a>
- Allowed attempts 3 - Max time disconnect <n/a>
- Time window 1 hour - Max time eliminate <n/a>
- Stabilize period 10 minute **Category** Manufacturer
Criteria:
This warning is raised if the status of the converter generator water cooling pump motor output signal is invalid.

No: 3244 **SupervisionID** 3244 **Name** ThermoFaultSx
Log text ConvGenWatCoolPumpThermoFault
Subsystem name ConverterGeneratorWaterCooling
Type Alarm **Timeout** <n/a>
Acknowledgement Auto **Shutdown type** StopSlow
- Allowed attempts 3 - Max time disconnect 3 second
- Time window 1 hour - Max time eliminate 9 second
- Stabilize period 10 minute **Category** Manufacturer
Criteria:
This alarm is raised the thermo signal of the converter generator water cooling pump motor indicates it is overloaded.

No: 3245 **SupervisionID** 3245 **Name** ThermoSignalInvalidSx
Log text ConvGenWatCoolPumpThermInvalid
Subsystem name ConverterGeneratorWaterCooling
Type Warning **Timeout** <disabled>
Acknowledgement Auto **Shutdown type** <n/a>
- Allowed attempts 3 - Max time disconnect <n/a>
- Time window 1 hour - Max time eliminate <n/a>
- Stabilize period 10 minute **Category** Manufacturer
Criteria:
This warning is raised if the status of the converter generator water cooling pump motor thermo signal is invalid.

No: 3246	SupervisionID 3246	Name PositiveFeedbackSx
Log text	ConvGenWatCoolPumpPosFeedback	
Subsystem name	ConverterGeneratorWaterCooling	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	10 minute	Category Manufacturer

Criteria:
This warning is raised when it is detected that the converter genertor water cooling pump motor is running when the output is deactivated.

No: 3247	SupervisionID 3247	Name NegativeFeedbackSx
Log text	ConvGenWatCoolPumpNegFeedback	
Subsystem name	ConverterGeneratorWaterCooling	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseFast
- Allowed attempts	3	- Max time disconnect 8 second
- Time window	1 hour	- Max time eliminate 3600 second
- Stabilize period	10 minute	Category Manufacturer

Criteria:
This alarm is raised when it is detected that the converter genertor water cooling pump motor is not running when the output is activated.

No: 3248	SupervisionID 3248	Name FeedbackSignalInvalidSx
Log text	ConvGenWatCoolPumpFeedBInvalid	
Subsystem name	ConverterGeneratorWaterCooling	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	10 minute	Category Manufacturer

Criteria:
This warning is raised if the status of the converter generator water cooling pump motor feedback signal is invalid.

No: 3249	SupervisionID 3249	Name OneSpeedMotorSignalInvalidSx
Log text	ConvGenWatCooHeaterSignInvalid	
Subsystem name	ConverterGeneratorWaterCooling	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	10 minute	Category Manufacturer

Criteria:
This warning is raised if the status of the converter generator water cooling heater output signal is invalid.

<u>No: 3250</u>	SupervisionID 3250	Name PositiveFeedbackSx	
Log text	ConvGenWatCoolHeatPosFeedback		
Subsystem name	ConverterGeneratorWaterCooling		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

This warning is raised when it is detected that the converter genertor water cooling heater is active when the output is deactivated.

<u>No: 3251</u>	SupervisionID 3251	Name NegativeFeedbackSx	
Log text	ConvGenWatCoolHeatNegFeedback		
Subsystem name	ConverterGeneratorWaterCooling		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

This warning is raised when it is detected that the converter genertor water cooling heater is not active when the output is activated.

<u>No: 3252</u>	SupervisionID 3252	Name FeedbackSignalInvalidSx	
Log text	ConvGenWatCoolHeatFeedBInvalid		
Subsystem name	ConverterGeneratorWaterCooling		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	10 minute	Category	Manufacturer

Criteria:

This warning is raised if the status of the converter generator water cooling heater feedback signal is invalid.

No: 3255	SupervisionID 3255	Name MSCCurrentLoadShareSx
Log text	MSCCurrLoadShare:PSC__,Phase__	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the Machine Side Converter (MSC) currents are not balanced between the converter modules inside each winding-set.

A mean module current is calculated for all active modules (f.x. 1,2,3,4) and phases (1,2,3) inside each winding-set, and first when the mean current is above Typical = 400A (RmsIMSCLoadshareActiveLevel_ModulePx) the load share protection is active.

The protection is evaluating that all module RMS currents are not larger or smaller than typical = 12% (RmsIMSCMarginLoadshare_ModulePx) of the rated module current of typical = 1135A (IG_NOM_ModulePx).

If this condition goes on for typical = 3s (MSCLoadShareMaxTimePx) the turbine will be stopped.

Limits, rated values and duration can vary on different turbine types.

In case a PSC module is taken a higher/lower current share it is reported which module is taken less/more of its share and which phase the current has been measured too high/low.

Par1 : Generator winding-set(1=Winding1, 2=Winding2).Power module(1=ModuleA, 2=ModuleB, 3=ModuleC, 4=ModuleD)

Par2 : Phase (1=L1,2=L2,3=L3)

Possible fault reasons:

The error is expected to be generated if a sensor error is present or a PSC module is not working correct.

Poor cabling between generator and converter modules

Hardware parts not inside specifications (PSC, chokes, Gate drivers etc.)

comments

It is possible to see in toolkit converter monitoring, which module is low/high in converter current. Alternatively the stream from the converter can be collected for debugging .

To deactivate the alarm the "EnableMSCCurrentLoadSharePx" can be set to 0. (only allowed for verry controlled troubleshooting, as modules can be overloaded if the current share is not correct).

No: 3258	SupervisionID 3258	Name LSCCurrentLoadShareSx	
Log text	LSCCurrLoadShare:Mod__,Phase__		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is raised if the Line Side Converter (LSC) currents are not balanced between the converter modules.

A mean module current is calculated for all active modules (f.x. 1,2,3,4) and phases (1,2,3) and first when the mean current (I_MEAN) is above Typical = 300A (RmsILSCLoadshareActiveLevel_ModulePx) the load share protection is active.

The protection is evaluating that all module RMS currents are not larger or smaller than typical = 12% (**RmsILSCMarginLoadshare_Module**) of the rated module current of typical = 1135A (IG_NOM_ModulePx).

If this condition goes on for typical = 3s (**LSCLoadShareMaxTime**) the turbine will be stopped.

Limits, rated values and duration can vary on different turbine types.

In case a PSC module is taken a higher/lower current share it is reported which module is taken less/more of its share and which phase the current has been measured too high/low.

Par1 : Power module (1,2,3,4).

Par2 : Phase (1=L1,2=L2,3=L3)

Possible fault reasons:

The error is expected to be generated if a sensor error is present or a PSC module is not working correct.

Poor cabling between grid and converter modules

Hardware parts not inside specifications (PSC, grid chokes, Gate drivers etc.)

comments

It is possible to see in toolkit converter monitoring, which module is low/high in converter current. Alternatively the stream from the converter can be collected for debugging .

To deactivate the alarm the RmsIMSCMarginLoadshare_ModulePx can be set to 0. (only allowed for verry controlled troubleshooting, as modules can be overloaded if the current share is not correct).

No: 3270	SupervisionID 3270	Name YawToCableTwistResetNotAllowedSx	
Log text	YawToCableTwistResetNotAvail		
Subsystem name	YawControl		
Type	Warning	Timeout	30 day
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	60 second
- Time window	1 hour	- Max time eliminate	60 second
- Stabilize period	0 second	Category	Manufacturer

Criteria:

This warning is raised when it is not possible to yaw to Cable Twist Reset due to problems with the signals from the yaw sensor.

No: 3271	SupervisionID 3271	Name YawToCableTwistResetFailedSx
Log text	YawToCableTwistResetFailed	
Subsystem name	YawControl	
Type	Warning	Timeout 30 day
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 60 second
- Time window	<n/a>	- Max time eliminate 60 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This warning is triggered if a search for cable twist reset failed due to reaching a certain cable twist code value without detecting cable twist reset.

No: 3272	SupervisionID 3272	Name UntwistCWSx
Log text	YawUntwistCW: Code__,_____°	
Subsystem name	YawControl	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect 60 second
- Time window	<n/a>	- Max time eliminate 60 second
- Stabilize period	0 second	Category Environmental

Criteria:

This alarm is raised when the yaw system starts untwisting.

The cable is being untwisted in clockwise (CW) direction.

The untwisting can be initiated by any of the the following events:

1. The cables has been twisted so much that an untwist is required. The amount of twist is stored in the software signal ****CableTwist****. The criterias for starting the untwisting is dependant on the number of degrees the cable has been twisted and the current windspeed.
2. The yaw lubrication system has requested the yaw system to turn the nacelle as a part of a greasing cycle. That is handled by untwisting one revolution.

Before the untwist is started the generator speed is derated to 0 RPM and the alarm UntwistCW is raised.

The untwist starts when the generator speed is low enough for starting the search, i.e. ****GeneratorTachoSpeed**** < ****YawingOutWindMaxGeneratorRPM****.

When the untwisting has ended, the alarm is automatically acknowledged. During the untwisting process the alarm cannot be acknowledged.

No: 3273	SupervisionID 3273	Name UntwistCCWSx	
Log text	YawUntwistCCW: Code __, _____°		
Subsystem name	YawControl		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect	60 second
- Time window	<n/a>	- Max time eliminate	60 second
- Stabilize period	0 second	Category	Environmental

Criteria:

This alarm is raised when the yaw system starts untwisting.

The cable is being untwisted in counterclockwise (CCW) direction.

The untwisting can be initiated by any of the the following events:

1. The cables has been twisted so much that an untwist is required. The amount of twist is stored in the software signal ****CableTwist****. The criterias for starting the untwisting is dependant on the number of degrees the cable has been twisted and the current windspeed.
2. The yaw lubrication system has requested the yaw system to turn the nacelle as a part of a greasing cycle. That is handled by untwisting one revolution.

Before the untwist is started the generator speed is derated to 0 RPM and the alarm UntwistCCW is raised.
The untwist starts when the generator speed is low enough for starting the search, i.e. ****GeneratorTachoSpeed**** < ****YawingOutWindMaxGeneratorRPM****.
When the untwisting has ended, the alarm is automatically acknowledged. During the untwisting process the alarm cannot be acknowledged.

No: 3276	SupervisionID 3276	Name YawWrongDirectionSx	
Log text	Yaw Wrong Direction		
Subsystem name	YawPositionVariant3		
Type	Warning	Timeout	<disabled>
Acknowledgement	Remote	Shutdown type	<n/a>
- Allowed attempts	<n/a>	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This warning is raised if the yaw sensor is shifting in the opposite yaw direction as the yaw motors currently are turning the nacelle.

The warning may be caused by the CableTwist sensors or the wiring to the yaw motors or the nacelle position encoder has been fitted incorrectly.

The warning is triggered if _all_ the following conditions are true:

* ****YawMotorsStarted**** and ****YawDemand**** = YawCW or CCW has been true for the last ****YawMoveDelayTime**** time
 * ****YawDemand**** has value "YawCW" and CableTwist decreases OR ****YawDemand**** has value "YawCCW" and CableTwist increases

The supervision will collect data for a period of ****YawMoveEvalResetTime**** seconds. Everytime the turbine begins to yaw, the supervision will wait for ****YawMoveDelayTime**** seconds before data is collected for evaluation.

YawDistance is found by integrating ****YawSpeed****. After a total collected data of ****YawMoveEvalDelayTime**** seconds the sign of the YawDistance is compared to the expected yaw direction and the warning activated if YawDistance has the wrong sign.

The timeout period ****YawMoveEvalResetTime**** defines the time before the supervision resets and start over the evaluation process.

The warning can be acknowledged at any time.

No: 3277	SupervisionID 3277	Name YawMoveUnexpectedSx	
Log text	Yaw Move Unexpected		
Subsystem name	YawMotor		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	60 minute	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This warning is triggered if the cable twist changes more than a given limit, while yawing is stopped.

No: 3296	SupervisionID 3296	Name YawToNacellePositionResetSx	
Log text	Yaw To Nacelle Position Reset		
Subsystem name	YawControl		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect	60 second
- Time window	<n/a>	- Max time eliminate	60 second
- Stabilize period	0 second	Category	Manufacturer

Criteria:

This alarm is raised when the yaw system starts to search for the reset position of the nacelle position sensor.

The search for the reset position is needed because the software signal ****NacellePosition**** has become unavailable.

Some examples of reasons for the ****NacellePosition**** becoming unavailable:

- * The nacelle position encoder is out of order
- * The nacelle has been yawing faster than it can be detected
- * There has been problems with the reset position of the nacelle position. I.e. ****FilteredNacellePositionReset**** has either been missing at the expected reset position or has been indicating reset at an unexpected position.

Before the search for the reset position is started the generator speed is de-rated to 0 RPM and the alarm is raised.

The search for the reset position starts when the wind speed and generator speed is low enough for starting the search, i.e. ****WindMeasurement.WindSpeedExpMean100s**** < (****MediumWindStartProduction**** - ****AutomaticYawControlWindHyst****) and the ****GeneratorTachoSpeed**** < ****YawingOutWindMaxGeneratorRPM****.

The nacelle position is being reset once for each revolution of the nacelle. The reset happens when one of the following situations happens:

- * The signal ****FilteredNacellePositionReset**** switches from true to false if passed while yawing counterclockwise
- * The signal ****FilteredNacellePositionReset**** switches from false to true if passed while yawing clockwise

During the search for the reset position this alarm combined with the de-rate of generator speed keeps the turbine from producing power.

When the search for the reset position has ended (i.e. reset position is passed) the alarm is automatically acknowledged.

During the search for the reset position the alarm cannot be acknowledged.

No: 3297

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 3297

YawToNacPositResetErr_____°

YawControl

Warning

Remote

<n/a>

<n/a>

<n/a>

Name YawToNacellePositionResetFailedSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<disabled>

<n/a>

<n/a>

<n/a>

Manufacturer

This warning is triggered if a search for nacelle position reset failed due to yawing for too long time without detecting nacelle position reset.

No: 3298

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 3298

Yaw To Cable Twist Reset

YawControl

Alarm

Auto

Unlimited

<n/a>

0 second

Name YawToCableTwistResetSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

PauseSlow

60 second

60 second

Manufacturer

This alarm is raised when the yaw system starts to search for the reset position of the cable twist sensor.

The search for the reset position is needed because the signal **CableTwist** has become unavailable.

Before the search is started the generator speed is derated to 0 RPM and YawToCableTwistReset is raised.

The search for the reset position starts when the wind speed and generator speed is low enough for starting the search, i.e. **WindMeasurement.WindSpeedExpMean100s** < (**MediumWindStartProduction** - **AutomaticYawControlWindHyst**) and the **GeneratorTachoSpeed** < **YawingOutWindMaxGeneratorRPM**.

The cable twist reset position is at the position where CableTwistCode shifts from 3 to 4.

During the search for the reset position this alarm combined with the derate of generator speed keeps the turbine from producing power.

When the search for the reset position has ended the alarm is automatically acknowledged. During the search for the reset position the alarm cannot be acknowledged.

No: 3315	SupervisionID 3315	Name CriticalPitchReferenceDetectedASx
Log text	PitchA step:__.__°, SwHist:____	
Subsystem name	PiRM	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	24 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors if there is an error in input reference for Pitch position servo A. This can be due to software errors or non bumpless transfer between states.

This alarm is activated if the following conditions are met for more than ****PiRM_CPS_ErrorTime**** sec:

1. ****PiRM_CPS_ActivityLevel**** = 2
2. ****SafetyPitchActive**** is false
3. ****ProdCtrl.SP_RotorSpdEst**** > ****PiRM_CPS_RotorSpdEnableLimit****
4. Step is detected in ****PiRM_PitchPosRefA**** > ****PiRM_CPS_MaxDeltaPitchRef****

No: 3316	SupervisionID 3316	Name CriticalPitchReferenceDetectedBSx
Log text	PitchB step:__.__°, SwHist:____	
Subsystem name	PiRM	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	24 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors if there is an error in input reference for Pitch position servo B. This can be due to software errors or non bumpless transfer between states.

This alarm is activated if the following conditions are met for more than ****PiRM_CPS_ErrorTime**** sec:

1. ****PiRM_CPS_ActivityLevel**** = 2
2. ****SafetyPitchActive**** is false
3. ****ProdCtrl.SP_RotorSpdEst**** > ****PiRM_CPS_RotorSpdEnableLimit****
4. Step is detected in ****PiRM_PitchPosRefB**** > ****PiRM_CPS_MaxDeltaPitchRef****

No: 3317	SupervisionID 3317	Name CriticalPitchReferenceDetectedCSx
Log text	PitchC step:__.__°, SwHist:___	
Subsystem name	PiRM	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	24 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors if there is an error in input reference for Pitch position servo C. This can be due to software errors or non bumpless transfer between states.

This alarm is activated if the following conditions are met for more than **PiRM_CPS_ErrorTime** sec:

1. **PiRM_CPS_ActivityLevel** = 2
2. **SafetyPitchActive** is false
3. **ProdCtrl.SP_RotorSpdEst** > **PiRM_CPS_RotorSpdEnableLimit**
4. Step is detected in **PiRM_PitchPosRefC** > **PiRM_CPS_MaxDeltaPitchRef**

No: 3318	SupervisionID 3318	Name CriticalPitchReferenceDetectedMSx
Log text	CollPi step:__.__°, SwHist:___	
Subsystem name	PiRM	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	24 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors if there is a step in the collective pitch reference.

This alarm is activated if the following conditions are met for more than **PiRM_CPS_ErrorTime** sec:

1. **PiRM_CPS_ActivityLevel** = 2
2. **SafetyPitchActive** is false
3. **ProdCtrl.SP_RotorSpdEst** > **PiRM_CPS_RotorSpdEnableLimit**
4. Step is detected in **ProdCtrl.PiRS_PitchPosRef** > **PiRM_CPS_MaxDeltaPitchRef**

No: 3323	SupervisionID 3323	Name OverspeedGuardConfigurationErrorSx
Log text	Overspeed Guard Config Err ___	
Subsystem name	OverspeedGuard	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect 9 second
- Time window	<n/a>	- Max time eliminate 10 second
- Stabilize period	0 second	Category Manufacturer

Criteria:

This alarm indicates an error in the overspeed guard configuration.

The alarm is reported if the virtual signal from the safety system

IO.OverspeedGuardConfigurationSetting does not match the setting given by the parameter **OverSpeedGuardConfigurationSetting**.

No: 3325

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 3325

GenerLubrErr:MissLubrTime____s

GeneratorLubrication

Warning

Auto

5

423 hour

70 hour

Name GeneratorLubrErrorSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

71 hour

PauseSlow

60 second

15 second

Manufacturer

This warning is raised if the proximity switch input from the grease distributor does not toggle as expected during a lubrication sequence.

Can be caused by missing grease or a faulty/clogged lubrication system.

The warning is only monitored if the lubrication pump is running - i.e. `**IO.GeneratorLubrPumpStart**` is true.

The warning is raised if `**IO.GeneratorLubrProximitySwitchOn**` has failed to toggle within the period `**SwitchTimeout**` for more than `**MaxFaultCount**` times.

The warning can be acknowledged as soon as it has been raised.

No: 3329

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 3329

DODP Leak Failure

PitchValvesTestFunction

Alarm

Auto

3

1 hour

1 second

Name PitchValvesTestDODPAccuLeakageFailureSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

PauseSlow

15 second

45 second

Manufacturer

The alarm indicates that the "pitch manifold pressure drop" exceeds a certain limit when running the DODP Valve Test.

The alarm is raised if the "pitch manifold pressure drop" exceeds the limit given by the parameter `**DODPAccuPressDrop**`.

The alarm is an one-shot supervision and can be acknowledged immediately.

No: 3332 **SupervisionID** 3332 **Name** ChargeContactorFeedBackResponseSx

Log text ChargeCont Fb timeout act:___

Subsystem name CubePower

Type Alarm **Timeout** <n/a>

Acknowledgement Auto **Shutdown type** StopSlow

- Allowed attempts 3 - Max time disconnect 3 second

- Time window 1 hour - Max time eliminate 9 second

- Stabilize period 60 second **Category** Manufacturer

Criteria:

This alarm is raised if a Charge Contactor is commanded to either open or close and it does not respond within timeout . Par1 : Power module (02,04,06,08) Par2 : Failed state (0=failed to open, 1=failed to close)

This alarm is raised if a Charge Contactor is commanded to either open or close and it does not respond within timeout

Par1 : Power module (1,2,3,4)

Par2 : Failed state (0=failed to open, 1=failed to close)

No: 3334 **SupervisionID** 3334 **Name** LineSideBreakerFeedBackResponseSx

Log text LSCBreakerFbTimeout PSC___,act_

Subsystem name CubePower

Type Alarm **Timeout** <n/a>

Acknowledgement Auto **Shutdown type** StopSlow

- Allowed attempts 3 - Max time disconnect 3 second

- Time window 1 hour - Max time eliminate 9 second

- Stabilize period 60 second **Category** Manufacturer

Criteria:

The Alarm is raised if a timeout occurs while expecting feedback from one of the Line Side Breakers.

Par1 : Breaker ID

Par2 : feedback (1 = missing CLOSE feedback)

No: 3335 **SupervisionID** **Name** StatorVoltageSensorContactorFeedBackResponseSx

3335

Log text StatVoltSensFbTimeout act:___

Subsystem name CubePower

Type Alarm **Timeout** <n/a>

Acknowledgement Auto **Shutdown type** StopSlow

- Allowed attempts 3 - Max time disconnect 8 second

- Time window 1 hour - Max time eliminate 9 second

- Stabilize period 60 second **Category** Manufacturer

Criteria:

This alarm is raised if the Stator Voltage Sensor Contactor is commanded to either open or close and it does not respond within timeout . Par1 : Power module (02,04,06,08) Par2 : Failed state (0=failed to open, 1=failed to close)

This alarm is raised if the Stator Voltage Sensor Contactor is commanded to either open or close and it does not respond within timeout . Par1 : Power module (02,04,06,08) Par2 : Failed state (0=failed to open, 1=failed to close)

No: 3336	SupervisionID 3336	Name GeneratorBreakerFeedBackResponseSx
Log text	GenBreakerFbTimeout PSC__,act_	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

The Alarm is raised if a timeout occurs while expecting feedback from one of the Generator Breakers

Arg: Breaker ID, feedback (1 = missing CLOSE feedback)

No: 3338	SupervisionID 3338	Name PSCLowDCVoltageSx
Log text	PSC Low DCVolt. PSC:__, ____V	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the DC Voltage in a PSC Power module is not above its minimum limit in converter state charged (DcOn) or connected. Par1 : PSC Power module (02,04,06,08)

This alarm is raised if the DC Voltage in a PSC Power module is not above its minimum limit in converter state charged (DcOn) or connected.

Par1: PSC module (1/2/3/4)

Par2: N/A

No: 3339	SupervisionID 3339	Name PSCHighDCVoltageSx
Log text	PSC High DCVolt. PSC:__, ____V	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the DC Voltage in a PSC Power module is above its maximum limit in converter state charged (DcOn) or connected. Par1 : PSC Power module (02,04,06,08)

This alarm is raised if the DC Voltage in a PSC Power module is above its maximum limit in converter state charged (DcOn) or connected.

Par1: PSC module (1/2/3/4)

Par2: N/A

No: 3342	SupervisionID 3342	Name UnexpectedChargeContactorFeedbackSx
Log text	Unexp ChargeContFb. Act:___	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

The Alarm is raised if one of the Charge contactors gives an unexpected feedback. This can occur if a Charge contactor disconnects without being commanded by the software

The Alarm is raised if the Charge contactor gives an unexpected feedback. This can occur if a Charge contactor disconnects without being commanded by the software

Par1 : Power module (1,2,3,4)

Par2 : Failed state (0=failed to open, 1=failed to close)

No: 3343	SupervisionID 3343	Name UnexpectedLineSideBreakerFeedbackSx
Log text	UnexpLSCBreaker Fb.PSC___,act_	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

The Alarm is raised if one of the Line Side Breakers gives an unexpected feedback. This most likely occurs if a Line Side Breaker disconnects without being commanded by the software

Par1 : Power module (1,2,3,4)

Par2 : Failed state (0=failed to open, 1=failed to close)

No: 3344	SupervisionID 3344	Name UnexpectedGeneratorBreakerFeedbackSx
Log text	UnexpGenBreakerFb.PSC___,act _	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

The Alarm is raised if one of the Generator side breakers gives an unexpected feedback. This can occur if a Generator side breaker disconnects without being commanded by the software.

Arg: Breaker ID, Feedback (0 = Unexpected OPEN, 1 = Unexpected CLOSE)

No: 3345	SupervisionID 3345	Name UnexpectedStatorVoltageSensorContactorFeedbackSx	
Log text	UnexpStatVoltContFb.act _		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	8 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:
The Alarm is raised if the Stator Voltage Sensor Contactor gives an unexpected feedback. This can occur if the Stator Voltage Sensor Contactor disconnects without being commanded by the software

The Alarm is raised if the Stator Voltage Sensor Contactor gives an unexpected feedback. This can occur if the Stator Voltage Sensor Contactor disconnects without being commanded by the software

No: 3419	SupervisionID 3419	Name ShadowControlShadowDetectedSx	
Log text	Shadow Detected		
Subsystem name	ShadowControl		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect	3600 second
- Time window	<n/a>	- Max time eliminate	3600 second
- Stabilize period	60 second	Category	Environmental

Criteria:
This alarm is raised if the Shadow detected signal is observed from the Shadow controller and the turbine is shutdown accordingly

No: 3420	SupervisionID 3420	Name ShadowControlControllerErrorSx	
Log text	Shadow Ctrl Error		
Subsystem name	ShadowControl		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	10 second	Category	Manufacturer

Criteria:
This warning is raised if any signal failure occurs more than specified time from the Shadow controller.

No: 3423	SupervisionID 3423	Name LowWindSpeedPauseSx
Log text	SWDS Low Wind:__.__m/s dir:__	
Subsystem name	ProductionManager	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect 60 second
- Time window	<n/a>	- Max time eliminate 60 second
- Stabilize period	1 second	Category Environmental

Criteria:

Sector Wind Direction System (aka. Wind Sector Management) has paused the turbine in the defined wind direction sector, because the mean wind speed is below the defined limit (e.g. Sector1MinWindSpeedPx). The sector can also have dependencies to environment temperature, date, time and weekdays. This feature is also known as 'Increased cut in wind speed' and the purpose can be noise reduction or other environmental conditions.

No: 3424	SupervisionID 3424	Name HighWindSpeedPauseSx
Log text	SWDS High Wind:__.__m/s dir:__	
Subsystem name	ProductionManager	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect 60 second
- Time window	<n/a>	- Max time eliminate 60 second
- Stabilize period	1 second	Category Environmental

Criteria:

Sector Wind Direction System (aka. Wind Sector Management) has paused the turbine in the defined wind direction sector, because the mean wind speed has exceeded the defined limit (e.g. Sector1MaxWindSpeedPx). The purpose is to reduce fatigue loads on the turbine during extreme wind conditions.

No: 3450	SupervisionID 3450	Name SPDFuseL1BlownSx
Log text	HighVoltageRoom SPDFuseL1Blown	
Subsystem name	ConverterContactors	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This alarm is reported if the the SPD fuse on phase 1 is blown.

This alarm is raised if the signal ****IO.SPDFuseL1Ok**** is 0 (false).

The alarm can be acknowledged when the signal ****IO.SPDFuseL1Ok**** is 1 (true).

No: 3451	SupervisionID 3451	Name SPDFuseL2BlownSx	
Log text	HighVoltageRoom SPDFuseL2Blown		
Subsystem name	ConverterContactors		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	StopSlow
- Allowed attempts	<n/a>	- Max time disconnect	3 second
- Time window	<n/a>	- Max time eliminate	9 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This alarm is reported if the the SPD fuse on phase 2 is blown.

This alarm is raised if the signal ****IO.SPDFuseL2Ok**** is 0 (false).

The alarm can be acknowledged when the signal ****IO.SPDFuseL2Ok**** is 1 (true).

No: 3452	SupervisionID 3452	Name SPDFuseL3BlownSx	
Log text	HighVoltageRoom SPDFuseL3Blown		
Subsystem name	ConverterContactors		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	StopSlow
- Allowed attempts	<n/a>	- Max time disconnect	3 second
- Time window	<n/a>	- Max time eliminate	9 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This alarm is reported if the the SPD fuse on phase 3 is blown.

This alarm is raised if the signal ****IO.SPDFuseL3Ok**** is 0 (false).

The alarm can be acknowledged when the signal ****IO.SPDFuseL3Ok**** has been 1 (true).

No: 3453	SupervisionID 3453	Name PowerBackupSupplyActiveSx	
Log text	PowerBackupSupplyActive__		
Subsystem name	PowerSupply		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseFast
- Allowed attempts	Unlimited	- Max time disconnect	8 second
- Time window	<n/a>	- Max time eliminate	1 hour
- Stabilize period	0 second	Category	Utility

Criteria:

This alarm is raised if the turbine is supplied by a power backup supply (e.g. diesel-generator) instead of being supplied from the grid (normal operation).

The alarm will ensure that the turbine does not produce power as long as the generator is connected.

The actual power backup supply can be selected from the operator panel.

The alarm is raised if the following condition is met:

Power backup supply is connected to high voltage side, i.e. ****PowerBackupSource**** is 2

The alarm is auto acknowledged when the turbine is not connected to an external power backup supply, i.e. ****PowerBackupSource**** different from 2.

No: 3461 **SupervisionID** 3461 **Name** LineSideBreakerOpenFailedSx
Log text LineSideBreakerOpenFail Mod:___
Subsystem name CubePower
Type Alarm **Timeout** <n/a>
Acknowledgement Auto **Shutdown type** StopFast
- **Allowed attempts** 3 - **Max time disconnect** 0.9 second
- **Time window** 1 hour - **Max time eliminate** 1 hour
- **Stabilize period** 60 second **Category** Manufacturer
Criteria:
The Alarm is raised when a line side breaker has been commanded to open but has failed to open on a PSC power module(CT-414).

The Alarm is raised when a line side breaker has been commanded to open but has failed to open during a limit of time (**LineSideBreakerOpenDelayTime**).

Par1 : Breaker ID
Par2 : feedback (0 = missing OPEN feedback)

No: 3462 **SupervisionID** 3462 **Name** GenSideBreakerOpenFailedSx
Log text GenSideBreakerOpenFail Mod:___
Subsystem name CubePower
Type Alarm **Timeout** <n/a>
Acknowledgement Auto **Shutdown type** StopFast
- **Allowed attempts** 3 - **Max time disconnect** 0.9 second
- **Time window** 1 hour - **Max time eliminate** 1 hour
- **Stabilize period** 60 second **Category** Manufacturer
Criteria:
The Alarm is raised when a generator side breaker has been commanded to open but has failed to open on a PSC power module(CT-414).

Par1 : Breaker ID

No: 3463 **SupervisionID** 3463 **Name** ChargeContOpenFailedSx
Log text ChargeContactorOpenFailed
Subsystem name CubePower
Type Alarm **Timeout** <n/a>
Acknowledgement Auto **Shutdown type** StopSlow
- **Allowed attempts** 3 - **Max time disconnect** 3 second
- **Time window** 1 hour - **Max time eliminate** 9 second
- **Stabilize period** 60 second **Category** Manufacturer
Criteria:
The Alarm is raised when a charge contactor has been commanded to open but has failed to open on a PSC power module(CT-414). Par1 : Power module (02,04,06,08).

The Alarm is raised when a charge contactor has been commanded to open but has failed to open.

No: 3464	SupervisionID 3464	Name StatVoltSensorContOpenFailedSx
Log text	StatVoltSensContOpenFailed	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 8 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

A request to open the Stator Voltage Sensor Contactor has not been executed within the specified time.

No: 3466	SupervisionID 3466	Name LineSideBreakerTrippedSx
Log text	LineSideBreakerTripped. Mod:___	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopFast
- Allowed attempts	<n/a>	- Max time disconnect 0.9 second
- Time window	<n/a>	- Max time eliminate 1 hour
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This alarm is raised if the Line Side breaker on a PSC power module trips.

Parl : Breaker ID

No: 3467	SupervisionID 3467	Name GenSideBreakerTrippedSx
Log text	GenSideBreakerTripped. Mod:___	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopFast
- Allowed attempts	<n/a>	- Max time disconnect 0.9 second
- Time window	<n/a>	- Max time eliminate 1 hour
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This alarm is raised if the Generator Side breaker on a PSC power module trips.

Parl : Breaker ID

No: 3468	SupervisionID 3468	Name HighChopperResistorLoadSx
Log text	DCChopperResistorLoad. ____°C	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if The Chopper Resistors have reached their maximum estimated temperature load.

Parl : Estimated temperature (celsius)

No: 3469	SupervisionID 3469	Name LineSideBreakerResetFailedSx
Log text	LineSideBreakResetErr Module__	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:
This alarm is raised if a line side breaker has previously tripped and now has failed to be reset again

Par1: Power module (02,04,06,08)

No: 3470	SupervisionID 3470	Name GenSideBreakerResetFailedSx
Log text	GenSideBreakResetErr Module__	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Local	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:
This alarm is raised if a generator side breaker has previously tripped and now has failed to be reset again

Par1 : Power module (01,02,03,04)

No: 3513	SupervisionID 3513	Name GeneratorSpeedLowSx
Log text	Min generator RPM: ____._	
Subsystem name	SV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 minute	Category Manufacturer

Criteria:
This supervision secures that the generator speed does not drop below the defined limits

No: 3514	SupervisionID 3514	Name PitchCalibrationNotOkProdSx	
Log text	Pitch Calib Not Complete		
Subsystem name	PiSV		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	9 second
- Time window	1 hour	- Max time eliminate	12 second
- Stabilize period	1 minute	Category	Manufacturer

Criteria:

This supervision ensures the turbine cannot enter production unless the pitch have been calibrated.

An alarm is reported if all of the conditions in one of the following group of conditions are met:

1. ****PitchCalibrationNotOkProd_ActivityLevel**** = 2
2. Pitch angle have not been calibrated
3. ****ProdCtrl.ProductionControllerMainState**** = eProdCtrlMainState_AwaitingTurbine OR
eProdCtrlMainState_AwaitingWind OR
eProdCtrlMainState_TowardsProduction OR
eProdCtrlMainState_Production

OR

1. ****PitchCalibrationNotOkProd_ActivityLevel**** = 2
2. Pitch angle have not been calibrated
3. ****ProdCtrl.SP_RotorSpdEst**** > ****PitchCalibrationNotOkProd_MaxRotorSpd****

No: 3562	SupervisionID 3562	Name OverspeedGuardErrorSx	
Log text	Overspeed Guard Error		
Subsystem name	OverspeedGuard		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	3600 second	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

The safety system has detected an error on the overspeed guard sensor.

No: 3565	SupervisionID 3565	Name ExtendedYawActiveSx	
Log text	Extended Yaw Active		
Subsystem name	YawControl		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect	60 second
- Time window	<n/a>	- Max time eliminate	60 second
- Stabilize period	60 second	Category	Environmental

Criteria:

This alarm is raised when the YawControlVariant1 subsystem is in Extended Yaw mode.

The alarm is caused by either:

- * The filtered wind speed exceeds a parameterized limit.
- * SCADA/Operator Panel has commanded the turbine into Extended Yaw mode.

The alarm is triggered if ****ExtendedYawEnabled**** is true and ANY the following conditions are true:

- * Status signal for ****WindMeasurement.WindSpeedExpMean100s**** is Valid AND ****WindMeasurement.WindSpeedExpMean100s**** exceeds ****ExtendedYawWindStart****
- * ****ExtendedYawMode**** has value "ForcedOn"

The alarm can be acknowledged if ****ExtendedYawEnabled**** is false OR ALL of the following two conditions are true:

- * Status signal for ****WindMeasurement.WindSpeedExpMean100s**** is not Valid OR
 - * Status signal for ****WindMeasurement.WindSpeedExpMean100s**** is Valid AND
 - * ValidWindSpeedExpMean100s is smaller than the difference: ****ExtendedYawWindStart**** - ****ExtendedYawWindHyst****
- * ****ExtendedYawMode**** has value "Auto"

The alarm is disabled if ****ExtendedYawEnabled**** is false.

Yawing upwind is highest priority when Extended Yaw is active. Untwist and other operations keeping the nacelle out of the wind are aborted when Extended Yaw is active.

In auto mode extended yaw is activated by high wind speed. In forced mode extended yaw is always activated independent of the wind speed.

No: 3569

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 3569

BladeAPeakLoad: ____ kNm

PiSV

Alarm

Auto

3

1 hour

1 minute

Name BladeAFlapPeakLoadSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

PauseSlow

1 hour

1 hour

Manufacturer

This supervision monitors the blade A flap moment, BladeALoadRootFlap. An alarm is raised if a number of abnormal high blade moments have been detected.

The supervision is enabled if the following conditions are met:

1. PiSV_ServiceDisable = 0 (Turbine is not in service)
2. **FlapPeak_ActivityLevel** = 2
3. BladeALoadRootFlap Status is valid

The alarm is activated if the value of BladeALoadRootFlap exceeds **FlapPeak_PosLoadThreshold** or **FlapPeak_NegLoadThreshold** for a time period larger than **FlapPeak_TimeOut**.

Log text: "Flapwise Peak Loads Blade A detected"

No: 3570

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 3570

BladeBPeakLoad: ____ kNm

PiSV

Alarm

Auto

3

1 hour

1 minute

Name BladeBFlapPeakLoadSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

PauseSlow

1 hour

1 hour

Manufacturer

This supervision monitors the blade B flap moment, BladeBLoadRootFlap. An alarm is raised if a number of abnormal high blade moments have been detected.

The supervision is enabled if the following conditions are met:

1. PiSV_ServiceDisable = 0 (Turbine is not in service)
2. **FlapPeak_ActivityLevel** = 2
3. BladeBLoadRootFlap Status is valid

The alarm is activated if the value of BladeBLoadRootFlap exceeds **FlapPeak_PosLoadThreshold** or **FlapPeak_NegLoadThreshold** for a time period larger than **FlapPeak_TimeOut**.

Log text: "Flapwise Peak Loads Blade B detected"

No: 3571	SupervisionID 3571	Name BladeCFlapPeakLoadSx
Log text	BladeCPeakLoad: ____ kNm	
Subsystem name	PiSV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	1 minute	Category Manufacturer

Criteria:

This supervision monitors the blade C flap moment, BladeCLoadRootFlap. An alarm is raised if a number of abnormal high blade moments have been detected.

The supervision is enabled if the following conditions are met:

1. PiSV_ServiceDisable = 0 (Turbine is not in service)
2. **FlapPeak_ActivityLevel** = 2
3. BladeCLoadRootFlap Status is valid

The alarm is activated if the value of BladeCLoadRootFlap exceeds **FlapPeak_PosLoadThreshold** or **FlapPeak_NegLoadThreshold** for a time period larger than **FlapPeak_TimeOut**.

Log text: "Flapwise Peak Loads Blade C detected"

No: 3572	SupervisionID 3572	Name MainBearingTiltPeakLoadSx
Log text	MBrngTiltPeakLoad: ____ kNm	
Subsystem name	PiSV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	1 minute	Category Manufacturer

Criteria:

This supervision monitors the tilt moment, PiSP_MainBrngTiltMoment. An alarm is raised if a number of abnormal high tilt moments have been detected.

The supervision is enabled if the following conditions are met:

1. **TiltPeak_ActivityLevel** = 2
2. PiSP_MainBrngTiltYawMomentStatus > 0

The alarm is activated if the value of PiSP_MainBrngTiltMoment exceeds **TiltPeak_PosLoadThreshold** or **TiltPeak_NegLoadThreshold** for a time period larger than **TiltPeak_TimeOut**.

Log text: "Tilt Peak Loads detected"

No: 3573

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 3573

MBrngYawPeakLoad: ____ kNm

PiSV

Alarm

Auto

3

1 hour

1 minute

Name MainBearingYawPeakLoadSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

PauseSlow

1 hour

1 hour

Manufacturer

This supervision monitors the yaw moment, PiSP_MainBrngYawMoment. An alarm is raised if a number of abnormal high yaw moments have been detected.

The supervision is enabled if the following conditions are met:

- 1. **YawPeak_ActivityLevel** = 2
- 2. PiSP_MainBrngTiltYawMomentStatus > 0

The alarm is activated if the value of PiSP_MainBrngYawMoment exceeds **YawPeak_PosLoadThreshold** or **YawPeak_NegLoadThreshold** for a time period larger than **YawPeak_TimeOut**.

Log text: "Yaw Peak Loads detected"

No: 3574

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 3574

BlAEdgeVibration: ____ kNm

PiSV

Alarm

Auto

3

24 hour

1 minute

Name BladeAEdgeVibrationSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

PauseFast

8 second

1 hour

Manufacturer

This supervision monitors the edgewise vibration level of blade A, BladeALoadRootEdge. An alarm is raised if the vibration level becomes too high.

The supervision is enabled if the following conditions are met:

- 1. **EdgeVib_ActivityLevel** = 2
- 2. BladeALoadRootEdge Status is valid

The alarm is activated if the following additional condition is met:
PiSV_BladeEdgeLoadOscLevelA > **EdgeVib_BladeEdgeAlarmLevel**

PiSV_BladeEdgeLoadOscLevelA is calculated as the RMS value of the bandpass filtered BladeALoadRootEdge.

Log text: "Edgewise vibration Blade A"

No: 3575

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 3575

BlBEdgeVibration: ____ kNm

PiSV

Alarm

Auto

3

24 hour

1 minute

Name BladeBEdgeVibrationSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

PauseFast

8 second

1 hour

Manufacturer

This supervision monitors the edgewise vibration level of blade B, BladeBLoadRootEdge. An alarm is raised if the vibration level becomes too high.

The supervision is enabled if the following conditions are met:

- 1. **EdgeVib_ActivityLevel** = 2
- 2. BladeBLoadRootEdge Status is valid

The alarm is activated if the following additional condition is met:
PiSV_BladeEdgeLoadOscLevelB > **EdgeVib_BladeEdgeAlarmLevel**

PiSV_BladeEdgeLoadOscLevelB is calculated as the RMS value of the bandpass filtered BladeBLoadRootEdge.

Log text: "Edgewise vibration Blade B"

No: 3576

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 3576

BlCEdgeVibration: ____ kNm

PiSV

Alarm

Auto

3

24 hour

1 minute

Name BladeCEdgeVibrationSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

PauseFast

8 second

1 hour

Manufacturer

This supervision monitors the edgewise vibration level of blade C, BladeCLoadRootEdge. An alarm is raised if the vibration level becomes too high.

The supervision is enabled if the following conditions are met:

- 1. **EdgeVib_ActivityLevel** = 2
- 2. BladeCLoadRootEdge Status is valid

The alarm is activated if the following additional condition is met:
PiSV_BladeEdgeLoadOscLevelC > **EdgeVib_BladeEdgeAlarmLevel**

PiSV_BladeEdgeLoadOscLevelC is calculated as the RMS value of the bandpass filtered BladeCLoadRootEdge.

Log text: "Edgewise vibration Blade C"

No: 3599	SupervisionID 3599	Name SWDSConfigurationInvalidSx
Log text	SWDS Conf Invalid	
Subsystem name	ProductionManager	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:
Sector Wind Direction System (aka. Wind Sector Management) has detected an invalid date configuration. I.e. for each sector, start date must not exceed stop date in the same month.

No: 3621	SupervisionID 3621	Name ConverterDisconnectedInProductionSx
Log text	Converter Disconnected In Prod	
Subsystem name	PSC	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	1 minute	Category Manufacturer

Criteria:
This supervision detect and secure the turbine from converter disconnection during power production

This alarm is activated if the following conditions are met continuously for
PSC_ConvDisconnectInProd_MinTimeSpan seconds

1. **PSC_ConvDisconnectInProd_ActivityLevel** = 2
2. **Converter.ConverterMainState** value not connected
3. **PSC_ProdCtrlState** in production or power up state

No: 3622	SupervisionID 3622	Name CutInGridVoltageSx
Log text	CutIn Grid Voltage _____.V	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	5	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Utility

Criteria:
Alarm condition: The alarm is raised if the calculated Mean Voltage (calculated from
VoltagePhase1, **VoltagePhase2**,
VoltagePhase3) exceeds the high limit (1 + **CutInGridVoltageConditionHighLimit**) or goes below the low limit
(1 - **CutInGridVoltageConditionLowLimit**). In both cases (re)connection is not allowed. To (re)establish connection the Mean Voltage must have been within the cut in limits for a time determined by
CutInGridVoltageConditionTime.

Par1: The calculated Mean Voltage
Par2: Low limit parameter

No: 3623	SupervisionID 3623	Name CutInGridFreqSx
Log text	CutIn Grid Frequency __.____Hz	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	5	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Utility

Criteria:

Alarm condition: The alarm is raised if the calculated Mean Frequency exceeds the high limit (1 + **CutInGridFreqConditionHighLimit**) or goes below the low limit (1 - **CutInGridFreqConditionLowLimit**). In both cases (re)connection is not allowed.

To (re)establish connection the Mean Frequency must have been within the cut in limits for a time determined by **CutInGridFreqConditionTime**.

Par1: Mean frequency (1 sec)

Par2: Nominal frequency

No: 3624	SupervisionID 3624	Name TowNatFreq_TestNotDoneSx
Log text	Tower nat freq test not done	
Subsystem name	TowerFrequencies	
Type	Warning	Timeout 21 day
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 60 second
- Time window	1 year	- Max time eliminate 60 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors if the Turbine Test Functions(TTF) to evaluate turbine natural frequency (test 11.42) has been performed or not

Note: This warning will be upgraded to an Alarm which shutdowns the turbine after 21 days if this problem haven't been fixed.

This warning is activated if following conditions are met

1. **TowNatFreq_TestNotDone_ActivityLevel** = 2
2. **MeasuredTowerNaturalFrequency** is less than 0.001 for continuously **TowNatFreq_TestNotDone_Timeout** seconds

No: 3625	SupervisionID 3625	Name TowNatFreq_OutsideBoundsSx
Log text	Tow Freq ____Hz OutsideBounds	
Subsystem name	TowerFrequencies	
Type	Warning	Timeout 21 day
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 1 hour
- Time window	1 year	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors if measured tower natural frequency found by the Turbine Test Functions (TTF) in picture 11.42 is valid compared to the estimated tower natural frequency provided by the component Lock Speed Operation (LSO).

Note: This warning will be upgraded to an Alarm which shutdowns the turbine after 21 days if this problem hasn't been fixed.

This warning is activated if the following conditions are met for TowNatFreq_OutsideBounds_Timeout seconds

1. TowNatFreq_OutsideBounds_ActivityLevel = 2
2. The ****MeasuredTowerNaturalFrequency**** is greater than ****EstimatedTowerNaturalFrequency** * (1 - TowNatFreq_OutsideBounds_LowerLimitPct/100)**
3. The ****MeasuredTowerNaturalFrequency**** is less than ****EstimatedTowerNaturalFrequency** * (1 + TowNatFreq_OutsideBounds_UpperLimitPct/100)**

If the measured frequency do not fall within the valid interval compared to the estimated tower natural frequency then do the following,

1. Verify that the correct tower height have been entered in the basic configuration of VOT4 since the estimated frequency comes from this tower height and turbine type
2. Rerun the tower neutral frequency test and see if the same frequency is measured
3. If the frequency is still outside the bounds then create a JIRA case assigned to the group LAC (Loads, Aerodynamic and Control) for further investigation

parameters:

- TowNatFreq_OutsideBounds_ActivityLevel
- TowNatFreq_OutsideBounds_Timeout
- TowNatFreq_OutsideBounds_LowerLimitPct
- TowNatFreq_OutsideBounds_UpperLimitPct

No: 3628	SupervisionID 3628	Name YawCWSignalInvalidSx
Log text	Yaw CW Signal Invalid	
Subsystem name	YawMotor	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	4	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This warning is raised if the status signal for ****IO.YawMotorsCWStart**** is Invalid.

The warning is only enabled when the yaw motors are having only one common control signals. i.e. when parameter ****OneCommonControlSignal**** is true

The warning can be acknowledged if the status signal for ****IO.YawMotorsCWStart**** is Valid.

No: 3629	SupervisionID 3629	Name YawCCWSignalInvalidSx	
Log text	Yaw CCW Signal Invalid		
Subsystem name	YawMotor		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	4	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This warning is raised if the status signal for ****IO.YawMotorsCCWStart**** is Invalid.

The warning is only enabled when the yaw motors are having only one common control signals. i.e. when parameter ****OneCommonControlSignal**** is true

The warning can be acknowledged if the status signal for ****IO.YawMotorsCCWStart**** is Valid.

No: 3631	SupervisionID 3631	Name YawToResetTooFrequentSx	
Log text	Yaw To Reset Too Frequent		
Subsystem name	YawControl		
Type	Warning	Timeout	<disabled>
Acknowledgement	Remote	Shutdown type	<n/a>
- Allowed attempts	<n/a>	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

The warning is raised if the turbine has been automatically yawing to Cable Twist Reset or Nacelle Position Reset too many times (a few) within a given time period (days).

The warning is triggered if ALL the following conditions are true:

- * ****YawToResetCounter**** is larger than ****YawToResetMaxCount****
- * Less than ****YawToResetTimeLimit**** time has passed since ****YawToResetCounter**** became larger than 0 (zero).

The warning can be acknowledged at any time.

****YawToResetCounter**** is reset to 0 (zero) when the warning is acknowledged or ****YawToResetTimeLimit**** time has passed without the warning has been triggered.

Functions performing automatic yaw to nacelle position reset, or yaw to cable twist reset has to increment ****YawToResetCounter**** when a succesful reset has been performed.

No: 3632	SupervisionID 3632	Name YawToNacellePositionResetNotAllowedSx	
Log text	Yaw To Nac Pos Reset Not Allwd		
Subsystem name	YawControl		
Type	Warning	Timeout	30 day
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	60 second
- Time window	1 hour	- Max time eliminate	60 second
- Stabilize period	0 second	Category	Manufacturer

Criteria:

This warning is raised when it is not possible to yaw to Nacelle Position Reset due to problems with the signals from the yaw sensor.

The warning is triggered by ****NacellePositionCalibratePossible**** having the value false, which is set by a Yaw Position subsystem. Refer to ****NacellePositionCalibratePossible**** for further information.

The warning can be acknowledged when ****NacellePositionCalibratePossible**** is true.

No: 3633	SupervisionID 3633	Name YawSystemStoppedSx	
Log text	Yaw System Stopped		
Subsystem name	YawControl		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect	60 second
- Time window	<n/a>	- Max time eliminate	60 second
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is raised when the turbine is no longer able to maintain yawing upwind.

The alarm is caused by either:

- * The yaw motors are in a fault state.
- * A Yaw Position subsystem is not allowing yawing in any direction.

The alarm is triggered if one of the following conditions are true:

- * Both ****YawCWAllowed**** and ****YawCCWAllowed**** are false
- * ****YawMotorsFaulted**** has been true for ****YawMotorsFailedStableTime****

The alarm can be acknowledged if ALL of the following conditions are true:

- * ****YawCWAllowed**** or ****YawCCWAllowed**** are true
- * ****YawMotorsFaulted**** is false

No: 3640	SupervisionID 3640	Name PitchBlockPilotLineOilPressDiffHighSx
Log text	PBOilDiffHiEMC:___ EMC ___bar	
Subsystem name	PitchBlock	
Type	Warning	Timeout 7 day
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	1 hour	- Max time eliminate 10 second
- Stabilize period	5 second	Category Manufacturer

Criteria:

The warning indicates that the difference between hydraulic main oil pressure and hydraulic pilot line oil pressure exceeds a certain limit.

The warning is raised if the difference between ****IO.PitchBlockEMCPilotPress**** and ****IO.HydrMainOilPress**** is above the limit given by the parameter ****OilPressPilotLineDiffMax****, for more than the time interval given by the parameter ****OilPressPilotLineDiffTime****.

This warning is only monitored if the following conditions are met:

1. Main turbine state is Production.
2. Hydraulic pressure is being build up.
3. System Drain Valve is closed.

The warning is auto acknowledged if the difference between ****IO.PitchBlockEMCPilotPress**** and ****IO.HydrMainOilPress**** drops below the parameter ****OilPressPilotLineDiffMax****. The warning will be converted to an alarm after 7 days.

No: 3647	SupervisionID 3647	Name BrakeTestRebuildPressureFailedSx
Log text	BrakePressRebuild Fail:Test _	
Subsystem name	BrakeTestFunction	
Type	Warning	Timeout 7 hour
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	4	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

The warning indicates that the brake accumulator pressure has not reached a certain limit at the end of a brake test.

The warning is raised if the ****IO.BrakeAccumulatorPress**** has not reached the limit given by the parameter ****BrakeTestRebuildPressureLimit****, within ****BrakeTestRebuildPressureTime**** time, at the end of a brake Test.

The warning is auto acknowledged when a successful test is completed.

No: 3648	SupervisionID 3648	Name BrakeSupplyValveLeakageSx
Log text	Brake SupplyValve Leak:___bar	
Subsystem name	BrakeTestFunction	
Type	Warning	Timeout 7 hour
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	4	- Max time disconnect 15 second
- Time window	1 hour	- Max time eliminate 45 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

The warning indicates that the Brake Supply Valve is leaking.

The warning is raised if the ****IO.BrakeAccumulatorPress**** exceeds the limit given by the parameter ****SupplyValveTestMaxPressure****, after a completed Accumulator & Supply Valve Test.

The warning is auto acknowledged when a successful test is completed.

No: 3649	SupervisionID 3649	Name RundownStopTimeoutSx
Log text	Rundown Stop Timeout	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

Alarm condition: The alarm is raised if the RundownStop sequencee is not completed within the time specified by RundownStopSupervisionTime and the generator SPEED at the same time exceeds the value specified by MaxSpeedRundownStopTimeout.

Alarm condition: The alarm is raised if the RundownStop sequence (which includes a normal rundown) is not completed within the time specified by RundownStopSupervisionTime and the generator SPEED at the same time exceeds the value specified by MaxSpeedRundownStopTimeout.

Par1: The RundownStop supervision time

No: 3651	SupervisionID 3651	Name PowerManagementActiveSx	
Log text	PowSavMode:___ PowResAct:___		
Subsystem name	PowerSupply		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseFast
- Allowed attempts	Unlimited	- Max time disconnect	8 second
- Time window	<n/a>	- Max time eliminate	1 hour
- Stabilize period	0 second	Category	Owner

Criteria:

This alarm is raised if power management is activated on the turbine.

The power management is active if either the ****PowerSaveActive**** or the ****PowerRestrictionActive**** signals are activated.

If power save mode is activated the turbine will reduce power consumption as much as possible and therefore motors, heaters and other power consuming actuators which are not critical for the turbine are stopped.

Power save is not allowed if the turbine is in production.

In restricted power mode the turbine must be connected to SCADA in order to request power when needed.

Power save is activated in restricted power mode.

Restricted power mode is allowed if all the following conditions are met:

- * ****PowerSupplyRestrictedExternalPowerEnabled**** is true
- * Turbine is supplied from external generator, i.e. ****PowerBackupSource**** is external
- * Service mode is none

If service mode is entered during restricted power mode, restricted power is deactivated but the turbine remains in power save.

The alarm is auto acknowledged when power management is deactivated.

No: 3656	SupervisionID 3656	Name ConverterChargeFailSx	
Log text	Conv Charge Failed		
Subsystem name	PSC		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	9 second
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This supervision detect and secure the turbine from converter not responding to the charge command for a long time

This alarm is activated if the following conditions are met continuously for ****PSC_ConvChargeFail_MinTimeSpan**** seconds

1. ****PSC_ConvChargeFail_ActivityLevel**** = 2
2. ****GeneratorCommand**** value is charge
3. ****Converter.ConverterMainState**** is not charged

No: 3662	SupervisionID 3662	Name TurbineShutdownManualEmergencySx
Log text	TSDManEmergency:____RPM,____kW	
Subsystem name	TurbineShutdownTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type Emergency
- Allowed attempts	<n/a>	- Max time disconnect 0 second
- Time window	<n/a>	- Max time eliminate 0 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision is triggered manually by the operator from the Turbine Shut-down test function to test the "EMERGENCY" shut-down type.

No: 3663	SupervisionID 3663	Name TurbineShutdownManualStopFastSx
Log text	TSDManStopFast:____RPM,____kW	
Subsystem name	TurbineShutdownTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopFast
- Allowed attempts	<n/a>	- Max time disconnect 0.9 second
- Time window	<n/a>	- Max time eliminate 1 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision is triggered manually by the operator from the Turbine Shut-down test function to test the "STOP FAST" shut-down type.

No: 3664	SupervisionID 3664	Name TurbineShutdownManualStopSlowSx
Log text	TSDManStopSlow:____RPM,____kW	
Subsystem name	TurbineShutdownTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type StopSlow
- Allowed attempts	<n/a>	- Max time disconnect 3 second
- Time window	<n/a>	- Max time eliminate 9 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision is triggered manually by the operator from the Turbine Shut-down test function to test the "STOP SLOW" shut-down type.

No: 3665	SupervisionID 3665	Name TurbineShutdownManualPauseFastSx
Log text	TSDManPauseFast:____RPM,____kW	
Subsystem name	TurbineShutdownTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseFast
- Allowed attempts	<n/a>	- Max time disconnect 8 second
- Time window	<n/a>	- Max time eliminate 10 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision is triggered manually by the operator from the Turbine Shut-down test function to test the "PAUSE FAST" shut-down type.

No: 3666	SupervisionID 3666	Name TurbineShutdownManualPauseSlowSx
Log text	TSDManPauseSlow:____RPM,____kW	
Subsystem name	TurbineShutdownTestFunction	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 9 second
- Time window	<n/a>	- Max time eliminate 10 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision is triggered manually by the operator from the Turbine Shut-down test function to test the "PAUSE SLOW" shut-down type.

No: 3667	SupervisionID 3667	Name VPCIntSwErrRundownStopSx
Log text	VPC Err Causing Rundown Stop	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This Alarm is raised in case of an internal software error causing a RundownStop sequence in the converter software

No: 3670	SupervisionID 3670	Name HighCurrentHarmonicLevel_L1Sx
Log text	Grid curr harmonics exceed L1	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Utility

Criteria:

This supervision is raised if the harmonic current level in phase 1 towards the transformer is too high.

This supervision is raised if the harmonic current level in phase 1 towards the transformer is too high.

Par1: Harmonic current level measured [Arms]

Par2: Harmonic current limit [Arms]

Alarm condition: If the harmonic current level (excluding the fundamental component) running in the HV transformer exceeds nominal current times IL_HarmonicHighLevel. This can happen if the harmonic level in the utility grid is very high.

No: 3671	SupervisionID 3671	Name HighCurrentHarmonicLevel_L2Sx	
Log text	Grid curr harmonics exceed L2		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Utility

Criteria:

This supervision is raised if the harmonic current level in phase 2 towards the transformer is too high.

This supervision is raised if the harmonic current level in phase 2 towards the transformer is too high.

Par1: Harmonic current level measured [Arms]

Par2: Harmonic current limit [Arms]

Alarm condition: If the harmonic current level (excluding the fundamental component) running in the HV transformer exceeds nominal current times IL_HarmonicHighLevel. This can happen if the harmonic level in the utility grid is very high.

No: 3672	SupervisionID 3672	Name HighCurrentHarmonicLevel_L3Sx	
Log text	Grid curr harmonics exceed L3		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	60 second	Category	Utility

Criteria:

This supervision is raised if the harmonic current level in phase 3 towards the transformer is too high.

This supervision is raised if the harmonic current level in phase 3 towards the transformer is too high.

Par1: Harmonic current level measured [Arms]

Par2: Harmonic current limit [Arms]

Alarm condition: If the harmonic current level (excluding the fundamental component) running in the HV transformer exceeds nominal current times IL_HarmonicHighLevel. This can happen if the harmonic level in the utility grid is very high.

No: 3674	SupervisionID 3674	Name PitchBlockEMCPilotPressLowSx
Log text	PilotPressLow:____bar____bar	
Subsystem name	PitchBlock	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	2 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

The alarm indicates that the Hydraulic Pilot Pressure drops below a certain limit.

The alarm is raised if the Hydraulic Pilot Pressure (**IO.PitchBlockEMCPilotPress**) drops below the minimum pressure specified by the parameter **PilotPressLow** for more than the time interval given by the parameter **PilotPressLowTime**.

This alarm is only monitored if the hydraulic oil is heated, initial pressure has been build up and the EMC valves are closed (**PitchHydrSupplyReady**).

The alarm is auto acknowledged, if the Hydraulic Pilot Pressure is equal or above the parameter **PilotPressLow**.

No: 3675	SupervisionID 3675	Name ConverterControllerArcNetReceiver1LightErrorSx
Log text	ConvArcNetRc1LightErr____.____dBm	
Subsystem name	FrameworkHealthMonitoring	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	Unlimited	- Max time disconnect <n/a>
- Time window	<n/a>	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if the level of one of the arc net receiver lights on one of the controllers is too low.

This concerns the arc net receiver 1 light.

For the converter controller.

<u>No: 3676</u>	SupervisionID	Name	ConverterControllerArcNetReceiver2LightErrorSx
	3676		
Log text	ConvArcNetRc2LightErr____.____dBm		
Subsystem name	FrameworkHealthMonitoring		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer
Criteria:			

This concerns the arc net receiver 2 light.

No: 3677

<u>No: 3677</u>	SupervisionID	Name	ConverterControllerArcNetReceiver5LightErrorSx
	3677		
Log text	ConvArcNetRc5LightErr____.__dBm		
Subsystem name	FrameworkHealthMonitoring		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer
Criteria:			

This concerns the arc net receiver 5 light.

For the converter controller,

No: 3679	SupervisionID 3679	Name YawLubricationErrorSx	
Log text	Yaw Lubrication Pump2 Failed		
Subsystem name	YawLubrication		
Type	Warning	Timeout	90 day
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect	1 hour
- Time window	<n/a>	- Max time eliminate	1 hour
- Stabilize period	10 second	Category	Manufacturer

Criteria:

This warning is raised if the yaw lubrication pump is not working properly.

When the pump is running, the signal from the grease distribution block (proximity switch) must change within the specified time given by ****ProximitySwitchTimeout****.

If the proximity switch signal does not change within the specified time, it can indicate one of the following problems:

- * there is no grease in the reservoir
- * the distribution system is not functioning correctly

Proximity switch from pump 2 is ****IO.YawLubr2ProximitySwitchOn****

No: 3683	SupervisionID 3683	Name GeneratorSpdStepDetectedSx	
Log text	Generator Speed Step Detected		
Subsystem name	ProdCtrl		
Type	Warning	Timeout	0,4 second
Acknowledgement	Auto	Shutdown type	StopSlow
- Allowed attempts	3	- Max time disconnect	3 second
- Time window	1 hour	- Max time eliminate	9 second
- Stabilize period	0 second	Category	Manufacturer

Criteria:

This supervision monitors the jumps when the generator speed is above the minimum generator speed limit.

This supervision will trigger when the following conditions are met

1. ****SPf_GenSpdStepDetection_ActivityLevel**** = 2.
2. ****SPf_GenSpdStepDetection_MinGenSpd**** > 200 rpm

No: 3690	SupervisionID 3690	Name HighChopperIGBTTempSx	
Log text	High Chopper IGBT Temp ____°C		
Subsystem name	CubePower		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	StopFast
- Allowed attempts	3	- Max time disconnect	0.9 second
- Time window	1 hour	- Max time eliminate	1 hour
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm is raised if the Chopper IGBTs have reached their maximum estimated temperature. Par1 : Estimated temperature (celsius)

This alarm is raised if the Chopper IGBTs have reached their maximum estimated temperature.

Par1 : Estimated temperature (celsius)

No: 3691	SupervisionID 3691	Name HighChopperWireTempSx
Log text	High Chopper Wire Temp ____°C	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopFast
- Allowed attempts	3	- Max time disconnect 0.9 second
- Time window	1 hour	- Max time eliminate 1 hour
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if The Wire in the Chopper Resistors have reached their maximum estimated temperature.

Parl : Estimated temperature (celsius)

No: 3695	SupervisionID 3695	Name UDCTooLowToCloseLineSideBreakerSx
Log text	UDC____ Low to close LSBreak	
Subsystem name	CubePower	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm is raised if a line side breaker does not close because the HW defence line has detected a low DC voltage. The error may be caused by an undetected DC-fuse blow or a bad measurement of the DC voltage due to a loose connection in the wire-harness.

Parl: PSC module (1/2/3/4)

No: 3709	SupervisionID 3709	Name EMCValvesUnexpectedOpenSx
Log text	EMC Valves Unexpected Open	
Subsystem name	PiSV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	1 minute	Category Manufacturer

Criteria:

This supervision is used to detect if the safety system has opened the EMC valves without telling why. This should not be possible and is currently being worked on fixing. However in the cases where this happens this supervision will trigger before any other follow alarms (E.g PitchDeviationToRef) are triggered.

The alarm is raised if following conditions are met continuously for
****EMCValvesUnexpectedOpen_MinTimeSpan**** sec

1. ****EMCValvesUnexpectedOpen_ActivityLevel**** = 2
2. ****SafetyPitchActive**** has been false for ****EMCValvesUnexpectedOpen_ActivationDelay**** seconds
3. **SafetySystemPitchControlBlocked** is true

No: 3718	SupervisionID 3718	Name TowerOscillationsXDirectionExtremeSx
Log text	TowAcc X, Extreme:__.__ m/s^2	
Subsystem name	SV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors the extreme tower oscillations in sidewise direction (lateral) during normal operation and reacts when the oscillation exceeds the extreme limit value. Since the filter constant for this supervision is very quick it can react very quick similar to the shock sensor.

This alarm is activated if the following conditions are met:

1. **TowOscExtremeX_ActivityLevel** = 2
2. SafetyPitchActive is false
3. When the SP_TowAccXdirRMS is greater than **TowOscExtremeX_Limit**

No: 3719	SupervisionID 3719	Name TowerOscillationsYDirectionExtremeSx
Log text	TowAcc Y, Extreme:__.__ m/s^2	
Subsystem name	SV	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 3 second
- Time window	1 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:

This supervision monitors the Tower oscillations in thrust wise direction (back and forth) during normal operation and reacts when the oscillation exceeds the extreme limit value. Since the filter constant for this supervision is very quick it can react very quick similar to the shock sensor.

This alarm is activated if the following conditions are met:

1. **TowOscExtremeY_ActivityLevel** = 2
2. AGO_AGOActive is false
3. When the SP_TowAccYdirRMS is greater than **TowOscExtremeY_Limit**

No: 3729	SupervisionID 3729	Name GridErrorDelaySx
Log text	Delay Start After Err:_____	
Subsystem name	TurbineStateMonitoring	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	Unlimited	- Max time disconnect 60 second
- Time window	<n/a>	- Max time eliminate 60 second
- Stabilize period	600 second	Category Utility

Criteria:

This alarm is reported following an error categoried as "Grid" if the option "Delayed startup after grid error" is enabled
The reason for enable this alarm is usually a local grid requirement.

No: 3739	SupervisionID 3739	Name SwitchgearDisconnectErrorSx
Log text	HVCBDDisconnectError	
Subsystem name	SwitchGear	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 15 second
- Time window	<n/a>	- Max time eliminate 45 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:
This alarm is reported if the High Voltage Circuit Breaker is not disconnected on request i.e. the signal ****IO.SwitchgearHVCBClosed**** does not change to false within the time given by in the parameter **SwitchgearResponseTime** after the signal ****SwitchgearTripHVCBRequest**** is set to true

The alarm can be acknowledged if the ****SwitchgearTripHVCBRequest**** is false.

No: 3740	SupervisionID 3740	Name SwitchgearNotHealthySx
Log text	HVCBNotHealthy	
Subsystem name	SwitchGear	
Type	Warning	Timeout 1440 hour
Acknowledgement	Auto	Shutdown type PauseSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	24 hour	- Max time eliminate 10 second
- Stabilize period	60 second	Category Manufacturer

Criteria:
This alarm is reported if the switchgear is not healthy i.e. the signal ****IO.SwitchgearHealthy**** changes to false.

The alarm can be acknowledged if the signal ****IO.SwitchgearHealthy**** changes to true.

No: 3741	SupervisionID 3741	Name SwitchgearHVCBErrorSx
Log text	HVCBError	
Subsystem name	SwitchGear	
Type	Alarm	Timeout <n/a>
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 15 second
- Time window	<n/a>	- Max time eliminate 45 second
- Stabilize period	<n/a>	Category Manufacturer

Criteria:
This alarm is reported if there is an error on the High Voltage Circuit Breaker i.e. the signal **SwitchgearHVCBOk** changes to false.

The alarm can be acknowledged if the signal **SwitchgearHVCBOk** changes to true.

No: 3742	SupervisionID 3742	Name SwitchgearTripHVButtonActivatedSx	
Log text	TripHVButtonActivated__		
Subsystem name	SwitchGear		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	StopSlow
- Allowed attempts	<n/a>	- Max time disconnect	3 second
- Time window	<n/a>	- Max time eliminate	9 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This alarm is reported if the Nacelle or Tower High Voltage Circuit Breaker Button has been activated and communication with the safety system is up running i.e. the signal ****IO.SwitchgearTripHVButtonInNacelleActivated**** or ****IO.SwitchgearTripHVButtonInTowerActivated**** are true.

The signals are transferred via protocol from the safety system. If the communication with the safety system is not up running i.e. the status of the signal ****IO.SafetySystemProtocolDataStatus**** is not valid the signals are disregarded and the alarm is not reported.

The alarm can be acknowledged if the signals ****IO.SwitchgearTripHVButtonInNacelleActivated**** and ****IO.SwitchgearTripHVButtonInTowerActivated**** are false.

No: 3796	SupervisionID 3796	Name HubSafetySystemEncoderBladeAErrAlarmSx
Log text	HubSafetySystem EncoderA,EC:_	
Subsystem name	OptiStop	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseFast
- Allowed attempts	3	- Max time disconnect 8 second
- Time window	1 hour	- Max time eliminate 3600 second
- Stabilize period	1 minute	Category Manufacturer

Criteria:

This alarm appears if the staus of the encoder in blade A is bad and Generator RPM is above warning threshold (Prm_SuperviseEncoderGeneratorSpeed). The status is reported from the Hub Safety System.

The alarm log argument holds information on why the encoder status is bad. The infomation can also be found in the signal HubSafetySystemEncoderAErrorCode. The errorcode has the following interpretation:

- 0: No error (All good)
- 1: Discrepancy + no signals frozen
- 2: Discrepancy + linear transducer frozen
- 3: Discrepancy + encoder frozen
- 4: Discrepancy + both signals frozen

Further details on signal HubSafetySystemEncoderAErrorCode:

- 1: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleA) differs from the standard controller's pitch position measurement (PitchBladeAAngle). - both signals are alive.
- 2: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleA) differs from the standard controller's pitch position measurement (PitchBladeAAngle). - The standard controller's measurement value is frozen.
- 3: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleA) differs from the standard controller's pitch position measurement (IO.PitchBladeAAngle). - The safety system's measurement value is frozen.
- 4: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleA) differs from the standard controller's pitch position measurement (PitchBladeAAngle). - Both measurements are frozen.

The following signals holds the counts on how the signals can differ and be frozen:
CusumEncLinA, CusumEncFreezeA, CusumLinFreezeA

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter ****OptiStopVariant2Installed**** is true.

No: 3797	SupervisionID 3797	Name HubSafetySystemEncoderBladeBErrAlarmSx
Log text	HubSafetySystem EncoderB,EC:_	
Subsystem name	OptiStop	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseFast
- Allowed attempts	3	- Max time disconnect 8 second
- Time window	1 hour	- Max time eliminate 3600 second
- Stabilize period	1 minute	Category Manufacturer

Criteria:

This alarm appears if the staus of the encoder in blade B is bad and Generator RPM is above warning threshold (Prm_SuperviseEncoderGeneratorSpeed). The status is reported from the Hub Safety System.

The alarm log argument holds information on why the encoder status is bad. The infomation can also be found in the signal HubSafetySystemEncoderBErrorCode. The errorcode has the following interpretation:

- 0: No error (All good)
- 1: Discrepancy + no signals frozen
- 2: Discrepancy + linear transducer frozen
- 3: Discrepancy + encoder frozen
- 4: Discrepancy + both signals frozen

Further details on signal HubSafetySystemEncoderBErrorCode:

- 1: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleB) differs from the standard controller's pitch position measurement (PitchBladeBAngle). - both signals are alive.
- 2: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleB) differs from the standard controller's pitch position measurement (PitchBladeBAngle). - The standard controller's measurement value is frozen.
- 3: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleB) differs from the standard controller's pitch position measurement (IO.PitchBladeBAngle). - The safety system's measurement value is frozen.
- 4: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleB) differs from the standard controller's pitch position measurement (PitchBladeBAngle). - Both measurements are frozen.

The following signals holds the counts on how the signals can differ and be frozen:
CusumEncLinB, CusumEncFreezeB, CusumLinFreezeB

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter **OptiStopVariant2Installed** is true.

No: 3798	SupervisionID 3798	Name HubSafetySystemEncoderBladeCErrAlarmSx
Log text	HubSafetySystem EncoderC,EC:_	
Subsystem name	OptiStop	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseFast
- Allowed attempts	3	- Max time disconnect 8 second
- Time window	1 hour	- Max time eliminate 3600 second
- Stabilize period	1 minute	Category Manufacturer

Criteria:

This alarm appears if the staus of the encoder in blade C is bad and Generator RPM is above warning threshold (Prm_SuperviseEncoderGeneratorSpeed). The status is reported from the Hub Safety System.

The alarm log argument holds information on why the encoder status is bad. The infomation can also be found in the signal HubSafetySystemEncoderCErrorCode. The errorcode has the following interpretation:

- 0: No error (All good)
- 1: Discrepancy + no signals frozen
- 2: Discrepancy + linear transducer frozen
- 3: Discrepancy + encoder frozen
- 4: Discrepancy + both signals frozen

Further details on signal HubSafetySystemEncoderCErrorCode:

- 1: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleC) differs from the standard controller's pitch position measurement (PitchBladeCAngle). - both signals are alive.
- 2: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleC) differs from the standard controller's pitch position measurement (PitchBladeCAngle). - The standard controller's measurement value is frozen.
- 3: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleC) differs from the standard controller's pitch position measurement (IO.PitchBladeCAngle). - The safety system's measurement value is frozen.
- 4: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleC) differs from the standard controller's pitch position measurement (PitchBladeCAngle). - Both measurements are frozen.

The following signals holds the counts on how the signals can differ and be frozen:
CusumEncLinC, CusumEncFreezeC, CusumLinFreezeC

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter **OptiStopVariant2Installed** is true.

No: 3799	SupervisionID 3799	Name HubSafetySystemRateGyroErrorSx	
Log text	HubSafetySystem Speed Err.:_		
Subsystem name	OptiStop		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseFast
- Allowed attempts	3	- Max time disconnect	8 second
- Time window	1 hour	- Max time eliminate	3600 second
- Stabilize period	1 minute	Category	Manufacturer

Criteria:

This alarm appears if the status of the rate gyro is bad. The status is reported from the Hub Safety System.

The alarm log argument holds information on why the gyro status is bad. The information can also be found in the signal HubSafetySystemRateGyroErrorCode. The errorcode has the following interpretation:

- 0: No error (All good)
- 1: LSS discrepancy
- 2: LSS discrepancy + frozen
- 3: HSS discrepancy
- 4: HSS discrepancy + frozen
- 5: Gyro discrepancy
- 6: Gyro discrepancy + frozen
- 7: Gyro discrepancy + LSS frozen + HSS frozen
- 8: Unknown failure"

Further details on signal HubSafetySystemRateGyroErrorCode:

The safety system evaluates the measurement of the rate gyro (SafetySystemHubRateGyroMeasuredRotorSpeed) by comparing it to the standard controller's rotor speed measurement LSS (OptiStopRotorTachoSpeed) and the standard controller's generator speed measurement HSS (OptiStopGenToRotorSpeed). The HSS measurement is converted to rotor speed using the gear ratio. The individual values of the errorcode describes how they differ.

- 1: SafetySystemHubRateGyroMeasuredRotorSpeed differs from OptiStopRotorTachoSpeed - Both signals are alive
- 2: SafetySystemHubRateGyroMeasuredRotorSpeed differs from OptiStopRotorTachoSpeed + OptiStopRotorTachoSpeed is frozen
- 3: SafetySystemHubRateGyroMeasuredRotorSpeed differs from OptiStopGenToRotorSpeed - Both signals are alive
- 4: SafetySystemHubRateGyroMeasuredRotorSpeed differs from OptiStopGenToRotorSpeed + OptiStopGenToRotorSpeed is frozen
- 5: SafetySystemHubRateGyroMeasuredRotorSpeed differs from OptiStopRotorTachoSpeed and OptiStopGenToRotorSpeed - All signals are alive
- 6: SafetySystemHubRateGyroMeasuredRotorSpeed differs from OptiStopRotorTachoSpeed and OptiStopGenToRotorSpeed + SafetySystemHubRateGyroMeasuredRotorSpeed is frozen
- 7: SafetySystemHubRateGyroMeasuredRotorSpeed differs from OptiStopRotorTachoSpeed and OptiStopGenToRotorSpeed + OptiStopRotorTachoSpeed and OptiStopGenToRotorSpeed are frozen
- 8: Unknown failure

The following signals hold the counts on how the signals can differ and be frozen: OptiStopCusumHssLss, CusumHssGyro, CusumLssGyro, CusumLssFreeze, CusumHssFreeze, CusumGyroFreeze

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter **OptiStopVariant2Installed** is true.

No: 3800	SupervisionID 3800	Name HubSafetySystemFastPitchValveAErrorSx	
Log text	HubSafety FastPitchValveA Err.		
Subsystem name	OptiStop		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseFast
- Allowed attempts	3	- Max time disconnect	8 second
- Time window	1 hour	- Max time eliminate	3600 second
- Stabilize period	1 minute	Category	Manufacturer

Criteria:

This alarm appears if the staus of the Fast Valve in blade A is bad. The status is reported from the Hub Safety System.

The alarm is automatically acknowledged when the Fast Valve status bits from blade A is zero.

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter ****OptiStopVariant2Installed**** is true.

No: 3801	SupervisionID 3801	Name HubSafetySystemFastPitchValveBErrorSx	
Log text	HubSafety FastPitchValveB Err.		
Subsystem name	OptiStop		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseFast
- Allowed attempts	3	- Max time disconnect	8 second
- Time window	1 hour	- Max time eliminate	3600 second
- Stabilize period	1 minute	Category	Manufacturer

Criteria:

This alarm appears if the staus of the Fast Valve in blade B is bad. The status is reported from the Hub Safety System.

The alarm is automatically acknowledged when the Fast Valve status bits from blade B is zero.

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter ****OptiStopVariant2Installed**** is true.

No: 3802	SupervisionID 3802	Name HubSafetySystemFastPitchValveCErrorSx	
Log text	HubSafety FastPitchValveC Err.		
Subsystem name	OptiStop		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseFast
- Allowed attempts	3	- Max time disconnect	8 second
- Time window	1 hour	- Max time eliminate	3600 second
- Stabilize period	1 minute	Category	Manufacturer

Criteria:

This alarm appears if the staus of the Fast Valve in blade C is bad. The status is reported from the Hub Safety System.

The alarm is automatically acknowledged when the Fast Valve status bits from blade C is zero.

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter ****OptiStopVariant2Installed**** is true.

No: 3803 **SupervisionID** 3803 **Name** HubSafetySystemPilotValve1ErrorSx
Log text HubSafety PilotValve1 Err.
Subsystem name OptiStop
Type Alarm **Timeout** <n/a>
Acknowledgement Auto **Shutdown type** StopSlow
- **Allowed attempts** 3 - **Max time disconnect** 3 second
- **Time window** 1 hour - **Max time eliminate** 9 second
- **Stabilize period** 1 minute **Category** Manufacturer
Criteria:
This alarm appears if the staus of the pilot Valve 1 is bad. The status is reported from the Hub Safety System.

The alarm is automatically acknowledged when the pilot Valve 1 status bits from blade A is zero.

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter ****OptiStopVariant2Installed**** is true.

No: 3804 **SupervisionID** 3804 **Name** HubSafetySystemPilotValve2ErrorSx
Log text HubSafety PilotValve2 Err.
Subsystem name OptiStop
Type Alarm **Timeout** <n/a>
Acknowledgement Auto **Shutdown type** StopSlow
- **Allowed attempts** 3 - **Max time disconnect** 3 second
- **Time window** 1 hour - **Max time eliminate** 9 second
- **Stabilize period** 1 minute **Category** Manufacturer
Criteria:
This alarm appears if the staus of the pilot Valve 2 is bad. The status is reported from the Hub Safety System.

The alarm is automatically acknowledged when the pilot Valve 2 status bits from blade A is zero.

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter ****OptiStopVariant2Installed**** is true.

No: 3805 **SupervisionID** 3805 **Name** HubSafetySystemDCSupplyErrorSx
Log text HubSafetySystem DC Supply Err.
Subsystem name OptiStop
Type Alarm **Timeout** <n/a>
Acknowledgement Auto **Shutdown type** PauseFast
- **Allowed attempts** 3 - **Max time disconnect** 8 second
- **Time window** 1 hour - **Max time eliminate** 3600 second
- **Stabilize period** 1 minute **Category** Manufacturer
Criteria:
This alarm appears if the staus of the UPS DC Supply of the Hub Safety System encounters an error.

The alarm is automatically acknowledged when the DC Supply status bits is zero.

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter ****OptiStopVariant2Installed**** is true.

No: 3806	SupervisionID 3806	Name HubSafetySystemBatteryChargerErrorSx
Log text	HubSafetySystem Batt.Charg.Err	
Subsystem name	OptiStop	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseFast
- Allowed attempts	3	- Max time disconnect 8 second
- Time window	1 hour	- Max time eliminate 3600 second
- Stabilize period	1 minute	Category Manufacturer

Criteria:

This alarm appears if the status of the UPS battery charger of the Hub Safety System encounters an error.

The alarm is automatically acknowledged when the UPS battery charger status bits is zero.

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter ****OptiStopVariant2Installed**** is true.

No: 3807	SupervisionID 3807	Name HubSafetySystemBatteryLevelErrorSx
Log text	HubSafetySystem Batt.Level Err	
Subsystem name	OptiStop	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type PauseFast
- Allowed attempts	3	- Max time disconnect 8 second
- Time window	1 hour	- Max time eliminate 3600 second
- Stabilize period	1 minute	Category Manufacturer

Criteria:

This alarm appears if the status of the UPS battery level of the Hub Safety System encounters an error.

The alarm is automatically acknowledged when the UPS battery level status bit is zero.

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter ****OptiStopVariant2Installed**** is true.

No: 3848	SupervisionID 3848	Name PFB_SensorAFaultSx
Log text	PitAPFBsensorunavailable	
Subsystem name	PFB	
Type	Warning	Timeout 20 day
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 1 hour
- Time window	<n/a>	- Max time eliminate 1 hour
- Stabilize period	<n/a>	Category Manufacturer

Criteria:

This supervision monitors the status of the sensor used for Pitch Force Boost and Pitch Blocking.

The sensor is the pressure sensor on the pitch block PitchBlockACylinderPress.

If this supervision is active Pitch Force Boost and Pitch Blocking will not be active leading to potential high loads on the turbine.

The loss of these features may lead to shutdowns during operation at high winds.

Possible Causes:

- Failure of the pressure sensor
- Loss of connection with the pressure sensor

No: 3849	SupervisionID 3849	Name PFB_SensorBFaultSx
Log text	PitBPFBsensorunavailable	
Subsystem name	PFB	
Type	Warning	Timeout 20 day
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 1 hour
- Time window	<n/a>	- Max time eliminate 1 hour
- Stabilize period	<n/a>	Category Manufacturer

Criteria:
This supervision monitors the status of the sensor used for Pitch Force Boost and Pitch Blocking.

The sensor is the pressure sensor on the pitch block PitchBlockBCylinderPress.
If this supervision is active Pitch Force Boost and Pitch Blocking will not be active leading to potential high loads on the turbine.

The loss of these features may lead to shutdowns during operation at high winds.

- Possible Causes:
- Failure of the pressure sensor
 - Loss of connection with the pressure sensor

No: 3850	SupervisionID 3850	Name PFB_SensorCFaultSx
Log text	PitCPFBsensorunavailable	
Subsystem name	PFB	
Type	Warning	Timeout 20 day
Acknowledgement	Remote	Shutdown type PauseSlow
- Allowed attempts	<n/a>	- Max time disconnect 1 hour
- Time window	<n/a>	- Max time eliminate 1 hour
- Stabilize period	<n/a>	Category Manufacturer

Criteria:
This supervision monitors the status of the sensor used for Pitch Force Boost and Pitch Blocking.

The sensor is the pressure sensor on the pitch block PitchBlockCCylinderPress.
If this supervision is active Pitch Force Boost and Pitch Blocking will not be active leading to potential high loads on the turbine.

The loss of these features may lead to shutdowns during operation at high winds.

- Possible Causes:
- Failure of the pressure sensor
 - Loss of connection with the pressure sensor

No: 3851	SupervisionID	Name	ValidateFastEmergencyPitchVelocityAFailSx
	3851		
Log text	PitchValAErr, FastVel.A____mm/s		
Subsystem name	PitchValvesTestFunction		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	15 second
- Time window	1 hour	- Max time eliminate	45 second
- Stabilize period	5 second	Category	Manufacturer

Criteria:
This alarm is raised if the validation of the fast emergency pitch valve A is failed when running emergency pitch valves test function

No: 3852	SupervisionID	Name	ValidateFastEmergencyPitchVelocityBFailSx
	3852		
Log text	PitchValAErr, FastVel.B____mm/s		
Subsystem name	PitchValvesTestFunction		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	15 second
- Time window	1 hour	- Max time eliminate	45 second
- Stabilize period	5 second	Category	Manufacturer

Criteria:
This alarm is raised if the validation of the fast emergency pitch valve B is failed when running emergency pitch valves test function

No: 3853	SupervisionID	Name	ValidateFastEmergencyPitchVelocityCFailSx
	3853		
Log text	PitchValAErr, FastVel.C____mm/s		
Subsystem name	PitchValvesTestFunction		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	15 second
- Time window	1 hour	- Max time eliminate	45 second
- Stabilize period	5 second	Category	Manufacturer

Criteria:
This alarm is raised if the validation of the fast emergency pitch valve C is failed when running emergency pitch valves test function

No: 3854

SupervisionID	3854	Name	ValidateFastEmergencyPitchVelocityDifferenceExceedSx
Log text	PitchVelocityDiffExceed____mm/s		
Subsystem name	PitchValvesTestFunction		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	15 second
- Time window	1 hour	- Max time eliminate	45 second
- Stabilize period	5 second	Category	Manufacturer

Criteria:

This alarm is raised if the difference between the maximum and minimum of all three velocities (for blade A, B or C) is above the difference limit, when running the emergency pitch valves test function. This alarm is one-shot alarm, i.e. it can be acknowledged immediately and they are not reported until next time the automatic test detects the failure.

No: 3941

SupervisionID	3941	Name	TowerUPSDC1BatteryErrorSx
Log text	Battery error in Tower UPS DC1		
Subsystem name	UPS		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	1 minute	Category	Manufacturer

Criteria:

There is error on the Tower UPS DC1 Battery.

No: 3942

SupervisionID	3942	Name	TowerUPSDC1ErrorSx
Log text	Error in Tower UPS DC1		
Subsystem name	UPS		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	Unlimited	- Max time disconnect	<n/a>
- Time window	<n/a>	- Max time eliminate	<n/a>
- Stabilize period	1 minute	Category	Manufacturer

Criteria:

There is error on the Tower UPS DC1.

No: 3947

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 3947

Confirm leave hub in safe mode

HubInSafeMode

Alarm

Remote

<n/a>

<n/a>

<n/a>

This alarm is raised to ensure the operator is ready to exit hub in safe mode and start building up hydraulic pressure again.

Name

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

ConfirmLeaveHubInSafeModeSx

<n/a>

PauseSlow

9 second

10 second

Manufacturer

The alarm is raised if hub is in safe mode and all conditions for leaving hub in safe mode have been fulfilled, i.e. `**IO.HubInSafeModeInactive**` is true.

The alarm can be acknowledged at any time.

The alarm will automatically be acknowledged if the operator reactivates the hub service switch, i.e. value for `**IO.HubInSafeModeHubServiceSwitchActivated**` becomes true.

No: 3948

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 3948

ManBladeSelectorSignalMismatch

HubInSafeMode

Warning

Remote

<n/a>

<n/a>

<n/a>

This warning indicates an error in determining which blade is selected to be operated manually during hub in safe mode.

Name

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

ManualBladeSelectorSignalMismatchSx

<disabled>

<n/a>

<n/a>

<n/a>

Manufacturer

The warning is raised if the values read from `**IO.HubInSafeModeManualBladeSelectorBit1**` and `**IO.HubInSafeModeManualBladeSelectorBit2**` are both true for `**ManualBladeSelectorBitStableTime**` time.

The warning can be acknowledged as soon as either `**IO.HubInSafeModeManualBladeSelectorBit1**` or `**IO.HubInSafeModeManualBladeSelectorBit2**` has a value different from true.

No: 3949	SupervisionID 3949	Name HubInSafeModeBallValveAPositionErrorSx	
Log text	Hub ball valve A position err		
Subsystem name	HubInSafeMode		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	StopSlow
- Allowed attempts	<n/a>	- Max time disconnect	3 second
- Time window	<n/a>	- Max time eliminate	9 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This alarm is raised if a ball valve is not opened.

The alarm is raised when the specific ball valve position error signal is true. This should only happen if the safety relay has determined that the turbine is in normal operation, i.e. not in safe mode.

The alarm can be acknowledged as soon as the specific ball valve position error signal is false.

This specific alarm applies to ball valve A and the specific ball valve position error signal is ****IO.HubInSafeModeBallValveAPositionError****.

The alarm is raised when ball valve is not open or whenever a mechanical failure occurs in one of the switches causing a mismatch between open and close signals of the ball valve.

No: 3950	SupervisionID 3950	Name HubInSafeModeBallValveBPositionErrorSx	
Log text	Hub ball valve B position err		
Subsystem name	HubInSafeMode		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	StopSlow
- Allowed attempts	<n/a>	- Max time disconnect	3 second
- Time window	<n/a>	- Max time eliminate	9 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This alarm is raised if a ball valve is not opened.

The alarm is raised when the specific ball valve position error signal is true. This should only happen if the safety relay has determined that the turbine is in normal operation, i.e. not in safe mode.

The alarm can be acknowledged as soon as the specific ball valve position error signal is false.

This specific alarm applies to ball valve B and the specific ball valve position error signal is ****IO.HubInSafeModeBallValveBPositionError****.

The alarm is raised when ball valve is not open or whenever a mechanical failure occurs in one of the switches causing a mismatch between open and close signals of the ball valve.

No: 3951	SupervisionID 3951	Name HubInSafeModeBallValveCPositionErrorSx	
Log text	Hub ball valve C position err		
Subsystem name	HubInSafeMode		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Remote	Shutdown type	StopSlow
- Allowed attempts	<n/a>	- Max time disconnect	3 second
- Time window	<n/a>	- Max time eliminate	9 second
- Stabilize period	<n/a>	Category	Manufacturer

Criteria:

This alarm is raised if a ball valve is not opened.

The alarm is raised when the specific ball valve position error signal is true. This should only happen if the safety relay has determined that the turbine is in normal operation, i.e. not in safe mode.

The alarm can be acknowledged as soon as the specific ball valve position error signal is false.

This specific alarm applies to ball valve C and the specific ball valve position error signal is ****IO.HubInSafeModeBallValveCPositionError****.

The alarm is raised when ball valve is not open or whenever a mechanical failure occurs in one of the switches causing a mismatch between open and close signals of the ball valve.

No: 3957	SupervisionID 3957	Name EnteringHubInSafeModeWhileRotatingSx	
Log text	Hub switch while rotating		
Subsystem name	HubInSafeMode		
Type	Alarm	Timeout	<n/a>
Acknowledgement	Auto	Shutdown type	PauseSlow
- Allowed attempts	3	- Max time disconnect	9 second
- Time window	1 hour	- Max time eliminate	10 second
- Stabilize period	10 second	Category	Manufacturer

Criteria:

This alarm is raised if the hub service switch is activated and the generator rotation speed is above idle speed.

The alarm is raised if the value for ****IO.HubInSafeModeHubServiceSwitchActivated**** is true and ****Turbine.GeneratorTachoSpeed**** is above ****Turbine.HubInSafeModeVariant1.HubInSafeModeIdleGeneratorSpeed****.

The alarm is acknowledged as soon as either the value for ****IO.HubInSafeModeHubServiceSwitchActivated**** is false or ****Turbine.GeneratorTachoSpeed**** is below ****Turbine.HubInSafeModeVariant1.HubInSafeModeIdleGeneratorSpeed****.

No: 4046**SupervisionID** 4046**Name** TYC_SafeModeActiveSx**Log text**

TYC SafeMode _ PowDerate:_____

Subsystem name

ProdCtrl

Type

Warning

Timeout

90 day

Acknowledgement

Auto

Shutdown type

PauseSlow

- Allowed attempts

1000

- Max time disconnect

1 hour

- Time window

1 minute

- Max time eliminate

1 hour

- Stabilize period

0 second

Category

Manufacturer

Criteria:

This supervision detects if the TiltYawController (TYC) is requesting a Safe Mode.

The TiltYawController can request a safe mode for one or more of the following reasons and might be accompanied by TYC warnings

1. Blade load sensor error
2. Rotor azimuth error
3. Missing blade load calibration
4. Wind conditions (extreme wind shear)

The warning is activated if the following conditions are met

1. ****LDO_TYCSafeModeSV_Enable**** = 1
2. ****PitchCtrl.TYC_SafeModeRequest**** changes value AND is different from zero

No: 4047**SupervisionID** 4047**Name** PSA_SafeModeActiveSx**Log text**

PSA SafeMode _ PowDerate:_____

Subsystem name

ProdCtrl

Type

Warning

Timeout

90 day

Acknowledgement

Auto

Shutdown type

PauseSlow

- Allowed attempts

3

- Max time disconnect

1 hour

- Time window

14 day

- Max time eliminate

1 hour

- Stabilize period

0 second

Category

Manufacturer

Criteria:

This supervision detects if the PowerSpeedAdapter (PSA) is requesting a Safe Mode.

The PowerSpeedAdaptor requests a safe mode for one or more of the following reasons

1. Blade load sensor error
2. TYC error

The warning is activated if the following conditions are met

1. ****LDO_PSASafeModeSV_Enable**** = 1
2. ****LDO_PSA_SafeModeRequest**** changes value AND is different from zero

No: 4113	SupervisionID 4113	Name HighRotorSpeedAndPitchSlopeToRefDisabledSx
Log text	HighRotSpd SlopeToRefDisabled	
Subsystem name	PiRM	
Type	Alarm	Timeout <n/a>
Acknowledgement	Auto	Shutdown type StopSlow
- Allowed attempts	3	- Max time disconnect 9 second
- Time window	24 hour	- Max time eliminate 9 second
- Stabilize period	60 second	Category Manufacturer

Criteria:
This supervision monitors the automatic slope out functionality is disabled during manual functions and the rotor speed at the same time gets too high.

This alarm is activated if the following conditions are met:

1. Automatic slope to reference during manual functions is disabled
2. ****ProdCtrl.SP_RotorSpdEst** > **PiRM_DisableSlopeToRefMaxRotorSpd****

No: 4114	SupervisionID 4114	Name HeatersTempAllowedDifferenceFaultSx
Log text	BladeA Heaters temp dif. error	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:
This alarm indicates that the difference between the heater1 temperature and heater2 temperature is too large, probably indicating temperature sensor failures.
Supervision is reported if the absolute difference of ****IO.DeIcingBladeAHeatersTemp1**** and ****IO.DeIcingBladeAHeatersTemp2**** is greater than **Prm_HeatersTempAllowedDifference** in stable time **Prm_HeatersTempStableTime**.

No: 4115	SupervisionID 4115	Name Fan1PositiveFeedbackErrorSx
Log text	BladeA Fan1 pos feedback error	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:
Supervision is reported if the control output to the Fan1 contactor is Off and the feedback from the Fan1 contactor is On for Blade A

No: 4116	SupervisionID 4116	Name Fan1NegativeFeedbackErrorSx	
Log text	BladeA Fan1 neg feedback error		
Subsystem name	DeIcing		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	10 second	Category	Manufacturer

Criteria:

Supervision is reported if the control output to the Fan1 contactor is On and the feedback from the Fan1 contactor is Off for Blade A

No: 4121	SupervisionID 4121	Name Fan1ThermoFaultSx	
Log text	BladeA Fan1 is overloaded		
Subsystem name	DeIcing		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	10 second	Category	Manufacturer

Criteria:

Supervision reported when Fan1 is overloaded. [****IO.DeIcingBladeAFan1Overloaded**** = High].

No: 4124	SupervisionID 4124	Name HeatersOutputTempAllowedDifferenceFaultSx	
Log text	BladeA Heat/Out temp dif. err		
Subsystem name	DeIcing		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm indicates that the difference between the heater temperature and outlet temperature is too large, probably indicating temperature sensor failures.

Supervision is triggered when the difference of ****IO.DeIcingBladeAHeatersTemp1**** / ****IO.DeIcingBladeAHeatersTemp2**** [highest of two heater sensor temperatures] and **IO.DeIcingBladeAOutputTemp** is greater than the limit given by the parameter **Prm_HeatersOutputTempAllowedDifference** for more than the time interval given by the parameter **Prm_HeatersOutputTempStableTime**.

No: 4127	SupervisionID 4127	Name HeatersTemperatureHighSx
Log text	BladeA Heaters has high temp	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	75 second	Category Manufacturer

Criteria:
This alarm indicates a high heater temperature condition, heating is stopped and cooling started.

Supervision is reported if the heater temperature [highest among **IO.DeIcingBladeAHeatersTemp1** and **IO.DeIcingBladeAHeatersTemp2**] is greater than Prm_HeatersTooHighTempLimit for a stable time Prm_HeatersHighTempStableTime

No: 4128	SupervisionID 4128	Name HeatersTemperatureTooHighSx
Log text	BladeA Heaters too high temp	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:
This alarm indicates very high heater temperature condition, heating is stopped and cooling started

Report the supervision when the highest value of the two heater sensors temperatures **IO.DeIcingBladeAHeatersTemp1** and **IO.DeIcingBladeAHeatersTemp2** is greater than Prm_HeatersTooHighTempLimit for a stable time Prm_HeatersHighTempStableTime

No: 4129	SupervisionID 4129	Name Heater1PositiveFeedbackErrorSx
Log text	BladeA Heater1 pos feedbck err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:
Supervision is reported if the control output to the heater1 contactor is Off and the feedback from the heater1 contactor is On for Blade A

No: 4130	SupervisionID 4130	Name Heater1NegativeFeedbackErrorSx
Log text	BladeA Heater1 neg feedbck err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	75 second	Category Manufacturer

Criteria:

Supervision is reported if the control output to the heater1 contactor is On and the feedback from the heater1 contactor is Off for Blade A

No: 4131	SupervisionID 4131	Name Heater2PositiveFeedbackErrorSx
Log text	BladeA Heater2 pos feedbck err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:

Supervision is reported if the control output to the heater2 contactor is Off and the feedback from the heater2 contactor is On for Blade A

No: 4132	SupervisionID 4132	Name Heater2NegativeFeedbackErrorSx
Log text	BladeA Heater2 neg feedbck err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	75 second	Category Manufacturer

Criteria:

Supervision is reported if the control output to the heater2 contactor is On and the feedback from the heater2 contactor is Off for Blade A

No: 4133	SupervisionID 4133	Name RootTempHighSx
Log text	BladeA Root temperature high	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm indicates that the root temperature is hotter than allowed limit, probably indicating an hot air leak from the duct to blade root

Supervision is reported if ****IO.DeIcingBladeARootTemp**** is greater than **Prm_RootTempHighLimit** for a stable time **Prm_RootTempHighStableTime**

No: 4134	SupervisionID 4134	Name HeatersTempAllowedDifferenceFaultSx	
Log text	BladeB Heaters temp dif. error		
Subsystem name	DeIcing		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	60 second	Category	Manufacturer

Criteria:

This alarm indicates that the difference between the heater1 temperature and heater2 temperature is too large, probably indicating temperature sensor failures.

Supervision is reported if the absolute difference of ****IO.DeIcingBladeBHeatersTemp1**** and ****IO.DeIcingBladeBHeatersTemp2**** is greater than **Prm_HeatersTempAllowedDifference** in stable
time **Prm_HeatersTempStableTime**

No: 4135	SupervisionID 4135	Name Fan1PositiveFeedbackErrorSx	
Log text	BladeB Fan1 pos feedback error		
Subsystem name	DeIcing		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	30 second	Category	Manufacturer

Criteria:

Supervision is reported if the control output to the Fan1 contactor is Off and the feedback from the Fan1 contactor is On for Blade B

No: 4136	SupervisionID 4136	Name Fan1NegativeFeedbackErrorSx	
Log text	BladeB Fan1 neg feedback error		
Subsystem name	DeIcing		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	10 second	Category	Manufacturer

Criteria:

Supervision is reported if the control output to the Fan1 contactor is On and the feedback from the Fan1 contactor is Off for Blade B

No: 4141	SupervisionID 4141	Name Fan1ThermoFaultSx	
Log text	BladeB Fan1 is overloaded		
Subsystem name	DeIcing		
Type	Warning	Timeout	<disabled>
Acknowledgement	Auto	Shutdown type	<n/a>
- Allowed attempts	3	- Max time disconnect	<n/a>
- Time window	1 hour	- Max time eliminate	<n/a>
- Stabilize period	10 second	Category	Manufacturer

Criteria:

Supervision reported when Fan1 is overloaded. [****IO.DeIcingBladeBFan1Overloaded**** = High].

No: 4144	SupervisionID 4144	Name HeatersOutputTempAllowedDifferenceFaultSx
Log text	BladeB Heat/Out temp dif. err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm indicates that the difference between the heater temperature and outlet temperature is too large, probably indicating temperature sensor failures.

Supervision is reported if the absolute difference of ****IO.DeIcingBladeBHeatersTemp1**** / ****IO.DeIcingBladeBHeatersTemp2**** [highest of two heater sensor temperatures] and **IO.DeIcingBladeBOutputTemp** is greater than the limit given by the parameter **Prm_HeatersOutputTempAllowedDifference** for more than the time interval given by the parameter **Prm_HeatersOutputTempStableTime**.

No: 4147	SupervisionID 4147	Name HeatersTemperatureHighSx
Log text	BladeB Heaters has high temp	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	75 second	Category Manufacturer

Criteria:

This alarm indicates a high heater temperature condition, heating is stopped and cooling started.

Supervision is reported if the heater temperature [highest among ****IO.DeIcingBladeBHeatersTemp1**** and ****IO.DeIcingBladeBHeatersTemp2****] is greater than **Prm_HeatersTooHighTempLimit** for a stable time **Prm_HeatersHighTempStableTime**.

No: 4148	SupervisionID 4148	Name HeatersTemperatureTooHighSx
Log text	BladeB Heaters too high temp	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm indicates very high heater temperature condition, heating is stopped and cooling started..

Report the supervision when the highest value of the two heater sensors temperatures ****IO.DeIcingBladeBHeatersTemp1**** and ****IO.DeIcingBladeBHeatersTemp2**** is greater than **Prm_HeatersTooHighTempLimit** for a stable time **Prm_HeatersHighTempStableTime**

No: 4149	SupervisionID 4149	Name Heater1PositiveFeedbackErrorSx
Log text	BladeB Heater1 pos feedbck err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:

Supervision is reported if the control output to the heater1 contactor is Off and the feedback from the heater1 contactor is On for Blade B

No: 4150	SupervisionID 4150	Name Heater1NegativeFeedbackErrorSx
Log text	BladeB Heater1 neg feedbck err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	75 second	Category Manufacturer

Criteria:

Supervision is reported if the control output to the heater1 contactor is On and the feedback from the heater1 contactor is Off for Blade B

No: 4151	SupervisionID 4151	Name Heater2PositiveFeedbackErrorSx
Log text	BladeB Heater2 pos feedbck err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:

Supervision is reported if the control output to the heater2 contactor is Off and the feedback from the heater2 contactor is On for Blade B

No: 4152	SupervisionID 4152	Name Heater2NegativeFeedbackErrorSx
Log text	BladeB Heater2 neg feedbck err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	75 second	Category Manufacturer

Criteria:

Supervision is reported if the control output to the heater2 contactor is On and the feedback from the heater2 contactor is Off for Blade B

No: 4153	SupervisionID 4153	Name RootTempHighSx
Log text	BladeB Root temperature high	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm indicates that the root temperature is hotter than allowed limit, probably indicating an hot air leak from the duct to blade root.

Supervision is reported if ****IO.DeIcingBladeBRootTemp**** is greater than **Prm_RootTempHighLimit** for a stable time **Prm_RootTempHighStableTime**.

No: 4154	SupervisionID 4154	Name HeatersTempAllowedDifferenceFaultSx
Log text	BladeC Heaters temp dif. error	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm indicates that the difference between the heater1 temperature and heater2 temperature is too large, probably indicating temperature sensor failures.

Supervision is reported if the absolute difference of ****IO.DeIcingBladeCHeatersTemp1**** and ****IO.DeIcingBladeCHeatersTemp2**** is greater than **Prm_HeatersTempAllowedDifference** in stable time **Prm_HeatersTempStableTime**

No: 4155	SupervisionID 4155	Name Fan1PositiveFeedbackErrorSx
Log text	BladeC Fan1 pos feedback error	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:

Supervision is reported if the control output to the Fan1 contactor is Off and the feedback from the Fan1 contactor is On for Blade C

No: 4156	SupervisionID 4156	Name Fan1NegativeFeedbackErrorSx
Log text	BladeC Fan1 neg feedback error	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:

Supervision is reported if the control output to the Fan1 contactor is On and the feedback from the Fan1 contactor is Off for Blade C

No: 4161	SupervisionID 4161	Name Fan1ThermoFaultSx
Log text	BladeC Fan1 is overloaded	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	10 second	Category Manufacturer

Criteria:

Supervision reported when Fan1 is overloaded. [****IO.DeIcingBladeCFan1Overloaded**** = High].

No: 4164	SupervisionID 4164	Name HeatersOutputTempAllowedDifferenceFaultSx
Log text	BladeC Heat/Out temp dif. err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm indicates that the difference between the heater temperature and outlet temperature is too large, probably indicating temperature sensor failures.

Supervision is reported if the absolute difference of ****IO.DeIcingBladeCHeatersTemp1**** / ****IO.DeIcingBladeCHeatersTemp2**** [highest of two heater sensor temperatures] and **IO.DeIcingBladeCOutputTemp** is greater than the limit given by the parameter **Prm_HeatersOutputTempAllowedDifference** for more than the time interval given by the parameter **Prm_HeatersOutputTempStableTime**.

No: 4167	SupervisionID 4167	Name HeatersTemperatureHighSx
Log text	BladeC Heaters has high temp	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	75 second	Category Manufacturer

Criteria:
This alarm indicates a high heater temperature condition, heating is stopped and cooling started.

Supervision is reported if the heater temperature [highest among **IO.DeIcingBladeCHeatersTemp1** and **IO.DeIcingBladeCHeatersTemp2**] is greater than Prm_HeatersTooHighTempLimit for a stable time Prm_HeatersHighTempStableTime.

No: 4168	SupervisionID 4168	Name HeatersTemperatureTooHighSx
Log text	BladeC Heaters too high temp	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:
This alarm indicates very high heater temperature condition, heating is stopped and cooling started..

Report the supervision when the highest value of the two heater sensors temperatures **IO.DeIcingBladeCHeatersTemp1** and **IO.DeIcingBladeCHeatersTemp2** is greater than Prm_HeatersTooHighTempLimit for a stable time Prm_HeatersHighTempStableTime

No: 4169	SupervisionID 4169	Name Heater1PositiveFeedbackErrorSx
Log text	BladeC Heater1 pos feedbck err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	30 second	Category Manufacturer

Criteria:
Supervision is reported if the control output to the heater1 contactor is Off and the feedback from the heater1 contactor is On for Blade C

No: 4170	SupervisionID 4170	Name Heater1NegativeFeedbackErrorSx
Log text	BladeC Heater1 neg feedbck err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	75 second	Category Manufacturer

Criteria:

Supervision is reported if the control output to the heater1 contactor is On and the feedback from the heater1 contactor is Off for Blade C

No: 4172	SupervisionID 4172	Name Heater2NegativeFeedbackErrorSx
Log text	BladeC Heater2 neg feedbck err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	75 second	Category Manufacturer

Criteria:

Supervision is reported if the control output to the heater2 contactor is On and the feedback from the heater2 contactor is Off for Blade C

No: 4172	SupervisionID 4172	Name Heater2PositiveFeedbackErrorSx
Log text	BladeC Heater2 neg feedbck err	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	75 second	Category Manufacturer

Criteria:

Supervision is reported if the control output to the heater2 contactor is Off and the feedback from the heater2 contactor is On for Blade C

No: 4173	SupervisionID 4173	Name RootTempHighSx
Log text	BladeC Root temperature high	
Subsystem name	DeIcing	
Type	Warning	Timeout <disabled>
Acknowledgement	Auto	Shutdown type <n/a>
- Allowed attempts	3	- Max time disconnect <n/a>
- Time window	1 hour	- Max time eliminate <n/a>
- Stabilize period	60 second	Category Manufacturer

Criteria:

This alarm indicates that the root temperature is hotter than allowed limit, probably indicating an hot air leak from the duct to blade root.

Supervision is reported if ****IO.DeIcingBladeCRootTemp**** is greater than **Prm_RootTempHighLimit** for a stable time **Prm_RootTempHighStableTime**.

- ```
1. **SafetyPitchVelocityNotOkProd_ActivityLevel** = 2
2. **SafetyPitchVelocityTestedOk** = false
3. **ProdCtrl.SP\ RotorSpdEst** > SafetyPitchVelocityOkProd MaxRotorSpd
```

|                        |                               |                                         |
|------------------------|-------------------------------|-----------------------------------------|
| <b>No: 4184</b>        | <b>SupervisionID 4184</b>     | <b>Name</b> PistonSpeedAOutsideLimitsSx |
| <b>Log text</b>        | A Ctrl:__. _V P.Vel:__. _mm/s |                                         |
| <b>Subsystem name</b>  | PiSV                          |                                         |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> StopSlow           |
| - Allowed attempts     | 3                             | - Max time disconnect 3 second          |
| - Time window          | 1 hour                        | - Max time eliminate 9 second           |
| - Stabilize period     | 1 minute                      | <b>Category</b> Manufacturer            |

**Criteria:**

This supervision monitors the piston A speed during normal operation compared to the expected piston speed based on proportional valve A input.

This alarm is activated if the following conditions are met for more than **\*\*PiSV\\_PistonSpdErr\\_ErrorTime\*\*** seconds,

- 1. **PistonSpdErr\_ActivityLevel** = 2
- 2. **\*\*SafetyPitchActive\*\*** is false
- 3. **\*\*PitchBladeAAngle\*\*** < **\*\*PiSV\\_PistonSpdErr\\_UpperPitchLimit\*\***
- 4. **\*\*PitchBladeAAngle\*\*** > **\*\*PiSV\\_PistonSpdErr\\_LowerPitchLimit\*\***
- 5. When the measured piston speed, **\*\*PiSP\\_PistonASpd\*\***, is outside the min/max limits

The min/max piston speed limits are calculated as,

```
MaxPistonSpd = abs(PistonSpdEst)*(1 + **PiSV_PistonSpdErr_ErrorGain**) +
PiSV_PistonSpdErr_ErrorOffset;
```

```
MinPistonSpd = abs(PistonSpdEst)*(1 - **PiSV_PistonSpdErr_ErrorGain**) -
PiSV_PistonSpdErr_ErrorOffset;
```

where "PistonSpdEst" is the expected piston speed found by a interpolation of the 20 parameters,

```
Px_PiSV_PistonSpdErr_ValveRefToPistonSpdX01-10
Px_PiSV_PistonSpdErrA_ValveRefToPistonSpdY01-10
```

|                        |                               |                                         |
|------------------------|-------------------------------|-----------------------------------------|
| <b>No: 4185</b>        | <b>SupervisionID 4185</b>     | <b>Name</b> PistonSpeedBOutsideLimitsSx |
| <b>Log text</b>        | B Ctrl:__. _V P.Vel:__. _mm/s |                                         |
| <b>Subsystem name</b>  | PiSV                          |                                         |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> StopSlow           |
| - Allowed attempts     | 3                             | - Max time disconnect 3 second          |
| - Time window          | 1 hour                        | - Max time eliminate 9 second           |
| - Stabilize period     | 1 minute                      | <b>Category</b> Manufacturer            |

**Criteria:**

This supervision monitors the piston B speed during normal operation compared to the expected piston speed based on proportional valve B input.

This alarm is activated if the following conditions are met for more than **\*\*PiSV\\_PistonSpdErr\\_ErrorTime\*\*** seconds,

- 1. **PistonSpdErr\_ActivityLevel** = 2
- 2. **\*\*SafetyPitchActive\*\*** is false
- 3. **\*\*PitchBladeBAngle\*\*** < **\*\*PiSV\\_PistonSpdErr\\_UpperPitchLimit\*\***
- 4. **\*\*PitchBladeBAngle\*\*** > **\*\*PiSV\\_PistonSpdErr\\_LowerPitchLimit\*\***
- 5. When the measured piston speed, **\*\*PiSP\\_PistonBSpd\*\***, is outside the min/max limits

The min/max piston speed limits are calculated as,

$$\begin{aligned} \text{MaxPistonSpd} &= \text{abs}(\text{PistonSpdEst}) * (1 + \text{**PiSV\_PistonSpdErr\_ErrorGain**}) + \\ &\text{**PiSV\_PistonSpdErr\_ErrorOffset**}; \\ \text{MinPistonSpd} &= \text{abs}(\text{PistonSpdEst}) * (1 - \text{**PiSV\_PistonSpdErr\_ErrorGain**}) - \\ &\text{**PiSV\_PistonSpdErr\_ErrorOffset**}; \end{aligned}$$

where "PistonSpdEst" is the expected piston speed found by a interpolation of the 20 parameters,

$$\begin{aligned} \text{Px\_PiSV\_PistonSpdErr\_ValveRefToPistonSpdX01-10} \\ \text{Px\_PiSV\_PistonSpdErrB\_ValveRefToPistonSpdY01-10} \end{aligned}$$

|                        |                               |                                          |
|------------------------|-------------------------------|------------------------------------------|
| <b>No:</b> 4186        | <b>SupervisionID</b> 4186     | <b>Name</b> PistonSpeedCOoutsideLimitsSx |
| <b>Log text</b>        | C Ctrl:__. _V P.Vel:__. _mm/s |                                          |
| <b>Subsystem name</b>  | PiSV                          |                                          |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                     |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> StopSlow            |
| - Allowed attempts     | 3                             | - Max time disconnect 3 second           |
| - Time window          | 1 hour                        | - Max time eliminate 9 second            |
| - Stabilize period     | 1 minute                      | <b>Category</b> Manufacturer             |

**Criteria:**

This supervision monitors the piston C speed during normal operation compared to the expected piston speed based on proportional valve C input.

This alarm is activated if the following conditions are met for more than **\*\*PiSV\\_PistonSpdErr\\_ErrorTime\*\*** seconds,

- 1. PistonSpdErr\_ActivityLevel = 2
- 2. **\*\*SafetyPitchActive\*\*** is false
- 3. **\*\*PitchBladeCAngle\*\*** < **\*\*PiSV\\_PistonSpdErr\\_UpperPitchLimit\*\***
- 4. **\*\*PitchBladeCAngle\*\*** > **\*\*PiSV\\_PistonSpdErr\\_LowerPitchLimit\*\***
- 5. When the measured piston speed, **\*\*PiSP\\_PistonCSpd\*\***, is outside the min/max limits

The min/max piston speed limits are calculated as,

$$\begin{aligned} \text{MaxPistonSpd} &= \text{abs}(\text{PistonSpdEst}) * (1 + \textbf{**PiSV\_PistonSpdErr\_ErrorGain**}) + \\ &\textbf{**PiSV\_PistonSpdErr\_ErrorOffset**}; \\ \text{MinPistonSpd} &= \text{abs}(\text{PistonSpdEst}) * (1 - \textbf{**PiSV\_PistonSpdErr\_ErrorGain**}) - \\ &\textbf{**PiSV\_PistonSpdErr\_ErrorOffset**}; \end{aligned}$$

where "PistonSpdEst" is the expected piston speed found by a interpolation of the 20 parameters,

$$\begin{aligned} \text{Px\_PiSV\_PistonSpdErr\_ValveRefToPistonSpdX01-10} \\ \text{Px\_PiSV\_PistonSpdErrC\_ValveRefToPistonSpdY01-10} \end{aligned}$$

|                        |                               |                                      |
|------------------------|-------------------------------|--------------------------------------|
| <b>No:</b> 4191        | <b>SupervisionID</b> 4191     | <b>Name</b> UnexpectedAirflowErrorSx |
| <b>Log text</b>        | BladeA Unexpected airflow err |                                      |
| <b>Subsystem name</b>  | DeIcing                       |                                      |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>            |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>           |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>          |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>           |
| - Stabilize period     | 60 second                     | <b>Category</b> Manufacturer         |

**Criteria:**

This alarm indicates an unexpected air flow condition even though the fans are not running , probably indicating pressure feedback sensor failure.

Supervision is reported if the airflow is deactivated and the feedback from the differential pressure sensor (**\*\*IO.DeIcingBladeADifferentialPressureInTubeOk\*\***)is On.

|                        |                               |                                      |
|------------------------|-------------------------------|--------------------------------------|
| <b>No: 4192</b>        | <b>SupervisionID</b> 4192     | <b>Name</b> UnexpectedAirflowErrorSx |
| <b>Log text</b>        | BladeB Unexpected airflow err |                                      |
| <b>Subsystem name</b>  | DeIcing                       |                                      |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>            |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>           |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>          |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>           |
| - Stabilize period     | 60 second                     | <b>Category</b> Manufacturer         |

**Criteria:**

This alarm indicates an unexpected air flow condition even though the fans are not running , probably indicating pressure feedback sensor failure.

Supervision is reported if the airflow is deactivated and the feedback from the differential pressure sensor (\*\*IO.DeIcingBladeBDifferentialPressureInTubeOk\*\*)is On.

|                        |                               |                                      |
|------------------------|-------------------------------|--------------------------------------|
| <b>No: 4193</b>        | <b>SupervisionID</b> 4193     | <b>Name</b> UnexpectedAirflowErrorSx |
| <b>Log text</b>        | BladeC Unexpected airflow err |                                      |
| <b>Subsystem name</b>  | DeIcing                       |                                      |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>            |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>           |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>          |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>           |
| - Stabilize period     | 60 second                     | <b>Category</b> Manufacturer         |

**Criteria:**

This alarm indicates an unexpected air flow condition even though the fans are not running , probably indicating pressure feedback sensor failure.

Supervision is reported if the airflow is deactivated and the feedback from the differential pressure sensor (\*\*IO.DeIcingBladeCDifferentialPressureInTubeOk\*\*)is On.

|                        |                              |                                   |
|------------------------|------------------------------|-----------------------------------|
| <b>No: 4194</b>        | <b>SupervisionID</b> 4194    | <b>Name</b> MissingAirflowErrorSx |
| <b>Log text</b>        | BladeA Missing airflow error |                                   |
| <b>Subsystem name</b>  | DeIcing                      |                                   |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>         |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>        |
| - Allowed attempts     | 3                            | - Max time disconnect <n/a>       |
| - Time window          | 1 hour                       | - Max time eliminate <n/a>        |
| - Stabilize period     | 10 second                    | <b>Category</b> Manufacturer      |

**Criteria:**

This alarm indicates a no air flow condition after the fans are started, probably indicating any fan failures or pressure feedback sensor failure

Supervision is reported if the airflow is activated and the feedback from the differential pressure sensor is Off

|                        |                              |                                   |
|------------------------|------------------------------|-----------------------------------|
| <b>No: 4195</b>        | <b>SupervisionID</b> 4195    | <b>Name</b> MissingAirflowErrorSx |
| <b>Log text</b>        | BladeB Missing airflow error |                                   |
| <b>Subsystem name</b>  | DeIcing                      |                                   |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>         |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>        |
| - Allowed attempts     | 3                            | - Max time disconnect <n/a>       |
| - Time window          | 1 hour                       | - Max time eliminate <n/a>        |
| - Stabilize period     | 10 second                    | <b>Category</b> Manufacturer      |

**Criteria:**

This alarm indicates a no air flow condition after the fans are started, probably indicating any fan failures or pressure feedback sensor failure.

Supervision is reported if the airflow is activated and the feedback from the differential pressure sensor is Off.

|                        |                              |                                   |
|------------------------|------------------------------|-----------------------------------|
| <b>No: 4196</b>        | <b>SupervisionID</b> 4196    | <b>Name</b> MissingAirflowErrorSx |
| <b>Log text</b>        | BladeC Missing airflow error |                                   |
| <b>Subsystem name</b>  | DeIcing                      |                                   |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>         |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>        |
| - Allowed attempts     | 3                            | - Max time disconnect <n/a>       |
| - Time window          | 1 hour                       | - Max time eliminate <n/a>        |
| - Stabilize period     | 10 second                    | <b>Category</b> Manufacturer      |

**Criteria:**

This alarm indicates a no air flow condition after the fans are started, probably indicating any fan failures or pressure feedback sensor failure.

Supervision is reported if the airflow is activated and the feedback from the differential pressure sensor is Off.

|                        |                                |                                     |
|------------------------|--------------------------------|-------------------------------------|
| <b>No: 4197</b>        | <b>SupervisionID</b> 4197      | <b>Name</b> HeatersTemperatureLowSx |
| <b>Log text</b>        | BladeA Heaters low temperature |                                     |
| <b>Subsystem name</b>  | DeIcing                        |                                     |
| <b>Type</b>            | Warning                        | <b>Timeout</b> <disabled>           |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> <n/a>          |
| - Allowed attempts     | 3                              | - Max time disconnect <n/a>         |
| - Time window          | 1 hour                         | - Max time eliminate <n/a>          |
| - Stabilize period     | 10 second                      | <b>Category</b> Manufacturer        |

**Criteria:**

This alarm indicates low heater temperature, probably indicating a temperature sensor fault

Supervision is reported if the heater temperature [lowest among \*\*IO.DeIcingBladeAHeatersTemp1\*\* and \*\*IO.DeIcingBladeAHeatersTemp2\*\* ] is lesser than Prm\_HeatersLowTempLimit for a stable time Prm\_HeatersLowTempStableTime



|                        |                                |                                     |
|------------------------|--------------------------------|-------------------------------------|
| <b>No: 4198</b>        | <b>SupervisionID</b> 4198      | <b>Name</b> HeatersTemperatureLowSx |
| <b>Log text</b>        | BladeB Heaters low temperature |                                     |
| <b>Subsystem name</b>  | DeIcing                        |                                     |
| <b>Type</b>            | Warning                        | <b>Timeout</b> <disabled>           |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> <n/a>          |
| - Allowed attempts     | 3                              | - Max time disconnect <n/a>         |
| - Time window          | 1 hour                         | - Max time eliminate <n/a>          |
| - Stabilize period     | 10 second                      | <b>Category</b> Manufacturer        |

**Criteria:**  
This alarm indicates low heater temperature, probably indicating a temperature sensor fault

Supervision is reported if the heater temperature [lowest among  
\*\*IO.DeIcingBladeBHeatersTemp1\*\* and  
\*\*IO.DeIcingBladeBHeatersTemp2\*\* ] is lesser than Prm\_HeatersLowTempLimit for a stable  
time Prm\_HeatersLowTempStableTime

|                        |                                |                                     |
|------------------------|--------------------------------|-------------------------------------|
| <b>No: 4199</b>        | <b>SupervisionID</b> 4199      | <b>Name</b> HeatersTemperatureLowSx |
| <b>Log text</b>        | BladeC Heaters low temperature |                                     |
| <b>Subsystem name</b>  | DeIcing                        |                                     |
| <b>Type</b>            | Warning                        | <b>Timeout</b> <disabled>           |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> <n/a>          |
| - Allowed attempts     | 3                              | - Max time disconnect <n/a>         |
| - Time window          | 1 hour                         | - Max time eliminate <n/a>          |
| - Stabilize period     | 10 second                      | <b>Category</b> Manufacturer        |

**Criteria:**  
This alarm indicates low heater temperature, probably indicating a temperature sensor fault

Supervision is reported if the heater temperature [lowest among  
\*\*IO.DeIcingBladeCHeatersTemp1\*\* and  
\*\*IO.DeIcingBladeCHeatersTemp2\*\* ] is lesser than Prm\_HeatersLowTempLimit for a stable  
time Prm\_HeatersLowTempStableTime

|                        |                              |                                            |
|------------------------|------------------------------|--------------------------------------------|
| <b>No: 4225</b>        | <b>SupervisionID</b> 4225    | <b>Name</b> TowerAccXDirectionSignalDeadSx |
| <b>Log text</b>        | TowerAccX SignalDead __m/s^2 |                                            |
| <b>Subsystem name</b>  | TAF                          |                                            |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                       |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> PauseSlow             |
| - Allowed attempts     | 3                            | - Max time disconnect 9 second             |
| - Time window          | 1 hour                       | - Max time eliminate 10 second             |
| - Stabilize period     | 60 second                    | <b>Category</b> Manufacturer               |

**Criteria:**  
This supervision monitors the quality of the tower acceleration in X-direction. If this signal is dead the turbine will shutdown

|                        |                               |                                           |
|------------------------|-------------------------------|-------------------------------------------|
| <b>No: 4226</b>        | <b>SupervisionID</b> 4226     | <b>Name</b> TowerAccXDirectionZeroCrossSx |
| <b>Log text</b>        | TowerAccX NoZeroCross __m/s^2 |                                           |
| <b>Subsystem name</b>  | TAF                           |                                           |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                      |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> PauseSlow            |
| - Allowed attempts     | 3                             | - Max time disconnect 9 second            |
| - Time window          | 1 hour                        | - Max time eliminate 10 second            |
| - Stabilize period     | 60 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This supervises the quality of the tower acceleration signal in X-direction by monitoring if the signal performs zero crossings (oscillating around zero).

This supervision can be used since the tower of a turbine always is expected to be oscillating a little side to side, hereby giving acceleratings and de-accelerations in both directions.

An alarm is triggered if following conditions are met:

1. TowAccXZeroCross\_ActivityLevel = 2
2. **\*\*PowerReference\*\*** is greater than the product of TowAccXZeroCross\_EnablePowerRatio and TowAccXZeroCross\_Pnom
3. **\*\*IO.TowerAccelerationXDirection\*\*** does not change its sign ( no zero crossing) for a period defined by TowAccXZeroCross\_NoTowCyclesToTrig divided by **\*\*TowerNaturalFrequency\*\***
4. Maximum & minimum value of **\*\*IO.TowerAccelerationXDirection\*\*** is outside the band defined by (+,-) TowAccXZeroCross\_TrigMinAmpl

|                        |                               |                                 |
|------------------------|-------------------------------|---------------------------------|
| <b>No: 4231</b>        | <b>SupervisionID</b> 4231     | <b>Name</b> NRMSPauseModeSx     |
| <b>Log text</b>        | NoiseReductionPauseModeActive |                                 |
| <b>Subsystem name</b>  | ProductionManager             |                                 |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>            |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> PauseSlow  |
| - Allowed attempts     | Unlimited                     | - Max time disconnect 60 second |
| - Time window          | <n/a>                         | - Max time eliminate 60 second  |
| - Stabilize period     | 60 second                     | <b>Category</b> Environmental   |

**Criteria:**

Noise Reduction System has paused the turbine on request. The purpose is to reduce noise produced from tips of blade.

|                        |                           |                                           |
|------------------------|---------------------------|-------------------------------------------|
| <b>No: 4239</b>        | <b>SupervisionID</b> 4239 | <b>Name</b> SwitchgearUnknownTripReasonSx |
| <b>Log text</b>        | HVCB Unknown Trip Reason  |                                           |
| <b>Subsystem name</b>  | SwitchGear                |                                           |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                      |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> StopSlow             |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 3 second            |
| - Time window          | <n/a>                     | - Max time eliminate 9 second             |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer              |

**Criteria:**

This alarm is reported if the reason for disconnecting the High Voltage Circuit Breaker is unknown i.e. the signal

**\*\*IO.SwitchgearHVCBClosed\*\*** is false and the signal **\*\*SwitchgearTripHVCBRequest\*\*** is set to false

The alarm can be acknowledged if the **\*\*SwitchgearTripHVCBRequest\*\*** is true or **\*\*IO.SwitchgearHVCBClosed\*\*** is true.

|                           |                               |                                              |              |
|---------------------------|-------------------------------|----------------------------------------------|--------------|
| <b>No: 4240</b>           | <b>SupervisionID</b> 4240     | <b>Name</b> ManualPitchAllBladesInHighWindSx |              |
| <b>Log text</b>           | ManPitchAllBldHighWind__._m/s |                                              |              |
| <b>Subsystem name</b>     | PiSV                          |                                              |              |
| <b>Type</b>               | Alarm                         | <b>Timeout</b>                               | <n/a>        |
| <b>Acknowledgement</b>    | Auto                          | <b>Shutdown type</b>                         | PauseFast    |
| - <b>Allowed attempts</b> | 3                             | - <b>Max time disconnect</b>                 | 8 second     |
| - <b>Time window</b>      | 1 hour                        | - <b>Max time eliminate</b>                  | 1 hour       |
| - <b>Stabilize period</b> | 60 second                     | <b>Category</b>                              | Manufacturer |

#### Criteria:

This supervision monitors whether the user in idle or stopped is pitching with all 3 blades into the wind while the wind speed is high.

An alarm is reported if all of the following conditions are met:

1. ManualPitchAllBladesInHighWind\_ActivityLevelPx = 2
2. \*\*ProdCtrl.ProductionControllerMainState\*\* = eProdCtrlMainState\_Idle OR  
eProdCtrlMainState\_Stopped

AND that all conditions in one of the following two groups (A & B) are meet

#### A) Rotor Locked Condition

- 3A. \*\*ProdCtrl.SP\\_RotorSpdEst\*\* < ManualPitchAllBladesInHighWind\_RotorLockedRotSpdPx
- 4A. \*\*ProdCtrl.SP\\_WindSpdFiltLpFastAverage\*\* >  
ManualPitchAllBladesInHighWind\_RotorLockedMaxWindPx
- 5A. Max(\*\*PitchBladeAAngle\*\*, \*\*PitchBladeBAngle\*\*, \*\*PitchBladeCAngle\*\*) <  
ManualPitchAllBladesInHighWind\_RotorLockedMaxPitchPx

OR

#### B) Rotor Unlocked Condition

- 3B. SP\_WindSpdFiltLpFastAverage > ManualPitchAllBladesInHighWind\_MaxWindPx
- 4B. Max(\*\*PitchBladeAAngle\*\*, \*\*PitchBladeBAngle\*\*, \*\*PitchBladeCAngle\*\*) <  
ManualPitchAllBladesInHighWind\_MaxPitchPx

|                           |                             |                                           |              |
|---------------------------|-----------------------------|-------------------------------------------|--------------|
| <b>No: 4245</b>           | <b>SupervisionID</b> 4245   | <b>Name</b> ExtConverterStopArcDetectedSx |              |
| <b>Log text</b>           | ExtConverterStopArcDetected |                                           |              |
| <b>Subsystem name</b>     | CubePower                   |                                           |              |
| <b>Type</b>               | Alarm                       | <b>Timeout</b>                            | <n/a>        |
| <b>Acknowledgement</b>    | Auto                        | <b>Shutdown type</b>                      | StopFast     |
| - <b>Allowed attempts</b> | 3                           | - <b>Max time disconnect</b>              | 0.9 second   |
| - <b>Time window</b>      | 1 hour                      | - <b>Max time eliminate</b>               | 1 hour       |
| - <b>Stabilize period</b> | 60 second                   | <b>Category</b>                           | Manufacturer |

#### Criteria:

This alarm is raised when the HW External Converter Stop Signal due to converter Arc dection input is activated. This digital input signal is a HW signal to the converter controller board (CT440)  
to stop switching PWM, open the breakers and stop the converter.

- Par1: Generator speed [RPM]
- Par2: Grid Converter Power (filtered) [W]

|                        |                           |                                      |
|------------------------|---------------------------|--------------------------------------|
| <b>No: 4271</b>        | <b>SupervisionID</b> 4271 | <b>Name</b> StatorPhaseSequenceErrSx |
| <b>Log text</b>        | StatorPhaseSequenceErr    |                                      |
| <b>Subsystem name</b>  | CubePower                 |                                      |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                 |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                         | - Max time disconnect 8 second       |
| - Time window          | 1 hour                    | - Max time eliminate 9 second        |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer         |

**Criteria:**

Prior to connecting and power production the converter measures the generator stator voltages US12 (stator voltage between phase 1 and phase 2) and US23 (stator voltage between phase 2 and 3) for the permanent magnet generator. If the phase sequence of phase 1, 2 and 3 is measured to be wrong, power production cannot be started.

Typically wiring is made wrong of the stator voltage measuring circuit (wires, TRU board), check and correct this first. Other problems could be the generator connections or problems with the VPC.

If the D- stator generator voltage (should be close to zero if the phase sequence is correct) is above StatPhaseSequenceLim = 20 volt for StatPhaseSequenceTime = 1 second during connecting the error will be reported.

Par1 : USD stator voltage [V]  
 Par2 : Parameter limit values [V]

|                        |                             |                                  |
|------------------------|-----------------------------|----------------------------------|
| <b>No: 4338</b>        | <b>SupervisionID</b> 4338   | <b>Name</b> ApplicationRebootSx  |
| <b>Log text</b>        | Watchdog Application Reboot |                                  |
| <b>Subsystem name</b>  | Watchdog                    |                                  |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>             |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> StopFast    |
| - Allowed attempts     | Unlimited                   | - Max time disconnect 0.9 second |
| - Time window          | <n/a>                       | - Max time eliminate 1 hour      |
| - Stabilize period     | 60 second                   | <b>Category</b> Manufacturer     |

**Criteria:**

The purpose of this alarm is to initiate an application requested reboot.

|                        |                           |                                    |
|------------------------|---------------------------|------------------------------------|
| <b>No: 4396</b>        | <b>SupervisionID</b> 4396 | <b>Name</b> DeIcingInProgressSx    |
| <b>Log text</b>        | DeIcing In Progress       |                                    |
| <b>Subsystem name</b>  | DeIcing                   |                                    |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>               |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> Run           |
| - Allowed attempts     | 5                         | - Max time disconnect 10000 second |
| - Time window          | 1 second                  | - Max time eliminate 10000 second  |
| - Stabilize period     | 1 second                  | <b>Category</b> Environmental      |

**Criteria:**

Supervision will be triggered when de-icing is in progress.

|                        |                           |                                |
|------------------------|---------------------------|--------------------------------|
| <b>No: 4397</b>        | <b>SupervisionID</b> 4397 | <b>Name</b> DeIcingCoolingSx   |
| <b>Log text</b>        | DeIcing Cooling           |                                |
| <b>Subsystem name</b>  | DeIcing                   |                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow  |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second |
| - Time window          | 1 hour                    | - Max time eliminate 9 second  |
| - Stabilize period     | 10 second                 | <b>Category</b> Environmental  |

**Criteria:**

This alarm is reported if a De-icing heating cycle is aborted before the normal heating period has expired.

The alarm must ensure cooling of the blades, since they are not allowed to rotate and be fully loaded before the cool down period has passed (cool down period is typical 30 minutes).

For turbines with Safety System-8000, this alarm will also be reported after reboot of Safety System, to ensure the turbine cannot start up while the blades are too warm. I.e. the Safety System will always enforce a cooling period after reboot, because the Safety System cannot determine if blades are too warm.

Remaining cooling period is shown by picture 11.152D as the main contactor 'Forced Open' time.

The alarm is auto acknowledged when cooling time has expired.

|                        |                               |                                |
|------------------------|-------------------------------|--------------------------------|
| <b>No: 4398</b>        | <b>SupervisionID</b> 4398     | <b>Name</b> DeIcingPostSx      |
| <b>Log text</b>        | DeIce Finished-Turbine paused |                                |
| <b>Subsystem name</b>  | DeIcing                       |                                |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Remote                        | <b>Shutdown type</b> PauseSlow |
| - Allowed attempts     | <n/a>                         | - Max time disconnect 9 second |
| - Time window          | <n/a>                         | - Max time eliminate 10 second |
| - Stabilize period     | <n/a>                         | <b>Category</b> Owner          |

**Criteria:**

Supervision is reported when DeIcing is finished and keep the turbine from production. It can be acknowledged once ready for production.

|                        |                           |                                     |
|------------------------|---------------------------|-------------------------------------|
| <b>No: 4407</b>        | <b>SupervisionID</b> 4407 | <b>Name</b> PitchCalibrationNotOKSx |
| <b>Log text</b>        | Pitch Calib Not Complete  |                                     |
| <b>Subsystem name</b>  | PiSV                      |                                     |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>          |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>         |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>          |
| - Stabilize period     | 1 minute                  | <b>Category</b> Manufacturer        |

**Criteria:**

This supervision monitors whether the pitch measurments have been calibrated

A warning is reported if the following conditions are met:

1. \*\*PitchCalibrationNotOK\\_ActivityLevel\*\* = 2
2. Pitch angle have not been calibrated

|                        |                           |                                         |
|------------------------|---------------------------|-----------------------------------------|
| <b>No: 4410</b>        | <b>SupervisionID</b> 4410 | <b>Name</b> PowerDeviationFromRefSlowSx |
| <b>Log text</b>        | PowerError ____._ kW      |                                         |
| <b>Subsystem name</b>  | SV                        |                                         |
| <b>Type</b>            | Warning                   | <b>Timeout</b> 30 day                   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow          |
| - Allowed attempts     | 3                         | - Max time disconnect 1 hour            |
| - Time window          | 1 hour                    | - Max time eliminate 1 hour             |
| - Stabilize period     | 1 minute                  | <b>Category</b> Manufacturer            |

**Criteria:**

This supervision monitors the deviation between **\*\*PowerReference\*\*** and **\*\*Converter.GridPower\*\*** during production. The difference between these signals is filtered using the time constant **\*\*PowDevSlow\\_PowErrorFiltTau\*\*** and compared to the tolerance **\*\*PowDevSlow\\_PowErrorLimitPct\*\*** \* **\*\*MaxPowerSetpoint\*\***.

This alarm is activated if the following conditions are met:

1. **\*\*PowDevSlow\\_ActivityLevel\*\*** = 2
2. **\*\*Converter.GridFaultRideThrough\*\*** = 0 (LVRT not active) for more than **\*\*PowDev\\_MinTimeSpanLVRT\*\*** seconds
3. **\*\*PoRS\\_FRBActive\*\*** = 0
4. **\*\*ProductionControllerMainState\*\*** = 6 (eProdCtrlMainState\_Production)
5. The absolute value of the filtered power deviation is greater than **\*\*PowDevSlow\\_PowErrorLimitPct\*\*** \* **\*\*MaxPowerSetpoint\*\***

|                        |                             |                                 |
|------------------------|-----------------------------|---------------------------------|
| <b>No: 4446</b>        | <b>SupervisionID</b> 4446   | <b>Name</b> BL_LockingTimeoutSx |
| <b>Log text</b>        | Blade Locking Timeout Error |                                 |
| <b>Subsystem name</b>  | BL                          |                                 |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>            |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> StopSlow   |
| - Allowed attempts     | Unlimited                   | - Max time disconnect 3 second  |
| - Time window          | <n/a>                       | - Max time eliminate 9 second   |
| - Stabilize period     | 1 minute                    | <b>Category</b> Manufacturer    |

**Criteria:**

The purpose of this supervision is to escape the blade locking procedure if it not finalised within an expected maximal period of time.

This alarm is activated if the the following conditions are met:

1. **\*\*BL\\_Locking\\_ActivityLevel\*\*** = 2
2. Blades are not locked within **\*\*BL\\_Locking\\_TimeLimit\*\*** seconds after request.

|                        |                               |                                           |
|------------------------|-------------------------------|-------------------------------------------|
| <b>No: 4453</b>        | <b>SupervisionID</b> 4453     | <b>Name</b> VTL_ConstLoadSignalDetectedSx |
| <b>Log text</b>        | VTL ConstLoad Signal Detected |                                           |
| <b>Subsystem name</b>  | ProdCtrl                      |                                           |
| <b>Type</b>            | Warning                       | <b>Timeout</b> 0,5 year                   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> StopSlow             |
| - Allowed attempts     | 3                             | - Max time disconnect 3 second            |
| - Time window          | 6 hour                        | - Max time eliminate 9 second             |
| - Stabilize period     | 15 minute                     | <b>Category</b> Manufacturer              |

**Criteria:**

This supervision monitors the load sensor signal for blade A/B/C and raise an error flag, if a dead signal is detected from any of the load sensors

This alarm is activated if the following conditions are met

1. **\*\*TL\\_VTL\\_ConstLoadSignal\\_Enable\*\*** = 1
2. **\*\*SP\\_RotorSpdEst\*\*** is greater than **\*\*TL\\_VTL\\_ConstLoadSignal\\_MinRotSpd\*\*** rpm
3. Current value of (**\*\*BladeLoadA\*\***, **\*\*BladeLoadB\*\*** or **\*\*BladeLoadC\*\***) is constant for **\*\*TL\\_VTL\\_ConstLoadSignal\\_Revolutions\*\*** rotor revolutions

|                        |                              |                                         |
|------------------------|------------------------------|-----------------------------------------|
| <b>No: 4454</b>        | <b>SupervisionID</b> 4454    | <b>Name</b> VTL_WindSensorStatusErrorSx |
| <b>Log text</b>        | VTL Wind Sensor Status Error |                                         |
| <b>Subsystem name</b>  | ProdCtrl                     |                                         |
| <b>Type</b>            | Warning                      | <b>Timeout</b> 0,5 year                 |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow           |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second          |
| - Time window          | 6 hour                       | - Max time eliminate 9 second           |
| - Stabilize period     | 15 minute                    | <b>Category</b> Manufacturer            |

**Criteria:**

This supervision monitors the status of the wind signal

An alarm is activated if the status of the wind speed goes invalid

|                        |                            |                                         |
|------------------------|----------------------------|-----------------------------------------|
| <b>No:</b> 4456        | <b>SupervisionID</b> 4456  | <b>Name</b> VTL_GainHystErrorDetectedSx |
| <b>Log text</b>        | VTL Gain Hyst Err Detected |                                         |
| <b>Subsystem name</b>  | ProdCtrl                   |                                         |
| <b>Type</b>            | Warning                    | <b>Timeout</b> 0,5 year                 |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopSlow           |
| - Allowed attempts     | 3                          | - Max time disconnect 3 second          |
| - Time window          | 6 hour                     | - Max time eliminate 9 second           |
| - Stabilize period     | 15 minute                  | <b>Category</b> Manufacturer            |

**Criteria:**  
This supervision monitors the quality of blade load signals by detecting if the blade load signals has very different standard deviations  
A warning is triggered if the following conditions are met:

1. **\*\*TL\\_VTL\\_GainHyst\\_Enable\*\*** = 1
  2. **\*\*SP\\_RotorSpdEst\*\*** is greater than **\*\*TL\\_VTL\\_GainHyst\\_MinRotSpd\*\***
  3. StdMinMaxRatio is continuously less than a wind speed dependent limit for **\*\*TL\\_VTL\\_GainHyst\\_PotentialFaultTimeout\*\*** seconds
- StdMinMaxRatio is calculated as the ratio of the minimum and maximum standard deviation of the three flapwise root moment signals (**\*\*BladeLoadA\*\***, **\*\*BladeLoadB\*\***, **\*\*BladeLoadC\*\***)  
highpass filtered with cutoff frequency **\*\*TL\\_VTL\\_GainHyst\\_LoadSignalHpFiltFreq\*\***.  
The standard deviation estimates are saturated to a minimum value of **\*\*TL\\_VTL\\_GainHyst\\_MinBladeLoadStd\*\***.
- The standard deviation is calculated for each flapwise root moment with a window length of **\*\*TL\\_VTL\\_GainHyst\\_LoadWindowTime\*\***.
- The limit for StdMinMaxRatio is calculated based on the average wind speed and interpolated using a curve having x-axis defined by points  
**[\*\*TL\\_VTL\\_GainHyst\\_WindPoint1\*\***, **\*\*TL\\_VTL\\_GainHyst\\_WindPoint2\*\***, **\*\*TL\\_VTL\\_GainHyst\\_WindPoint3\*\***]  
and y-axis defined by **[\*\*TL\\_VTL\\_GainHyst\\_StdRatioLimit1\*\***, **\*\*TL\\_VTL\\_GainHyst\\_StdRatioLimit2\*\***, **\*\*TL\\_VTL\\_GainHyst\\_StdRatioLimit3\*\***].
- The wind speed **\*\*WindMeasurement.WindSpeed\*\*** is averaged with a window length of **\*\*TL\\_VTL\\_GainHyst\\_WindWindowTime\*\***.
- The warning is cleared if:
- **\*\*SP\\_RotorSpdEst\*\*** drops below **TL\_VTL\_GainHyst\_MinRotSpdForLog** or
  - StdMinMaxRatio becomes greater than the current limit plus a hysteresis parameter **\*\*TL\\_VTL\\_GainHyst\\_StdRatioHyst\*\***.



|                           |                                |                                         |              |
|---------------------------|--------------------------------|-----------------------------------------|--------------|
| <b>No: 4457</b>           | <b>SupervisionID</b> 4457      | <b>Name</b> WindSpeedHighSlowTYCNotOkSx |              |
| <b>Log text</b>           | High wind TYCNotOk : __. _ m/s |                                         |              |
| <b>Subsystem name</b>     | SV                             |                                         |              |
| <b>Type</b>               | Alarm                          | <b>Timeout</b>                          | <n/a>        |
| <b>Acknowledgement</b>    | Auto                           | <b>Shutdown type</b>                    | PauseFast    |
| - <b>Allowed attempts</b> | Unlimited                      | - <b>Max time disconnect</b>            | 8 second     |
| - <b>Time window</b>      | <n/a>                          | - <b>Max time eliminate</b>             | 1 hour       |
| - <b>Stabilize period</b> | 1 minute                       | <b>Category</b>                         | Manufacturer |

#### Criteria:

The purpose of this supervision is to shutdown the turbine and avoid start-up when the wind speed is too high.

This must be done to avoid high loads on the turbine at high wind speeds. A climate dependent cutout wind speed can be defined and used instead of the standard setting.

An alarm is raised if the following conditions are met:

1. **\*\*WindSpdHighSlowTYCNotOk\\_ActivityLevel\*\*** = 2
2. **TYC\_StatusSignal** = 0
3. A filtered wind speed signal is above a certain wind speed limit for a certain time as defined below.

The wind speed limit and time are specified as follows:

a. The wind speed signal **\*\*WindMeasurement.WindSpeed\*\*** is filtered through a lowpass filter with time constant **\*\*WindSpdHigh\\_WindSpdFiltTauSlow\*\***.

b. The filtered wind speed signal is input to a square filter whose output defines the state of the supervision. The square filter has the following parameters:

```

* HighHyst = **WindSpdHigh_CutoutWindSpd** +
WindSpdHighSlowTYCNotOk_CutoutWindSpdOffset if
WindSpdHigh_ClimateDependentCutoutEnable = 0
 HighHyst = **WindSpdHigh_ClimateDependentCutoutWindSpd** +
WindSpdHighSlowTYCNotOk_CutoutWindSpdOffset if
WindSpdHigh_ClimateDependentCutoutEnable = 1
 * LowHyst = HighHyst - **WindSpdHighSlowTYCNotOk_Hyst**
 * HighHystTime = **WindSpdHighSlowTYCNotOk_HighHystTime**
 * LowHystTime = **WindSpdHighSlowTYCNotOk_LowHystTime**

```

The filtered wind speed **SV\_WindSpdHigh\_WindSpdSlowFilt** should be logged as:

Log text: "High wind speed: \_\_. \_ m/s"

|                           |                                 |                                       |
|---------------------------|---------------------------------|---------------------------------------|
| <b>No: 4458</b>           | <b>SupervisionID</b> 4458       | <b>Name</b> WindSpeedHighFastSx       |
| <b>Log text</b>           | High windspeed fast: __. __ m/s |                                       |
| <b>Subsystem name</b>     | SV                              |                                       |
| <b>Type</b>               | Alarm                           | <b>Timeout</b> <n/a>                  |
| <b>Acknowledgement</b>    | Auto                            | <b>Shutdown type</b> PauseFast        |
| - <b>Allowed attempts</b> | Unlimited                       | - <b>Max time disconnect</b> 8 second |
| - <b>Time window</b>      | <n/a>                           | - <b>Max time eliminate</b> 1 hour    |
| - <b>Stabilize period</b> | 1 minute                        | <b>Category</b> Environmental         |

**Criteria:**  
The purpose of this supervision is to shutdown the turbine and avoid start-up when the wind speed is too high.  
This must be done to avoid high loads on the turbine at high wind speeds. A climate dependent cutout wind speed can be defined and used instead of the standard setting.

An alarm is raised if the following conditions are met:

- 1. **\*\*WindSpdHighFast\\_ActivityLevel\*\*** = 2
- 2. A filtered wind speed signal is above a certain wind speed limit for a certain time as defined below.

The wind speed limit and time are specified as follows:

- a. The wind speed signal **\*\*WindMeasurement.WindSpeed\*\*** is filtered through a lowpass filter with time constant **\*\*WindSpdHigh\\_WindSpdFiltTauFast\*\***.
- b. The filtered wind speed signal is input to a square filter whose output defines the state of the supervision. The square filter has the following parameters:
  - \* **HighHyst** = **\*\*WindSpdHigh\\_CutoutWindSpd\*\*** + **\*\*WindSpdHighFast\\_CutoutWindSpdOffset\*\*** if **\*\*WindSpdHigh\\_ClimateDependentCutoutEnable\*\*** = 0
  - \* **HighHyst** = **\*\*WindSpdHigh\\_ClimateDependentCutoutWindSpd\*\*** + **\*\*WindSpdHighFast\\_CutoutWindSpdOffset\*\*** if **\*\*WindSpdHigh\\_ClimateDependentCutoutEnable\*\*** = 1
  - \* **LowHyst** = **HighHyst - \*\*WindSpdHighFast\\_Hyst\*\***
  - \* **HighHystTime** = **\*\*WindSpdHighFast\\_HighHystTime\*\***
  - \* **LowHystTime** = **\*\*WindSpdHighFast\\_LowHystTime\*\***

The filtered wind speed **\*\*SV\\_WindSpdHigh\\_WindSpdFiltFast\*\*** should be logged as:  
Log text: "High wind speed: \_\_. \_\_ m/s"

|                        |                               |                                           |
|------------------------|-------------------------------|-------------------------------------------|
| <b>No: 4495</b>        | <b>SupervisionID</b> 4495     | <b>Name</b> SafetyCircuitUnexpectedOpenSx |
| <b>Log text</b>        | SafetyCircuit Unexpected Open |                                           |
| <b>Subsystem name</b>  | PSC                           |                                           |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                      |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> Emergency            |
| - Allowed attempts     | 3                             | - Max time disconnect 0 second            |
| - Time window          | 1 hour                        | - Max time eliminate 0 second             |
| - Stabilize period     | 2 minute                      | <b>Category</b> Manufacturer              |

**Criteria:**

This supervision monitors if the safety circuit is opened without reporting a corresponding error (EMC alarm).  
In this case the rest of the software see the opening of the safety circuit as unexpected since no alarm is reported.

The alarm is reported if following conditions are met for more than  
\*\*PSC\\_SafetyCircuitUnexpectedOpen\\_MinTimeSpan\*\* seconds.

1. \*\*PSC\\_SafetyCircuitUnexpectedOpen\\_ActivityLevel\*\* = 2
2. \*\*IO.SafetyCircuitClosed\*\* == false
3. \*\*ProductionControllerMainState\*\* != eStopped (see signal description for value of eStopped)
4. \*\*PSC\\_ShutDownState\*\* != 0

|                        |                              |                                                |
|------------------------|------------------------------|------------------------------------------------|
| <b>No: 4496</b>        | <b>SupervisionID</b> 4496    | <b>Name</b> PFB_PBL_NumActDiff_ValveAHighActSx |
| <b>Log text</b>        | PitA: PBL max: ____ min:____ |                                                |
| <b>Subsystem name</b>  | PFB                          |                                                |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                      |
| <b>Acknowledgement</b> | Remote                       | <b>Shutdown type</b> <n/a>                     |
| - Allowed attempts     | <n/a>                        | - Max time disconnect <n/a>                    |
| - Time window          | <n/a>                        | - Max time eliminate <n/a>                     |
| - Stabilize period     | <n/a>                        | <b>Category</b> Manufacturer                   |

**Criteria:**

This supervision monitors the difference in the number of activations between Pitch BLocking valve A, \*\*PFB\\_PBL\\_ValveANumAct\*\*, and the minimum number of activations for any of the PBL valves A,B,C, \*\*PFB\\_PBL\\_ValveABCMinNumAct\*\*.

If this difference exceeds the limit, PFB\_PBL\_NumActDiff\_MaxNumPx, a warning is raised.

|                        |                              |                                                |
|------------------------|------------------------------|------------------------------------------------|
| <b>No: 4497</b>        | <b>SupervisionID</b> 4497    | <b>Name</b> PFB_PBL_NumActDiff_ValveBHighActSx |
| <b>Log text</b>        | PitB: PBL max: ____ min:____ |                                                |
| <b>Subsystem name</b>  | PFB                          |                                                |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                      |
| <b>Acknowledgement</b> | Remote                       | <b>Shutdown type</b> <n/a>                     |
| - Allowed attempts     | <n/a>                        | - Max time disconnect <n/a>                    |
| - Time window          | <n/a>                        | - Max time eliminate <n/a>                     |
| - Stabilize period     | <n/a>                        | <b>Category</b> Manufacturer                   |

**Criteria:**

This supervision monitors the difference in the number of activations between Pitch BLocking valve C, \*\*PFB\\_PBL\\_ValveBNumAct\*\*, and the minimum number of activations for any of the PBL valves A,B,C, \*\*PFB\\_PBL\\_ValveABCMinNumAct\*\*.

If this difference exceeds the limit, PFB\_PBL\_NumActDiff\_MaxNumPx, a warning is raised.

No: 4498

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 4498

PitC: PBL max: \_\_\_\_ min:\_\_\_\_

PFB

Warning

Remote

<n/a>

<n/a>

<n/a>

Name PFB\_PBL\_NumActDiff\_ValveCHighActSx

Timeout<disabled>

Shutdown type<n/a>

- Max time disconnect<n/a>

- Max time eliminate<n/a>

CategoryManufacturer

This supervision monitors the difference in the number of activations between Pitch BLocking valve C, **\*\*PFB\\_PBL\\_ValveCNumAct\*\***, and the minimum number of activations for any of the PBL valves A,B,C, **\*\*PFB\\_PBL\\_ValveABCMinNumAct\*\***.

If this difference exceeds the limit, PFB\_PBL\_NumActDiff\_MaxNumPx, a warning is raised.

No: 4499

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 376

Pitch B too low: \_\_. \_\_ ° < \_\_. \_\_ °

PiSV

Alarm

Remote

<n/a>

<n/a>

<n/a>

Name PitchPosBStopLowSx

Timeout<n/a>

Shutdown typeStopSlow

- Max time disconnect3 second

- Max time eliminate9 second

CategoryManufacturer

This supervision is used during Stop shutdowns to verify that the pitch angle reach a specified value within a specified time period.

The supervision is enabled if the following conditions are met:

- \*\*Stop\\_ActivityLevel\*\*** = 2
- \*\*SafetyPitchActive\*\*** is True

The alarm is activated if the following additional condition is met:  
**\*\*PitchBladeBAngle\*\*** is less than **\*\*Stop\\_PitchWhenStop\*\*** after waiting for **\*\*Stop\\_MaxPitchErrorTime\*\*** sec since being enabled

Log text: "Pitch too low: \_\_. \_\_ ° < \_\_. \_\_ °, i.e. pitch to low at pitch system B."

|                        |                                    |                                |              |
|------------------------|------------------------------------|--------------------------------|--------------|
| <b>No: 4500</b>        | <b>SupervisionID</b> 380           | <b>Name</b> PitchPosCStopLowSx |              |
| <b>Log text</b>        | Pitch C too low: __. __° < __. __° |                                |              |
| <b>Subsystem name</b>  | PiSV                               |                                |              |
| <b>Type</b>            | Alarm                              | <b>Timeout</b>                 | <n/a>        |
| <b>Acknowledgement</b> | Remote                             | <b>Shutdown type</b>           | StopSlow     |
| - Allowed attempts     | <n/a>                              | - Max time disconnect          | 3 second     |
| - Time window          | <n/a>                              | - Max time eliminate           | 9 second     |
| - Stabilize period     | <n/a>                              | <b>Category</b>                | Manufacturer |

#### Criteria:

This supervision is used during Stop shutdowns to verify that the pitch angle reach a specified value within a specified time period.

The supervision is enabled if the following conditions are met:

1. **\*\*Stop\\_ActivityLevel\*\*** = 2
2. **\*\*SafetyPitchActive\*\*** is True

The alarm is activated if the following additional condition is met:

**\*\*PitchBladeCAngle\*\*** is less than **\*\*Stop\\_PitchWhenStop\*\*** after waiting for **\*\*Stop\\_MaxPitchErrorTime\*\*** sec since being enabled

Log text: "Pitch too low: \_\_. \_\_° < \_\_. \_\_°, i.e. pitch to low at pitch system C."

|                        |                            |                                                    |              |
|------------------------|----------------------------|----------------------------------------------------|--------------|
| <b>No: 4516</b>        | <b>SupervisionID</b> 4516  | <b>Name</b> SafetySystemHubBladeAHydrPressTooLowSx |              |
| <b>Log text</b>        | HubSafty HydrPres Low BldA |                                                    |              |
| <b>Subsystem name</b>  | PitchBlock                 |                                                    |              |
| <b>Type</b>            | Alarm                      | <b>Timeout</b>                                     | <n/a>        |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b>                               | StopSlow     |
| - Allowed attempts     | 3                          | - Max time disconnect                              | 3 second     |
| - Time window          | 2 hour                     | - Max time eliminate                               | 9 second     |
| - Stabilize period     | 600 second                 | <b>Category</b>                                    | Manufacturer |

#### Criteria:

This supervision is raised when the hub safety system Hydraulic pressure in blade A is too low below production level.

|                        |                            |                                                    |              |
|------------------------|----------------------------|----------------------------------------------------|--------------|
| <b>No: 4517</b>        | <b>SupervisionID</b> 4517  | <b>Name</b> SafetySystemHubBladeBHydrPressTooLowSx |              |
| <b>Log text</b>        | HubSafty HydrPres Low BldB |                                                    |              |
| <b>Subsystem name</b>  | PitchBlock                 |                                                    |              |
| <b>Type</b>            | Alarm                      | <b>Timeout</b>                                     | <n/a>        |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b>                               | StopSlow     |
| - Allowed attempts     | 3                          | - Max time disconnect                              | 3 second     |
| - Time window          | 2 hour                     | - Max time eliminate                               | 9 second     |
| - Stabilize period     | 600 second                 | <b>Category</b>                                    | Manufacturer |

#### Criteria:

This supervision is raised when the hub safety system Hydraulic pressure in blade B is too low below production level.

|                        |                            |                                                    |
|------------------------|----------------------------|----------------------------------------------------|
| <b>No: 4518</b>        | <b>SupervisionID</b> 4518  | <b>Name</b> SafetySystemHubBladeCHydrPressTooLowSx |
| <b>Log text</b>        | HubSafty HydrPres Low BldC |                                                    |
| <b>Subsystem name</b>  | PitchBlock                 |                                                    |
| <b>Type</b>            | Alarm                      | <b>Timeout</b> <n/a>                               |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopSlow                      |
| - Allowed attempts     | 3                          | - Max time disconnect 3 second                     |
| - Time window          | 2 hour                     | - Max time eliminate 9 second                      |
| - Stabilize period     | 600 second                 | <b>Category</b> Manufacturer                       |

**Criteria:**

This supervision is raised when the hub safety system Hydraulic pressure in blade C is too low below production level.

|                        |                            |                                                       |
|------------------------|----------------------------|-------------------------------------------------------|
| <b>No: 4519</b>        | <b>SupervisionID</b> 4519  | <b>Name</b> SafetySystemHubDistBlockHydrPressTooLowSx |
| <b>Log text</b>        | HubSafty HydrPres Low DBlk |                                                       |
| <b>Subsystem name</b>  | PitchBlock                 |                                                       |
| <b>Type</b>            | Alarm                      | <b>Timeout</b> <n/a>                                  |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopSlow                         |
| - Allowed attempts     | 3                          | - Max time disconnect 3 second                        |
| - Time window          | 2 hour                     | - Max time eliminate 9 second                         |
| - Stabilize period     | 600 second                 | <b>Category</b> Manufacturer                          |

**Criteria:**

This supervision is raised when the hub safety system Hydraulic pressure in distribution block is too low below production level.

|                        |                           |                                                   |
|------------------------|---------------------------|---------------------------------------------------|
| <b>No: 4527</b>        | <b>SupervisionID</b> 4527 | <b>Name</b> OverspeedGuardRotorSpeedExtremeHighSx |
| <b>Log text</b>        | Rotor Speed Extreme High  |                                                   |
| <b>Subsystem name</b>  | OverspeedGuard            |                                                   |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                              |
| <b>Acknowledgement</b> | Local                     | <b>Shutdown type</b> StopSlow                     |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 3 second                    |
| - Time window          | <n/a>                     | - Max time eliminate 9 second                     |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer                      |

**Criteria:**

This alarm indicates that the rotor speed has exceeded the maximum allowable limit (\*\*RotorSpeedExtremeHigh\*\*) during a VOG shutdown. This is an unexpected event, which could potentially endanger the structural integrity of the turbine. It is not permitted to start up the turbine before an inspection of the gearbox and generator has been performed. Please look into triggered time-traces to validate how high the rotor speed has in fact been during the event. In rare cases, a false alarm could be caused by a malfunction in the speed sensor or the control system, i.e. the actual speed have not reached the trigger limit. In this case, the root cause must be identified but an inspection of gearbox and generator might not be necessary.

The alarm is reported if the virtual signal \*\*IO.OverspeedGuardMaxShutdownRotorSpeed\*\* crossed the value of \*\*RotorSpeedExtremeHigh\*\*.

Note: The alarm requires local reset and must be acknowledged twice to make sure that other alarms does not overshadow this one.

|                        |                               |                                                |              |
|------------------------|-------------------------------|------------------------------------------------|--------------|
| <b>No: 4528</b>        | <b>SupervisionID</b> 4528     | <b>Name</b> OverspeedGuardExpectedActivationSx |              |
| <b>Log text</b>        | OverspeedGuardExptectedActive |                                                |              |
| <b>Subsystem name</b>  | OverspeedGuard                |                                                |              |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>                                 | <n/a>        |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                           | StopSlow     |
| - Allowed attempts     | 3                             | - Max time disconnect                          | 3 second     |
| - Time window          | 3 hour                        | - Max time eliminate                           | 9 second     |
| - Stabilize period     | 0 second                      | <b>Category</b>                                | Manufacturer |

**Criteria:**

This alarm indicates that the overspeed guard has triggered the safety system.  
The alarm is reported if the virtual signal from the safety system  
\*\*IO.OverspeedDetected\*\* and GeneratorHighSpeedDetected from ProdCtrl changes to true.  
The alarm can be acknowledged if the signal \*\*IO.OverspeedDetected\*\* changes to false.  
When the alarm is no longer reported a safety system reset is initiated.

|                        |                           |                                       |              |
|------------------------|---------------------------|---------------------------------------|--------------|
| <b>No: 4553</b>        | <b>SupervisionID</b> 4553 | <b>Name</b> ConverterDisconnectFailSx |              |
| <b>Log text</b>        | Conv Disconnect Failed    |                                       |              |
| <b>Subsystem name</b>  | PSC                       |                                       |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                        | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                  | PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect                 | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate                  | 1 hour       |
| - Stabilize period     | 60 second                 | <b>Category</b>                       | Manufacturer |

**Criteria:**

This supervision detect and secure the turbine from converter not responding to the charge command for a long time

This alarm is activated if the following conditions are met within  
\*\*PSC\\_ConvDisconnectFail\\_MinTimeSpan\*\* seconds

1. \*\*PSC\\_ConvDisconnectFail\\_ActivityLevel\*\* = 2
2. \*\*GeneratorCommand\*\* value is disconnect
3. \*\*Converter.ConverterMainState\*\* is not Charged or Off

No: 4558

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 4558

BladeAEdgePeakLoad: \_\_\_\_ kNm

PiSV

Alarm

Local

<n/a>

<n/a>

<n/a>

Name BladeAEdgePeakLoadSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

PauseFast

8 second

1 hour

Manufacturer

This supervision monitors the blade A Edge moment, BladeALoadRootEdge. An alarm is raised if a number of abnormal high blade moments have been detected.

The supervision is enabled if the following conditions are met:

1. PiSV\_ServiceDisable = 0 (Turbine is not in service)
2. \*\*EdgePeak\\_ActivityLevel\*\* = 2
3. BladeALoadRootEdge Status is valid

The alarm is activated if the value of BladeALoadRootEdge exceeds \*\*EdgePeak\\_PosLoadThreshold\*\* or \*\*EdgePeak\\_NegLoadThreshold\*\* for a time period larger than \*\*EdgePeak\\_TimeOut\*\*.

Log test: "Edgewise Peak Loads Blade A detected"

No: 4559

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 4559

BladeBEdgePeakLoad: \_\_\_\_ kNm

PiSV

Alarm

Local

<n/a>

<n/a>

<n/a>

Name BladeBEdgePeakLoadSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

PauseFast

8 second

1 hour

Manufacturer

This supervision monitors the blade B Edge moment, BladeBLoadRootEdge. An alarm is raised if a number of abnormal high blade moments have been detected.

The supervision is enabled if the following conditions are met:

1. PiSV\_ServiceDisable = 0 (Turbine is not in service)
2. \*\*EdgePeak\\_ActivityLevel\*\* = 2
3. BladeBLoadRootEdge Status is valid

The alarm is activated if the value of BladeBLoadRootEdge exceeds \*\*EdgePeak\\_PosLoadThreshold\*\* or \*\*EdgePeak\\_NegLoadThreshold\*\* for a time period larger than \*\*EdgePeak\\_TimeOut\*\*.

Log test: "Edgewise Peak Loads Blade B detected"



|                        |                              |                                  |
|------------------------|------------------------------|----------------------------------|
| <b>No: 4560</b>        | <b>SupervisionID</b> 4560    | <b>Name</b> BladeCEdgePeakLoadSx |
| <b>Log text</b>        | BladeCEdgePeakLoad: ____ kNm |                                  |
| <b>Subsystem name</b>  | PiSV                         |                                  |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>             |
| <b>Acknowledgement</b> | Local                        | <b>Shutdown type</b> PauseFast   |
| - Allowed attempts     | <n/a>                        | - Max time disconnect 8 second   |
| - Time window          | <n/a>                        | - Max time eliminate 1 hour      |
| - Stabilize period     | <n/a>                        | <b>Category</b> Manufacturer     |

**Criteria:**

This supervision monitors the blade C Edge moment, BladeCLoadRootEdge. An alarm is raised if a number of abnormal high blade moments have been detected.

The supervision is enabled if the following conditions are met:

1. PiSV\_ServiceDisable = 0 (Turbine is not in service)
2. \*\*EdgePeak\\_ActivityLevel\*\* = 2
3. BladeCLoadRootEdge Status is valid

The alarm is activated if the value of BladeCLoadRootEdge exceeds \*\*EdgePeak\\_PosLoadThreshold\*\* or \*\*EdgePeak\\_NegLoadThreshold\*\* for a time period larger than \*\*EdgePeak\\_TimeOut\*\*.

Log test: "Edgewise Peak Loads Blade C detected"

|                        |                             |                                                |
|------------------------|-----------------------------|------------------------------------------------|
| <b>No: 4598</b>        | <b>SupervisionID</b> 4598   | <b>Name</b> GenSideBreakerReadyToCloseFailedSx |
| <b>Log text</b>        | GenSideBreakrRdyToCloseFail |                                                |
| <b>Subsystem name</b>  | CubePower                   |                                                |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                           |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> StopSlow                  |
| - Allowed attempts     | 3                           | - Max time disconnect 3 second                 |
| - Time window          | 1 hour                      | - Max time eliminate 9 second                  |
| - Stabilize period     | 60 second                   | <b>Category</b> Manufacturer                   |

**Criteria:**

This alarm is raised if the expected Generator Side Breaker spring wind up response is not received within the given time or that the UnderVoltageCoil (UVR) is not activated.

Par1: Breaker ID

|                        |                              |                                                 |
|------------------------|------------------------------|-------------------------------------------------|
| <b>No: 4599</b>        | <b>SupervisionID</b> 4599    | <b>Name</b> LineSideBreakerReadyToCloseFailedSx |
| <b>Log text</b>        | LineSideBreakrRdyToCloseFail |                                                 |
| <b>Subsystem name</b>  | CubePower                    |                                                 |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                            |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow                   |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second                  |
| - Time window          | 1 hour                       | - Max time eliminate 9 second                   |
| - Stabilize period     | 60 second                    | <b>Category</b> Manufacturer                    |

**Criteria:**

This alarm is raised if the expected Line Side Breaker spring wind up response is not received within the given time (\*\*LSBSpringWindUpTimeout\*\*) or that the UnderVoltageCoil (UVR) is not activated.

Par1: Breaker ID

The breakers are not allowed to wind up until the DC link is charged. When the DC link is charged the converter signals a wind up to breakers and waits for a ready to close signal from the breakers.

|                        |                                 |                                              |
|------------------------|---------------------------------|----------------------------------------------|
| <b>No: 4601</b>        | <b>SupervisionID</b> 4601       | <b>Name</b> UDCTooLowToCloseGenSideBreakerSx |
| <b>Log text</b>        | UDC _____ LowToClose GenBreaker |                                              |
| <b>Subsystem name</b>  | CubePower                       |                                              |
| <b>Type</b>            | Alarm                           | <b>Timeout</b> <n/a>                         |
| <b>Acknowledgement</b> | Auto                            | <b>Shutdown type</b> StopFast                |
| - Allowed attempts     | 3                               | - Max time disconnect 0.9 second             |
| - Time window          | 1 hour                          | - Max time eliminate 1 hour                  |
| - Stabilize period     | 60 second                       | <b>Category</b> Manufacturer                 |

**Criteria:**

This alarm is raised if a generator side breaker does not close because the HW defence line has detected a low DC voltage.

The error may be caused by an undetected DC-fuse blow or a bad measurement of the DC voltage due to a loose connection in the wire-harness.

Arg: Breaker ID

|                        |                                |                                                       |
|------------------------|--------------------------------|-------------------------------------------------------|
| <b>No: 4604</b>        | <b>SupervisionID</b> 4604      | <b>Name</b> RemotePowerRefZeroReactivePowerPossibleSx |
| <b>Log text</b>        | Remote Pow=0,Reactive possible |                                                       |
| <b>Subsystem name</b>  | RoadrunnerAgent                |                                                       |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                                  |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> PauseSlow                        |
| - Allowed attempts     | 5                              | - Max time disconnect 9 second                        |
| - Time window          | 1 second                       | - Max time eliminate 10 second                        |
| - Stabilize period     | 1 second                       | <b>Category</b> Utility                               |

**Criteria:**

This alarm indicates that Power-Plant-Controller has commanded the turbine to idle by setting absolute active power reference = 0

This alarm appears if PPC sets an absolute active power reference of 0 kW

This alarm is acknowledged if the PPC change the power reference or PPC connection becomes inactive (No UDP telegrams received for parameter \*\*PowerPlantCtrlTimeout\*\*)

|                        |                           |                                        |
|------------------------|---------------------------|----------------------------------------|
| <b>No: 4636</b>        | <b>SupervisionID</b> 4636 | <b>Name</b> HighVoltageHarmonicLevelSx |
| <b>Log text</b>        | TempSwitch_GridFilter     |                                        |
| <b>Subsystem name</b>  | CubePower                 |                                        |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow          |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second         |
| - Time window          | 1 hour                    | - Max time eliminate 9 second          |
| - Stabilize period     | 60 second                 | <b>Category</b> Utility                |

**Criteria:**

High Voltage Harmonic Level. All three line voltages are evaluated towards a THD level (UL\_HarmonicHighLevel. default 10%) and if the level is exceeded the turbine is stoppped

Par1 : Phase [L1=1,L2=2,L3=3]

Par2 : Measured Harmonic level [%]

The alarm can typically be triggered if the grid voltage is very distorted or if the grid filters in the turbine and not working as intended.

|                        |                           |                                |
|------------------------|---------------------------|--------------------------------|
| <b>No: 4641</b>        | <b>SupervisionID</b> 4641 | <b>Name</b> LowRotorFluxSx     |
| <b>Log text</b>        | MSI Low Rotor Flux        |                                |
| <b>Subsystem name</b>  | CubePower                 |                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow  |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second |
| - Time window          | 1 hour                    | - Max time eliminate 9 second  |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer   |

**Criteria:**

This alarm is raised if the estimated generator rotor flux is detected too low.

Par1: Estimated Flux [Wb]

Par2: Power [W]

|                        |                           |                                     |
|------------------------|---------------------------|-------------------------------------|
| <b>No: 4667</b>        | <b>SupervisionID</b> 4667 | <b>Name</b> HighMSCPowerDeviationSx |
| <b>Log text</b>        | HighMSCPowerDeviation     |                                     |
| <b>Subsystem name</b>  | CubePower                 |                                     |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopFast       |
| - Allowed attempts     | 2                         | - Max time disconnect 0.9 second    |
| - Time window          | 24 hour                   | - Max time eliminate 1 hour         |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer        |

**Criteria:**

This supervision monitors if the MSC power deviates too much from its reference.

Par1 : RMS of MSC Power deviation

Alarm condition: If the MscPowerDeviation signal exceed the limit given by MSC\_POWER\_Deviation\_LIM the supervision is reported.

The alarm can be seen if the control of the MSC power is unstable.

This supervision monitors if the MSC power deviates too much from its reference.

Par1 : MSC power deviation passed through the lowpass filter

Par2 : MSC power deviation level(1,2)

Alarm condition: If the MscPowerDeviation signal exceeds the limit given by (\*\*HIGH\\_MSC\\_POWER\\_Deviation\*\*, \*\*HIGH\\_MSC\\_POWER\\_Deviation2\*\*) the supervision is reported.

The alarm can be seen if the control of the MSC power is unstable.

The MSC power deviation Level2 supervision can be disabled by

(EnableHighMSCPowerDeviation2Px=0).

|                        |                                   |                                      |
|------------------------|-----------------------------------|--------------------------------------|
| <b>No: 4725</b>        | <b>SupervisionID</b> 4725         | <b>Name</b> AutoTNFReachedMaxEntrySx |
| <b>Log text</b>        | AutoTNFReachedMaxRetry            |                                      |
| <b>Subsystem name</b>  | TowerNaturalFrequencyTestFunction |                                      |
| <b>Type</b>            | Warning                           | <b>Timeout</b> <disabled>            |
| <b>Acknowledgement</b> | Remote                            | <b>Shutdown type</b> <n/a>           |
| - Allowed attempts     | <n/a>                             | - Max time disconnect <n/a>          |
| - Time window          | <n/a>                             | - Max time eliminate <n/a>           |
| - Stabilize period     | <n/a>                             | <b>Category</b> Manufacturer         |

**Criteria:**

For maximum retry of automatic test

|                        |                              |                                                     |
|------------------------|------------------------------|-----------------------------------------------------|
| <b>No: 4730</b>        | <b>SupervisionID</b> 4730    | <b>Name</b> DeIcingIceDetectActivatedPostCycleRunSx |
| <b>Log text</b>        | IceDetectDeIcingPostCycleRun |                                                     |
| <b>Subsystem name</b>  | DeIcing                      |                                                     |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                                |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> Run                            |
| - Allowed attempts     | 5                            | - Max time disconnect 10000 second                  |
| - Time window          | 1 second                     | - Max time eliminate 10000 second                   |
| - Stabilize period     | 1 second                     | <b>Category</b> Environmental                       |

**Criteria:**

Supervision is reported when Turbine state is changed to Pause state and Deicing heating cycle is executed.

Supervision is initiated automatically by Scada Ice Detector function.

Supervision is acknowledged when Deicing heating cycle is finished or aborted.

After Deicing and supervision acknowledge, the turbine will return to Run state.

|                        |                             |                                                    |
|------------------------|-----------------------------|----------------------------------------------------|
| <b>No: 4731</b>        | <b>SupervisionID</b> 4731   | <b>Name</b> DeIcingOperatorActivatedPostCycleRunSx |
| <b>Log text</b>        | OperatorDeIcingPostCycleRun |                                                    |
| <b>Subsystem name</b>  | DeIcing                     |                                                    |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                               |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> Run                           |
| - Allowed attempts     | 5                           | - Max time disconnect 10000 second                 |
| - Time window          | 1 second                    | - Max time eliminate 10000 second                  |
| - Stabilize period     | 1 second                    | <b>Category</b> Owner                              |

**Criteria:**

Supervision is reported when Turbine state is changed to Pause state and Deicing heating cycle is executed.

Supervision is initiated by manual Scada Operator command.

Supervision is acknowledged when Deicing heating cycle is finished or aborted.

After Deicing and supervision acknowledge, the turbine will return to Run state.

|                        |                                |                                                       |
|------------------------|--------------------------------|-------------------------------------------------------|
| <b>No: 4732</b>        | <b>SupervisionID</b> 4732      | <b>Name</b> DeIcingIceDetectActivatedPostCyclePauseSx |
| <b>Log text</b>        | IceDetectDeIcingPostCyclePause |                                                       |
| <b>Subsystem name</b>  | DeIcing                        |                                                       |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                                  |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> Run                              |
| - Allowed attempts     | 5                              | - Max time disconnect 10000 second                    |
| - Time window          | 1 second                       | - Max time eliminate 10000 second                     |
| - Stabilize period     | 1 second                       | <b>Category</b> Environmental                         |

**Criteria:**

Supervision is reported when Turbine state is changed to Pause state and Deicing heating cycle is executed.

Supervision is initiated automatically by Scada Ice Detector function.

Supervision is acknowledged when Deicing heating cycle is finished or aborted.

After Deicing and supervision acknowledge, the turbine will remain in Pause state and wait for Operator interaction.

**No: 4733**                      **SupervisionID** 4733    **Name** DeIcingOperatorActivatedPostCyclePauseSx

**Log text**                      OperatorDeIcingPostCyclePause

**Subsystem name**              DeIcing

**Type**                          Alarm                              **Timeout**                              <n/a>

**Acknowledgement**              Auto                              **Shutdown type**                      Run

- **Allowed attempts**              5                                  - **Max time disconnect**              10000 second

- **Time window**                      1 second                          - **Max time eliminate**              10000 second

- **Stabilize period**              1 second                          **Category**                              Owner

**Criteria:**

Supervision is reported when Turbine state is changed to Pause state and Deicing heating cycle is executed.

Supervision is initiated by manual Scada Operator command.

Supervision is acknowledged when Deicing heating cycle is finished or aborted.

After Deicing and supervision acknowledge, the turbine will remain in Pause state and wait for Operator interaction.

**No: 4757**                      **SupervisionID** 4757                      **Name** AviationEquipmentErrorSx

**Log text**                          Aviation equipment error

**Subsystem name**              NavigationAid

**Type**                              Warning                              **Timeout**                              <disabled>

**Acknowledgement**              Auto                              **Shutdown type**                      <n/a>

- **Allowed attempts**              3                                  - **Max time disconnect**              <n/a>

- **Time window**                      1 hour                              - **Max time eliminate**              <n/a>

- **Stabilize period**              10 second                          **Category**                              Manufacturer

**Criteria:**

The warning indicates that the aviation light system is reporting error

The warning is raised when the signal **\*\*IO.AviationEquipmentOk\*\*** has been false for **\*\*AviationEquipmentOkStableTime\*\***.

The warning is auto acknowledged if the signal **\*\*IO.AviationEquipmentOk\*\*** changes to true.

**No: 4758**                      **SupervisionID** 4758                      **Name** MarineEquipmentErrorSx

**Log text**                          Marine equipment error

**Subsystem name**              NavigationAid

**Type**                              Warning                              **Timeout**                              <disabled>

**Acknowledgement**              Auto                              **Shutdown type**                      <n/a>

- **Allowed attempts**              3                                  - **Max time disconnect**              <n/a>

- **Time window**                      1 hour                              - **Max time eliminate**              <n/a>

- **Stabilize period**              10 second                          **Category**                              Manufacturer

**Criteria:**

The warning indicates that the marine equipment system is reporting error

The warning is raised when the signal **\*\*IO.MarineEquipmentOk\*\*** has been false for **\*\*MarineEquipmentOkStableTime\*\***.

The warning is auto acknowledged if the signal **\*\*IO.MarineEquipmentOk\*\*** changes to true.

The warning can only be raised when **\*\*MarineEquipmentInstalled\*\*** is true.

|                        |                               |                                        |            |
|------------------------|-------------------------------|----------------------------------------|------------|
| <b><u>No: 4761</u></b> | <b>SupervisionID</b> 4761     | <b>Name</b> ExternFastGridDisconnectSx |            |
| <b>Log text</b>        | ExternFastGridDisconnectAlarm |                                        |            |
| <b>Subsystem name</b>  | CubePower                     |                                        |            |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>                         | <n/a>      |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                   | StopFast   |
| - Allowed attempts     | 3                             | - Max time disconnect                  | 0.9 second |
| - Time window          | 1 hour                        | - Max time eliminate                   | 1 hour     |
| - Stabilize period     | 60 second                     | <b>Category</b>                        | Utility    |

**Criteria:**

Extern fast grid disconnect alarm is raised by request from Power Plant Controller.

This alarm is raised when an External fast grid disconnect event is requested by Power Production Controller.

|                        |                           |                           |              |
|------------------------|---------------------------|---------------------------|--------------|
| <b><u>No: 4762</u></b> | <b>SupervisionID</b> 4762 | <b>Name</b> OutOfMemorySx |              |
| <b>Log text</b>        | OutOfMemory               |                           |              |
| <b>Subsystem name</b>  | FrameworkHealthMonitoring |                           |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>            | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>      | PauseSlow    |
| - Allowed attempts     | 4                         | - Max time disconnect     | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate      | 10 second    |
| - Stabilize period     | 0 second                  | <b>Category</b>           | Manufacturer |

**Criteria:**

The memory usage is monitored for each node in order to detect if one or more nodes are running out of memory. If that happens this supervision is reported. This is done to handle uncontrolled turbine crashes, which result in an emergency shutdown. This shutdown procedure can cause high loads on the turbine and thus damage it unnecessarily. Monitoring the memory usage enables the turbine to shut down in a controlled manner, when the memory loft is reached, and provide the user with information of this event.

This alarm will be acknowledged automatically upon a triggered reboot of the turbine.

|                        |                           |                            |              |
|------------------------|---------------------------|----------------------------|--------------|
| <b><u>No: 4763</u></b> | <b>SupervisionID</b> 4763 | <b>Name</b> NtpSyncErrorSx |              |
| <b>Log text</b>        | NtpSyncError              |                            |              |
| <b>Subsystem name</b>  | FrameworkHealthMonitoring |                            |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>             | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>       | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect      | <n/a>        |
| - Time window          | 7 day                     | - Max time eliminate       | <n/a>        |
| - Stabilize period     | 10 second                 | <b>Category</b>            | Manufacturer |

**Criteria:**

When NTP (Network Time Protocol) is unable to synchronize time with the configured time server then this is reported.

This warning will be acknowledged automatically upon NTP is synchronized.

**No: 4770**                      **SupervisionID**                      **Name**  
4770                      Nacelle1ControllerProcessorBatteryCapacityLowSx  
**Log text**                      Nac1ControllerProcessorBattLow  
**Subsystem name**                      FrameworkHealthMonitoring  
**Type**                      Warning                      **Timeout**                      <disabled>  
**Acknowledgement**                      Auto                      **Shutdown type**                      <n/a>  
- Allowed                      3                      - Max time disconnect                      <n/a>  
**attempts**  
- Time window                      1 hour                      - Max time eliminate                      <n/a>  
- Stabilize                      10 second                      **Category**                      Manufacturer  
**period**  
**Criteria:**  
This alarm is raised if Nacelle1 Controller Processor Battery status is in error.

**No: 4771**                      **SupervisionID**                      **Name**  
4771                      Nacelle2ControllerProcessorBatteryCapacityLowSx  
**Log text**                      Nac2ControllerProcessorBattLow  
**Subsystem name**                      FrameworkHealthMonitoring  
**Type**                      Warning                      **Timeout**                      <disabled>  
**Acknowledgement**                      Auto                      **Shutdown type**                      <n/a>  
- Allowed                      3                      - Max time disconnect                      <n/a>  
**attempts**  
- Time window                      1 hour                      - Max time eliminate                      <n/a>  
- Stabilize                      10 second                      **Category**                      Manufacturer  
**period**  
**Criteria:**  
This alarm is raised if Nacelle2 Controller Processor Battery status is in error.

**No: 4772**                      **SupervisionID** 4772                      **Name** Hub1ControllerProcessorBatteryCapacityLowSx  
**Log text**                      Hub1ControllerProcessorBattLow  
**Subsystem name**                      FrameworkHealthMonitoring  
**Type**                      Warning                      **Timeout**                      <disabled>  
**Acknowledgement**                      Auto                      **Shutdown type**                      <n/a>  
- Allowed attempts                      3                      - Max time disconnect                      <n/a>  
- Time window                      1 hour                      - Max time eliminate                      <n/a>  
- Stabilize period                      10 second                      **Category**                      Manufacturer  
**Criteria:**  
This alarm is raised if Hub1 Controller Processor Battery status is in error.

**No: 4773**                      **SupervisionID** 4773                      **Name** Hub2ControllerProcessorBatteryCapacityLowSx  
**Log text**                      Hub2ControllerProcessorBattLow  
**Subsystem name**                      FrameworkHealthMonitoring  
**Type**                      Warning                      **Timeout**                      <disabled>  
**Acknowledgement**                      Auto                      **Shutdown type**                      <n/a>  
- Allowed attempts                      3                      - Max time disconnect                      <n/a>  
- Time window                      1 hour                      - Max time eliminate                      <n/a>  
- Stabilize period                      10 second                      **Category**                      Manufacturer  
**Criteria:**  
This alarm is raised if Hub2 Controller Processor Battery status is in error.

**No: 4774****SupervisionI****Name**

D 4774

ConverterMSINegativeControllerProcessorBatteryCapacityLowS  
x**Log text**

ConMSINegContrProcessorBattLow

**Subsystem name**

FrameworkHealthMonitoring

**Type**

Warning

**Timeout**

&lt;disabled&gt;

**Acknowledgement**

Auto

**Shutdown type**

&lt;n/a&gt;

**- Allowed attempts**

3

**- Max time disconnect**

&lt;n/a&gt;

**- Time window**

1 hour

**- Max time eliminate**

&lt;n/a&gt;

**- Stabilize period**

10 second

**Category**

Manufacturer

**Criteria:**

This alarm is raised if Converter MSI Negative Controller Processor Battery status is in error.

**No: 4775****SupervisionI****Name**

D 4775

ConverterMSIPositiveControllerProcessorBatteryCapacityLowS  
x**Log text**

ConMSIPosContrProcessorBattLow

**Subsystem name**

FrameworkHealthMonitoring

**Type**

Warning

**Timeout**

&lt;disabled&gt;

**Acknowledgement**

Auto

**Shutdown type**

&lt;n/a&gt;

**- Allowed attempts**

3

**- Max time disconnect**

&lt;n/a&gt;

**- Time window**

1 hour

**- Max time eliminate**

&lt;n/a&gt;

**- Stabilize period**

10 second

**Category**

Manufacturer

**Criteria:**

This alarm is raised if Converter MSI Positive Controller Processor Battery status is in error.

**No: 4776****SupervisionI****Name**

D 4776

ConverterLSINegativeControllerProcessorBatteryCapacityLowS  
x**Log text**

ConLSINegContrProcessorBattLow

**Subsystem name**

FrameworkHealthMonitoring

**Type**

Warning

**Timeout**

&lt;disabled&gt;

**Acknowledgement**

Auto

**Shutdown type**

&lt;n/a&gt;

**- Allowed attempts**

3

**- Max time disconnect**

&lt;n/a&gt;

**- Time window**

1 hour

**- Max time eliminate**

&lt;n/a&gt;

**- Stabilize period**

10 second

**Category**

Manufacturer

**Criteria:**

This alarm is raised if Converter LSI Negative Controller Processor Battery status is in error.



No: 4777

SupervisionID 4777

Name ConverterLSIPositiveControllerProcessorBatteryCapacityLowSx

Log text

ConLSIPosContrProcessorBattLow

Subsystem name

FrameworkHealthMonitoring

Type

Warning

Timeout

<disabled>

Acknowledgement

Auto

Shutdown type

<n/a>

- Allowed attempts

3

- Max time disconnect

<n/a>

- Time window

1 hour

- Max time eliminate

<n/a>

- Stabilize period

10 second

Category

Manufacturer

Criteria:

This alarm is raised if Converter LSI Positive Controller Processor Battery status is in error.

No: 4784

SupervisionID 4784

Name SmokeDetectorSystemErrorSx

Log text

Smoke Detector System Error

Subsystem name

SmokeDetector

Type

Warning

Timeout

48 hour

Acknowledgement

Auto

Shutdown type

PauseSlow

- Allowed attempts

5

- Max time disconnect

9 second

- Time window

1 hour

- Max time eliminate

10 second

- Stabilize period

10 second

Category

Manufacturer

Criteria:

This warning in reported when there is a system error on the smoke detection system.

This warning is raised if the smoke detection system is reporting a system error (ASDSystemErrorReportSupervision is true - OBS: Add signal).

This warning will be automatically acknowledged when the smoke detection system is no longer reporting a system error (ASDSystemErrorReportSupervision is false - OBS. Add signal).

|                        |                               |                                              |
|------------------------|-------------------------------|----------------------------------------------|
| <b>No: 4786</b>        | <b>SupervisionID</b> 4786     | <b>Name</b> SmokeDetectorInMaintenanceModeSx |
| <b>Log text</b>        | Smoke Detector In Maintenance |                                              |
| <b>Subsystem name</b>  | SmokeDetector                 |                                              |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                         |
| <b>Acknowledgement</b> | Remote                        | <b>Shutdown type</b> PauseSlow               |
| - Allowed attempts     | <n/a>                         | - Max time disconnect 9 second               |
| - Time window          | <n/a>                         | - Max time eliminate 10 second               |
| - Stabilize period     | <n/a>                         | <b>Category</b> Manufacturer                 |

**Criteria:**

This alarm indicates that the Smoke Detector System is in maintenance mode and does not allow power production.

When the turbine production is not allowed by Fire Protection System (\*\*IO.FireProtectionTurbineReleasedForOperation\*\* is false) and the Fire Protection System is in operating mode (\*\*IO.FireProtectionInOperatingMode\*\* is true) for Startup time, the turbine production is prevented. This alarm is raised when the turbine production is prevented and the Fire Protection System is in maintenance mode (\*\*IO.FireProtectionInMaintenanceMode\*\* is true).

This alarm can be acknowledged if the Fire Protection System is not in maintenance mode (\*\*IO.FireProtectionInMaintenanceMode\*\* is false) AND is released for Operation (\*\*IO.FireProtectionTurbineReleasedForOperation\*\* is true).

|                        |                             |                                               |
|------------------------|-----------------------------|-----------------------------------------------|
| <b>No: 4787</b>        | <b>SupervisionID</b> 4787   | <b>Name</b> SmokeDetectorCommissioningErrorSx |
| <b>Log text</b>        | SmokeDetectCommissioningErr |                                               |
| <b>Subsystem name</b>  | SmokeDetector               |                                               |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                          |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> PauseSlow                |
| - Allowed attempts     | Unlimited                   | - Max time disconnect 9 second                |
| - Time window          | <n/a>                       | - Max time eliminate 10 second                |
| - Stabilize period     | 0 second                    | <b>Category</b> Manufacturer                  |

**Criteria:**

This alarm indicates that the smoke detection system cannot detect all the sensors that is configured to be present.

The alarm is raised if the smoke detection system reports a commissioning error (ASDCommissioningErrorReportSupervision is true - OBS: Add signal).

The alarm is automatically acknowledged when the smoke detection system no longer reports a commissioning error (ASDCommissioningErrorReportSupervision is false - OBS: Add signal).

|                           |                             |                                               |
|---------------------------|-----------------------------|-----------------------------------------------|
| <b>No: 4787</b>           | <b>SupervisionID</b> 4787   | <b>Name</b> SmokeDetectorCommissioningErrorSx |
| <b>Log text</b>           | SmokeDetectCommissioningErr |                                               |
| <b>Subsystem name</b>     | SmokeDetector               |                                               |
| <b>Type</b>               | Alarm                       | <b>Timeout</b> <n/a>                          |
| <b>Acknowledgement</b>    | Auto                        | <b>Shutdown type</b> PauseSlow                |
| - <b>Allowed attempts</b> | Unlimited                   | - <b>Max time disconnect</b> 9 second         |
| - <b>Time window</b>      | <n/a>                       | - <b>Max time eliminate</b> 10 second         |
| - <b>Stabilize period</b> | 0 second                    | <b>Category</b> Manufacturer                  |

**Criteria:**

This alarm indicates that the Smoke Detection System commissioning took too long time.

When the turbine production is not allowed by Fire Protection System (\*\*IO.FireProtectionTurbineReleasedForOperation\*\* is false) and the Fire Protection System is in operating mode (\*\*IO.FireProtectionInOperatingMode\*\* is true) for Startup time, the turbine production is prevented. This alarm is raised when the turbine production is prevented and the Fire Protection System commissioning takes too long time (IO.FireProtectionCommissioned is false for Startup time).

This alarm can be acknowledged if the Fire Protection System is successfully commissioned (i.e., \*\*IO.FireProtectionCommissioned\*\* is true for the time \*\*StartupTime\*\*) and turbine is released for operation by Fire Protection System (\*\*IO.FireProtectionTurbineReleasedForOperation\*\* is true).

|                           |                               |                                                |
|---------------------------|-------------------------------|------------------------------------------------|
| <b>No: 4788</b>           | <b>SupervisionID</b> 4788     | <b>Name</b> SmokeDetectorLockedForInspectionSx |
| <b>Log text</b>           | SmokeDetectLockedForInspect _ |                                                |
| <b>Subsystem name</b>     | SmokeDetector                 |                                                |
| <b>Type</b>               | Alarm                         | <b>Timeout</b> <n/a>                           |
| <b>Acknowledgement</b>    | Remote                        | <b>Shutdown type</b> PauseSlow                 |
| - <b>Allowed attempts</b> | <n/a>                         | - <b>Max time disconnect</b> 9 second          |
| - <b>Time window</b>      | <n/a>                         | - <b>Max time eliminate</b> 10 second          |
| - <b>Stabilize period</b> | <n/a>                         | <b>Category</b> Manufacturer                   |

**Criteria:**

This alarm indicates whether the Smoke Detector System is locked for inspection. The inspection could be either for a maintenance inspection or a Fire inspection.

When the turbine production is not allowed by Fire Protection System (\*\*IO.FireProtectionTurbineReleasedForOperation\*\* is false) and the Fire Protection System is in operating mode (\*\*IO.FireProtectionInOperatingMode\*\* is true) for Startup time, the turbine production is prevented. This alarm is raised when the turbine production is prevented and the inspection of Smoke Detector System is ongoing (one of the signals \*\*IO.FireProtectionLockedForServiceInspection\*\* or \*\*IO.FireProtectionLockedForFireInspection\*\* is true).

This alarm can be acknowledged if the signals \*\*IO.FireProtectionLockedForServiceInspection\*\* and \*\*IO.FireProtectionLockedForFireInspection\*\* are both false and turbine is released for operation by Fire Protection System (\*\*IO.FireProtectionTurbineReleasedForOperation\*\* is true).

|                        |                           |                                                 |
|------------------------|---------------------------|-------------------------------------------------|
| <b>No: 4789</b>        | <b>SupervisionID</b> 4789 | <b>Name</b> SmokeDetectorProductionNotAllowedSx |
| <b>Log text</b>        | SmokeDetectProdNotAllowed |                                                 |
| <b>Subsystem name</b>  | SmokeDetector             |                                                 |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                            |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow                  |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second                  |
| - Time window          | 1 hour                    | - Max time eliminate 10 second                  |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                    |

**Criteria:**

This alarm indicates that the Smoke Detector System does not allow power production.

When the turbine production is not allowed by Fire Protection System (\*\*IO.FireProtectionTurbineReleasedForOperation\*\* is false) and the Fire Protection System is in operating mode (IO.FireProtectionInOperatingMode is true) for \*\*StartupTime\*\*, the turbine production is prevented.

When production is prevented, one of the possible reasons could be:

1. Fire Protection System is in maintenance (\*\*IO.FireProtectionInMaintenanceMode\*\* is true)
2. Fire Protection System is under commissioning (\*\*IO.FireProtectionCommissioned\*\* is false)
3. Fire Protection System is locked for inspection (\*\*IO.FireProtectionLockedForServiceInspection\*\* is true or \*\*IO.FireProtectionLockedForFireInspection\*\* is true).

If none of these reasons are present, but the Fire Protection System still does not allowed the turbine to start power production, the alarm is raised

This alarm can be acknowledged if the Smoke Detector System is released for Operation (\*\*IO.FireProtectionTurbineReleasedForOperation\*\* is true).

|                        |                               |                                             |
|------------------------|-------------------------------|---------------------------------------------|
| <b>No: 4791</b>        | <b>SupervisionID</b> 4791     | <b>Name</b> SmokeDetectorDiscoveryBusFailSx |
| <b>Log text</b>        | SmokeDetectorDiscoveryBusFail |                                             |
| <b>Subsystem name</b>  | SmokeDetector                 |                                             |
| <b>Type</b>            | Warning                       | <b>Timeout</b> 90 day                       |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> PauseSlow              |
| - Allowed attempts     | 3                             | - Max time disconnect 9 second              |
| - Time window          | 1 hour                        | - Max time eliminate 10 second              |
| - Stabilize period     | 10 second                     | <b>Category</b> Manufacturer                |

**Criteria:**

This warning indicates that the Smoke Detection System commissioning took too long time.

This warning is raised if the Smoke Detection System is in Operating mode (\*\*IO.FireProtectionInOperatingMode\*\* is true for \*\*StartupTime\*\*) AND the Discovery Bus has failed (\*\*IO.FireProtectionDiscoveryBusOk\*\* is false).

This warning is automatically acknowledged if the Fire Protection System Discovery Bus is OK (i.e., \*\*IO.FireProtectionDiscoveryBusOk\*\* is true).

|                        |                             |                                        |
|------------------------|-----------------------------|----------------------------------------|
| <b>No: 4792</b>        | <b>SupervisionID</b> 4792   | <b>Name</b> SmokeDetectorSensorErrorSx |
| <b>Log text</b>        | Smoke Detector Sensor Error |                                        |
| <b>Subsystem name</b>  | SmokeDetector               |                                        |
| <b>Type</b>            | Warning                     | <b>Timeout</b> 48 hour                 |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> PauseSlow         |
| - Allowed attempts     | 5                           | - Max time disconnect 9 second         |
| - Time window          | 1 hour                      | - Max time eliminate 10 second         |
| - Stabilize period     | 60 second                   | <b>Category</b> Manufacturer           |

**Criteria:**  
This warning indicates that the smoke detection system has detected a sensor error on one or more smoke sensors.

This warning is raised when the smoke detection system reports that it has detected a sensor error (ASDSensorErrorReportSupervision is true - OBS: Add signal).

This warning will be auto acknowledged if the smoke detection system determines all sensors to be ok (ASDSensorErrorReportSupervision is false - OBS: Add signal).

|                        |                              |                                         |
|------------------------|------------------------------|-----------------------------------------|
| <b>No: 4793</b>        | <b>SupervisionID</b> 4793    | <b>Name</b> SmokeDetectorSensorSoiledSx |
| <b>Log text</b>        | Smoke Detector Sensor Soiled |                                         |
| <b>Subsystem name</b>  | SmokeDetector                |                                         |
| <b>Type</b>            | Warning                      | <b>Timeout</b> 48 hour                  |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> PauseSlow          |
| - Allowed attempts     | 5                            | - Max time disconnect 9 second          |
| - Time window          | 12 hour                      | - Max time eliminate 10 second          |
| - Stabilize period     | 60 second                    | <b>Category</b> Manufacturer            |

**Criteria:**  
This warning indicates that the smoke detection system has detected that one or more of the smoke sensors are soiled.

This warning is raised when the smoke detection system reports that it has detected a soiled sensor (ASDSensorSoiledReportSupervision is true - OBS: Add signal).

This warning can be acknowledged if the smoke detection system determines all sensors to be ok (ASDSensorSoiledReportSupervision is false - OBS: Add signal).

|                        |                           |                                              |
|------------------------|---------------------------|----------------------------------------------|
| <b>No: 4794</b>        | <b>SupervisionID</b> 4794 | <b>Name</b> SmokeDetectorPollutionDetectedSx |
| <b>Log text</b>        | Smoke Detector Pollution  |                                              |
| <b>Subsystem name</b>  | SmokeDetector             |                                              |
| <b>Type</b>            | Warning                   | <b>Timeout</b> 90 day                        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow               |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second               |
| - Time window          | 1 hour                    | - Max time eliminate 10 second               |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                 |

**Criteria:**  
This warning supervises whether the Smoke Detector system has detected pollution (smoke without a temperature increase).

This warning is raised if pollution has been detected (\*\*IO.FireProtectionPollutionDetected\*\* is true) while the Smoke Detector system is in Operating mode (\*\*IO.FireProtectionInOperatingMode\*\* is true for the time \*\*StartupTime\*\*) and the Smoke Detection system is not in maintenance mode (\*\*IO.FireProtectionInMaintenanceMode\*\* is false).

This warning is automatically acknowledged if the signal \*\*IO.FireProtectionPollutionDetected\*\* turns false.

|                        |                           |                                           |
|------------------------|---------------------------|-------------------------------------------|
| <b>No: 4818</b>        | <b>SupervisionID</b> 4818 | <b>Name</b> BladeAPropValvesUnavailableSx |
| <b>Log text</b>        | Prop valves unavailable A |                                           |
| <b>Subsystem name</b>  | PiVM                      |                                           |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                      |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> StopSlow             |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 3 second            |
| - Time window          | <n/a>                     | - Max time eliminate 9 second             |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer              |

**Criteria:**  
This supervision monitors the operational condition of the proportional valves in blade A

This alarm is activated if the following conditions are met

1. PiVM\_PropValvesUnavailable\_ActivityLevelPx = 2
2. The warnings PropValveStatusErrorA1 or PropValvePosDevToRefA1 is triggered
3. The warnings PropValveStatusErrorA2 or PropValvePosDevToRefA2 is triggered

PropValveStatusError monitors the status of the valve position feedback signal.  
PropValvePosDevToRef highlights poor tracking performance of the valve glider position reference

|                        |                           |                                           |
|------------------------|---------------------------|-------------------------------------------|
| <b>No: 4819</b>        | <b>SupervisionID</b> 4819 | <b>Name</b> BladeBPropValvesUnavailableSx |
| <b>Log text</b>        | Prop valves unavailable B |                                           |
| <b>Subsystem name</b>  | PiVM                      |                                           |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                      |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> StopSlow             |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 3 second            |
| - Time window          | <n/a>                     | - Max time eliminate 9 second             |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer              |

**Criteria:**

This supervision monitors the operational condition of the proportional valves in blade A

This alarm is activated if the following conditions are met

1. PiVM\_PropValvesUnavailable\_ActivityLevelPx = 2
2. The warnings PropValveStatusErrorB1 or PropValvePosDevToRefB1 is triggered
3. The warnings PropValveStatusErrorB2 or PropValvePosDevToRefB2 is triggered

PropValveStatusError monitors the status of the valve position feedback signal.  
PropValvePosDevToRef highlights poor tracking performance of the valve glider position reference

|                        |                           |                                           |
|------------------------|---------------------------|-------------------------------------------|
| <b>No: 4820</b>        | <b>SupervisionID</b> 4820 | <b>Name</b> BladeCPropValvesUnavailableSx |
| <b>Log text</b>        | Prop valves unavailable C |                                           |
| <b>Subsystem name</b>  | PiVM                      |                                           |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                      |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> StopSlow             |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 3 second            |
| - Time window          | <n/a>                     | - Max time eliminate 9 second             |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer              |

**Criteria:**

This supervision monitors the operational condition of the proportional valves in blade A

This alarm is activated if the following conditions are met

1. PiVM\_PropValvesUnavailable\_ActivityLevelPx = 2
2. The warnings PropValveStatusErrorC1 or PropValvePosDevToRefC1 is triggered
3. The warnings PropValveStatusErrorC2 or PropValvePosDevToRefC2 is triggered

PropValveStatusError monitors the status of the valve position feedback signal.  
PropValvePosDevToRef highlights poor tracking performance of the valve glider position reference

|                        |                            |                                      |
|------------------------|----------------------------|--------------------------------------|
| <b>No: 4821</b>        | <b>SupervisionID</b> 4821  | <b>Name</b> PropValveStatusErrorA1Sx |
| <b>Log text</b>        | Prop Valve Status Error A1 |                                      |
| <b>Subsystem name</b>  | PiVM                       |                                      |
| <b>Type</b>            | Warning                    | <b>Timeout</b> 30 day                |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                          | - Max time disconnect 3 second       |
| - Time window          | 1 day                      | - Max time eliminate 9 second        |
| - Stabilize period     | 10 minute                  | <b>Category</b> Manufacturer         |

**Criteria:**

This supervision monitors the status of feedback from the proportional valve

This warning is activated if the following conditions are met for more than  
**\*\*PiVM\\_PropValveStatusErrorTime\*\*** seconds

1. **\*\*PiVM\\_PropValveStatusError\\_ActivityLevel\*\*** is True
2. SupervisionInServiceModeDisabled is False
3. The status of the feedback signal **\*\*IO.PitchProportionalValveASpoolPos\*\*** is not valid

The warning will turn off the valve for a period, and try to enable it again. If the attempt to restore the performance of the valve is unsuccessful the turbine will run with only one valve for a limited period. If the status signal of **IO.PitchProportionalValveAOutput** is valid, indicates that the proportional valve installed may not support the proportional valve control feature, the feature can be disabled by setting **\*\*PiVM\\_PropValveCtrl\\_Enable\*\***  
false

|                        |                            |                                      |
|------------------------|----------------------------|--------------------------------------|
| <b>No: 4822</b>        | <b>SupervisionID</b> 4822  | <b>Name</b> PropValveStatusErrorA2Sx |
| <b>Log text</b>        | Prop Valve Status Error A2 |                                      |
| <b>Subsystem name</b>  | PiVM                       |                                      |
| <b>Type</b>            | Warning                    | <b>Timeout</b> 30 day                |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                          | - Max time disconnect 3 second       |
| - Time window          | 1 day                      | - Max time eliminate 9 second        |
| - Stabilize period     | 10 minute                  | <b>Category</b> Manufacturer         |

**Criteria:**

This supervision monitors the status of feedback from the proportional valve

This warning is activated if the following conditions are met for more than  
**\*\*PiVM\\_PropValveStatusErrorTime\*\*** seconds

1. **\*\*PiVM\\_PropValveStatusError\\_ActivityLevel\*\*** is True
2. SupervisionInServiceModeDisabled is False
3. The status of the feedback signal **\*\*IO.PitchProportionalValveASpoolPos2\*\*** is not valid

The warning will turn off the valve for a period, and try to enable it again. If the attempt to restore the performance of the valve is unsuccessful the turbine will run with only one valve for a limited period. If the status signal of **\*\*IO.PitchProportionalValveAOutput2\*\*** is valid, indicates that the proportional valve installed may not support the proportional valve control feature, the feature can be disabled by setting **\*\*PiVM\\_PropValveCtrl\\_Enable\*\***  
false



|                        |                            |                                      |
|------------------------|----------------------------|--------------------------------------|
| <b>No: 4823</b>        | <b>SupervisionID</b> 4823  | <b>Name</b> PropValveStatusErrorB1Sx |
| <b>Log text</b>        | Prop Valve Status Error B1 |                                      |
| <b>Subsystem name</b>  | PiVM                       |                                      |
| <b>Type</b>            | Warning                    | <b>Timeout</b> 30 day                |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                          | - Max time disconnect 3 second       |
| - Time window          | 1 day                      | - Max time eliminate 9 second        |
| - Stabilize period     | 10 minute                  | <b>Category</b> Manufacturer         |

**Criteria:**

This supervision monitors the status of feedback from the proportional valve

This warning is activated if the following conditions are met for more than  
**\*\*PiVM\\_PropValveStatusErrorTime\*\*** seconds

1. **\*\*PiVM\\_PropValveStatusError\\_ActivityLevel\*\*** is True
2. SupervisionInServiceModeDisabled is False
3. The status of the feedback signal **\*\*IO.PitchProportionalValveBSpoolPos\*\*** is not valid

The warning will turn off the valve for a period, and try to enable it again. If the attempt to restore the performance of the valve is unsuccessful the turbine will run with only one valve for a limited period. If the status signal of **IO.PitchProportionalValveBOutput** is valid, indicates that the proportional valve installed may not support the proportional valve control feature, the feature can be disabled by setting **\*\*PiVM\\_PropValveCtrl\\_Enable\*\***  
false

|                        |                            |                                      |
|------------------------|----------------------------|--------------------------------------|
| <b>No: 4824</b>        | <b>SupervisionID</b> 4824  | <b>Name</b> PropValveStatusErrorB2Sx |
| <b>Log text</b>        | Prop Valve Status Error B2 |                                      |
| <b>Subsystem name</b>  | PiVM                       |                                      |
| <b>Type</b>            | Warning                    | <b>Timeout</b> 30 day                |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                          | - Max time disconnect 3 second       |
| - Time window          | 1 day                      | - Max time eliminate 9 second        |
| - Stabilize period     | 10 minute                  | <b>Category</b> Manufacturer         |

**Criteria:**

This supervision monitors the status of feedback from the proportional valve

This warning is activated if the following conditions are met for more than  
**\*\*PiVM\\_PropValveStatusErrorTime\*\*** seconds

1. **\*\*PiVM\\_PropValveStatusError\\_ActivityLevel\*\*** is True
2. SupervisionInServiceModeDisabled is False
3. The status of the feedback signal **\*\*IO.PitchProportionalValveBSpoolPos2\*\*** is not valid

The warning will turn off the valve for a period, and try to enable it again. If the attempt to restore the performance of the valve is unsuccessful the turbine will run with only one valve for a limited period. If the status signal of **\*\*IO.PitchProportionalValveBOutput2\*\*** is valid, indicates that the proportional valve installed may not support the proportional valve control feature, the feature can be disabled by setting **\*\*PiVM\\_PropValveCtrl\\_Enable\*\***  
false

|                        |                            |                                      |
|------------------------|----------------------------|--------------------------------------|
| <b>No: 4825</b>        | <b>SupervisionID</b> 4825  | <b>Name</b> PropValveStatusErrorC1Sx |
| <b>Log text</b>        | Prop Valve Status Error C1 |                                      |
| <b>Subsystem name</b>  | PiVM                       |                                      |
| <b>Type</b>            | Warning                    | <b>Timeout</b> 30 day                |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                          | - Max time disconnect 3 second       |
| - Time window          | 1 day                      | - Max time eliminate 9 second        |
| - Stabilize period     | 10 minute                  | <b>Category</b> Manufacturer         |

**Criteria:**

This supervision monitors the status of feedback from the proportional valve

This warning is activated if the following conditions are met for more than  
**\*\*PiVM\\_PropValveStatusErrorTime\*\*** seconds

1. **\*\*PiVM\\_PropValveStatusError\\_ActivityLevel\*\*** is True
2. SupervisionInServiceModeDisabled is False
3. The status of the feedback signal **\*\*IO.PitchProportionalValveCSpoolPos\*\*** is not valid

The warning will turn off the valve for a period, and try to enable it again. If the attempt to restore the performance of the valve is unsuccessful the turbine will run with only one valve for a limited period. If the status signal of IO.PitchProportionalValveCOutput is valid, indicates that the proportional valve installed may not support the proportional valve control feature, the feature can be disabled by setting **\*\*PiVM\\_PropValveCtrl\\_Enable\*\***  
false

|                        |                            |                                      |
|------------------------|----------------------------|--------------------------------------|
| <b>No: 4826</b>        | <b>SupervisionID</b> 4826  | <b>Name</b> PropValveStatusErrorC2Sx |
| <b>Log text</b>        | Prop Valve Status Error C2 |                                      |
| <b>Subsystem name</b>  | PiVM                       |                                      |
| <b>Type</b>            | Warning                    | <b>Timeout</b> 30 day                |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                          | - Max time disconnect 3 second       |
| - Time window          | 1 day                      | - Max time eliminate 9 second        |
| - Stabilize period     | 10 minute                  | <b>Category</b> Manufacturer         |

**Criteria:**

This supervision monitors the status of feedback from the proportional valve

This warning is activated if the following conditions are met for more than  
**\*\*PiVM\\_PropValveStatusErrorTime\*\*** seconds

1. **\*\*PiVM\\_PropValveStatusError\\_ActivityLevel\*\*** is True
2. SupervisionInServiceModeDisabled is False
3. The status of the feedback signal **\*\*IO.PitchProportionalValveCSpoolPos2\*\*** is not valid

The warning will turn off the valve for a period, and try to enable it again. If the attempt to restore the performance of the valve is unsuccessful the turbine will run with only one valve for a limited period. If the status signal of **\*\*IO.PitchProportionalValveCOutput2\*\*** is valid, indicates that the proportional valve installed may not support the proportional valve control feature, the feature can be disabled by setting **\*\*PiVM\\_PropValveCtrl\\_Enable\*\***  
false

|                        |                              |                                      |
|------------------------|------------------------------|--------------------------------------|
| <b>No: 4827</b>        | <b>SupervisionID</b> 4827    | <b>Name</b> PropValvePosDevToRefA1Sx |
| <b>Log text</b>        | PValve A1 Act:_.___Ref:_.___ |                                      |
| <b>Subsystem name</b>  | PiVM                         |                                      |
| <b>Type</b>            | Warning                      | <b>Timeout</b> 30 day                |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second       |
| - Time window          | 1 day                        | - Max time eliminate 9 second        |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer         |

**Criteria:**

This supervision monitors whether proportional valve position follows the proportional valve reference.

This warning is activated if the following conditions are met for more than **\*\*PiVM\\_PropValveDevTime\*\*** seconds

1. **\*\*PiVM\\_PropValvePosDevToRef\\_ActivityLevel\*\*** is True
2. **SupervisionInServiceModeDisabled** is False
3. The absolute value of the valve position deviation is above the threshold **\*\*PiVM\\_MaxPropValveErrorGain\*\*****PitchProportionalValveASpoolPos** with a minimum of **PiVM\_MinPropValveErrorTol**  
This valve position deviation is calculated as the difference between of two signals **PitchProportionalValveASpoolPos** and **PitchProportionalValveAOutput**, these are then low pass filtered with a time constant of **\*\*PiVM\\_PropValveErrorTimeConst\*\***.

The warning will turn off the valve for a period, and try to enable it again. If the attempt to restore the performance of the valve is unsuccessful the turbine will run with only one valve for a limited period.

|                        |                              |                                      |
|------------------------|------------------------------|--------------------------------------|
| <b>No: 4828</b>        | <b>SupervisionID</b> 4828    | <b>Name</b> PropValvePosDevToRefA2Sx |
| <b>Log text</b>        | PValve A2 Act:_.___Ref:_.___ |                                      |
| <b>Subsystem name</b>  | PiVM                         |                                      |
| <b>Type</b>            | Warning                      | <b>Timeout</b> 30 day                |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second       |
| - Time window          | 1 day                        | - Max time eliminate 9 second        |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer         |

**Criteria:**

This supervision monitors whether proportional valve position follows the proportional valve reference.

This warning is activated if the following conditions are met for more than **\*\*PiVM\\_PropValveDevTime\*\*** seconds

1. **\*\*PiVM\\_PropValvePosDevToRef\\_ActivityLevel\*\*** is True
2. **SupervisionInServiceModeDisabled** is False
3. The absolute value of the valve position deviation is above the threshold **\*\*PiVM\\_MaxPropValveErrorGain\*\*PitchProportionalValveASpoolPos2** with a minimum of **PiVM\_MinPropValveErrorTol**  
This valve position deviation is calculated as the difference between of two signals **PitchProportionalValveASpoolPos2** and **PitchProportionalValveAOutput2**, these are then low pass filtered with a time constant of **\*\*PiVM\\_PropValveErrorTimeConst\*\***.

The warning will turn off the valve for a period, and try to enable it again. If the attempt to restore the performance of the valve is unsuccessful the turbine will run with only one valve for a limited period.

|                        |                              |                                      |
|------------------------|------------------------------|--------------------------------------|
| <b>No: 4829</b>        | <b>SupervisionID</b> 4829    | <b>Name</b> PropValvePosDevToRefB1Sx |
| <b>Log text</b>        | PValve B1 Act:_.___Ref:_.___ |                                      |
| <b>Subsystem name</b>  | PiVM                         |                                      |
| <b>Type</b>            | Warning                      | <b>Timeout</b> 30 day                |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second       |
| - Time window          | 1 day                        | - Max time eliminate 9 second        |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer         |

**Criteria:**

This supervision monitors whether proportional valve position follows the proportional valve reference.

This warning is activated if the following conditions are met for more than **\*\*PiVM\\_PropValveDevTime\*\*** seconds

- 1. **\*\*PiVM\\_PropValvePosDevToRef\\_ActivityLevel\*\*** is True
- 2. **SupervisionInServiceModeDisabled** is False
- 3. The absolute value of the valve position deviation is above the threshold **\*\*PiVM\\_MaxPropValveErrorGain\*\*PitchProportionalValveBSpoolPos** with a minimum of **PiVM\_MinPropValveErrorTol**  
This valve position deviation is calculated as the difference between of two signals **PitchProportionalValveBSpoolPos** and **PitchProportionalValveBOutput**, these are then low pass filtered with a time constant of **\*\*PiVM\\_PropValveErrorTimeConst\*\***.

The warning will turn off the valve for a period, and try to enable it again. If the attempt to restore the performance of the valve is unsuccessful the turbine will run with only one valve for a limited period.

|                        |                              |                                      |
|------------------------|------------------------------|--------------------------------------|
| <b>No: 4830</b>        | <b>SupervisionID</b> 4830    | <b>Name</b> PropValvePosDevToRefB2Sx |
| <b>Log text</b>        | PValve B2 Act:_.___Ref:_.___ |                                      |
| <b>Subsystem name</b>  | PiVM                         |                                      |
| <b>Type</b>            | Warning                      | <b>Timeout</b> 30 day                |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second       |
| - Time window          | 1 day                        | - Max time eliminate 9 second        |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer         |

**Criteria:**

This supervision monitors whether proportional valve position follows the proportional valve reference.

This warning is activated if the following conditions are met for more than **\*\*PiVM\\_PropValveDevTime\*\*** seconds

- 1. **\*\*PiVM\\_PropValvePosDevToRef\\_ActivityLevel\*\*** is True
- 2. **SupervisionInServiceModeDisabled** is False
- 3. The absolute value of the valve position deviation is above the threshold **\*\*PiVM\\_MaxPropValveErrorGain\*\*PitchProportionalValveBSpoolPos2** with a minimum of **PiVM\_MinPropValveErrorTol**  
This valve position deviation is calculated as the difference between of two signals **PitchProportionalValveBSpoolPos2** and **PitchProportionalValveBOutput2**, these are then low pass filtered with a time constant of **\*\*PiVM\\_PropValveErrorTimeConst\*\***.

The warning will turn off the valve for a period, and try to enable it again. If the attempt to restore the performance of the valve is unsuccessful the turbine will run with only one valve for a limited period.

|                        |                              |                                      |
|------------------------|------------------------------|--------------------------------------|
| <b>No: 4831</b>        | <b>SupervisionID</b> 4831    | <b>Name</b> PropValvePosDevToRefC1Sx |
| <b>Log text</b>        | PValve C1 Act:_.___Ref:_.___ |                                      |
| <b>Subsystem name</b>  | PiVM                         |                                      |
| <b>Type</b>            | Warning                      | <b>Timeout</b> 30 day                |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second       |
| - Time window          | 1 day                        | - Max time eliminate 9 second        |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer         |

**Criteria:**

This supervision monitors whether proportional valve position follows the proportional valve reference.

This warning is activated if the following conditions are met for more than **\*\*PiVM\\_PropValveDevTime\*\*** seconds

- 1. **\*\*PiVM\\_PropValvePosDevToRef\\_ActivityLevel\*\*** is True
- 2. **SupervisionInServiceModeDisabled** is False
- 3. The absolute value of the valve position deviation is above the threshold **\*\*PiVM\\_MaxPropValveErrorGain\*\*****PitchProportionalValveCSpoolPos** with a minimum of **PiVM\_MinPropValveErrorTol**  
This valve position deviation is calculated as the difference between of two signals **PitchProportionalValveCSpoolPos** and **PitchProportionalValveCOutput**, these are then low pass filtered with a time constant of **\*\*PiVM\\_PropValveErrorTimeConst\*\***.

The warning will turn off the valve for a period, and try to enable it again. If the attempt to restore the performance of the valve is unsuccessful the turbine will run with only one valve for a limited period.

|                        |                              |                                      |
|------------------------|------------------------------|--------------------------------------|
| <b>No: 4832</b>        | <b>SupervisionID</b> 4832    | <b>Name</b> PropValvePosDevToRefC2Sx |
| <b>Log text</b>        | PValve C2 Act:_.___Ref:_.___ |                                      |
| <b>Subsystem name</b>  | PiVM                         |                                      |
| <b>Type</b>            | Warning                      | <b>Timeout</b> 30 day                |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second       |
| - Time window          | 1 day                        | - Max time eliminate 9 second        |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer         |

**Criteria:**

This supervision monitors whether proportional valve position follows the proportional valve reference.

This warning is activated if the following conditions are met for more than **\*\*PiVM\\_PropValveDevTime\*\*** seconds

1. **\*\*PiVM\\_PropValvePosDevToRef\\_ActivityLevel\*\*** is True
2. **SupervisionInServiceModeDisabled** is False
3. The absolute value of the valve position deviation is above the threshold **\*\*PiVM\\_MaxPropValveErrorGain\*\*PitchProportionalValveCSpoolPos2** with a minimum of **PiVM\_MinPropValveErrorTol**  
This valve position deviation is calculated as the difference between of two signals **PitchProportionalValveCSpoolPos2** and **PitchProportionalValveCOutput2**, these are then low pass filtered with a time constant of **\*\*PiVM\\_PropValveErrorTimeConst\*\***.

The warning will turn off the valve for a period, and try to enable it again. If the attempt to restore the performance of the valve is unsuccessful the turbine will run with only one valve for a limited period.

|                        |                           |                                        |
|------------------------|---------------------------|----------------------------------------|
| <b>No: 4875</b>        | <b>SupervisionID</b> 4875 | <b>Name</b> SwitchgearTrippedBySCADASx |
| <b>Log text</b>        | HVCB tripped by SCADA     |                                        |
| <b>Subsystem name</b>  | SwitchGear                |                                        |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                   |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> StopSlow          |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 3 second         |
| - Time window          | <n/a>                     | - Max time eliminate 9 second          |
| - Stabilize period     | <n/a>                     | <b>Category</b> Owner                  |

**Criteria:**

This alarm is reported when the HVCB switchgear is tripped by SCADA.

The switch gear is tripped by setting a pulse on **\*\*IO.SwitchgearHVCBTripPulse\*\***

The alarm can be acknowledged at any time



|                        |                               |                                                      |              |
|------------------------|-------------------------------|------------------------------------------------------|--------------|
| <b><u>No: 4876</u></b> | <b>SupervisionID</b>          | <b>Name</b> HubSafetySystemEncoderBladeAErrWarningSx |              |
|                        | 4876                          |                                                      |              |
| <b>Log text</b>        | HubSafetySystem EncoderA,EC:_ |                                                      |              |
| <b>Subsystem name</b>  | OptiStop                      |                                                      |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                       | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                 | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                                | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                                 | <n/a>        |
| - Stabilize period     | 1 minute                      | <b>Category</b>                                      | Manufacturer |

**Criteria:**  
This warning appears if the staus of the encoder in blade A is bad and Generator RPM is below warning threshold (Prm\_SuperviseEncoderGeneratorSpeed). The status is reported from the Hub Safety System.

The warning log argument holds information on why the encoder status is bad. The infomation can also be found in the signal HubSafetySystemEncoderAErrorCode. The errorcode has the following interpretation:  
0: No error (All good)  
1: Discrepancy + no signals frozen  
2: Discrepancy + linear transducer frozen  
3: Discrepancy + encoder frozen  
4: Discrepancy + both signals frozen

Further details on signal HubSafetySystemEncoderAErrorCode:  
1: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleA) differs from the standard controller's pitch position measurement (PitchBladeAAngle). - both signals are alive.  
2: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleA) differs from the standard controller's pitch position measurement (PitchBladeAAngle). - The standard controller's measurement value is frozen.  
3: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleA) differs from the standard controller's pitch position measurement (IO.PitchBladeAAngle). - The safety system's measurement value is frozen.  
4: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleA) differs from the standard controller's pitch position measurement (PitchBladeAAngle). - Both measurements are frozen.

The following signals holds the counts on how the signals can differ and be frozen:  
CusumEncLinA, CusumEncFreezeA, CusumLinFreezeA

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter \*\*OptiStopVariant2Installed\*\* is true.

|                        |                               |                                                      |              |
|------------------------|-------------------------------|------------------------------------------------------|--------------|
| <b><u>No: 4877</u></b> | <b>SupervisionID</b>          | <b>Name</b> HubSafetySystemEncoderBladeBErrWarningSx |              |
|                        | 4877                          |                                                      |              |
| <b>Log text</b>        | HubSafetySystem EncoderB,EC:_ |                                                      |              |
| <b>Subsystem name</b>  | OptiStop                      |                                                      |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                       | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                 | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                                | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                                 | <n/a>        |
| - Stabilize period     | 1 minute                      | <b>Category</b>                                      | Manufacturer |

**Criteria:**  
This warning appears if the staus of the encoder in blade B is bad and Generator RPM is below warning threshold (Prm\_SuperviseEncoderGeneratorSpeed). The status is reported from the Hub Safety System.

The warning log argument holds information on why the encoder status is bad. The infomation can also be found in the signal HubSafetySystemEncoderBErrorCode. The errorcode has the following interpretation:  
0: No error (All good)  
1: Discrepancy + no signals frozen  
2: Discrepancy + linear transducer frozen  
3: Discrepancy + encoder frozen  
4: Discrepancy + both signals frozen

Further details on signal HubSafetySystemEncoderBErrorCode:  
1: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleB) differs from the standard controller's pitch position measurement (PitchBladeBAngle). - both signals are alive.  
2: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleB) differs from the standard controller's pitch position measurement (PitchBladeBAngle). - The standard controller's measurement value is frozen.  
3: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleB) differs from the standard controller's pitch position measurement (IO.PitchBladeBAngle). - The safety system's measurement value is frozen.  
4: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleB) differs from the standard controller's pitch position measurement (PitchBladeBAngle). - Both measurements are frozen.

The following signals holds the counts on how the signals can differ and be frozen:  
CusumEncLinB, CusumEncFreezeB, CusumLinFreezeB

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter \*\*OptiStopVariant2Installed\*\* is true.

|                        |                               |                                                      |              |
|------------------------|-------------------------------|------------------------------------------------------|--------------|
| <b><u>No: 4878</u></b> | <b>SupervisionID</b>          | <b>Name</b> HubSafetySystemEncoderBladeCErrWarningSx |              |
|                        | 4878                          |                                                      |              |
| <b>Log text</b>        | HubSafetySystem EncoderC,EC:_ |                                                      |              |
| <b>Subsystem name</b>  | OptiStop                      |                                                      |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                       | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                 | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                                | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                                 | <n/a>        |
| - Stabilize period     | 1 minute                      | <b>Category</b>                                      | Manufacturer |

**Criteria:**  
This warning appears if the staus of the encoder in blade C is bad and Generator RPM is below warning threshold (Prm\_SuperviseEncoderGeneratorSpeed). The status is reported from the Hub Safety System.

The warning log argument holds information on why the encoder status is bad. The infomation can also be found in the signal HubSafetySystemEncoderCErrorCode. The errorcode has the following interpretation:  
0: No error (All good)  
1: Discrepancy + no signals frozen  
2: Discrepancy + linear transducer frozen  
3: Discrepancy + encoder frozen  
4: Discrepancy + both signals frozen

Further details on signal HubSafetySystemEncoderCErrorCode:  
1: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleC) differs from the standard controller's pitch position measurement (PitchBladeCAngle). - both signals are alive.  
2: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleC) differs from the standard controller's pitch position measurement (PitchBladeCAngle). - The standard controller's measurement value is frozen.  
3: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleC) differs from the standard controller's pitch position measurement (IO.PitchBladeCAngle). - The safety system's measurement value is frozen.  
4: The safety system's pitch encoder measurement (SafetySystemBladePitchAngleC) differs from the standard controller's pitch position measurement (PitchBladeCAngle). - Both measurements are frozen.

The following signals holds the counts on how the signals can differ and be frozen:  
CusumEncLinC, CusumEncFreezeC, CusumLinFreezeC

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter \*\*OptiStopVariant2Installed\*\* is true.

|                           |                               |                                            |
|---------------------------|-------------------------------|--------------------------------------------|
| <b>No: 4882</b>           | <b>SupervisionID</b> 4882     | <b>Name</b> SpeedDerateBelowMinStaticSpdSx |
| <b>Log text</b>           | Derate<MinStatSpd: ____rpm, _ |                                            |
| <b>Subsystem name</b>     | ProdCtrl                      |                                            |
| <b>Type</b>               | Alarm                         | <b>Timeout</b> <n/a>                       |
| <b>Acknowledgement</b>    | Auto                          | <b>Shutdown type</b> PauseSlow             |
| - <b>Allowed attempts</b> | 3                             | - <b>Max time disconnect</b> 1 hour        |
| - <b>Time window</b>      | 1 hour                        | - <b>Max time eliminate</b> 1 hour         |
| - <b>Stabilize period</b> | 30 second                     | <b>Category</b> Manufacturer               |

**Criteria:**

This supervision triggers if we are in production or towards production and get a speed derate which is below our minimum static speed.

1. **\*\*SC\\_SpdDerateBelowMinSpdSV\\_ActivityLevel\*\*** = 2.
2. **\*\*ProductionControllerMainState\*\*** is in eProdCtrlMainState\_TowardsProduction or eProdCtrlMainState\_Production
3. **\*\*SC\\_GenSpdRefDerate\*\*** is below minimum static speed

|                           |                               |                                                |
|---------------------------|-------------------------------|------------------------------------------------|
| <b>No: 4889</b>           | <b>SupervisionID</b> 4889     | <b>Name</b> PitchPosADeviationBetweenSensorsSx |
| <b>Log text</b>           | Pitch A Pist:____°,Ring:____° |                                                |
| <b>Subsystem name</b>     | PiSV                          |                                                |
| <b>Type</b>               | Alarm                         | <b>Timeout</b> <n/a>                           |
| <b>Acknowledgement</b>    | Auto                          | <b>Shutdown type</b> StopSlow                  |
| - <b>Allowed attempts</b> | 3                             | - <b>Max time disconnect</b> 3 second          |
| - <b>Time window</b>      | 1 hour                        | - <b>Max time eliminate</b> 9 second           |
| - <b>Stabilize period</b> | 1 minute                      | <b>Category</b> Manufacturer                   |

**Criteria:**

This supervision monitors deviation between the pitch position measurements (piston and blade bearing) during normal operation of the turbine.

This alarm is activated if the following conditions are met for more than **\*\*DevPosSen\\_MaxTime\*\*** seconds

1. Service Mode is disabled
2. **\*\*DevPosSen\\_ActivityLevel\*\*** is True
3. PiSP\_PistonMeasA\_Valid and PiSP\_BladeRingPitchMeasA\_Valid are True
4. Sensors are calibrated
5. The absolute value of the pitch deviation is above the threshold **\*\*DevSen\\_MaxPosDev\*\***,

pitch deviation = abs(**\*\*PitchBladeAAngle\*\*** - PitchBladeARingAngle)

|                           |                                 |                                                |              |
|---------------------------|---------------------------------|------------------------------------------------|--------------|
| <b>No: 4890</b>           | <b>SupervisionID</b> 4890       | <b>Name</b> PitchPosBDeviationBetweenSensorsSx |              |
| <b>Log text</b>           | Pitch B Pist:__.__°,Ring:__.__° |                                                |              |
| <b>Subsystem name</b>     | PiSV                            |                                                |              |
| <b>Type</b>               | Alarm                           | <b>Timeout</b>                                 | <n/a>        |
| <b>Acknowledgement</b>    | Auto                            | <b>Shutdown type</b>                           | StopSlow     |
| - <b>Allowed attempts</b> | 3                               | - <b>Max time disconnect</b>                   | 3 second     |
| - <b>Time window</b>      | 1 hour                          | - <b>Max time eliminate</b>                    | 9 second     |
| - <b>Stabilize period</b> | 1 minute                        | <b>Category</b>                                | Manufacturer |

**Criteria:**

This supervision monitors deviation between the pitch position measurements (piston and blade bearing) during normal operation of the turbine.

This alarm is activated if the following conditions are met for more than  
\*\*DevPosSen\\_MaxTime\*\* seconds

1. Service Mode is disabled
  2. \*\*DevPosSen\\_ActivityLevel\*\* is True
  3. PiSP\_PistonMeasB\_Valid and PiSP\_BladeRingPitchMeasB\_Valid are True
  4. Sensors are calibrated
  5. The absolute value of the pitch deviation is above the threshold
- \*\*DevSen\\_MaxPosDev\*\*,  
  
pitch deviation = abs(\*\*PitchBladeBAngle\*\* - \*\*PitchBladeBRingAngle\*\*)

|                           |                                 |                                                |              |
|---------------------------|---------------------------------|------------------------------------------------|--------------|
| <b>No: 4891</b>           | <b>SupervisionID</b> 4891       | <b>Name</b> PitchPosCDeviationBetweenSensorsSx |              |
| <b>Log text</b>           | Pitch C Pist:__.__°,Ring:__.__° |                                                |              |
| <b>Subsystem name</b>     | PiSV                            |                                                |              |
| <b>Type</b>               | Alarm                           | <b>Timeout</b>                                 | <n/a>        |
| <b>Acknowledgement</b>    | Auto                            | <b>Shutdown type</b>                           | StopSlow     |
| - <b>Allowed attempts</b> | 3                               | - <b>Max time disconnect</b>                   | 3 second     |
| - <b>Time window</b>      | 1 hour                          | - <b>Max time eliminate</b>                    | 9 second     |
| - <b>Stabilize period</b> | 1 minute                        | <b>Category</b>                                | Manufacturer |

**Criteria:**

This supervision monitors deviation between the pitch position measurements (piston and blade bearing) during normal operation of the turbine.

This alarm is activated if the following conditions are met for more than  
\*\*DevPosSen\\_MaxTime\*\* seconds

1. Service Mode is disabled
  2. \*\*DevPosSen\\_ActivityLevel\*\* is True
  3. PiSP\_PistonMeasC\_Valid and PiSP\_BladeRingPitchMeasC\_Valid are True
  4. Sensors are calibrated
  5. The absolute value of the pitch deviation is above the threshold
- \*\*DevSen\\_MaxPosDev\*\*,  
  
pitch deviation = abs(\*\*PitchBladeCAngle\*\* - \*\*PitchBladeCRingAngle\*\*)

|                    |                                |                                                      |
|--------------------|--------------------------------|------------------------------------------------------|
| <b>No: 4892</b>    | <b>SupervisionID</b> 4892      | <b>Name</b> HubSafetySystemBladeEncoderCalibActiveSx |
| Log text           | SafetSysBladeEncCalibActiveEC_ |                                                      |
| Subsystem name     | OptiStop                       |                                                      |
| Type               | Alarm                          | <b>Timeout</b> <n/a>                                 |
| Acknowledgement    | Remote                         | <b>Shutdown type</b> StopSlow                        |
| - Allowed attempts | <n/a>                          | - Max time disconnect 3 second                       |
| - Time window      | <n/a>                          | - Max time eliminate 9 second                        |
| - Stabilize period | <n/a>                          | <b>Category</b> Manufacturer                         |

**Criteria:**  
This alarm appears when the blade encoder calibration is activated while the Hub rotates at more than 3 rpm.

Note: This alarm is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter **\*\*OptiStopVariant2Installed\*\*** is true.

|                    |                                |                                 |
|--------------------|--------------------------------|---------------------------------|
| <b>No: 4898</b>    | <b>SupervisionID</b> 4898      | <b>Name</b> HeatersOverheatedSx |
| Log text           | BladeA Heaters are Over Heated |                                 |
| Subsystem name     | DeIcing                        |                                 |
| Type               | Alarm                          | <b>Timeout</b> <n/a>            |
| Acknowledgement    | Local                          | <b>Shutdown type</b> PauseSlow  |
| - Allowed attempts | <n/a>                          | - Max time disconnect 9 second  |
| - Time window      | <n/a>                          | - Max time eliminate 10 second  |
| - Stabilize period | <n/a>                          | <b>Category</b> Manufacturer    |

**Criteria:**  
This alarm is raised if IO.DeIcingBladeXHeatersOverheated signal is become true. And this alarm can be acknowledged once this IO.DeIcingBladeXHeatersOverheated becomes false

|                    |                                |                                 |
|--------------------|--------------------------------|---------------------------------|
| <b>No: 4899</b>    | <b>SupervisionID</b> 4899      | <b>Name</b> HeatersOverheatedSx |
| Log text           | BladeB Heaters are Over Heated |                                 |
| Subsystem name     | DeIcing                        |                                 |
| Type               | Alarm                          | <b>Timeout</b> <n/a>            |
| Acknowledgement    | Local                          | <b>Shutdown type</b> PauseSlow  |
| - Allowed attempts | <n/a>                          | - Max time disconnect 9 second  |
| - Time window      | <n/a>                          | - Max time eliminate 10 second  |
| - Stabilize period | <n/a>                          | <b>Category</b> Manufacturer    |

**Criteria:**  
This alarm is raised if IO.DeIcingBladeXHeatersOverheated signal is become true. And this alarm can be acknowledged once this IO.DeIcingBladeXHeatersOverheated becomes false

|                    |                                |                                 |
|--------------------|--------------------------------|---------------------------------|
| <b>No: 4900</b>    | <b>SupervisionID</b> 4900      | <b>Name</b> HeatersOverheatedSx |
| Log text           | BladeC Heaters are Over Heated |                                 |
| Subsystem name     | DeIcing                        |                                 |
| Type               | Alarm                          | <b>Timeout</b> <n/a>            |
| Acknowledgement    | Local                          | <b>Shutdown type</b> PauseSlow  |
| - Allowed attempts | <n/a>                          | - Max time disconnect 9 second  |
| - Time window      | <n/a>                          | - Max time eliminate 10 second  |
| - Stabilize period | <n/a>                          | <b>Category</b> Manufacturer    |

**Criteria:**  
This alarm is raised if IO.DeIcingBladeXHeatersOverheated signal is become true. And this alarm can be acknowledged once this IO.DeIcingBladeXHeatersOverheated becomes false

**No: 4905****SupervisionID** 610**Name** FeedbackSignalInvalidSx**Log text**

Hydr SignalError. \_\_\_\_\_, \_\_\_\_\_

**Subsystem name**

HydraulicStation

**Type**

Warning

**Timeout**

&lt;disabled&gt;

**Acknowledgement**

Auto

**Shutdown type**

&lt;n/a&gt;

**- Allowed attempts**

3

**- Max time disconnect**

&lt;n/a&gt;

**- Time window**

1 hour

**- Max time eliminate**

&lt;n/a&gt;

**- Stabilize period**

60 second

**Category**

Manufacturer

**Criteria:**

This warning is raised if the status of the hydraulic offline pump motor feedback signal is invalid.

**No: 4905****SupervisionID** 605**Name** OneSpeedMotorSignalInvalidSx**Log text**

Hydr SignalError. \_\_\_\_\_, \_\_\_\_\_

**Subsystem name**

HydraulicStation

**Type**

Warning

**Timeout**

&lt;disabled&gt;

**Acknowledgement**

Auto

**Shutdown type**

&lt;n/a&gt;

**- Allowed attempts**

3

**- Max time disconnect**

&lt;n/a&gt;

**- Time window**

1 hour

**- Max time eliminate**

&lt;n/a&gt;

**- Stabilize period**

60 second

**Category**

Manufacturer

**Criteria:**

This warning is raised if the status of the hydraulic offline pump motor output signal is invalid.

**No: 4905****SupervisionID** 607**Name** ThermoSignalInvalidSx**Log text**

Hydr SignalError. \_\_\_\_\_, \_\_\_\_\_

**Subsystem name**

HydraulicStation

**Type**

Warning

**Timeout**

&lt;disabled&gt;

**Acknowledgement**

Auto

**Shutdown type**

&lt;n/a&gt;

**- Allowed attempts**

3

**- Max time disconnect**

&lt;n/a&gt;

**- Time window**

1 hour

**- Max time eliminate**

&lt;n/a&gt;

**- Stabilize period**

60 second

**Category**

Manufacturer

**Criteria:**

This warning is raised if the status of the hydraulic offline pump motor thermo signal is invalid.

|                        |                              |                                                  |
|------------------------|------------------------------|--------------------------------------------------|
| <b>No:</b> 4914        | <b>SupervisionID</b> 667     | <b>Name</b> MainShaftBearingNRETempSignalFaultSx |
| <b>Log text</b>        | MainShaftSigError._____,____ |                                                  |
| <b>Subsystem name</b>  | MainShaft                    |                                                  |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                             |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> PauseFast                   |
| - Allowed attempts     | 3                            | - Max time disconnect 8 second                   |
| - Time window          | 1 hour                       | - Max time eliminate 1 hour                      |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer                     |

**Criteria:**

This alarm indicates that the temperature measured at the bearing in the non-rotor end of the main shaft is faulty.

Most likely caused by an electrical error - the sensor is short circuited or disconnected.

May also be caused by failing power to CAN modules or a failing CAN bus (for relevant turbines).

This alarm is raised if the status of **\*\*IO.MainShaftBearingNRETemp\*\*** is invalid.

The alarm is auto acknowledged if the status of **\*\*IO.MainShaftBearingNRETemp\*\*** changes to valid.

The alarm is only monitored if the temperature sensor is installed - i.e. **\*\*MainShaftBearingNREHighTempEnable\*\*** is true.

|                        |                              |                                                 |
|------------------------|------------------------------|-------------------------------------------------|
| <b>No:</b> 4914        | <b>SupervisionID</b> 666     | <b>Name</b> MainShaftBearingRETempSignalFaultSx |
| <b>Log text</b>        | MainShaftSigError._____,____ |                                                 |
| <b>Subsystem name</b>  | MainShaft                    |                                                 |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                            |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> PauseFast                  |
| - Allowed attempts     | 3                            | - Max time disconnect 8 second                  |
| - Time window          | 1 hour                       | - Max time eliminate 1 hour                     |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer                    |

**Criteria:**

This alarm indicates that the temperature measured at the bearing in the rotor end of the main shaft is faulty.

Most likely caused by an electrical error - the sensor is short circuited or disconnected.

May also be caused by failing power to CAN modules or a failing CAN bus (for relevant turbines).

This alarm is raised if the status of **\*\*IO.MainShaftBearingRETemp\*\*** is invalid.

The alarm is auto acknowledged if the status of **\*\*IO.MainShaftBearingRETemp\*\*** changes to valid.

The alarm is only monitored if the temperature sensor is installed - i.e. **\*\*MainShaftBearingREHighTempEnable\*\*** is true.



|                        |                                |                                     |              |
|------------------------|--------------------------------|-------------------------------------|--------------|
| <b><u>No: 4917</u></b> | <b>SupervisionID</b> 306       | <b>Name</b> RotorSpeedSignalFaultSx |              |
| <b>Log text</b>        | RotorTachSpdSigErr._____,_____ |                                     |              |
| <b>Subsystem name</b>  | PSC                            |                                     |              |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>                      | <n/a>        |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                | PauseSlow    |
| - Allowed attempts     | 3                              | - Max time disconnect               | 1 hour       |
| - Time window          | 1 hour                         | - Max time eliminate                | 1 hour       |
| - Stabilize period     | 60 second                      | <b>Category</b>                     | Manufacturer |

**Criteria:**

This supervision checks the validity of Rotor speed measurement.

The alarm is raised if:

1. \*\*PSC\\_RotorFault\\_ActivityLevel\*\* = 2
2. \*\*PSC\\_RotorSpdSignalValid\*\* goes low for more than  
\*\*PSC\\_RotorFault\\_InvalidSignalTimeLimit\*\* seconds

|                        |                               |                                |              |
|------------------------|-------------------------------|--------------------------------|--------------|
| <b><u>No: 4918</u></b> | <b>SupervisionID</b> 433      | <b>Name</b> ShockSignalFaultSx |              |
| <b>Log text</b>        | ShockSensorSigErr._____,_____ |                                |              |
| <b>Subsystem name</b>  | PSC                           |                                |              |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>                 | <n/a>        |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>           | PauseSlow    |
| - Allowed attempts     | 3                             | - Max time disconnect          | 1 hour       |
| - Time window          | 1 hour                        | - Max time eliminate           | 1 hour       |
| - Stabilize period     | 60 second                     | <b>Category</b>                | Manufacturer |

**Criteria:**

This supervision checks the validity of tower vibration measurements.

An alarm is reported if following conditions are met:

1. \*\*PSC\\_ShockFault\\_ActivityLevel\*\* = 2
2. \*\*PSC\\_ShockSignalValid\*\* is false for more than  
\*\*PSC\\_ShockFault\\_InvalidSignalTimeLimit\*\* sec

|                        |                               |                                |              |
|------------------------|-------------------------------|--------------------------------|--------------|
| <b><u>No: 4919</u></b> | <b>SupervisionID</b> 434      | <b>Name</b> PowerSignalFaultSx |              |
| <b>Log text</b>        | ProdCtrlPwrSigErr._____,_____ |                                |              |
| <b>Subsystem name</b>  | PSC                           |                                |              |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>                 | <n/a>        |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>           | PauseSlow    |
| - Allowed attempts     | 3                             | - Max time disconnect          | 1 hour       |
| - Time window          | 1 hour                        | - Max time eliminate           | 1 hour       |
| - Stabilize period     | 60 second                     | <b>Category</b>                | Manufacturer |

**Criteria:**

This supervision checks the validity of power measurements.

An alarm is reported if following conditions are met:

1. \*\*PSC\\_PowFault\\_ActivityLevel\*\* = 2
2. \*\*PSC\\_PowSignalValid\*\* is false for more than  
\*\*PSC\\_PowFault\\_InvalidSignalTimeLimit\*\* sec

|                        |                           |                                     |
|------------------------|---------------------------|-------------------------------------|
| <b>No: 4924</b>        | <b>SupervisionID</b> 4924 | <b>Name</b> UserDefinedIOTowerDI1Sx |
| <b>Log text</b>        | User defined IO tower DI1 |                                     |
| <b>Subsystem name</b>  | UserDefinedIO             |                                     |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow      |
| - Allowed attempts     | 4                         | - Max time disconnect 15 second     |
| - Time window          | 1 hour                    | - Max time eliminate 45 second      |
| - Stabilize period     | 60 second                 | <b>Category</b> Owner               |

**Criteria:**

The alarm indicates that the conditions for activation of a user defined alarm are met.

The alarm is raised if parameter **\*\*TowerDI1.SignalInvert\*\*** is true and **\*\*IO.UserDefinedIOTowerDI1\*\*** change to low OR **\*\*TowerDI1.SignalInvert\*\*** is false and **\*\*IO.UserDefinedIOTowerDI1\*\*** change to high.

The alarm is only monitored if the following condition is met:

1. **\*\*TowerDI1.Config\*\*** is 4 - User Alarm.

The alarm is auto acknowledged, if **\*\*IO.UserDefinedIOTowerDI1\*\*** change.

|                        |                           |                                     |
|------------------------|---------------------------|-------------------------------------|
| <b>No: 4925</b>        | <b>SupervisionID</b> 4925 | <b>Name</b> UserDefinedIOTowerDI2Sx |
| <b>Log text</b>        | User defined IO tower DI2 |                                     |
| <b>Subsystem name</b>  | UserDefinedIO             |                                     |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow      |
| - Allowed attempts     | 4                         | - Max time disconnect 15 second     |
| - Time window          | 1 hour                    | - Max time eliminate 45 second      |
| - Stabilize period     | 60 second                 | <b>Category</b> Owner               |

**Criteria:**

The alarm indicates that the conditions for activation of a user defined alarm are met.

The alarm is raised if parameter **\*\*TowerDI2.SignalInvert\*\*** is true and **\*\*IO.UserDefinedIOTowerDI2\*\*** change to low OR **\*\*TowerDI2.SignalInvert\*\*** is false and **\*\*IO.UserDefinedIOTowerDI2\*\*** change to high.

The alarm is only monitored if the following condition is met:

1. **\*\*TowerDI2.Config\*\*** is 4 - User Alarm.

The alarm is auto acknowledged, if **\*\*IO.UserDefinedIOTowerDI2\*\*** change.

|                        |                           |                                     |
|------------------------|---------------------------|-------------------------------------|
| <b>No: 4926</b>        | <b>SupervisionID</b> 4926 | <b>Name</b> UserDefinedIOTowerDI3Sx |
| <b>Log text</b>        | User defined IO tower DI3 |                                     |
| <b>Subsystem name</b>  | UserDefinedIO             |                                     |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow      |
| - Allowed attempts     | 4                         | - Max time disconnect 15 second     |
| - Time window          | 1 hour                    | - Max time eliminate 45 second      |
| - Stabilize period     | 60 second                 | <b>Category</b> Owner               |

**Criteria:**  
The alarm indicates that the conditions for activation of a user defined alarm are met.

The alarm is raised if parameter **\*\*TowerDI3.SignalInvert\*\*** is true and **\*\*IO.UserDefinedIOTowerDI3\*\*** change to low OR **\*\*TowerDI3.SignalInvert\*\*** is false and **\*\*IO.UserDefinedIOTowerDI3\*\*** change to high.

The alarm is only monitored if the following condition is met:

1. **\*\*TowerDI3.Config\*\*** is 4 - User Alarm.

The alarm is auto acknowledged, if **\*\*IO.UserDefinedIOTowerDI3\*\*** change.

|                        |                           |                                     |
|------------------------|---------------------------|-------------------------------------|
| <b>No: 4927</b>        | <b>SupervisionID</b> 4927 | <b>Name</b> UserDefinedIOTowerDI4Sx |
| <b>Log text</b>        | User defined IO tower DI4 |                                     |
| <b>Subsystem name</b>  | UserDefinedIO             |                                     |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow      |
| - Allowed attempts     | 4                         | - Max time disconnect 15 second     |
| - Time window          | 1 hour                    | - Max time eliminate 45 second      |
| - Stabilize period     | 60 second                 | <b>Category</b> Owner               |

**Criteria:**  
The alarm indicates that the conditions for activation of a user defined alarm are met.

The alarm is raised if parameter **\*\*TowerDI4.SignalInvert\*\*** is true and **\*\*IO.UserDefinedIOTowerDI4\*\*** change to low OR **\*\*TowerDI4.SignalInvert\*\*** is false and **\*\*IO.UserDefinedIOTowerDI4\*\*** change to high.

The alarm is only monitored if the following condition is met:

1. **\*\*TowerDI4.Config\*\*** is 4 - User Alarm.

The alarm is auto acknowledged, if **\*\*IO.UserDefinedIOTowerDI4\*\*** change.

|                        |                            |                                  |
|------------------------|----------------------------|----------------------------------|
| <b>No: 4932</b>        | <b>SupervisionID</b> 4932  | <b>Name</b> NodeDisconnectedSx   |
| <b>Log text</b>        | CPR Node ____ disconnected |                                  |
| <b>Subsystem name</b>  | Watchdog                   |                                  |
| <b>Type</b>            | Alarm                      | <b>Timeout</b> <n/a>             |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopFast    |
| - Allowed attempts     | Unlimited                  | - Max time disconnect 0.9 second |
| - Time window          | <n/a>                      | - Max time eliminate 1 hour      |
| - Stabilize period     | 60 second                  | <b>Category</b> Manufacturer     |

**Criteria:**  
The purpose of this alarm is to stop the turbine, due to a disconnected DAO controller node.

|                        |                             |                                       |
|------------------------|-----------------------------|---------------------------------------|
| <b>No: 4933</b>        | <b>SupervisionID</b> 4933   | <b>Name</b> UserDefinedIONacelleDI1Sx |
| <b>Log text</b>        | User defined IO nacelle DI1 |                                       |
| <b>Subsystem name</b>  | UserDefinedIO               |                                       |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                  |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> PauseSlow        |
| - Allowed attempts     | 4                           | - Max time disconnect 15 second       |
| - Time window          | 1 hour                      | - Max time eliminate 45 second        |
| - Stabilize period     | 60 second                   | <b>Category</b> Owner                 |

**Criteria:**

The alarm indicates that the conditions for activation of a user defined alarm are met.

The alarm is raised if parameter **\*\*NacelleDI1.SignalInvert\*\*** is true and **\*\*IO.UserDefinedIONacelleDI1\*\*** change to low OR **\*\*NacelleDI1.SignalInvert\*\*** is false and **\*\*IO.UserDefinedIONacelleDI1\*\*** change to high.

The alarm is only monitored if the following condition is met:

- \*\*NacelleDI1.Config\*\*** is 4 - User Alarm.

The alarm is auto acknowledged, if **\*\*IO.UserDefinedIONacelleDI1\*\*** change.

|                        |                             |                                       |
|------------------------|-----------------------------|---------------------------------------|
| <b>No: 4934</b>        | <b>SupervisionID</b> 4934   | <b>Name</b> UserDefinedIONacelleDI2Sx |
| <b>Log text</b>        | User defined IO nacelle DI2 |                                       |
| <b>Subsystem name</b>  | UserDefinedIO               |                                       |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                  |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> PauseSlow        |
| - Allowed attempts     | 4                           | - Max time disconnect 15 second       |
| - Time window          | 1 hour                      | - Max time eliminate 45 second        |
| - Stabilize period     | 60 second                   | <b>Category</b> Owner                 |

**Criteria:**

The alarm indicates that the conditions for activation of a user defined alarm are met.

The alarm is raised if parameter **\*\*NacelleDI2.SignalInvert\*\*** is true and **\*\*IO.UserDefinedIONacelleDI2\*\*** change to low OR **\*\*NacelleDI2.SignalInvert\*\*** is false and **\*\*IO.UserDefinedIONacelleDI2\*\*** change to high.

The alarm is only monitored if the following condition is met:

- \*\*NacelleDI2.Config\*\*** is 4 - User Alarm.

The alarm is auto acknowledged, if **\*\*IO.UserDefinedIONacelleDI2\*\*** change.

|                        |                             |                                       |           |
|------------------------|-----------------------------|---------------------------------------|-----------|
| <b>No: 4935</b>        | <b>SupervisionID</b> 4935   | <b>Name</b> UserDefinedIONacelleDI3Sx |           |
| <b>Log text</b>        | User defined IO nacelle DI3 |                                       |           |
| <b>Subsystem name</b>  | UserDefinedIO               |                                       |           |
| <b>Type</b>            | Alarm                       | <b>Timeout</b>                        | <n/a>     |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b>                  | PauseSlow |
| - Allowed attempts     | 4                           | - Max time disconnect                 | 15 second |
| - Time window          | 1 hour                      | - Max time eliminate                  | 45 second |
| - Stabilize period     | 60 second                   | <b>Category</b>                       | Owner     |

**Criteria:**

The alarm indicates that the conditions for activation of a user defined alarm are met.

The alarm is raised if parameter **\*\*NacelleDI3.SignalInvert\*\*** is true and **\*\*IO.UserDefinedIONacelleDI3\*\*** change to low OR **\*\*NacelleDI3.SignalInvert\*\*** is false and **\*\*IO.UserDefinedIONacelleDI3\*\*** change to high.

The alarm is only monitored if the following condition is met:

- \*\*NacelleDI3.Config\*\*** is 4 - User Alarm.

The alarm is auto acknowledged, if **\*\*IO.UserDefinedIONacelleDI3\*\*** change.

|                        |                             |                                       |           |
|------------------------|-----------------------------|---------------------------------------|-----------|
| <b>No: 4936</b>        | <b>SupervisionID</b> 4936   | <b>Name</b> UserDefinedIONacelleDI4Sx |           |
| <b>Log text</b>        | User defined IO nacelle DI4 |                                       |           |
| <b>Subsystem name</b>  | UserDefinedIO               |                                       |           |
| <b>Type</b>            | Alarm                       | <b>Timeout</b>                        | <n/a>     |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b>                  | PauseSlow |
| - Allowed attempts     | 4                           | - Max time disconnect                 | 15 second |
| - Time window          | 1 hour                      | - Max time eliminate                  | 45 second |
| - Stabilize period     | 60 second                   | <b>Category</b>                       | Owner     |

**Criteria:**

The alarm indicates that the conditions for activation of a user defined alarm are met.

The alarm is raised if parameter **\*\*NacelleDI4.SignalInvert\*\*** is true and **\*\*IO.UserDefinedIONacelleDI4\*\*** change to low OR **\*\*NacelleDI4.SignalInvert\*\*** is false and **\*\*IO.UserDefinedIONacelleDI4\*\*** change to high.

The alarm is only monitored if the following condition is met:

- \*\*NacelleDI4.Config\*\*** is 4 - User Alarm.

The alarm is auto acknowledged, if **\*\*IO.UserDefinedIONacelleDI4\*\*** change.

|                        |                           |                                   |
|------------------------|---------------------------|-----------------------------------|
| <b>No: 4941</b>        | <b>SupervisionID</b> 4941 | <b>Name</b> UserDefinedIOHubDI1Sx |
| <b>Log text</b>        | User defined IO hub DI1   |                                   |
| <b>Subsystem name</b>  | UserDefinedIO             |                                   |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>              |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow    |
| - Allowed attempts     | 4                         | - Max time disconnect 15 second   |
| - Time window          | 1 hour                    | - Max time eliminate 45 second    |
| - Stabilize period     | 60 second                 | <b>Category</b> Owner             |

**Criteria:**

The alarm indicates that the conditions for activation of a user defined alarm are met.

The alarm is raised if parameter **\*\*HubDI1.SignalInvert\*\*** is true and **\*\*IO.UserDefinedIOHubDI1\*\*** change to low OR **\*\*HubDI1.SignalInvert\*\*** is false and **\*\*IO.UserDefinedIOHubDI1\*\*** change to high.

The alarm is only monitored if the following condition is met:

1. **\*\*HubDI1.Config\*\*** is 4 - User Alarm.

The alarm is auto acknowledged, if **\*\*IO.UserDefinedIOHubDI1\*\*** change.

|                        |                           |                                   |
|------------------------|---------------------------|-----------------------------------|
| <b>No: 4942</b>        | <b>SupervisionID</b> 4942 | <b>Name</b> UserDefinedIOHubDI2Sx |
| <b>Log text</b>        | User defined IO hub DI2   |                                   |
| <b>Subsystem name</b>  | UserDefinedIO             |                                   |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>              |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow    |
| - Allowed attempts     | 4                         | - Max time disconnect 15 second   |
| - Time window          | 1 hour                    | - Max time eliminate 45 second    |
| - Stabilize period     | 60 second                 | <b>Category</b> Owner             |

**Criteria:**

The alarm indicates that the conditions for activation of a user defined alarm are met.

The alarm is raised if parameter **\*\*HubDI2.SignalInvert\*\*** is true and **\*\*IO.UserDefinedIOHubDI2\*\*** change to low OR **\*\*HubDI2.SignalInvert\*\*** is false and **\*\*IO.UserDefinedIOHubDI2\*\*** change to high.

The alarm is only monitored if the following condition is met:

1. **\*\*HubDI2.Config\*\*** is 4 - User Alarm.

The alarm is auto acknowledged, if **\*\*IO.UserDefinedIOHubDI2\*\*** change.

|                        |                           |                                   |
|------------------------|---------------------------|-----------------------------------|
| <b>No: 4943</b>        | <b>SupervisionID</b> 4943 | <b>Name</b> UserDefinedIOHubDI3Sx |
| <b>Log text</b>        | User defined IO hub DI3   |                                   |
| <b>Subsystem name</b>  | UserDefinedIO             |                                   |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>              |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow    |
| - Allowed attempts     | 4                         | - Max time disconnect 15 second   |
| - Time window          | 1 hour                    | - Max time eliminate 45 second    |
| - Stabilize period     | 60 second                 | <b>Category</b> Owner             |

**Criteria:**

The alarm indicates that the conditions for activation of a user defined alarm are met.

The alarm is raised if parameter **\*\*HubDI3.SignalInvert\*\*** is true and **\*\*IO.UserDefinedIOHubDI3\*\*** change to low OR **\*\*HubDI3.SignalInvert\*\*** is false and **\*\*IO.UserDefinedIOHubDI3\*\*** change to high.

The alarm is only monitored if the following condition is met:

1. **\*\*HubDI3.Config\*\*** is 4 - User Alarm.

The alarm is auto acknowledged, if **\*\*IO.UserDefinedIOHubDI3\*\*** change.

|                        |                           |                                   |
|------------------------|---------------------------|-----------------------------------|
| <b>No: 4944</b>        | <b>SupervisionID</b> 4944 | <b>Name</b> UserDefinedIOHubDI4Sx |
| <b>Log text</b>        | User defined IO hub DI4   |                                   |
| <b>Subsystem name</b>  | UserDefinedIO             |                                   |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>              |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow    |
| - Allowed attempts     | 4                         | - Max time disconnect 15 second   |
| - Time window          | 1 hour                    | - Max time eliminate 45 second    |
| - Stabilize period     | 60 second                 | <b>Category</b> Owner             |

**Criteria:**

The alarm indicates that the conditions for activation of a user defined alarm are met.

The alarm is raised if parameter **\*\*HubDI4.SignalInvert\*\*** is true and **\*\*IO.UserDefinedIOHubDI4\*\*** change to low OR **\*\*HubDI4.SignalInvert\*\*** is false and **\*\*IO.UserDefinedIOHubDI4\*\*** change to high.

The alarm is only monitored if the following condition is met:

1. **\*\*HubDI4.Config\*\*** is 4 - User Alarm.

The alarm is auto acknowledged, if **\*\*IO.UserDefinedIOHubDI4\*\*** change.

|                        |                           |                                 |
|------------------------|---------------------------|---------------------------------|
| <b>No: 4949</b>        | <b>SupervisionID</b> 4949 | <b>Name</b> GridQUProtectionSx  |
| <b>Log text</b>        | Grid QU Protection        |                                 |
| <b>Subsystem name</b>  | UserDefinedIO             |                                 |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>            |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow  |
| - Allowed attempts     | 4                         | - Max time disconnect 15 second |
| - Time window          | 1 hour                    | - Max time eliminate 45 second  |
| - Stabilize period     | 60 second                 | <b>Category</b> Utility         |

**Criteria:**

Activated when a user input that is configured to trigger this alarm change to active condition.

The alarm is auto acknowledged, if the input change.

|                        |                               |                                                     |
|------------------------|-------------------------------|-----------------------------------------------------|
| <b>No: 4950</b>        | <b>SupervisionID</b> 4950     | <b>Name</b> HighRotorSpeedAndFreezeInactiveValvesSx |
| <b>Log text</b>        | HighRotSpd FreezeInact Valves |                                                     |
| <b>Subsystem name</b>  | PiVM                          |                                                     |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                                |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> StopSlow                       |
| - Allowed attempts     | 3                             | - Max time disconnect 9 second                      |
| - Time window          | 24 hour                       | - Max time eliminate 9 second                       |
| - Stabilize period     | 60 second                     | <b>Category</b> Manufacturer                        |

**Criteria:**

This supervision monitors if the inactive valves are configured to be frozen during manual functions and the rotor speed at the same time gets too high.

This alarm is activated if the following conditions are met:

1. Inactive valves are frozen during manual functions
2. **\*\*ProdCtrl.SP\\_RotorSpdEst\*\* > \*\*PiVM\\_FreezeInactiveValves\\_MaxRotorSpd\*\***

|                        |                                |                                          |
|------------------------|--------------------------------|------------------------------------------|
| <b>No: 4951</b>        | <b>SupervisionID</b> 4951      | <b>Name</b> UserDefinedIOConfigInvalidSx |
| <b>Log text</b>        | UserDefined IO invalid conf __ |                                          |
| <b>Subsystem name</b>  | UserDefinedIO                  |                                          |
| <b>Type</b>            | Warning                        | <b>Timeout</b> <disabled>                |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> <n/a>               |
| - Allowed attempts     | Unlimited                      | - Max time disconnect <n/a>              |
| - Time window          | <n/a>                          | - Max time eliminate <n/a>               |
| - Stabilize period     | 0 second                       | <b>Category</b> Manufacturer             |

**Criteria:**

The alarm indicates that the conditions for activation of a user defined alarm are met..

|                        |                               |                                    |
|------------------------|-------------------------------|------------------------------------|
| <b>No: 4955</b>        | <b>SupervisionID</b> 4955     | <b>Name</b> IceDetectorCommErrorSx |
| <b>Log text</b>        | NoCcommunicationToVID Warning |                                    |
| <b>Subsystem name</b>  | IceDetector                   |                                    |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>          |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>         |
| - Allowed attempts     | Unlimited                     | - Max time disconnect <n/a>        |
| - Time window          | <n/a>                         | - Max time eliminate <n/a>         |
| - Stabilize period     | 10 second                     | <b>Category</b> Manufacturer       |

**Criteria:**

Warning to indicate that the communication to the VID unit is Not Ok.

This warning is triggered if the following conditions are met:

- The IO.IceDetectorCommunicationOk is false

The warning can be acknowledged when signal IO.IceDetectorCommunicationOk becomes true.



|                           |                           |                                         |
|---------------------------|---------------------------|-----------------------------------------|
| <b>No: 4957</b>           | <b>SupervisionID</b> 4957 | <b>Name</b> IceDetectorSystemNotAliveSx |
| <b>Log text</b>           | AliveSignal Warning Error |                                         |
| <b>Subsystem name</b>     | IceDetector               |                                         |
| <b>Type</b>               | Warning                   | <b>Timeout</b> <disabled>               |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b> <n/a>              |
| - <b>Allowed attempts</b> | Unlimited                 | - <b>Max time disconnect</b> <n/a>      |
| - <b>Time window</b>      | <n/a>                     | - <b>Max time eliminate</b> <n/a>       |
| - <b>Stabilize period</b> | 10 second                 | <b>Category</b> Manufacturer            |

**Criteria:**

This Warning is to indicate that the VID alive signal is Not Ok.

This warning is triggered if the following condition is met:

- IO.IceDetectorCabinetAlive is false

The warning can be acknowledged when IO.IceDetectorCabinetAlive becomes true.

|                           |                              |                                          |
|---------------------------|------------------------------|------------------------------------------|
| <b>No: 4958</b>           | <b>SupervisionID</b> 4958    | <b>Name</b> IceDetectorEvaluationErrorSx |
| <b>Log text</b>           | EvaluationSignal Alarm Error |                                          |
| <b>Subsystem name</b>     | IceDetector                  |                                          |
| <b>Type</b>               | Alarm                        | <b>Timeout</b> <n/a>                     |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b> PauseSlow           |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b> 9 second    |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b> 10 second    |
| - <b>Stabilize period</b> | 10 second                    | <b>Category</b> Manufacturer             |

**Criteria:**

Alarm to pause the turbine, as VID cabinet data signal Not Ok with IceThrowRisk(low temperature with rotation) so its not possible to detect ice.

Furthermore the weather condition incidcates that there can be risk for ice throw if the turbine starts to rotate too fast.

This alarm is triggered if the following conditions are met:

- IO.IceDetectorCabinetAliveStatus is true
- IO.IceDetectorCabinetDataOk is false
- IceThrowRisk is true

The alarm can be acknowledged when condition IO.IceDetectorCabinetDataOk becomes true or IceThrowRisk becomes false

|                           |                                |                                                 |
|---------------------------|--------------------------------|-------------------------------------------------|
| <b>No: 4959</b>           | <b>SupervisionID</b> 4959      | <b>Name</b> IceDetectorEvaluationErrorWarningSx |
| <b>Log text</b>           | EvaluationSignal Warning Error |                                                 |
| <b>Subsystem name</b>     | IceDetector                    |                                                 |
| <b>Type</b>               | Warning                        | <b>Timeout</b> <disabled>                       |
| <b>Acknowledgement</b>    | Auto                           | <b>Shutdown type</b> <n/a>                      |
| - <b>Allowed attempts</b> | Unlimited                      | - <b>Max time disconnect</b> <n/a>              |
| - <b>Time window</b>      | <n/a>                          | - <b>Max time eliminate</b> <n/a>               |
| - <b>Stabilize period</b> | 10 second                      | <b>Category</b> Manufacturer                    |

**Criteria:**

Warning to indicate that the VID cabinet data signal is Not Ok

This warning is triggered if the following conditions are met:

- IO.IceDetectorCabinetAliveStatus is true
- IO.IceDetectorCabinetDataOk is false

The warning can be acknowledged when condition IO.IceDetectorCabinetDataOk becomes true

|                           |                                |                                             |
|---------------------------|--------------------------------|---------------------------------------------|
| <b>No: 4961</b>           | <b>SupervisionID</b> 4961      | <b>Name</b> IceDetectorCommissioningErrorSx |
| <b>Log text</b>           | WrongCommissioningInVIDWarning |                                             |
| <b>Subsystem name</b>     | IceDetector                    |                                             |
| <b>Type</b>               | Warning                        | <b>Timeout</b> <disabled>                   |
| <b>Acknowledgement</b>    | Auto                           | <b>Shutdown type</b> <n/a>                  |
| - <b>Allowed attempts</b> | Unlimited                      | - <b>Max time disconnect</b> <n/a>          |
| - <b>Time window</b>      | <n/a>                          | - <b>Max time eliminate</b> <n/a>           |
| - <b>Stabilize period</b> | 10 second                      | <b>Category</b> Manufacturer                |

**Criteria:**

Warning to indicate that the VID unit was commissioned incorrectly and the system cannot function.

This warning is triggered if the following conditions are met:

- IO.IceDetectorCabinetAliveStatus is true
- IO.IceDetectorSystemOk is false

The warning can be acknowledged when IceDetectorSystemOk signal becomes true.

|                           |                           |                                            |
|---------------------------|---------------------------|--------------------------------------------|
| <b>No: 4962</b>           | <b>SupervisionID</b> 4962 | <b>Name</b> IceDetectorCalibrationActiveSx |
| <b>Log text</b>           | Calibration Warning       |                                            |
| <b>Subsystem name</b>     | IceDetector               |                                            |
| <b>Type</b>               | Warning                   | <b>Timeout</b> <disabled>                  |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b> <n/a>                 |
| - <b>Allowed attempts</b> | Unlimited                 | - <b>Max time disconnect</b> <n/a>         |
| - <b>Time window</b>      | <n/a>                     | - <b>Max time eliminate</b> <n/a>          |
| - <b>Stabilize period</b> | 10 second                 | <b>Category</b> Manufacturer               |

**Criteria:**

Warning to indicate that the VID unit is in calibration mode.

This warning is triggered if the following conditions are met:

- IO.IceDetectorCabinetAliveStatus is true
- IO.IceDetectorWrongCommissioningSysOk is false

The warning can be acknowledged when one of the above condition become false.

|                           |                                |                                                         |
|---------------------------|--------------------------------|---------------------------------------------------------|
| <b>No: 4963</b>           | <b>SupervisionID</b> 4963      | <b>Name</b> IceDetectorIceDetectedInBladeAutoAckAlarmSx |
| <b>Log text</b>           | IceDetectedInBladeAutoAckAlarm |                                                         |
| <b>Subsystem name</b>     | IceDetector                    |                                                         |
| <b>Type</b>               | Alarm                          | <b>Timeout</b> <n/a>                                    |
| <b>Acknowledgement</b>    | Auto                           | <b>Shutdown type</b> PauseSlow                          |
| - <b>Allowed attempts</b> | Unlimited                      | - <b>Max time disconnect</b> 9 second                   |
| - <b>Time window</b>      | <n/a>                          | - <b>Max time eliminate</b> 3600 second                 |
| - <b>Stabilize period</b> | 10 second                      | <b>Category</b> Environmental                           |

**Criteria:**

Alarm to pause the turbine, Turbine will be paused until no ice detected.

This Alarm is triggered if the following conditions are met:

- If Px\_IceDetectorSupervisionStrategy = Variant 1
- IceDetectorIceDetectedProvidedBySCADA is true or
- IceDetectorIceDetectedProvidedByVID is IceDetected and Px\_IceDetectorInHubInstalled is true

The Alarm can only be auto acknowledged when no ice detected.

|                           |                            |                                        |
|---------------------------|----------------------------|----------------------------------------|
| <b>No: 4987</b>           | <b>SupervisionID</b> 4987  | <b>Name</b> GeneratorSpeedHighInIdleSx |
| <b>Log text</b>           | GenSpd:__.RPM, Ref:__. RPM |                                        |
| <b>Subsystem name</b>     | SV                         |                                        |
| <b>Type</b>               | Alarm                      | <b>Timeout</b> <n/a>                   |
| <b>Acknowledgement</b>    | Remote                     | <b>Shutdown type</b> StopSlow          |
| - <b>Allowed attempts</b> | <n/a>                      | - <b>Max time disconnect</b> 3 second  |
| - <b>Time window</b>      | <n/a>                      | - <b>Max time eliminate</b> 9 second   |
| - <b>Stabilize period</b> | <n/a>                      | <b>Category</b> Manufacturer           |

**Criteria:**

This supervision monitors **\*\*GeneratorTachoSpeed\*\*** (measured on the high speed side) when the turbine is in Idle and reacts when it exceeds an upper limit value.

An alarm is issued if following conditions are met:

1. **\*\*SV\\_GenSpdHighIdle\\_ActivityLevel\*\*** = 2
2. **\*\*GeneratorTachoSpeed\*\*** is greater than **\*\*SV\\_RtdSpd\*\*** \* **\*\*SV\\_GenSpdHighIdle\\_NomSpeedIdleLimitGain\*\*** (Default: rated speed \* 0.5)

|                           |                           |                                             |
|---------------------------|---------------------------|---------------------------------------------|
| <b>No: 5000</b>           | <b>SupervisionID</b> 5000 | <b>Name</b> GeneratorLubrReturnValveErrorSx |
| <b>Log text</b>           | GenLubrRetValve Error     |                                             |
| <b>Subsystem name</b>     | GeneratorLubrication      |                                             |
| <b>Type</b>               | Warning                   | <b>Timeout</b> 90 day                       |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b> PauseSlow              |
| - <b>Allowed attempts</b> | Unlimited                 | - <b>Max time disconnect</b> 15 second      |
| - <b>Time window</b>      | <n/a>                     | - <b>Max time eliminate</b> 45 second       |
| - <b>Stabilize period</b> | 0 second                  | <b>Category</b> Manufacturer                |

**Criteria:**

This warning is raised if the return valve is failing. I.e - the proximity switch changes level too many times when the grease mixing is active.

The warning is only monitored when the Grease Mixing Operation is Performed. I.e - both **\*\*IO.GeneratorLubrPumpStart\*\*** and **\*\*IO.GeneratorLubrReturnValveActivate\*\*** are true.

The warning can be acknowledged if the Return Valve is Ok.( i.e - No Proximity Swith Movement during the Grease Mixing ) or Grease Mixing is Not Installed.

|                        |                                |                                                    |
|------------------------|--------------------------------|----------------------------------------------------|
| <b>No: 5007</b>        | <b>SupervisionID</b> 5007      | <b>Name</b> IceDetectorReplcePowerSurgeProtectorSx |
| <b>Log text</b>        | ReplacePowerSurgeProtectorWarn |                                                    |
| <b>Subsystem name</b>  | IceDetector                    |                                                    |
| <b>Type</b>            | Warning                        | <b>Timeout</b> <disabled>                          |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> <n/a>                         |
| - Allowed attempts     | Unlimited                      | - Max time disconnect <n/a>                        |
| - Time window          | <n/a>                          | - Max time eliminate <n/a>                         |
| - Stabilize period     | 10 second                      | <b>Category</b> Manufacturer                       |

**Criteria:**  
Warning to indicate that the VID's power surge protector is Not OK (Needs replacement).

This warning is triggered if the following conditions are met:

- IO.IceDetectorStatusVectorByte1Byte0 (BIT 14) is false

The warning can be acknowledged when IO.IceDetectorStatusVectorByte1Byte0 (BIT 14) is true.

|                        |                           |                                                                |
|------------------------|---------------------------|----------------------------------------------------------------|
| <b>No: 5008</b>        | <b>SupervisionID</b> 5008 | <b>Name</b> IceDetectorIceDetectedInBladeLocalManualAckAlarmSx |
| <b>Log text</b>        | IceDetected               |                                                                |
| <b>Subsystem name</b>  | IceDetector               |                                                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                                           |
| <b>Acknowledgement</b> | Local                     | <b>Shutdown type</b> PauseSlow                                 |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 9 second                                 |
| - Time window          | <n/a>                     | - Max time eliminate 3600 second                               |
| - Stabilize period     | <n/a>                     | <b>Category</b> Environmental                                  |

**Criteria:**  
Alarm to pause the turbine, Turbine will be paused until no ice detected.

This Alarm is triggered if the following conditions are met:

- If Px\_IceDetectorSupervisionStrategy = Variant 3
- IceDetectorIceDetectedProvidedBySCADA is true or
- IceDetectorIceDetectedProvidedByVID is IceDetected and Px\_IceDetectorInHubInstalled is true

The Alarm can only be acknowledged manually when no ice detected.

|                        |                           |                                       |
|------------------------|---------------------------|---------------------------------------|
| <b>No: 5009</b>        | <b>SupervisionID</b> 5009 | <b>Name</b> PowerDerateTimeExceededSx |
| <b>Log text</b>        | PowerDerateTimeExceeded   |                                       |
| <b>Subsystem name</b>  | ProductionManager         |                                       |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>             |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> <n/a>            |
| - Allowed attempts     | <n/a>                     | - Max time disconnect <n/a>           |
| - Time window          | <n/a>                     | - Max time eliminate <n/a>            |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer          |

**Criteria:**  
This warning triggered when power derate time exceeded by the source InternalDerateSource

No: 5010

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

This supervision triggered when speed derate time exceeded by the source InternalDerateSource

SupervisionID 5010

SpeedDerateTimeExceeded

ProductionManager

Alarm

Auto

3

3600 second

60 second

Name SpeedDerateTimeExceededSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

PauseSlow

3600 second

3600 second

Manufacturer

No: 5011

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

Blade loads automatic calibration has failed after AutoCalibrationErrorCountPx times

SupervisionID 5011

BladeLoads auto calib. failed

BladeLoads

Warning

Remote

<n/a>

<n/a>

<n/a>

Name BladeLoadsAutoCalibrationErrorSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<disabled>

<n/a>

<n/a>

<n/a>

Manufacturer

|                        |                              |                                               |              |
|------------------------|------------------------------|-----------------------------------------------|--------------|
| <b>No: 5013</b>        | <b>SupervisionID</b> 5013    | <b>Name</b> BladeLoadSensorFaultSupervisionSx |              |
| <b>Log text</b>        | BladeLoadSensorFaultDetected |                                               |              |
| <b>Subsystem name</b>  | BladeLoadSensing             |                                               |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                                | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                          | <n/a>        |
| - Allowed attempts     | 4                            | - Max time disconnect                         | <n/a>        |
| - Time window          | 1 hour                       | - Max time eliminate                          | <n/a>        |
| - Stabilize period     | 60 second                    | <b>Category</b>                               | Manufacturer |

**Criteria:**

This warning indicates that there is a fault with one or more of the blade load sensors. This warning can be Enabled/Disabled by setting parameter SensorFaultSupervisionEnabled.

This warning is active when one of the following conditions is detected:

1. A blade load sensor is unavailable.
2. A blade load sensor is saturated or out of range.
  - The detection can be enabled/disabled by setting parameter Pos1DetectSensorSaturationEnabled or Pos2DetectSensorSaturationEnabled.
  - Log "5017 SensorSaturationDetected" will provide more information on which blade, position and sensor is failing.
3. A blade load sensor is frozen or constant for more than a specified amount of time.
  - The detection can be enabled/disabled by setting parameter Pos1DetectFrozenSensorEnabled or Pos2DetectFrozenSensorEnabled.
  - Log "5018 FrozenSensorDetected" will provide more information on which blade, position and sensor is failing.
4. A blade load sensor has had a high fluctuation or large change in value over one time step.
  - The detection can be enabled/disabled by setting parameter Pos1DetectHighSensorFluctuationEnabled or Pos2DetectHighSensorFluctuationEnabled.
  - Log "5019 HighSensorFluctuationDetected" will provide more information on which blade, position and sensor is failing.

This warning will be acknowledged when there are no longer any faults with any blade load sensors.

When a warning is reported:

1. Check the IO status of the sensors and ensure all signals are available.
2. Check if there are any errors on the CAN bus or hub controller.
3. Check the power and CAN cables going out to the sensors.
4. Check the connectors. For optical cables, the connectors can be cleaned with alcohol.
5. Check the sensors for damage.

|                        |                           |                                         |              |
|------------------------|---------------------------|-----------------------------------------|--------------|
| <b>No: 5014</b>        | <b>SupervisionID</b> 5014 | <b>Name</b> BladeLoadFaultSupervisionSx |              |
| <b>Log text</b>        | BladeLoadFaultDetected    |                                         |              |
| <b>Subsystem name</b>  | BladeLoadSensing          |                                         |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                          | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                    | <n/a>        |
| - Allowed attempts     | 4                         | - Max time disconnect                   | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate                    | <n/a>        |
| - Stabilize period     | 60 second                 | <b>Category</b>                         | Manufacturer |

**Criteria:**

This warning indicates that an error has been detected with the blade loads. This warning can be Enabled/Disabled by setting parameter LoadFaultSupervisionEnabled.

This warning is active when one of the following conditions is detected:

1. A large deviation between a measured blade load (flap, edge, axial) and the estimated value has been detected.  
- Log "5025 BladeLoadEstimatorDeviationDetected" will provide more information on which blade and position is triggering.
2. A large deviation between the measured blade loads (flap, edge, axial) of two blades has been detected.  
- Log "5094 BladeToBladeLoadDeviationDetected" will provide more information on which blade and position is triggering.

This warning will be acknowledged when all loads are within the specified limits.

When a warning is reported:

1. A sudden change in the loading (i.e. wind gust, wind shear) may cause the measured loads to deviate from the estimator. No action required if only for a short time.
2. Certain operations may cause the blades to have different pitch which will cause the loads to differ between blades.
3. Re-calibrate if this warning is repeating for unexplained reasons.
4. If the deviations continue, check for azimuth or pitch offsets.

|                        |                              |                                                 |              |
|------------------------|------------------------------|-------------------------------------------------|--------------|
| <b>No: 5015</b>        | <b>SupervisionID</b> 5015    | <b>Name</b> BladeLoadNotCalibratedSupervisionSx |              |
| <b>Log text</b>        | BladeLoadSystemNotCalibrated |                                                 |              |
| <b>Subsystem name</b>  | BladeLoadSensing             |                                                 |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                                  | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                            | <n/a>        |
| - Allowed attempts     | 4                            | - Max time disconnect                           | <n/a>        |
| - Time window          | 1 hour                       | - Max time eliminate                            | <n/a>        |
| - Stabilize period     | 60 second                    | <b>Category</b>                                 | Manufacturer |

#### Criteria:

This warning indicates that the blade load sensors are not calibrated. This warning can be Enabled/Disabled by setting parameter NotCalibratedSupervisionEnabled.

- The detection can be enabled/disabled by setting parameter Pos1DetectMissingCalibrationEnabled and Pos2DetectMissingCalibrationEnabled.
- The following logs will provide more information:

1. 5020 BladeAMissingCalibrationDetected
2. 5021 BladeBMissingCalibrationDetected
3. 5022 BladeCMissingCalibrationDetected

This warning will be acknowledged when the blade load sensors are calibrated either manually or automatically.

When a warning is reported:

1. Perform a calibration using the test menu or wait for the scheduler (if enabled) to perform a calibration.

|                        |                             |                                                      |              |
|------------------------|-----------------------------|------------------------------------------------------|--------------|
| <b>No: 5016</b>        | <b>SupervisionID</b> 5016   | <b>Name</b> BladeLoadCalibrationExpiredSupervisionSx |              |
| <b>Log text</b>        | BladeLoadCalibrationExpired |                                                      |              |
| <b>Subsystem name</b>  | BladeLoadSensing            |                                                      |              |
| <b>Type</b>            | Warning                     | <b>Timeout</b>                                       | <disabled>   |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b>                                 | <n/a>        |
| - Allowed attempts     | 4                           | - Max time disconnect                                | <n/a>        |
| - Time window          | 1 hour                      | - Max time eliminate                                 | <n/a>        |
| - Stabilize period     | 60 second                   | <b>Category</b>                                      | Manufacturer |

#### Criteria:

This warning indicates that the calibration of the blade load sensors has expired. This warning can be Enabled/Disabled by setting parameter CalibrationExpiredSupervisionEnabled.

- The detection can be enabled/disabled by setting parameter Pos1DetectExpiredCalibrationEnabled or Pos2DetectExpiredCalibrationEnabled.
- Log "5023 ExpiredCalibrationDetected" will provide more information on which blade and position has expired.

This warning will be acknowledged when the blade load sensors are re-calibrated either manually or automatically.

When a warning is reported:

1. Perform a calibration using the test menu or wait for the scheduler (if enabled) to perform a re-calibration.



|                        |                             |                                                         |              |
|------------------------|-----------------------------|---------------------------------------------------------|--------------|
| <b><u>No: 5031</u></b> | <b>SupervisionID</b>        | <b>Name</b> SideSideTowerDampingTowerAccelSensorErrorSx |              |
|                        | 5031                        |                                                         |              |
| <b>Log text</b>        | SideSideTwrDampTwrAccSenErr |                                                         |              |
| <b>Subsystem name</b>  | ProdCtrl                    |                                                         |              |
| <b>Type</b>            | Warning                     | <b>Timeout</b>                                          | 90 day       |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b>                                    | PauseSlow    |
| - Allowed attempts     | 3                           | - Max time disconnect                                   | 1 hour       |
| - Time window          | 1 hour                      | - Max time eliminate                                    | 1 hour       |
| - Stabilize period     | 60 second                   | <b>Category</b>                                         | Manufacturer |

**Criteria:**  
This supervision informs that the Side-Side Tower Damping control feature is not working because of invalid tower accelerometer sensor.

A warning will be issued whenever any supervision monitoring the tower accelerometer on the cross wind direction has detected an issue.  
(e.g. signal invalid LogNo.910, no zero cross LogNo.4226, signal dead LogNo.4225).  
If other supervisions are not active then the sensor might have been driven into saturation while the turbine yawing.  
If this warning comes often but not any other sensor related alarm (e.g. signal invalid LogNo.910, no zero cross LogNo.4226, signal dead LogNo.4225)  
then the yaw sliding surface shall be lubricated or the yaw lubrication strategy shall be changed.

This alarm is activated if the following conditions are met

1. Px\_SSTD\_Pitch\_ActivityLevel = 2 OR Px\_SSTD\_Power\_ActivityLevel = 2
2. There are errors in the tower accelerometer measurement (e.g. signal invalid LogNo.910, no zero cross LogNo.4226, signal dead LogNo.4225)

The alarm is deactivated when the detected tower accelerometer errors are cleared.

|                        |                              |                                         |              |
|------------------------|------------------------------|-----------------------------------------|--------------|
| <b>No: 5032</b>        | <b>SupervisionID</b> 5032    | <b>Name</b> AviationEquipmentUPSErrorSx |              |
| <b>Log text</b>        | Aviation Equipment UPS Error |                                         |              |
| <b>Subsystem name</b>  | NavigationAid                |                                         |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                          | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                    | <n/a>        |
| - Allowed attempts     | 3                            | - Max time disconnect                   | <n/a>        |
| - Time window          | 1 hour                       | - Max time eliminate                    | <n/a>        |
| - Stabilize period     | 10 second                    | <b>Category</b>                         | Manufacturer |

**Criteria:**  
The warning indicates an error in aviation equipment UPS system

The warning is raised when the signal **\*\*IO.AviationEquipmentUPSOk\*\*** has been false for **\*\*AviationEquipmentUPSOkStableTime\*\***.

The warning is auto acknowledged if the signal **\*\*IO.AviationEquipmentUPSOk\*\*** changes to true.

|                        |                           |                                     |              |
|------------------------|---------------------------|-------------------------------------|--------------|
| <b><u>No: 5033</u></b> | <b>SupervisionID</b> 5033 | <b>Name</b> SARLightFeedbackErrorSx |              |
| <b>Log text</b>        | SAR Light Feedback Error  |                                     |              |
| <b>Subsystem name</b>  | NavigationAid             |                                     |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                      | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect               | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate                | <n/a>        |
| - Stabilize period     | 10 second                 | <b>Category</b>                     | Manufacturer |

#### Criteria:

The warning indicates the SAR light system error

The warning is raised if the feedback signal **\*\*IO.SARLightTurnedOn\*\*** is not equal to the output signal **\*\*IO.SARLightOn\*\*** for **\*\*SARLightFeedbackStableTime\*\***.

The warning is auto acknowledged if the signal **\*\*IO.SARLightTurnedOn\*\*** equal to **\*\*IO.SARLightOn\*\***.

|                        |                              |                                          |              |
|------------------------|------------------------------|------------------------------------------|--------------|
| <b>No: 5036</b>        | <b>SupervisionID</b> 5036    | <b>Name</b> NacelleInletHatchOpenErrorSx |              |
| <b>Log text</b>        | NacelleInletHatch open error |                                          |              |
| <b>Subsystem name</b>  | NacelleTempCtrl              |                                          |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                           | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                     | <n/a>        |
| - Allowed attempts     | Unlimited                    | - Max time disconnect                    | <n/a>        |
| - Time window          | <n/a>                        | - Max time eliminate                     | <n/a>        |
| - Stabilize period     | 10 second                    | <b>Category</b>                          | Manufacturer |

#### Criteria:

This warning indicates that there is a feedback open error on the nacelle inlet hatch.

The warning is raised if the output signal **\*\*IO.NacelleInletHatchOpen\*\*** is true and the corresponding feedback input **\*\*IO.NacelleInletHatchOpened\*\*** is not true within a period of **\*\*NacelleInletHatchReachEndstopTime\*\***.

The warning can be acknowledged when the two signals **\*\*IO.NacelleInletHatchOpen\*\*** and **\*\*IO.NacelleInletHatchOpened\*\*** are aligned at either true or false level.

|                        |                               |                                           |              |
|------------------------|-------------------------------|-------------------------------------------|--------------|
| <b><u>No: 5037</u></b> | <b>SupervisionID</b> 5037     | <b>Name</b> NacelleInletHatchCloseErrorSx |              |
| <b>Log text</b>        | NacelleInletHatch close error |                                           |              |
| <b>Subsystem name</b>  | NacelleTempCtrl               |                                           |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                            | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                      | <n/a>        |
| - Allowed attempts     | Unlimited                     | - Max time disconnect                     | <n/a>        |
| - Time window          | <n/a>                         | - Max time eliminate                      | <n/a>        |
| - Stabilize period     | 10 second                     | <b>Category</b>                           | Manufacturer |

#### Criteria:

This warning indicates that there is a feedback close error on the nacelle inlet hatch.

The warning is raised if the output signal **\*\*IO.NacelleInletHatchClose\*\*** is true and the corresponding feedback input **\*\*IO.NacelleInletHatchClosed\*\*** is not true within a period of **\*\*NacelleInletHatchReachEndstopTime\*\***.

The warning can be acknowledged when the two signals **\*\*IO.NacelleInletHatchClose\*\*** and **\*\*IO.NacelleInletHatchClosed\*\*** are aligned at either true or false level.

|                        |                               |                                           |
|------------------------|-------------------------------|-------------------------------------------|
| <b>No: 5038</b>        | <b>SupervisionID</b> 5038     | <b>Name</b> NacelleOutletHatchOpenErrorSx |
| <b>Log text</b>        | NacelleOutletHatch open error |                                           |
| <b>Subsystem name</b>  | NacelleTempCtrl               |                                           |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | Unlimited                     | - Max time disconnect <n/a>               |
| - Time window          | <n/a>                         | - Max time eliminate <n/a>                |
| - Stabilize period     | 10 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that there is a feedback open error on the nacelle outlet hatch.

The warning is raised if the output signal **\*\*IO.NacelleOutletHatchOpen\*\*** is true and the corresponding feedback input **\*\*IO.NacelleOutletHatchOpened\*\*** is not true within a period of **\*\*NacelleOutletHatchReachEndstopTime\*\***.

The warning can be acknowledged when the two signals **\*\*IO.NacelleOutletHatchOpen\*\*** and **\*\*IO.NacelleOutletHatchOpened\*\*** are aligned at either true or false level.

|                        |                                |                                            |
|------------------------|--------------------------------|--------------------------------------------|
| <b>No: 5039</b>        | <b>SupervisionID</b> 5039      | <b>Name</b> NacelleOutletHatchCloseErrorSx |
| <b>Log text</b>        | NacelleOutletHatch close error |                                            |
| <b>Subsystem name</b>  | NacelleTempCtrl                |                                            |
| <b>Type</b>            | Warning                        | <b>Timeout</b> <disabled>                  |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> <n/a>                 |
| - Allowed attempts     | Unlimited                      | - Max time disconnect <n/a>                |
| - Time window          | <n/a>                          | - Max time eliminate <n/a>                 |
| - Stabilize period     | 10 second                      | <b>Category</b> Manufacturer               |

**Criteria:**

This warning indicates that there is a feedback open error on the nacelle outlet hatch.

The warning is raised if the output signal **\*\*IO.NacelleOutletHatchClose\*\*** is true and the corresponding feedback input **\*\*IO.NacelleOutletHatchClosed\*\*** is not true within a period of **\*\*NacelleOutletHatchReachEndstopTime\*\***.

The warning can be acknowledged when the two signals **\*\*IO.NacelleOutletHatchClose\*\*** and **\*\*IO.NacelleOutletHatchClosed\*\*** are aligned at either true or false level.

|                        |                           |                               |
|------------------------|---------------------------|-------------------------------|
| <b>No: 5040</b>        | <b>SupervisionID</b> 5040 | <b>Name</b> NacelleFanErrorSx |
| <b>Log text</b>        | Nacelle fan error         |                               |
| <b>Subsystem name</b>  | NacelleTempCtrl           |                               |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>     |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>    |
| - Allowed attempts     | Unlimited                 | - Max time disconnect <n/a>   |
| - Time window          | <n/a>                     | - Max time eliminate <n/a>    |
| - Stabilize period     | 10 second                 | <b>Category</b> Manufacturer  |

**Criteria:**

This warning indicates that frequency converter of the variable speed nacelle fan reports an error.

The warning is raised if the signal **\*\*IO.NacelleFanOk\*\*** is false for a period longer than **\*\*NacelleFanOkStableTime\*\***.

The warning is auto acknowledged when the NacelleFanOk signal changes to true.

|                           |                             |                              |                                                |
|---------------------------|-----------------------------|------------------------------|------------------------------------------------|
| <b><u>No: 5041</u></b>    | <b>SupervisionID</b>        | <b>Name</b>                  | SideSideTowerDampingRotorPositionSensorErrorSx |
|                           | 5041                        |                              |                                                |
| <b>Log text</b>           | SideSideTwrDampRotPosSenErr |                              |                                                |
| <b>Subsystem name</b>     | ProdCtrl                    |                              |                                                |
| <b>Type</b>               | Warning                     | <b>Timeout</b>               | 90 day                                         |
| <b>Acknowledgement</b>    | Auto                        | <b>Shutdown type</b>         | PauseSlow                                      |
| <b>- Allowed attempts</b> | 3                           | <b>- Max time disconnect</b> | 1 hour                                         |
| <b>- Time window</b>      | 1 hour                      | <b>- Max time eliminate</b>  | 1 hour                                         |
| <b>- Stabilize period</b> | 60 second                   | <b>Category</b>              | Manufacturer                                   |
| <b>Criteria:</b>          |                             |                              |                                                |

This supervision informs that the Side-Side Tower Damping load reducing feature is not working because of invalid rotor position sensor.

This alarm is activated if the following conditions are met

1. Px\_SSTD\_Pitch\_ActivityLevel = 2
  2. There are errors in the rotor position measurement (A warning related to the sensor is visible additionally to this one)
- The alarm is deactivated when the rotor sensor errors are cleared.

|                        |                              |                                          |
|------------------------|------------------------------|------------------------------------------|
| <b><u>No: 5054</u></b> | <b>SupervisionID</b> 5054    | <b>Name</b> TowerOscillationXBladeFreqSx |
| <b>Log text</b>        | TowAcc Whirl Frq P __. N __. |                                          |
| <b>Subsystem name</b>  | SV                           |                                          |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                     |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow            |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second           |
| - Time window          | 1 hour                       | - Max time eliminate 9 second            |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer             |
| <b>Criteria:</b>       |                              |                                          |

This supervision monitors the Tower oscillations in sidewise direction ( lateral) during normal operation near the two whirling mode frequencies (blade edgewise frequency +/- 1P frequency) and reacts when the oscillation exceeds the limit value.

This alarm is activated if the following conditions are met:

1. SV\_TowOscXBladeFreq\_ActivityLevelPx = 2
2. \*\*TowerAccelerationXDirectionFilt\*\* Status is Valid
3. SV\_TowOscX\_NegWhirl\_Level > SV\_TowOscXBladeFreq\_NegWhirl\_VibrLevelPx OR SV\_TowOscX\_NegWhirl\_Level > SV\_TowOscXBladeFreq\_NegWhirl\_VibrLevelPx

The SV\_TowOscX\_NegWhirl\_Level and SV\_TowOscX\_PosWhirl\_Level are calculated as root-mean-square of \*\*TowerAccelerationXDirectionFilt\*\* bandpass filtered (time constant/window length of SV\_TowOscXBladeFreq\_BladeEdgeRMSTimeConstPx seconds) at the whirling mode frequencies (SV\_TowOscXBladeFreq\_BladeEdgeFrequencyPx +/- 1P frequency). The 1P frequency (once per rotation) is obtained from the \*\*SP\\_RotorSpdEst\*\* at a SV\_TowOscXBladeFreq\_RotSpdFiltTimePx second filter.

**No: 5055**                      **SupervisionID** 509   **Name** SlowIdleSx  
**Log text**                      Commanded pause slow  
**Subsystem name**              SV  
**Type**                          Alarm                              **Timeout**                          <n/a>  
**Acknowledgement**              Auto                              **Shutdown type**                  PauseSlow  
- **Allowed attempts**              Unlimited                      - **Max time disconnect**              9 second  
- **Time window**                  <n/a>                          - **Max time eliminate**              10 second  
- **Stabilize period**              10000 second                  **Category**                          Manufacturer  
**Criteria:**  
Production Control - Internal Test Supervision 1

**No: 5056**                      **SupervisionID** 510   **Name** FastIdleSx  
**Log text**                      Commanded pause fast  
**Subsystem name**              SV  
**Type**                          Alarm                              **Timeout**                          <n/a>  
**Acknowledgement**              Auto                              **Shutdown type**                  PauseFast  
- **Allowed attempts**              Unlimited                      - **Max time disconnect**              8 second  
- **Time window**                  <n/a>                          - **Max time eliminate**              10000 second  
- **Stabilize period**              10000 second                  **Category**                          Manufacturer  
**Criteria:**  
Production Control - Internal Test Supervision 2

**No: 5057**                      **SupervisionID** 511   **Name** SlowStopSx  
**Log text**                      Commanded stop slow  
**Subsystem name**              SV  
**Type**                          Alarm                              **Timeout**                          <n/a>  
**Acknowledgement**              Auto                              **Shutdown type**                  StopSlow  
- **Allowed attempts**              Unlimited                      - **Max time disconnect**              3 second  
- **Time window**                  <n/a>                          - **Max time eliminate**              9 second  
- **Stabilize period**              10000 second                  **Category**                          Manufacturer  
**Criteria:**  
Production Control - Internal Test Supervision 3

**No: 5058**                      **SupervisionID** 512   **Name** FastStopSx  
**Log text**                      Commanded stop fast  
**Subsystem name**              SV  
**Type**                          Alarm                              **Timeout**                          <n/a>  
**Acknowledgement**              Remote                              **Shutdown type**                  StopFast  
- **Allowed attempts**              <n/a>                          - **Max time disconnect**              0,9 second  
- **Time window**                  <n/a>                          - **Max time eliminate**              10000 second  
- **Stabilize period**              <n/a>                          **Category**                          Manufacturer  
**Criteria:**  
Production Control - Internal Test Supervision 4

No: 5059

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 513

Commanded emc alarm

SV

Alarm

Remote

<n/a>

<n/a>

<n/a>

Production Control - Internal Test Supervision 5

Name EmcSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

Emergency

0 second

0 second

Manufacturer

No: 5066

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 5066

Rotor Left Locked

PiSV

Alarm

Auto

3

1 hour

1 minute

This supervision is triggered if the rotor has been left locked. Or is commanded into production with the rotor locked.

Name RotorLeftLockedSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

PauseFast

8 second

1 hour

Manufacturer

This alarm is active if the rotor should be rotating but is not,

1. **\*\*PiSV\\_RotorLeftLocked\\_ActivityLevel\*\*** = 2

2. **\*\*ProdCtrl.SP\\_RotorSpdEst\*\*** < **\*\*PiSV\\_RotorLeftLocked\\_MaxRotorSpd\*\***

3. **\*\*ProdCtrl.SP\\_WindSpdFiltLpFastAverage\*\*** > **PiSV\\_RotorLeftLocked\\_MinWindSpd**

4. **\*\*Yaw.UYC\\_TurbineIsUpwind\*\*** = true

5. **Max(\*\*PitchBladeAAngle\*\*,\*\*PitchBladeBAngle\*\*,\*\*PitchBladeCAngle\*\*)** < **\*\*PiSV\\_IdlePitchPos\*\*** + **\*\*PiSV\\_RotorLeftLocked\\_IdlePitchHyst\*\***

6. Pitch angles has been calibrated and are valid

It is then triggered if one of the two conditions are met,

- A) Personnel has left the turbine (**\*\*OperationManager.PointOfOperation\*\*** = remote)
- B) **\*\*ProdCtrl.ProductionControllerMainState\*\*** in (AwaitingTurbine, AwaitingWind) since turbine has been commanded into production

|                        |                                |                                         |              |
|------------------------|--------------------------------|-----------------------------------------|--------------|
| <b>No: 5067</b>        | <b>SupervisionID</b> 428       | <b>Name</b> PitchPositionASignalFaultSx |              |
| <b>Log text</b>        | Pitch pos A meas. signal fault |                                         |              |
| <b>Subsystem name</b>  | PiSP                           |                                         |              |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>                          | <n/a>        |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                    | StopSlow     |
| - Allowed attempts     | 3                              | - Max time disconnect                   | 3 second     |
| - Time window          | 1 hour                         | - Max time eliminate                    | 9 second     |
| - Stabilize period     | 60 second                      | <b>Category</b>                         | Manufacturer |

**Criteria:**

This supervision checks the validity of pitch position measurements for blade A.

An alarm is reported if following conditions are met:

- 1. **\*\*PiSP\\_PitchFault\\_ActivityLevel\*\*** = 2
- 2. Turbine is not in service
- 3. The signal PitchPistonAPositionRawStatus takes the value 2 (unavailable) for more than **\*\*PiSP\\_PitchFault\\_ErrorTime\*\*** sec,  
    where PitchPistonAPositionRawStatus is the status signal of **\*\*IO.PitchPistonAPositionRaw\*\***

|                        |                                |                                         |              |
|------------------------|--------------------------------|-----------------------------------------|--------------|
| <b>No: 5068</b>        | <b>SupervisionID</b> 429       | <b>Name</b> PitchPositionBSignalFaultSx |              |
| <b>Log text</b>        | Pitch pos B meas. signal fault |                                         |              |
| <b>Subsystem name</b>  | PiSP                           |                                         |              |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>                          | <n/a>        |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                    | StopSlow     |
| - Allowed attempts     | 3                              | - Max time disconnect                   | 3 second     |
| - Time window          | 1 hour                         | - Max time eliminate                    | 9 second     |
| - Stabilize period     | 60 second                      | <b>Category</b>                         | Manufacturer |

**Criteria:**

This supervision checks the validity of pitch position measurements for blade B.

An alarm is reported if following conditions are met:

- 1. **\*\*PiSP\\_PitchFault\\_ActivityLevel\*\*** = 2
- 2. Turbine is not in service
- 3. The signal PitchPistonBPositionRawStatus takes the value 2 (unavailable) for more than **\*\*PiSP\\_PitchFault\\_ErrorTime\*\*** sec,  
    where PitchPistonBPositionRawStatus is the status signal of **\*\*IO.PitchPistonBPositionRaw\*\***

|                        |                                |                                         |
|------------------------|--------------------------------|-----------------------------------------|
| <b>No: 5069</b>        | <b>SupervisionID</b> 430       | <b>Name</b> PitchPositionCSignalFaultSx |
| <b>Log text</b>        | Pitch pos C meas. signal fault |                                         |
| <b>Subsystem name</b>  | PiSP                           |                                         |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> StopSlow           |
| - Allowed attempts     | 3                              | - Max time disconnect 3 second          |
| - Time window          | 1 hour                         | - Max time eliminate 9 second           |
| - Stabilize period     | 60 second                      | <b>Category</b> Manufacturer            |

**Criteria:**

This supervision checks the validity of pitch position measurements for blade C.

An alarm is reported if following conditions are met:

1. **\*\*PiSP\\_PitchFault\\_ActivityLevel\*\*** = 2
2. Turbine is not in service
3. The signal PitchPistonCPositionRawStatus takes the value 2 (unavailable) for more than **\*\*PiSP\\_PitchFault\\_ErrorTime\*\*** sec,  
where PitchPistonCPositionRawStatus is the status signal of **\*\*IO.PitchPistonCPositionRaw\*\***

|                        |                           |                                   |
|------------------------|---------------------------|-----------------------------------|
| <b>No: 5079</b>        | <b>SupervisionID</b> 5079 | <b>Name</b> TransformerFanErrorSx |
| <b>Log text</b>        | Transformer fan error     |                                   |
| <b>Subsystem name</b>  | TransformerTempCtrl       |                                   |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>         |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>        |
| - Allowed attempts     | Unlimited                 | - Max time disconnect <n/a>       |
| - Time window          | <n/a>                     | - Max time eliminate <n/a>        |
| - Stabilize period     | 10 second                 | <b>Category</b> Manufacturer      |

**Criteria:**

This warning indicates that frequency converter of the variable speed transformer fan reports an error.

The warning is raised if the signal **\*\*IO.TransformerFanOk\*\*** is false for a period longer than **\*\*TransformerFanOkStableTime\*\***.

The warning is auto acknowledged when the TransformerFanOk signal changes to true.

|                        |                             |                                         |
|------------------------|-----------------------------|-----------------------------------------|
| <b>No: 5080</b>        | <b>SupervisionID</b> 5080   | <b>Name</b> TransformerHatchOpenErrorSx |
| <b>Log text</b>        | TransfHatchActuator1OpenErr |                                         |
| <b>Subsystem name</b>  | TransformerTempCtrl         |                                         |
| <b>Type</b>            | Warning                     | <b>Timeout</b> <disabled>               |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> <n/a>              |
| - Allowed attempts     | Unlimited                   | - Max time disconnect <n/a>             |
| - Time window          | <n/a>                       | - Max time eliminate <n/a>              |
| - Stabilize period     | 10 second                   | <b>Category</b> Manufacturer            |

**Criteria:**

This warning indicates that there is a feedback open error on the transformer hatch.

The warning is raised if the output signal **\*\*IO.TransformerHatchOpen\*\*** is true and the corresponding feedback input **\*\*IO.TransformerHatchOpened\*\*** is not true within a period of **\*\*TransformerHatchReachEndstopTime\*\***.

The warning can be acknowledged when the two signals **\*\*IO.TransformerHatchOpen\*\*** and **\*\*IO.TransformerHatchOpened\*\*** are alligned at either true or false level.



|                           |                              |                                          |              |
|---------------------------|------------------------------|------------------------------------------|--------------|
| <b>No: 5081</b>           | <b>SupervisionID</b> 5081    | <b>Name</b> TransformerHatchCloseErrorSx |              |
| <b>Log text</b>           | TransfHatchActuator1CloseErr |                                          |              |
| <b>Subsystem name</b>     | TransformerTempCtrl          |                                          |              |
| <b>Type</b>               | Warning                      | <b>Timeout</b>                           | <disabled>   |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b>                     | <n/a>        |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b>             | <n/a>        |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b>              | <n/a>        |
| - <b>Stabilize period</b> | 10 second                    | <b>Category</b>                          | Manufacturer |

#### Criteria:

This warning indicates that there is a feedback close error on the transformer hatch.

The warning is raised if the output signal **\*\*IO.TransformerHatchClose\*\*** is true and the corresponding feedback input **\*\*IO.TransformerHatchClosed\*\*** is not true within a period of **\*\*TransformerHatchReachEndstopTime\*\***.

The warning can be acknowledged when the two signals **\*\*IO.TransformerHatchClose\*\*** and **\*\*IO.TransformerHatchClosed\*\*** are aligned at either true or false level.

|                           |                           |                                                 |              |
|---------------------------|---------------------------|-------------------------------------------------|--------------|
| <b>No: 5084</b>           | <b>SupervisionID</b> 5084 | <b>Name</b> BladeLoadHighTxCurrentSupervisionSx |              |
| <b>Log text</b>           | BladeLoadHighTxCurrent    |                                                 |              |
| <b>Subsystem name</b>     | BladeLoadSensing          |                                                 |              |
| <b>Type</b>               | Warning                   | <b>Timeout</b>                                  | <disabled>   |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b>                            | <n/a>        |
| - <b>Allowed attempts</b> | 4                         | - <b>Max time disconnect</b>                    | <n/a>        |
| - <b>Time window</b>      | 1 hour                    | - <b>Max time eliminate</b>                     | <n/a>        |
| - <b>Stabilize period</b> | 60 second                 | <b>Category</b>                                 | Manufacturer |

#### Criteria:

This warning indicates that there is a fault with one or more of the blade load sensors. This warning can be Enabled/Disabled by setting parameter HighTxCurrentSupervisionEnabled.

This warning is triggered if the current of the transmit (Tx) diode is above the limit.

- The detection can be enabled/disabled by setting parameter Pos1DetectHighLoadSensorTxCurrentEnabled.
- Log "5085 BladeLoadHighTxCurrentDetected" will provide more information on which blade, position and sensor is failing.

This warning will be acknowledged when there are no longer any faults with any blade load sensors.

When a warning is reported:

1. If the warning is repeating or will not acknowledge, then the sensor may need to be replaced.

|                        |                                |                                                   |              |
|------------------------|--------------------------------|---------------------------------------------------|--------------|
| <b>No: 5088</b>        | <b>SupervisionID</b> 5088      | <b>Name</b> ConvGenWaterCoolingWaterLevelTooLowSx |              |
| <b>Log text</b>        | WaterLevelTooLowAlarm Error    |                                                   |              |
| <b>Subsystem name</b>  | ConverterGeneratorWaterCooling |                                                   |              |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>                                    | <n/a>        |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                              | PauseSlow    |
| - Allowed attempts     | 3                              | - Max time disconnect                             | 9 second     |
| - Time window          | 1 hour                         | - Max time eliminate                              | 10 second    |
| - Stabilize period     | 10 minute                      | <b>Category</b>                                   | Manufacturer |

**Criteria:**

The alarm indicates too low converter and generator water level in the expansion tank.

The alarm is raised if the ConvGenWaterCoolingWaterLevel drops below the minimum level specified by the parameter **\*\*TankLevel2\*\***, for more than the time interval given by the parameter **\*\*TankLevelStableTime\*\***.

This alarm is auto acknowledged if ConvGenWaterCoolingWaterLevel is equal or above the parameter **\*\*TankLevel2\*\*** + **\*\*TankLevelHyst\*\***.

|                        |                                |                                                   |              |
|------------------------|--------------------------------|---------------------------------------------------|--------------|
| <b>No: 5088</b>        | <b>SupervisionID</b> 5088      | <b>Name</b> ConvGenWaterCoolingWaterLevelTooLowSx |              |
| <b>Log text</b>        | WaterLevelTooLowAlarm Error    |                                                   |              |
| <b>Subsystem name</b>  | ConverterGeneratorWaterCooling |                                                   |              |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>                                    | <n/a>        |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                              | PauseSlow    |
| - Allowed attempts     | 3                              | - Max time disconnect                             | 9 second     |
| - Time window          | 1 hour                         | - Max time eliminate                              | 10 second    |
| - Stabilize period     | 10 minute                      | <b>Category</b>                                   | Manufacturer |

**Criteria:**

The alarm indicates too low converter and generator water level in the expansion tank.

**\*\*TankSensorType\*\*** equals "LevelSwitch":

The alarm is raised if the signal IO.ConvGenWaterCoolingWaterLevelOK is false for more than the time interval given by the parameter **\*\*TankLevelStableTime\*\***.

The alarm is auto acknowledged if the signal IO.ConvGenWaterCoolingWaterLevelOK changes to true.

**\*\*TankSensorType\*\*** equals "PressureSensor":

The alarm is raised if the ConvGenWaterCoolingWaterLevel drops below the minimum pressure specified by the parameter **\*\*TankLevel2\*\***, for more than the time interval given by the parameter **\*\*TankLevelStableTime\*\***.

This alarm is auto acknowledged if ConvGenWaterCoolingWaterLevel is equal or above the parameter **\*\*TankLevel2\*\***.

|                        |                                |                                                 |              |
|------------------------|--------------------------------|-------------------------------------------------|--------------|
| <b>No: 5091</b>        | <b>SupervisionID</b> 5091      | <b>Name</b> ConvGenWaterCoolingHeaterCBOpenedSx |              |
| <b>Log text</b>        | HeaterCBOpened Warning Error   |                                                 |              |
| <b>Subsystem name</b>  | ConverterGeneratorWaterCooling |                                                 |              |
| <b>Type</b>            | Warning                        | <b>Timeout</b>                                  | <disabled>   |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                            | <n/a>        |
| - Allowed attempts     | Unlimited                      | - Max time disconnect                           | <n/a>        |
| - Time window          | <n/a>                          | - Max time eliminate                            | <n/a>        |
| - Stabilize period     | 3 second                       | <b>Category</b>                                 | Manufacturer |

**Criteria:**

The warning indicates Heater Circuit breaker is opened.

The warning is raised if the IO.ConvGenWaterCoolingHeaterCBClosed is true for more than the time interval given by the parameter **\*\*CBFeedbackStableTime\*\***.

This warning is auto acknowledged if ConvGenWaterCoolingHeaterCBClosed is false.

|                        |                                |                                                 |              |
|------------------------|--------------------------------|-------------------------------------------------|--------------|
| <b>No: 5091</b>        | <b>SupervisionID</b> 5091      | <b>Name</b> ConvGenWaterCoolingHeaterCBOpenedSx |              |
| <b>Log text</b>        | HeaterCBOpened Warning Error   |                                                 |              |
| <b>Subsystem name</b>  | ConverterGeneratorWaterCooling |                                                 |              |
| <b>Type</b>            | Warning                        | <b>Timeout</b>                                  | <disabled>   |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                            | <n/a>        |
| - Allowed attempts     | Unlimited                      | - Max time disconnect                           | <n/a>        |
| - Time window          | <n/a>                          | - Max time eliminate                            | <n/a>        |
| - Stabilize period     | 3 second                       | <b>Category</b>                                 | Manufacturer |

**Criteria:**

The warning indicates Heater Circuit breaker is opened.

The warning is raised if the IO.ConvGenWaterCoolingHeaterCBClosed is true for more than the time interval given by the parameter **\*\*CBFeedbackStableTime\*\***.

This warning is auto acknowledged if ConvGenWaterCoolingHeaterCBClosed is false.

|                        |                             |                                       |              |
|------------------------|-----------------------------|---------------------------------------|--------------|
| <b>No: 5095</b>        | <b>SupervisionID</b> 5095   | <b>Name</b> ChargeTrafo_Temp_switchSx |              |
| <b>Log text</b>        | ConvChargeTrafo_Temp_switch |                                       |              |
| <b>Subsystem name</b>  | CubePower                   |                                       |              |
| <b>Type</b>            | Alarm                       | <b>Timeout</b>                        | <n/a>        |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b>                  | StopSlow     |
| - Allowed attempts     | 3                           | - Max time disconnect                 | 3 second     |
| - Time window          | 1 hour                      | - Max time eliminate                  | 9 second     |
| - Stabilize period     | 10 minute                   | <b>Category</b>                       | Manufacturer |

**Criteria:**

This alarm is raised when the internal temperature of the LSC pre-charge trafo has exceeded the max. limit. The temperature switch of the trafo is automatically activated to protect the trafo.

Due to the activation of the temperature switch the pre-charge circuit can not be operated before the temperature is lower and the temperature switch is disable.

Par1: N/A

Par2: N/A

|                        |                           |                                   |
|------------------------|---------------------------|-----------------------------------|
| <b>No: 5096</b>        | <b>SupervisionID</b> 5096 | <b>Name</b> ChargeSupervTimeoutSx |
| <b>Log text</b>        | ConvChargeSupervTimeout   |                                   |
| <b>Subsystem name</b>  | CubePower                 |                                   |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>              |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow     |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second    |
| - Time window          | 1 hour                    | - Max time eliminate 9 second     |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer      |

**Criteria:**

This alarm is an overall supervision timer of a charge sequence.  
It will be raised is a successful charge is not possible within the specified time  
(\*\*Charge\\_Max\\_Time\*\*)

|                        |                            |                                      |
|------------------------|----------------------------|--------------------------------------|
| <b>No: 5097</b>        | <b>SupervisionID</b> 5097  | <b>Name</b> ConnectMMSupervTimeoutSx |
| <b>Log text</b>        | ConvConnectMMSupervTimeout |                                      |
| <b>Subsystem name</b>  | CubePower                  |                                      |
| <b>Type</b>            | Alarm                      | <b>Timeout</b> <n/a>                 |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                          | - Max time disconnect 3 second       |
| - Time window          | 1 hour                     | - Max time eliminate 9 second        |
| - Stabilize period     | 60 second                  | <b>Category</b> Manufacturer         |

**Criteria:**

This alarm is raised when the Motor-mode is not successfully connected in motormode  
within the specified time (\*\*ConnectMM\\_Max\\_Time\*\*)

Par1: N/A

Par2: N/A

|                        |                           |                                    |
|------------------------|---------------------------|------------------------------------|
| <b>No: 5098</b>        | <b>SupervisionID</b> 5098 | <b>Name</b> ConnectSupervTimeoutSx |
| <b>Log text</b>        | ConvConnectSupervTimeout  |                                    |
| <b>Subsystem name</b>  | CubePower                 |                                    |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>               |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow      |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second     |
| - Time window          | 1 hour                    | - Max time eliminate 9 second      |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer       |

**Criteria:**

This alarm is raised when the converter is not successfully changed to connected state  
within the specified time (\*\*Connect\\_Max\\_Time\*\*)

Par1: N/A

Par2: N/A

**No: 5099**

|                        |                               |                       |      |             |                               |
|------------------------|-------------------------------|-----------------------|------|-------------|-------------------------------|
| <b>Log text</b>        | ConvCoolWaterHighTemp: ____°C | <b>SupervisionID</b>  | 5099 | <b>Name</b> | Conv_Cooling_Water_HighTempSx |
| <b>Subsystem name</b>  | CubePower                     |                       |      |             |                               |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>        |      |             | <n/a>                         |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>  |      |             | StopSlow                      |
| - Allowed attempts     | 3                             | - Max time disconnect |      |             | 3 second                      |
| - Time window          | 1 hour                        | - Max time eliminate  |      |             | 9 second                      |
| - Stabilize period     | 10 minute                     | <b>Category</b>       |      |             | Manufacturer                  |

**Criteria:**

This alarm is raised if the Cooling Water of the Converter is above the upper temperature limit (\*\*Conv\\_Cooling\\_Water\\_HighTemp\\_Limit\*\*).

Par1 : Actual cooling water temperature [celsius]

Par2 : N/A

**No: 5100**

|                        |                               |                       |      |             |                             |
|------------------------|-------------------------------|-----------------------|------|-------------|-----------------------------|
| <b>Log text</b>        | ConvChargeTrafoHiTemp: ____°C | <b>SupervisionID</b>  | 5100 | <b>Name</b> | LSC_Charge_trafo_HighTempSx |
| <b>Subsystem name</b>  | CubePower                     |                       |      |             |                             |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>        |      |             | <n/a>                       |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>  |      |             | StopSlow                    |
| - Allowed attempts     | 3                             | - Max time disconnect |      |             | 3 second                    |
| - Time window          | 1 hour                        | - Max time eliminate  |      |             | 9 second                    |
| - Stabilize period     | 10 minute                     | <b>Category</b>       |      |             | Manufacturer                |

**Criteria:**

This alarm is raised if the temperature of the precharge trafo exceeds the max temperature limit (\*\*LSC\\_Charge\\_trafo\\_HighTemp\\_Limit\*\*).

**No: 5101**

|                        |                               |                       |      |             |                             |
|------------------------|-------------------------------|-----------------------|------|-------------|-----------------------------|
| <b>Log text</b>        | HiTempChokeWind:Mod__; ____°C | <b>SupervisionID</b>  | 5101 | <b>Name</b> | LSC_ChokeWinding_HighTempSx |
| <b>Subsystem name</b>  | CubePower                     |                       |      |             |                             |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>        |      |             | <n/a>                       |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>  |      |             | StopFast                    |
| - Allowed attempts     | 3                             | - Max time disconnect |      |             | 0.9 second                  |
| - Time window          | 1 hour                        | - Max time eliminate  |      |             | 1 hour                      |
| - Stabilize period     | 10 minute                     | <b>Category</b>       |      |             | Manufacturer                |

**Criteria:**

This alarm is raised when a high temperature of the LSC choke winding exceeds the high limit (\*\*LSC\\_ChokeWinding\\_HighTemp\\_Limit\*\*).

Par1: PSC module (1/2/3/4)

Par2: The actual temperature of the choke winding (Celsius).

|                        |                               |                                           |
|------------------------|-------------------------------|-------------------------------------------|
| <b>No: 5102</b>        | <b>SupervisionID</b> 5102     | <b>Name</b> LSC_CircuitBreaker_HighTempSx |
| <b>Log text</b>        | LSCCircuitBreakHiTemp: ____°C |                                           |
| <b>Subsystem name</b>  | CubePower                     |                                           |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                      |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> StopSlow             |
| - Allowed attempts     | 3                             | - Max time disconnect 3 second            |
| - Time window          | 1 hour                        | - Max time eliminate 9 second             |
| - Stabilize period     | 10 minute                     | <b>Category</b> Manufacturer              |

**Criteria:**

This alarm is raised if the temperature of the housing of the LSC breakers exceeds the max. limit (\*\*LSC\CircuitBreaker\\_HighTemp\\_Limit\*\*).

The temerature sensor is located close to the breakers. But There are other components inside this cabinet (e.g. Aux trafo) as well.  
It means this alarm is not 100% indicate if there is something wrong with the breakers. This indictes that some component in this cabinet causes the high temperature.

Par1: The measured temperature (Celsius).

Par2: N/A

|                        |                                |                                          |
|------------------------|--------------------------------|------------------------------------------|
| <b>No: 5103</b>        | <b>SupervisionID</b> 5103      | <b>Name</b> LSC_ControlCabAir_HighTempSx |
| <b>Log text</b>        | LSCControlCabAirHiTemp: ____°C |                                          |
| <b>Subsystem name</b>  | CubePower                      |                                          |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                     |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> StopSlow            |
| - Allowed attempts     | 3                              | - Max time disconnect 3 second           |
| - Time window          | 1 hour                         | - Max time eliminate 9 second            |
| - Stabilize period     | 10 minute                      | <b>Category</b> Manufacturer             |

**Criteria:**

This alarm is raised if the temperature of the control cabinet exceeds the max. operation limit (\*\*LSC\\_ControlCabAir\\_HighTemp\\_Limit\*\*).

|                        |                                |                                         |
|------------------------|--------------------------------|-----------------------------------------|
| <b>No: 5104</b>        | <b>SupervisionID</b> 5104      | <b>Name</b> LSC_ControlCabAir_LowTempSx |
| <b>Log text</b>        | LSCControlCabAirLoTemp: ____°C |                                         |
| <b>Subsystem name</b>  | CubePower                      |                                         |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> StopSlow           |
| - Allowed attempts     | 3                              | - Max time disconnect 3 second          |
| - Time window          | 1 hour                         | - Max time eliminate 9 second           |
| - Stabilize period     | 10 minute                      | <b>Category</b> Manufacturer            |

**Criteria:**

This alarm is raised if the temperature of the control cabinet is lower than the min. operation limit (\*\*LSC\\_ControlCabAir\\_LowTemp\\_Limit\*\*).

|                    |                               |                                         |
|--------------------|-------------------------------|-----------------------------------------|
| <b>No: 5105</b>    | <b>SupervisionID</b> 5105     | <b>Name</b> LSC_DVDT_FILT_TEMP_SWITCHSx |
| Log text           | LSC DVDTFilt TempSwitch:Mod__ |                                         |
| Subsystem name     | CubePower                     |                                         |
| Type               | Alarm                         | Timeout <n/a>                           |
| Acknowledgement    | Auto                          | Shutdown type StopFast                  |
| - Allowed attempts | 3                             | - Max time disconnect 0.9 second        |
| - Time window      | 1 hour                        | - Max time eliminate 1 hour             |
| - Stabilize period | 60 second                     | Category Manufacturer                   |

**Criteria:**

This alarm is raised

|                    |                            |                                     |
|--------------------|----------------------------|-------------------------------------|
| <b>No: 5106</b>    | <b>SupervisionID</b> 5106  | <b>Name</b> LSC_CHOKE_TEMP_SWITCHSx |
| Log text           | LSC Choke TempSwitch:Mod__ |                                     |
| Subsystem name     | CubePower                  |                                     |
| Type               | Alarm                      | Timeout <n/a>                       |
| Acknowledgement    | Auto                       | Shutdown type StopFast              |
| - Allowed attempts | 3                          | - Max time disconnect 0.9 second    |
| - Time window      | 1 hour                     | - Max time eliminate 1 hour         |
| - Stabilize period | 10 minute                  | Category Manufacturer               |

**Criteria:**

This alarm is raised if the temperature switch of the LSC choke is activated due to an error or to a too high temperature of the LSC grid choke.

|                    |                               |                                         |
|--------------------|-------------------------------|-----------------------------------------|
| <b>No: 5107</b>    | <b>SupervisionID</b> 5107     | <b>Name</b> MSC_DVDT_FILT_TEMP_SWITCHSx |
| Log text           | MSC DVDTFilt TempSwitch:Mod__ |                                         |
| Subsystem name     | CubePower                     |                                         |
| Type               | Alarm                         | Timeout <n/a>                           |
| Acknowledgement    | Auto                          | Shutdown type StopFast                  |
| - Allowed attempts | 3                             | - Max time disconnect 0.9 second        |
| - Time window      | 1 hour                        | - Max time eliminate 1 hour             |
| - Stabilize period | 60 second                     | Category Manufacturer                   |

**Criteria:**

This alarm is raised if a MSC dVdT filter thermostat switch has triggered due to the thermal protection.

- Par1: PSC module (1/2/3/4)
- Par2: Actual measured temperature (Celsius)

|                    |                              |                                    |
|--------------------|------------------------------|------------------------------------|
| <b>No: 5108</b>    | <b>SupervisionID</b> 5108    | <b>Name</b> MSC_CHOP_TEMP_SWITCHSx |
| Log text           | MSC Chopper TempSwitch:Mod__ |                                    |
| Subsystem name     | CubePower                    |                                    |
| Type               | Alarm                        | Timeout <n/a>                      |
| Acknowledgement    | Auto                         | Shutdown type StopFast             |
| - Allowed attempts | 3                            | - Max time disconnect 0.9 second   |
| - Time window      | 1 hour                       | - Max time eliminate 1 hour        |
| - Stabilize period | 60 second                    | Category Manufacturer              |

**Criteria:**

This alarm is raised if the temperature switch of the MSC chopper is activated due to an error or to a too high temperature.

- Par1: PSC module (1/2/3/4)
- Par2: The actual temperature of the choke winding (Celsius).

|                        |                             |                                       |
|------------------------|-----------------------------|---------------------------------------|
| <b><u>No: 5109</u></b> | <b>SupervisionID</b> 5109   | <b>Name</b> DisconnectSupervTimeoutSx |
| <b>Log text</b>        | ConvDisconnectSupervTimeout |                                       |
| <b>Subsystem name</b>  | CubePower                   |                                       |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                  |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> StopFast         |
| - Allowed attempts     | 3                           | - Max time disconnect 0.9 second      |
| - Time window          | 3600 second                 | - Max time eliminate 1 hour           |
| - Stabilize period     | 60 second                   | <b>Category</b> Manufacturer          |

**Criteria:**  
This alarm is raised when a disconnect command is activated and a successful disconnect progress is not possible within the specified time (\*\*Disconnect\\_Max\\_Time\*\*).

|                        |                             |                                        |
|------------------------|-----------------------------|----------------------------------------|
| <b><u>No: 5110</u></b> | <b>SupervisionID</b> 5110   | <b>Name</b> Disable_LSC_CTRL_TimeoutSx |
| <b>Log text</b>        | DisableLSCCTRL__s,LSCState_ |                                        |
| <b>Subsystem name</b>  | CubePower                   |                                        |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                   |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> StopFast          |
| - Allowed attempts     | 3                           | - Max time disconnect 0.9 second       |
| - Time window          | 1 hour                      | - Max time eliminate 1 hour            |
| - Stabilize period     | 10 minute                   | <b>Category</b> Manufacturer           |

**Criteria:**  
This alarm is raised when the turbine trips due to errors and the LSC control state machine is too slow due the timeout then the LSC converter is forced to disable.

|                        |                            |                                       |
|------------------------|----------------------------|---------------------------------------|
| <b><u>No: 5111</u></b> | <b>SupervisionID</b> 5111  | <b>Name</b> Enable_LSC_CTRL_TimeoutSx |
| <b>Log text</b>        | EnableLSCCTRL__s,LSCState_ |                                       |
| <b>Subsystem name</b>  | CubePower                  |                                       |
| <b>Type</b>            | Alarm                      | <b>Timeout</b> <n/a>                  |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopSlow         |
| - Allowed attempts     | 3                          | - Max time disconnect 3 second        |
| - Time window          | 1 hour                     | - Max time eliminate 9 second         |
| - Stabilize period     | 60 second                  | <b>Category</b> Manufacturer          |

**Criteria:**  
This alarm is raised if the LSC control state machine during an activating of the DC Control exceeds time limit (\*\*Max\\_EnableControlTime\*\*)

Par1 : Timeout time [s].  
Par2 : LSC control main state



|                    |                            |                                      |
|--------------------|----------------------------|--------------------------------------|
| <b>No: 5112</b>    | <b>SupervisionID</b> 5112  | <b>Name</b> PrechargeSupervTimeoutSx |
| Log text           | ConvPrechargeSupervTimeout |                                      |
| Subsystem name     | CubePower                  |                                      |
| Type               | Alarm                      | Timeout <n/a>                        |
| Acknowledgement    | Auto                       | Shutdown type StopFast               |
| - Allowed attempts | 3                          | - Max time disconnect 0.9 second     |
| - Time window      | 1 hour                     | - Max time eliminate 1 hour          |
| - Stabilize period | 60 second                  | Category Manufacturer                |

**Criteria:**

This alarm is raised if the DC Link voltage has not reached the required level within an supervision timeout (\*\*PrechargeInitTime\*\*).

Par1 : State of Pre-charge state machine

Par2 : N/A

|                    |                             |                                       |
|--------------------|-----------------------------|---------------------------------------|
| <b>No: 5113</b>    | <b>SupervisionID</b> 5113   | <b>Name</b> PreconnectSupervTimeoutSx |
| Log text           | ConvPreconnectSupervTimeout |                                       |
| Subsystem name     | CubePower                   |                                       |
| Type               | Alarm                       | Timeout <n/a>                         |
| Acknowledgement    | Auto                        | Shutdown type StopSlow                |
| - Allowed attempts | 3                           | - Max time disconnect 3 second        |
| - Time window      | 1 hour                      | - Max time eliminate 9 second         |
| - Stabilize period | 10 minute                   | Category Manufacturer                 |

**Criteria:**

This alarm is raised when the electrical disconnect of the generator is not completed within a specified time (\*\*Preconnect\\_Max\\_Time\*\*)

|                    |                              |                                        |
|--------------------|------------------------------|----------------------------------------|
| <b>No: 5114</b>    | <b>SupervisionID</b> 5114    | <b>Name</b> RundownStopSupervTimeoutSx |
| Log text           | ConvRundownStopSupervTimeout |                                        |
| Subsystem name     | CubePower                    |                                        |
| Type               | Alarm                        | Timeout <n/a>                          |
| Acknowledgement    | Auto                         | Shutdown type StopFast                 |
| - Allowed attempts | 3                            | - Max time disconnect 0.9 second       |
| - Time window      | 1 hour                       | - Max time eliminate 1 hour            |
| - Stabilize period | 60 second                    | Category Manufacturer                  |

**Criteria:**

Alarm condition: The alarm is raised if the RundownStop sequence (which includes a normal rundown) is not completed within the time specified by RundownStopSupervisionTime and the generator SPEED at the same time exceeds the value specified by MaxSpeedRundownStopTimeout.

Par1: The RundownStop supervision time

|                        |                           |                                    |
|------------------------|---------------------------|------------------------------------|
| <b>No: 5115</b>        | <b>SupervisionID</b> 5115 | <b>Name</b> RundownSupervTimeoutSx |
| <b>Log text</b>        | ConvRundownSupervTimeout  |                                    |
| <b>Subsystem name</b>  | CubePower                 |                                    |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>               |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopFast      |
| - Allowed attempts     | 3                         | - Max time disconnect 0.9 second   |
| - Time window          | 1 hour                    | - Max time eliminate 1 hour        |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer       |

**Criteria:**

This alarm is raised if a rundown of the produced power is not completed within the rundown timeout.

Par1 : Rundown timeout (s)

Par2 : N/A

|                        |                                |                                                   |
|------------------------|--------------------------------|---------------------------------------------------|
| <b>No: 5116</b>        | <b>SupervisionID</b> 5116      | <b>Name</b> Synchronize_GridFilter_CTRL_TimeoutSx |
| <b>Log text</b>        | SyncGridFilt__s,ScanLSCState__ |                                                   |
| <b>Subsystem name</b>  | CubePower                      |                                                   |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                              |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> StopSlow                     |
| - Allowed attempts     | 3                              | - Max time disconnect 3 second                    |
| - Time window          | 1 hour                         | - Max time eliminate 9 second                     |
| - Stabilize period     | 10 minute                      | <b>Category</b> Manufacturer                      |

**Criteria:**

This alarm is raised if the synchronizing of gridfilter exceeds timelimit (\*\*Max\\_SyncGridFilterControlTime\*\*).

Hint: if the Grid filters synschronisation fails one or more of the Grid fuses could be blown.

Par1: Timeout paramter

Par2: State of scan state machine state

|                        |                             |                                |
|------------------------|-----------------------------|--------------------------------|
| <b>No: 5117</b>        | <b>SupervisionID</b> 5117   | <b>Name</b> PreChargeErrorSx   |
| <b>Log text</b>        | DCLinkPrechargeErr___v,___s |                                |
| <b>Subsystem name</b>  | CubePower                   |                                |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> StopSlow  |
| - Allowed attempts     | 3                           | - Max time disconnect 3 second |
| - Time window          | 1 hour                      | - Max time eliminate 9 second  |
| - Stabilize period     | 60 second                   | <b>Category</b> Manufacturer   |

**Criteria:**

This alarm is raised if the DC link pre-charge sequence not activated properly. The DC link voltage is not reached the minimum level (\*\*PrechargeInitLevel\*\*) within a timeout

Par1: DC link voltage [V]

Par2: Timeout [S]

|                        |                                 |                                       |
|------------------------|---------------------------------|---------------------------------------|
| <b>No: 5118</b>        | <b>SupervisionID</b> 5118       | <b>Name</b> PreChargeVoltageTimeoutSx |
| <b>Log text</b>        | PrechargeVoltTimeout____v,____s |                                       |
| <b>Subsystem name</b>  | CubePower                       |                                       |
| <b>Type</b>            | Alarm                           | <b>Timeout</b> <n/a>                  |
| <b>Acknowledgement</b> | Auto                            | <b>Shutdown type</b> StopFast         |
| - Allowed attempts     | 3                               | - Max time disconnect 0.9 second      |
| - Time window          | 1 hour                          | - Max time eliminate 1 hour           |
| - Stabilize period     | 60 second                       | <b>Category</b> Manufacturer          |

**Criteria:**  
This alarm is raised if the DC Link voltage has not reached the required level within a timeout.

Par1 : State of Pre-charge state machine

Par2 : N/A

Alarm condition: If the DC Link voltage is not reached the completed level given by parameter **\*\*PrechargeCompleteLevel\*\*** then this alarm is raised.

|                        |                            |                                    |
|------------------------|----------------------------|------------------------------------|
| <b>No: 5119</b>        | <b>SupervisionID</b> 5119  | <b>Name</b> Ext_SUM_CURRENT_ILSCSx |
| <b>Log text</b>        | Ext SumCurrentILSC,Mod____ |                                    |
| <b>Subsystem name</b>  | CubePower                  |                                    |
| <b>Type</b>            | Alarm                      | <b>Timeout</b> <n/a>               |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopFast      |
| - Allowed attempts     | 3                          | - Max time disconnect 0.9 second   |
| - Time window          | 1 hour                     | - Max time eliminate 1 hour        |
| - Stabilize period     | 60 second                  | <b>Category</b> Manufacturer       |

**Criteria:**  
This alarm is raised when the Defenseline detects a too high sum current of one of the LSC PSC stacks compaired to the threshold limit  
**(\*\*CurrentSum\\_Treshold\*\*\*\*\*SENSORSCALE\\_ILSC\*\*)**.

Par1 : PSC stack [1/2/3/4].

Par2 : N/A

|                        |                            |                                    |
|------------------------|----------------------------|------------------------------------|
| <b>No: 5120</b>        | <b>SupervisionID</b> 5120  | <b>Name</b> Ext_SUM_CURRENT_IMSCSx |
| <b>Log text</b>        | Ext SumCurrentIMSC,Mod____ |                                    |
| <b>Subsystem name</b>  | CubePower                  |                                    |
| <b>Type</b>            | Alarm                      | <b>Timeout</b> <n/a>               |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopFast      |
| - Allowed attempts     | 3                          | - Max time disconnect 0.9 second   |
| - Time window          | 1 hour                     | - Max time eliminate 1 hour        |
| - Stabilize period     | 60 second                  | <b>Category</b> Manufacturer       |

**Criteria:**  
This alarm is raised when the Defenseline detects a too high sum current of one of the MSC PSC stacks compaired to the threshold limit  
**(\*\*CurrentSum\\_Treshold\*\*\*\*\*SENSORSCALE\\_IMSC\*\*)**.

Par1 : PSC stack [1/2/3/4].

Par2 : N/A

|                        |                              |                                       |
|------------------------|------------------------------|---------------------------------------|
| <b>No: 5121</b>        | <b>SupervisionID</b> 5121    | <b>Name</b> HighTempPreventChargingSx |
| <b>Log text</b>        | HiTempPrevCharge,Trafo____°C |                                       |
| <b>Subsystem name</b>  | CubePower                    |                                       |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                  |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow         |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second        |
| - Time window          | 1 hour                       | - Max time eliminate 9 second         |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer          |

**Criteria:**

This alarm is raised when the charge circuit is activated while the temperature of the charge trafo exceeds the highest limit (\*\*MaxTrafoTemp\*\*)

|                        |                              |                                               |
|------------------------|------------------------------|-----------------------------------------------|
| <b>No: 5122</b>        | <b>SupervisionID</b> 5122    | <b>Name</b> LowCurrentDuringGridfilterCheckSx |
| <b>Log text</b>        | LowCurrGridFiltCheck:Mod__L_ |                                               |
| <b>Subsystem name</b>  | CubePower                    |                                               |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                          |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow                 |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second                |
| - Time window          | 1 hour                       | - Max time eliminate 9 second                 |
| - Stabilize period     | 60 second                    | <b>Category</b> Manufacturer                  |

**Criteria:**

This alarm is raised if the gridfilter synchronization fails during a transition from "precharge" to "charge"sequence.

Hint: check gridfilter fuses. They could be blown due to a too some HW errors which cause a too high current during synchronization.

Par1: Phase (1/2/3)

Par2: PSC module (1/2/3/4)

|                        |                            |                                           |
|------------------------|----------------------------|-------------------------------------------|
| <b>No: 5123</b>        | <b>SupervisionID</b> 5123  | <b>Name</b> LSC_Harmonicfilter_HighTempSx |
| <b>Log text</b>        | LSCHarmFilterHiTemp:____°C |                                           |
| <b>Subsystem name</b>  | CubePower                  |                                           |
| <b>Type</b>            | Alarm                      | <b>Timeout</b> <n/a>                      |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopFast             |
| - Allowed attempts     | 3                          | - Max time disconnect 0.9 second          |
| - Time window          | 1 hour                     | - Max time eliminate 1 hour               |
| - Stabilize period     | 10 minute                  | <b>Category</b> Manufacturer              |

**Criteria:**

This alarm is raised if LSC the gridfilter's ambient temperature is above the max. limit (\*\*LSC\\_Harmonicfilter\\_HighTemp\\_Limit\*\*)

Par1: Actual measured temperature (Celsius)

|                        |                            |                                       |
|------------------------|----------------------------|---------------------------------------|
| <b>No: 5124</b>        | <b>SupervisionID</b> 5124  | <b>Name</b> LSC_WTGAmbient_HighTempSx |
| <b>Log text</b>        | LSCWTGAmbientHiTemp:____°C |                                       |
| <b>Subsystem name</b>  | CubePower                  |                                       |
| <b>Type</b>            | Alarm                      | <b>Timeout</b> <n/a>                  |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> StopSlow         |
| - Allowed attempts     | 3                          | - Max time disconnect 3 second        |
| - Time window          | 1 hour                     | - Max time eliminate 9 second         |
| - Stabilize period     | 10 minute                  | <b>Category</b> Manufacturer          |

**Criteria:**

This alarm is raised if the LSC side has been provided with a WTG ambient temperature which exceeds the max. limit (\*\*LSC\\_WTGAmbient\\_HighTemp\\_Limit\*\*)

|                        |                           |                                       |
|------------------------|---------------------------|---------------------------------------|
| <b>No: 5125</b>        | <b>SupervisionID</b> 5125 | <b>Name</b> MSC_ChopperRES_HighTempSx |
| <b>Log text</b>        | MSCChopResHiTemp:____°C   |                                       |
| <b>Subsystem name</b>  | CubePower                 |                                       |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                  |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow         |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second        |
| - Time window          | 1 hour                    | - Max time eliminate 9 second         |
| - Stabilize period     | 10 minute                 | <b>Category</b> Manufacturer          |

**Criteria:**

This alarm is raised if the MSC Chopper Resistor temperature is above High Temperature limit (\*\*MSC\\_ChopperRES\\_HighTemp\\_Limit\*\*)

- Par1: PSC module (1/2/3/4)
- Par2: Actual measured temperature (Celsius)

|                        |                               |                                        |
|------------------------|-------------------------------|----------------------------------------|
| <b>No: 5126</b>        | <b>SupervisionID</b> 5126     | <b>Name</b> LSC_ChopperIGBT_HighTempSx |
| <b>Log text</b>        | LSCChopIGBTHiTemp:Mod_,____°C |                                        |
| <b>Subsystem name</b>  | CubePower                     |                                        |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> StopFast          |
| - Allowed attempts     | 3                             | - Max time disconnect 0.9 second       |
| - Time window          | 1 hour                        | - Max time eliminate 1 hour            |
| - Stabilize period     | 10 minute                     | <b>Category</b> Manufacturer           |

**Criteria:**

This alarm is raised if the temperature switch of the LSC IGBT chopper is activated due to an error or to a too high temperature.

- Par1: PSC module (1/2/3/4)
- Par2: The actual temperature of the choke winding (Celsius).

|                    |                              |                                         |
|--------------------|------------------------------|-----------------------------------------|
| <b>No: 5127</b>    | <b>SupervisionID</b> 5127    | <b>Name</b> LSC_IGBT_HighTempGradientSx |
| Log text           | LSCIGBTGradHiTemp:Mod_,___°C |                                         |
| Subsystem name     | CubePower                    |                                         |
| Type               | Alarm                        | Timeout <n/a>                           |
| Acknowledgement    | Auto                         | Shutdown type StopFast                  |
| - Allowed attempts | 3                            | - Max time disconnect 0.9 second        |
| - Time window      | 1 hour                       | - Max time eliminate 1 hour             |
| - Stabilize period | 10 minute                    | Category Manufacturer                   |

**Criteria:**

This alarm is raised if a LSC IGBT exceeds set temperature gradient (delta variation per second) limit (\*\*LSC\\_HighTempGradient\\_IGBT\\_Limit\*\*).

- Par1: PSC module (1/2/3/4)
- Par2: temperature rise per second (Celsius)

|                    |                           |                                  |
|--------------------|---------------------------|----------------------------------|
| <b>No: 5128</b>    | <b>SupervisionID</b> 5128 | <b>Name</b> LSC_IGBT_HighTempSx  |
| Log text           | LSCIGBTHiTemp:Mod_,___°C  |                                  |
| Subsystem name     | CubePower                 |                                  |
| Type               | Alarm                     | Timeout <n/a>                    |
| Acknowledgement    | Auto                      | Shutdown type StopFast           |
| - Allowed attempts | 3                         | - Max time disconnect 0.9 second |
| - Time window      | 1 hour                    | - Max time eliminate 1 hour      |
| - Stabilize period | 10 minute                 | Category Manufacturer            |

**Criteria:**

This alarm is raised if one of the LSC IGBT's temperature exceeds the max. limit (\*\*LSC\\_IGBT\\_TempHigh\\_Limit\*\*)

Par1: PSC module (1/2/3/4)

Par2: Actual measured temperature (Celsius)

|                    |                           |                                |
|--------------------|---------------------------|--------------------------------|
| <b>No: 5129</b>    | <b>SupervisionID</b> 5129 | <b>Name</b> LSC_IGBT_LowTempSx |
| Log text           | LSCIGBTLowTemp:Mod_,___°C |                                |
| Subsystem name     | CubePower                 |                                |
| Type               | Alarm                     | Timeout <n/a>                  |
| Acknowledgement    | Auto                      | Shutdown type StopSlow         |
| - Allowed attempts | 3                         | - Max time disconnect 3 second |
| - Time window      | 1 hour                    | - Max time eliminate 9 second  |
| - Stabilize period | 10 minute                 | Category Manufacturer          |

**Criteria:**

This alarm is raised if one of the LSC IGBT's temperature is below the min. operation temperature (\*\*LSC\\_IGBT\\_TempLow\\_Limit\*\*)

Par1: PSC module (1/2/3/4)

Par2: Actual measured temperature (Celsius)

|                        |                              |                                     |
|------------------------|------------------------------|-------------------------------------|
| <b>No: 5130</b>        | <b>SupervisionID</b> 5130    | <b>Name</b> LSC_StackAir_HighTempSx |
| <b>Log text</b>        | LSCStackAirHiTemp:Mod_,___°C |                                     |
| <b>Subsystem name</b>  | CubePower                    |                                     |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow       |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second      |
| - Time window          | 1 hour                       | - Max time eliminate 9 second       |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer        |

**Criteria:**

This alarm is raised if the air temperature inside the cabinet of the LSC PSC stacks exceeds the max. limit (\*\*LSC\\_StackAir\\_HighTemp\\_Limit\*\*)

Par1: Module PSC (1/2/3/4)  
Par2: Actual measured temperature (Celsius)

|                        |                              |                                   |
|------------------------|------------------------------|-----------------------------------|
| <b>No:</b> 5131        | <b>SupervisionID</b> 5131    | <b>Name</b> LSC_TempSensor_FailSx |
| <b>Log text</b>        | LSCTempSensorFail:id__,Mod__ |                                   |
| <b>Subsystem name</b>  | CubePower                    |                                   |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>              |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow     |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second    |
| - Time window          | 1 hour                       | - Max time eliminate 9 second     |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer      |

**Criteria:**

This alarm is raised if a LSC temperature sensor reports a value which is out of temperature range.

Par1: Sensor ID  
Par2: Sensor value

|    |               |                 |
|----|---------------|-----------------|
| ID | sensor        | CT440 connector |
| 0  | X20_33_PSC_A1 | X20 pin 33      |
| 1  | X20_27_PSC_A1 | X20 pin 27      |
| 2  | X20_21_PSC_A1 | X20 pin 21      |
| 3  | X20_38_PSC_A1 | X40 pin 33      |
| 4  | X20_46_PSC_A1 | X40 pin 27      |
| 5  | X20_44_PSC_A1 | X40 pin 21      |
| 6  | X40_33_PSC_B1 | X60 pin 33      |
| 7  | X40_27_PSC_B1 | X60 pin 27      |
| 8  | X40_21_PSC_B1 | X60 pin 21      |
| 9  | X40_38_PSC_B1 | X80 pin 33      |
| 10 | X40_46_PSC_B1 | X80 pin 27      |
| 11 | X40_44_PSC_B1 | X80 pin 21      |
| 12 | X60_33_PSC_C1 | X20 pin 38      |
| 13 | X60_27_PSC_C1 | X40 pin 38      |
| 14 | X60_21_PSC_C1 | X60 pin 38      |
| 15 | X60_38_PSC_C1 | X80 pin 38      |
| 16 | X60_46_PSC_C1 | X20 pin 46      |
| 17 | X60_44_PSC_C1 | X40 pin 46      |
| 18 | X80_33_PSC_D1 | X60 pin 46      |
| 19 | X80_27_PSC_D1 | X80 pin 46      |
| 20 | X80_21_PSC_D1 | X20 pin 44      |
| 21 | X80_38_PSC_D1 | X40 pin 44      |
| 22 | X80_46_PSC_D1 | X60 pin 44      |
| 23 | X80_44_PSC_D1 | X80 pin 44      |
| 24 | X30_24_GEN1   | X30 pin 24      |
| 25 | X30_25_GEN1   | X30 pin 25      |
| 26 | X31_24_GEN2   | X31 pin 24      |
| 27 | X31_25_GEN2   | X31 pin 25      |
| 28 | X32_24_GEN3   | X32 pin 24      |
| 29 | X32_25_GEN3   | X32 pin 25      |
| 30 | X34_24_GEN5   | X34 pin 24      |
| 31 | X34_25_GEN5   | X34 pin 25      |
| 32 | X35_24_GEN6   | X35 pin 24      |
| 33 | X35_25_GEN6   | X35 pin 25      |



**No: 5132**                      **SupervisionID** 5132    **Name** LSC\_IGBTErrorChopSx  
**Log text**                      LSC ChopIGBT HWEError:Mod\_  
**Subsystem name**                CubePower  
**Type**                            Alarm                            **Timeout**                            <n/a>  
**Acknowledgement**                Auto                            **Shutdown type**                      StopFast  
- **Allowed attempts**                3                                - **Max time disconnect**                0.9 second  
- **Time window**                    1 hour                            - **Max time eliminate**                1 hour  
- **Stabilize period**                60 second                        **Category**                            Manufacturer

**Criteria:**

This alarm is raised if a LSC Chopper IGBT (HW error) is not functioning.

Par1: PSC module (1/2/3/4)

**No: 5133**                      **SupervisionID** 5133    **Name** LSC\_IGBTErrorSx  
**Log text**                      LSC IGBT HWEError:Mod\_  
**Subsystem name**                CubePower  
**Type**                            Alarm                            **Timeout**                            <n/a>  
**Acknowledgement**                Auto                            **Shutdown type**                      StopFast  
- **Allowed attempts**                3                                - **Max time disconnect**                0.9 second  
- **Time window**                    1 hour                            - **Max time eliminate**                1 hour  
- **Stabilize period**                60 second                        **Category**                            Manufacturer

**Criteria:**

This alarm is raised if a LSC IGBT (HW error) is not functioning.

Par1: PSC module (1/2/3/4)

**No: 5134**                      **SupervisionID** 5134                      **Name** MSC\_ChopperIGBT\_HighTempSx  
**Log text**                      MSCChopIGBTHiTemp:Mod\_,\_\_°C  
**Subsystem name**                CubePower  
**Type**                            Alarm                            **Timeout**                            <n/a>  
**Acknowledgement**                Auto                            **Shutdown type**                      StopFast  
- **Allowed attempts**                3                                - **Max time disconnect**                0.9 second  
- **Time window**                    1 hour                            - **Max time eliminate**                1 hour  
- **Stabilize period**                10 minute                        **Category**                            Manufacturer

**Criteria:**

This alarm is raised if the temperature switch of the MSC IGBT chopper is activated due to an error or to a too high temperature.

Par1: PSC module (1/2/3/4)

Par2: The actual temperature of the choke winding (Celsius).

|                        |                              |                                         |
|------------------------|------------------------------|-----------------------------------------|
| <b>No: 5135</b>        | <b>SupervisionID</b> 5135    | <b>Name</b> MSC_IGBT_HighTempGradientSx |
| <b>Log text</b>        | MSCIGBTGradHiTemp:Mod_,___°C |                                         |
| <b>Subsystem name</b>  | CubePower                    |                                         |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopFast           |
| - Allowed attempts     | 3                            | - Max time disconnect 0.9 second        |
| - Time window          | 1 hour                       | - Max time eliminate 1 hour             |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer            |

**Criteria:**

This alarm is raised if a MSC IGBT exceeds set temperature gradient (delta variation per second) limit (MSC\_HighTempGradient\_IGBT\_Limit).

- Par1: PSC module (1/2/3/4)
- Par2: temperature rise per second (Celsius)

|                        |                           |                                  |
|------------------------|---------------------------|----------------------------------|
| <b>No: 5136</b>        | <b>SupervisionID</b> 5136 | <b>Name</b> MSC_IGBT_HighTempSx  |
| <b>Log text</b>        | MSCIGBTHiTemp:Mod_,___°C  |                                  |
| <b>Subsystem name</b>  | CubePower                 |                                  |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>             |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopFast    |
| - Allowed attempts     | 3                         | - Max time disconnect 0.9 second |
| - Time window          | 1 hour                    | - Max time eliminate 1 hour      |
| - Stabilize period     | 10 minute                 | <b>Category</b> Manufacturer     |

**Criteria:**

This alarm is raised if one of the MSC IGBT's temperature exceeds the max. limit (\*\*MSC\\_IGBT\\_TempHigh\\_Limit\*\*)

Par1: PSC module (1/2/3/4)

Par2: Actual measured temperature (Celsius)

|                        |                           |                                |
|------------------------|---------------------------|--------------------------------|
| <b>No: 5137</b>        | <b>SupervisionID</b> 5137 | <b>Name</b> MSC_IGBT_LowTempSx |
| <b>Log text</b>        | MSCIGBTLowTemp:Mod_,___°C |                                |
| <b>Subsystem name</b>  | CubePower                 |                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow  |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second |
| - Time window          | 1 hour                    | - Max time eliminate 9 second  |
| - Stabilize period     | 10 minute                 | <b>Category</b> Manufacturer   |

**Criteria:**

This alarm is raised if one of the MSC IGBT's temperature is below the min. operation temperature (\*\*MSC\\_IGBT\\_TempLow\\_Limit\*\*)

Par1: PSC module (1/2/3/4)

Par2: Actual measured temperature (Celsius)

|                        |                              |                                     |
|------------------------|------------------------------|-------------------------------------|
| <b>No: 5138</b>        | <b>SupervisionID</b> 5138    | <b>Name</b> MSC_StackAir_HighTempSx |
| <b>Log text</b>        | MSCStackAirHiTemp:Mod_,___°C |                                     |
| <b>Subsystem name</b>  | CubePower                    |                                     |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow       |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second      |
| - Time window          | 1 hour                       | - Max time eliminate 9 second       |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer        |

**Criteria:**

This alarm is raised if the air temperature inside the cabinet of the MSC PSC stacks exceeds the max. limit (\*\*MSC\\_StackAir\\_HighTemp\\_Limit\*\*)

Par1: Module PSC (1/2/3/4)

Par2: Actual measured temperature (Celsius)

|                        |                             |                                   |
|------------------------|-----------------------------|-----------------------------------|
| <b>No: 5139</b>        | <b>SupervisionID</b> 5139   | <b>Name</b> MSC_TempSensor_FailSx |
| <b>Log text</b>        | MSCTempSensorFail:id__,Mod_ |                                   |
| <b>Subsystem name</b>  | CubePower                   |                                   |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>              |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> StopSlow     |
| - Allowed attempts     | 3                           | - Max time disconnect 3 second    |
| - Time window          | 1 hour                      | - Max time eliminate 9 second     |
| - Stabilize period     | 10 minute                   | <b>Category</b> Manufacturer      |

**Criteria:**

This alarm is raised if a MSC temperature sensor reports a value which is out of temperature range.

Par1: Sensor ID

Par2: sensor value

|    |               |                 |
|----|---------------|-----------------|
| ID | sensor        | CT440 connector |
| 0  | X21_33_PSC_A2 | X21 pin 33      |
| 1  | X21_27_PSC_A2 | X21 pin 27      |
| 2  | X21_21_PSC_A2 | X21 pin 21      |
| 3  | X21_38_PSC_A2 | X21 pin 38      |
| 4  | X21_46_PSC_A2 | X21 pin 46      |
| 5  | X21_44_PSC_A2 | X21 pin 44      |
| 6  | X41_33_PSC_B2 | X41 pin 33      |
| 7  | X41_27_PSC_B2 | X41 pin 27      |
| 8  | X41_21_PSC_B2 | X41 pin 21      |
| 9  | X41_38_PSC_B2 | X41 pin 38      |
| 10 | X41_46_PSC_B2 | X41 pin 46      |
| 11 | X41_44_PSC_B2 | X41 pin 44      |
| 12 | X61_33_PSC_C2 | X61 pin 33      |
| 13 | X61_27_PSC_C2 | X61 pin 27      |
| 14 | X61_21_PSC_C2 | X61 pin 21      |
| 15 | X61_38_PSC_C2 | X61 pin 38      |
| 16 | X61_46_PSC_C2 | X61 pin 46      |
| 17 | X61_44_PSC_C2 | X61 pin 44      |
| 18 | X81_33_PSC_D2 | X81 pin 33      |
| 19 | X81_27_PSC_D2 | X81 pin 27      |
| 20 | X81_21_PSC_D2 | X81 pin 21      |
| 21 | X81_38_PSC_D2 | X81 pin 38      |
| 22 | X81_46_PSC_D2 | X81 pin 46      |
| 23 | X81_44_PSC_D2 | X81 pin 44      |

No: 5140

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

SupervisionID 5140

MSC ChopIGBT HWEError:Mod\_

CubePower

Alarm

Auto

3

1 hour

60 second

Name MSC\_IGBTErrorChopSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopFast

0.9 second

1 hour

Manufacturer

Criteria:  
This alarm is raised if a MSC Chopper IGBT (HW error) is not functioning.

Par1: PSC module (1/2/3/4)

No: 5141

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

SupervisionID 5141

MSC IGBT HWEError:Mod\_

CubePower

Alarm

Auto

3

1 hour

60 second

Name MSC\_IGBTErrorSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopFast

0.9 second

1 hour

Manufacturer

Criteria:  
This alarm is raised if a MSC IGBT (HW error) is not functioning.

Par1: PSC module (1/2/3/4)

No: 5142

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

SupervisionID 5142

WaterLevelTooLowAlarm Error

GearHydraulicWaterCooling

Alarm

Auto

3

1 hour

10 minute

Name GearHydrWaterCoolingWaterLevelTooLowSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

PauseSlow

9 second

10 second

Manufacturer

Criteria:  
The alarm indicates too low GearHydraulic water level in the expansion tank.

**\*\*TankSensorType\*\* equals "LevelSwitch":**  
The alarm is raised if the signal **\*\*IO.GearHydrWaterCoolingWaterLevelOK\*\*** is false for more than the time interval given by the parameter TankLevelStableTime.

The alarm is auto acknowledged if the signal **\*\*IO.GearHydrWaterCoolingWaterLevelOK\*\*** changes to true.

**\*\*TankSensorType\*\* equals "PressureSensor" or "LevelSensor":**  
The alarm is raised if the **\*\*GearHydrWaterCoolingWaterLevel\*\*** drops below the minimum pressure specified by the parameter **\*\*TankLevel2\*\***, for more than the time interval given by the parameter TankLevelStableTime.

This alarm is auto acknowledged if **\*\*GearHydrWaterCoolingWaterLevel\*\*** is equal or above the parameter **\*\*TankLevel2\*\***.

|                        |                            |                                                |              |
|------------------------|----------------------------|------------------------------------------------|--------------|
| <b>No: 5144</b>        | <b>SupervisionID</b> 5144  | <b>Name</b> GearHydrWaterCoolingPumpCBOpenedSx |              |
| <b>Log text</b>        | PumpCBOpened Warning Error |                                                |              |
| <b>Subsystem name</b>  | GearHydraulicWaterCooling  |                                                |              |
| <b>Type</b>            | Warning                    | <b>Timeout</b>                                 | <disabled>   |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b>                           | <n/a>        |
| - Allowed attempts     | Unlimited                  | - Max time disconnect                          | <n/a>        |
| - Time window          | <n/a>                      | - Max time eliminate                           | <n/a>        |
| - Stabilize period     | 3 second                   | <b>Category</b>                                | Manufacturer |

**Criteria:**

The warning indicates Pump Circuit breaker is opened.

The warning is raised if the IO.GearHydrWaterCoolingPumpCBClosed is true for more than the time interval given by the parameter **\*\*CBFeedbackStableTime\*\***.

This warning is auto acknowledged if GearHydrWaterCoolingPumpCBClosed is false.

|                        |                           |                                        |              |
|------------------------|---------------------------|----------------------------------------|--------------|
| <b>No: 5153</b>        | <b>SupervisionID</b> 5153 | <b>Name</b> GearboxOilHeaterCBOpenedSx |              |
| <b>Log text</b>        | GearOilHeaterCBOpened     |                                        |              |
| <b>Subsystem name</b>  | GearboxLubrication        |                                        |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                         | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                   | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect                  | <n/a>        |
| - Time window          | 0 second                  | - Max time eliminate                   | <n/a>        |
| - Stabilize period     | 3 second                  | <b>Category</b>                        | Manufacturer |

**Criteria:**

This warning is indicating that the gear oil heater CB is opened.

This warning is raised if **\*\*OilHeaterCBFeedbackInstalled\*\*** is true and **\*\*IO.GearboxOilHeaterCBClosed\*\*** is false for the time specified by **\*\*CBFeedbackStableTime\*\***.

This warning can be acknowledged if **\*\*IO.GearboxOilHeaterCBClosed\*\*** is true.

|                        |                              |                                          |              |
|------------------------|------------------------------|------------------------------------------|--------------|
| <b>No: 5163</b>        | <b>SupervisionID</b> 5163    | <b>Name</b> HydrHighPressPump1CBOpenedSx |              |
| <b>Log text</b>        | HydrHighPressPmp1CB open err |                                          |              |
| <b>Subsystem name</b>  | HydraulicStation             |                                          |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                           | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                     | <n/a>        |
| - Allowed attempts     | Unlimited                    | - Max time disconnect                    | <n/a>        |
| - Time window          | <n/a>                        | - Max time eliminate                     | <n/a>        |
| - Stabilize period     | 3 second                     | <b>Category</b>                          | Manufacturer |

**Criteria:**

The warning indicates Pump Circuit breaker is opened.

The warning is raised if the **\*\*IO.HydrHighPressPump1CBClosed\*\*** is false for more than the time interval given by the parameter **\*\*CBFeedbackStableTime\*\***.

This warning is auto acknowledged if **\*\*IO.HydrHighPressPump1CBClosed\*\*** is true.

The supervision is monitored only if the circuit breakers are installed (**\*\*PumpMotorsCBFeedbackInstalled\*\*** is equal to true)

|                        |                              |                                          |              |
|------------------------|------------------------------|------------------------------------------|--------------|
| <b>No: 5163</b>        | <b>SupervisionID</b> 5163    | <b>Name</b> HydrHighPressPump1CBOpenedSx |              |
| <b>Log text</b>        | HydrHighPressPmp1CB open err |                                          |              |
| <b>Subsystem name</b>  | HydraulicStation             |                                          |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                           | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                     | <n/a>        |
| - Allowed attempts     | Unlimited                    | - Max time disconnect                    | <n/a>        |
| - Time window          | <n/a>                        | - Max time eliminate                     | <n/a>        |
| - Stabilize period     | 3 second                     | <b>Category</b>                          | Manufacturer |

**Criteria:**

The warning indicates Pump Circuit breaker is opened.

The warning is raised if the **\*\*IO.HydrHighPressPump1CBClosed\*\*** is false for more than the time interval given by the parameter **\*\*CBFeedbackStableTime\*\***.

This warning is auto acknowledged if **\*\*IO.HydrHighPressPump1CBClosed\*\*** is true.

The supervision is monitored only if the circuit breakers are installed (**\*\*PumpMotorsCBFeedbackInstalled\*\*** is equal to true)

|                        |                              |                                          |              |
|------------------------|------------------------------|------------------------------------------|--------------|
| <b>No: 5164</b>        | <b>SupervisionID</b> 5164    | <b>Name</b> HydrHighPressPump2CBOpenedSx |              |
| <b>Log text</b>        | HydrHighPressPmp2CB open err |                                          |              |
| <b>Subsystem name</b>  | HydraulicStation             |                                          |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                           | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                     | <n/a>        |
| - Allowed attempts     | Unlimited                    | - Max time disconnect                    | <n/a>        |
| - Time window          | <n/a>                        | - Max time eliminate                     | <n/a>        |
| - Stabilize period     | 3 second                     | <b>Category</b>                          | Manufacturer |

**Criteria:**

The warning indicates Pump2 Circuit breaker is opened.

The warning is raised if the **\*\*IO.HydrHighPressPump2CBClosed\*\*** is false for more than the time interval given by the parameter **\*\*CBFeedbackStableTime\*\***.

This warning is auto acknowledged if **\*\*IO.HydrHighPressPump2CBClosed\*\*** is true.

The supervision is monitored only if the circuit breakers are installed (**\*\*PumpMotorsCBFeedbackInstalled\*\*** is equal to true)

|                           |                              |                                          |
|---------------------------|------------------------------|------------------------------------------|
| <b>No: 5164</b>           | <b>SupervisionID</b> 5164    | <b>Name</b> HydrHighPressPump2CBOpenedSx |
| <b>Log text</b>           | HydrHighPressPmp2CB open err |                                          |
| <b>Subsystem name</b>     | HydraulicStation             |                                          |
| <b>Type</b>               | Warning                      | <b>Timeout</b> <disabled>                |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b> <n/a>               |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b> <n/a>       |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b> <n/a>        |
| - <b>Stabilize period</b> | 3 second                     | <b>Category</b> Manufacturer             |

**Criteria:**

The warning indicates Pump2 Circuit breaker is opened.

The warning is raised if the **\*\*IO.HydrHighPressPump2CBClosed\*\*** is false for more than the time interval given by the parameter **\*\*CBFeedbackStableTime\*\***.

This warning is auto acknowledged if **\*\*IO.HydrHighPressPump2CBClosed\*\*** is true.

The supervision is monitored only if the circuit breakers are installed (**\*\*PumpMotorsCBFeedbackInstalled\*\*** is equal to true)

|                           |                                |                                          |
|---------------------------|--------------------------------|------------------------------------------|
| <b>No: 5165</b>           | <b>SupervisionID</b> 5165      | <b>Name</b> TowNatFreq_InvalidCheckSumSx |
| <b>Log text</b>           | Invalid Tower Sticker Checksum |                                          |
| <b>Subsystem name</b>     | TowerFrequencies               |                                          |
| <b>Type</b>               | Alarm                          | <b>Timeout</b> <n/a>                     |
| <b>Acknowledgement</b>    | Remote                         | <b>Shutdown type</b> PauseSlow           |
| - <b>Allowed attempts</b> | <n/a>                          | - <b>Max time disconnect</b> 1000 second |
| - <b>Time window</b>      | <n/a>                          | - <b>Max time eliminate</b> 1000 second  |
| - <b>Stabilize period</b> | <n/a>                          | <b>Category</b> Manufacturer             |

**Criteria:**

Please double check that the values from the Tower Sticker have been entered correctly in the Basic Configuration.

This supervision serves as a consistency check on typed in values from the Tower Sticker, i.e. hub height, tower natural frequency etc.

The supervision is activated when the following criteria are met

1. SP\_TowNatFreq\_InvalidCheckSum\_ActivityLevelPx = 2
2. Expected checksum differs from value given by SP\_TowerStickerChecksumPx

The expected checksum is derived from the following parameters

- SP\_HubHeightPx
- SP\_EstimatedTowerNaturalFreqPx
- SP\_EstimatedTower2ModeFreqPx
- TowNatFreq\_OutsideBounds\_LowerLimitPct
- TowNatFreq\_OutsideBounds\_UpperLimitPct

parameters:

- SP\_TowNatFreq\_InvalidCheckSum\_ActivityLevel
- SP\_TowerStickerChecksum
- SP\_HubHeight
- SP\_EstimatedTowerNaturalFreq
- SP\_EstimatedTower2ModeFreq
- TowNatFreq\_OutsideBounds\_LowerLimitPct
- TowNatFreq\_OutsideBounds\_UpperLimitPct

|                        |                               |                                      |
|------------------------|-------------------------------|--------------------------------------|
| <b>No: 5166</b>        | <b>SupervisionID</b> 5166     | <b>Name</b> GeneratorSpeedHighLTPOsx |
| <b>Log text</b>        | Max Gen RPM: ____._s____._RPM |                                      |
| <b>Subsystem name</b>  | SV                            |                                      |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                 |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | 3                             | - Max time disconnect 3 second       |
| - Time window          | 1 hour                        | - Max time eliminate 9 second        |
| - Stabilize period     | 60 second                     | <b>Category</b> Manufacturer         |

**Criteria:**  
This supervision monitors **\*\*GeneratorTachoSpeed\*\***, and reacts when it exceeds an upper limit value.

An alarm is issued if following conditions are met:

1. **\*\*GenSpdHigh\\_LTPO\\_ActivityLevel\*\*** = 2
  2. **\*\*AGO\\_AGOActive\*\*** is false
  3. **\*\*GeneratorTachoSpeed\*\*** is greater than GenSpdHigh\_LTPO\_SpeedLow + GenSpdHigh\_LTPO\_SpeedLowOffset rpm for more than GenSpdHigh\_LTPO\_SpeedLowTime sec or GenSpdHigh\_LTPO\_SpeedHigh + GenSpdHigh\_LTPO\_SpeedHighOffset rpm for GenSpdHigh\_LTPO\_SpeedHighTime sec.
- A hysteresis is added to the speed measurement of  
RotorSpeedHigh\_LowThresholdPersistentOverspeed\_SpeedLowHyst rpm.

|                        |                                 |                                   |
|------------------------|---------------------------------|-----------------------------------|
| <b>No: 5168</b>        | <b>SupervisionID</b> 5168       | <b>Name</b> LowHydrPressATYCOffSx |
| <b>Log text</b>        | Low Press A TYC Off, ____._ bar |                                   |
| <b>Subsystem name</b>  | PiSV                            |                                   |
| <b>Type</b>            | Alarm                           | <b>Timeout</b> <n/a>              |
| <b>Acknowledgement</b> | Auto                            | <b>Shutdown type</b> PauseFast    |
| - Allowed attempts     | 3                               | - Max time disconnect 8 second    |
| - Time window          | 1 hour                          | - Max time eliminate 1 hour       |
| - Stabilize period     | 1 minute                        | <b>Category</b> Manufacturer      |

**Criteria:**  
This supervision monitors if the EMF accumulator pressure in pitch block A gets too low - TYC gets disabled during the pause shut down by the signal **\*\*PiSV\\_DisableTYCLowHydrPress\*\***  
This alarm is activated if the following conditions are met for more than **\*\*LowHydrPressTYCOff\\_Timeout\*\*** sec

1. **\*\*LowHydrPressTYCOff\\_ActivityLevel\*\*** = 2
2. Turbine in production
3. **\*\*PiSP\\_EMFAccumulatorPressA\*\*** is below **\*\*LowHydrPressTYCOff\\_PressLimit\*\***



|                        |                                 |                                   |
|------------------------|---------------------------------|-----------------------------------|
| <b>No: 5169</b>        | <b>SupervisionID</b> 5169       | <b>Name</b> LowHydrPressBTYCOffSx |
| <b>Log text</b>        | Low Press B TYC Off, ____._ bar |                                   |
| <b>Subsystem name</b>  | PiSV                            |                                   |
| <b>Type</b>            | Alarm                           | <b>Timeout</b> <n/a>              |
| <b>Acknowledgement</b> | Auto                            | <b>Shutdown type</b> PauseFast    |
| - Allowed attempts     | 3                               | - Max time disconnect 8 second    |
| - Time window          | 1 hour                          | - Max time eliminate 1 hour       |
| - Stabilize period     | 1 minute                        | <b>Category</b> Manufacturer      |

**Criteria:**

This supervision monitors if the EMF accumulator pressure in pitch block B gets too low - TYC gets disabled during the pause shut down by the signal **\*\*PiSV\\_DisableTYCLowHydrPress\*\***  
This alarm is activated if the following conditions are met for more than **\*\*LowHydrPressTYCOff\\_Timeout\*\*** sec

1. **\*\*LowHydrPressTYCOff\\_ActivityLevel\*\*** = 2
2. Turbine in production
3. **\*\*PiSP\\_EMFAccumulatorPressB\*\*** is below **\*\*LowHydrPressTYCOff\\_PressLimit\*\***

|                        |                                 |                                   |
|------------------------|---------------------------------|-----------------------------------|
| <b>No: 5170</b>        | <b>SupervisionID</b> 5170       | <b>Name</b> LowHydrPressCTYCOffSx |
| <b>Log text</b>        | Low Press C TYC Off, ____._ bar |                                   |
| <b>Subsystem name</b>  | PiSV                            |                                   |
| <b>Type</b>            | Alarm                           | <b>Timeout</b> <n/a>              |
| <b>Acknowledgement</b> | Auto                            | <b>Shutdown type</b> PauseFast    |
| - Allowed attempts     | 3                               | - Max time disconnect 8 second    |
| - Time window          | 1 hour                          | - Max time eliminate 1 hour       |
| - Stabilize period     | 1 minute                        | <b>Category</b> Manufacturer      |

**Criteria:**

This supervision monitors if the EMF accumulator pressure in pitch block C gets too low - TYC gets disabled during the pause shut down by the signal **\*\*PiSV\\_DisableTYCLowHydrPress\*\***  
This alarm is activated if the following conditions are met for more than **\*\*LowHydrPressTYCOff\\_Timeout\*\*** sec

1. **\*\*LowHydrPressTYCOff\\_ActivityLevel\*\*** = 2
2. Turbine in production
3. **\*\*PiSP\\_EMFAccumulatorPressC\*\*** is below **\*\*LowHydrPressTYCOff\\_PressLimit\*\***

|                        |                                  |                                                         |
|------------------------|----------------------------------|---------------------------------------------------------|
| <b>No: 5172</b>        | <b>SupervisionID</b> 5172        | <b>Name</b> HubSafetySystemOptiStopConfigurationErrorSx |
| <b>Log text</b>        | HubSafetyOptiStopConfig.Err ____ |                                                         |
| <b>Subsystem name</b>  | OptiStop                         |                                                         |
| <b>Type</b>            | Alarm                            | <b>Timeout</b> <n/a>                                    |
| <b>Acknowledgement</b> | Auto                             | <b>Shutdown type</b> PauseSlow                          |
| - Allowed attempts     | 3                                | - Max time disconnect 9 second                          |
| - Time window          | 1 hour                           | - Max time eliminate 10 second                          |
| - Stabilize period     | 1 minute                         | <b>Category</b> Manufacturer                            |

**Criteria:**

This alarm indicates an error in the OptiStopVariant2 configuration.

The alarm is reported if the virtual signal from the safety system **\*\*IO.HubSafetySystemOptiStopConfiguration\*\*** does not match the setting given by the parameter **\*\*HubSafetySystemOptiStopConfiguration\*\***.

|                           |                            |                                         |              |
|---------------------------|----------------------------|-----------------------------------------|--------------|
| <b>No: 5173</b>           | <b>SupervisionID</b> 5173  | <b>Name</b> ExtConverterRundownActiveSx |              |
| <b>Log text</b>           | Ext.ConverterRundownActive |                                         |              |
| <b>Subsystem name</b>     | CubePower                  |                                         |              |
| <b>Type</b>               | Alarm                      | <b>Timeout</b>                          | <n/a>        |
| <b>Acknowledgement</b>    | Auto                       | <b>Shutdown type</b>                    | StopSlow     |
| - <b>Allowed attempts</b> | Unlimited                  | - <b>Max time disconnect</b>            | 3 second     |
| - <b>Time window</b>      | <n/a>                      | - <b>Max time eliminate</b>             | 9 second     |
| - <b>Stabilize period</b> | 60 second                  | <b>Category</b>                         | Manufacturer |

**Criteria:**

This alarm is raised when an HW External Converter Rundown Input signal is Active. This digital input signal is a HW signal to the converter controller board (CT440) to initiate a controlled ramp down of the power, stop switching PWM and open the breakers.

- Par1: Generator speed [RPM]
- Par2: Grid Converter Power (filtered) [W]

|                           |                              |                                                |              |
|---------------------------|------------------------------|------------------------------------------------|--------------|
| <b>No: 5179</b>           | <b>SupervisionID</b> 5179    | <b>Name</b> FireSuppressionCylinder1PressLowSx |              |
| <b>Log text</b>           | Fire cylinder1 gas level low |                                                |              |
| <b>Subsystem name</b>     | FireSuppression              |                                                |              |
| <b>Type</b>               | Warning                      | <b>Timeout</b>                                 | 2 day        |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b>                           | PauseSlow    |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b>                   | 9 second     |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b>                    | 10 second    |
| - <b>Stabilize period</b> | 10 second                    | <b>Category</b>                                | Manufacturer |

**Criteria:**

This supervision is active during normal operation i.e. when the fire suppression system has not been deployed.

The warning is reported if the gas pressure in the cylinder is low (input equals false) for the time given by parameter **\*\*FireSuppressionPressLowStableTime\*\***

The warning is transferred into an alarm after 2 days

The warning / alarm is automatically acknowledged when gas level input changes to true.

Cylinder 1: Input **\*\*IO.FireSuppressionCylinder1PressOk\*\***

**No: 5180**                      **SupervisionID** 5180      **Name** FireSuppressionCylinder2PressLowSx  
**Log text**                      Fire cylinder2 gas level low  
**Subsystem name**              FireSuppression  
**Type**                              Warning                      **Timeout**                      2 day  
**Acknowledgement**              Auto                      **Shutdown type**              PauseSlow  
- **Allowed attempts**              Unlimited                      - **Max time disconnect**              9 second  
- **Time window**                      <n/a>                      - **Max time eliminate**              10 second  
- **Stabilize period**              10 second                      **Category**                      Manufacturer  
**Criteria:**  
This supervision is active during normal operation i.e. when the fire suppression system has not been deployed.

The warning is reported if the gas pressure in the cylinder is low (input equals false) for the time given by parameter **\*\*FireSuppressionPressLowStableTime\*\***

The warning is transferred into an alarm after 2 days

The warning / alarm is automatically acknowledged when gas level input changes to true.

Cylinder 2: Input **\*\*IO.FireSuppressionCylinder2PressOk\*\***

**No: 5181**                      **SupervisionID** 5181      **Name** FireSuppressionCylinder3PressLowSx  
**Log text**                      Fire cylinder3 gas level low  
**Subsystem name**              FireSuppression  
**Type**                              Warning                      **Timeout**                      2 day  
**Acknowledgement**              Auto                      **Shutdown type**              PauseSlow  
- **Allowed attempts**              Unlimited                      - **Max time disconnect**              9 second  
- **Time window**                      <n/a>                      - **Max time eliminate**              10 second  
- **Stabilize period**              10 second                      **Category**                      Manufacturer  
**Criteria:**  
This supervision is active during normal operation i.e. when the fire suppression system has not been deployed.

The warning is reported if the gas pressure in the cylinder is low (input equals false) for the time given by parameter **\*\*FireSuppressionPressLowStableTime\*\***

The warning is transferred into an alarm after 2 days

The warning / alarm is automatically acknowledged when gas level input changes to true.

Cylinder 3: Input **\*\*IO.FireSuppressionCylinder3PressOk\*\***

**No: 5182**                      **SupervisionID** 5182      **Name** FireSuppressionCylinder4PressLowSx  
**Log text**                      Fire cylinder4 gas level low  
**Subsystem name**              FireSuppression  
**Type**                              Warning                      **Timeout**                      2 day  
**Acknowledgement**              Auto                      **Shutdown type**              PauseSlow  
- **Allowed attempts**              Unlimited              - **Max time disconnect**              9 second  
- **Time window**                      <n/a>              - **Max time eliminate**              10 second  
- **Stabilize period**              10 second              **Category**                      Manufacturer  
**Criteria:**  
This supervision is active during normal operation i.e. when the fire suppression system has not been deployed.

The warning is reported if the gas pressure in the cylinder is low (input equals false) for the time given by parameter **\*\*FireSuppressionPressLowStableTime\*\***

The warning is transferred into an alarm after 2 days

The warning / alarm is automatically acknowledged when gas level input changes to true.

Cylinder 4: Input **\*\*IO.FireSuppressionCylinder4PressOk\*\***

**No: 5184**                      **SupervisionID** 5184      **Name** FireSuppressionCylinder1ErrorSx  
**Log text**                      Fire suppression cylinder1 err  
**Subsystem name**              FireSuppression  
**Type**                              Alarm                      **Timeout**                      <n/a>  
**Acknowledgement**              Remote                      **Shutdown type**              PauseSlow  
- **Allowed attempts**              <n/a>              - **Max time disconnect**              9 second  
- **Time window**                      <n/a>              - **Max time eliminate**              10 second  
- **Stabilize period**              <n/a>              **Category**                      Manufacturer  
**Criteria:**  
This supervision is active during or after the fire suppression system has been deployed.

The alarm is reported if the fire suppression agent (gas) is not released as expected i.e. the gas pressure in the cylinder is still high (input equals true for the time given by parameter **\*\*FireSuppressionActivationDetectionTime\*\***) after the fire suppression system was supposed to be deployed.

The alarm is a one-shot alarm and can only be manually acknowledged.

Cylinder 1: Input **\*\*IO.FireSuppressionCylinder1PressOk\*\***

|                        |                                |                                             |              |
|------------------------|--------------------------------|---------------------------------------------|--------------|
| <b>No: 5185</b>        | <b>SupervisionID</b> 5185      | <b>Name</b> FireSuppressionCylinder2ErrorSx |              |
| <b>Log text</b>        | Fire suppression cylinder2 err |                                             |              |
| <b>Subsystem name</b>  | FireSuppression                |                                             |              |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>                              | <n/a>        |
| <b>Acknowledgement</b> | Remote                         | <b>Shutdown type</b>                        | PauseSlow    |
| - Allowed attempts     | <n/a>                          | - Max time disconnect                       | 9 second     |
| - Time window          | <n/a>                          | - Max time eliminate                        | 10 second    |
| - Stabilize period     | <n/a>                          | <b>Category</b>                             | Manufacturer |

**Criteria:**

This supervision is active during or after the fire suppression system has been deployed.

The alarm is reported if the fire suppression agent (gas) is not released as expected i.e. the gas pressure in the cylinder is still high (input equals true for the time given by parameter **\*\*FireSuppressionActivationDetectionTime\*\***) after the fire suppression system was supposed to be deployed.

The alarm is a one-shot alarm and can only be manually acknowledged.

Cylinder 2: Input **\*\*IO.FireSuppressionCylinder2PressOk\*\***

|                        |                                |                                             |              |
|------------------------|--------------------------------|---------------------------------------------|--------------|
| <b>No: 5186</b>        | <b>SupervisionID</b> 5186      | <b>Name</b> FireSuppressionCylinder3ErrorSx |              |
| <b>Log text</b>        | Fire suppression cylinder3 err |                                             |              |
| <b>Subsystem name</b>  | FireSuppression                |                                             |              |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>                              | <n/a>        |
| <b>Acknowledgement</b> | Remote                         | <b>Shutdown type</b>                        | PauseSlow    |
| - Allowed attempts     | <n/a>                          | - Max time disconnect                       | 9 second     |
| - Time window          | <n/a>                          | - Max time eliminate                        | 10 second    |
| - Stabilize period     | <n/a>                          | <b>Category</b>                             | Manufacturer |

**Criteria:**

This supervision is active during or after the fire suppression system has been deployed.

The alarm is reported if the fire suppression agent (gas) is not released as expected i.e. the gas pressure in the cylinder is still high (input equals true for the time given by parameter **\*\*FireSuppressionActivationDetectionTime\*\***) after the fire suppression system was supposed to be deployed.

The alarm is a one-shot alarm and can only be manually acknowledged.

Cylinder 3: Input **\*\*IO.FireSuppressionCylinder3PressOk\*\***

|                        |                                |                                             |
|------------------------|--------------------------------|---------------------------------------------|
| <b>No: 5187</b>        | <b>SupervisionID</b> 5187      | <b>Name</b> FireSuppressionCylinder4ErrorSx |
| <b>Log text</b>        | Fire suppression cylinder4 err |                                             |
| <b>Subsystem name</b>  | FireSuppression                |                                             |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                        |
| <b>Acknowledgement</b> | Remote                         | <b>Shutdown type</b> PauseSlow              |
| - Allowed attempts     | <n/a>                          | - Max time disconnect 9 second              |
| - Time window          | <n/a>                          | - Max time eliminate 10 second              |
| - Stabilize period     | <n/a>                          | <b>Category</b> Manufacturer                |

**Criteria:**

This supervision is active during or after the fire suppression system has been deployed.

The alarm is reported if the fire suppression agent (gas) is not released as expected i.e. the gas pressure in the cylinder is still high (input equals true for the time given by parameter **\*\*FireSuppressionActivationDetectionTime\*\***) after the fire suppression system was supposed to be deployed.

The alarm is a one-shot alarm and can only be manually acknowledged.

Cylinder 4: Input **\*\*IO.FireSuppressionCylinder4PressOk\*\***

|                        |                                |                                                  |
|------------------------|--------------------------------|--------------------------------------------------|
| <b>No: 5189</b>        | <b>SupervisionID</b> 5189      | <b>Name</b> FireSuppressionCylinder1DischargedSx |
| <b>Log text</b>        | Fire suppression C1 discharged |                                                  |
| <b>Subsystem name</b>  | FireSuppression                |                                                  |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                             |
| <b>Acknowledgement</b> | Remote                         | <b>Shutdown type</b> PauseSlow                   |
| - Allowed attempts     | <n/a>                          | - Max time disconnect 9 second                   |
| - Time window          | <n/a>                          | - Max time eliminate 10 second                   |
| - Stabilize period     | <n/a>                          | <b>Category</b> Manufacturer                     |

**Criteria:**

This supervision is active during or after the fire suppression system has been deployed.

The alarm is reported if the fire suppression agent (gas) was released as expected i.e. the gas pressure in the cylinder is low (input equals false) within the time given by parameter **\*\*FireSuppressionPressLowStableTime\*\***

The alarm is a one-shot alarm and can only be manually acknowledged.

Cylinder 1: Input **\*\*IO.FireSuppressionCylinder1PressOk\*\***

|                        |                                |                                                  |
|------------------------|--------------------------------|--------------------------------------------------|
| <b>No: 5190</b>        | <b>SupervisionID</b> 5190      | <b>Name</b> FireSuppressionCylinder2DischargedSx |
| <b>Log text</b>        | Fire suppression C2 discharged |                                                  |
| <b>Subsystem name</b>  | FireSuppression                |                                                  |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                             |
| <b>Acknowledgement</b> | Remote                         | <b>Shutdown type</b> PauseSlow                   |
| - Allowed attempts     | <n/a>                          | - Max time disconnect 9 second                   |
| - Time window          | <n/a>                          | - Max time eliminate 10 second                   |
| - Stabilize period     | <n/a>                          | <b>Category</b> Manufacturer                     |

**Criteria:**

This supervision is active during or after the fire suppression system has been deployed.

The alarm is reported if the fire suppression agent (gas) was released as expected i.e. the gas pressure in the cylinder is low (input equals false) within the time given by parameter **\*\*FireSuppressionPressLowStableTime\*\***

The alarm is a one-shot alarm and can only be manually acknowledged.

Cylinder 2: Input **\*\*IO.FireSuppressionCylinder2PressOk\*\***

|                        |                                |                                                  |
|------------------------|--------------------------------|--------------------------------------------------|
| <b>No: 5191</b>        | <b>SupervisionID</b> 5191      | <b>Name</b> FireSuppressionCylinder3DischargedSx |
| <b>Log text</b>        | Fire suppression C3 discharged |                                                  |
| <b>Subsystem name</b>  | FireSuppression                |                                                  |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                             |
| <b>Acknowledgement</b> | Remote                         | <b>Shutdown type</b> PauseSlow                   |
| - Allowed attempts     | <n/a>                          | - Max time disconnect 9 second                   |
| - Time window          | <n/a>                          | - Max time eliminate 10 second                   |
| - Stabilize period     | <n/a>                          | <b>Category</b> Manufacturer                     |

**Criteria:**

This supervision is active during or after the fire suppression system has been deployed.

The alarm is reported if the fire suppression agent (gas) was released as expected i.e. the gas pressure in the cylinder is low (input equals false) within the time given by parameter **\*\*FireSuppressionPressLowStableTime\*\***

The alarm is a one-shot alarm and can only be manually acknowledged.

Cylinder 3: Input **\*\*IO.FireSuppressionCylinder3PressOk\*\***

|                        |                                |                                                  |
|------------------------|--------------------------------|--------------------------------------------------|
| <b>No: 5192</b>        | <b>SupervisionID</b> 5192      | <b>Name</b> FireSuppressionCylinder4DischargedSx |
| <b>Log text</b>        | Fire suppression C4 discharged |                                                  |
| <b>Subsystem name</b>  | FireSuppression                |                                                  |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                             |
| <b>Acknowledgement</b> | Remote                         | <b>Shutdown type</b> PauseSlow                   |
| - Allowed attempts     | <n/a>                          | - Max time disconnect 9 second                   |
| - Time window          | <n/a>                          | - Max time eliminate 10 second                   |
| - Stabilize period     | <n/a>                          | <b>Category</b> Manufacturer                     |

**Criteria:**

This supervision is active during or after the fire suppression system has been deployed.

The alarm is reported if the fire suppression agent (gas) was released as expected i.e. the gas pressure in the cylinder is low (input equals false) within the time given by parameter **\*\*FireSuppressionPressLowStableTime\*\***

The alarm is a one-shot alarm and can only be manually acknowledged.

Cylinder 4: Input **\*\*IO.FireSuppressionCylinder4PressOk\*\***

|                        |                           |                                |
|------------------------|---------------------------|--------------------------------|
| <b>No: 5194</b>        | <b>SupervisionID</b> 5194 | <b>Name</b> AutoYawDisabledSx  |
| <b>Log text</b>        | Auto Yaw Disabled         |                                |
| <b>Subsystem name</b>  | YawControl                |                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow |
| - Allowed attempts     | Unlimited                 | - Max time disconnect 9 second |
| - Time window          | <n/a>                     | - Max time eliminate 10 second |
| - Stabilize period     | 60 second                 | <b>Category</b> Owner          |

**Criteria:**

This alarm is reported to communicate to the user if auto yaw is disabled and nobody is working on the turbine.

The alarm is reported when:

- \* RemoteManualYawingEnabled is true
- \* PointOfOperation is Remote
- \* ServiceMode is NoService

The alarm can be acknowledged if All of the following conditions are true:

- \* RemoteManualYawingEnabled is false
- \* PointOfOperation is Local
- \* ServiceMode is Service



|                        |                           |                                     |              |
|------------------------|---------------------------|-------------------------------------|--------------|
| <b>No: 5195</b>        | <b>SupervisionID</b> 5195 | <b>Name</b> PropValveAStatusFaultSx |              |
| <b>Log text</b>        | Prop Valve A Status Fault |                                     |              |
| <b>Subsystem name</b>  | PiSV                      |                                     |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                      | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                | StopSlow     |
| - Allowed attempts     | 3                         | - Max time disconnect               | 3 second     |
| - Time window          | 1 hour                    | - Max time eliminate                | 9 second     |
| - Stabilize period     | 1 minute                  | <b>Category</b>                     | Manufacturer |

**Criteria:**

This supervision monitors the operational condition of the proportional valves in blade A

This alarm is activated if the following conditions are met for more than  
PiSV\_PropValveStatusFault\_TimeOut seconds

1. PiSV\_PropValveStatusFault\_ActivityLevel = 2
2. SupervisionInServiceModeDisabled is False
3. The status of the feedback signal IO.PitchProportionalValveAOutput is not valid

|                        |                           |                                     |              |
|------------------------|---------------------------|-------------------------------------|--------------|
| <b>No: 5196</b>        | <b>SupervisionID</b> 5196 | <b>Name</b> PropValveBStatusFaultSx |              |
| <b>Log text</b>        | Prop Valve B Status Fault |                                     |              |
| <b>Subsystem name</b>  | PiSV                      |                                     |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                      | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                | StopSlow     |
| - Allowed attempts     | 3                         | - Max time disconnect               | 3 second     |
| - Time window          | 1 hour                    | - Max time eliminate                | 9 second     |
| - Stabilize period     | 1 minute                  | <b>Category</b>                     | Manufacturer |

**Criteria:**

This supervision monitors the operational condition of the proportional valves in blade B

This alarm is activated if the following conditions are met for more than  
PiSV\_PropValveStatusFault\_TimeOut seconds

1. PiSV\_PropValveStatusFault\_ActivityLevel = 2
2. SupervisionInServiceModeDisabled is False
3. The status of the feedback signal IO.PitchProportionalValveBOutput is not valid

|                        |                           |                                     |              |
|------------------------|---------------------------|-------------------------------------|--------------|
| <b>No: 5197</b>        | <b>SupervisionID</b> 5197 | <b>Name</b> PropValveCStatusFaultSx |              |
| <b>Log text</b>        | Prop Valve C Status Fault |                                     |              |
| <b>Subsystem name</b>  | PiSV                      |                                     |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                      | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                | StopSlow     |
| - Allowed attempts     | 3                         | - Max time disconnect               | 3 second     |
| - Time window          | 1 hour                    | - Max time eliminate                | 9 second     |
| - Stabilize period     | 1 minute                  | <b>Category</b>                     | Manufacturer |

**Criteria:**

This supervision monitors the operational condition of the proportional valves in blade C

This alarm is activated if the following conditions are met for more than  
PiSV\_PropValveStatusFault\_TimeOut seconds

1. PiSV\_PropValveStatusFault\_ActivityLevel = 2
2. SupervisionInServiceModeDisabled is False
3. The status of the feedback signal IO.PitchProportionalValveCOutput is not valid

|                    |                      |                                                     |               |
|--------------------|----------------------|-----------------------------------------------------|---------------|
| <b>No: 5204</b>    | <b>SupervisionID</b> | <b>Name</b>                                         |               |
|                    | 5204                 | IceDetectorIceDetectedInBladeRemoteManualAckAlarmSx |               |
| Log text           | IceDetected          |                                                     |               |
| Subsystem name     | IceDetector          |                                                     |               |
| Type               | Alarm                | Timeout                                             | <n/a>         |
| Acknowledgement    | Remote               | Shutdown type                                       | PauseSlow     |
| - Allowed attempts | <n/a>                | - Max time disconnect                               | 9 second      |
| - Time window      | <n/a>                | - Max time eliminate                                | 3600 second   |
| - Stabilize        | <n/a>                | Category                                            | Environmental |

**Criteria:**  
Alarm to pause the turbine, Turbine will be paused until no ice detected.

This Alarm is triggered if the following conditions are met:

- If Px\_IceDetectorSupervisionStrategy = Variant 2
- IceDetectorIceDetectedProvidedBySCADA is true or
- IceDetectorIceDetectedProvidedByVID is IceDetected and Px\_IceDetectorInHubInstalled is true

The Alarm can only be acknowledged remotely when no ice detected.

|                    |                             |                                      |              |
|--------------------|-----------------------------|--------------------------------------|--------------|
| <b>No: 5205</b>    | <b>SupervisionID</b> 5205   | <b>Name</b> IceDetectorSystemErrorSx |              |
| Log text           | IceDetectorSystem Alarm Err |                                      |              |
| Subsystem name     | IceDetector                 |                                      |              |
| Type               | Alarm                       | Timeout                              | <n/a>        |
| Acknowledgement    | Auto                        | Shutdown type                        | PauseSlow    |
| - Allowed attempts | Unlimited                   | - Max time disconnect                | 9 second     |
| - Time window      | <n/a>                       | - Max time eliminate                 | 3600 second  |
| - Stabilize period | 10 second                   | Category                             | Manufacturer |

**Criteria:**  
Alarm to pause the turbine, as ice detection system is failing so its not possible to detect ice. Furthermore the weather condition incidcates that there can be risk for ice throw if the turbine starts to rotate too fast.

This Alarm is triggered if one of the following condition is met:

- Sx\_IceDetectorCommError is triggered
- Sx\_IceDetectorSystemNotAlive is triggered
- Sx\_IceDetectorEvaluationError is triggered and
- IceThrowRisk is true

The Alarm can be acknowledged when none of the above alarm conditions are valid

|                           |                           |                                      |              |
|---------------------------|---------------------------|--------------------------------------|--------------|
| <b>No: 5206</b>           | <b>SupervisionID</b> 5206 | <b>Name</b> IceDetectorSensorErrorSx |              |
| <b>Log text</b>           | Ice detector sensor error |                                      |              |
| <b>Subsystem name</b>     | IceDetector               |                                      |              |
| <b>Type</b>               | Warning                   | <b>Timeout</b>                       | <disabled>   |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b>                 | <n/a>        |
| - <b>Allowed attempts</b> | Unlimited                 | - <b>Max time disconnect</b>         | <n/a>        |
| - <b>Time window</b>      | <n/a>                     | - <b>Max time eliminate</b>          | <n/a>        |
| - <b>Stabilize period</b> | 10 second                 | <b>Category</b>                      | Manufacturer |

**Criteria:**

Warning to indicate that the VID sensor is not ok .

This warning is triggered if the following conditions are met:

- If VIDSystem is Ok
- IceRisk is false
- Ice is detected on the Blade ( IO.IceDetectorCMIIndexValue > Px\_IceDetectorCMIThresholdIndex ) for Px\_IceDetectorSensorErrorStableTime

The warning can be acknowledged when no ice detected.

|                           |                           |                                                     |              |
|---------------------------|---------------------------|-----------------------------------------------------|--------------|
| <b>No: 5207</b>           | <b>SupervisionID</b> 5207 | <b>Name</b> IceDetectorVIDStoredMkVersionMismatchSx |              |
| <b>Log text</b>           | VID MkVersion Mismatch    |                                                     |              |
| <b>Subsystem name</b>     | IceDetector               |                                                     |              |
| <b>Type</b>               | Warning                   | <b>Timeout</b>                                      | <disabled>   |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b>                                | <n/a>        |
| - <b>Allowed attempts</b> | Unlimited                 | - <b>Max time disconnect</b>                        | <n/a>        |
| - <b>Time window</b>      | <n/a>                     | - <b>Max time eliminate</b>                         | <n/a>        |
| - <b>Stabilize period</b> | 10 second                 | <b>Category</b>                                     | Manufacturer |

**Criteria:**

The warning indicates the VID system is using an incorrect configuration parameter.

This Warning is triggered if the following signals didn't match MkVersion of turbine

- IO.IceDetectorTurbineTypeMkVersionByte0
- IO.IceDetectorTurbineTypeMkVersionByte1
- IO.IceDetectorTurbineTypeMkVersionByte2
- IO.IceDetectorTurbineTypeMkVersionByte3
- IO.IceDetectorTurbineTypeMkVersionByte4

|                           |                           |                                                    |              |
|---------------------------|---------------------------|----------------------------------------------------|--------------|
| <b>No: 5208</b>           | <b>SupervisionID</b> 5208 | <b>Name</b> IceDetectorVIDStoredMaxPowerMismatchSx |              |
| <b>Log text</b>           | VID MaxPower Mismatch     |                                                    |              |
| <b>Subsystem name</b>     | IceDetector               |                                                    |              |
| <b>Type</b>               | Warning                   | <b>Timeout</b>                                     | <disabled>   |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b>                               | <n/a>        |
| - <b>Allowed attempts</b> | Unlimited                 | - <b>Max time disconnect</b>                       | <n/a>        |
| - <b>Time window</b>      | <n/a>                     | - <b>Max time eliminate</b>                        | <n/a>        |
| - <b>Stabilize period</b> | 10 second                 | <b>Category</b>                                    | Manufacturer |

**Criteria:**

The warning indicates the VID system is using an incorrect configuration parameter.

This Warning is triggered if the following signal didn't match NominalPower of turbine

- IO.IceDetectorTurbineTypeMaxPower

|                        |                           |                                                       |
|------------------------|---------------------------|-------------------------------------------------------|
| <b>No: 5209</b>        | <b>SupervisionID</b> 5209 | <b>Name</b> IceDetectorVIDStoredTurbineTypeMismatchSx |
| <b>Log text</b>        | VID TurbineType Mismatch  |                                                       |
| <b>Subsystem name</b>  | IceDetector               |                                                       |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                             |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>                            |
| - Allowed attempts     | Unlimited                 | - Max time disconnect <n/a>                           |
| - Time window          | <n/a>                     | - Max time eliminate <n/a>                            |
| - Stabilize period     | 10 second                 | <b>Category</b> Manufacturer                          |

**Criteria:**

The warning indicates the VID system is using an incorrect configuration parameter.

This Warning is triggered if the following signal didn't match turbine type

- IO.IceDetectorTurbineTypeDiameter

|                        |                           |                                              |
|------------------------|---------------------------|----------------------------------------------|
| <b>No: 5215</b>        | <b>SupervisionID</b> 5215 | <b>Name</b> PowerSupplyYawMainSwitchOpenedSx |
| <b>Log text</b>        | Yaw Main Switch Opened    |                                              |
| <b>Subsystem name</b>  | PowerSupply               |                                              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                         |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow               |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second               |
| - Time window          | 7 day                     | - Max time eliminate 10 second               |
| - Stabilize period     | 10 second                 | <b>Category</b> Manufacturer                 |

**Criteria:**

This alarm is reported if the Nacelle cabinet main circuit breaker is opened.

This alarm is raised if the signal IO.PowerSupplyYawMainSwitchClosed remians false (0), for \*\*PowerSupplyCBOpenedStableTime\*\*.

This alarm will be auto acknowledged when the signal IO.PowerSupplyYawMainSwitchClosed has remained true (1) for \*\*PowerSupplyCBOpenedStableTime\*\*.

|                        |                           |                                             |
|------------------------|---------------------------|---------------------------------------------|
| <b>No: 5216</b>        | <b>SupervisionID</b> 5216 | <b>Name</b> PowerSupplyYawCabinetCBOpenedSx |
| <b>Log text</b>        | Yaw Cabinet CB Opened     |                                             |
| <b>Subsystem name</b>  | PowerSupply               |                                             |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow              |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second              |
| - Time window          | 7 day                     | - Max time eliminate 10 second              |
| - Stabilize period     | 10 second                 | <b>Category</b> Manufacturer                |

**Criteria:**

This alarm is reported if the Nacelle cabinet main circuit breaker is opened.

This alarm is raised if the signal IO.PowerSupplyYawCabinetCBClosed remians false (0), for \*\*PowerSupplyCBOpenedStableTime\*\*.

This alarm will be auto acknowledged when the signal IO.PowerSupplyYawCabinetCBClosed has remained true (1) for \*\*PowerSupplyCBOpenedStableTime\*\*.

|                        |                           |                                               |              |
|------------------------|---------------------------|-----------------------------------------------|--------------|
| <b>No: 5217</b>        | <b>SupervisionID</b> 5217 | <b>Name</b> PowerSupplyTowerCabinetCBOpenedSx |              |
| <b>Log text</b>        | Tower Cabinet CB Opened   |                                               |              |
| <b>Subsystem name</b>  | PowerSupply               |                                               |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                                | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                          | PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect                         | 9 second     |
| - Time window          | 7 day                     | - Max time eliminate                          | 10 second    |
| - Stabilize period     | 10 second                 | <b>Category</b>                               | Manufacturer |

**Criteria:**

This alarm is reported if the Nacelle cabinet main circuit breaker is opened.

This alarm is raised if the signal IO.PowerSupplyTowerCabinetCBClosed remains false (0), for \*\*PowerSupplyCBOpenedStableTime\*\*.

This alarm will be auto acknowledged when the signal IO.PowerSupplyTowerCabinetCBClosed has remained true (1) for \*\*PowerSupplyCBOpenedStableTime\*\*.

|                        |                           |                                        |              |
|------------------------|---------------------------|----------------------------------------|--------------|
| <b>No: 5218</b>        | <b>SupervisionID</b> 5218 | <b>Name</b> PowerSupplyOtherCBOpenedSx |              |
| <b>Log text</b>        | Other CB Opened           |                                        |              |
| <b>Subsystem name</b>  | PowerSupply               |                                        |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                         | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                   | PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect                  | 9 second     |
| - Time window          | 7 day                     | - Max time eliminate                   | 10 second    |
| - Stabilize period     | 10 second                 | <b>Category</b>                        | Manufacturer |

**Criteria:**

This alarm is reported if the hydrolic circuit breaker is opened.

This alarm is raised if the signal IO.PowerSupplyOtherCBClosed remains false (0), for \*\*PowerSupplyCBOpenedStableTime\*\*.

This alarm will be auto acknowledged when the signal IO.PowerSupplyOtherCBClosed has remained true (1) for \*\*PowerSupplyCBOpenedStableTime\*\*.

|                        |                                |                                                     |              |
|------------------------|--------------------------------|-----------------------------------------------------|--------------|
| <b>No: 5219</b>        | <b>SupervisionID</b> 5219      | <b>Name</b> PowerSupplyNacelleCabinetMainCBOpenedSx |              |
| <b>Log text</b>        | Nacelle Cabinet Main CB Opened |                                                     |              |
| <b>Subsystem name</b>  | PowerSupply                    |                                                     |              |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>                                      | <n/a>        |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                                | PauseSlow    |
| - Allowed attempts     | 3                              | - Max time disconnect                               | 9 second     |
| - Time window          | 7 day                          | - Max time eliminate                                | 10 second    |
| - Stabilize period     | 10 second                      | <b>Category</b>                                     | Manufacturer |

**Criteria:**

This alarm is reported if the Nacelle cabinet main circuit breaker is opened.

This alarm is raised if the signal IO.PowerSupplyNacelleCabinetMainCBClosed remains false (0), for \*\*PowerSupplyCBOpenedStableTime\*\*.

This alarm will be auto acknowledged when the signal IO.PowerSupplyNacelleCabinetMainCBClosed has remained true (1) for \*\*PowerSupplyCBOpenedStableTime\*\*.

|                        |                           |                                        |
|------------------------|---------------------------|----------------------------------------|
| <b>No: 5220</b>        | <b>SupervisionID</b> 5220 | <b>Name</b> PowerSupplyHydrCBCOpenedSx |
| <b>Log text</b>        | Hydr CB Opened            |                                        |
| <b>Subsystem name</b>  | PowerSupply               |                                        |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow         |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second         |
| - Time window          | 7 day                     | - Max time eliminate 10 second         |
| - Stabilize period     | 10 second                 | <b>Category</b> Manufacturer           |

**Criteria:**

This alarm is reported if the hydrolic circuit breaker is opened.

This alarm is raised if the signal IO.PowerSupplyHydrCBClosed remians false (0), for \*\*PowerSupplyCBCOpenedStableTime\*\*.

This alarm will be auto acknowledged when the signal IO.PowerSupplyHydrCBClosed has remained true (1) for \*\*PowerSupplyCBCOpenedStableTime\*\*.

|                        |                               |                                                   |
|------------------------|-------------------------------|---------------------------------------------------|
| <b>No: 5221</b>        | <b>SupervisionID</b> 5221     | <b>Name</b> PowerSupplyColdClimateMainCBCOpenedSx |
| <b>Log text</b>        | DeIcing Main Supply CB Opened |                                                   |
| <b>Subsystem name</b>  | PowerSupply                   |                                                   |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                         |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                        |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                       |
| - Time window          | 7 day                         | - Max time eliminate <n/a>                        |
| - Stabilize period     | 10 second                     | <b>Category</b> Manufacturer                      |

**Criteria:**

This warning is reported if the hydrolic circuit breaker is opened.

This warning is raised if the signal IO.PowerSupplyColdClimateMainCBClosed remians false (0), for \*\*PowerSupplyCBCOpenedStableTime\*\*.

This warning will be auto acknowledged when the signal IO.PowerSupplyColdClimateMainCBClosed has remained true (1) for \*\*PowerSupplyCBCOpenedStableTime\*\*.

|                        |                           |                                                       |
|------------------------|---------------------------|-------------------------------------------------------|
| <b>No: 5222</b>        | <b>SupervisionID</b> 5222 | <b>Name</b> PowerSupplyConvGenWaterCoolingCBCOpenedSx |
| <b>Log text</b>        | Conv Gen WCool CB Opened  |                                                       |
| <b>Subsystem name</b>  | PowerSupply               |                                                       |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                                  |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow                        |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second                        |
| - Time window          | 7 day                     | - Max time eliminate 10 second                        |
| - Stabilize period     | 10 second                 | <b>Category</b> Manufacturer                          |

**Criteria:**

This alarm is reported if the converter/generator waterpump circuit breaker is opened.

This alarm is raised if the signal IO.PowerSupplyConvGenWaterCoolingCBClosed remains false (0), for \*\*PowerSupplyCBCOpenedStableTime\*\*.

This alarm will be auto acknowledged when the signal IO.PowerSupplyConvGenWaterCoolingCBClosed has remained true (1) for \*\*PowerSupplyCBCOpenedStableTime\*\*.

|                        |                           |                                          |
|------------------------|---------------------------|------------------------------------------|
| <b>No: 5223</b>        | <b>SupervisionID</b> 5223 | <b>Name</b> PowerSupplyNacelle24VErrorSx |
| <b>Log text</b>        | Nacelle 24V Error         |                                          |
| <b>Subsystem name</b>  | PowerSupply               |                                          |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>               |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>              |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>               |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer             |

**Criteria:**

This warning indicates that the Nacelle 24V power supply is not working correctly.

This warning is raised if the signal **\*\*IO.PowerSupplyNacelleCabinet24VOk\*\*** remains false (0), for StableTime.

This warning can be acknowledged when the signal **IO.Tower24VPSU1Ok** has remained true (1) for StableTime.

|                        |                           |                                               |
|------------------------|---------------------------|-----------------------------------------------|
| <b>No: 5224</b>        | <b>SupervisionID</b> 5224 | <b>Name</b> PowerSupplyAuxTrafoMainCBOpenedSx |
| <b>Log text</b>        | Aux Trafo Main CB Opened  |                                               |
| <b>Subsystem name</b>  | PowerSupply               |                                               |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                          |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> PauseSlow                |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 9 second                |
| - Time window          | <n/a>                     | - Max time eliminate 10 second                |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer                  |

**Criteria:**

This alarm is reported if the auxiliary Trafo main circuit breaker is opened, when it should be closed (due to the internal power backup supply).

This alarm is raised if the signal **\*\*IO.PowerSupplyAuxTrafoMainCBClosed\*\*** remains false (0) and **\*\*PowerBackupMode\*\*** is not PowerBackupModeInternal, for **\*\*AuxTrafoMainCBStableTime\*\***.

This alarm can be acknowledged when the signal **\*\*IO.PowerSupplyAuxTrafoMainCBClosed\*\*** has remained true (1) or **\*\*PowerBackupMode\*\*** is PowerBackupModeInternal for **\*\*AuxTrafoMainCBStableTime\*\***.

|                        |                           |                                               |
|------------------------|---------------------------|-----------------------------------------------|
| <b>No: 5225</b>        | <b>SupervisionID</b> 5225 | <b>Name</b> PowerSupplyAuxTrafoMainCBClosedSx |
| <b>Log text</b>        | Aux Trafo Main CB Closed  |                                               |
| <b>Subsystem name</b>  | PowerSupply               |                                               |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                          |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> PauseSlow                |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 9 second                |
| - Time window          | <n/a>                     | - Max time eliminate 10 second                |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer                  |

**Criteria:**

This alarm is reported if the auxiliary Trafo main circuit breaker is closed, when it should be opened (due to the internal power backup supply).

This alarm is raised if the signal **\*\*IO.PowerSupplyAuxTrafoMainCBClosed\*\*** remains true (1) and PowerBackupMode is PowerBackupModeInternal, for **\*\*AuxTrafoMainCBStableTime\*\***.

This alarm can be acknowledged when the signal **\*\*IO.PowerSupplyAuxTrafoMainCBClosed\*\*** has remained false (0) or PowerBackupMode is not PowerBackupModeInternal for **\*\*AuxTrafoMainCBStableTime\*\***.

No: 5228

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

SupervisionID 5228

Edge Vibrations In Service

PiSV

Warning

Auto

3

1 second

1 minute

Name BladeEdgeVibInServiceSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

1 hour

PauseSlow

1 hour

1 hour

Manufacturer

Criteria:

This supervision monitors the edgewise vibration level of all blades, BladeALoadRootEdge BladeBLoadRootEdge and BladeCLoadRootEdge.

An warning is raised and an acoustic alarm will become active if the vibration level becomes too high.

The supervision is enabled if the following conditions are met:

1. \*\*EdgeVibInService\\_Enabled\*\* = 1

2. BladeALoadRootEdge Status is valid

The warning is activated if the following additional condition is met(does also apply for Blade B and Blade C):

PiSV\_BladeEdgeLoadOscLevelA > \*\*EdgeVibInService\\_AlarmLevel\*\*

PiSV\_BladeEdgeLoadOscLevelA is calculated as the RMS value of the bandpass filtered BladeALoadRootEdge.

No: 5233

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

SupervisionID 5233

ConverterPanelExternalFanError

ConverterPanelAirCooling

Warning

Auto

Unlimited

<n/a>

10 second

Name ConverterExternalFanErrorSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<disabled>

<n/a>

<n/a>

<n/a>

Manufacturer

Criteria:

This warning indicates that frequency converter of the variable speed converter external fan reports an error.

The warning is raised if the signal \*\*IO.ConverterExternalFanOk\*\* is false for a period longer than \*\*ConverterExternalFanOkStableTime\*\*.

The warning is auto acknowledged when the ConverterExternalFanOk signal changes to true.



|                        |                           |                                         |              |
|------------------------|---------------------------|-----------------------------------------|--------------|
| <b>No: 5234</b>        | <b>SupervisionID</b> 5234 | <b>Name</b> ConverterAirFilterCloggedSx |              |
| <b>Log text</b>        | ConverterAirFilterClogged |                                         |              |
| <b>Subsystem name</b>  | ConverterPanelAirCooling  |                                         |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                          | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                    | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect                   | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate                    | <n/a>        |
| - Stabilize period     | 60 second                 | <b>Category</b>                         | Manufacturer |

#### Criteria:

This warning indicates that converter air filter is clogged.

The warning is only monitored when the converter external fan speed is above **\*\*ConverterAirFilterSupervisionMinFanSpeed\*\***.

The warning is raised if the calculated clogged value is above value given by parameter **\*\*ConverterAirFilterCloggedValue\*\*** for a period longer than **\*\*ConverterAirFilterCloggedStableTime\*\***.

The calculated clogged value depends on converter air filter pressure (**\*\*IO.ConverterAirFilterPress\*\***) and on converter external fan speed (**\*\*IO.ConverterExternalFanSpeed\*\***).

The warning is auto acknowledged when the the calculated clogged value is below than value given by parameter **\*\*ConverterAirFilterCloggedValue\*\*** for a period longer than **\*\*ConverterAirFilterCloggedStableTime\*\***.

|                        |                                |                                               |              |
|------------------------|--------------------------------|-----------------------------------------------|--------------|
| <b>No: 5240</b>        | <b>SupervisionID</b> 5240      | <b>Name</b> PitchSystemDisabledManInTurbineSx |              |
| <b>Log text</b>        | Pitch Sys Disabled Man In Turb |                                               |              |
| <b>Subsystem name</b>  | PSC                            |                                               |              |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>                                | <n/a>        |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                          | StopSlow     |
| - Allowed attempts     | 3                              | - Max time disconnect                         | 3 second     |
| - Time window          | 1 hour                         | - Max time eliminate                          | 9 second     |
| - Stabilize period     | 1 second                       | <b>Category</b>                               | Manufacturer |

#### Criteria:

This supervision ensure that the pitch system is disabled during service operations (Man In Turbine). The pitch system can be disabled if the blade is parked in stop position. This allows that the hydraulic station can be turn off reducing the noise level during service operations

The pitch system can be enabled again through the Setup Picture (menu + #)

|                        |                           |                                          |              |
|------------------------|---------------------------|------------------------------------------|--------------|
| <b>No: 5244</b>        | <b>SupervisionID</b> 5244 | <b>Name</b> TransformerTempSensorFaultSx |              |
| <b>Log text</b>        | Trafo Temp Sensor Fault   |                                          |              |
| <b>Subsystem name</b>  | Transformer               |                                          |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                           | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                     | PauseFast    |
| - Allowed attempts     | 3                         | - Max time disconnect                    | 8 second     |
| - Time window          | 1 hour                    | - Max time eliminate                     | 1 hour       |
| - Stabilize period     | 60 second                 | <b>Category</b>                          | Manufacturer |

#### Criteria:

This alarm is reported if all 3 transformer temperature sensors are fault

This alarm is reported if all 3 transformer core temperature sensor are fault

|                        |                              |                                              |              |
|------------------------|------------------------------|----------------------------------------------|--------------|
| <b>No: 5290</b>        | <b>SupervisionID</b> 5290    | <b>Name</b> TooFrequentAccRechargingLevel1Sx |              |
| <b>Log text</b>        | TooFrequentAccuRechargLevel1 |                                              |              |
| <b>Subsystem name</b>  | HydraulicStation             |                                              |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                               | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                         | <n/a>        |
| - Allowed attempts     | Unlimited                    | - Max time disconnect                        | <n/a>        |
| - Time window          | <n/a>                        | - Max time eliminate                         | <n/a>        |
| - Stabilize period     | 3 second                     | <b>Category</b>                              | Manufacturer |

**Criteria:**

The warning indicates too frequent accumulator recharging.

The warning is raised if the one of the signals **\*\*IO.HydrReliefValve1Close\*\*** or **\*\*IO.HydrReliefValve2Close\*\*** has been activated more than **\*\*HydrReliefValveNOA\*\*** for time interval given by the parameter **\*\*HydrReliefValveActivationTimeFrame\*\***.

This warning is auto acknowledged when the number of activation for each signal (**\*\*IO.HydrReliefValve1Close\*\*** and **\*\*IO.HydrReliefValve2Close\*\***) is less than **\*\*HydrReliefValveNOA\*\*** for time interval given by the parameter **\*\*HydrReliefValveActivationTimeFrame\*\***.

|                        |                              |                                              |              |
|------------------------|------------------------------|----------------------------------------------|--------------|
| <b>No: 5291</b>        | <b>SupervisionID</b> 5291    | <b>Name</b> TooFrequentAccRechargingLevel2Sx |              |
| <b>Log text</b>        | TooFrequentAccuRechargLevel2 |                                              |              |
| <b>Subsystem name</b>  | HydraulicStation             |                                              |              |
| <b>Type</b>            | Alarm                        | <b>Timeout</b>                               | <n/a>        |
| <b>Acknowledgement</b> | Remote                       | <b>Shutdown type</b>                         | PauseSlow    |
| - Allowed attempts     | <n/a>                        | - Max time disconnect                        | 9 second     |
| - Time window          | <n/a>                        | - Max time eliminate                         | 10 second    |
| - Stabilize period     | <n/a>                        | <b>Category</b>                              | Manufacturer |

**Criteria:**

The alarm indicates that too frequent accumulator recharging was present for time longer than parameter **\*\*TooFrequentAccRechargingTimeout\*\***.

The warning is raised if the one of the signals **\*\*IO.HydrReliefValve1Close\*\*** or **\*\*IO.HydrReliefValve2Close\*\*** has been activated more than **\*\*HydrReliefValveNOA\*\*** for time interval given by the parameter **\*\*HydrReliefValveActivationTimeFrame\*\***.

If the warning TooFrequentAccRechargingLevel1 is not auto acknowledged after time **\*\*TooFrequentAccRechargingTimeout\*\***, this alarm is reported.

This alarm can be acknowledged. The number of relief valves activation is monitored only during production.

No: 5299

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID

BladeA heat cont.primary err

BladeHeating

Warning

Auto

3

1 hour

60 second

This warning indicates a feedback issue in the primary blade contactor.

Name

BladeHeatingMainContactorPrimaryFeedbackErrorSx

5299

BladeA heat cont.primary err

BladeHeating

Warning

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<disabled>

<n/a>

<n/a>

<n/a>

Manufacturer

The supervision is reported if the signal **\*\*IO.BladeHeatingBladeAPrimaryContactorFeedbackError\*\*** is true for a period longer than **\*\*BladeHeatingMainContactorStableTime\*\***.  
The supervision can be acknowledged when the signal **\*\*IO.BladeHeatingBladeAPrimaryContactorFeedbackError\*\*** is false.

No: 5300

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID

BladeB heat cont.primary err

BladeHeating

Warning

Auto

3

1 hour

60 second

This warning indicates a feedback issue in the primary blade contactor.

Name

BladeHeatingMainContactorPrimaryFeedbackErrorSx

5300

BladeB heat cont.primary err

BladeHeating

Warning

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<disabled>

<n/a>

<n/a>

<n/a>

Manufacturer

The supervision is reported if the signal **\*\*IO.BladeHeatingBladeBPrimaryContactorFeedbackError\*\*** is true for a period longer than **\*\*BladeHeatingMainContactorStableTime\*\***.  
The supervision can be acknowledged when the signal **\*\*IO.BladeHeatingBladeBPrimaryContactorFeedbackError\*\*** is false.

**No: 5301**                      **SupervisionID** 5301                      **Name** BladeHeatingMainContactorPrimaryFeedbackErrorSx

**Log text** BladeC heat cont.primary err

**Subsystem name** BladeHeating

**Type** Warning                      **Timeout** <disabled>

**Acknowledgement** Auto                      **Shutdown type** <n/a>

- **Allowed attempts** 3                      - **Max time disconnect** <n/a>

- **Time window** 1 hour                      - **Max time eliminate** <n/a>

- **Stabilize period** 60 second                      **Category** Manufacturer

**Criteria:**

This warning indicates a feedback issue in the primary blade contactor.

The supervision is reported if the signal **\*\*IO.BladeHeatingBladeCPrimaryContactorFeedbackError\*\*** is true for a period longer than **\*\*BladeHeatingMainContactorStableTime\*\***.

The supervision can be acknowledged when the signal **\*\*IO.BladeHeatingBladeCPrimaryContactorFeedbackError\*\*** is false.

**No: 5302**                      **SupervisionID** 5302                      **Name** BladeHeatingLWE1E2FuseBlownSx

**Log text** BladeAHeatingLWE1E2FuseBlown

**Subsystem name** BladeHeating

**Type** Warning                      **Timeout** <disabled>

**Acknowledgement** Auto                      **Shutdown type** <n/a>

- **Allowed attempts** Unlimited                      - **Max time disconnect** <n/a>

- **Time window** <n/a>                      - **Max time eliminate** <n/a>

- **Stabilize period** 0 second                      **Category** Manufacturer

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeALWE1E2FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeALWE1E2FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE1E2Disable\*\*** is set true to disable the heating element.

**No: 5303**                      **SupervisionID** 5303                      **Name** BladeHeatingLWE3E4FuseBlownSx

**Log text** BladeAHeatingLWE3E4FuseBlown

**Subsystem name** BladeHeating

**Type** Warning                      **Timeout** <disabled>

**Acknowledgement** Auto                      **Shutdown type** <n/a>

- **Allowed attempts** Unlimited                      - **Max time disconnect** <n/a>

- **Time window** <n/a>                      - **Max time eliminate** <n/a>

- **Stabilize period** 0 second                      **Category** Manufacturer

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeALWE3E4FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeALWE3E4FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE3E4Disable\*\*** is set true to disable the heating element.

|                           |                              |                                           |
|---------------------------|------------------------------|-------------------------------------------|
| <b>No: 5304</b>           | <b>SupervisionID</b> 5304    | <b>Name</b> BladeHeatingLWE5E6FuseBlownSx |
| <b>Log text</b>           | BladeAHeatingLWE5E6FuseBlown |                                           |
| <b>Subsystem name</b>     | BladeHeating                 |                                           |
| <b>Type</b>               | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b> <n/a>                |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b> <n/a>        |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b> <n/a>         |
| - <b>Stabilize period</b> | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeALWE5E6FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeALWE5E6FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE5E6Disable\*\*** is set true to disable the heating element.

|                           |                              |                                           |
|---------------------------|------------------------------|-------------------------------------------|
| <b>No: 5305</b>           | <b>SupervisionID</b> 5305    | <b>Name</b> BladeHeatingLWE7E8FuseBlownSx |
| <b>Log text</b>           | BladeAHeatingLWE7E8FuseBlown |                                           |
| <b>Subsystem name</b>     | BladeHeating                 |                                           |
| <b>Type</b>               | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b> <n/a>                |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b> <n/a>        |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b> <n/a>         |
| - <b>Stabilize period</b> | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeALWE7E8FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeALWE7E8FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE7E8Disable\*\*** is set true to disable the heating element.

|                        |                               |                                                     |              |
|------------------------|-------------------------------|-----------------------------------------------------|--------------|
| <b>No: 5306</b>        | <b>SupervisionID</b>          | <b>Name</b> BladeHeatingE3E4CurrentCalibrateErrorSx |              |
|                        | 5306                          |                                                     |              |
| <b>Log text</b>        | BladeA E3E4 heat current err. |                                                     |              |
| <b>Subsystem name</b>  | BladeHeating                  |                                                     |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                      | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                               | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                                | <n/a>        |
| - Stabilize period     | 60 second                     | <b>Category</b>                                     | Manufacturer |

**Criteria:**  
This warning indicates that the measured heating element current has too large deviation from the expected nominal current.

The warning is reported if the measured current  
\*\*BladeHeatingBladeAHeatingE3E4CalibrateCurrent\*\* and nominal current  
\*\*BladeHeatingElementE3E4NominalCurrent\*\* has a percentage deviation larger than  
\*\*BladeHeatingCurrentTolerance\*\*.

The warning can be acknowledged in two ways:  
1) After executing a new calibration command without current deviation being outside the tolerance limit \*\*BladeHeatingCurrentTolerance\*\*.  
2) After disabling the heating element by setting the parameter  
\*\*BladeHeatingE3E4Disable\*\* to true.

|                        |                               |                                                     |              |
|------------------------|-------------------------------|-----------------------------------------------------|--------------|
| <b>No: 5307</b>        | <b>SupervisionID</b>          | <b>Name</b> BladeHeatingE1E2CurrentCalibrateErrorSx |              |
|                        | 5307                          |                                                     |              |
| <b>Log text</b>        | BladeA E1E2 heat current err. |                                                     |              |
| <b>Subsystem name</b>  | BladeHeating                  |                                                     |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                      | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                               | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                                | <n/a>        |
| - Stabilize period     | 60 second                     | <b>Category</b>                                     | Manufacturer |

**Criteria:**  
This warning indicates that the measured heating element current has too large deviation from the expected nominal current.

The warning is reported if the measured current  
\*\*BladeHeatingBladeAHeatingE1E2CalibrateCurrent\*\* and nominal current  
\*\*BladeHeatingElementE1E2NominalCurrent\*\* has a percentage deviation larger than  
\*\*BladeHeatingCurrentTolerance\*\*.

The warning can be acknowledged in two ways:  
1) After executing a new calibration command without current deviation being outside the tolerance limit \*\*BladeHeatingCurrentTolerance\*\*.  
2) After disabling the heating element by setting the parameter  
\*\*BladeHeatingE1E2Disable\*\* to true.

|                           |                              |                                           |
|---------------------------|------------------------------|-------------------------------------------|
| <b>No: 5308</b>           | <b>SupervisionID</b> 5308    | <b>Name</b> BladeHeatingLWE1E2FuseBlownSx |
| <b>Log text</b>           | BladeBHeatingLWE1E2FuseBlown |                                           |
| <b>Subsystem name</b>     | BladeHeating                 |                                           |
| <b>Type</b>               | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b> <n/a>                |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b> <n/a>        |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b> <n/a>         |
| - <b>Stabilize period</b> | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeBLWE1E2FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeBLWE1E2FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE1E2Disable\*\*** is set true to disable the heating element.

|                           |                              |                                           |
|---------------------------|------------------------------|-------------------------------------------|
| <b>No: 5309</b>           | <b>SupervisionID</b> 5309    | <b>Name</b> BladeHeatingLWE3E4FuseBlownSx |
| <b>Log text</b>           | BladeBHeatingLWE3E4FuseBlown |                                           |
| <b>Subsystem name</b>     | BladeHeating                 |                                           |
| <b>Type</b>               | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b> <n/a>                |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b> <n/a>        |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b> <n/a>         |
| - <b>Stabilize period</b> | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeBLWE3E4FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeBLWE3E4FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE3E4Disable\*\*** is set true to disable the heating element.

|                           |                              |                                           |
|---------------------------|------------------------------|-------------------------------------------|
| <b>No: 5310</b>           | <b>SupervisionID</b> 5310    | <b>Name</b> BladeHeatingLWE5E6FuseBlownSx |
| <b>Log text</b>           | BladeBHeatingLWE5E6FuseBlown |                                           |
| <b>Subsystem name</b>     | BladeHeating                 |                                           |
| <b>Type</b>               | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b> <n/a>                |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b> <n/a>        |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b> <n/a>         |
| - <b>Stabilize period</b> | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeBLWE5E6FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeBLWE5E6FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE5E6Disable\*\*** is set true to disable the heating element.

|                           |                              |                                           |
|---------------------------|------------------------------|-------------------------------------------|
| <b>No: 5311</b>           | <b>SupervisionID</b> 5311    | <b>Name</b> BladeHeatingLWE7E8FuseBlownSx |
| <b>Log text</b>           | BladeBHeatingLWE7E8FuseBlown |                                           |
| <b>Subsystem name</b>     | BladeHeating                 |                                           |
| <b>Type</b>               | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b> <n/a>                |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b> <n/a>        |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b> <n/a>         |
| - <b>Stabilize period</b> | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeBLWE7E8FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeBLWE7E8FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE7E8Disable\*\*** is set true to disable the heating element.

|                           |                               |                                                     |
|---------------------------|-------------------------------|-----------------------------------------------------|
| <b>No: 5312</b>           | <b>SupervisionID</b> 5312     | <b>Name</b> BladeHeatingE3E4CurrentCalibrateErrorSx |
| <b>Log text</b>           | BladeB E3E4 heat current err. |                                                     |
| <b>Subsystem name</b>     | BladeHeating                  |                                                     |
| <b>Type</b>               | Warning                       | <b>Timeout</b> <disabled>                           |
| <b>Acknowledgement</b>    | Auto                          | <b>Shutdown type</b> <n/a>                          |
| - <b>Allowed attempts</b> | 3                             | - <b>Max time disconnect</b> <n/a>                  |
| - <b>Time window</b>      | 1 hour                        | - <b>Max time eliminate</b> <n/a>                   |
| - <b>Stabilize period</b> | 60 second                     | <b>Category</b> Manufacturer                        |

**Criteria:**

This warning indicates that the measured heating element current has too large deviation from the expected nominal current.

The warning is reported if the measured current **\*\*BladeHeatingBladeBHeatingE3E4CalibrateCurrent\*\*** and nominal current **\*\*BladeHeatingElementE3E4NominalCurrent\*\*** has a percentage deviation larger than **\*\*BladeHeatingCurrentTolerance\*\***.

The warning can be acknowledged in two ways:

- 1) After executing a new calibration command without current deviation being outside the tolerance limit **\*\*BladeHeatingCurrentTolerance\*\***.
- 2) After disabling the heating element by setting the parameter **\*\*BladeHeatingE3E4Disable\*\*** to true.



|                        |                               |                                                     |              |
|------------------------|-------------------------------|-----------------------------------------------------|--------------|
| <b>No: 5313</b>        | <b>SupervisionID</b>          | <b>Name</b> BladeHeatingE1E2CurrentCalibrateErrorSx |              |
| <b>Log text</b>        | 5313                          |                                                     |              |
| <b>Subsystem name</b>  | BladeB E1E2 heat current err. |                                                     |              |
| <b>Type</b>            | BladeHeating                  | <b>Timeout</b>                                      | <disabled>   |
| <b>Acknowledgement</b> | Warning                       | <b>Shutdown type</b>                                | <n/a>        |
| - Allowed attempts     | Auto                          | - Max time disconnect                               | <n/a>        |
| - Time window          | 3                             | - Max time eliminate                                | <n/a>        |
| - Stabilize period     | 1 hour                        | <b>Category</b>                                     | Manufacturer |
|                        | 60 second                     |                                                     |              |

**Criteria:**  
This warning indicates that the measured heating element current has too large deviation from the expected nominal current.

The warning is reported if the measured current  
\*\*BladeHeatingBladeBHeatingE1E2CalibrateCurrent\*\* and nominal current  
\*\*BladeHeatingElementE1E2NominalCurrent\*\* has a percentage deviation larger than  
\*\*BladeHeatingCurrentTolerance\*\*.  
The warning can be acknowledged in two ways:  
1) After executing a new calibration command without current deviation being outside the tolerance limit \*\*BladeHeatingCurrentTolerance\*\*.  
2) After disabling the heating element by setting the parameter  
\*\*BladeHeatingE1E2Disable\*\* to true.

|                        |                              |                                           |              |
|------------------------|------------------------------|-------------------------------------------|--------------|
| <b>No: 5314</b>        | <b>SupervisionID</b>         | <b>Name</b> BladeHeatingLWE1E2FuseBlownSx |              |
| <b>Log text</b>        | 5314                         |                                           |              |
| <b>Subsystem name</b>  | BladeCHeatingLWE1E2FuseBlown |                                           |              |
| <b>Type</b>            | BladeHeating                 | <b>Timeout</b>                            | <disabled>   |
| <b>Acknowledgement</b> | Warning                      | <b>Shutdown type</b>                      | <n/a>        |
| - Allowed attempts     | Auto                         | - Max time disconnect                     | <n/a>        |
| - Time window          | Unlimited                    | - Max time eliminate                      | <n/a>        |
| - Stabilize period     | <n/a>                        | <b>Category</b>                           | Manufacturer |
|                        | 0 second                     |                                           |              |

**Criteria:**  
This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal \*\*IO.BladeHeatingBladeCLWE1E2FuseOk\*\* is false for a period longer than \*\*BladeHeatingElementFuseBlownStableTime\*\*.  
The warning can be acknowledged when the signal \*\*IO.BladeHeatingBladeCLWE1E2FuseOk\*\* is true, or if the parameter \*\*BladeHeatingE1E2Disable\*\* is set true to disable the heating element.

|                        |                              |                                           |
|------------------------|------------------------------|-------------------------------------------|
| <b>No: 5315</b>        | <b>SupervisionID</b> 5315    | <b>Name</b> BladeHeatingLWE3E4FuseBlownSx |
| <b>Log text</b>        | BladeCHeatingLWE3E4FuseBlown |                                           |
| <b>Subsystem name</b>  | BladeHeating                 |                                           |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | Unlimited                    | - Max time disconnect <n/a>               |
| - Time window          | <n/a>                        | - Max time eliminate <n/a>                |
| - Stabilize period     | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeCLWE3E4FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeCLWE3E4FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE3E4Disable\*\*** is set true to disable the heating element.

|                        |                              |                                           |
|------------------------|------------------------------|-------------------------------------------|
| <b>No: 5316</b>        | <b>SupervisionID</b> 5316    | <b>Name</b> BladeHeatingLWE5E6FuseBlownSx |
| <b>Log text</b>        | BladeCHeatingLWE5E6FuseBlown |                                           |
| <b>Subsystem name</b>  | BladeHeating                 |                                           |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | Unlimited                    | - Max time disconnect <n/a>               |
| - Time window          | <n/a>                        | - Max time eliminate <n/a>                |
| - Stabilize period     | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeCLWE5E6FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeCLWE5E6FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE5E6Disable\*\*** is set true to disable the heating element.

|                        |                              |                                           |
|------------------------|------------------------------|-------------------------------------------|
| <b>No: 5317</b>        | <b>SupervisionID</b> 5317    | <b>Name</b> BladeHeatingLWE7E8FuseBlownSx |
| <b>Log text</b>        | BladeCHeatingLWE7E8FuseBlown |                                           |
| <b>Subsystem name</b>  | BladeHeating                 |                                           |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | Unlimited                    | - Max time disconnect <n/a>               |
| - Time window          | <n/a>                        | - Max time eliminate <n/a>                |
| - Stabilize period     | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeCLWE7E8FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeCLWE7E8FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE7E8Disable\*\*** is set true to disable the heating element.

|                        |                               |                                                     |              |
|------------------------|-------------------------------|-----------------------------------------------------|--------------|
| <b>No: 5318</b>        | <b>SupervisionID</b>          | <b>Name</b> BladeHeatingE3E4CurrentCalibrateErrorSx |              |
|                        | 5318                          |                                                     |              |
| <b>Log text</b>        | BladeC E3E4 heat current err. |                                                     |              |
| <b>Subsystem name</b>  | BladeHeating                  |                                                     |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                      | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                               | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                                | <n/a>        |
| - Stabilize period     | 60 second                     | <b>Category</b>                                     | Manufacturer |

**Criteria:**  
This warning indicates that the measured heating element current has too large deviation from the expected nominal current.

The warning is reported if the measured current  
\*\*BladeHeatingBladeCHeatingE3E4CalibrateCurrent\*\* and nominal current  
\*\*BladeHeatingElementE3E4NominalCurrent\*\* has a percentage deviation larger than  
\*\*BladeHeatingCurrentTolerance\*\*.

The warning can be acknowledged in two ways:  
1) After executing a new calibration command without current deviation being outside the tolerance limit \*\*BladeHeatingCurrentTolerance\*\*.  
2) After disabling the heating element by setting the parameter  
\*\*BladeHeatingE3E4Disable\*\* to true.

|                        |                               |                                                     |              |
|------------------------|-------------------------------|-----------------------------------------------------|--------------|
| <b>No: 5319</b>        | <b>SupervisionID</b>          | <b>Name</b> BladeHeatingE1E2CurrentCalibrateErrorSx |              |
|                        | 5319                          |                                                     |              |
| <b>Log text</b>        | BladeC E1E2 heat current err. |                                                     |              |
| <b>Subsystem name</b>  | BladeHeating                  |                                                     |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                      | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                               | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                                | <n/a>        |
| - Stabilize period     | 60 second                     | <b>Category</b>                                     | Manufacturer |

**Criteria:**  
This warning indicates that the measured heating element current has too large deviation from the expected nominal current.

The warning is reported if the measured current  
\*\*BladeHeatingBladeCHeatingE1E2CalibrateCurrent\*\* and nominal current  
\*\*BladeHeatingElementE1E2NominalCurrent\*\* has a percentage deviation larger than  
\*\*BladeHeatingCurrentTolerance\*\*.

The warning can be acknowledged in two ways:  
1) After executing a new calibration command without current deviation being outside the tolerance limit \*\*BladeHeatingCurrentTolerance\*\*.  
2) After disabling the heating element by setting the parameter  
\*\*BladeHeatingE1E2Disable\*\* to true.

|                        |                              |                                           |
|------------------------|------------------------------|-------------------------------------------|
| <b>No: 5320</b>        | <b>SupervisionID</b> 5320    | <b>Name</b> BladeHeatingWWE1E2FuseBlownSx |
| <b>Log text</b>        | BladeAHeatingWWE1E2FuseBlown |                                           |
| <b>Subsystem name</b>  | BladeHeating                 |                                           |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | Unlimited                    | - Max time disconnect <n/a>               |
| - Time window          | <n/a>                        | - Max time eliminate <n/a>                |
| - Stabilize period     | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeAWWE1E2FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeAWWE1E2FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE1E2Disable\*\*** is set true to disable the heating element.

|                        |                              |                                           |
|------------------------|------------------------------|-------------------------------------------|
| <b>No: 5321</b>        | <b>SupervisionID</b> 5321    | <b>Name</b> BladeHeatingWWE3E4FuseBlownSx |
| <b>Log text</b>        | BladeAHeatingWWE3E4FuseBlown |                                           |
| <b>Subsystem name</b>  | BladeHeating                 |                                           |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | Unlimited                    | - Max time disconnect <n/a>               |
| - Time window          | <n/a>                        | - Max time eliminate <n/a>                |
| - Stabilize period     | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeAWWE3E4FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeAWWE3E4FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE3E4Disable\*\*** is set true to disable the heating element.

|                        |                              |                                           |
|------------------------|------------------------------|-------------------------------------------|
| <b>No: 5322</b>        | <b>SupervisionID</b> 5322    | <b>Name</b> BladeHeatingWWE5E6FuseBlownSx |
| <b>Log text</b>        | BladeAHeatingWWE5E6FuseBlown |                                           |
| <b>Subsystem name</b>  | BladeHeating                 |                                           |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | Unlimited                    | - Max time disconnect <n/a>               |
| - Time window          | <n/a>                        | - Max time eliminate <n/a>                |
| - Stabilize period     | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeAWWE5E6FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeAWWE5E6FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE5E6Disable\*\*** is set true to disable the heating element.

|                           |                              |                                           |
|---------------------------|------------------------------|-------------------------------------------|
| <b>No: 5323</b>           | <b>SupervisionID</b> 5323    | <b>Name</b> BladeHeatingWWE7E8FuseBlownSx |
| <b>Log text</b>           | BladeAHeatingWWE7E8FuseBlown |                                           |
| <b>Subsystem name</b>     | BladeHeating                 |                                           |
| <b>Type</b>               | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b> <n/a>                |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b> <n/a>        |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b> <n/a>         |
| - <b>Stabilize period</b> | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeAWWE7E8FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeAWWE7E8FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE7E8Disable\*\*** is set true to disable the heating element.

|                           |                               |                                                     |
|---------------------------|-------------------------------|-----------------------------------------------------|
| <b>No: 5324</b>           | <b>SupervisionID</b> 5324     | <b>Name</b> BladeHeatingE7E8CurrentCalibrateErrorSx |
| <b>Log text</b>           | BladeA E7E8 heat current err. |                                                     |
| <b>Subsystem name</b>     | BladeHeating                  |                                                     |
| <b>Type</b>               | Warning                       | <b>Timeout</b> <disabled>                           |
| <b>Acknowledgement</b>    | Auto                          | <b>Shutdown type</b> <n/a>                          |
| - <b>Allowed attempts</b> | 3                             | - <b>Max time disconnect</b> <n/a>                  |
| - <b>Time window</b>      | 1 hour                        | - <b>Max time eliminate</b> <n/a>                   |
| - <b>Stabilize period</b> | 60 second                     | <b>Category</b> Manufacturer                        |

**Criteria:**

This warning indicates that the measured heating element current has too large deviation from the expected nominal current.

The warning is reported if the measured current **\*\*BladeHeatingBladeAHeatingE7E8CalibrateCurrent\*\*** and nominal current **\*\*BladeHeatingElementE7E8NominalCurrent\*\*** has a percentage deviation larger than **\*\*BladeHeatingCurrentTolerance\*\***.

The warning can be acknowledged in two ways:

- 1) After executing a new calibration command without current deviation being outside the tolerance limit **\*\*BladeHeatingCurrentTolerance\*\***.
- 2) After disabling the heating element by setting the parameter **\*\*BladeHeatingE7E8Disable\*\*** to true.

|                        |                               |                                                     |              |
|------------------------|-------------------------------|-----------------------------------------------------|--------------|
| <b>No: 5325</b>        | <b>SupervisionID</b> 5325     | <b>Name</b> BladeHeatingE5E6CurrentCalibrateErrorSx |              |
| <b>Log text</b>        | BladeA E5E6 heat current err. |                                                     |              |
| <b>Subsystem name</b>  | BladeHeating                  |                                                     |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                      | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                               | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                                | <n/a>        |
| - Stabilize period     | 60 second                     | <b>Category</b>                                     | Manufacturer |

**Criteria:**

This warning indicates that the measured heating element current has too large deviation from the expected nominal current.

The warning is reported if the measured current

**\*\*BladeHeatingBladeAHeatingE5E6CalibrateCurrent\*\*** and nominal current

**\*\*BladeHeatingElementE5E6NominalCurrent\*\*** has a percentage deviation larger than

**\*\*BladeHeatingCurrentTolerance\*\***.

The warning can be acknowledged in two ways:

1) After executing a new calibration command without current deviation being outside the tolerance limit **\*\*BladeHeatingCurrentTolerance\*\***.

2) After disabling the heating element by setting the parameter

**\*\*BladeHeatingE5E6Disable\*\*** to true.

|                        |                              |                                           |              |
|------------------------|------------------------------|-------------------------------------------|--------------|
| <b>No: 5326</b>        | <b>SupervisionID</b> 5326    | <b>Name</b> BladeHeatingWWE1E2FuseBlownSx |              |
| <b>Log text</b>        | BladeBHeatingWWE1E2FuseBlown |                                           |              |
| <b>Subsystem name</b>  | BladeHeating                 |                                           |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                            | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                      | <n/a>        |
| - Allowed attempts     | Unlimited                    | - Max time disconnect                     | <n/a>        |
| - Time window          | <n/a>                        | - Max time eliminate                      | <n/a>        |
| - Stabilize period     | 0 second                     | <b>Category</b>                           | Manufacturer |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeBWWE1E2FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeBWWE1E2FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE1E2Disable\*\*** is set true to disable the heating element.

|                           |                              |                                           |
|---------------------------|------------------------------|-------------------------------------------|
| <b>No: 5327</b>           | <b>SupervisionID</b> 5327    | <b>Name</b> BladeHeatingWWE3E4FuseBlownSx |
| <b>Log text</b>           | BladeBHeatingWWE3E4FuseBlown |                                           |
| <b>Subsystem name</b>     | BladeHeating                 |                                           |
| <b>Type</b>               | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b> <n/a>                |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b> <n/a>        |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b> <n/a>         |
| - <b>Stabilize period</b> | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeBWWE3E4FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeBWWE3E4FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE3E4Disable\*\*** is set true to disable the heating element.

|                           |                              |                                           |
|---------------------------|------------------------------|-------------------------------------------|
| <b>No: 5328</b>           | <b>SupervisionID</b> 5328    | <b>Name</b> BladeHeatingWWE5E6FuseBlownSx |
| <b>Log text</b>           | BladeBHeatingWWE5E6FuseBlown |                                           |
| <b>Subsystem name</b>     | BladeHeating                 |                                           |
| <b>Type</b>               | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b> <n/a>                |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b> <n/a>        |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b> <n/a>         |
| - <b>Stabilize period</b> | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeBWWE5E6FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeBWWE5E6FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE5E6Disable\*\*** is set true to disable the heating element.

|                           |                              |                                           |
|---------------------------|------------------------------|-------------------------------------------|
| <b>No: 5329</b>           | <b>SupervisionID</b> 5329    | <b>Name</b> BladeHeatingWWE7E8FuseBlownSx |
| <b>Log text</b>           | BladeBHeatingWWE7E8FuseBlown |                                           |
| <b>Subsystem name</b>     | BladeHeating                 |                                           |
| <b>Type</b>               | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b> <n/a>                |
| - <b>Allowed attempts</b> | Unlimited                    | - <b>Max time disconnect</b> <n/a>        |
| - <b>Time window</b>      | <n/a>                        | - <b>Max time eliminate</b> <n/a>         |
| - <b>Stabilize period</b> | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeBWWE7E8FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeBWWE7E8FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE7E8Disable\*\*** is set true to disable the heating element.

|                        |                               |                                                     |              |
|------------------------|-------------------------------|-----------------------------------------------------|--------------|
| <b>No: 5330</b>        | <b>SupervisionID</b>          | <b>Name</b> BladeHeatingE7E8CurrentCalibrateErrorSx |              |
|                        | 5330                          |                                                     |              |
| <b>Log text</b>        | BladeB E7E8 heat current err. |                                                     |              |
| <b>Subsystem name</b>  | BladeHeating                  |                                                     |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                      | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                               | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                                | <n/a>        |
| - Stabilize period     | 60 second                     | <b>Category</b>                                     | Manufacturer |

**Criteria:**  
This warning indicates that the measured heating element current has too large deviation from the expected nominal current.

The warning is reported if the measured current  
\*\*BladeHeatingBladeBHeatingE7E8CalibrateCurrent\*\* and nominal current  
\*\*BladeHeatingElementE7E8NominalCurrent\*\* has a percentage deviation larger than  
\*\*BladeHeatingCurrentTolerance\*\*.

The warning can be acknowledged in two ways:  
1) After executing a new calibration command without current deviation being outside the tolerance limit \*\*BladeHeatingCurrentTolerance\*\*.  
2) After disabling the heating element by setting the parameter  
\*\*BladeHeatingE7E8Disable\*\* to true.

|                        |                               |                                                     |              |
|------------------------|-------------------------------|-----------------------------------------------------|--------------|
| <b>No: 5331</b>        | <b>SupervisionID</b>          | <b>Name</b> BladeHeatingE5E6CurrentCalibrateErrorSx |              |
|                        | 5331                          |                                                     |              |
| <b>Log text</b>        | BladeB E5E6 heat current err. |                                                     |              |
| <b>Subsystem name</b>  | BladeHeating                  |                                                     |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                      | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                               | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                                | <n/a>        |
| - Stabilize period     | 60 second                     | <b>Category</b>                                     | Manufacturer |

**Criteria:**  
This warning indicates that the measured heating element current has too large deviation from the expected nominal current.

The warning is reported if the measured current  
\*\*BladeHeatingBladeBHeatingE5E6CalibrateCurrent\*\* and nominal current  
\*\*BladeHeatingElementE5E6NominalCurrent\*\* has a percentage deviation larger than  
\*\*BladeHeatingCurrentTolerance\*\*.

The warning can be acknowledged in two ways:  
1) After executing a new calibration command without current deviation being outside the tolerance limit \*\*BladeHeatingCurrentTolerance\*\*.  
2) After disabling the heating element by setting the parameter  
\*\*BladeHeatingE5E6Disable\*\* to true.



|                        |                              |                                           |
|------------------------|------------------------------|-------------------------------------------|
| <b>No: 5332</b>        | <b>SupervisionID</b> 5332    | <b>Name</b> BladeHeatingWWE1E2FuseBlownSx |
| <b>Log text</b>        | BladeCHeatingWWE1E2FuseBlown |                                           |
| <b>Subsystem name</b>  | BladeHeating                 |                                           |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | Unlimited                    | - Max time disconnect <n/a>               |
| - Time window          | <n/a>                        | - Max time eliminate <n/a>                |
| - Stabilize period     | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeCWWE1E2FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeCWWE1E2FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE1E2Disable\*\*** is set true to disable the heating element.

|                        |                              |                                           |
|------------------------|------------------------------|-------------------------------------------|
| <b>No: 5333</b>        | <b>SupervisionID</b> 5333    | <b>Name</b> BladeHeatingWWE3E4FuseBlownSx |
| <b>Log text</b>        | BladeCHeatingWWE3E4FuseBlown |                                           |
| <b>Subsystem name</b>  | BladeHeating                 |                                           |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | Unlimited                    | - Max time disconnect <n/a>               |
| - Time window          | <n/a>                        | - Max time eliminate <n/a>                |
| - Stabilize period     | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeCWWE3E4FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeCWWE3E4FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE3E4Disable\*\*** is set true to disable the heating element.

|                        |                              |                                           |
|------------------------|------------------------------|-------------------------------------------|
| <b>No: 5334</b>        | <b>SupervisionID</b> 5334    | <b>Name</b> BladeHeatingWWE5E6FuseBlownSx |
| <b>Log text</b>        | BladeCHeatingWWE5E6FuseBlown |                                           |
| <b>Subsystem name</b>  | BladeHeating                 |                                           |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | Unlimited                    | - Max time disconnect <n/a>               |
| - Time window          | <n/a>                        | - Max time eliminate <n/a>                |
| - Stabilize period     | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeCWWE5E6FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeCWWE5E6FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE5E6Disable\*\*** is set true to disable the heating element.

|                        |                              |                                           |
|------------------------|------------------------------|-------------------------------------------|
| <b>No: 5335</b>        | <b>SupervisionID</b> 5335    | <b>Name</b> BladeHeatingWWE7E8FuseBlownSx |
| <b>Log text</b>        | BladeCHeatingWWE7E8FuseBlown |                                           |
| <b>Subsystem name</b>  | BladeHeating                 |                                           |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | Unlimited                    | - Max time disconnect <n/a>               |
| - Time window          | <n/a>                        | - Max time eliminate <n/a>                |
| - Stabilize period     | 0 second                     | <b>Category</b> Manufacturer              |

**Criteria:**

This warning indicates that the specific heating element fuse is blown in the given blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeCWWE7E8FuseOk\*\*** is false for a period longer than **\*\*BladeHeatingElementFuseBlownStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeCWWE7E8FuseOk\*\*** is true, or if the parameter **\*\*BladeHeatingE7E8Disable\*\*** is set true to disable the heating element.

|                        |                               |                                                     |
|------------------------|-------------------------------|-----------------------------------------------------|
| <b>No: 5336</b>        | <b>SupervisionID</b> 5336     | <b>Name</b> BladeHeatingE7E8CurrentCalibrateErrorSx |
| <b>Log text</b>        | BladeC E7E8 heat current err. |                                                     |
| <b>Subsystem name</b>  | BladeHeating                  |                                                     |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                           |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                          |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                         |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>                          |
| - Stabilize period     | 60 second                     | <b>Category</b> Manufacturer                        |

**Criteria:**

This warning indicates that the measured heating element current has too large deviation from the expected nominal current.

The warning is reported if the measured current **\*\*BladeHeatingBladeCHeatingE7E8CalibrateCurrent\*\*** and nominal current **\*\*BladeHeatingElementE7E8NominalCurrent\*\*** has a percentage deviation larger than **\*\*BladeHeatingCurrentTolerance\*\***.

The warning can be acknowledged in two ways:

- 1) After executing a new calibration command without current deviation being outside the tolerance limit **\*\*BladeHeatingCurrentTolerance\*\***.
- 2) After disabling the heating element by setting the parameter **\*\*BladeHeatingE7E8Disable\*\*** to true.

|                           |                               |                                                     |              |
|---------------------------|-------------------------------|-----------------------------------------------------|--------------|
| <b>No: 5337</b>           | <b>SupervisionID</b> 5337     | <b>Name</b> BladeHeatingE5E6CurrentCalibrateErrorSx |              |
| <b>Log text</b>           | BladeC E5E6 heat current err. |                                                     |              |
| <b>Subsystem name</b>     | BladeHeating                  |                                                     |              |
| <b>Type</b>               | Warning                       | <b>Timeout</b>                                      | <disabled>   |
| <b>Acknowledgement</b>    | Auto                          | <b>Shutdown type</b>                                | <n/a>        |
| - <b>Allowed attempts</b> | 3                             | - <b>Max time disconnect</b>                        | <n/a>        |
| - <b>Time window</b>      | 1 hour                        | - <b>Max time eliminate</b>                         | <n/a>        |
| - <b>Stabilize period</b> | 60 second                     | <b>Category</b>                                     | Manufacturer |

**Criteria:**  
This warning indicates that the measured heating element current has too large deviation from the expected nominal current.

The warning is reported if the measured current **\*\*BladeHeatingBladeCHeatingE5E6CalibrateCurrent\*\*** and nominal current **\*\*BladeHeatingElementE5E6NominalCurrent\*\*** has a percentage deviation larger than **\*\*BladeHeatingCurrentTolerance\*\***.

The warning can be acknowledged in two ways:

- 1) After executing a new calibration command without current deviation being outside the tolerance limit **\*\*BladeHeatingCurrentTolerance\*\***.
- 2) After disabling the heating element by setting the parameter **\*\*BladeHeatingE5E6Disable\*\*** to true.

|                           |                              |                                        |              |
|---------------------------|------------------------------|----------------------------------------|--------------|
| <b>No: 5338</b>           | <b>SupervisionID</b> 5338    | <b>Name</b> BladeHeatingCurrentErrorSx |              |
| <b>Log text</b>           | BladeA heating current error |                                        |              |
| <b>Subsystem name</b>     | BladeHeating                 |                                        |              |
| <b>Type</b>               | Warning                      | <b>Timeout</b>                         | <disabled>   |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b>                   | <n/a>        |
| - <b>Allowed attempts</b> | 3                            | - <b>Max time disconnect</b>           | <n/a>        |
| - <b>Time window</b>      | 1 hour                       | - <b>Max time eliminate</b>            | <n/a>        |
| - <b>Stabilize period</b> | 60 second                    | <b>Category</b>                        | Manufacturer |

**Criteria:**  
This warning indicates that a current in the blade heating circuit has deviation from the expected level.

The supervision is reported when the average current value **\*\*BladeHeatingBladeANominalCurrentExpMean\*\*** has a deviation larger than tolerance limit **\*\*BladeHeatingCurrentTolerance\*\*** from expected current value **\*\*BladeHeatingBladeAExpectedCurrentConsumption\*\*** during the time **\*\*BladeHeatingCurrentStableTime\*\***.

The expected current value **\*\*BladeHeatingBladeAExpectedCurrentConsumption\*\*** depends on the number of heating elements which are turned on (sum of calibration values for each active element, e.g. **\*\*BladeHeatingBladeAHeatingE1E2CalibrateCurrent\*\***, **E3E4**, etc.). When all heating elements are turned off, the max. leakage current allowed is given by **\*\*BladeHeatingMaxLeakCurrent\*\***.

The average current filter time is given by **\*\*CurrentMeasurementMeanTime\*\*** (When the parameter is set to -1, the filter is disabled).

The supervision can be acknowledged when the current value is lower than **\*\*BladeHeatingMaxLeakCurrent\*\*** at off state, and during on state the current value must be inside the tolerance limit **\*\*BladeHeatingCurrentTolerance\*\*** from expected current value during the time **\*\*BladeHeatingCurrentStableTime\*\***.

|                        |                              |                                        |
|------------------------|------------------------------|----------------------------------------|
| <b>No: 5339</b>        | <b>SupervisionID</b> 5339    | <b>Name</b> BladeHeatingCurrentErrorSx |
| <b>Log text</b>        | BladeB heating current error |                                        |
| <b>Subsystem name</b>  | BladeHeating                 |                                        |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>              |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>             |
| - Allowed attempts     | 3                            | - Max time disconnect <n/a>            |
| - Time window          | 1 hour                       | - Max time eliminate <n/a>             |
| - Stabilize period     | 60 second                    | <b>Category</b> Manufacturer           |

**Criteria:**

This warning indicates that a current in the blade heating circuit has deviation from the expected level.

The supervision is reported when the average current value **\*\*BladeHeatingBladeBNominalCurrentExpMean\*\*** has a deviation larger than tolerance limit **\*\*BladeHeatingCurrentTolerance\*\*** from expected current value **\*\*BladeHeatingBladeBExpectedCurrentConsumption\*\*** during the time **\*\*BladeHeatingCurrentStableTime\*\***.  
The expected current value **\*\*BladeHeatingBladeBExpectedCurrentConsumption\*\*** depends on the number of heating elements which are turned on (sum of calibration values for each active element, e.g. **\*\*BladeHeatingBladeBHeatingElE2CalibrateCurrent\*\***, E3E4, etc.). When all heating elements are turned off, the max. leakage current allowed is given by **\*\*BladeHeatingMaxLeakCurrent\*\***.  
The average current filter time is given by **\*\*CurrentMeasurementMeanTime\*\*** (When the parameter is set to -1, the filter is disabled).

The supervision can be acknowledged when the current value is lower than **\*\*BladeHeatingMaxLeakCurrent\*\*** at off state, and during on state the current value must be inside the tolerance limit **\*\*BladeHeatingCurrentTolerance\*\*** from expected current value during the time **\*\*BladeHeatingCurrentStableTime\*\***.

|                        |                              |                                        |
|------------------------|------------------------------|----------------------------------------|
| <b>No: 5340</b>        | <b>SupervisionID</b> 5340    | <b>Name</b> BladeHeatingCurrentErrorSx |
| <b>Log text</b>        | BladeC heating current error |                                        |
| <b>Subsystem name</b>  | BladeHeating                 |                                        |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>              |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>             |
| - Allowed attempts     | 3                            | - Max time disconnect <n/a>            |
| - Time window          | 1 hour                       | - Max time eliminate <n/a>             |
| - Stabilize period     | 60 second                    | <b>Category</b> Manufacturer           |

**Criteria:**  
This warning indicates that a current in the blade heating circuit has deviation from the expected level.

The supervision is reported when the average current value **\*\*BladeHeatingBladeCNominalCurrentExpMean\*\*** has a deviation larger than tolerance limit **\*\*BladeHeatingCurrentTolerance\*\*** from expected current value **\*\*BladeHeatingBladeCExpectedCurrentConsumption\*\*** during the time **\*\*BladeHeatingCurrentStableTime\*\***.

The expected current value **\*\*BladeHeatingBladeCExpectedCurrentConsumption\*\*** depends on the number of heating elements which are turned on (sum of calibration values for each active element, e.g. **\*\*BladeHeatingBladeCHeatingElE2CalibrateCurrent\*\***, E3E4, etc.). When all heating elements are turned off, the max. leakage current allowed is given by **\*\*BladeHeatingMaxLeakCurrent\*\***.

The average current filter time is given by **\*\*CurrentMeasurementMeanTime\*\*** (When the parameter is set to -1, the filter is disabled).

The supervision can be acknowledged when the current value is lower than **\*\*BladeHeatingMaxLeakCurrent\*\*** at off state, and during on state the current value must be inside the tolerance limit **\*\*BladeHeatingCurrentTolerance\*\*** from expected current value during the time **\*\*BladeHeatingCurrentStableTime\*\***.

|                        |                           |                                                 |
|------------------------|---------------------------|-------------------------------------------------|
| <b>No: 5343</b>        | <b>SupervisionID</b> 5343 | <b>Name</b> DeIcingInitiatedByOwnerInProgressSx |
| <b>Log text</b>        | DeIcingStarted - ByOwner  |                                                 |
| <b>Subsystem name</b>  | BladeHeating              |                                                 |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                            |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> Run                        |
| - Allowed attempts     | 5                         | - Max time disconnect 10000 second              |
| - Time window          | 1 second                  | - Max time eliminate 10000 second               |
| - Stabilize period     | 1 second                  | <b>Category</b> Owner                           |

**Criteria:**  
DeIcing started - initiated by owner

|                        |                             |                                                        |
|------------------------|-----------------------------|--------------------------------------------------------|
| <b>No: 5344</b>        | <b>SupervisionID</b> 5344   | <b>Name</b> DeIcingInitiatedByManufacturerInProgressSx |
| <b>Log text</b>        | DeIcingStarted - ByManufact |                                                        |
| <b>Subsystem name</b>  | BladeHeating                |                                                        |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                                   |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> Run                               |
| - Allowed attempts     | 5                           | - Max time disconnect 10000 second                     |
| - Time window          | 1 second                    | - Max time eliminate 10000 second                      |
| - Stabilize period     | 1 second                    | <b>Category</b> Manufacturer                           |

**Criteria:**  
DeIcing started - initiated by manufacturer

|                        |                               |                                |
|------------------------|-------------------------------|--------------------------------|
| <b>No: 5345</b>        | <b>SupervisionID</b> 5345     | <b>Name</b> DeIcingPostSx      |
| <b>Log text</b>        | DeIce finished-turbine idling |                                |
| <b>Subsystem name</b>  | BladeHeating                  |                                |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Remote                        | <b>Shutdown type</b> PauseSlow |
| - Allowed attempts     | <n/a>                         | - Max time disconnect 9 second |
| - Time window          | <n/a>                         | - Max time eliminate 10 second |
| - Stabilize period     | <n/a>                         | <b>Category</b> Owner          |

**Criteria:**

DeIcingResumeMode is set to Manual in order to keep the turbine in Idle state (Pause) after a De-icing cycle

The turbine can restart when this alarm has been acknowledged manually

|                        |                             |                                       |
|------------------------|-----------------------------|---------------------------------------|
| <b>No: 5346</b>        | <b>SupervisionID</b> 5346   | <b>Name</b> BladeHeatingCommTimeoutSx |
| <b>Log text</b>        | Bld heat SCADA Comm timeout |                                       |
| <b>Subsystem name</b>  | BladeHeating                |                                       |
| <b>Type</b>            | Warning                     | <b>Timeout</b> <disabled>             |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> <n/a>            |
| - Allowed attempts     | 5                           | - Max time disconnect <n/a>           |
| - Time window          | 1 second                    | - Max time eliminate <n/a>            |
| - Stabilize period     | 1 second                    | <b>Category</b> Manufacturer          |

**Criteria:**

When Blade Heating is active, the Scada Start command with HeatingLevelRequest must be updated frequently to prevent this supervision to report communication timeout  
The warning can be acknowledged when a new Scada Start command or Stop command has been received

|                        |                           |                                         |
|------------------------|---------------------------|-----------------------------------------|
| <b>No: 5364</b>        | <b>SupervisionID</b> 5364 | <b>Name</b> GearboxODMSensorCommFaultSx |
| <b>Log text</b>        | GearODMSensorCommFault    |                                         |
| <b>Subsystem name</b>  | GearboxODMSensor          |                                         |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>               |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>              |
| - Allowed attempts     | 5                         | - Max time disconnect <n/a>             |
| - Time window          | 12 hour                   | - Max time eliminate <n/a>              |
| - Stabilize period     | 0 second                  | <b>Category</b> Manufacturer            |

**Criteria:**

This warning is indicating that the communication to the ODM sensor is faulty.

The warning is raised if the communication to the sensor is down  
(IO.GearboxODMSensorCommOk is false) for longer than specified by  
ODMSensorCommStableTime.

The warning is auto acknowledged when the communication is restored  
(IO.GearboxODMSensorCommOk changes to true).

|                        |                           |                                        |              |
|------------------------|---------------------------|----------------------------------------|--------------|
| <b>No: 5365</b>        | <b>SupervisionID</b> 5365 | <b>Name</b> GearboxODMSensorBITFaultSx |              |
| <b>Log text</b>        | GearODMSensorBITFault     |                                        |              |
| <b>Subsystem name</b>  | GearboxODMSensor          |                                        |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                         | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                   | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect                  | <n/a>        |
| - Time window          | 24 hour                   | - Max time eliminate                   | <n/a>        |
| - Stabilize period     | 3 second                  | <b>Category</b>                        | Manufacturer |

#### Criteria:

This warning is indicating that the ODM sensor is faulty.

The warning is raised if the Built In Test (BIT) of the sensor reports a problem (IO.GearboxODMSensorBITStatus is non-zero) consistently for longer than specified by ODMSensorBITStatusErrorTime.

The warning is auto acknowledged when the sensor reports a passing BIT status (IO.GearboxODMSensorBITStatus is zero).

|                        |                                  |                                 |               |
|------------------------|----------------------------------|---------------------------------|---------------|
| <b>No: 5366</b>        | <b>SupervisionID</b> 5366        | <b>Name</b> ConverterNotReadySx |               |
| <b>Log text</b>        | ConverterNotReady ____ °C ____ % |                                 |               |
| <b>Subsystem name</b>  | TurbineCabinets                  |                                 |               |
| <b>Type</b>            | Alarm                            | <b>Timeout</b>                  | <n/a>         |
| <b>Acknowledgement</b> | Auto                             | <b>Shutdown type</b>            | PauseSlow     |
| - Allowed attempts     | Unlimited                        | - Max time disconnect           | 9 second      |
| - Time window          | <n/a>                            | - Max time eliminate            | 10 second     |
| - Stabilize period     | 5 second                         | <b>Category</b>                 | Environmental |

#### Criteria:

This alarm indicates that the converter is not ready in the converter controller cabinet and is not safe for powering the converter electronics.

The alarm is reported when the signal **\*\*IO.ConverterReady\*\*** is false for more than stable time ( **\*\*CabinetConverterNotReadyStableTime\*\*** ).

The signal **\*\*IO.ConverterClimateConditionsOk\*\*** is an important precondition for **\*\*IO.ConverterReady\*\*** to become true.  
**\*\*IO.ConverterClimateConditionsOk\*\*** is set true when all the following three conditions are fulfilled for more than stable time ( **\*\*CabinetConverterClimateOkStableTime\*\*** ):

- 1) The signal **\*\*IO.ConverterPanelAirHumidity\*\*** is below the limit:  
**\*\*CabinetConverterAirHumidityMax\*\*** - **\*\*CabinetConverterAirHumidityMaxHyst\*\***
- 2) The signal **\*\*IO.ConverterPanelAirTemp\*\*** is above the limit :  
**\*\*CabinetConverterAirTempMin\*\*** + **\*\*CabinetConverterAirTempMinHyst\*\***
- 3) Both signals **\*\*IO.ConverterPanelAirHumidity\*\*** and **\*\*IO.ConverterPanelAirTemp\*\*** are valid.

The alarm is auto acknowledged when the signal **\*\*IO.ConverterReady\*\*** is true.

|                        |                            |                                               |
|------------------------|----------------------------|-----------------------------------------------|
| <b>No: 5367</b>        | <b>SupervisionID</b> 5367  | <b>Name</b> ModeSelectorTowerSignalMismatchSx |
| <b>Log text</b>        | ModeSelTowerSignalMismatch |                                               |
| <b>Subsystem name</b>  | ModeSelector               |                                               |
| <b>Type</b>            | Warning                    | <b>Timeout</b> <disabled>                     |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> <n/a>                    |
| - Allowed attempts     | 3                          | - Max time disconnect <n/a>                   |
| - Time window          | 1 hour                     | - Max time eliminate <n/a>                    |
| - Stabilize period     | 60 second                  | <b>Category</b> Manufacturer                  |

**Criteria:**

The Tower Mode Selector inputs combination is invalid

This warning is active when the following inputs are misaligned

- ModeSelectorTowerStopModeRequested
- ModeSelectorTowerRemoteControlModeRequested
- ModeSelectorTowerPosBit1High
- ModeSelectorTowerPosBit2High

|                        |                              |                                                 |
|------------------------|------------------------------|-------------------------------------------------|
| <b>No: 5368</b>        | <b>SupervisionID</b> 5368    | <b>Name</b> ModeSelectorNacelleSignalMismatchSx |
| <b>Log text</b>        | ModeSelNacelleSignalMismatch |                                                 |
| <b>Subsystem name</b>  | ModeSelector                 |                                                 |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                       |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                      |
| - Allowed attempts     | 3                            | - Max time disconnect <n/a>                     |
| - Time window          | 1 hour                       | - Max time eliminate <n/a>                      |
| - Stabilize period     | 60 second                    | <b>Category</b> Manufacturer                    |

**Criteria:**

The Nacelle Mode Selector inputs combination is invalid

This warning is active when the following inputs are misaligned

- ModeSelectorNacelleStopModeRequested
- ModeSelectorNacelleRemoteControlModeRequested
- ModeSelectorNacellePosBit1High
- ModeSelectorNacellePosBit2High

|                        |                           |                                      |
|------------------------|---------------------------|--------------------------------------|
| <b>No: 5369</b>        | <b>SupervisionID</b> 5369 | <b>Name</b> ModeSelectorInStopModeSx |
| <b>Log text</b>        | ModeSelectorInStopMode    |                                      |
| <b>Subsystem name</b>  | ModeSelector              |                                      |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                 |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 3 second       |
| - Time window          | <n/a>                     | - Max time eliminate 9 second        |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer         |

**Criteria:**

This alarm appears to inform a service technician that the Mode Selector in either Nacelle or Tower is in position 4 and that the turbine is stopping down.

All outputs are set to neutral. Before outputs can be enabled in stop mode this alarm must be manually acknowledged.



|                        |                            |                                            |
|------------------------|----------------------------|--------------------------------------------|
| <b>No: 5370</b>        | <b>SupervisionID</b> 5370  | <b>Name</b> ModeSelectorOperationFailureSx |
| <b>Log text</b>        | ModeSelectorOperationErr__ |                                            |
| <b>Subsystem name</b>  | ModeSelector               |                                            |
| <b>Type</b>            | Alarm                      | <b>Timeout</b> <n/a>                       |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> PauseSlow             |
| - Allowed attempts     | Unlimited                  | - Max time disconnect 9 second             |
| - Time window          | <n/a>                      | - Max time eliminate 10 second             |
| - Stabilize period     | 3 second                   | <b>Category</b> Manufacturer               |

**Criteria:**

This alarm is raised inputs ModeSelectorCommunicationEnabled or ModeSelectorOutputEnabled is true while the Mode Selector in the Nacelle (NacelleModeSelectorPosition) is in position 1, 2 or 3

|                        |                           |                                             |
|------------------------|---------------------------|---------------------------------------------|
| <b>No: 5371</b>        | <b>SupervisionID</b> 5371 | <b>Name</b> ModeSelectorHardwareErrorcodeSx |
| <b>Log text</b>        | ModeSelectorHWEError      |                                             |
| <b>Subsystem name</b>  | ModeSelector              |                                             |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow               |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second              |
| - Time window          | 1 hour                    | - Max time eliminate 9 second               |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                |

**Criteria:**

This alarm appears if the virtual signal ModeSelectorHardwareErrorcode from safety system is different from 0

|                        |                           |                                  |
|------------------------|---------------------------|----------------------------------|
| <b>No: 5376</b>        | <b>SupervisionID</b> 5376 | <b>Name</b> BrakeLeakageLevel1Sx |
| <b>Log text</b>        | Brake hydraulic leakage   |                                  |
| <b>Subsystem name</b>  | Brake                     |                                  |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>       |
| - Allowed attempts     | 4                         | - Max time disconnect <n/a>      |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>       |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer     |

**Criteria:**

The warning indicates that there is a hydraulic leakage on the brake system.

The warning is reported if the Brake supply valve (\*\*IO.BrakeSupplyValveOpen\*\*) is opened more times than parameter \*\*BrakeLeakageLevel1\*\*, during the time interval given by the parameter \*\*BrakeLeakageSlidingWindowTime\*\*.

The warning is automatically acknowledged when the number of supply valve (\*\*IO.BrakeSupplyValveOpen\*\*) openings becomes less than (\*\*BrakeLeakageLevel1\*\* - \*\*BrakeLeakageLevel1Hyst\*\*)

|                        |                              |                                  |              |
|------------------------|------------------------------|----------------------------------|--------------|
| <b>No: 5377</b>        | <b>SupervisionID</b> 5377    | <b>Name</b> BrakeLeakageLevel2Sx |              |
| <b>Log text</b>        | Brake hydraulic leakage high |                                  |              |
| <b>Subsystem name</b>  | Brake                        |                                  |              |
| <b>Type</b>            | Alarm                        | <b>Timeout</b>                   | <n/a>        |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>             | PauseSlow    |
| - Allowed attempts     | 5                            | - Max time disconnect            | 9 second     |
| - Time window          | 1 hour                       | - Max time eliminate             | 10 second    |
| - Stabilize period     | 60 second                    | <b>Category</b>                  | Manufacturer |

**Criteria:**

The alarm indicates that the hydraulic leakage on the brake system is to high.

The alarm is reported if the brake supply valve (\*\*IO.BrakeSupplyValveOpen\*\*) is opened more times than parameter \*\*BrakeLeakageLevel2\*\*, during the time interval given by the parameter \*\*BrakeLeakageSlidingWindowTime\*\*.

The alarm is automatically acknowledged when the number of supply valve (\*\*IO.BrakeSupplyValveOpen\*\*) openings becomes less than (\*\*BrakeLeakageLevel2\*\* - \*\*BrakeLeakageLevel2Hyst\*\*)

|                        |                           |                                     |              |
|------------------------|---------------------------|-------------------------------------|--------------|
| <b>No: 5382</b>        | <b>SupervisionID</b> 5382 | <b>Name</b> ArcLightDetectorErrorSx |              |
| <b>Log text</b>        | ArcLightDetectorError     |                                     |              |
| <b>Subsystem name</b>  | ArcLightDetector          |                                     |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                      | <n/a>        |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b>                | PauseSlow    |
| - Allowed attempts     | <n/a>                     | - Max time disconnect               | 9 second     |
| - Time window          | <n/a>                     | - Max time eliminate                | 10 second    |
| - Stabilize period     | <n/a>                     | <b>Category</b>                     | Manufacturer |

**Criteria:**

This alarm indicates that there is an error in the arc detecting system.

This alarm is raised if either hardware input ArcDetectorOk is false OR software input ArcLightDetectorOk is false for \*\*ArcDetectorOkStableTime\*\*.

When the generator RPM drops below parameter \*\*OpenHVCBGeneratorRPM\*\* the switch gear is tripped by opening the High Voltage Curcuit Breaker (HVCB).

The switch gear is tripped unless the ArcDectorOk signal goes ok again within \*\*ArcDetectorOkStableTime\*\* of activation.

The alarm can be acknowledged when both signals are true.

The supervision can be disabled in ServiceMode if the command DisableArcLightErrorSupervision is active.

|                        |                           |                                      |              |
|------------------------|---------------------------|--------------------------------------|--------------|
| <b>No: 5383</b>        | <b>SupervisionID</b> 5383 | <b>Name</b> ArcLightDetector2ErrorSx |              |
| <b>Log text</b>        | ArcLightDetector2Error    |                                      |              |
| <b>Subsystem name</b>  | ArcLightDetector          |                                      |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                       | <n/a>        |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b>                 | PauseSlow    |
| - Allowed attempts     | <n/a>                     | - Max time disconnect                | 9 second     |
| - Time window          | <n/a>                     | - Max time eliminate                 | 10 second    |
| - Stabilize period     | <n/a>                     | <b>Category</b>                      | Manufacturer |

#### Criteria:

This alarm indicates that there is an error in the arc detecting system.

The alarm is only active on turbines where parameter **\*\*ArcDetector2Installed\*\*** equals true.

This alarm is raised if either hardware input ArcDetector2Ok is false OR software input ArcLightDetector2Ok is false for **\*\*ArcDetectorOkStableTime\*\***.

When the generator RPM drops below parameter **\*\*OpenHVCBGeneratorRPM\*\*** the switch gear is tripped by opening the High Voltage Curcuit Breaker (HVCB).

The switch gear is tripped unless the ArcDector2Ok signal goes ok again within **\*\*ArcDetectorOkStableTime\*\*** of activation.

The alarm can be acknowledged when both signals are true.

The supervision can be disabled in ServiceMode if the command DisableArcLightErrorSupervision is active.

|                        |                             |                                      |              |
|------------------------|-----------------------------|--------------------------------------|--------------|
| <b>No: 5384</b>        | <b>SupervisionID</b> 5384   | <b>Name</b> CertificateGracePeriodSx |              |
| <b>Log text</b>        | Configuration is unapproved |                                      |              |
| <b>Subsystem name</b>  | CertificateMonitor          |                                      |              |
| <b>Type</b>            | Warning                     | <b>Timeout</b>                       | <disabled>   |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b>                 | <n/a>        |
| - Allowed attempts     | Unlimited                   | - Max time disconnect                | <n/a>        |
| - Time window          | <n/a>                       | - Max time eliminate                 | <n/a>        |
| - Stabilize period     | 30 second                   | <b>Category</b>                      | Manufacturer |

#### Criteria:

The warning is reported if the turbine configuration is unapproved. The turbine configuration needs to be approved by the central configuration server. Once approved, the server will provide a certificate which can be uploaded to the turbine. Hence, the alarm will be active if any of the following conditions are met:

- the turbine is missing a certificate
- the turbine certificate is invalid
- the turbine certificate is not for this turbine
- the turbine certificate is not for this turbine software version
- the turbine configuration differs from the configuration described in the certificate

Note, if left unhandled, the warning will eventually be followed by alarm 5430.

|                        |                                |                                           |
|------------------------|--------------------------------|-------------------------------------------|
| <b>No: 5398</b>        | <b>SupervisionID</b> 5398      | <b>Name</b> YawCamSwitch1IncorrectStateSx |
| <b>Log text</b>        | YawCam1StateErr:_ CTwist:____° |                                           |
| <b>Subsystem name</b>  | YawPositionVariant3            |                                           |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                      |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> PauseSlow            |
| - Allowed attempts     | 2                              | - Max time disconnect 9 second            |
| - Time window          | 15 minute                      | - Max time eliminate 10 second            |
| - Stabilize period     | 5 second                       | <b>Category</b> Manufacturer              |

**Criteria:**

The purpose of this alarm is to supervise that the CAM switches for the safety system CableTwistProtectionStop function are operational.

The yaw sensor CAM switches have certain patterns between the end stops that enables for verification of the CAM switch operation. This alarm is raised if the signal **\*\*IO.YawSensorCam1State\*\*** does not comply with the **\*\*CableTwist\*\*** position within a hysteresis defined by parameter **\*\*CamSwitchHysteresis\*\***.

This alarm can be caused by:

- \* Broken link between absolute encoder and CAM switches
- \* Wrong gearing between absolute encoder and CAM switches
- \* Bad CAM alignment
- \* Wrong CAM profile

This alarm will require inspection to determine which of above is the case. Worse case scenario is that the yaw sensor must be replaced.

This alarm can be acknowledged if the conditions turns false.

|                        |                                |                                           |
|------------------------|--------------------------------|-------------------------------------------|
| <b>No: 5399</b>        | <b>SupervisionID</b> 5399      | <b>Name</b> YawCamSwitch2IncorrectStateSx |
| <b>Log text</b>        | YawCam2StateErr:_ CTwist:____° |                                           |
| <b>Subsystem name</b>  | YawPositionVariant3            |                                           |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                      |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> PauseSlow            |
| - Allowed attempts     | 2                              | - Max time disconnect 9 second            |
| - Time window          | 15 minute                      | - Max time eliminate 10 second            |
| - Stabilize period     | 5 second                       | <b>Category</b> Manufacturer              |

**Criteria:**

The purpose of this alarm is to supervise that the CAM switches for the safety system CableTwistProtectionStop function are operational.

The yaw sensor CAM switches have certain patterns between the end stops that enables for verification of the CAM switch operation. This alarm is raised if the signal **\*\*IO.YawSensorCam2State\*\*** does not comply with the **\*\*CableTwist\*\*** position within a hysteresis defined by parameter **\*\*CamSwitchHysteresis\*\***.

This alarm can be caused by:

- \* Broken link between absolute encoder and CAM switches
- \* Wrong gearing between absolute encoder and CAM switches
- \* Bad CAM alignment
- \* Wrong CAM profile

This alarm will require inspection to determine which of above is the case. Worse case scenario is that the yaw sensor must be replaced.

This alarm can be acknowledged if the conditions turns false.

|                        |                                  |                                           |              |
|------------------------|----------------------------------|-------------------------------------------|--------------|
| <b>No: 5400</b>        | <b>SupervisionID</b> 5400        | <b>Name</b> YawCamSwitch3IncorrectStateSx |              |
| <b>Log text</b>        | YawCam3StateErr: _ CTwist: ____° |                                           |              |
| <b>Subsystem name</b>  | YawPositionVariant3              |                                           |              |
| <b>Type</b>            | Alarm                            | <b>Timeout</b>                            | <n/a>        |
| <b>Acknowledgement</b> | Auto                             | <b>Shutdown type</b>                      | PauseSlow    |
| - Allowed attempts     | 2                                | - Max time disconnect                     | 9 second     |
| - Time window          | 15 minute                        | - Max time eliminate                      | 10 second    |
| - Stabilize period     | 5 second                         | <b>Category</b>                           | Manufacturer |

**Criteria:**

The purpose of this alarm is to supervise that the CAM switches for the safety system CableTwistProtectionStop function are operational.

The yaw sensor CAM switches have certain patterns between the end stops that enables for verification of the CAM switch operation. This alarm is raised if the signal **\*\*IO.YawSensorCam3State\*\*** does not comply with the **\*\*CableTwist\*\*** position within a hysteresis defined by parameter **\*\*CamSwitchHysteresis\*\***.

This alarm can be caused by:

- \* Broken link between absolute encoder and CAM switches
- \* Wrong gearing between absolute encoder and CAM switches
- \* Bad CAM alignment
- \* Wrong CAM profile

This alarm will require inspection to determine which of above is the case. Worse case scenario is that the yaw sensor must be replaced.

This alarm can be acknowledged if the conditions turns false.

|                        |                           |                                               |              |
|------------------------|---------------------------|-----------------------------------------------|--------------|
| <b>No: 5401</b>        | <b>SupervisionID</b> 5401 | <b>Name</b> YawCamSwitch1RequiresActivationSx |              |
| <b>Log text</b>        | YawCam1RequiresActivation |                                               |              |
| <b>Subsystem name</b>  | YawPositionVariant3       |                                               |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                                | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                          | <n/a>        |
| - Allowed attempts     | Unlimited                 | - Max time disconnect                         | <n/a>        |
| - Time window          | <n/a>                     | - Max time eliminate                          | <n/a>        |
| - Stabilize period     | 5 second                  | <b>Category</b>                               | Manufacturer |

**Criteria:**

The purpose of this warning is to indicate if a yaw sensor CAM switch has not been activated for a long time.

The CAM switches are required to be activated at least once a year to confirm proper operation of the safety function. This warning is raised if **IO.YawSensorCam3State** has not changed for parameter **\*\*CamSwitchActivationIntervalThreshold\*\*** hours of time.

To get rid of the warning, simply yaw the turbine and the warning will be auto acknowledged when the signal **\*\*IO.YawSensorCam1State\*\*** changes state.

|                        |                           |                                               |              |
|------------------------|---------------------------|-----------------------------------------------|--------------|
| <b>No: 5402</b>        | <b>SupervisionID</b> 5402 | <b>Name</b> YawCamSwitch2RequiresActivationSx |              |
| <b>Log text</b>        | YawCam2RequiresActivation |                                               |              |
| <b>Subsystem name</b>  | YawPositionVariant3       |                                               |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                                | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                          | <n/a>        |
| - Allowed attempts     | Unlimited                 | - Max time disconnect                         | <n/a>        |
| - Time window          | <n/a>                     | - Max time eliminate                          | <n/a>        |
| - Stabilize period     | 5 second                  | <b>Category</b>                               | Manufacturer |

**Criteria:**

The purpose of this warning is to indicate if a yaw sensor CAM switch has not been activated for a long time.

The CAM switches are required to be activated at least once a year to confirm proper operation of the safety function. This warning is raised if IO.YawSensorCam3State has not changed for parameter **\*\*CamSwitchActivationIntervalThreshold\*\*** hours of time.

To get rid of the warning, simply yaw the turbine and the warning will be auto acknowledged when the signal **\*\*IO.YawSensorCam2State\*\*** changes state.

|                        |                           |                                               |              |
|------------------------|---------------------------|-----------------------------------------------|--------------|
| <b>No: 5403</b>        | <b>SupervisionID</b> 5403 | <b>Name</b> YawCamSwitch3RequiresActivationSx |              |
| <b>Log text</b>        | YawCam3RequiresActivation |                                               |              |
| <b>Subsystem name</b>  | YawPositionVariant3       |                                               |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                                | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                          | <n/a>        |
| - Allowed attempts     | Unlimited                 | - Max time disconnect                         | <n/a>        |
| - Time window          | <n/a>                     | - Max time eliminate                          | <n/a>        |
| - Stabilize period     | 5 second                  | <b>Category</b>                               | Manufacturer |

**Criteria:**

The purpose of this warning is to indicate if a yaw sensor CAM switch has not been activated for a long time.

The CAM switches are required to be activated at least once a year to confirm proper operation of the safety function. This warning is raised if **\*\*IO.YawSensorCam3State\*\*** has not changed for parameter **\*\*CamSwitchActivationIntervalThreshold\*\*** hours of time.

To get rid of the warning, simply yaw the turbine and the warning will be auto acknowledged when the signal **\*\*IO.YawSensorCam3State\*\*** changes state.

|                        |                           |                                       |              |
|------------------------|---------------------------|---------------------------------------|--------------|
| <b>No: 5428</b>        | <b>SupervisionID</b> 5428 | <b>Name</b> SwitchgearFeedbackErrorSx |              |
| <b>Log text</b>        | Switchgear SC/OC/EF fault |                                       |              |
| <b>Subsystem name</b>  | SwitchGear                |                                       |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                        | <n/a>        |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b>                  | StopSlow     |
| - Allowed attempts     | <n/a>                     | - Max time disconnect                 | 3 second     |
| - Time window          | <n/a>                     | - Max time eliminate                  | 9 second     |
| - Stabilize period     | <n/a>                     | <b>Category</b>                       | Manufacturer |

**Criteria:**

This alarm is indicating that the switchgear reports a problem - i.e. switchgear short circuit, over current or earth fault.

The alarm is only installed if the parameter **\*\*SwitchgearFeedbackSupervisionEnabled\*\*** is true.

The alarm is reported if the signal **\*\*IO.SwitchgearFeedbackOk\*\*** changes to false.

The alarm can be acknowledged if the signal **\*\*IO.SwitchgearFeedbackOk\*\*** changes to true.

|                        |                               |                                     |              |
|------------------------|-------------------------------|-------------------------------------|--------------|
| <b>No: 5429</b>        | <b>SupervisionID</b> 5429     | <b>Name</b> SwitchgearResetNeededSx |              |
| <b>Log text</b>        | Awaiting safety reset pressed |                                     |              |
| <b>Subsystem name</b>  | SwitchGear                    |                                     |              |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>                      | <n/a>        |
| <b>Acknowledgement</b> | Remote                        | <b>Shutdown type</b>                | StopFast     |
| - Allowed attempts     | <n/a>                         | - Max time disconnect               | 0.9 second   |
| - Time window          | <n/a>                         | - Max time eliminate                | 3600 second  |
| - Stabilize period     | <n/a>                         | <b>Category</b>                     | Manufacturer |

**Criteria:**

This alarm is used to indicate to the user that the safety system needs a reset by pressing the switchgear reset button or otherwise to release the Switchgear Emergency Latch.

The alarm is only installed if the parameter **\*\*SwitchgearLatchAvailable\*\*** is true.

The alarm is raised if the switchgear emergency latch is active (**\*\*IO.SwitchgearTripLatchReleased\*\*** is false) for more than **\*\*SwitchgearLatchResetTimeout\*\*** without the SwitchgearTripHVButtonActivated alarm is reported.

To reset the switchgear emergency latch, press the reset button or otherwise reset the safety system.

The alarm can be acknowledged when **\*\*IO.SwitchgearTripLatchReleased\*\*** is true.

Note: When the alarm is no longer reported a safety system reset is initiated.

|                           |                                |                                       |
|---------------------------|--------------------------------|---------------------------------------|
| <b>No: 5430</b>           | <b>SupervisionID</b> 5430      | <b>Name</b> CertificateAlarmSx        |
| <b>Log text</b>           | Config unapproved for too long |                                       |
| <b>Subsystem name</b>     | CertificateMonitor             |                                       |
| <b>Type</b>               | Alarm                          | <b>Timeout</b> <n/a>                  |
| <b>Acknowledgement</b>    | Auto                           | <b>Shutdown type</b> StopSlow         |
| - <b>Allowed attempts</b> | Unlimited                      | - <b>Max time disconnect</b> 3 second |
| - <b>Time window</b>      | <n/a>                          | - <b>Max time eliminate</b> 9 second  |
| - <b>Stabilize period</b> | 30 second                      | <b>Category</b> Manufacturer          |

**Criteria:**

The alarm is reported because the turbine configuration has been left unapproved for too long time. The turbine configuration needs to be approved by the central configuration server. Once approved, the server will provide a certificate which can be uploaded to the turbine. Hence, the alarm will be active if any of the following conditions are met:

- the turbine is missing a certificate
- the turbine certificate is invalid
- the turbine certificate is not for this turbine
- the turbine certificate is not for this turbine software version
- the turbine configuration differs from the configuration described in the certificate

|                           |                               |                                    |
|---------------------------|-------------------------------|------------------------------------|
| <b>No: 5478</b>           | <b>SupervisionID</b> 5478     | <b>Name</b> WdSevereDisagreementSx |
| <b>Log text</b>           | WindSensor WindDirRelDisagree |                                    |
| <b>Subsystem name</b>     | WIS                           |                                    |
| <b>Type</b>               | Warning                       | <b>Timeout</b> <disabled>          |
| <b>Acknowledgement</b>    | Remote                        | <b>Shutdown type</b> <n/a>         |
| - <b>Allowed attempts</b> | <n/a>                         | - <b>Max time disconnect</b> <n/a> |
| - <b>Time window</b>      | <n/a>                         | - <b>Max time eliminate</b> <n/a>  |
| - <b>Stabilize period</b> | <n/a>                         | <b>Category</b> Manufacturer       |

**Criteria:**

The purpose of this warning is to tell when the two wind direction sensors disagree.

If **\*\*WDAD\\_Severe\\_EnableSpeed\*\*** = true it uses the **\*\*IO.WindMeasurementWS1RawWindDirRel\*\*** and **\*\*IO.WindMeasurementWS2RawWindDirRel\*\*** as input for the supervision. This warning is raised if the difference between the two inputs has been more than half of **\*\*WDAD\\_Severe\\_mul\*\*** for a certain period proportional to **\*\*WDAD\\_Severe\\_Threshold\*\***.

To get rid of the warning, re-align the wind direction sensors.

|                           |                               |                                         |
|---------------------------|-------------------------------|-----------------------------------------|
| <b>No: 5479</b>           | <b>SupervisionID</b> 5479     | <b>Name</b> ExtConverterStopActiveSx    |
| <b>Log text</b>           | Ext.ConverterStopSignalActive |                                         |
| <b>Subsystem name</b>     | CubePower                     |                                         |
| <b>Type</b>               | Alarm                         | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b>    | Auto                          | <b>Shutdown type</b> StopFast           |
| - <b>Allowed attempts</b> | Unlimited                     | - <b>Max time disconnect</b> 0.9 second |
| - <b>Time window</b>      | <n/a>                         | - <b>Max time eliminate</b> 1 hour      |
| - <b>Stabilize period</b> | 60 second                     | <b>Category</b> Manufacturer            |

**Criteria:**

This alarm is raised when the HW External Converter Stop Input signal is Active. This digital input signal is a HW signal to the converter controller board (CT440) to stop switching PWM, open the breakers and stop the converter.

- Par1: Generator speed [RPM]
- Par2: Grid Converter Power (filtered) [W]



|                        |                                |                                                 |              |
|------------------------|--------------------------------|-------------------------------------------------|--------------|
| <b>No: 5480</b>        | <b>SupervisionID</b> 5480      | <b>Name</b> ConvGenWaterCoolingLiquidTempHighSx |              |
| <b>Log text</b>        | ConvGen WCool liquid temp high |                                                 |              |
| <b>Subsystem name</b>  | ConverterGeneratorWaterCooling |                                                 |              |
| <b>Type</b>            | Warning                        | <b>Timeout</b>                                  | <disabled>   |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                            | <n/a>        |
| - Allowed attempts     | 3                              | - Max time disconnect                           | <n/a>        |
| - Time window          | 1 hour                         | - Max time eliminate                            | <n/a>        |
| - Stabilize period     | 1 minute                       | <b>Category</b>                                 | Manufacturer |

**Criteria:**

The warning is raised if the converter generator water cooling liquid temperature is too high.

The warning is raised if the temperature of the cooling liquid (\*\*IO.ConvGenWaterCoolingTemp\*\*) is above the warning level (parameter \*\*LiquidHighTemp\*\*) for more than the stabilize time (parameter \*\*LiquidTempStableTime\*\*) when cooling has been active for the time specified by parameter \*\*WaterTempCoolingActiveStableTime\*\*.

This warning is auto acknowledged if the cooling liquid temperature (\*\*IO.ConvGenWaterCoolingTemp\*\*) is equal or below the warning level (parameter \*\*LiquidHighTemp\*\* ).

|                        |                           |                                         |              |
|------------------------|---------------------------|-----------------------------------------|--------------|
| <b>No: 5505</b>        | <b>SupervisionID</b> 5505 | <b>Name</b> UPSACOnGridSignalMismatchSx |              |
| <b>Log text</b>        | UPS AC Grd Mismatch       |                                         |              |
| <b>Subsystem name</b>  | UPS                       |                                         |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                          | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                    | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect                   | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate                    | <n/a>        |
| - Stabilize period     | 30 second                 | <b>Category</b>                         | Manufacturer |

**Criteria:**

The warning is reported when the grid detection in the UPS and the grid detection in the turbine differs. That can e.g. be caused by open breakers, blown fuses, wrong grid measurement or UPS failure.

The warning is reported when UPSACOnGrid is equal to PowerSupplyOffGrid for more than \*\*UPSSignalMismatchTime\*\*.

The supervision is active when \*\*ExtendedControlEnabled\*\* is true.

The warning can be acknowledged when UPSACOnGrid is not equal to PowerSupplyOffGrid again.

|                        |                           |                                         |
|------------------------|---------------------------|-----------------------------------------|
| <b>No: 5506</b>        | <b>SupervisionID</b> 5506 | <b>Name</b> UPSACAwaitDisconnectPowerSx |
| <b>Log text</b>        | UPS AC Await disconn pwr  |                                         |
| <b>Subsystem name</b>  | UPS                       |                                         |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow          |
| - Allowed attempts     | Unlimited                 | - Max time disconnect 9 second          |
| - Time window          | <n/a>                     | - Max time eliminate 10 second          |
| - Stabilize period     | 60 second                 | <b>Category</b> Utility                 |

**Criteria:**

The alarm is reported when the grid is disconnected from the UPS. It is a warning that the control system will powered off within some minutes.

The alarm is reported when UPSACOnGrid is false or PowerSupplyOffGrid is true for more than \*\*UPSDisconnectPowerStableTime\*\*.

When UPSACOnGrid has been false for \*\*UPSDisconnectPowerDelay\*\* after the alarm is reported, the power to the control system is powered off.

The supervision is active when \*\*ExtendedControlEnabled\*\* is true.

The alarm can be acknowledged when UPSACOnGrid is true and PowerSupplyOffGrid is false.

|                        |                           |                                   |
|------------------------|---------------------------|-----------------------------------|
| <b>No: 5511</b>        | <b>SupervisionID</b> 5511 | <b>Name</b> HeaterTurnOffFailedSx |
| <b>Log text</b>        | ConvHeaterTurnOffFailed   |                                   |
| <b>Subsystem name</b>  | CubePower                 |                                   |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>              |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow     |
| - Allowed attempts     | 3                         | - Max time disconnect 8 second    |
| - Time window          | 1 hour                    | - Max time eliminate 9 second     |
| - Stabilize period     | 10 minute                 | <b>Category</b> Manufacturer      |

**Criteria:**

This alarm is raised when the heater is commanded to be turned off but there is no correct feedback status is received after a timeout.

|                        |                           |                                                |
|------------------------|---------------------------|------------------------------------------------|
| <b>No: 5523</b>        | <b>SupervisionID</b> 5523 | <b>Name</b> SafetySystemInitialResetRequiredSx |
| <b>Log text</b>        | Safety, waiting for reset |                                                |
| <b>Subsystem name</b>  | SafetySystem              |                                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                           |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> PauseSlow                 |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 9 second                 |
| - Time window          | <n/a>                     | - Max time eliminate 10 second                 |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer                   |

**Criteria:**

Manual confirmation of safety system initial reset.

This alarm is reported to notify the service technician that a safety system reset is required when powering up the safety system or the turbine.

The intention of the supervision is to notify a man in turbine that a safety system reset has been requested and for him to confirm when to carry out the reset, therefore The alarm can be acknowledged as soon as it has been reported.

|                        |                             |                                                     |              |
|------------------------|-----------------------------|-----------------------------------------------------|--------------|
| <b>No: 5524</b>        | <b>SupervisionID</b> 5524   | <b>Name</b> SafetySystemNacelleUnknownResetReasonSx |              |
| <b>Log text</b>        | SftyNac, UnknownResetReason |                                                     |              |
| <b>Subsystem name</b>  | SafetySystem                |                                                     |              |
| <b>Type</b>            | Alarm                       | <b>Timeout</b>                                      | <n/a>        |
| <b>Acknowledgement</b> | Remote                      | <b>Shutdown type</b>                                | StopSlow     |
| - Allowed attempts     | <n/a>                       | - Max time disconnect                               | 3 second     |
| - Time window          | <n/a>                       | - Max time eliminate                                | 9 second     |
| - Stabilize period     | <n/a>                       | <b>Category</b>                                     | Manufacturer |

**Criteria:**

The alarm is raised when a Safety System zone is waiting for a reset, but no reset cause has been reported.

The alarm is raised when the Nacelle Safety zone is waiting for a reset, but no reset cause has been reported.

The alarm is raised if **\*\*IO.SafetySystemNacelleReadyForReset\*\*** is true and **\*\*SafetySystemAlarmDetected\*\*** is false for the time specified in the parameter **\*\*SafetySystemErrorHandlingTime\*\***.

The alarm can be acknowledged.

|                        |                             |                                                 |              |
|------------------------|-----------------------------|-------------------------------------------------|--------------|
| <b>No: 5525</b>        | <b>SupervisionID</b> 5525   | <b>Name</b> SafetySystemHubUnknownResetReasonSx |              |
| <b>Log text</b>        | SftyHub, UnknownResetReason |                                                 |              |
| <b>Subsystem name</b>  | SafetySystem                |                                                 |              |
| <b>Type</b>            | Alarm                       | <b>Timeout</b>                                  | <n/a>        |
| <b>Acknowledgement</b> | Remote                      | <b>Shutdown type</b>                            | StopSlow     |
| - Allowed attempts     | <n/a>                       | - Max time disconnect                           | 3 second     |
| - Time window          | <n/a>                       | - Max time eliminate                            | 9 second     |
| - Stabilize period     | <n/a>                       | <b>Category</b>                                 | Manufacturer |

**Criteria:**

The alarm is raised when a Safety System zone is waiting for a reset, but no reset cause has been reported.

The alarm is raised when the Hub Safety zone is waiting for a reset, but no reset cause has been reported.

The alarm is raised if **\*\*IO.SafetySystemHubReadyForReset\*\*** is true and **\*\*SafetySystemAlarmDetected\*\*** is false for the time specified in the parameter **\*\*SafetySystemErrorHandlingTime\*\***.

The alarm can be acknowledged.

|                        |                             |                                                   |
|------------------------|-----------------------------|---------------------------------------------------|
| <b>No: 5526</b>        | <b>SupervisionID</b> 5526   | <b>Name</b> SafetySystemTowerUnknownResetReasonSx |
| <b>Log text</b>        | SftyTow, UnknownResetReason |                                                   |
| <b>Subsystem name</b>  | SafetySystem                |                                                   |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                              |
| <b>Acknowledgement</b> | Remote                      | <b>Shutdown type</b> StopSlow                     |
| - Allowed attempts     | <n/a>                       | - Max time disconnect 3 second                    |
| - Time window          | <n/a>                       | - Max time eliminate 9 second                     |
| - Stabilize period     | <n/a>                       | <b>Category</b> Manufacturer                      |

**Criteria:**

The alarm is raised when a Safety System zone is waiting for a reset, but no reset cause has been reported.

The alarm is raised when the Tower Safety zone is waiting for a reset, but no reset cause has been reported.

The alarm is raised if **\*\*IO.SafetySystemTowerReadyForReset\*\*** is true and **\*\*SafetySystemAlarmDetected\*\*** is false for the time specified in the parameter **\*\*SafetySystemErrorHandlingTime\*\***.

The alarm can be acknowledged.

|                        |                               |                                                       |
|------------------------|-------------------------------|-------------------------------------------------------|
| <b>No: 5527</b>        | <b>SupervisionID</b> 5527     | <b>Name</b> SafetySystemNacelleUnknownPendingReasonSx |
| <b>Log text</b>        | SftyNac, UnknownPendingReason |                                                       |
| <b>Subsystem name</b>  | SafetySystem                  |                                                       |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                                  |
| <b>Acknowledgement</b> | Remote                        | <b>Shutdown type</b> StopSlow                         |
| - Allowed attempts     | <n/a>                         | - Max time disconnect 3 second                        |
| - Time window          | <n/a>                         | - Max time eliminate 9 second                         |
| - Stabilize period     | <n/a>                         | <b>Category</b> Manufacturer                          |

**Criteria:**

The alarm is raised when a Safety System zone has a pending cause, and no other subsystem have taken responsibility for the pending cause.

The alarm is raised when the Nacelle Safety zone has a pending cause, and no other subsystem have taken responsibility for the pending cause.

The alarm is raised if **\*\*IO.SafetySystemNacellePendingSignals\*\*** is true and **\*\*SafetySystemAlarmDetected\*\*** is false for the time specified in the parameter **\*\*SafetySystemErrorHandlingTime\*\***.

The alarm can be acknowledged.

No: 5528

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 5528

Name SafetySystemHubUnknownPendingReasonSx

SftyHub, UnknownPendingReason

SafetySystem

Alarm

Remote

<n/a>

<n/a>

<n/a>

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopSlow

3 second

9 second

Manufacturer

The alarm is raised when a Safety System zone has a pending cause, and no other subsystem have taken responsibility for the pending cause.

The alarm is raised when the Hub Safety zone has a pending cause, and no other subsystem have taken responsibility for the pending cause.

The alarm is raised if **\*\*IO.SafetySystemHubPendingSignals\*\*** is true and **\*\*SafetySystemAlarmDetected\*\*** is false for the time specified in the parameter **\*\*SafetySystemErrorHandlingTime\*\***.

The alarm can be acknowledged.

No: 5529

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 5529

Name SafetySystemTowerUnknownPendingReasonSx

SftyTow, UnknownPendingReason

SafetySystem

Alarm

Remote

<n/a>

<n/a>

<n/a>

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopSlow

3 second

9 second

Manufacturer

The alarm is raised when a Safety System zone has a pending cause, and no other subsystem have taken responsibility for the pending cause.

The alarm is raised when the Tower Safety zone has a pending cause, and no other subsystem have taken responsibility for the pending cause.

The alarm is raised if **\*\*IO.SafetySystemTowerPendingSignals\*\*** is true and **\*\*SafetySystemAlarmDetected\*\*** is false for the time specified in the parameter **\*\*SafetySystemErrorHandlingTime\*\***.

The alarm can be acknowledged.

No: 5530

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 5530

EmergStopButtonActivated:

SafetySystem

Alarm

Remote

<n/a>

<n/a>

<n/a>

Name EmergencyStopButtonActivatedSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopFast

0.9 second

3600 second

Manufacturer

The purpose of this alarm is to monitor the state of emergency stop buttons and report an alarm in case one or more emergency stop buttons are active.

The alarm is raised if one or more of the following signals are true

```
IO.EmergencyStopButtonHubCabinetActivated
IO.EmergencyStopButtonIOCabinetActivated
IO.EmergencyStopButtonLowSpeedShaftActivated
IO.EmergencyStopButtonHighSpeedShaftActivated
IO.EmergencyStopButtonNacelleCabinetActivated
IO.EmergencyStopButtonYawActivated
IO.EmergencyStopButtonTowerTopActivated
IO.EmergencyStopButtonTowerCabinetActivated
IO.EmergencyStopButtonConvCabinetActivated
```

The alarm can be acknowledged when all the signals are false.

Note: When the alarm is no longer reported a safety system reset is initiated.

No: 5532

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 5532

EStopButtonIOCabinet HwError

SafetySystem

Alarm

Auto

3

1 hour

60 second

Name EmergencyStopButtonHubIOPanelHwErrorSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopSlow

3 second

9 second

Manufacturer

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.EmergencyStopButtonHubIOPanelHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.EmergencyStopButtonHubIOPanelHwError\*\*** changes to false.

|                        |                               |                                             |              |
|------------------------|-------------------------------|---------------------------------------------|--------------|
| <b>No: 5533</b>        | <b>SupervisionID</b> 5533     | <b>Name</b> EmergencyStopButtonHubHwErrorSx |              |
| <b>Log text</b>        | EStopButtonHubCabinet HwError |                                             |              |
| <b>Subsystem name</b>  | SafetySystem                  |                                             |              |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>                              | <n/a>        |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                        | StopSlow     |
| - Allowed attempts     | 3                             | - Max time disconnect                       | 3 second     |
| - Time window          | 1 hour                        | - Max time eliminate                        | 9 second     |
| - Stabilize period     | 60 second                     | <b>Category</b>                             | Manufacturer |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.EmergencyStopButtonHubHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.EmergencyStopButtonHubHwError\*\*** changes to false.

|                        |                                |                                                        |              |
|------------------------|--------------------------------|--------------------------------------------------------|--------------|
| <b>No: 5534</b>        | <b>SupervisionID</b> 5534      | <b>Name</b> EmergencyStopButtonHighSpeedShaftHwErrorSx |              |
| <b>Log text</b>        | EStopBtnHighSpeedShaft HwError |                                                        |              |
| <b>Subsystem name</b>  | SafetySystem                   |                                                        |              |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>                                         | <n/a>        |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                                   | StopSlow     |
| - Allowed attempts     | 3                              | - Max time disconnect                                  | 3 second     |
| - Time window          | 1 hour                         | - Max time eliminate                                   | 9 second     |
| - Stabilize period     | 60 second                      | <b>Category</b>                                        | Manufacturer |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.EmergencyStopButtonHighSpeedShaftHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.EmergencyStopButtonHighSpeedShaftHwError\*\*** changes to false.

|                        |                               |                                                       |              |
|------------------------|-------------------------------|-------------------------------------------------------|--------------|
| <b>No: 5535</b>        | <b>SupervisionID</b>          | <b>Name</b> EmergencyStopButtonLowSpeedShaftHwErrorSx |              |
|                        | 5535                          |                                                       |              |
| <b>Log text</b>        | EStopBtnLowSpeedShaft HwError |                                                       |              |
| <b>Subsystem name</b>  | SafetySystem                  |                                                       |              |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>                                        | <n/a>        |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                  | StopSlow     |
| - Allowed attempts     | 3                             | - Max time disconnect                                 | 3 second     |
| - Time window          | 1 hour                        | - Max time eliminate                                  | 9 second     |
| - Stabilize period     | 60 second                     | <b>Category</b>                                       | Manufacturer |

**Criteria:**  
This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal  
\*\*IO.EmergencyStopButtonLowSpeedShaftHwError\*\* is true.

The alarm is automatically acknowledged when the signal  
\*\*IO.EmergencyStopButtonLowSpeedShaftHwError\*\* changes to false.

|                        |                                |                                                        |              |
|------------------------|--------------------------------|--------------------------------------------------------|--------------|
| <b><u>No: 5536</u></b> | <b>SupervisionID</b>           | <b>Name</b> EmergencyStopButtonNacelleCabinetHwErrorSx |              |
|                        | 5536                           |                                                        |              |
| <b>Log text</b>        | EStopBtnNacelleCabinet HwError |                                                        |              |
| <b>Subsystem name</b>  | SafetySystem                   |                                                        |              |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>                                         | <n/a>        |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                                   | StopSlow     |
| - Allowed attempts     | 3                              | - Max time disconnect                                  | 3 second     |
| - Time window          | 1 hour                         | - Max time eliminate                                   | 9 second     |
| - Stabilize period     | 60 second                      | <b>Category</b>                                        | Manufacturer |

**Criteria:**  
This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal  
\*\*IO.EmergencyStopButtonNacelleCabinetHwError\*\* is true.

The alarm is automatically acknowledged when the signal  
\*\*IO.EmergencyStopButtonNacelleCabinetHwError\*\* changes to false.



|                        |                              |                                                      |              |
|------------------------|------------------------------|------------------------------------------------------|--------------|
| <b>No: 5537</b>        | <b>SupervisionID</b>         | <b>Name</b> EmergencyStopButtonTowerCabinetHwErrorSx |              |
|                        | 5537                         |                                                      |              |
| <b>Log text</b>        | EStopBtnTowerCabinet HwError |                                                      |              |
| <b>Subsystem name</b>  | SafetySystem                 |                                                      |              |
| <b>Type</b>            | Alarm                        | <b>Timeout</b>                                       | <n/a>        |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                                 | StopSlow     |
| - Allowed attempts     | 3                            | - Max time disconnect                                | 3 second     |
| - Time window          | 1 hour                       | - Max time eliminate                                 | 9 second     |
| - Stabilize period     | 60 second                    | <b>Category</b>                                      | Manufacturer |

**Criteria:**  
This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal  
\*\*IO.EmergencyStopButtonTowerCabinetHwError\*\* is true.

The alarm is automatically acknowledged when the signal  
\*\*IO.EmergencyStopButtonTowerCabinetHwError\*\* changes to false.

|                        |                           |                                                  |              |
|------------------------|---------------------------|--------------------------------------------------|--------------|
| <b>No: 5538</b>        | <b>SupervisionID</b> 5538 | <b>Name</b> EmergencyStopButtonTowerTopHwErrorSx |              |
| <b>Log text</b>        | EStopBtnTowerTop HwError  |                                                  |              |
| <b>Subsystem name</b>  | SafetySystem              |                                                  |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                                   | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                             | StopSlow     |
| - Allowed attempts     | 3                         | - Max time disconnect                            | 3 second     |
| - Time window          | 1 hour                    | - Max time eliminate                             | 9 second     |
| - Stabilize period     | 60 second                 | <b>Category</b>                                  | Manufacturer |

**Criteria:**  
This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal \*\*IO.EmergencyStopButtonTowerTopHwError\*\* is true.

The alarm is automatically acknowledged when the signal  
\*\*IO.EmergencyStopButtonTowerTopHwError\*\* changes to false.

|                        |                           |                                             |
|------------------------|---------------------------|---------------------------------------------|
| <b>No: 5539</b>        | <b>SupervisionID</b> 5539 | <b>Name</b> EmergencyStopButtonYawHwErrorSx |
| <b>Log text</b>        | EStopBtnYaw HwError       |                                             |
| <b>Subsystem name</b>  | SafetySystem              |                                             |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow               |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second              |
| - Time window          | 1 hour                    | - Max time eliminate 9 second               |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.EmergencyStopButtonYawHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.EmergencyStopButtonYawHwError\*\*** changes to false.

|                        |                             |                                                     |
|------------------------|-----------------------------|-----------------------------------------------------|
| <b>No: 5540</b>        | <b>SupervisionID</b> 5540   | <b>Name</b> EmergencyStopButtonConvCabinetHwErrorSx |
| <b>Log text</b>        | EStopBtnConvCabinet HwError |                                                     |
| <b>Subsystem name</b>  | SafetySystem                |                                                     |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                                |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> StopSlow                       |
| - Allowed attempts     | 3                           | - Max time disconnect 3 second                      |
| - Time window          | 1 hour                      | - Max time eliminate 9 second                       |
| - Stabilize period     | 60 second                   | <b>Category</b> Manufacturer                        |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

The alarm is reported if the software signal **\*\*IO.EmergencyStopButtonConvCabinetHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.EmergencyStopButtonConvCabinetHwError\*\*** changes to false.

|                        |                           |                                                    |              |
|------------------------|---------------------------|----------------------------------------------------|--------------|
| <b>No: 5541</b>        | <b>SupervisionID</b> 5541 | <b>Name</b> HubInSafeModeHubServiceSwitchHwErrorSx |              |
| <b>Log text</b>        | HubServiceSwitch HwError  |                                                    |              |
| <b>Subsystem name</b>  | SafetySystem              |                                                    |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                                     | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                               | StopSlow     |
| - Allowed attempts     | 3                         | - Max time disconnect                              | 3 second     |
| - Time window          | 1 hour                    | - Max time eliminate                               | 9 second     |
| - Stabilize period     | 60 second                 | <b>Category</b>                                    | Manufacturer |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.HubInSafeModeHubServiceSwitchHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.HubInSafeModeHubServiceSwitchHwError\*\*** changes to false.

|                        |                           |                                                  |              |
|------------------------|---------------------------|--------------------------------------------------|--------------|
| <b>No: 5542</b>        | <b>SupervisionID</b> 5542 | <b>Name</b> HubInSafeModeBallValveAOpenHwErrorSx |              |
| <b>Log text</b>        | BallValveAOpen HwError    |                                                  |              |
| <b>Subsystem name</b>  | SafetySystem              |                                                  |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                                   | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                             | StopSlow     |
| - Allowed attempts     | 3                         | - Max time disconnect                            | 3 second     |
| - Time window          | 1 hour                    | - Max time eliminate                             | 9 second     |
| - Stabilize period     | 60 second                 | <b>Category</b>                                  | Manufacturer |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.HubInSafeModeBallValveAOpenHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.HubInSafeModeBallValveAOpenHwError\*\*** changes to false.

|                        |                           |                                                    |              |
|------------------------|---------------------------|----------------------------------------------------|--------------|
| <b>No: 5543</b>        | <b>SupervisionID</b> 5543 | <b>Name</b> HubInSafeModeBallValveAClosedHwErrorSx |              |
| <b>Log text</b>        | BallValveAClosed HwError  |                                                    |              |
| <b>Subsystem name</b>  | SafetySystem              |                                                    |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                                     | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                               | StopSlow     |
| - Allowed attempts     | 3                         | - Max time disconnect                              | 3 second     |
| - Time window          | 1 hour                    | - Max time eliminate                               | 9 second     |
| - Stabilize period     | 60 second                 | <b>Category</b>                                    | Manufacturer |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.HubInSafeModeBallValveAClosedHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.HubInSafeModeBallValveAClosedHwError\*\*** changes to false.

|                        |                           |                                                  |              |
|------------------------|---------------------------|--------------------------------------------------|--------------|
| <b>No: 5544</b>        | <b>SupervisionID</b> 5544 | <b>Name</b> HubInSafeModeBallValveBOpenHwErrorSx |              |
| <b>Log text</b>        | BallValveBOpen HwError    |                                                  |              |
| <b>Subsystem name</b>  | SafetySystem              |                                                  |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                                   | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                             | StopSlow     |
| - Allowed attempts     | 3                         | - Max time disconnect                            | 3 second     |
| - Time window          | 1 hour                    | - Max time eliminate                             | 9 second     |
| - Stabilize period     | 60 second                 | <b>Category</b>                                  | Manufacturer |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.HubInSafeModeBallValveBOpenHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.HubInSafeModeBallValveBOpenHwError\*\*** changes to false.

|                        |                           |                                                    |              |
|------------------------|---------------------------|----------------------------------------------------|--------------|
| <b>No: 5545</b>        | <b>SupervisionID</b> 5545 | <b>Name</b> HubInSafeModeBallValveBClosedHwErrorSx |              |
| <b>Log text</b>        | BallValveBClosed HwError  |                                                    |              |
| <b>Subsystem name</b>  | SafetySystem              |                                                    |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                                     | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                               | StopSlow     |
| - Allowed attempts     | 3                         | - Max time disconnect                              | 3 second     |
| - Time window          | 1 hour                    | - Max time eliminate                               | 9 second     |
| - Stabilize period     | 60 second                 | <b>Category</b>                                    | Manufacturer |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.HubInSafeModeBallValveBClosedHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.HubInSafeModeBallValveBClosedHwError\*\*** changes to false.

|                        |                           |                                                  |              |
|------------------------|---------------------------|--------------------------------------------------|--------------|
| <b>No: 5546</b>        | <b>SupervisionID</b> 5546 | <b>Name</b> HubInSafeModeBallValveCOpenHwErrorSx |              |
| <b>Log text</b>        | BallValveCOpen HwError    |                                                  |              |
| <b>Subsystem name</b>  | SafetySystem              |                                                  |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                                   | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                             | StopSlow     |
| - Allowed attempts     | 3                         | - Max time disconnect                            | 3 second     |
| - Time window          | 1 hour                    | - Max time eliminate                             | 9 second     |
| - Stabilize period     | 60 second                 | <b>Category</b>                                  | Manufacturer |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.HubInSafeModeBallValveCOpenHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.HubInSafeModeBallValveCOpenHwError\*\*** changes to false.

**No: 5547**

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 5547

BallValveCClosed HwError

SafetySystem

Alarm

Auto

3

1 hour

60 second

**Name**

HubInSafeModeBallValveCClosedHwErrorSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopSlow

3 second

9 second

Manufacturer

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.HubInSafeModeBallValveCClosedHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.HubInSafeModeBallValveCClosedHwError\*\*** changes to false.

**No: 5548**

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID 5548

HoldToRun HwError

SafetySystem

Alarm

Auto

3

1 hour

60 second

**Name**

HubInSafeModeHoldToRunHwErrorSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopSlow

3 second

9 second

Manufacturer

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.HubInSafeModeHoldToRunHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.HubInSafeModeHoldToRunHwError\*\*** changes to false.

|                        |                            |                                                     |              |
|------------------------|----------------------------|-----------------------------------------------------|--------------|
| <b>No: 5549</b>        | <b>SupervisionID</b> 5549  | <b>Name</b> SafetySystemExcessiveVibrationHwErrorSx |              |
| <b>Log text</b>        | ExcessiveVibration HwError |                                                     |              |
| <b>Subsystem name</b>  | SafetySystem               |                                                     |              |
| <b>Type</b>            | Alarm                      | <b>Timeout</b>                                      | <n/a>        |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b>                                | StopSlow     |
| - Allowed attempts     | 3                          | - Max time disconnect                               | 3 second     |
| - Time window          | 1 hour                     | - Max time eliminate                                | 9 second     |
| - Stabilize period     | 60 second                  | <b>Category</b>                                     | Manufacturer |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal

**\*\*IO.SafetySystemExcessiveVibrationHwError\*\*** is true.

The alarm is automatically acknowledged when the signal

**\*\*IO.SafetySystemExcessiveVibrationHwError\*\*** changes to false.

|                        |                            |                                                     |              |
|------------------------|----------------------------|-----------------------------------------------------|--------------|
| <b>No: 5550</b>        | <b>SupervisionID</b> 5550  | <b>Name</b> SafetySystemAbnormalCableTwistHwErrorSx |              |
| <b>Log text</b>        | AbnormalCableTwist HwError |                                                     |              |
| <b>Subsystem name</b>  | SafetySystem               |                                                     |              |
| <b>Type</b>            | Alarm                      | <b>Timeout</b>                                      | <n/a>        |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b>                                | StopSlow     |
| - Allowed attempts     | 3                          | - Max time disconnect                               | 3 second     |
| - Time window          | 1 hour                     | - Max time eliminate                                | 9 second     |
| - Stabilize period     | 60 second                  | <b>Category</b>                                     | Manufacturer |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal

**\*\*IO.SafetySystemAbnormalCableTwistHwError\*\*** is true.

The alarm is automatically acknowledged when the signal

**\*\*IO.SafetySystemAbnormalCableTwistHwError\*\*** changes to false.

|                        |                                |                                            |              |
|------------------------|--------------------------------|--------------------------------------------|--------------|
| <b>No: 5551</b>        | <b>SupervisionID</b> 5551      | <b>Name</b> SafetySystemConverterStoppedSx |              |
| <b>Log text</b>        | SafetySystem Converter Stopped |                                            |              |
| <b>Subsystem name</b>  | SafetySystem                   |                                            |              |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>                             | <n/a>        |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                       | StopSlow     |
| - Allowed attempts     | 3                              | - Max time disconnect                      | 3 second     |
| - Time window          | 1 hour                         | - Max time eliminate                       | 9 second     |
| - Stabilize period     | 60 second                      | <b>Category</b>                            | Manufacturer |

**Criteria:**

This alarm indicates that the safety relays has detected that the converter is not running.

This alarm is reported if the signal **\*\*IO.ConverterOk\*\*** is false.

The alarm is auto acknowledged if the the signal **\*\*IO.ConverterOk\*\*** is true.

|                        |                           |                                                  |
|------------------------|---------------------------|--------------------------------------------------|
| <b>No: 5552</b>        | <b>SupervisionID</b> 5552 | <b>Name</b> SafetySystemNacelle1SwVersionErrorSx |
| <b>Log text</b>        | SafetyNac1 SwVers Error   |                                                  |
| <b>Subsystem name</b>  | SafetySystem              |                                                  |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                             |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow                   |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second                   |
| - Time window          | 1 hour                    | - Max time eliminate 10 second                   |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                     |

**Criteria:**

This alarm indicates that the software version of the safety systems does not match what the turbine software expect.

The alarm will automatically be acknowledged when the software version is correct.

This alarm indicates that the software version in the Nacelle1 Safety node does not match what the turbine software expect.

The alarm is raised if **\*\*IO.SafetySystemNacelle1SwVersion\*\*** does not match parameter **\*\*SafetySystemNacelle1SwVersion\*\***.

The alarm can be acknowledged.

|                        |                           |                                                  |
|------------------------|---------------------------|--------------------------------------------------|
| <b>No: 5554</b>        | <b>SupervisionID</b> 5554 | <b>Name</b> SafetySystemNacelle2SwVersionErrorSx |
| <b>Log text</b>        | SafetyNac2 SwVers Error   |                                                  |
| <b>Subsystem name</b>  | SafetySystem              |                                                  |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                             |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow                   |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second                   |
| - Time window          | 1 hour                    | - Max time eliminate 10 second                   |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                     |

**Criteria:**

This alarm indicates that the software version of the safety systems does not match what the turbine software expect.

The alarm will automatically be acknowledged when the software version is correct.

This alarm indicates that the software version in the Nacelle2 Safety node does not match what the turbine software expect.

The alarm is raised if **\*\*IO.SafetySystemNacelle2SwVersion\*\*** does not match parameter **\*\*SafetySystemNacelle2SwVersion\*\***.

The alarm can be acknowledged.



|                        |                           |                                                  |
|------------------------|---------------------------|--------------------------------------------------|
| <b>No: 5556</b>        | <b>SupervisionID</b> 5556 | <b>Name</b> SafetySystemNacelle3SwVersionErrorSx |
| <b>Log text</b>        | SafetyNac3 SwVers Error   |                                                  |
| <b>Subsystem name</b>  | SafetySystem              |                                                  |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                             |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow                   |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second                   |
| - Time window          | 1 hour                    | - Max time eliminate 10 second                   |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                     |

**Criteria:**

This alarm indicates that the software version of the safety systems does not match what the turbine software expect.

The alarm will automatically be acknowledged when the software version is correct.

This alarm indicates that the software version in the Nacelle3 Safety node does not match what the turbine software expect.

The alarm is raised if **\*\*IO.SafetySystemNacelle3SwVersion\*\*** does not match parameter **\*\*SafetySystemNacelle3SwVersion\*\***.

The alarm can be acknowledged.

|                        |                           |                                              |
|------------------------|---------------------------|----------------------------------------------|
| <b>No: 5558</b>        | <b>SupervisionID</b> 5558 | <b>Name</b> SafetySystemHub1SwVersionErrorSx |
| <b>Log text</b>        | SafetyHub1 SwVers Error   |                                              |
| <b>Subsystem name</b>  | SafetySystem              |                                              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                         |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow               |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second               |
| - Time window          | 1 hour                    | - Max time eliminate 10 second               |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                 |

**Criteria:**

This alarm indicates that the software version of the safety systems does not match what the turbine software expect.

The alarm will automatically be acknowledged when the software version is correct.

This alarm indicates that the software version in the Hub1 Safety node does not match what the turbine software expect.

The alarm is raised if **\*\*IO.SafetySystemHub1SwVersion\*\*** does not match parameter **\*\*SafetySystemHub1SwVersion\*\***.

The alarm can be acknowledged.

**No: 5560**                      **SupervisionID** 5560    **Name** SafetySystemTower1SwVersionErrorSx  
**Log text**                      SafetyTowl SwVers Error  
**Subsystem name**                SafetySystem  
**Type**                          Alarm                              **Timeout**                              <n/a>  
**Acknowledgement**              Auto                               **Shutdown type**                      PauseSlow  
- **Allowed attempts**            3                                  - **Max time disconnect**              9 second  
- **Time window**                1 hour                           - **Max time eliminate**              10 second  
- **Stabilize period**            60 second                       **Category**                            Manufacturer  
**Criteria:**  
This alarm indicates that the software version of the safety systems does not match what the turbine software expect.

The alarm will automatically be acknowledged when the software version is correct.

This alarm indicates that the software version in the Tower1 Safety node does not match what the turbine software expect.

The alarm is raised if **\*\*IO.SafetySystemTower1SwVersion\*\*** does not match parameter **\*\*SafetySystemTower1SwVersion\*\***.

The alarm can be acknowledged.

**No: 5562**                      **SupervisionID** 5562    **Name** SafetySystemNacelle1CommunicationErrorSx  
**Log text**                      SafetyNac1 Communication Error  
**Subsystem name**                SafetySystem  
**Type**                          Alarm                              **Timeout**                              <n/a>  
**Acknowledgement**              Auto                               **Shutdown type**                      PauseSlow  
- **Allowed attempts**            5                                  - **Max time disconnect**              9 second  
- **Time window**                20 minute                       - **Max time eliminate**              10 second  
- **Stabilize period**            60 second                       **Category**                            Manufacturer  
**Criteria:**

This alarm indicates that the communication with the safety system nodes is faulty.

The alarm is automatically acknowledged when the communication is Ok.

The alarm is raised if the communication to the Nacelle1 safety node is faulty.

The alarm is automatically acknowledged when the communication is ok.

**No: 5563**                      **SupervisionID** 5563    **Name** SafetySystemNacelle2CommunicationErrorSx  
**Log text**                      SafetyNac2 Communication Error  
**Subsystem name**                SafetySystem  
**Type**                          Alarm                              **Timeout**                              <n/a>  
**Acknowledgement**              Auto                               **Shutdown type**                      PauseSlow  
- **Allowed attempts**            5                                  - **Max time disconnect**              9 second  
- **Time window**                20 minute                       - **Max time eliminate**              10 second  
- **Stabilize period**            60 second                       **Category**                            Manufacturer  
**Criteria:**

This alarm indicates that the communication with the safety system nodes is faulty.

The alarm is automatically acknowledged when the communication is Ok.

The alarm is raised if the communication to the Nacelle2 safety node is faulty.

The alarm is automatically acknowledged when the communication is ok.

**No: 5564**                      **SupervisionID** 5564   **Name** SafetySystemNacelle3CommunicationErrorSx  
**Log text**                      SafetyNac3 Communication Error  
**Subsystem name**              SafetySystem  
**Type**                          Alarm                              **Timeout**                              <n/a>  
**Acknowledgement**              Auto                              **Shutdown type**                      PauseSlow  
- **Allowed attempts**              5                                  - **Max time disconnect**              9 second  
- **Time window**                  20 minute                      - **Max time eliminate**              10 second  
- **Stabilize period**              60 second                      **Category**                              Manufacturer

**Criteria:**

This alarm indicates that the communication with the safety system nodes is faulty.

The alarm is automatically acknowledged when the communication is Ok.

The alarm is raised if the communication to the Nacelle3 safety node is faulty.

The alarm is automatically acknowledged when the communication is ok.

**No: 5565**                      **SupervisionID** 5565   **Name** SafetySystemHub1CommunicationErrorSx  
**Log text**                      SafetyHub1 Communication Error  
**Subsystem name**              SafetySystem  
**Type**                          Alarm                              **Timeout**                              <n/a>  
**Acknowledgement**              Auto                              **Shutdown type**                      PauseSlow  
- **Allowed attempts**              5                                  - **Max time disconnect**              9 second  
- **Time window**                  20 minute                      - **Max time eliminate**              10 second  
- **Stabilize period**              60 second                      **Category**                              Manufacturer

**Criteria:**

This alarm indicates that the communication with the safety system nodes is faulty.

The alarm is automatically acknowledged when the communication is Ok.

The alarm is raised if the communication to the Hub1 safety node is faulty.

**No: 5566**                      **SupervisionID** 5566   **Name** SafetySystemTower1CommunicationErrorSx  
**Log text**                      SafetyTowl Communication Error  
**Subsystem name**              SafetySystem  
**Type**                          Alarm                              **Timeout**                              <n/a>  
**Acknowledgement**              Auto                              **Shutdown type**                      PauseSlow  
- **Allowed attempts**              5                                  - **Max time disconnect**              9 second  
- **Time window**                  20 minute                      - **Max time eliminate**              10 second  
- **Stabilize period**              60 second                      **Category**                              Manufacturer

**Criteria:**

This alarm indicates that the communication with the safety system nodes is faulty.

The alarm is automatically acknowledged when the communication is Ok.

The alarm is raised if the communication to the Tower1 safety node is faulty.

|                        |                                 |                                             |              |
|------------------------|---------------------------------|---------------------------------------------|--------------|
| <b>No: 5567</b>        | <b>SupervisionID</b> 5567       | <b>Name</b> SafetySystemCriticalCommErrorSx |              |
| <b>Log text</b>        | SafetySysCriticalCommErr __, __ |                                             |              |
| <b>Subsystem name</b>  | SafetySystem                    |                                             |              |
| <b>Type</b>            | Alarm                           | <b>Timeout</b>                              | <n/a>        |
| <b>Acknowledgement</b> | Auto                            | <b>Shutdown type</b>                        | StopSlow     |
| - Allowed attempts     | 3                               | - Max time disconnect                       | 3 second     |
| - Time window          | 1 hour                          | - Max time eliminate                        | 9 second     |
| - Stabilize period     | 60 second                       | <b>Category</b>                             | Manufacturer |

**Criteria:**

This alarm indicates that the communication with the main safety controller (MSC) is faulty.

The alarm is reported if input **\*\*IO.SafetySystemConnectivityCriticalNetworkLoss\*\*** is false.

The alarm is automatically acknowledged when input **\*\*IO.SafetySystemConnectivityCriticalNetworkLoss\*\*** is true.

|                        |                           |                                             |              |
|------------------------|---------------------------|---------------------------------------------|--------------|
| <b>No: 5568</b>        | <b>SupervisionID</b> 5568 | <b>Name</b> SafetySystemNacelle1EKeyErrorSx |              |
| <b>Log text</b>        | SafetyNac1 EKey Error     |                                             |              |
| <b>Subsystem name</b>  | SafetySystem              |                                             |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                              | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                        | PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect                       | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate                        | 10 second    |
| - Stabilize period     | 60 second                 | <b>Category</b>                             | Manufacturer |

**Criteria:**

This alarm indicates that the EKey mounted in the safety system node is faulty.

The alarm is reported if the EKey mounted in the Nacelle1 safety node is faulty.

The alarm is reported if input **\*\*IO.SafetySystemEKeyDataNacelle1Ok\*\*** is false.

The alarm is automatically acknowledged when input **\*\*IO.SafetySystemEKeyDataNacelle1Ok\*\*** is true.

|                        |                           |                                             |              |
|------------------------|---------------------------|---------------------------------------------|--------------|
| <b>No: 5569</b>        | <b>SupervisionID</b> 5569 | <b>Name</b> SafetySystemNacelle2EKeyErrorSx |              |
| <b>Log text</b>        | SafetyNac2 EKey Error     |                                             |              |
| <b>Subsystem name</b>  | SafetySystem              |                                             |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                              | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                        | PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect                       | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate                        | 10 second    |
| - Stabilize period     | 60 second                 | <b>Category</b>                             | Manufacturer |

**Criteria:**

This alarm indicates that the EKey mounted in the safety system node is faulty.

The alarm is reported if the EKey mounted in the Nacelle2 safety node is faulty.

The alarm is reported if input **\*\*IO.SafetySystemEKeyDataNacelle2Ok\*\*** is false.

The alarm is automatically acknowledged when input **\*\*IO.SafetySystemEKeyDataNacelle2Ok\*\*** is true.

|                        |                           |                                             |
|------------------------|---------------------------|---------------------------------------------|
| <b>No: 5570</b>        | <b>SupervisionID</b> 5570 | <b>Name</b> SafetySystemNacelle3EKeyErrorSx |
| <b>Log text</b>        | SafetyNac3 EKey Error     |                                             |
| <b>Subsystem name</b>  | SafetySystem              |                                             |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow              |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second              |
| - Time window          | 1 hour                    | - Max time eliminate 10 second              |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                |

**Criteria:**

This alarm indicates that the EKey mounted in the safety system node is faulty.

The alarm is reported if the EKey mounted in the Nacelle3 safety node is faulty.

The alarm is reported if input **\*\*IO.SafetySystemEKeyDataNacelle3Ok\*\*** is false.

The alarm is automatically acknowledged when input **\*\*IO.SafetySystemEKeyDataNacelle3Ok\*\*** is true.

|                        |                           |                                         |
|------------------------|---------------------------|-----------------------------------------|
| <b>No: 5571</b>        | <b>SupervisionID</b> 5571 | <b>Name</b> SafetySystemHub1EKeyErrorSx |
| <b>Log text</b>        | SafetyHub1 EKey Error     |                                         |
| <b>Subsystem name</b>  | SafetySystem              |                                         |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow          |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second          |
| - Time window          | 1 hour                    | - Max time eliminate 10 second          |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer            |

**Criteria:**

This alarm indicates that the EKey mounted in the safety system node is faulty.

The alarm is reported if the EKey mounted in the Hub1 safety node is faulty.

The alarm is reported if input **\*\*IO.SafetySystemEKeyDataHub1Ok\*\*** is false.

The alarm is automatically acknowledged when input **\*\*IO.SafetySystemEKeyDataHub1Ok\*\*** is true.

|                        |                           |                                           |
|------------------------|---------------------------|-------------------------------------------|
| <b>No: 5572</b>        | <b>SupervisionID</b> 5572 | <b>Name</b> SafetySystemTower1EKeyErrorSx |
| <b>Log text</b>        | SafetyTowl EKey Error     |                                           |
| <b>Subsystem name</b>  | SafetySystem              |                                           |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                      |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow            |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second            |
| - Time window          | 1 hour                    | - Max time eliminate 10 second            |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer              |

**Criteria:**

This alarm indicates that the EKey mounted in the safety system node is faulty.

The alarm is reported if the EKey mounted in the Tower1 safety node is faulty.

The alarm is reported if input **\*\*IO.SafetySystemEKeyDataTower1Ok\*\*** is false.

The alarm is automatically acknowledged when input **\*\*IO.SafetySystemEKeyDataTower1Ok\*\*** is true.

|                        |                              |                                                    |
|------------------------|------------------------------|----------------------------------------------------|
| <b>No: 5573</b>        | <b>SupervisionID</b> 5573    | <b>Name</b> SafetySystemNacelle1OperationalErrorSx |
| <b>Log text</b>        | SafetyNac1 Operational Error |                                                    |
| <b>Subsystem name</b>  | SafetySystem                 |                                                    |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                               |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> PauseSlow                     |
| - Allowed attempts     | 3                            | - Max time disconnect 9 second                     |
| - Time window          | 1 hour                       | - Max time eliminate 10 second                     |
| - Stabilize period     | 60 second                    | <b>Category</b> Manufacturer                       |

**Criteria:**  
This alarm indicates that the safety node is not operational i.e. not up-and-running.

The alarm can be acknowledged.

This alarm indicates that the Nacelle1 safety node is not operational i.e. not up-and-running.

The alarm is reported if input **\*\*IO.SafetySystemNacelle1Operational\*\*** is false.

The alarm is automatically acknowledged when **\*\*IO.SafetySystemNacelle1Operational\*\*** is true.

|                        |                              |                                                    |
|------------------------|------------------------------|----------------------------------------------------|
| <b>No: 5574</b>        | <b>SupervisionID</b> 5574    | <b>Name</b> SafetySystemNacelle2OperationalErrorSx |
| <b>Log text</b>        | SafetyNac2 Operational Error |                                                    |
| <b>Subsystem name</b>  | SafetySystem                 |                                                    |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                               |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> PauseSlow                     |
| - Allowed attempts     | 3                            | - Max time disconnect 9 second                     |
| - Time window          | 1 hour                       | - Max time eliminate 10 second                     |
| - Stabilize period     | 60 second                    | <b>Category</b> Manufacturer                       |

**Criteria:**  
This alarm indicates that the safety node is not operational i.e. not up-and-running.

The alarm can be acknowledged.

This alarm indicates that the Nacelle2 safety node is not operational i.e. not up-and-running.

The alarm is reported if input **\*\*IO.SafetySystemNacelle2Operational\*\*** is false.

The alarm is automatically acknowledged when **\*\*IO.SafetySystemNacelle2Operational\*\*** is true.

|                        |                              |                                                    |              |
|------------------------|------------------------------|----------------------------------------------------|--------------|
| <b>No: 5575</b>        | <b>SupervisionID</b> 5575    | <b>Name</b> SafetySystemNacelle3OperationalErrorSx |              |
| <b>Log text</b>        | SafetyNac3 Operational Error |                                                    |              |
| <b>Subsystem name</b>  | SafetySystem                 |                                                    |              |
| <b>Type</b>            | Alarm                        | <b>Timeout</b>                                     | <n/a>        |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                               | PauseSlow    |
| - Allowed attempts     | 3                            | - Max time disconnect                              | 9 second     |
| - Time window          | 1 hour                       | - Max time eliminate                               | 10 second    |
| - Stabilize period     | 60 second                    | <b>Category</b>                                    | Manufacturer |

**Criteria:**

This alarm indicates that the safety node is not operational i.e. not up-and-running.

The alarm can be acknowledged.

This alarm indicates that the Nacelle3 safety node is not operational i.e. not up-and-running.

The alarm is reported if input **\*\*IO.SafetySystemNacelle3Operational\*\*** is false.

The alarm can be acknowledged when **\*\*IO.SafetySystemNacelle3Operational\*\*** is true.

|                        |                              |                                                |              |
|------------------------|------------------------------|------------------------------------------------|--------------|
| <b>No: 5576</b>        | <b>SupervisionID</b> 5576    | <b>Name</b> SafetySystemHub1OperationalErrorSx |              |
| <b>Log text</b>        | SafetyHub1 Operational Error |                                                |              |
| <b>Subsystem name</b>  | SafetySystem                 |                                                |              |
| <b>Type</b>            | Alarm                        | <b>Timeout</b>                                 | <n/a>        |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                           | PauseSlow    |
| - Allowed attempts     | 3                            | - Max time disconnect                          | 9 second     |
| - Time window          | 1 hour                       | - Max time eliminate                           | 10 second    |
| - Stabilize period     | 60 second                    | <b>Category</b>                                | Manufacturer |

**Criteria:**

This alarm indicates that the safety node is not operational i.e. not up-and-running.

The alarm can be acknowledged.

This alarm indicates that the Hub1 safety node is not operational i.e. not up-and-running.

The alarm is reported if input **\*\*IO.SafetySystemHub1Operational\*\*** is false.

The alarm can be acknowledged when **\*\*IO.SafetySystemHub1Operational\*\*** is true.

|                        |                              |                                                  |              |
|------------------------|------------------------------|--------------------------------------------------|--------------|
| <b>No: 5577</b>        | <b>SupervisionID</b> 5577    | <b>Name</b> SafetySystemTower1OperationalErrorSx |              |
| <b>Log text</b>        | SafetyTowl Operational Error |                                                  |              |
| <b>Subsystem name</b>  | SafetySystem                 |                                                  |              |
| <b>Type</b>            | Alarm                        | <b>Timeout</b>                                   | <n/a>        |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                             | PauseSlow    |
| - Allowed attempts     | 3                            | - Max time disconnect                            | 9 second     |
| - Time window          | 1 hour                       | - Max time eliminate                             | 10 second    |
| - Stabilize period     | 60 second                    | <b>Category</b>                                  | Manufacturer |

**Criteria:**

This alarm indicates that the safety node is not operational i.e. not up-and-running.

The alarm can be acknowledged.

This alarm indicates that the Tower1 safety node is not operational i.e. not up-and-running.

The alarm is reported if input **\*\*IO.SafetySystemTower1Operational\*\*** is false.

The alarm can be acknowledged when **\*\*IO.SafetySystemTower1Operational\*\*** is true.

|                        |                             |                                                      |              |
|------------------------|-----------------------------|------------------------------------------------------|--------------|
| <b>No: 5579</b>        | <b>SupervisionID</b> 5579   | <b>Name</b> SafetySystemTripHVButtonNacelleHwErrorSx |              |
| <b>Log text</b>        | TripHVButtonNacelle HwError |                                                      |              |
| <b>Subsystem name</b>  | SafetySystem                |                                                      |              |
| <b>Type</b>            | Alarm                       | <b>Timeout</b>                                       | <n/a>        |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b>                                 | StopSlow     |
| - Allowed attempts     | 3                           | - Max time disconnect                                | 3 second     |
| - Time window          | 1 hour                      | - Max time eliminate                                 | 9 second     |
| - Stabilize period     | 60 second                   | <b>Category</b>                                      | Manufacturer |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.SafetySystemTripHVButtonNacelleHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.SafetySystemTripHVButtonNacelleHwError\*\*** changes to false.



|                        |                           |                                                    |
|------------------------|---------------------------|----------------------------------------------------|
| <b>No: 5580</b>        | <b>SupervisionID</b> 5580 | <b>Name</b> SafetySystemTripHVButtonTowerHwErrorSx |
| <b>Log text</b>        | TripHVButtonTower HwError |                                                    |
| <b>Subsystem name</b>  | SafetySystem              |                                                    |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                               |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow                      |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second                     |
| - Time window          | 1 hour                    | - Max time eliminate 9 second                      |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                       |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.SafetySystemTripHVButtonTowerHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.SafetySystemTripHVButtonTowerHwError\*\*** changes to false.

|                        |                           |                                                |
|------------------------|---------------------------|------------------------------------------------|
| <b>No: 5628</b>        | <b>SupervisionID</b> 5628 | <b>Name</b> ControllerPowerDCNHub1RailAErrorSx |
| <b>Log text</b>        | CtrlPwr DCNHub1 RailA Err |                                                |
| <b>Subsystem name</b>  | ControllerPower           |                                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow                 |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second                 |
| - Time window          | 1 hour                    | - Max time eliminate 10 second                 |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                   |

**Criteria:**

This alarm is raised when an error is present on DCN Hub1 power rail A.

Alarm condition: **\*\*Turbine.ControllerPowerDCNHub1RailAError\*\*** is true.

If **\*\*Turbine.ControllerPowerDCNHub1RailAError\*\*** is false this alarm can be acknowledged after a manually inititated DCN power test

The DCN power test can be initiated through the operator panel.

|                        |                           |                                                |
|------------------------|---------------------------|------------------------------------------------|
| <b>No: 5629</b>        | <b>SupervisionID</b> 5629 | <b>Name</b> ControllerPowerDCNHub1RailBErrorSx |
| <b>Log text</b>        | CtrlPwr DCNHub1 RailB Err |                                                |
| <b>Subsystem name</b>  | ControllerPower           |                                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow                 |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second                 |
| - Time window          | 1 hour                    | - Max time eliminate 10 second                 |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                   |

**Criteria:**

This alarm is raised when an error is present on DCN Hub1 power rail B.

Alarm condition: **\*\*Turbine.ControllerPowerDCNHub1RailBError\*\*** is true.

If **\*\*Turbine.ControllerPowerDCNHub1RailBError\*\*** is false this alarm can be acknowledged after a manually inititated DCN power test

The DCN power test can be initiated through the operator panel.

|                        |                           |                                               |              |
|------------------------|---------------------------|-----------------------------------------------|--------------|
| <b>No: 5630</b>        | <b>SupervisionID</b> 5630 | <b>Name</b> ControllerPowerDCNHub1TestErrorSx |              |
| <b>Log text</b>        | CtrlPwr DCNHub1 Test Err  |                                               |              |
| <b>Subsystem name</b>  | ControllerPower           |                                               |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                                | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                          | PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect                         | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate                          | 10 second    |
| - Stabilize period     | 60 second                 | <b>Category</b>                               | Manufacturer |

**Criteria:**

This alarm is raised if a DCN power test has failed.

Alarm condition: During a DCN power test one of the following:

**\*\*Turbine.ControllerPowerDCNHub1RailAError\*\*** is true

**\*\*Turbine.ControllerPowerDCNHub1RailBError\*\*** is true

The DCN has rebooted

This alarm can be acknowledged when the latest DCN power test has been succesfull.

This requires both **\*\*Turbine.ControllerPowerDCNHub1RailAError\*\*** and

**\*\*Turbine.ControllerPowerDCNHub1RailBError\*\***

to be false.

|                        |                              |                                                 |              |
|------------------------|------------------------------|-------------------------------------------------|--------------|
| <b>No: 5631</b>        | <b>SupervisionID</b> 5631    | <b>Name</b> ControllerPowerDCNHub1TestMissingSx |              |
| <b>Log text</b>        | CtrlPwr DCNHub1 Test Missing |                                                 |              |
| <b>Subsystem name</b>  | ControllerPower              |                                                 |              |
| <b>Type</b>            | Alarm                        | <b>Timeout</b>                                  | <n/a>        |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                            | PauseSlow    |
| - Allowed attempts     | 3                            | - Max time disconnect                           | 9 second     |
| - Time window          | 1 hour                       | - Max time eliminate                            | 10 second    |
| - Stabilize period     | 60 second                    | <b>Category</b>                                 | Manufacturer |

**Criteria:**

This alarm is raised if the automatic DCN power tests have not been run regularly.

Alarm condition: **\*\*Turbine.ControllerPowerDCNHub1TestTimeExceeded\*\*** is true.

This alarm can be acknowledged when **\*\*Turbine.ControllerPowerDCNHub1TestTimeExceeded\*\*** is false meaning that automatic test are again performed regularly.

|                        |                               |                                  |              |
|------------------------|-------------------------------|----------------------------------|--------------|
| <b>No: 5684</b>        | <b>SupervisionID</b> 5684     | <b>Name</b> FastPauseActivatedSx |              |
| <b>Log text</b>        | Fast Pause Activated. Src: __ |                                  |              |
| <b>Subsystem name</b>  | PSC                           |                                  |              |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>                   | <n/a>        |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>             | Run          |
| - Allowed attempts     | Unlimited                     | - Max time disconnect            | 10000 second |
| - Time window          | <n/a>                         | - Max time eliminate             | 10000 second |
| - Stabilize period     | 30 second                     | <b>Category</b>                  | Utility      |

**Criteria:**

This supervision activates when Fast Pause is requested from the Power Plant Controller through the Road Runner interface

|                        |                           |                                        |
|------------------------|---------------------------|----------------------------------------|
| <b>No: 5694</b>        | <b>SupervisionID</b> 5694 | <b>Name</b> PreChargeEstimationErrorSx |
| <b>Log text</b>        | DCLinkPrechargeEstErr___v |                                        |
| <b>Subsystem name</b>  | CubePower                 |                                        |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow         |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second         |
| - Time window          | 1 hour                    | - Max time eliminate 10 second         |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer           |

**Criteria:**

This alarm is raised

|                        |                           |                                      |
|------------------------|---------------------------|--------------------------------------|
| <b>No: 5695</b>        | <b>SupervisionID</b> 5695 | <b>Name</b> BrakeApplyValve1FaultySx |
| <b>Log text</b>        | BrakeApplyValve1Faulty    |                                      |
| <b>Subsystem name</b>  | Brake                     |                                      |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                 |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow       |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second       |
| - Time window          | 1 hour                    | - Max time eliminate 10 second       |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer         |

**Criteria:**

The alarm is reported if the safety system detects a faulty brake apply valve 1

The alarm is reported when **\*\*IO.BrakeApplyValve1Faulty\*\*** is true

The alarm is automatically acknowledged when **\*\*IO.BrakeApplyValve1Faulty\*\*** is false

|                        |                           |                                      |
|------------------------|---------------------------|--------------------------------------|
| <b>No: 5696</b>        | <b>SupervisionID</b> 5696 | <b>Name</b> BrakeApplyValve2FaultySx |
| <b>Log text</b>        | BrakeApplyValve2Faulty    |                                      |
| <b>Subsystem name</b>  | Brake                     |                                      |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                 |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow       |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second       |
| - Time window          | 1 hour                    | - Max time eliminate 10 second       |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer         |

**Criteria:**

The alarm is reported if the safety system detects a faulty brake apply valve 2

The alarm is reported when **\*\*IO.BrakeApplyValve2Faulty\*\*** is true

The alarm is automatically acknowledged when **\*\*IO.BrakeApplyValve2Faulty\*\*** is false

|                        |                           |                                     |              |
|------------------------|---------------------------|-------------------------------------|--------------|
| <b>No: 5697</b>        | <b>SupervisionID</b> 5697 | <b>Name</b> BrakeDrainValveFaultySx |              |
| <b>Log text</b>        | BrakeDrainValveFaulty     |                                     |              |
| <b>Subsystem name</b>  | Brake                     |                                     |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                      | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                | PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect               | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate                | 10 second    |
| - Stabilize period     | 60 second                 | <b>Category</b>                     | Manufacturer |

**Criteria:**

The alarm is reported if the safety system detects a faulty brake drain valve

The alarm is reported when **\*\*IO.BrakeDrainValveFaulty\*\*** is true

The alarm is automatically acknowledged when **\*\*IO.BrakeDrainValveFaulty\*\*** is false

|                        |                               |                                                         |              |
|------------------------|-------------------------------|---------------------------------------------------------|--------------|
| <b>No: 5698</b>        | <b>SupervisionID</b> 5698     | <b>Name</b> FanMotorsSpaceHeaterPositiveFeedbackErrorSx |              |
| <b>Log text</b>        | BldAFanSpaceHeater pos fb err |                                                         |              |
| <b>Subsystem name</b>  | DeIcing                       |                                                         |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                          | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                    | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                                   | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                                    | <n/a>        |
| - Stabilize period     | 30 second                     | <b>Category</b>                                         | Manufacturer |

**Criteria:**

Supervision is reported if **\*\*IO.DeIcingBladeAFanMotorsSpaceHeaterContactorClosed\*\*** does not change to false within the time **\*\*FanMotorsSpaceHeaterFeedbackTime\*\*** after **\*\*IO.DeIcingBladeAFanMotorsSpaceHeaterOn\*\*** has changed from true to false.

|                        |                               |                                                         |              |
|------------------------|-------------------------------|---------------------------------------------------------|--------------|
| <b>No: 5699</b>        | <b>SupervisionID</b> 5699     | <b>Name</b> FanMotorsSpaceHeaterNegativeFeedbackErrorSx |              |
| <b>Log text</b>        | BldAFanSpaceHeater neg fb err |                                                         |              |
| <b>Subsystem name</b>  | DeIcing                       |                                                         |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                          | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                    | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                                   | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                                    | <n/a>        |
| - Stabilize period     | 30 second                     | <b>Category</b>                                         | Manufacturer |

**Criteria:**

Supervision is reported if **\*\*IO.DeIcingBladeAFanMotorsSpaceHeaterContactorClosed\*\*** does not change to true within the time **\*\*FanMotorsSpaceHeaterFeedbackTime\*\*** after **\*\*IO.DeIcingBladeAFanMotorsSpaceHeaterOn\*\*** has changed from false to true.

|                        |                            |                                           |
|------------------------|----------------------------|-------------------------------------------|
| <b>No: 5700</b>        | <b>SupervisionID</b> 5700  | <b>Name</b> ShortCircuitProtectionErrorSx |
| <b>Log text</b>        | BladeA short circuit error |                                           |
| <b>Subsystem name</b>  | DeIcing                    |                                           |
| <b>Type</b>            | Warning                    | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | 3                          | - Max time disconnect <n/a>               |
| - Time window          | 1 hour                     | - Max time eliminate <n/a>                |
| - Stabilize period     | 60 second                  | <b>Category</b> Manufacturer              |

**Criteria:**

Supervision is reported if the short circuit protection has tripped and the signal **\*\*IO.DeIcingBladeAShortCircuitProtectionOk\*\*** has been false in the time period **\*\*ShortCircuitProtectionStableTime\*\***.  
This blade signal will indicate protection status of fan, space heater and basic heaters. In case power has been tripped by the short circuit protection, it will require manual reset in the blade cabinet.  
Supervision can be acknowledged once the short circuit protection has been reset and the signal has been true in the time period **\*\*ShortCircuitProtectionStableTime\*\***.

|                        |                               |                                                         |
|------------------------|-------------------------------|---------------------------------------------------------|
| <b>No: 5701</b>        | <b>SupervisionID</b> 5701     | <b>Name</b> FanMotorsSpaceHeaterPositiveFeedbackErrorSx |
| <b>Log text</b>        | BldBFanSpaceHeater pos fb err |                                                         |
| <b>Subsystem name</b>  | DeIcing                       |                                                         |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                               |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                              |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                             |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>                              |
| - Stabilize period     | 30 second                     | <b>Category</b> Manufacturer                            |

**Criteria:**

Supervision is reported if **\*\*IO.DeIcingBladeBFanMotorsSpaceHeaterContactorClosed\*\*** does not change to false within the time **\*\*FanMotorsSpaceHeaterFeedbackTime\*\*** after **\*\*IO.DeIcingBladeBFanMotorsSpaceHeaterOn\*\*** has changed from true to false.

|                        |                               |                                                         |
|------------------------|-------------------------------|---------------------------------------------------------|
| <b>No: 5702</b>        | <b>SupervisionID</b> 5702     | <b>Name</b> FanMotorsSpaceHeaterNegativeFeedbackErrorSx |
| <b>Log text</b>        | BldBFanSpaceHeater neg fb err |                                                         |
| <b>Subsystem name</b>  | DeIcing                       |                                                         |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                               |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                              |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                             |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>                              |
| - Stabilize period     | 30 second                     | <b>Category</b> Manufacturer                            |

**Criteria:**

Supervision is reported if **\*\*IO.DeIcingBladeBFanMotorsSpaceHeaterContactorClosed\*\*** does not change to true within the time **\*\*FanMotorsSpaceHeaterFeedbackTime\*\*** after **\*\*IO.DeIcingBladeBFanMotorsSpaceHeaterOn\*\*** has changed from false to true.

|                        |                            |                                           |
|------------------------|----------------------------|-------------------------------------------|
| <b>No: 5703</b>        | <b>SupervisionID</b> 5703  | <b>Name</b> ShortCircuitProtectionErrorSx |
| <b>Log text</b>        | BladeB short circuit error |                                           |
| <b>Subsystem name</b>  | DeIcing                    |                                           |
| <b>Type</b>            | Warning                    | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | 3                          | - Max time disconnect <n/a>               |
| - Time window          | 1 hour                     | - Max time eliminate <n/a>                |
| - Stabilize period     | 60 second                  | <b>Category</b> Manufacturer              |

**Criteria:**

Supervision is reported if the short circuit protection has tripped and the signal **\*\*IO.DeIcingBladeBShortCircuitProtectionOk\*\*** has been false in the time period **\*\*ShortCircuitProtectionStableTime\*\***.  
This blade signal will indicate protection status of fan, space heater and basic heaters. In case power has been tripped by the short circuit protection, it will require manual reset in the blade cabinet.  
Supervision can be acknowledged once the short circuit protection has been reset and the signal has been true in the time period **\*\*ShortCircuitProtectionStableTime\*\***.

|                        |                               |                                                         |
|------------------------|-------------------------------|---------------------------------------------------------|
| <b>No: 5704</b>        | <b>SupervisionID</b> 5704     | <b>Name</b> FanMotorsSpaceHeaterPositiveFeedbackErrorSx |
| <b>Log text</b>        | BldCFanSpaceHeater pos fb err |                                                         |
| <b>Subsystem name</b>  | DeIcing                       |                                                         |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                               |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                              |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                             |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>                              |
| - Stabilize period     | 30 second                     | <b>Category</b> Manufacturer                            |

**Criteria:**

Supervision is reported if **\*\*IO.DeIcingBladeCFanMotorsSpaceHeaterContactorClosed\*\*** does not change to false within the time **\*\*FanMotorsSpaceHeaterFeedbackTime\*\*** after **\*\*IO.DeIcingBladeCFanMotorsSpaceHeaterOn\*\*** has changed from true to false.

|                        |                               |                                                         |
|------------------------|-------------------------------|---------------------------------------------------------|
| <b>No: 5705</b>        | <b>SupervisionID</b> 5705     | <b>Name</b> FanMotorsSpaceHeaterNegativeFeedbackErrorSx |
| <b>Log text</b>        | BldCFanSpaceHeater neg fb err |                                                         |
| <b>Subsystem name</b>  | DeIcing                       |                                                         |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                               |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                              |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                             |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>                              |
| - Stabilize period     | 30 second                     | <b>Category</b> Manufacturer                            |

**Criteria:**

Supervision is reported if **\*\*IO.DeIcingBladeCFanMotorsSpaceHeaterContactorClosed\*\*** does not change to true within the time **\*\*FanMotorsSpaceHeaterFeedbackTime\*\*** after **\*\*IO.DeIcingBladeCFanMotorsSpaceHeaterOn\*\*** has changed from false to true.

|                        |                            |                                           |
|------------------------|----------------------------|-------------------------------------------|
| <b>No: 5706</b>        | <b>SupervisionID</b> 5706  | <b>Name</b> ShortCircuitProtectionErrorSx |
| <b>Log text</b>        | BladeC short circuit error |                                           |
| <b>Subsystem name</b>  | DeIcing                    |                                           |
| <b>Type</b>            | Warning                    | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | 3                          | - Max time disconnect <n/a>               |
| - Time window          | 1 hour                     | - Max time eliminate <n/a>                |
| - Stabilize period     | 60 second                  | <b>Category</b> Manufacturer              |

**Criteria:**

Supervision is reported if the short circuit protection has tripped and the signal **\*\*IO.DeIcingBladeCShortCircuitProtectionOk\*\*** has been false in the time period **\*\*ShortCircuitProtectionStableTime\*\***.

This blade signal will indicate protection status of fan, space heater and basic heaters. In case power has been tripped by the short circuit protection, it will require manual reset in the blade cabinet.

Supervision can be acknowledged once the short circuit protection has been reset and the signal has been true in the time period **\*\*ShortCircuitProtectionStableTime\*\***.

|                        |                                |                                                          |
|------------------------|--------------------------------|----------------------------------------------------------|
| <b>No: 5707</b>        | <b>SupervisionID</b> 5707      | <b>Name</b> DeIcingMainContactorSecondaryFeedbackErrorSx |
| <b>Log text</b>        | DeIcing maincont.secondary err |                                                          |
| <b>Subsystem name</b>  | DeIcing                        |                                                          |
| <b>Type</b>            | Warning                        | <b>Timeout</b> <disabled>                                |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> <n/a>                               |
| - Allowed attempts     | 3                              | - Max time disconnect <n/a>                              |
| - Time window          | 1 hour                         | - Max time eliminate <n/a>                               |
| - Stabilize period     | 30 second                      | <b>Category</b> Manufacturer                             |

**Criteria:**

Supervision is reported when the main contactor secondary feedback not followed the connect request or disconnect request: The signals **IO.DeIcingControlSwitchClose** and **IO.DeIcingControlSwitchClosed** have different levels in the time period **\*\*MainContactorStableTime\*\***. I.e. the power to the De-icing system cannot be disconnected and this will trip the main power to the switch.

Supervision can be acknowledged when the Power Switch feedback is ok and the signals **IO.DeIcingControlSwitchClose** and **IO.DeIcingControlSwitchClosed** have the same levels in the time period **\*\*MainContactorStableTime\*\***.

|                        |                               |                                                        |
|------------------------|-------------------------------|--------------------------------------------------------|
| <b>No: 5708</b>        | <b>SupervisionID</b> 5708     | <b>Name</b> DeIcingMainContactorPrimaryFeedbackErrorSx |
| <b>Log text</b>        | DeIcing maincont. primary err |                                                        |
| <b>Subsystem name</b>  | DeIcing                       |                                                        |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                              |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                             |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                            |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>                             |
| - Stabilize period     | 30 second                     | <b>Category</b> Manufacturer                           |

**Criteria:**

Supervision is reported when the Power Switch cannot be closed: The signals **IO.DeIcingControlSwitchClose** and **IO.DeIcingControlSwitchClosed** have different levels in the time period **\*\*MainContactorStableTime\*\***.

Supervision can be acknowledged when the Power Switch feedback is ok and the signals **IO.DeIcingControlSwitchClose** and **IO.DeIcingControlSwitchClosed** have the same levels in the time period **\*\*MainContactorStableTime\*\***.

|                        |                             |                                           |
|------------------------|-----------------------------|-------------------------------------------|
| <b>No: 5709</b>        | <b>SupervisionID</b> 5709   | <b>Name</b> YawSensorCommunicationErrorSx |
| <b>Log text</b>        | YawSensorCommunicationError |                                           |
| <b>Subsystem name</b>  | YawPositionVariant3         |                                           |
| <b>Type</b>            | Warning                     | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | Unlimited                   | - Max time disconnect <n/a>               |
| - Time window          | <n/a>                       | - Max time eliminate <n/a>                |
| - Stabilize period     | 5 second                    | <b>Category</b> Manufacturer              |

**Criteria:**  
This warning indicates a communication error between the yaw sensor and the turbine control system.

The warning is active when the status for **\*\*IO.YawSensorPosition\*\*** is unavailable (==2).

The warning auto acknowledges when the status changes state.

|                        |                           |                                   |
|------------------------|---------------------------|-----------------------------------|
| <b>No: 5713</b>        | <b>SupervisionID</b> 5713 | <b>Name</b> HydraulicOilLeakageSx |
| <b>Log text</b>        | HydraulicOilLeakage       |                                   |
| <b>Subsystem name</b>  | HydraulicStation          |                                   |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>         |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> <n/a>        |
| - Allowed attempts     | <n/a>                     | - Max time disconnect <n/a>       |
| - Time window          | <n/a>                     | - Max time eliminate <n/a>        |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer      |

**Criteria:**  
The warning indicates that the Hydraulic Oil leakage flow is above a certain limit.  
  
The warning is raised when the hydrulic oil leakage is above value given by the paramter **\*\*HydraulicLeakageHigh\*\*** for more than time interval given by the parameter **\*\*HydraulicLeakageHighTime\*\***.

This hydraulic leakage is monitored when the hydraulic station is in normal operation (**\*\*HydrNormalOperation\*\***) and hydraulic pump(s) are not controlled manually (**\*\*HydrPumpsManaulCtrlActive\*\***).

The warning is manually acknowledged, if the Hydraulic Oil leakage flow is equal or below the parameter **\*\*HydraulicLeakageHigh\*\***.



|                        |                           |                                   |              |
|------------------------|---------------------------|-----------------------------------|--------------|
| <b>No: 5713</b>        | <b>SupervisionID</b> 5713 | <b>Name</b> HydraulicOilLeakageSx |              |
| <b>Log text</b>        | HydraulicOilLeakage       |                                   |              |
| <b>Subsystem name</b>  | HydraulicStation          |                                   |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                    | <disabled>   |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b>              | <n/a>        |
| - Allowed attempts     | <n/a>                     | - Max time disconnect             | <n/a>        |
| - Time window          | <n/a>                     | - Max time eliminate              | <n/a>        |
| - Stabilize period     | <n/a>                     | <b>Category</b>                   | Manufacturer |

**Criteria:**

The warning indicates that the Hydraulic Oil leakage flow is above a certain limit.

The warning is raised when the hydrulic oil leakage is above value given by the paramter **\*\*HydraulicLeakageHigh\*\*** for more than time interval given by the parameter **\*\*HydraulicLeakageHighTime\*\***.

This hydraulic leakage is monitored when the hydraulic station is in normal operation (**\*\*HydrNormalOperation\*\***) and hydraulic pump(s) are not controlled manually (**\*\*HydrPumpsManualCtrlActive\*\***).

The warning is manually acknowledged, if the Hydraulic Oil leakage flow is equal or below the parameter **\*\*HydraulicLeakageHigh\*\***.

|                        |                           |                                 |              |
|------------------------|---------------------------|---------------------------------|--------------|
| <b>No: 5714</b>        | <b>SupervisionID</b> 5714 | <b>Name</b> BrakeReleaseErrorSx |              |
| <b>Log text</b>        | Brake release error       |                                 |              |
| <b>Subsystem name</b>  | Brake                     |                                 |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                  | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>            | StopSlow     |
| - Allowed attempts     | 2                         | - Max time disconnect           | 3 second     |
| - Time window          | 1 hour                    | - Max time eliminate            | 9 second     |
| - Stabilize period     | 10 second                 | <b>Category</b>                 | Manufacturer |

**Criteria:**

This alarm is reported when the brake cannot be released

The alarm is reported when the brake has been ordered to be released, but it is detected that it is not released.

The brake is regarded as not released when it has not been released for **\*\*BrakeFeedbackErrorStableTime\*\***, or it has left the released state **\*\*BrakeReleasedToggleCount\*\*** times within the last **\*\*BrakeReleasedToggleCountTime\*\***.

The supervision is active when the brake has been ordered to be released for **\*\*BrakeReleasePressStableTime\*\***.

The alarm can be acknowledged when the brake is released and has left the the released state less than **\*\*BrakeReleasedToggleCount\*\*** within the last **\*\*BrakeReleasedToggleCountTime\*\***

|                        |                           |                               |              |
|------------------------|---------------------------|-------------------------------|--------------|
| <b>No: 5715</b>        | <b>SupervisionID</b> 5715 | <b>Name</b> BrakeApplyErrorSx |              |
| <b>Log text</b>        | Brake apply error         |                               |              |
| <b>Subsystem name</b>  | Brake                     |                               |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>          | <n/a>        |
| - Allowed attempts     | 2                         | - Max time disconnect         | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate          | <n/a>        |
| - Stabilize period     | 10 second                 | <b>Category</b>               | Manufacturer |

**Criteria:**

This alarm is reported when the brake cannot be applied

The alarm is reported when the brake has been ordered to be applied, but it is detected that it is not applied.

The brake is regarded as not applied when it has not been applied for **\*\*BrakeFeedbackErrorStableTime\*\***, or it has left the applied state **\*\*BrakeAppliedToggleCount\*\*** times within the last **\*\*BrakeAppliedToggleCountTime\*\***.

The supervision is active when the brake has been ordered to be applied for **\*\*BrakeApplyPressStableTime\*\***.

The alarm can be acknowledged when the brake is applied and has left the the applied state less than **\*\*BrakeAppliedToggleCount\*\*** within the last **\*\*BrakeAppliedToggleCountTime\*\***

|                        |                           |                                             |              |
|------------------------|---------------------------|---------------------------------------------|--------------|
| <b>No: 5735</b>        | <b>SupervisionID</b> 5735 | <b>Name</b> PowerSupplyTowerDCSupplyErrorSx |              |
| <b>Log text</b>        | Tower/SwG DC supply error |                                             |              |
| <b>Subsystem name</b>  | PowerSupply               |                                             |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                              | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                        | PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect                       | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate                        | 10 second    |
| - Stabilize period     | 60 second                 | <b>Category</b>                             | Manufacturer |

**Criteria:**

This alarm indicates that the DC supply to tower or switch gear is not working correctly.

This alarm is raised if the signal **\*\*IO.PowerSupplyTowerDC10k\*\*** remains false (0), for **\*\*PowerSupplyTowerDCSupplyStableTime\*\***.

This alarm can be acknowledged when the signal **\*\*IO.PowerSupplyTowerDC10k\*\*** has remained true (1) for **\*\*PowerSupplyTowerDCSupplyStableTime\*\***.

|                        |                             |                                    |
|------------------------|-----------------------------|------------------------------------|
| <b>No: 5746</b>        | <b>SupervisionID</b> 5746   | <b>Name</b> ExtrExtrExtrHighVoltSx |
| <b>Log text</b>        | ExtExt High Volt L_: ____ V |                                    |
| <b>Subsystem name</b>  | CubePower                   |                                    |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>               |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> StopSlow      |
| - Allowed attempts     | 3                           | - Max time disconnect 3 second     |
| - Time window          | 1 hour                      | - Max time eliminate 9 second      |
| - Stabilize period     | 60 second                   | <b>Category</b> Utility            |

**Criteria:**

The grid voltage has exceeded certain grid voltage limits.

Alarm condition: One of the grid voltage **\*\*VoltagePhase1\*\***, **\*\*VoltagePhase2\*\*** or **\*\*VoltagePhase3\*\*** exceed the limit given by (**\*\*NominalVoltage\*\*** x (1 + **\*\*ExtrExtrExtrHighVoltLim\*\*** )) and still exceed the limit given by (**\*\*NominalVoltage\*\*** x (1 + **\*\*ExtrExtrExtrHighVoltHyst\*\***)) after the time given by **\*\*ExtrExtrExtrHighVoltTime\*\*** has passed.  
The supervision use signals with a higher sample rate then **\*\*VoltagePhase1\*\***, **\*\*VoltagePhase2\*\*** and **\*\*VoltagePhase3\*\***. The supervision will therefor be able to be raised even though the signals seems ok.

Par1= Phase number (1,2 or 3)

Par2= Phase Voltage RMS [Volt]

|                        |                             |                                           |
|------------------------|-----------------------------|-------------------------------------------|
| <b>No: 5799</b>        | <b>SupervisionID</b> 5799   | <b>Name</b> ConverterEstAirHumidityHighSx |
| <b>Log text</b>        | ConverterEstAirHumidityHigh |                                           |
| <b>Subsystem name</b>  | CubePower                   |                                           |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                      |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> StopSlow             |
| - Allowed attempts     | 3                           | - Max time disconnect 3 second            |
| - Time window          | 1 hour                      | - Max time eliminate 9 second             |
| - Stabilize period     | 10 minute                   | <b>Category</b> Manufacturer              |

**Criteria:**

This alarm is raised if the estimated air humidity of the converter controller cabinet exceeds the max. operation limit (**\*\*AirHumidityHighLimit\*\***).  
The alarm is cleared again when the estimated air humidity of the converter controller cabinet has fallen below limit (**\*\*AirHumidityLowLimit\*\***)

|                        |                           |                                                  |
|------------------------|---------------------------|--------------------------------------------------|
| <b>No: 5801</b>        | <b>SupervisionID</b> 5801 | <b>Name</b> BladeLoadHardwareChangeSupervisionSx |
| <b>Log text</b>        | BladeLoadHardwareChange   |                                                  |
| <b>Subsystem name</b>  | BladeLoadSensing          |                                                  |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                        |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> <n/a>                       |
| - Allowed attempts     | <n/a>                     | - Max time disconnect <n/a>                      |
| - Time window          | <n/a>                     | - Max time eliminate <n/a>                       |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer                     |

**Criteria:**

This warning indicates that a blade load sensor has been replaced based upon the serial number. This warning can be Enabled/Disabled by setting parameter HardwareChangeSupervisionEnabled.

- The detection can be enabled/disabled by setting parameter Pos1DetectHardwareChangeEnabled
- Log "5024 BladeLoadHardwareChangeDetected" will provide more information.

When a warning is reported:

1. The calibration will be automatically cleared for the affected sensor.
2. A new calibration must be executed either from the test menu or by the automatic scheduler.

|                        |                                |                                          |
|------------------------|--------------------------------|------------------------------------------|
| <b>No: 5802</b>        | <b>SupervisionID</b> 5802      | <b>Name</b> LightningSensorErrorBladeASx |
| <b>Log text</b>        | Lightning det. BldA sensor err |                                          |
| <b>Subsystem name</b>  | LightningDetector              |                                          |
| <b>Type</b>            | Warning                        | <b>Timeout</b> <disabled>                |
| <b>Acknowledgement</b> | Remote                         | <b>Shutdown type</b> <n/a>               |
| - Allowed attempts     | <n/a>                          | - Max time disconnect <n/a>              |
| - Time window          | <n/a>                          | - Max time eliminate <n/a>               |
| - Stabilize period     | <n/a>                          | <b>Category</b> Manufacturer             |

**Criteria:**

This warning is raised if an error is detected on the lightning detector sensor at blade A.

|                        |                                |                                          |
|------------------------|--------------------------------|------------------------------------------|
| <b>No: 5803</b>        | <b>SupervisionID</b> 5803      | <b>Name</b> LightningSensorErrorBladeBSx |
| <b>Log text</b>        | Lightning det. BldB sensor err |                                          |
| <b>Subsystem name</b>  | LightningDetector              |                                          |
| <b>Type</b>            | Warning                        | <b>Timeout</b> <disabled>                |
| <b>Acknowledgement</b> | Remote                         | <b>Shutdown type</b> <n/a>               |
| - Allowed attempts     | <n/a>                          | - Max time disconnect <n/a>              |
| - Time window          | <n/a>                          | - Max time eliminate <n/a>               |
| - Stabilize period     | <n/a>                          | <b>Category</b> Manufacturer             |

**Criteria:**

This warning is raised if an error is detected on the lightning detector sensor at blade B.

**No: 5804**                      **SupervisionID** 5804                      **Name** LightningSensorErrorBladeCSx  
**Log text**                      Lightning det. BldC sensor err  
**Subsystem name**              LightningDetector  
**Type**                          Warning                      **Timeout**                      <disabled>  
**Acknowledgement**              Remote                      **Shutdown type**              <n/a>  
- **Allowed attempts**              <n/a>                      - **Max time disconnect**              <n/a>  
- **Time window**                      <n/a>                      - **Max time eliminate**              <n/a>  
- **Stabilize period**              <n/a>                      **Category**                      Manufacturer  
**Criteria:**  
This warning is raised if an error is detected on the lightning detector sensor at blade C.

**No: 5805**                      **SupervisionID** 5805                      **Name** LightningDetectorSystemErrorSx  
**Log text**                      Lightning det. system error  
**Subsystem name**              LightningDetector  
**Type**                          Warning                      **Timeout**                      <disabled>  
**Acknowledgement**              Auto                      **Shutdown type**              <n/a>  
- **Allowed attempts**              3                      - **Max time disconnect**              <n/a>  
- **Time window**                      1 hour                      - **Max time eliminate**              <n/a>  
- **Stabilize period**              60 second                      **Category**                      Manufacturer  
**Criteria:**  
This warning is raised when an error is detected in the lightning detection system

**No: 5806**                      **SupervisionID** 5806                      **Name** LightningDetectorCommunicationErrorSx  
**Log text**                      Lightning det. comm. error  
**Subsystem name**              LightningDetector  
**Type**                          Warning                      **Timeout**                      <disabled>  
**Acknowledgement**              Auto                      **Shutdown type**              <n/a>  
- **Allowed attempts**              3                      - **Max time disconnect**              <n/a>  
- **Time window**                      1 hour                      - **Max time eliminate**              <n/a>  
- **Stabilize period**              60 second                      **Category**                      Manufacturer  
**Criteria:**  
This warning is raised when a communication error is detected

**No: 5931**                      **SupervisionID** 5931                      **Name** CabinetConverterDCVoltageFailureSx  
**Log text**                      Cabinet conv. DC voltage fail  
**Subsystem name**              TurbineCabinets  
**Type**                          Alarm                      **Timeout**                      <n/a>  
**Acknowledgement**              Auto                      **Shutdown type**              PauseSlow  
- **Allowed attempts**              4                      - **Max time disconnect**              9 second  
- **Time window**                      1 hour                      - **Max time eliminate**              10 second  
- **Stabilize period**              60 second                      **Category**                      Manufacturer  
**Criteria:**  
This alarm indicates that the converter DC power supply failure.

The alarm is reported when the signal **\*\*IO.ConverterPowerSupply10k\*\*** or **\*\*IO.ConverterPowerSupply20k\*\*** is false for more than stable time ( **\*\*CabinetConverterDCPowerSupplyStableTime\*\*** ).

The alarm is auto acknowledged when both signals are true for more than stable time ( **\*\*CabinetConverterDCPowerSupplyStableTime\*\*** ).

|                        |                              |                                         |
|------------------------|------------------------------|-----------------------------------------|
| <b>No: 5936</b>        | <b>SupervisionID</b> 5936    | <b>Name</b> GeneratorSpeedHighReverseSx |
| <b>Log text</b>        | GenSpdHighReverse: _____ RPM |                                         |
| <b>Subsystem name</b>  | SV                           |                                         |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow           |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second          |
| - Time window          | 1 hour                       | - Max time eliminate 9 second           |
| - Stabilize period     | 60 second                    | <b>Category</b> Manufacturer            |

**Criteria:**

This supervision monitors **\*\*GeneratorTachoSpeed\*\*** (measured on the high speed side) and reacts when it exceeds a negative speed limit defined as a ratio of nominal speed.

An alarm is issued if following conditions are met:

1. **\*\*SV\\_GenSpdHighReverse\\_ActivityLevel\*\*** = 2
2. **\*\*GeneratorTachoSpeed\*\*** is below **\*\*SV\\_GenSpdHighReverse\\_LimitRatio\*\*** times nominal speed for **\*\*SV\\_GenSpdHighReverse\\_HighHystTime\*\*** seconds

|                        |                                 |                                     |
|------------------------|---------------------------------|-------------------------------------|
| <b>No: 5937</b>        | <b>SupervisionID</b> 5937       | <b>Name</b> DcLinkCupper_HighTempSx |
| <b>Log text</b>        | DcLinkCupper_HighTemp: _____ °C |                                     |
| <b>Subsystem name</b>  | CubePower                       |                                     |
| <b>Type</b>            | Alarm                           | <b>Timeout</b> <n/a>                |
| <b>Acknowledgement</b> | Auto                            | <b>Shutdown type</b> StopSlow       |
| - Allowed attempts     | 3                               | - Max time disconnect 3 second      |
| - Time window          | 1 hour                          | - Max time eliminate 9 second       |
| - Stabilize period     | 10 minute                       | <b>Category</b> Manufacturer        |

**Criteria:**

This alarm is raised if DcLinkCupper of the Converter is above the upper temperature limit (**\*\*DcLinkCu\\_HighTemp\\_Limit\*\***).

Par1 : Actual DcLinkCupper temperature [celsius]

Par2 : N/A

|                        |                                 |                                     |
|------------------------|---------------------------------|-------------------------------------|
| <b>No: 5938</b>        | <b>SupervisionID</b> 5938       | <b>Name</b> ExtAirOutlet_HighTempSx |
| <b>Log text</b>        | ExtAirOutlet_HighTemp: _____ °C |                                     |
| <b>Subsystem name</b>  | CubePower                       |                                     |
| <b>Type</b>            | Alarm                           | <b>Timeout</b> <n/a>                |
| <b>Acknowledgement</b> | Auto                            | <b>Shutdown type</b> StopSlow       |
| - Allowed attempts     | 3                               | - Max time disconnect 3 second      |
| - Time window          | 1 hour                          | - Max time eliminate 9 second       |
| - Stabilize period     | 10 minute                       | <b>Category</b> Manufacturer        |

**Criteria:**

This alarm is raised if ExtAirOutlet of the Converter is above the upper temperature limit (**\*\*ExtAirOutlet\\_HighTemp\\_Limit\*\***).

Par1 : Actual ExtAirOutlet temperature [celsius]

Par2 : N/A

|                        |                           |                                  |
|------------------------|---------------------------|----------------------------------|
| <b>No: 5939</b>        | <b>SupervisionID</b> 5939 | <b>Name</b> WindSensor1FailureSx |
| <b>Log text</b>        | WindSensor1 Failure       |                                  |
| <b>Subsystem name</b>  | WIS                       |                                  |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>       |
| - Allowed attempts     | 2                         | - Max time disconnect <n/a>      |
| - Time window          | 7 day                     | - Max time eliminate <n/a>       |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer     |

**Criteria:**

The purpose of this warning is to tell when there is something wrong with wind sensor 1.

If the status from the wind sensor has been unavailable for **\*\*StatusInvalidDelay\*\*** seconds or if the signals **\*\*IO.WindMeasurementWS1RawWindDirRel\*\*** or **\*\*IO.WindMeasurementWS1RawWindSpeed\*\*** have been frozen for **\*\*SDSD\\_DetectDelay\*\*** seconds this warning is raised.

The warning is cleared if status has been valid again for **\*\*SDSD\\_UnDetectDelay\*\*** seconds or signal has been alive again for **\*\*StatusValidDelay\*\*** seconds.  
However this normally requires as service visit for inspection of the wind sensor.

|                        |                           |                                  |
|------------------------|---------------------------|----------------------------------|
| <b>No: 5940</b>        | <b>SupervisionID</b> 5940 | <b>Name</b> WindSensor2FailureSx |
| <b>Log text</b>        | WindSensor2 Failure       |                                  |
| <b>Subsystem name</b>  | WIS                       |                                  |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>       |
| - Allowed attempts     | 2                         | - Max time disconnect <n/a>      |
| - Time window          | 7 day                     | - Max time eliminate <n/a>       |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer     |

**Criteria:**

The purpose of this warning is to tell when there is something wrong with wind sensor 2.

If the status from the wind sensor has been unavailable for **\*\*StatusInvalidDelay\*\*** seconds or if the signals **\*\*IO.WindMeasurementWS2RawWindDirRel\*\*** or **\*\*IO.WindMeasurementWS2RawWindSpeed\*\*** have been frozen for **\*\*SDSD\\_DetectDelay\*\*** seconds this warning is raised.

The warning is cleared if status has been valid again for **\*\*SDSD\\_UnDetectDelay\*\*** seconds or signal has been alive again for **\*\*StatusValidDelay\*\*** seconds.  
However this normally requires as service visit for inspection of the wind sensor.

|                        |                              |                                       |
|------------------------|------------------------------|---------------------------------------|
| <b>No: 5941</b>        | <b>SupervisionID</b> 5941    | <b>Name</b> SwitchgearVDSLowVoltageSx |
| <b>Log text</b>        | Swg VDS Low voltage detected |                                       |
| <b>Subsystem name</b>  | SwitchGear                   |                                       |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>             |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>            |
| - Allowed attempts     | Unlimited                    | - Max time disconnect <n/a>           |
| - Time window          | <n/a>                        | - Max time eliminate <n/a>            |
| - Stabilize period     | 0 second                     | <b>Category</b> Manufacturer          |

**Criteria:**

Switchgear Voltage Detection System (VDS) Low voltage detected  
This warning is reported if the **IO.In\_RtoP\_MCP\_VDSGridVoltageIsZero** is true and **IO.In\_RtoP\_MCP\_VDSGridVoltageDiffersFromZero** is false.  
The warning can be acknowledged if **IO.In\_RtoP\_MCP\_VDSGridVoltageIsZero** is false or **IO.In\_RtoP\_MCP\_VDSGridVoltageDiffersFromZero** is true.

|                        |                           |                                            |
|------------------------|---------------------------|--------------------------------------------|
| <b>No: 5942</b>        | <b>SupervisionID</b> 5942 | <b>Name</b> SwitchgearVDSHighAsymVoltageSx |
| <b>Log text</b>        | Swg VDS or HV fault       |                                            |
| <b>Subsystem name</b>  | SwitchGear                |                                            |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                  |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>                 |
| - Allowed attempts     | Unlimited                 | - Max time disconnect <n/a>                |
| - Time window          | <n/a>                     | - Max time eliminate <n/a>                 |
| - Stabilize period     | 0 second                  | <b>Category</b> Manufacturer               |

**Criteria:**

Switchgear Voltage Detection System (VDS) High voltage or asymmetry detected  
This warning is reported if the IO.In\_RtoP\_MCP\_VDSGridVoltageIsZero is true and IO.In\_RtoP\_MCP\_VDSGridVoltageDiffersFromZero is true.  
The warning can be acknowledged if IO.In\_RtoP\_MCP\_VDSGridVoltageIsZero is false or IO.In\_RtoP\_MCP\_VDSGridVoltageDiffersFromZero is fasle.

|                        |                           |                                  |
|------------------------|---------------------------|----------------------------------|
| <b>No: 5943</b>        | <b>SupervisionID</b> 5943 | <b>Name</b> SwitchgearVDSFaultSx |
| <b>Log text</b>        | Swg VDS fault             |                                  |
| <b>Subsystem name</b>  | SwitchGear                |                                  |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>       |
| - Allowed attempts     | Unlimited                 | - Max time disconnect <n/a>      |
| - Time window          | <n/a>                     | - Max time eliminate <n/a>       |
| - Stabilize period     | 0 second                  | <b>Category</b> Manufacturer     |

**Criteria:**

Switchgear Voltage Detection System (VDS) fault  
This warning is reported if the IO.In\_RtoP\_MCP\_VDSGridVoltageIsZero is false and IO.In\_RtoP\_MCP\_VDSGridVoltageDiffersFromZero is false.  
The warning can be acknowledged if IO.In\_RtoP\_MCP\_VDSGridVoltageIsZero is true or IO.In\_RtoP\_MCP\_VDSGridVoltageDiffersFromZero is true.

|                        |                           |                              |
|------------------------|---------------------------|------------------------------|
| <b>No: 5944</b>        | <b>SupervisionID</b> 5944 | <b>Name</b> SwitchgearOpenSx |
| <b>Log text</b>        | Switchgear is open        |                              |
| <b>Subsystem name</b>  | SwitchGear                |                              |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>    |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>   |
| - Allowed attempts     | Unlimited                 | - Max time disconnect <n/a>  |
| - Time window          | <n/a>                     | - Max time eliminate <n/a>   |
| - Stabilize period     | 0 second                  | <b>Category</b> Manufacturer |

**Criteria:**

Switchgear is still open at unknown trip reason.  
Switchgear is still open after the supervision has been acknowledged when trip reason in unknown.  
The warning auto acknowledge if \*\*IO.SwitchgearHVCBClosed\*\* is true.



|                        |                               |                                           |
|------------------------|-------------------------------|-------------------------------------------|
| <b>No: 5945</b>        | <b>SupervisionID</b> 5945     | <b>Name</b> SwitchgearOpenVDSLowVoltageSx |
| <b>Log text</b>        | Swg open due to voltage fault |                                           |
| <b>Subsystem name</b>  | SwitchGear                    |                                           |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | Unlimited                     | - Max time disconnect <n/a>               |
| - Time window          | <n/a>                         | - Max time eliminate <n/a>                |
| - Stabilize period     | 0 second                      | <b>Category</b> Manufacturer              |

**Criteria:**

Switchgear open due to voltage fault.

This warning is reported if Switchgear open due to low Voltage.

The warning auto acknowledge if **\*\*IO.SwitchgearHVCBClosed\*\*** is false and Voltage is normal.

|                        |                                |                                                  |
|------------------------|--------------------------------|--------------------------------------------------|
| <b>No: 5946</b>        | <b>SupervisionID</b> 5946      | <b>Name</b> SwitchgearOpenPendantOpenActivatedSx |
| <b>Log text</b>        | Swg opened manually by pendant |                                                  |
| <b>Subsystem name</b>  | SwitchGear                     |                                                  |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                             |
| <b>Acknowledgement</b> | Remote                         | <b>Shutdown type</b> StopSlow                    |
| - Allowed attempts     | <n/a>                          | - Max time disconnect 3 second                   |
| - Time window          | <n/a>                          | - Max time eliminate 9 second                    |
| - Stabilize period     | <n/a>                          | <b>Category</b> Manufacturer                     |

**Criteria:**

Switchgear opened manually by pendant.

Supervision is reported when switchgear is opened by the pendant control.

The alarm can be acknowledged if **\*\*IO.SwitchgearHVCBClosed\*\*** is true.

|                        |                                |                                                   |
|------------------------|--------------------------------|---------------------------------------------------|
| <b>No: 5947</b>        | <b>SupervisionID</b> 5947      | <b>Name</b> ConverterGridCBsSafetyFeedbackErrorSx |
| <b>Log text</b>        | Conv. grid CBs safety FB error |                                                   |
| <b>Subsystem name</b>  | ConverterContactors            |                                                   |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                              |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> StopSlow                     |
| - Allowed attempts     | 3                              | - Max time disconnect 3 second                    |
| - Time window          | 1 hour                         | - Max time eliminate 9 second                     |
| - Stabilize period     | 0 second                       | <b>Category</b> Manufacturer                      |

**Criteria:**

The alarm is raised when there is a feedback error on the converter grid circuit breaker.

The alarm is raised when **\*\*IO.SafetySystemConverterGridCBsFeedbackError\*\*** is true.

The alarm is automatically acknowledged when there is no feedback error  
(**\*\*IO.SafetySystemConverterGridCBsFeedbackError\*\*** = false).

|                        |                            |                                          |
|------------------------|----------------------------|------------------------------------------|
| <b>No: 5948</b>        | <b>SupervisionID</b> 5948  | <b>Name</b> BrakeDrainingDurationErrorSx |
| <b>Log text</b>        | BrakeDrainingDurationError |                                          |
| <b>Subsystem name</b>  | Brake                      |                                          |
| <b>Type</b>            | Alarm                      | <b>Timeout</b> <n/a>                     |
| <b>Acknowledgement</b> | Remote                     | <b>Shutdown type</b> StopSlow            |
| - Allowed attempts     | <n/a>                      | - Max time disconnect 3 second           |
| - Time window          | <n/a>                      | - Max time eliminate 9 second            |
| - Stabilize period     | <n/a>                      | <b>Category</b> Manufacturer             |

**Criteria:**

This alarm is raised if the brake accumulator draining is active for too long time.

The alarm is raised if the brake accumulator draining is active for time longer than parameter **\*\*BrakeAccDrainingMaxTime\*\***.

The alarm can be acknowledged when brake accumulator draining is not active.

|                        |                             |                                        |
|------------------------|-----------------------------|----------------------------------------|
| <b>No: 5949</b>        | <b>SupervisionID</b> 5949   | <b>Name</b> BrakeAccDrainingTooOftenSx |
| <b>Log text</b>        | BrakeAccDrainingTooOfte:___ |                                        |
| <b>Subsystem name</b>  | Brake                       |                                        |
| <b>Type</b>            | Warning                     | <b>Timeout</b> <disabled>              |
| <b>Acknowledgement</b> | Remote                      | <b>Shutdown type</b> <n/a>             |
| - Allowed attempts     | <n/a>                       | - Max time disconnect <n/a>            |
| - Time window          | <n/a>                       | - Max time eliminate <n/a>             |
| - Stabilize period     | <n/a>                       | <b>Category</b> Manufacturer           |

**Criteria:**

The warning indicates that brake accumulator is drained too often.

The warning is reported if the number of brake accumulator draining is above the parameter **\*\*BrakeAccDrainingMaxCount\*\***, during the time interval given by the parameter **\*\*BrakeAccDrainingMaxActivationTime\*\***.

The warning can be acknowledged when the number of activation goes below the limit.

|                        |                           |                                |
|------------------------|---------------------------|--------------------------------|
| <b>No: 5950</b>        | <b>SupervisionID</b> 5950 | <b>Name</b> AGOStateTimeOutSx  |
| <b>Log text</b>        | AGOStateTimeOut           |                                |
| <b>Subsystem name</b>  | ProdCtrl                  |                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseFast |
| - Allowed attempts     | 3                         | - Max time disconnect 8 second |
| - Time window          | 1 hour                    | - Max time eliminate 1 hour    |
| - Stabilize period     | 1 minute                  | <b>Category</b> Manufacturer   |

**Criteria:**

This alarm is reported if any of the AGO state times out.

An alarm is reported if following conditions are met:

1. AGOv1\_TimeOut\_ActivityLevel = 2
2. TimeInState of any AGO state is greater than equal to AGOv1\_TimeOut

**No: 5951**                      **SupervisionID** 5951              **Name** DeIcingSafetySwVersionErrorSx  
**Log text**                      DeIcing safety swversion error  
**Subsystem name**              DeIcing  
**Type**                          Warning                      **Timeout**                      <disabled>  
**Acknowledgement**              Auto                      **Shutdown type**              <n/a>  
- **Allowed attempts**              Unlimited                  - **Max time disconnect**              <n/a>  
- **Time window**                  <n/a>                      - **Max time eliminate**              <n/a>  
- **Stabilize period**              0 second                  **Category**                      Manufacturer  
**Criteria:**  
Supervision is reported when **\*\*DeIcingSafetySwVersionSupervisionEnabled\*\*** is enabled and **\*\*IO.DeIcingSafetySwVersion\*\*** doesn't match parameter **\*\*DeIcingExpectedSafetySwVersion\*\***  
  
Supervision can be acknowledged when the **\*\*IO.DeIcingSafetySwVersion\*\*** matches **\*\*DeIcingExpectedSafetySwVersion\*\***

**No: 5954**                      **SupervisionID** 5954              **Name** SmokeDetectorCommunicationErrorSx  
**Log text**                      SmokeDetector Com. Error  
**Subsystem name**              SmokeDetector  
**Type**                          Warning                      **Timeout**                      48 hour  
**Acknowledgement**              Auto                      **Shutdown type**              PauseSlow  
- **Allowed attempts**              5                          - **Max time disconnect**              9 second  
- **Time window**                  1 hour                      - **Max time eliminate**              10 second  
- **Stabilize period**              10 second                  **Category**                      Manufacturer  
**Criteria:**  
This warning indicates an error in the Smoke Detector System.

This warning indicates a communication error in the smoke detection system.

This warning is raised if ASDCommunicationErrorReportSupervision is true (OBS: Add signal) or that the ASDCommunicationErrorReportSupervision signal status is not valid for **\*\*ASDCommunicationErrorStableTime\*\***.

This warning is auto acknowledged if no communication error is detected on the smoke detection system (ASDCommunicationErrorReportSupervision is false (OBS: Add signal) and the ASDCommunicationErrorReportSupervision (OBS: Add signal) signal status is valid).

**No: 5963**                      **SupervisionID** 5963              **Name** DiagnosticsAvailableSx  
**Log text**                      Diagnostics Available  
**Subsystem name**              DiagnosticsApp  
**Type**                          Warning                      **Timeout**                      <disabled>  
**Acknowledgement**              Remote                      **Shutdown type**              <n/a>  
- **Allowed attempts**              <n/a>                      - **Max time disconnect**              <n/a>  
- **Time window**                  <n/a>                      - **Max time eliminate**              <n/a>  
- **Stabilize period**              <n/a>                      **Category**                      Manufacturer  
**Criteria:**

This warning is raised when new Diagnostics Information generated by the CCI Diagnostics system is available.

Precondition: New information was detected by the CCI Diagnostics service.

The Diagnostics are useful for detecting non critical faults, which might evolve into real supervisions or hardware errors.

It is recommended to review the diagnostics information, as this information might be able to pinpoint faulty hardware devices or connections that can be replaced or repaired.

|                        |                                |                                                  |
|------------------------|--------------------------------|--------------------------------------------------|
| <b>No: 5964</b>        | <b>SupervisionID</b> 5964      | <b>Name</b> Harmonicfilter_HighEstimatedEnergySx |
| <b>Log text</b>        | High Energy in Harm Filt ____J |                                                  |
| <b>Subsystem name</b>  | CubePower                      |                                                  |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                             |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> StopFast                    |
| - Allowed attempts     | 3                              | - Max time disconnect 0.9 second                 |
| - Time window          | 1 hour                         | - Max time eliminate 1 hour                      |
| - Stabilize period     | 10 minute                      | <b>Category</b> Manufacturer                     |

**Criteria:**

This alarm is set if the estimated energy dispersed in Harmonic filter is too high

Par1: Energy in harmonic filter [Joule]

Par2: Eestimated energy level

|                        |                           |                                          |
|------------------------|---------------------------|------------------------------------------|
| <b>No: 5973</b>        | <b>SupervisionID</b> 5973 | <b>Name</b> PitchOscillationHighBladeASx |
| <b>Log text</b>        | Pitch Osc High in Blade A |                                          |
| <b>Subsystem name</b>  | PiSP                      |                                          |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                     |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow            |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second           |
| - Time window          | 1 hour                    | - Max time eliminate 9 second            |
| - Stabilize period     | 1 minute                  | <b>Category</b> Manufacturer             |

**Criteria:**

This supervision monitors the pitch oscillations in blade A

An alarm is reported if follwing conditions are met continously for

**\*\*PiSP\\_PitchOscillationHigh\\_ErrTime\*\*** sec:

1. **\*\*PiSP\\_PitchOscillationHigh\\_ActivityLevel\*\*** = 2
2. **\*\*PiSP\\_PitchOscillationHigh\\_ErrLimit\*\*** is exceeded

|                        |                           |                                          |
|------------------------|---------------------------|------------------------------------------|
| <b>No: 5974</b>        | <b>SupervisionID</b> 5974 | <b>Name</b> PitchOscillationHighBladeBSx |
| <b>Log text</b>        | Pitch Osc High in Blade B |                                          |
| <b>Subsystem name</b>  | PiSP                      |                                          |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                     |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow            |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second           |
| - Time window          | 1 hour                    | - Max time eliminate 9 second            |
| - Stabilize period     | 1 minute                  | <b>Category</b> Manufacturer             |

**Criteria:**

This supervision monitors the pitch oscillations in blade B

An alarm is reported if follwing conditions are met continously for

**\*\*PiSP\\_PitchOscillationHigh\\_ErrTime\*\*** sec:

1. **\*\*PiSP\\_PitchOscillationHigh\\_ActivityLevel\*\*** = 2
2. **\*\*PiSP\\_PitchOscillationHigh\\_ErrLimit\*\*** is exceeded

|                        |                           |                                          |
|------------------------|---------------------------|------------------------------------------|
| <b>No: 5975</b>        | <b>SupervisionID</b> 5975 | <b>Name</b> PitchOscillationHighBladeCSx |
| <b>Log text</b>        | Pitch Osc High in Blade C |                                          |
| <b>Subsystem name</b>  | PiSP                      |                                          |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                     |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow            |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second           |
| - Time window          | 1 hour                    | - Max time eliminate 9 second            |
| - Stabilize period     | 1 minute                  | <b>Category</b> Manufacturer             |

**Criteria:**

This supervision monitors the pitch oscillations in blade B

An alarm is reported if follwing conditions are met continously for  
**\*\*PiSP\\_PitchOscillationHigh\\_ErrTime\*\*** sec:

1. **\*\*PiSP\\_PitchOscillationHigh\\_ActivityLevel\*\*** = 2
2. **\*\*PiSP\\_PitchOscillationHigh\\_ErrLimit\*\*** is exceeded

|                        |                               |                                                     |
|------------------------|-------------------------------|-----------------------------------------------------|
| <b>No: 5984</b>        | <b>SupervisionID</b> 5984     | <b>Name</b> HubSafetySystemBatteryServiceRequiredSx |
| <b>Log text</b>        | HubSafetySystem Batt.Serv.Reg |                                                     |
| <b>Subsystem name</b>  | OptiStop                      |                                                     |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                           |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                          |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                         |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>                          |
| - Stabilize period     | 1 minute                      | <b>Category</b> Manufacturer                        |

**Criteria:**

This warning is reported if signal from hub safety UPS indicating that battery service is needed is true.

The warning is reported when HubSafetySystemSafetyBatteryFault is true, and it will be acknowledged automatically when HubSafetySystemSafetyBatteryFault is false.

Note: This warning is active only if the OptiStopVariant2 monitor is installed, i.e., the parameter **\*\*OptiStopVariant2Installed\*\*** is true.

|                        |                              |                                               |
|------------------------|------------------------------|-----------------------------------------------|
| <b>No: 5989</b>        | <b>SupervisionID</b> 5989    | <b>Name</b> GearboxBearingTempSensorFailureSx |
| <b>Log text</b>        | GearboxBearingTempSensorFail |                                               |
| <b>Subsystem name</b>  | Gearbox                      |                                               |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                          |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> PauseSlow                |
| - Allowed attempts     | 3                            | - Max time disconnect 9 second                |
| - Time window          | 3600 second                  | - Max time eliminate 10 second                |
| - Stabilize period     | 60 second                    | <b>Category</b> Manufacturer                  |

**Criteria:**

This alarm indicates that all bearing temperature signals are invalid.

The supervision is triggered if ALL of the following signals are invalid:  
**\*\*GearboxOilInletTemp\*\***, GearboxHSBearTempA,  
 GearboxHSBearTempB, GearboxHSBearTempC, GearboxIMBearTempA, GearboxIMBearTempB.  
 GearboxIMBearTempB and GearboxHSBearTempB are only supervised when the corresponding  
 parameter is true (Prm\_GearboxIMBearTempBInstalled and Prm\_GearboxHSBearTempBInstalled)

The supervision can be acknowledged when at least one of the temperature signals is valid.

|                        |                           |                                              |
|------------------------|---------------------------|----------------------------------------------|
| <b>No: 5992</b>        | <b>SupervisionID</b> 5992 | <b>Name</b> EnvironmentTempSafeSensorErrorSx |
| <b>Log text</b>        | EnvTmpSafeSensorErr:___   |                                              |
| <b>Subsystem name</b>  | Environment               |                                              |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                    |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>                   |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>                  |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>                   |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                 |

**Criteria:**

This supervision is reported whenever any I/O signal used by this subsystem is unavailable.

This supervision is only relevant if the safe sensor is installed (\*\*EnvironmentTempSafeSensorInstalled\*\*).

The Error code for this safe sensor can be seen with (EnvironmentTempSafeErrorCode).

The safe sensor does not comply with the generic interface for sensors and must be handled separately in case of sensor error:

This alarm is reported if the \*\*IO.EnvironmentTempSafe\*\* signal is NOT Valid, i.e. EnvironmentTempSafe\_valid is false.

This alarm is acknowledged if the \*\*IO.EnvironmentTempSafe\*\* signal is Valid, i.e. EnvironmentTempSafe\_valid is true.

|                        |                           |                                   |
|------------------------|---------------------------|-----------------------------------|
| <b>No: 5993</b>        | <b>SupervisionID</b> 5993 | <b>Name</b> ConvIntFanMissingFBSx |
| <b>Log text</b>        | ConvIntFanMissingFB       |                                   |
| <b>Subsystem name</b>  | CubePower                 |                                   |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>              |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second    |
| - Time window          | 1 hour                    | - Max time eliminate 10 second    |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer      |

**Criteria:**

This alarm is raised if the signal called FanM1\_ThermalRelayFB, which is connected to CT440 X31 pin 14 is low.

This is either because the thermal relay that protects the fan has tripped, or because the internal fan has been disabled with the switch (-405-22-01-01) on the converter.

|                        |                           |                                         |
|------------------------|---------------------------|-----------------------------------------|
| <b>No: 5994</b>        | <b>SupervisionID</b> 5994 | <b>Name</b> ConvExtLiquidCoolingNotOKSx |
| <b>Log text</b>        | ConvExtLiquidCoolingNotOK |                                         |
| <b>Subsystem name</b>  | CubePower                 |                                         |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow           |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second          |
| - Time window          | 1 hour                    | - Max time eliminate 9 second           |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer            |

**Criteria:**

This alarm is raised when the converter water cooling is not running successfully as reported by the status signal

Par1: N/A

Par2: N/A

|                        |                           |                                      |
|------------------------|---------------------------|--------------------------------------|
| <b>No: 5995</b>        | <b>SupervisionID</b> 5995 | <b>Name</b> ConvExtFanCoolingNotOKSx |
| <b>Log text</b>        | ConvExtFanCoolingNotOK    |                                      |
| <b>Subsystem name</b>  | CubePower                 |                                      |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                 |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow       |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second       |
| - Time window          | 1 hour                    | - Max time eliminate 10 second       |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer         |

**Criteria:**  
This alarm is raised when the converter external fan cooling is not running successfully as reported by the status signal

Par1: N/A  
Par2: N/A

|                        |                               |                                                            |
|------------------------|-------------------------------|------------------------------------------------------------|
| <b>No: 5998</b>        | <b>SupervisionID</b> 5998     | <b>Name</b> PowerSupplyConvGenWaterCoolingBackupCBOpenedSx |
| <b>Log text</b>        | Conv/Gen WCool Bck cont. open |                                                            |
| <b>Subsystem name</b>  | PowerSupply                   |                                                            |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                                       |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> PauseSlow                             |
| - Allowed attempts     | 3                             | - Max time disconnect 9 second                             |
| - Time window          | 7 day                         | - Max time eliminate 10 second                             |
| - Stabilize period     | 10 second                     | <b>Category</b> Manufacturer                               |

**Criteria:**  
This alarm is reported if the converter/generator waterpump backup circuit breaker is opened.

This alarm is raised if the signal IO.PowerSupplyConvGenWaterCoolingBackupCBClosed remains false (0), for \*\*PowerSupplyCBOpenedStableTime\*\*.

This alarm will be auto acknowledged when the signal IO.PowerSupplyConvGenWaterCoolingBackupCBClosed has remained true (1) for \*\*PowerSupplyCBOpenedStableTime\*\*.

|                        |                           |                                                  |
|------------------------|---------------------------|--------------------------------------------------|
| <b>No: 6005</b>        | <b>SupervisionID</b> 6005 | <b>Name</b> SafetySystemNacelle4SwVersionErrorSx |
| <b>Log text</b>        | SafetyNac4 SwVers Error   |                                                  |
| <b>Subsystem name</b>  | SafetySystem              |                                                  |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                             |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow                   |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second                   |
| - Time window          | 1 hour                    | - Max time eliminate 10 second                   |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                     |

**Criteria:**  
This alarm indicates that the software version of the safety systems does not match what the turbine software expect.

The alarm will automatically be acknowledged when the software version is correct.

This alarm indicates that the software version in the Nacelle4 Safety node does not match what the turbine software expect.

The alarm is raised if **\*\*IO.SafetySystemNacelle4SwVersion\*\*** does not match parameter **\*\*SafetySystemNacelle4SwVersion\*\***.

The alarm can be acknowledged.

|                        |                                |                                                      |
|------------------------|--------------------------------|------------------------------------------------------|
| <b>No: 6007</b>        | <b>SupervisionID</b> 6007      | <b>Name</b> SafetySystemNacelle4CommunicationErrorSx |
| <b>Log text</b>        | SafetyNac4 Communication Error |                                                      |
| <b>Subsystem name</b>  | SafetySystem                   |                                                      |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                                 |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> PauseSlow                       |
| - Allowed attempts     | 5                              | - Max time disconnect 9 second                       |
| - Time window          | 20 minute                      | - Max time eliminate 10 second                       |
| - Stabilize period     | 60 second                      | <b>Category</b> Manufacturer                         |

**Criteria:**  
This alarm indicates that the communication with the safety system nodes is faulty.

The alarm is automatically acknowledged when the communication is Ok.

The alarm is raised if the communication to the Nacelle4 safety node is faulty.

The alarm is automatically acknowledged when the communication is ok.



|                        |                           |                                             |              |
|------------------------|---------------------------|---------------------------------------------|--------------|
| <b>No: 6008</b>        | <b>SupervisionID</b> 6008 | <b>Name</b> SafetySystemNacelle4EKeyErrorSx |              |
| <b>Log text</b>        | SafetyNac4 EKey Error     |                                             |              |
| <b>Subsystem name</b>  | SafetySystem              |                                             |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                              | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                        | PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect                       | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate                        | 10 second    |
| - Stabilize period     | 60 second                 | <b>Category</b>                             | Manufacturer |

**Criteria:**

This alarm indicates that the EKey mounted in the safety system node is faulty.

The alarm is reported if the EKey mounted in the Nacelle4 safety node is faulty.

The alarm is reported if input **\*\*IO.SafetySystemEKeyDataNacelle4Ok\*\*** is false.

The alarm is automatically acknowledged when input **\*\*IO.SafetySystemEKeyDataNacelle4Ok\*\*** is true.

|                        |                              |                                                    |              |
|------------------------|------------------------------|----------------------------------------------------|--------------|
| <b>No: 6009</b>        | <b>SupervisionID</b> 6009    | <b>Name</b> SafetySystemNacelle4OperationalErrorSx |              |
| <b>Log text</b>        | SafetyNac4 Operational Error |                                                    |              |
| <b>Subsystem name</b>  | SafetySystem                 |                                                    |              |
| <b>Type</b>            | Alarm                        | <b>Timeout</b>                                     | <n/a>        |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                               | PauseSlow    |
| - Allowed attempts     | 3                            | - Max time disconnect                              | 9 second     |
| - Time window          | 1 hour                       | - Max time eliminate                               | 10 second    |
| - Stabilize period     | 60 second                    | <b>Category</b>                                    | Manufacturer |

**Criteria:**

This alarm indicates that the safety node is not operational i.e. not up-and-running.

The alarm can be acknowledged.

This alarm indicates that the Nacelle4 safety node is not operational i.e. not up-and-running.

The alarm is reported if input **\*\*IO.SafetySystemNacelle4Operational\*\*** is false.

The alarm is automatically acknowledged when **\*\*IO.SafetySystemNacelle4Operational\*\*** is true.

|                        |                                 |                                           |
|------------------------|---------------------------------|-------------------------------------------|
| <b>No:</b> 6013        | <b>SupervisionID</b> 6013       | <b>Name</b> GearHydrWaterCoolingTempLowSx |
| <b>Log text</b>        | GearHydrWaterCoolTempLow ____°C |                                           |
| <b>Subsystem name</b>  | GearHydraulicWaterCooling       |                                           |
| <b>Type</b>            | Warning                         | <b>Timeout</b> <disabled>                 |
| <b>Acknowledgement</b> | Auto                            | <b>Shutdown type</b> <n/a>                |
| - Allowed attempts     | 3                               | - Max time disconnect <n/a>               |
| - Time window          | 1 hour                          | - Max time eliminate <n/a>                |
| - Stabilize period     | 10 minute                       | <b>Category</b> Manufacturer              |

**Criteria:**

The warning indicates low gear/hydraulic cooling liquid temperature.

One of the reasons for the low temperature can be that the 3-way valve is in a forced position leading too much liquid in to the cooler.

The warning is raised if **\*\*IO.GearHydrWaterCoolingTemp\*\*** drops below the minimum temperature specified by the parameter **\*\*LiquidTempLimit\*\***, for more than the time interval given by the parameter **\*\*LiquidTempStableTime\*\***.

The supervision is only active if the cooling has been active for the stable time specified by the parameter **\*\*WaterTempCoolingActiveStableTime\*\***.

This warning is auto acknowledged if **\*\*IO.GearHydrWaterCoolingTemp\*\*** is above the parameter **\*\*LiquidTempLimit\*\***.

|                        |                                |                                                   |
|------------------------|--------------------------------|---------------------------------------------------|
| <b>No:</b> 6014        | <b>SupervisionID</b> 6014      | <b>Name</b> ConvGenWaterCoolingMainPumpPressLowSx |
| <b>Log text</b>        | ConvWaterCoolPressLow__._ bar  |                                                   |
| <b>Subsystem name</b>  | ConverterGeneratorWaterCooling |                                                   |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                              |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> StopSlow                     |
| - Allowed attempts     | 3                              | - Max time disconnect 3 second                    |
| - Time window          | 1 hour                         | - Max time eliminate 9 second                     |
| - Stabilize period     | 10 minute                      | <b>Category</b> Manufacturer                      |

**Criteria:**

The alarm indicates that the converter and generator water cooling main pump pressure drops below a certain limit.

The alarm is raised if the converter and generator water cooling main pump pressure (**\*\*IO.ConvGenWaterCoolingPumpPress\*\***) drops below the minimum pressure specified by the parameter **\*\*PumpPressMin\*\***, for more than the time interval given by the parameter **\*\*PumpPresTime\*\***.

This alarm is only monitored if the following condition is met:

1. The converter and generator water cooling pump is running (**\*\*IO.ConvGenWaterCoolingPumpStart\*\*** is true).

The alarm is auto acknowledged, if the converter and generator water cooling main pump pressure is equal or above the parameter **\*\*PumpPressMin\*\***.

|                           |                                |                                                     |              |
|---------------------------|--------------------------------|-----------------------------------------------------|--------------|
| <b><u>No: 6015</u></b>    | <b>SupervisionID</b>           | <b>Name</b> ConvGenWaterCoolingBackupPumpPressLowSx |              |
|                           | 6015                           |                                                     |              |
| <b>Log text</b>           | ConvWaterCBckPressLow__._ bar  |                                                     |              |
| <b>Subsystem name</b>     | ConverterGeneratorWaterCooling |                                                     |              |
| <b>Type</b>               | Alarm                          | <b>Timeout</b>                                      | <n/a>        |
| <b>Acknowledgement</b>    | Auto                           | <b>Shutdown type</b>                                | StopSlow     |
| <b>- Allowed attempts</b> | 3                              | <b>- Max time disconnect</b>                        | 3 second     |
| <b>- Time window</b>      | 1 hour                         | <b>- Max time eliminate</b>                         | 9 second     |
| <b>- Stabilize period</b> | 10 minute                      | <b>Category</b>                                     | Manufacturer |

**Criteria:**

The alarm indicates that the converter and generator water cooling backup pump pressure drops below a certain limit.

The alarm is raised if the converter and generator water cooling backup pump pressure (IO.ConvGenWaterCoolingBackupPumpPress) drops below the minimum pressure specified by the parameter **\*\*PumpPressMin\*\***, for more than the time interval given by the parameter **\*\*PumpPressTime\*\***.

This alarm is only monitored if the following conditions are met:

1. The converter and generator water cooling backup pump is not UPS powered (**\*\*PowerSupplyConvGenWaterCoolingBackupPumpOnUPS\*\*** is false).
2. The converter and generator water cooling backup pump is running (IO.ConvGenWaterCoolingBackupPumpStart is true).

The alarm is auto acknowledged, if the converter and generator water cooling backup pump pressure is equal or above the parameter **\*\*PumpPressMin\*\***.

|                           |                                |                                                         |              |
|---------------------------|--------------------------------|---------------------------------------------------------|--------------|
| <b><u>No: 6016</u></b>    | <b>SupervisionID</b>           | <b>Name</b> ConvGenWaterCoolingHeaterNegativeFeedbackSx |              |
|                           | 6016                           |                                                         |              |
| <b>Log text</b>           | ConvGenWatCoolHeatNegFeedback  |                                                         |              |
| <b>Subsystem name</b>     | ConverterGeneratorWaterCooling |                                                         |              |
| <b>Type</b>               | Warning                        | <b>Timeout</b>                                          | <disabled>   |
| <b>Acknowledgement</b>    | Auto                           | <b>Shutdown type</b>                                    | <n/a>        |
| <b>- Allowed attempts</b> | 3                              | <b>- Max time disconnect</b>                            | <n/a>        |
| <b>- Time window</b>      | 1 hour                         | <b>- Max time eliminate</b>                             | <n/a>        |
| <b>- Stabilize period</b> | 10 minute                      | <b>Category</b>                                         | Manufacturer |

**Criteria:**

This warning is indicating that the contactor for the converter generator water cooling heater does not close when the control output is activated.

The warning is raised if **\*\*IO.ConvGenWaterCoolingHeaterContactorClosed\*\*** does not change to true within the time **\*\*HeaterFeedbackTime\*\*** after **\*\*IO.ConvGenWaterCoolingHeaterStart\*\*** has changed from false to true.

The warning is auto acknowledged when the two signals **\*\*IO.ConvGenWaterCoolingHeaterStart\*\*** and **\*\*IO.ConvGenWaterCoolingHeaterContactorClosed\*\*** are aligned at either true or false level.

|                           |                                |                                                         |              |
|---------------------------|--------------------------------|---------------------------------------------------------|--------------|
| <b><u>No: 6017</u></b>    | <b>SupervisionID</b>           | <b>Name</b> ConvGenWaterCoolingHeaterPositiveFeedbackSx |              |
|                           | 6017                           |                                                         |              |
| <b>Log text</b>           | ConvGenWatCoolHeatPosFeedback  |                                                         |              |
| <b>Subsystem name</b>     | ConverterGeneratorWaterCooling |                                                         |              |
| <b>Type</b>               | Warning                        | <b>Timeout</b>                                          | <disabled>   |
| <b>Acknowledgement</b>    | Auto                           | <b>Shutdown type</b>                                    | <n/a>        |
| <b>- Allowed attempts</b> | 3                              | <b>- Max time disconnect</b>                            | <n/a>        |
| <b>- Time window</b>      | 1 hour                         | <b>- Max time eliminate</b>                             | <n/a>        |
| <b>- Stabilize period</b> | 10 minute                      | <b>Category</b>                                         | Manufacturer |

**Criteria:**

This warning is indicating that the contactor for the converter generator water cooling heater does not open when the control output is deactivated.

The warning is raised if **\*\*IO.ConvGenWaterCoolingHeaterContactorClosed\*\*** does not change to false within the time **\*\*HeaterFeedbackTime\*\*** after **\*\*IO.ConvGenWaterCoolingHeaterStart\*\*** has changed from true to false.

The warning is auto acknowledged when the two signals **\*\*IO.ConvGenWaterCoolingHeaterStart\*\*** and **\*\*IO.ConvGenWaterCoolingHeaterContactorClosed\*\*** are aligned at either true or false level.

|                           |                                |                                                      |              |
|---------------------------|--------------------------------|------------------------------------------------------|--------------|
| <b><u>No: 6018</u></b>    | <b>SupervisionID</b>           | <b>Name</b> ConvGenWaterCoolingMainPumpThermoFaultSx |              |
|                           | 6018                           |                                                      |              |
| <b>Log text</b>           | ConvGenWatCoolPumpThermoFault  |                                                      |              |
| <b>Subsystem name</b>     | ConverterGeneratorWaterCooling |                                                      |              |
| <b>Type</b>               | Alarm                          | <b>Timeout</b>                                       | <n/a>        |
| <b>Acknowledgement</b>    | Auto                           | <b>Shutdown type</b>                                 | PauseFast    |
| <b>- Allowed attempts</b> | 3                              | <b>- Max time disconnect</b>                         | 8 second     |
| <b>- Time window</b>      | 1 hour                         | <b>- Max time eliminate</b>                          | 3600 second  |
| <b>- Stabilize period</b> | 10 minute                      | <b>Category</b>                                      | Manufacturer |

**Criteria:**

This alarm is indicating that the protection for the converter generator water cooling main pump is tripped because the pump is overloaded.

The alarm is raised when the signal **\*\*IO.ConvGenWaterCoolingPumpOverloaded\*\*** is true.

The alarm can be acknowledged when the signal **\*\*IO.ConvGenWaterCoolingPumpOverloaded\*\*** is false.

|                           |                                |                              |                                            |
|---------------------------|--------------------------------|------------------------------|--------------------------------------------|
| <b><u>No: 6019</u></b>    | <b>SupervisionID</b>           | <b>Name</b>                  | ConvGenWaterCoolingBackupPumpThermoFaultSx |
|                           | 6019                           |                              |                                            |
| <b>Log text</b>           | ConvGenWatCBckPumpThermoFault  |                              |                                            |
| <b>Subsystem name</b>     | ConverterGeneratorWaterCooling |                              |                                            |
| <b>Type</b>               | Alarm                          | <b>Timeout</b>               | <n/a>                                      |
| <b>Acknowledgement</b>    | Auto                           | <b>Shutdown type</b>         | PauseFast                                  |
| <b>- Allowed attempts</b> | 3                              | <b>- Max time disconnect</b> | 8 second                                   |
| <b>- Time window</b>      | 1 hour                         | <b>- Max time eliminate</b>  | 3600 second                                |
| <b>- Stabilize period</b> | 10 minute                      | <b>Category</b>              | Manufacturer                               |

#### Criteria:

This alarm is indicating that the protection for the converter generator water cooling backup pump is tripped because the pump is overloaded.

The alarm is raised when the signal PowerSupplyConvGenWaterCoolingBackupPumpOverloaded is true.

The alarm can be acknowledged when the signal PowerSupplyConvGenWaterCoolingBackupPumpOverloaded is false.

|                           |                                |                              |                                          |
|---------------------------|--------------------------------|------------------------------|------------------------------------------|
| <b><u>No: 6020</u></b>    | <b>SupervisionID</b>           | <b>Name</b>                  | ConvGenWaterCoolingBypassFilterCloggedSx |
|                           | 6020                           |                              |                                          |
| <b>Log text</b>           | ConvGenWatBypassFilterClogged  |                              |                                          |
| <b>Subsystem name</b>     | ConverterGeneratorWaterCooling |                              |                                          |
| <b>Type</b>               | Warning                        | <b>Timeout</b>               | <disabled>                               |
| <b>Acknowledgement</b>    | Auto                           | <b>Shutdown type</b>         | <n/a>                                    |
| <b>- Allowed attempts</b> | 3                              | <b>- Max time disconnect</b> | <n/a>                                    |
| <b>- Time window</b>      | 1 hour                         | <b>- Max time eliminate</b>  | <n/a>                                    |
| <b>- Stabilize period</b> | 60 second                      | <b>Category</b>              | Manufacturer                             |

#### Criteria:

The warning indicates that the converter generator water cooling bypass filter is clogged.

The warning is raised if the bypass filter pressure (ConvGenWaterCoolingBeforeFilterPress - ConvGenWaterCoolingAfterFilterPress) is above the warning level (parameter \*\*BypassFilterPressDiffLimit\*\*) for more than the stabilize time (parameter \*\*BypassFilterPressDiffStableTime\*\*).

This warning must be manually acknowledged.

|                        |                                |                                                |              |
|------------------------|--------------------------------|------------------------------------------------|--------------|
| <b>No: 6021</b>        | <b>SupervisionID</b> 6021      | <b>Name</b> ConvGenWaterCoolingLiquidTempLowSx |              |
| <b>Log text</b>        | ConvGen LiquidTempLow____°C    |                                                |              |
| <b>Subsystem name</b>  | ConverterGeneratorWaterCooling |                                                |              |
| <b>Type</b>            | Warning                        | <b>Timeout</b>                                 | <disabled>   |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                           | <n/a>        |
| - Allowed attempts     | 3                              | - Max time disconnect                          | <n/a>        |
| - Time window          | 1 hour                         | - Max time eliminate                           | <n/a>        |
| - Stabilize period     | 10 minute                      | <b>Category</b>                                | Manufacturer |

**Criteria:**

The warning is raised if the converter generator water cooling liquid temperature is low.

The warning is raised if the temperature of the cooling liquid (\*\*IO.ConvGenWaterCoolingTemp\*\*) is below the warning level (parameter \*\*LiquidLowTemp\*\*) for more than the stabilize time (parameter \*\*LiquidTempStableTime\*\*) when cooling has been active for the time specified by parameter \*\*WaterTempCoolingActiveStableTime\*\*.

This warning is auto acknowledged if the cooling liquid temperature (\*\*IO.ConvGenWaterCoolingTemp\*\*) is equal or above the warning level (parameter \*\*LiquidLowTemp\*\* ).

|                        |                           |                                     |              |
|------------------------|---------------------------|-------------------------------------|--------------|
| <b>No: 6026</b>        | <b>SupervisionID</b> 6026 | <b>Name</b> SmokeDetectorHubErrorSx |              |
| <b>Log text</b>        | Smoke Detector Hub Error  |                                     |              |
| <b>Subsystem name</b>  | SmokeDetector             |                                     |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                      | 48 hour      |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                | PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect               | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate                | 10 second    |
| - Stabilize period     | 10 second                 | <b>Category</b>                     | Manufacturer |

**Criteria:**

This warning is reported when the Smoke Detector is up and running and there is an error in the Smoke Detector.

This warning is raised if the Smoke Detector error is detected i.e. \*\*IO.SmokeDetectorHubCurrent\*\* < Prm\_SensorErrorCurrent for the time Prm\_SensorErrorCurrentStableTime.

This warning is automatically acknowledged when the Smoke Detector has become normal i.e. \*\*IO.SmokeDetectorHubCurrent\*\* >= Prm\_SensorErrorCurrent.

|                        |                               |                                             |
|------------------------|-------------------------------|---------------------------------------------|
| <b>No: 6027</b>        | <b>SupervisionID</b> 6027     | <b>Name</b> SmokeDetectorHubSmokeDetectedSx |
| <b>Log text</b>        | SmokeDetectorHubSmokeDetected |                                             |
| <b>Subsystem name</b>  | SmokeDetector                 |                                             |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                        |
| <b>Acknowledgement</b> | Local                         | <b>Shutdown type</b> StopSlow               |
| - Allowed attempts     | <n/a>                         | - Max time disconnect 3 second              |
| - Time window          | <n/a>                         | - Max time eliminate 9 second               |
| - Stabilize period     | <n/a>                         | <b>Category</b> Manufacturer                |

**Criteria:**

This alarm indicates that the Smoke Detector System has detected smoke.

This alarm is raised when the smoke is detected in the hub i.e.  
\*\*IO.SmokeDetectorHubCurrent\*\* > Prm\_SmokeDetectedCurrent for  
Prm\_SmokeDetectedCurrentStableTime.

This alarm can be acknowledged when switch gear is tripped after smoke detection i.e.  
IO.SwitchgerHVCBClosed is false.

|                        |                                |                                                       |
|------------------------|--------------------------------|-------------------------------------------------------|
| <b>No: 6030</b>        | <b>SupervisionID</b> 6030      | <b>Name</b> SmokeDetectorSwitchgearHVCBCloseBlockedSx |
| <b>Log text</b>        | SmokeDetector SwG HVCB blocked |                                                       |
| <b>Subsystem name</b>  | SmokeDetector                  |                                                       |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                                  |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> PauseSlow                        |
| - Allowed attempts     | Unlimited                      | - Max time disconnect 9 second                        |
| - Time window          | <n/a>                          | - Max time eliminate 10 second                        |
| - Stabilize period     | 1 second                       | <b>Category</b> Manufacturer                          |

**Criteria:**

This alarm is reporten if the smoke detection system prevent the switchgear high voltage circuit breaker from closing.

This alarm is raised if the smoke detection system is blocking the switchgear from closing (ASDSwitchgearHVCBCloseBlockedReportSupervision is true - OBS: Add signal).

This alarm is automatically acknowledged when the smoke detector system is allowing the switchgear to close (ASDSwitchgearHVCBCloseBlockedReportSupervision is false - OBS: Add signal).

|                        |                              |                                                 |              |
|------------------------|------------------------------|-------------------------------------------------|--------------|
| <b>No: 6033</b>        | <b>SupervisionID</b> 6033    | <b>Name</b> HubSafetySystemPowerSupplyHwErrorSx |              |
| <b>Log text</b>        | HubSafetyPowerSupply HwError |                                                 |              |
| <b>Subsystem name</b>  | SafetySystem                 |                                                 |              |
| <b>Type</b>            | Alarm                        | <b>Timeout</b>                                  | <n/a>        |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                            | StopSlow     |
| - Allowed attempts     | 3                            | - Max time disconnect                           | 3 second     |
| - Time window          | 1 hour                       | - Max time eliminate                            | 9 second     |
| - Stabilize period     | 60 second                    | <b>Category</b>                                 | Manufacturer |

**Criteria:**

This alarm indicates that the safety system has detected a hardware input error.

This alarm is reported if a software signal from the SafetyController is true.

This alarm is reported if the software signal **\*\*IO.HubSafetySystemPowerSupplyHwError\*\*** is true.

The alarm is automatically acknowledged when the signal **\*\*IO.HubSafetySystemPowerSupplyHwError\*\*** changes to false.

|                        |                             |                                          |              |
|------------------------|-----------------------------|------------------------------------------|--------------|
| <b>No: 6034</b>        | <b>SupervisionID</b> 6034   | <b>Name</b> PreUpgradeValidationFailedSx |              |
| <b>Log text</b>        | SwUpgradeErrorPreValidation |                                          |              |
| <b>Subsystem name</b>  | UpgradeSession              |                                          |              |
| <b>Type</b>            | Warning                     | <b>Timeout</b>                           | <disabled>   |
| <b>Acknowledgement</b> | Remote                      | <b>Shutdown type</b>                     | <n/a>        |
| - Allowed attempts     | <n/a>                       | - Max time disconnect                    | <n/a>        |
| - Time window          | <n/a>                       | - Max time eliminate                     | <n/a>        |
| - Stabilize period     | <n/a>                       | <b>Category</b>                          | Manufacturer |

**Criteria:**

DESCRIPTION \_TODO\_: PreUpgradeValidationFailed

|                        |                           |                             |              |
|------------------------|---------------------------|-----------------------------|--------------|
| <b>No: 6035</b>        | <b>SupervisionID</b> 6035 | <b>Name</b> UpgradeFailedSx |              |
| <b>Log text</b>        | SwUpgradeErrorMainPhase   |                             |              |
| <b>Subsystem name</b>  | UpgradeSession            |                             |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>              | <disabled>   |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b>        | <n/a>        |
| - Allowed attempts     | <n/a>                     | - Max time disconnect       | <n/a>        |
| - Time window          | <n/a>                     | - Max time eliminate        | <n/a>        |
| - Stabilize period     | <n/a>                     | <b>Category</b>             | Manufacturer |

**Criteria:**

DESCRIPTION \_TODO\_: UpgradeFailed

|                        |                            |                            |              |
|------------------------|----------------------------|----------------------------|--------------|
| <b>No: 6036</b>        | <b>SupervisionID</b> 6036  | <b>Name</b> CommitFailedSx |              |
| <b>Log text</b>        | SwUpgradeErrorCommitFailed |                            |              |
| <b>Subsystem name</b>  | UpgradeSession             |                            |              |
| <b>Type</b>            | Warning                    | <b>Timeout</b>             | <disabled>   |
| <b>Acknowledgement</b> | Remote                     | <b>Shutdown type</b>       | <n/a>        |
| - Allowed attempts     | <n/a>                      | - Max time disconnect      | <n/a>        |
| - Time window          | <n/a>                      | - Max time eliminate       | <n/a>        |
| - Stabilize period     | <n/a>                      | <b>Category</b>            | Manufacturer |

**Criteria:**

DESCRIPTION \_TODO\_: CommitFailed



|                        |                           |                                  |
|------------------------|---------------------------|----------------------------------|
| <b>No: 6039</b>        | <b>SupervisionID</b> 6039 | <b>Name</b> RtoPShutdownSx       |
| <b>Log text</b>        | RtoP Reboot               |                                  |
| <b>Subsystem name</b>  | Watchdog                  |                                  |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>             |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopFast    |
| - Allowed attempts     | 5                         | - Max time disconnect 0.9 second |
| - Time window          | 1 second                  | - Max time eliminate 1 hour      |
| - Stabilize period     | 300 second                | <b>Category</b> Utility          |

**Criteria:**

The purpose of this alarm is to report RtoP shutdown on system-8000.

|                        |                           |                                   |
|------------------------|---------------------------|-----------------------------------|
| <b>No: 6040</b>        | <b>SupervisionID</b> 6040 | <b>Name</b> PitchAngleDeviationSx |
| <b>Log text</b>        | PitchAngDev: A__ B__ C__  |                                   |
| <b>Subsystem name</b>  | PitchAngleMeasurement     |                                   |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>         |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> <n/a>        |
| - Allowed attempts     | <n/a>                     | - Max time disconnect <n/a>       |
| - Time window          | <n/a>                     | - Max time eliminate <n/a>        |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer      |

**Criteria:**

This warning indicates that there is a significant pitch angle deviation in relation to the mean of the three blades.

The responsible algorithm (PitchAngleDeviationDetection) takes the measured blade flap loads to estimate these deviations.

This warning is active if one of the following conditiond are met:

- PitchBladeAAngleDeviation - PitchBladeBAngleDeviation > Px\_MaxPitchDeviation
- PitchBladeAAngleDeviation - PitchBladeCAngleDeviation > Px\_MaxPitchDeviation
- PitchBladeBAngleDeviation - PitchBladeCAngleDeviation > Px\_MaxPitchDeviation

|                        |                           |                                |
|------------------------|---------------------------|--------------------------------|
| <b>No: 6042</b>        | <b>SupervisionID</b> 6042 | <b>Name</b> GearOilPumpFaultSx |
| <b>Log text</b>        | Gear Oil Pump Fault       |                                |
| <b>Subsystem name</b>  | GearboxLubrication        |                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second |
| - Time window          | 1 hour                    | - Max time eliminate 10 second |
| - Stabilize period     | 10 second                 | <b>Category</b> Manufacturer   |

**Criteria:**

This warning/alarm is indicating that the frequency drive of the variable speed gear oil pump is reporting a fault.

If the warning/alarm is reported, the gear oil pump is stopped.

Most likely caused by problems with the gear oil pump frequency drive.

The warning/alarm is raised if **\*\*IO.GearboxOilPumpOk\*\*** remains false for the period specified by **\*\*GearboxOilPumpFaultTime\*\***.

The warning/alarm can be acknowledged once **\*\*IO.GearboxOilPumpOk\*\*** is true.

|                    |                           |                                                     |
|--------------------|---------------------------|-----------------------------------------------------|
| <b>No: 6052</b>    | <b>SupervisionID</b> 6052 | <b>Name</b> UserDefinedSupervisionCMSGearboxErrorSx |
| Log text           | CMS Gearbox Warning       |                                                     |
| Subsystem name     | UserDefinedSupervision    |                                                     |
| Type               | Warning                   | Timeout <disabled>                                  |
| Acknowledgement    | Auto                      | Shutdown type <n/a>                                 |
| - Allowed attempts | 3                         | - Max time disconnect <n/a>                         |
| - Time window      | 1 hour                    | - Max time eliminate <n/a>                          |
| - Stabilize period | 60 second                 | Category Manufacturer                               |

**Criteria:**  
The external CMS system detected an error in the subsystem.

|                    |                           |                                                 |
|--------------------|---------------------------|-------------------------------------------------|
| <b>No: 6053</b>    | <b>SupervisionID</b> 6053 | <b>Name</b> UserDefinedSupervisionCMSGenErrorSx |
| Log text           | CMS Gen Warning           |                                                 |
| Subsystem name     | UserDefinedSupervision    |                                                 |
| Type               | Warning                   | Timeout <disabled>                              |
| Acknowledgement    | Auto                      | Shutdown type <n/a>                             |
| - Allowed attempts | 3                         | - Max time disconnect <n/a>                     |
| - Time window      | 1 hour                    | - Max time eliminate <n/a>                      |
| - Stabilize period | 60 second                 | Category Manufacturer                           |

**Criteria:**  
The external CMS system detected an error in the subsystem.

|                    |                           |                                                         |
|--------------------|---------------------------|---------------------------------------------------------|
| <b>No: 6054</b>    | <b>SupervisionID</b> 6054 | <b>Name</b> UserDefinedSupervisionCMSMainBearingErrorSx |
| Log text           | CMS MainBearing Warning   |                                                         |
| Subsystem name     | UserDefinedSupervision    |                                                         |
| Type               | Warning                   | Timeout <disabled>                                      |
| Acknowledgement    | Auto                      | Shutdown type <n/a>                                     |
| - Allowed attempts | 3                         | - Max time disconnect <n/a>                             |
| - Time window      | 1 hour                    | - Max time eliminate <n/a>                              |
| - Stabilize period | 60 second                 | Category Manufacturer                                   |

**Criteria:**  
The external CMS system detected an error in the subsystem.

|                    |                           |                                                   |
|--------------------|---------------------------|---------------------------------------------------|
| <b>No: 6055</b>    | <b>SupervisionID</b> 6055 | <b>Name</b> UserDefinedSupervisionCMSTowerErrorSx |
| Log text           | CMS Tower Warning         |                                                   |
| Subsystem name     | UserDefinedSupervision    |                                                   |
| Type               | Warning                   | Timeout <disabled>                                |
| Acknowledgement    | Auto                      | Shutdown type <n/a>                               |
| - Allowed attempts | 3                         | - Max time disconnect <n/a>                       |
| - Time window      | 1 hour                    | - Max time eliminate <n/a>                        |
| - Stabilize period | 60 second                 | Category Manufacturer                             |

**Criteria:**  
The external CMS system detected an error in the subsystem.

No: 6056

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID

6056

BladeA heat cont.secondary err

BladeHeating

Warning

Auto

3

1 hour

60 second

Name

BladeHeatingMainContactorSecondaryFeedbackErrorSx

Timeout

<disabled>

Shutdown type

<n/a>

- Max time disconnect

<n/a>

- Max time eliminate

<n/a>

Category

Manufacturer

This warning indicates a feedback issue in the secondary blade contactor.

The supervision is reported if the signal  
\*\*IO.BladeHeatingBladeASecondaryContactorFeedbackError\*\* is true for a period longer than  
\*\*BladeHeatingMainContactorStableTime\*\*.  
The supervision can be acknowledged when the signal  
\*\*IO.BladeHeatingBladeASecondaryContactorFeedbackError\*\* is false.

No: 6057

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Criteria:

SupervisionID

6057

BladeB heat cont.secondary err

BladeHeating

Warning

Auto

3

1 hour

60 second

Name

BladeHeatingMainContactorSecondaryFeedbackErrorSx

Timeout

<disabled>

Shutdown type

<n/a>

- Max time disconnect

<n/a>

- Max time eliminate

<n/a>

Category

Manufacturer

This warning indicates a feedback issue in the secondary blade contactor.

The supervision is reported if the signal  
\*\*IO.BladeHeatingBladeBSecondaryContactorFeedbackError\*\* is true for a period longer than  
\*\*BladeHeatingMainContactorStableTime\*\*.  
The supervision can be acknowledged when the signal  
\*\*IO.BladeHeatingBladeBSecondaryContactorFeedbackError\*\* is false.

|                        |                                |                                                               |              |
|------------------------|--------------------------------|---------------------------------------------------------------|--------------|
| <b><u>No: 6058</u></b> | <b>SupervisionID</b>           | <b>Name</b> BladeHeatingMainContactorSecondaryFeedbackErrorSx |              |
|                        | 6058                           |                                                               |              |
| <b>Log text</b>        | BladeC heat cont.secondary err |                                                               |              |
| <b>Subsystem name</b>  | BladeHeating                   |                                                               |              |
| <b>Type</b>            | Warning                        | <b>Timeout</b>                                                | <disabled>   |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                                          | <n/a>        |
| - Allowed attempts     | 3                              | - Max time disconnect                                         | <n/a>        |
| - Time window          | 1 hour                         | - Max time eliminate                                          | <n/a>        |
| - Stabilize period     | 60 second                      | <b>Category</b>                                               | Manufacturer |

**Criteria:**

This warning indicates a feedback issue in the secondary blade contactor.

The supervision is reported if the signal  
\*\*IO.BladeHeatingBladeCSecondaryContactorFeedbackError\*\* is true for a period longer than  
\*\*BladeHeatingMainContactorStableTime\*\*.  
The supervision can be acknowledged when the signal  
\*\*IO.BladeHeatingBladeCSecondaryContactorFeedbackError\*\* is false.

|                        |                               |                                          |              |
|------------------------|-------------------------------|------------------------------------------|--------------|
| <b><u>No: 6059</u></b> | <b>SupervisionID</b> 6059     | <b>Name</b> BladeHeatingImbalanceErrorSx |              |
| <b>Log text</b>        | Blade Heating Imbalance Error |                                          |              |
| <b>Subsystem name</b>  | BladeHeating                  |                                          |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                           | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                     | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                    | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                     | <n/a>        |
| - Stabilize period     | 60 second                     | <b>Category</b>                          | Manufacturer |

**Criteria:**

This warning indicates that the current consumption by the heating elements per blade is imbalanced, indicating high current in the Neutral wire through the rotating connection.

The warning is reported if Neutral current exceeds the limit  
\*\*BladeHeatingNeutralCurrentMax\*\* in a period longer than  
\*\*BladeHeatingNeutralCurrentMaxStableTime\*\*.  
The Neutral current is calculated from the average blade current values  
\*\*BladeHeatingBladeANominalCurrentExpMean\*\*, \*\*BladeHeatingBladeBNominalCurrentExpMean\*\*,  
and \*\*BladeHeatingBladeCNominalCurrentExpMean\*\*.  
The warning can be acknowledged when the Neutral current is below the limit  
\*\*BladeHeatingNeutralCurrentMax\*\*.

|                        |                              |                                               |
|------------------------|------------------------------|-----------------------------------------------|
| <b>No: 6060</b>        | <b>SupervisionID</b> 6060    | <b>Name</b> ColdClimateTrafoTemperatureHighSx |
| <b>Log text</b>        | Cold Climate Trafo Temp High |                                               |
| <b>Subsystem name</b>  | BladeHeating                 |                                               |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                     |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                    |
| - Allowed attempts     | 3                            | - Max time disconnect <n/a>                   |
| - Time window          | 1 hour                       | - Max time eliminate <n/a>                    |
| - Stabilize period     | 10 second                    | <b>Category</b> Manufacturer                  |

**Criteria:**

This warning indicates that the the cold climate transformer temperature is too high.

The warning is reported if the signal **\*\*IO.ColdClimateTransformerTemp\*\*** exceeds the limit **\*\*ColdClimateTrafoTempHighLimit\*\*** for a longer period than **\*\*ColdClimateTrafoTempHighStableTime\*\***.

The warning can be acknowledged when the signal **\*\*IO.ColdClimateTransformerTemp\*\*** is below the limit **\*\*ColdClimateTrafoTempHighLimit\*\*** minus hysteresis **\*\*ColdClimateTrafoTempHighHyst\*\***.

|                        |                           |                                                         |
|------------------------|---------------------------|---------------------------------------------------------|
| <b>No: 6061</b>        | <b>SupervisionID</b> 6061 | <b>Name</b> UserDefinedSupervisionCMSGearboxCommErrorSx |
| <b>Log text</b>        | CMS Gearbox Sensor Error  |                                                         |
| <b>Subsystem name</b>  | UserDefinedSupervision    |                                                         |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                               |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>                              |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>                             |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>                              |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer                            |

**Criteria:**

No communication with the external CMS system.

|                        |                            |                                                     |
|------------------------|----------------------------|-----------------------------------------------------|
| <b>No: 6062</b>        | <b>SupervisionID</b> 6062  | <b>Name</b> UserDefinedSupervisionCMSGenCommErrorSx |
| <b>Log text</b>        | CMS Generator Sensor Error |                                                     |
| <b>Subsystem name</b>  | UserDefinedSupervision     |                                                     |
| <b>Type</b>            | Warning                    | <b>Timeout</b> <disabled>                           |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> <n/a>                          |
| - Allowed attempts     | 3                          | - Max time disconnect <n/a>                         |
| - Time window          | 1 hour                     | - Max time eliminate <n/a>                          |
| - Stabilize period     | 60 second                  | <b>Category</b> Manufacturer                        |

**Criteria:**

No communication with the external CMS system.

|                        |                              |                                                             |
|------------------------|------------------------------|-------------------------------------------------------------|
| <b>No: 6063</b>        | <b>SupervisionID</b> 6063    | <b>Name</b> UserDefinedSupervisionCMSMainBearingCommErrorSx |
| <b>Log text</b>        | CMS MainBearing Sensor Error |                                                             |
| <b>Subsystem name</b>  | UserDefinedSupervision       |                                                             |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                                   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                                  |
| - Allowed attempts     | 3                            | - Max time disconnect <n/a>                                 |
| - Time window          | 1 hour                       | - Max time eliminate <n/a>                                  |
| - Stabilize period     | 60 second                    | <b>Category</b> Manufacturer                                |

**Criteria:**

No communication with the external CMS system.

**No: 6064**                      **SupervisionID** 6064    **Name** UserDefinedSupervisionCMSTowerCommErrorSx  
**Log text**                      CMS Tower Sensor Error  
**Subsystem name**              UserDefinedSupervision  
**Type**                          Warning                      **Timeout**                      <disabled>  
**Acknowledgement**              Auto                          **Shutdown type**                  <n/a>  
- **Allowed attempts**              3                              - **Max time disconnect**              <n/a>  
- **Time window**                  1 hour                      - **Max time eliminate**              <n/a>  
- **Stabilize period**              60 second                  **Category**                      Manufacturer  
**Criteria:**  
No communication with the external CMS system.

**No: 6073**                      **SupervisionID** 6073              **Name** NacelleEmergencyResetNeededSx  
**Log text**                      Awaiting safety reset pressed  
**Subsystem name**              SafetySystem  
**Type**                          Alarm                          **Timeout**                      <n/a>  
**Acknowledgement**              Remote                          **Shutdown type**                  StopSlow  
- **Allowed attempts**              <n/a>                          - **Max time disconnect**              3 second  
- **Time window**                  <n/a>                          - **Max time eliminate**              9 second  
- **Stabilize period**              <n/a>                          **Category**                      Manufacturer  
**Criteria:**  
This alarm is used to indicate to the user that the safety system needs a reset by pressing one of the reset buttons or otherwise to release the Nacelle Emergency Latch.

The alarm is raised if the Nacelle Emergency Latch is active  
(\*\*IO.SafetySystemNacelleEmergencyLatchReleased\*\* is false).

To reset the nacelle emergency latch, press one of the reset buttons or otherwise reset the safety system.

The alarm can be acknowledged when \*\*IO.SafetySystemNacelleEmergencyLatchReleased\*\* is true.

Note: When the alarm is no longer reported a safety system reset is initiated.

**No: 6074**                      **SupervisionID** 6074              **Name** HubEmergencyResetNeededSx  
**Log text**                      Awaiting safety reset pressed  
**Subsystem name**              SafetySystem  
**Type**                          Alarm                          **Timeout**                      <n/a>  
**Acknowledgement**              Remote                          **Shutdown type**                  StopSlow  
- **Allowed attempts**              <n/a>                          - **Max time disconnect**              3 second  
- **Time window**                  <n/a>                          - **Max time eliminate**              9 second  
- **Stabilize period**              <n/a>                          **Category**                      Manufacturer  
**Criteria:**  
This alarm is used to indicate to the user that the safety system needs a reset by pressing one of the reset buttons or otherwise to release the Hub Emergency Latch.

The alarm is raised if the Hub Emergency Latch is active  
(\*\*IO.SafetySystemHubEmergencyLatchReleased\*\* is false).

To reset the hub emergency latch, press one of the reset buttons or otherwise reset the safety system.

The alarm can be acknowledged when \*\*IO.SafetySystemHubEmergencyLatchReleased\*\* is true.

Note: When the alarm is no longer reported a safety system reset is initiated.

|                        |                               |                                            |
|------------------------|-------------------------------|--------------------------------------------|
| <b>No: 6075</b>        | <b>SupervisionID</b> 6075     | <b>Name</b> BladeHeatingLeakCurrentErrorSx |
| <b>Log text</b>        | BladeA Heat. Leak Curr. Error |                                            |
| <b>Subsystem name</b>  | BladeHeating                  |                                            |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                  |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                 |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>                 |
| - Stabilize period     | 60 second                     | <b>Category</b> Manufacturer               |

**Criteria:**

This warning indicates that the ground fault protection circuit has been tripped by too high leak current in the blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeALeakCurrentOk\*\*** is false. The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeALeakCurrentOk\*\*** is true.

|                        |                               |                                            |
|------------------------|-------------------------------|--------------------------------------------|
| <b>No: 6076</b>        | <b>SupervisionID</b> 6076     | <b>Name</b> BladeHeatingLeakCurrentErrorSx |
| <b>Log text</b>        | BladeB Heat. Leak Curr. Error |                                            |
| <b>Subsystem name</b>  | BladeHeating                  |                                            |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                  |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                 |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>                 |
| - Stabilize period     | 60 second                     | <b>Category</b> Manufacturer               |

**Criteria:**

This warning indicates that the ground fault protection circuit has been tripped by too high leak current in the blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeBLeakCurrentOk\*\*** is false. The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeBLeakCurrentOk\*\*** is true.

|                        |                               |                                            |
|------------------------|-------------------------------|--------------------------------------------|
| <b>No: 6077</b>        | <b>SupervisionID</b> 6077     | <b>Name</b> BladeHeatingLeakCurrentErrorSx |
| <b>Log text</b>        | BladeC Heat. Leak Curr. Error |                                            |
| <b>Subsystem name</b>  | BladeHeating                  |                                            |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                  |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                 |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>                 |
| - Stabilize period     | 60 second                     | <b>Category</b> Manufacturer               |

**Criteria:**

This warning indicates that the ground fault protection circuit has been tripped by too high leak current in the blade.

The warning is reported if the signal **\*\*IO.BladeHeatingBladeCLeakCurrentOk\*\*** is false. The warning can be acknowledged when the signal **\*\*IO.BladeHeatingBladeCLeakCurrentOk\*\*** is true.

|                        |                           |                                    |
|------------------------|---------------------------|------------------------------------|
| <b>No: 6078</b>        | <b>SupervisionID</b> 6078 | <b>Name</b> HubInSafeModePendingSx |
| <b>Log text</b>        | Hub in safe mode pending  |                                    |
| <b>Subsystem name</b>  | HubInSafeMode             |                                    |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>               |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow     |
| - Allowed attempts     | Unlimited                 | - Max time disconnect 9 second     |
| - Time window          | <n/a>                     | - Max time eliminate 10 second     |
| - Stabilize period     | 0 second                  | <b>Category</b> Manufacturer       |

**Criteria:**

This alarm is raised to inform user the turbine is not producing the power due to pending hub in safe mode.

The alarm is raised during preparation for hub in safe mode (hub in safe mode is entered from the operator panel and/or service switch is activated (\*\*IO.HubInSafeModeHubServiceSwitchActivated\*\* is true)).

The alarm is acknowledged while the turbine is in hub in safe mode. No alarms are present in hub in safe mode to enable operator to perform the requested tests.

|                        |                               |                                                           |
|------------------------|-------------------------------|-----------------------------------------------------------|
| <b>No: 6079</b>        | <b>SupervisionID</b> 6079     | <b>Name</b> IceDetectorIceDetectedInBladeAutoAckWarningSx |
| <b>Log text</b>        | IceDetectedInBladeAutoAckWarn |                                                           |
| <b>Subsystem name</b>  | IceDetector                   |                                                           |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                                 |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                                |
| - Allowed attempts     | Unlimited                     | - Max time disconnect <n/a>                               |
| - Time window          | <n/a>                         | - Max time eliminate <n/a>                                |
| - Stabilize period     | 10 second                     | <b>Category</b> Environmental                             |

**Criteria:**

Warning that ice has been detected in Turbine.

This Warning is triggered if the following conditions are met:

- If Px\_IceDetectorSupervisionStrategy = Variant 0
- IceDetectorIceDetectedProvidedBySCADA is true or
- IceDetectorIceDetectedProvidedByVID is IceDetected and Px\_IceDetectorInHubInstalled is true

The Warning can only be auto acknowledged when no ice detected.

|                        |                           |                                       |
|------------------------|---------------------------|---------------------------------------|
| <b>No: 6080</b>        | <b>SupervisionID</b> 6080 | <b>Name</b> HydrHighPressPumpsNotOkSx |
| <b>Log text</b>        | HydrHighPressPumpNotOk    |                                       |
| <b>Subsystem name</b>  | HydraulicStation          |                                       |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                  |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow         |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second        |
| - Time window          | 1 hour                    | - Max time eliminate 9 second         |
| - Stabilize period     | 120 second                | <b>Category</b> Manufacturer          |

**Criteria:**

This alarm is raised if one or more active supervisions on both pump 1 and pump 2 are present at the same time.



|                        |                                |                                                   |
|------------------------|--------------------------------|---------------------------------------------------|
| <b>No: 6082</b>        | <b>SupervisionID</b> 6082      | <b>Name</b> SafetySystemConverterProtectionStopSx |
| <b>Log text</b>        | SafetySystemConvProtectionStop |                                                   |
| <b>Subsystem name</b>  | SafetySystem                   |                                                   |
| <b>Type</b>            | Alarm                          | Timeout <n/a>                                     |
| <b>Acknowledgement</b> | Auto                           | Shutdown type StopSlow                            |
| - Allowed attempts     | 3                              | - Max time disconnect 3 second                    |
| - Time window          | 1 hour                         | - Max time eliminate 9 second                     |
| - Stabilize period     | 60 second                      | Category Manufacturer                             |

**Criteria:**

This alarm indicates that the safety system has detected that the converter protection stop is active.

This alarm is reported if the signal **\*\*IO.ConverterReady\*\*** is true and **\*\*IO.ConverterProtectionStopOk\*\*** is false.

The alarm is auto acknowledged if the the signal **\*\*IO.ConverterReady\*\*** is false or **\*\*IO.ConverterProtectionStopOk\*\*** is true.

|                        |                              |                                                 |
|------------------------|------------------------------|-------------------------------------------------|
| <b>No: 6104</b>        | <b>SupervisionID</b> 6104    | <b>Name</b> NacelleLiquidCoolingPump1PressLowSx |
| <b>Log text</b>        | NacLiquidP1PressLow__._bar   |                                                 |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1 |                                                 |
| <b>Type</b>            | Warning                      | Timeout <disabled>                              |
| <b>Acknowledgement</b> | Auto                         | Shutdown type <n/a>                             |
| - Allowed attempts     | 3                            | - Max time disconnect <n/a>                     |
| - Time window          | 1 hour                       | - Max time eliminate <n/a>                      |
| - Stabilize period     | 10 minute                    | Category Manufacturer                           |

**Criteria:**

The warning indicates that the Nacelle Liquid Cooling Pump #1 Pressure drops below a certain limit when running for a given amount of time.

The warning is raised if the Nacelle Liquid Cooling Pump #1 Pressure (**\*\*IO.NacelleLiquidCoolingPump1Press\*\***) drops below the LOWER\_LIMIT for more than the time interval given by the parameter **\*\*PumpPressLow\*\***. The pump needs to be running for a minimum amounf of time given by the parameter **\*\*PumpActiveStableTime\*\***.

The warning is auto acknowledged, if the Nacelle Liquid Cooling Pump #1 Pressure is equal or above the parameter **\*\*PumpPressLow\*\***, or the pump is stopped.

|                        |                               |                                                    |              |
|------------------------|-------------------------------|----------------------------------------------------|--------------|
| <b>No: 6105</b>        | <b>SupervisionID</b> 6105     | <b>Name</b> NacelleLiquidCoolingPump1PressTooLowSx |              |
| <b>Log text</b>        | NacLiquidP1PressTooLow__._bar |                                                    |              |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1  |                                                    |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                     | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                               | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                              | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                               | <n/a>        |
| - Stabilize period     | 30 second                     | <b>Category</b>                                    | Manufacturer |

**Criteria:**

The warning indicates that the Nacelle Liquid Cooling Pump #1 Pressure drops below a certain limit when running for a given amount of time.

The warning is raised if the Nacelle Liquid Cooling Pump #1 Pressure (\*\*IO.NacelleLiquidCoolingPump1Press\*\*) drops below the LOWEST\_LIMIT for more than the time interval given by the parameter \*\*PumpPressTooLowTime\*\*. The pump needs to be running for a minimum amount of time given by the parameter \*\*PumpPressTooLowTime\*\*.

The warning requires remote acknowledgment.

|                        |                               |                                                    |              |
|------------------------|-------------------------------|----------------------------------------------------|--------------|
| <b>No: 6106</b>        | <b>SupervisionID</b> 6106     | <b>Name</b> NacelleLiquidCoolingPump1ThermoFaultSx |              |
| <b>Log text</b>        | NacLiquidCoolPump1ThermoFault |                                                    |              |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1  |                                                    |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                     | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                               | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                              | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                               | <n/a>        |
| - Stabilize period     | 120 second                    | <b>Category</b>                                    | Manufacturer |

**Criteria:**

This warning is raised when the thermo protection feedback of Pump 1 is active.

If the pump is overloaded (\*\*IO.NacelleLiquidCoolingPump1Overloaded\*\*), a supervision must be reported, and the pump must be stopped.

The warning is auto acknowledged when the overloaded condition disappears.

|                        |                              |                                                         |              |
|------------------------|------------------------------|---------------------------------------------------------|--------------|
| <b><u>No: 6107</u></b> | <b>SupervisionID</b>         | <b>Name</b> NacelleLiquidCoolingPump1NegativeFeedbackSx |              |
|                        | 6107                         |                                                         |              |
| <b>Log text</b>        | NacLiquidCoolPump1NegFBError |                                                         |              |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1 |                                                         |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                                          | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                                    | <n/a>        |
| - Allowed attempts     | 3                            | - Max time disconnect                                   | <n/a>        |
| - Time window          | 1 hour                       | - Max time eliminate                                    | <n/a>        |
| - Stabilize period     | 120 second                   | <b>Category</b>                                         | Manufacturer |

#### Criteria:

This warning is indicating that the contactor for the nacelle liquid cooling pump #1 does not close when the control output is activated.

The warning is raised if **\*\*IO.NacelleLiquidCoolingPump1ContactorClosed\*\*** does not change to true within the time **\*\*NacelleLiquidCoolingPumpFeedbackTime\*\*** after **\*\*IO.NacelleLiquidCoolingPump1Start\*\*** has changed from false to true.

The warning is auto acknowledged when the two signals **\*\*IO.NacelleLiquidCoolingPump1Start\*\*** and **\*\*IO.NacelleLiquidCoolingPump1ContactorClosed\*\*** are aligned at either true or false level.

|                           |                              |                                                         |              |
|---------------------------|------------------------------|---------------------------------------------------------|--------------|
| <b><u>No: 6108</u></b>    | <b>SupervisionID</b>         | <b>Name</b> NacelleLiquidCoolingPump1PositiveFeedbackSx |              |
|                           | 6108                         |                                                         |              |
| <b>Log text</b>           | NacLiquidCoolPump1PosFBError |                                                         |              |
| <b>Subsystem name</b>     | NacelleLiquidCoolingVariant1 |                                                         |              |
| <b>Type</b>               | Warning                      | <b>Timeout</b>                                          | <disabled>   |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b>                                    | <n/a>        |
| <b>- Allowed attempts</b> | 3                            | <b>- Max time disconnect</b>                            | <n/a>        |
| <b>- Time window</b>      | 1 hour                       | <b>- Max time eliminate</b>                             | <n/a>        |
| <b>- Stabilize period</b> | 120 second                   | <b>Category</b>                                         | Manufacturer |

#### Criteria:

This warning is indicating that the contactor for the nacelle liquid cooling pump #1 does not open when the control output is deactivated.

The warning is raised if **\*\*IO.NacelleLiquidCoolingPump1ContactorClosed\*\*** does not change to false within the time **\*\*NacelleLiquidCoolingPumpFeedbackTime\*\*** after **\*\*IO.NacelleLiquidCoolingPump1Start\*\*** has changed from true to false.

The warning is auto acknowledged when the two signals **\*\*IO.NacelleLiquidCoolingPump1Start\*\*** and **\*\*IO.NacelleLiquidCoolingPump1ContactorClosed\*\*** are aligned at either true or false level.

|                        |                              |                                               |
|------------------------|------------------------------|-----------------------------------------------|
| <b>No: 6109</b>        | <b>SupervisionID</b> 6109    | <b>Name</b> NacelleLiquidCoolingPump1CBOpenSx |
| <b>Log text</b>        | NacLiquidCoolPump1CBOpen     |                                               |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1 |                                               |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                     |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                    |
| - Allowed attempts     | 3                            | - Max time disconnect <n/a>                   |
| - Time window          | 1 hour                       | - Max time eliminate <n/a>                    |
| - Stabilize period     | 120 second                   | <b>Category</b> Manufacturer                  |

**Criteria:**

This warning supervises that the pump circuit breaker is closed.  
If the circuit breaker is open (\*\*IO.NacelleLiquidCoolingPump1CBClosed\*\* is false) a warning is raised.

The warning is auto acknowledged when the circuit breaker closes.

|                        |                              |                                                 |
|------------------------|------------------------------|-------------------------------------------------|
| <b>No: 6110</b>        | <b>SupervisionID</b> 6110    | <b>Name</b> NacelleLiquidCoolingPump2PressLowSx |
| <b>Log text</b>        | NacLiquidP2PressLow___.__bar |                                                 |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1 |                                                 |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                       |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                      |
| - Allowed attempts     | 3                            | - Max time disconnect <n/a>                     |
| - Time window          | 1 hour                       | - Max time eliminate <n/a>                      |
| - Stabilize period     | 10 minute                    | <b>Category</b> Manufacturer                    |

**Criteria:**

The warning indicates that the Nacelle Liquid Cooling Pump #2 Pressure drops below a certain limit when running for a given amount of time.

The warning is raised if the Nacelle Liquid Cooling Pump #2 Pressure (\*\*IO.NacelleLiquidCoolingPump2Press\*\*) drops below the LOWER\_LIMIT for more than the time interval given by the parameter \*\*PumpPressLow\*\*. The pump needs to be running for a minimum amount of time given by the parameter \*\*PumpActiveStableTime\*\*.

The warning is auto acknowledged, if the Nacelle Liquid Cooling Pump #2 Pressure is equal or above the parameter \*\*PumpPressLow\*\*, or the pump is stopped.

|                        |                                 |                                                    |
|------------------------|---------------------------------|----------------------------------------------------|
| <b>No: 6111</b>        | <b>SupervisionID</b> 6111       | <b>Name</b> NacelleLiquidCoolingPump2PressTooLowSx |
| <b>Log text</b>        | NacLiquidP2PressTooLow___.__bar |                                                    |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1    |                                                    |
| <b>Type</b>            | Warning                         | <b>Timeout</b> <disabled>                          |
| <b>Acknowledgement</b> | Auto                            | <b>Shutdown type</b> <n/a>                         |
| - Allowed attempts     | 3                               | - Max time disconnect <n/a>                        |
| - Time window          | 1 hour                          | - Max time eliminate <n/a>                         |
| - Stabilize period     | 30 second                       | <b>Category</b> Manufacturer                       |

**Criteria:**

The warning indicates that the Nacelle Liquid Cooling Pump #2 Pressure drops below a certain limit when running for a given amount of time.

The warning is raised if the Nacelle Liquid Cooling Pump #2 Pressure (\*\*IO.NacelleLiquidCoolingPump2Press\*\*) drops below the LOWEST\_LIMIT for more than the time interval given by the parameter \*\*PumpPressTooLowTime\*\*. The pump needs to be running for a minimum amount of time given by the parameter \*\*PumpPressTooLowTime\*\*.

The warning requires remote acknowledgment.

|                        |                               |                                                    |              |
|------------------------|-------------------------------|----------------------------------------------------|--------------|
| <b>No: 6112</b>        | <b>SupervisionID</b> 6112     | <b>Name</b> NacelleLiquidCoolingPump2ThermoFaultSx |              |
| <b>Log text</b>        | NacLiquidCoolPump2ThermoFault |                                                    |              |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1  |                                                    |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                     | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                               | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                              | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                               | <n/a>        |
| - Stabilize period     | 120 second                    | <b>Category</b>                                    | Manufacturer |

**Criteria:**

This warning is raised when the thermo protection feedback of Pump 2 is active.

If the pump is overloaded (\*\*IO.NacelleLiquidCoolingPump2Overloaded\*\*), a supervision must be reported, and the pump must be stopped.

The warning is auto acknowledged when the overloaded condition disappears.

|                        |                              |                                                         |              |
|------------------------|------------------------------|---------------------------------------------------------|--------------|
| <b>No: 6113</b>        | <b>SupervisionID</b> 6113    | <b>Name</b> NacelleLiquidCoolingPump2NegativeFeedbackSx |              |
| <b>Log text</b>        | NacLiquidCoolPump2NegFBError |                                                         |              |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1 |                                                         |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                                          | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                                    | <n/a>        |
| - Allowed attempts     | 3                            | - Max time disconnect                                   | <n/a>        |
| - Time window          | 1 hour                       | - Max time eliminate                                    | <n/a>        |
| - Stabilize period     | 120 second                   | <b>Category</b>                                         | Manufacturer |

**Criteria:**

This warning is indicating that the contactor for the nacelle liquid cooling pump #2 does not close when the control output is activated.

The warning is raised if \*\*IO.NacelleLiquidCoolingPump2ContactorClosed\*\* does not change to true within the time \*\*NacelleLiquidCoolingPumpFeedbackTime\*\* after \*\*IO.NacelleLiquidCoolingPump2Start\*\* has changed from false to true.

The warning is auto acknowledged when the two signals \*\*IO.NacelleLiquidCoolingPump2Start\*\* and \*\*IO.NacelleLiquidCoolingPump2ContactorClosed\*\* are aligned at either true or false level.

|                        |                              |                                                         |              |
|------------------------|------------------------------|---------------------------------------------------------|--------------|
| <b><u>No: 6114</u></b> | <b>SupervisionID</b>         | <b>Name</b> NacelleLiquidCoolingPump2PositiveFeedbackSx |              |
|                        | 6114                         |                                                         |              |
| <b>Log text</b>        | NacLiquidCoolPump2PosFBError |                                                         |              |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1 |                                                         |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                                          | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                                    | <n/a>        |
| - Allowed attempts     | 3                            | - Max time disconnect                                   | <n/a>        |
| - Time window          | 1 hour                       | - Max time eliminate                                    | <n/a>        |
| - Stabilize period     | 120 second                   | <b>Category</b>                                         | Manufacturer |

**Criteria:**  
This warning is indicating that the contactor for the nacelle liquid cooling pump #2 does not open when the control output is deactivated.

The warning is raised if **\*\*IO.NacelleLiquidCoolingPump2ContactorClosed\*\*** does not change to false within the time **\*\*NacelleLiquidCoolingPumpFeedbackTime\*\*** after **\*\*IO.NacelleLiquidCoolingPump2Start\*\*** has changed from true to false.

The warning is auto acknowledged when the two signals **\*\*IO.NacelleLiquidCoolingPump2Start\*\*** and **\*\*IO.NacelleLiquidCoolingPump2ContactorClosed\*\*** are aligned at either true or false level.

|                        |                              |                                               |
|------------------------|------------------------------|-----------------------------------------------|
| <b>No: 6115</b>        | <b>SupervisionID</b> 6115    | <b>Name</b> NacelleLiquidCoolingPump2CBOpenSx |
| <b>Log text</b>        | NacLiquidCoolPump2CBOpen     |                                               |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1 |                                               |
| <b>Type</b>            | Warning                      | <b>Timeout</b> <disabled>                     |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> <n/a>                    |
| - Allowed attempts     | 3                            | - Max time disconnect <n/a>                   |
| - Time window          | 1 hour                       | - Max time eliminate <n/a>                    |
| - Stabilize period     | 120 second                   | <b>Category</b> Manufacturer                  |

**Criteria:**  
This warning supervises that the pump circuit breaker is closed.  
If the circuit breaker is open (**\*\*IO.NacelleLiquidCoolingPump2CBClosed\*\*** is false) a warning is raised.

The warning is auto acknowledged when the circuit breaker closes.

|                        |                              |                                                          |              |
|------------------------|------------------------------|----------------------------------------------------------|--------------|
| <b><u>No: 6116</u></b> | <b>SupervisionID</b>         | <b>Name</b> NacelleLiquidCoolingHeaterNegativeFeedbackSx |              |
|                        | 6116                         |                                                          |              |
| <b>Log text</b>        | NacLiquidCoolHeatNegFBError  |                                                          |              |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1 |                                                          |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                                           | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                                     | <n/a>        |
| - Allowed attempts     | 3                            | - Max time disconnect                                    | <n/a>        |
| - Time window          | 1 hour                       | - Max time eliminate                                     | <n/a>        |
| - Stabilize period     | 120 second                   | <b>Category</b>                                          | Manufacturer |

**Criteria:**  
This warning is indicating that the contactor for the nacelle liquid cooling heater does not close when the control output is activated.

The warning is raised if **\*\*IO.NacelleLiquidCoolingHeaterContactorClosed\*\*** does not change to true within the time **\*\*HeaterFeedbackTime\*\*** after **\*\*IO.NacelleLiquidCoolingHeaterOn\*\*** has changed from false to true.

The warning is auto acknowledged when the two signals **\*\*IO.NacelleLiquidCoolingHeaterOn\*\*** and **\*\*IO.NacelleLiquidCoolingHeaterContactorClosed\*\*** are aligned at either true or false level.

|                           |                              |                                                          |              |
|---------------------------|------------------------------|----------------------------------------------------------|--------------|
| <b><u>No: 6117</u></b>    | <b>SupervisionID</b>         | <b>Name</b> NacelleLiquidCoolingHeaterPositiveFeedbackSx |              |
|                           | 6117                         |                                                          |              |
| <b>Log text</b>           | NacLiquidCoolHeatPosFBError  |                                                          |              |
| <b>Subsystem name</b>     | NacelleLiquidCoolingVariant1 |                                                          |              |
| <b>Type</b>               | Warning                      | <b>Timeout</b>                                           | <disabled>   |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b>                                     | <n/a>        |
| <b>- Allowed attempts</b> | 3                            | <b>- Max time disconnect</b>                             | <n/a>        |
| <b>- Time window</b>      | 1 hour                       | <b>- Max time eliminate</b>                              | <n/a>        |
| <b>- Stabilize period</b> | 120 second                   | <b>Category</b>                                          | Manufacturer |

**Criteria:**  
This warning is indicating that the contactor for the nacelle liquid cooling heater does not open when the control output is deactivated.

The warning is raised if **\*\*IO.NacelleLiquidCoolingHeaterContactorClosed\*\*** does not change to false within the time **\*\*HeaterFeedbackTime\*\*** after **\*\*IO.NacelleLiquidCoolingHeaterOn\*\*** has changed from true to false.

The warning is auto acknowledged when the two signals **\*\*IO.NacelleLiquidCoolingHeaterOn\*\*** and **\*\*IO.NacelleLiquidCoolingHeaterContactorClosed\*\*** are aligned at either true or false level.

|                        |                              |                                                |              |
|------------------------|------------------------------|------------------------------------------------|--------------|
| <b>No: 6118</b>        | <b>SupervisionID</b> 6118    | <b>Name</b> NacelleLiquidCoolingHeaterCBOpenSx |              |
| <b>Log text</b>        | NacLiquidCoolHeatCBOpen      |                                                |              |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1 |                                                |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                                 | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                           | <n/a>        |
| - Allowed attempts     | 3                            | - Max time disconnect                          | <n/a>        |
| - Time window          | 1 hour                       | - Max time eliminate                           | <n/a>        |
| - Stabilize period     | 120 second                   | <b>Category</b>                                | Manufacturer |

**Criteria:**

This warning supervises that the heater circuit breaker is closed.  
If the circuit breaker is open (\*\*IO.NacelleLiquidCoolingHeaterCBClosed\*\* is false) a warning is raised.

The warning is auto acknowledged when the circuit breaker closes.

|                        |                              |                                                  |              |
|------------------------|------------------------------|--------------------------------------------------|--------------|
| <b>No: 6119</b>        | <b>SupervisionID</b> 6119    | <b>Name</b> NacelleLiquidCoolingLiquidLevelLowSx |              |
| <b>Log text</b>        | NacLiquidCoolLiquidLo ____ 1 |                                                  |              |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1 |                                                  |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                                   | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                             | <n/a>        |
| - Allowed attempts     | 3                            | - Max time disconnect                            | <n/a>        |
| - Time window          | 1 hour                       | - Max time eliminate                             | <n/a>        |
| - Stabilize period     | 60 second                    | <b>Category</b>                                  | Manufacturer |

**Criteria:**

This warning supervises the liquid volume in the tank.

If the liquid level TankLiquidVolume on the tank is lower than the level given by the parameter \*\*MinLiquidVolume\*\* for a certain amount of time given by parameter \*\*MinLiquidVolumeStableTime\*\*, a warning is raised.

TankLiquidVolume is given by the multiplication of \*\*IO.NacelleLiquidCoolingLiquidLevel\*\* times parameter \*\*LiquidLevelToVolume\*\*.

The warning is auto acknowledged when the liquid level is above \*\*MinLiquidVolume\*\* plus a small hysteresis given by parameter \*\*MinLiquidVolumeHyst\*\*.



No: 6120

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

SupervisionID 6120

NacLiquidCoolLiquidHi \_\_\_\_ 1

NacelleLiquidCoolingVariant1

Warning

Auto

3

1 hour

60 second

Name NacelleLiquidCoolingLiquidLevelHighSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<disabled>

<n/a>

<n/a>

<n/a>

Manufacturer

Criteria:

This warning supervises the liquid volume in the tank.

If the liquid level TankLiquidVolume on the tank is higher than the level given by the parameter **\*\*MaxLiquidVolume\*\*** for a certain amount of time given by parameter **\*\*MaxLiquidVolumeStableTime\*\***, a warning is raised.

TankLiquidVolume is given by the multiplication of **\*\*IO.NacelleLiquidCoolingLiquidLevel\*\*** times parameter **\*\*LiquidLevelToVolume\*\***.

The warning is auto acknowledged when the liquid level is below **\*\*MaxLiquidVolume\*\*** minus a small hysteresis given by parameter **\*\*MaxLiquidVolumeHyst\*\***.

No: 6121

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

SupervisionID

6121

NacLiquidCoolBypassFilterClog

NacelleLiquidCoolingVariant1

Warning

Auto

3

1 hour

60 second

Name NacelleLiquidCoolingBypassFilterCloggedSx

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<disabled>

<n/a>

<n/a>

<n/a>

Manufacturer

Criteria:

The warning indicates that the nacelle liquid cooling bypass filter is clogged.

The warning is raised if the bypass filter clean ratio BypassFilterCleanRatio is less than the amount given by parameter **\*\*BypassFilterCloggedRatio\*\***.

The BypassFilterCleanRatio is the result of:

$$\left( 1 - \frac{\text{NacelleLiquidCoolingPump1Press} * \text{BypassFilterPressAvg}}{\text{**BypassFilterCloggedPress**} - \text{Prm\_BypassFilterCleanPress}} \right)$$

BypassFilterPressAvg is the average value of NacelleLiquidCoolingAfterFilterPress in the amount of time given by parameter **\*\*BypassFilterPressAverageTime\*\***.

This warning must be manually acknowledged.

|                        |                               |                                                  |
|------------------------|-------------------------------|--------------------------------------------------|
| <b>No:</b> 6122        | <b>SupervisionID</b> 6122     | <b>Name</b> NacelleLiquidCoolingLiquidTempHighSx |
| <b>Log text</b>        | NacLiquidCoolLiquidHi ____ °C |                                                  |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1  |                                                  |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                        |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                       |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                      |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>                       |
| - Stabilize period     | 60 second                     | <b>Category</b> Manufacturer                     |

**Criteria:**

This warning supervises nacelle liquid cooling liquid temperature.

If cooling has been active for a certain cool down time and the liquid temperature **\*\*IO.NacelleLiquidCoolingTemp\*\*** is higher than the temperature given by parameter **\*\*LiquidTempHigh\*\*** for an amount of time given by parameter **\*\*LiquidTempHighStableTime\*\***, a supervision must be reported.

The liquid temperature can only be measured when there is a liquid flow (LiquidFlowOk is true).

LiquidFlowOk is true if the pressure on nacelle liquid cooling pumps (**\*\*IO.NacelleLiquidCoolingPump1Press\*\*** and **\*\*IO.NacelleLiquidCoolingPump2Press\*\***) is higher than the pressure given by parameter **\*\*PumpPressLow\*\***

The warning can be auto acknowledged when the liquid temperature is less than **\*\*LiquidTempHigh\*\*** minus an hysteresis level **\*\*LiquidTempHighHyst\*\***.

|                        |                                  |                                                     |
|------------------------|----------------------------------|-----------------------------------------------------|
| <b>No:</b> 6123        | <b>SupervisionID</b> 6123        | <b>Name</b> NacelleLiquidCoolingLiquidTempTooHighSx |
| <b>Log text</b>        | NacLiquidCoolLiquidTooHi ____ °C |                                                     |
| <b>Subsystem name</b>  | NacelleLiquidCoolingVariant1     |                                                     |
| <b>Type</b>            | Alarm                            | <b>Timeout</b> <n/a>                                |
| <b>Acknowledgement</b> | Remote                           | <b>Shutdown type</b> PauseSlow                      |
| - Allowed attempts     | <n/a>                            | - Max time disconnect 9 second                      |
| - Time window          | <n/a>                            | - Max time eliminate 10 second                      |
| - Stabilize period     | <n/a>                            | <b>Category</b> Manufacturer                        |

**Criteria:**

This warning supervises nacelle liquid cooling liquid temperature.

If cooling has been active for a certain cool down time and the liquid temperature **\*\*IO.NacelleLiquidCoolingTemp\*\*** is higher than the temperature given by the sum of parameters **\*\*CoolingValveSetpointHeatingTemp\*\*** and **\*\*LiquidTempHighHyst\*\*** for an amount of time given by parameter **\*\*LiquidTempHighStableTime\*\***, an alarm must be reported and the turbine stopped.

The liquid temperature can only be measured when there is a liquid flow (LiquidFlowOk is true).

LiquidFlowOk is true if the pressure on nacelle liquid cooling pumps (**\*\*IO.NacelleLiquidCoolingPump1Press\*\*** and **\*\*IO.NacelleLiquidCoolingPump2Press\*\***) is higher than the pressure given by parameter **\*\*PumpPressLow\*\***

This alarm must be manually acknowledged.

|                        |                            |                                          |
|------------------------|----------------------------|------------------------------------------|
| <b>No: 6136</b>        | <b>SupervisionID</b> 6136  | <b>Name</b> SimulinkDataBlockReadErrorSx |
| <b>Log text</b>        | Data file fail-see opr log |                                          |
| <b>Subsystem name</b>  | DataBlockSupervision       |                                          |
| <b>Type</b>            | Alarm                      | <b>Timeout</b> <n/a>                     |
| <b>Acknowledgement</b> | Remote                     | <b>Shutdown type</b> PauseSlow           |
| - Allowed attempts     | <n/a>                      | - Max time disconnect 60 second          |
| - Time window          | <n/a>                      | - Max time eliminate 60 second           |
| - Stabilize period     | <n/a>                      | <b>Category</b> Manufacturer             |

**Criteria:**

This alarm is raised if any of the referenced data files cannot be read.  
The code originates from the Simulink blocks constFromFile and jsonFromFile  
A number of different faults can occur: encoded by this enumeration  
eOk = 0;  
eFileOrTagNameEmpty = 1;  
eFileTooLarge = 2;  
eFileCouldNotBeFoundOrOpened = 3;  
eTableTagNotFound = 4;  
eInvalidJsonSyntax = 5;  
eNothingReadFromFile = 6;  
eIncorrect\_data\_size = 7;  
eXvectorNotMonotonic = 8;  
eYvectorNotMonotonic = 9;  
eUninitialized = 10;

An operation log with specific error info can be found

|                        |                           |                                  |
|------------------------|---------------------------|----------------------------------|
| <b>No: 6148</b>        | <b>SupervisionID</b> 6148 | <b>Name</b> GenAirCoolingErrorSx |
| <b>Log text</b>        | GenAirCoolingError        |                                  |
| <b>Subsystem name</b>  | Generator                 |                                  |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>             |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow   |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second   |
| - Time window          | 1 hour                    | - Max time eliminate 10 second   |
| - Stabilize period     | 10 second                 | <b>Category</b> Manufacturer     |

**Criteria:**

This alarm is indicating that too many fans are not functional and the air cooling system cannot provide sufficient cooling during power production.

The alarm is raised when the amount of functional fans are below the minimum limit specified by **\*\*MinNoOfFunctionalFans\*\***.

Fan<N> is not functional if one the following conditions is met:

- GenCoolingFan<N>Error warning is active
- Not PowerOK

PowerOK is true if all of the following conditions are met:

- Operation is allowed GenCoolingFanland2Start(for Fan 1 and Fan 2) or GenCoolingFan3and4Start (for Fan 3 and Fan 4)
- GenCoolingFan<N>CBOpen is not active

where N is the Fan number.

The alarm is auto acknowledged when the amount of functional fans is above or equal to **\*\*MinNoOfFunctionalFans\*\***.

|                        |                           |                                   |              |
|------------------------|---------------------------|-----------------------------------|--------------|
| <b>No: 6150</b>        | <b>SupervisionID</b> 6150 | <b>Name</b> GenCoolingFanCBOpenSx |              |
| <b>Log text</b>        | GenCoolFan1CBOpen         |                                   |              |
| <b>Subsystem name</b>  | Generator                 |                                   |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                    | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>              | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect             | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate              | <n/a>        |
| - Stabilize period     | 10 second                 | <b>Category</b>                   | Manufacturer |

**Criteria:**

This warning is indicating that CB is open.

The warning is raised when **\*\*IO.GenCoolingFanCBClosed\*\*** is false, meaning that the CB is open.

The warning is auto acknowledged when CB is closed, which is verified when **\*\*IO.GenCoolingFanCBClosed\*\*** is true

|                        |                           |                                   |              |
|------------------------|---------------------------|-----------------------------------|--------------|
| <b>No: 6152</b>        | <b>SupervisionID</b> 6152 | <b>Name</b> GenCoolingFan1ErrorSx |              |
| <b>Log text</b>        | GenCoolingFan1Error       |                                   |              |
| <b>Subsystem name</b>  | Generator                 |                                   |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                    | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>              | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect             | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate              | <n/a>        |
| - Stabilize period     | 30 second                 | <b>Category</b>                   | Manufacturer |

**Criteria:**

This warning is indicating the fan 1 is not OK.

The warning is raised when **\*\*IO.GenCoolingFan1Ok\*\*** is false within **\*\*FanOkStableTime\*\***.

The warning is auto acknowledged when the **\*\*IO.GenCoolingFan1Ok\*\*** is true.

|                        |                           |                                   |              |
|------------------------|---------------------------|-----------------------------------|--------------|
| <b>No: 6154</b>        | <b>SupervisionID</b> 6154 | <b>Name</b> GenCoolingFan2ErrorSx |              |
| <b>Log text</b>        | GenCoolingFan2Error       |                                   |              |
| <b>Subsystem name</b>  | Generator                 |                                   |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                    | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>              | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect             | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate              | <n/a>        |
| - Stabilize period     | 30 second                 | <b>Category</b>                   | Manufacturer |

**Criteria:**

This warning is indicating the fan 2 is not OK.

The warning is raised when **\*\*IO.GenCoolingFan2Ok\*\*** is false within **\*\*FanOkStableTime\*\***.

The warning is auto acknowledged when the **\*\*IO.GenCoolingFan2Ok\*\*** is true.

|                        |                           |                                   |
|------------------------|---------------------------|-----------------------------------|
| <b>No: 6158</b>        | <b>SupervisionID</b> 6158 | <b>Name</b> GenCoolingFan3ErrorSx |
| <b>Log text</b>        | GenCoolingFan3Error       |                                   |
| <b>Subsystem name</b>  | Generator                 |                                   |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>         |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>       |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>        |
| - Stabilize period     | 30 second                 | <b>Category</b> Manufacturer      |

**Criteria:**  
This warning is indicating the fan 3 is not OK.

The warning is raised when **\*\*IO.GenCoolingFan3Ok\*\*** is false within **\*\*FanOkStableTime\*\***.

The warning is auto acknowledged when the **\*\*IO.GenCoolingFan3Ok\*\*** is true.

|                        |                           |                                   |
|------------------------|---------------------------|-----------------------------------|
| <b>No: 6160</b>        | <b>SupervisionID</b> 6160 | <b>Name</b> GenCoolingFan4ErrorSx |
| <b>Log text</b>        | GenCoolingFan4Error       |                                   |
| <b>Subsystem name</b>  | Generator                 |                                   |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>         |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>       |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>        |
| - Stabilize period     | 30 second                 | <b>Category</b> Manufacturer      |

**Criteria:**  
This warning is indicating the fan 4 is not OK.

The warning is raised when **\*\*IO.GenCoolingFan4Ok\*\*** is false within **\*\*FanOkStableTime\*\***.

The warning is auto acknowledged when the **\*\*IO.GenCoolingFan4Ok\*\*** is true.

|                        |                           |                                 |
|------------------------|---------------------------|---------------------------------|
| <b>No: 6162</b>        | <b>SupervisionID</b> 6162 | <b>Name</b> GenMagnetTempHighSx |
| <b>Log text</b>        | GenMagnetTempHigh         |                                 |
| <b>Subsystem name</b>  | Generator                 |                                 |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>            |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow  |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second  |
| - Time window          | 1 hour                    | - Max time eliminate 10 second  |
| - Stabilize period     | 10 minute                 | <b>Category</b> Manufacturer    |

**Criteria:**  
This alarm is indicating that generator magnet temperature is too high.

The alarm is raised when MagnetTempMax is above the maximum limit specified by **\*\*MagnetMaxTemp\*\*** within **\*\*TempSensorStableTime\*\***

- MagnetTempMax is calculated based on the the following formula:  
$$\text{**IO.GenInletAirTemp**} * \text{**CoolingConst**} + \text{StatorTempMax} * \text{**StatorConst**} + \text{**MagnetOffsetTemp**}$$
- StatorTempMax is calculated based on the maximum value from **\*\*IO.GenStatorTopTemp1\*\***, **\*\*IO.GenStatorTopTemp2\*\***, **\*\*IO.GenStatorTopTemp3\*\***, **\*\*IO.GenStatorBottomTemp1\*\***, **\*\*IO.GenStatorBottomTemp2\*\***, **\*\*IO.GenStatorBottomTemp3\*\***

The alarm is Auto acknowledged when generator powertap maximum temperature is below the limit defined by

$$\text{PowerTapMaxTemp} - \text{PowerTapMaxTempHyst}$$

|                           |                             |                                              |
|---------------------------|-----------------------------|----------------------------------------------|
| <b>No: 6164</b>           | <b>SupervisionID</b> 6164   | <b>Name</b> GenMagnetWarmInColdEnvironmentSx |
| <b>Log text</b>           | GenMagnetTempHighAtColdCond |                                              |
| <b>Subsystem name</b>     | Generator                   |                                              |
| <b>Type</b>               | Warning                     | <b>Timeout</b> <disabled>                    |
| <b>Acknowledgement</b>    | Auto                        | <b>Shutdown type</b> <n/a>                   |
| - <b>Allowed attempts</b> | 3                           | - <b>Max time disconnect</b> <n/a>           |
| - <b>Time window</b>      | 1 hour                      | - <b>Max time eliminate</b> <n/a>            |
| - <b>Stabilize period</b> | 60 second                   | <b>Category</b> Manufacturer                 |

**Criteria:**  
This warning is indicating that the turbine is being derated due to high generator magnet temperature in cold environment.

The warning is raised when DerateActive and IO.EnvironmentTemp is below the maximum limit specified by **\*\*EnvironmentHighTempLimit\*\*** - **\*\*WarmEnvironmentMargin\*\***.

- DerateActive is true when MagnetTempMax is greater than **\*\*DerateMagnetTemp1\*\*** + **\*\*DerateMagnetTemp1Hyst\*\***
- MagnetTempMax is calculated based on the the following formula:  
**\*\*IO.GenInletAirTemp\*\*** \* **\*\*CoolingConst\*\*** + **StatorTempMax** \* **\*\*StatorConst\*\*** + **\*\*MagnetOffsetTemp\*\***
- StatorTempMax is calculated based on the maximum value from **\*\*IO.GenStatorTopTemp1\*\***, **\*\*IO.GenStatorTopTemp2\*\***, **\*\*IO.GenStatorTopTemp3\*\***, **\*\*IO.GenStatorBottomTemp1\*\***, **\*\*IO.GenStatorBottomTemp2\*\***, **\*\*IO.GenStatorBottomTemp3\*\***

The warning can be acknowledged when one of the following conditions is met:

- DerateActive is false
  - MagnetTempMax is less than **\*\*DerateMagnetTemp1\*\***
- Not in a warm environment
  - IO.EnvironmentTemp is greater than (**\*\*EnvironmentHighTempLimit\*\*** - **\*\*WarmEnvironmentMargin\*\***) + **\*\*WarmEnvironmentHyst\*\***

Warning is disabled if **\*\*DerateEnabled\*\*** is false, otherwise is enabled

|                           |                           |                                       |
|---------------------------|---------------------------|---------------------------------------|
| <b>No: 6166</b>           | <b>SupervisionID</b> 6166 | <b>Name</b> GenPowerTapTempHighSx     |
| <b>Log text</b>           | GenPowerTapTempHigh       |                                       |
| <b>Subsystem name</b>     | Generator                 |                                       |
| <b>Type</b>               | Alarm                     | <b>Timeout</b> <n/a>                  |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b> PauseSlow        |
| - <b>Allowed attempts</b> | 3                         | - <b>Max time disconnect</b> 9 second |
| - <b>Time window</b>      | 1 hour                    | - <b>Max time eliminate</b> 10 second |
| - <b>Stabilize period</b> | 10 minute                 | <b>Category</b> Manufacturer          |

**Criteria:**  
This alarm is indicating that generator powertap temperature is too high.

The alarm is raised when PowerTapTempMax is above the maximum limit specified by **\*\*PowerTapMaxTemp\*\*** within **\*\*TempSensorStableTime\*\***

- PowerTapTempMax is calculated based on the maximum value from **\*\*IO.GenPowerTapLeftTemp\*\*** and **\*\*IO.GenPowerTapRightTemp\*\***

The alarm is Auto acknowledged when generator powertap maximum temperature is below the limit defined by **\*\*PowerTapMaxTemp\*\*** - **\*\*PowerTapMaxTempHyst\*\***

|                        |                               |                                                |              |
|------------------------|-------------------------------|------------------------------------------------|--------------|
| <b>No: 6168</b>        | <b>SupervisionID</b> 6168     | <b>Name</b> GenPowerTapWarmInColdEnvironmentSx |              |
| <b>Log text</b>        | GenPowerTapTempHighAtColdCond |                                                |              |
| <b>Subsystem name</b>  | Generator                     |                                                |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                 | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                           | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                          | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                           | <n/a>        |
| - Stabilize period     | 60 second                     | <b>Category</b>                                | Manufacturer |

**Criteria:**

This warning is indicating that the turbine is being derated due to high generator power tap temperature in cold environment.

The warning is raised when DerateActive and IO.EnvironmentTemp is below the maximum limit specified by **\*\*EnvironmentHighTempLimit\*\*** - **\*\*WarmEnvironmentMargin\*\***.

- DerateActive is true when PowerTapTempMax is greater than **\*\*DeratePowerTapTemp1\*\*** + **\*\*DeratePowerTapTemp1Hyst\*\***
- PowerTapTempMax is calculated based on the maximum value from **\*\*IO.GenPowerTapLeftTemp\*\*** and **\*\*IO.GenPowerTapRightTemp\*\***

The warning can be acknowledged when one of the following conditions is met:

- DerateActive is false
  - PowerTapTempMax is less than **\*\*DeratePowerTapTemp1\*\***
- Not in a warm environment
  - IO.EnvironmentTemp is greater than (**\*\*EnvironmentHighTempLimit\*\*** - **\*\*WarmEnvironmentMargin\*\***) + **\*\*WarmEnvironmentHyst\*\***

Warning is disabled if **\*\*DerateEnabled\*\*** is false, otherwise is enabled

|                        |                           |                                 |              |
|------------------------|---------------------------|---------------------------------|--------------|
| <b>No: 6170</b>        | <b>SupervisionID</b> 6170 | <b>Name</b> GenStatorTempHighSx |              |
| <b>Log text</b>        | GenStatorTempHigh         |                                 |              |
| <b>Subsystem name</b>  | Generator                 |                                 |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                  | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>            | PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect           | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate            | 10 second    |
| - Stabilize period     | 10 minute                 | <b>Category</b>                 | Manufacturer |

**Criteria:**

This alarm is indicating that generator stator temperature is too high.

The alarm is raised when StatorTempMax is above the maximum limit specified by **\*\*StatorMaxTemp\*\*** within **\*\*TempSensorStableTime\*\***

- StatorTempMax is calculated based on the maximum value from **\*\*IO.GenStatorTopTemp1\*\***, **\*\*IO.GenStatorTopTemp2\*\***, **\*\*IO.GenStatorTopTemp3\*\***, **\*\*IO.GenStatorBottomTemp1\*\***, **\*\*IO.GenStatorBottomTemp2\*\***, **\*\*IO.GenStatorBottomTemp3\*\***

The alarm is Auto acknowledged when generator maximum temperature is below the limit defined by

**\*\*StatorMaxTemp\*\*** - **\*\*StatorMaxTempHyst\*\***

**No: 6172**                      **SupervisionID** 6172      **Name** GenStatorWarmInColdEnvironmentSx  
**Log text**                      GenStatorTempHighAtColdCond  
**Subsystem name**              Generator  
**Type**                          Warning                      **Timeout**                      <disabled>  
**Acknowledgement**              Auto                      **Shutdown type**              <n/a>  
- **Allowed attempts**              3                      - **Max time disconnect**              <n/a>  
- **Time window**                  1 hour                      - **Max time eliminate**              <n/a>  
- **Stabilize period**              60 second                  **Category**                      Manufacturer  
**Criteria:**  
This warning is indicating that the turbine is being derated due to high generator stator temperature in cold environment.

The warning is raised when DerateActive and IO.EnvironmentTemp is below the maximum limit specified by **\*\*EnvironmentHighTempLimit\*\*** - **\*\*WarmEnvironmentMargin\*\***.  
- DerateActive is true when StatorTempMax is greater than **\*\*DerateStatorTemp1\*\*** + **\*\*DerateStatorTemp1Hyst\*\***  
- StatorTempMax is calculated based on the maximum value from **\*\*IO.GenStatorTopTemp1\*\***, **\*\*IO.GenStatorTopTemp2\*\***, **\*\*IO.GenStatorTopTemp3\*\***, **\*\*IO.GenStatorBottomTemp1\*\***, **\*\*IO.GenStatorBottomTemp2\*\***, **\*\*IO.GenStatorBottomTemp3\*\***

The warning can be acknowledged when one of the following conditions is met:  
- DerateActive is false  
    - StatorTempMax is less than **\*\*DerateStatorTemp1\*\***  
- Not in a warm environment  
    - IO.EnvironmentTemp is greater than (**\*\*EnvironmentHighTempLimit\*\*** - **\*\*WarmEnvironmentMargin\*\***) + **\*\*WarmEnvironmentHyst\*\***

Warning is disabled if **\*\*DerateEnabled\*\*** is false, otherwise is enabled

**No: 6175**                      **SupervisionID** 6175      **Name** UserDefinedSupervisionBatProtectionActiveSx  
**Log text**                      UserDefSupvBatProtectActive  
**Subsystem name**              UserDefinedSupervision  
**Type**                          Alarm                      **Timeout**                      <n/a>  
**Acknowledgement**              Auto                      **Shutdown type**              PauseSlow  
- **Allowed attempts**              Unlimited                  - **Max time disconnect**              9 second  
- **Time window**                  <n/a>                      - **Max time eliminate**              10 second  
- **Stabilize period**              1 second                  **Category**                      Environmental  
**Criteria:**  
Turbine is put into PAUSE by remote control system due to bat protection.

**No: 6176**                      **SupervisionID**              **Name**  
6176                      UserDefinedSupervisionShadowFlickerControlActiveSx  
**Log text**                      UserDefSupvShadowFlickerActive  
**Subsystem name**              UserDefinedSupervision  
**Type**                          Alarm                      **Timeout**                      <n/a>  
**Acknowledgement**              Auto                      **Shutdown type**              PauseSlow  
- **Allowed attempts**              Unlimited                  - **Max time disconnect**              9 second  
- **Time window**                  <n/a>                      - **Max time eliminate**              10 second  
- **Stabilize period**              1 second                  **Category**                      Environmental  
**Criteria:**  
Turbine is put into PAUSE by remote control system to control shadow flickering



|                        |                           |                                            |
|------------------------|---------------------------|--------------------------------------------|
| <b>No: 6178</b>        | <b>SupervisionID</b> 6178 | <b>Name</b> ConverterMSIExternalFanErrorSx |
| <b>Log text</b>        | ConverterMSIExtFanError   |                                            |
| <b>Subsystem name</b>  | ConverterPanelAirCooling  |                                            |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                  |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>                 |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>                |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>                 |
| - Stabilize period     | 30 second                 | <b>Category</b> Manufacturer               |

**Criteria:**

This warning is raised if the external fan is not working as expected.  
This warning is raised when the signal **\*\*IO.ConverterMSIExternalFanOk\*\*** becomes false for **\*\*FanOkStableTime\*\***.

The warning is auto acknowledged when the signal **\*\*IO.ConverterMSIExternalFanOk\*\*** is true.

|                        |                           |                                             |
|------------------------|---------------------------|---------------------------------------------|
| <b>No: 6179</b>        | <b>SupervisionID</b> 6179 | <b>Name</b> ConverterLSIExternalFan1ErrorSx |
| <b>Log text</b>        | ConverterLSIExtFan1Error  |                                             |
| <b>Subsystem name</b>  | ConverterPanelAirCooling  |                                             |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>                  |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>                 |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>                  |
| - Stabilize period     | 30 second                 | <b>Category</b> Manufacturer                |

**Criteria:**

This warning is raised if the external fan is not working as expected.  
This warning is raised when the signal **\*\*IO.ConverterLSIExternalFan1Ok\*\*** becomes false for **\*\*FanOkStableTime\*\***.

The warning is auto acknowledged when the signal **\*\*IO.ConverterLSIExternalFan1Ok\*\*** is true.

|                        |                           |                                             |
|------------------------|---------------------------|---------------------------------------------|
| <b>No: 6180</b>        | <b>SupervisionID</b> 6180 | <b>Name</b> ConverterLSIExternalFan2ErrorSx |
| <b>Log text</b>        | ConverterLSIExtFan2Error  |                                             |
| <b>Subsystem name</b>  | ConverterPanelAirCooling  |                                             |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>                  |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>                 |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>                  |
| - Stabilize period     | 30 second                 | <b>Category</b> Manufacturer                |

**Criteria:**

This warning is raised if the external fan is not working as expected.  
This warning is raised when the signal **\*\*IO.ConverterLSIExternalFan2Ok\*\*** becomes false for **\*\*FanOkStableTime\*\***.

The warning is auto acknowledged when the signal **\*\*IO.ConverterLSIExternalFan2Ok\*\*** is true.

|                        |                           |                                             |
|------------------------|---------------------------|---------------------------------------------|
| <b>No: 6181</b>        | <b>SupervisionID</b> 6181 | <b>Name</b> ConverterMSIExternalFanCBOpenSx |
| <b>Log text</b>        | ConverterMSIExtFanCBOpen  |                                             |
| <b>Subsystem name</b>  | ConverterPanelAirCooling  |                                             |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>                  |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>                 |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>                  |
| - Stabilize period     | 10 second                 | <b>Category</b> Manufacturer                |

**Criteria:**

This warning supervises that the fan circuit breaker is closed.

This warning is raised when the circuit breaker is open

(\*\*IO.ConverterMSIExternalFanCBClosed\*\* is false) for \*\*FanCBStableTime\*\*.

The warning is auto acknowledged when the circuit breaker closes.

|                        |                           |                                             |
|------------------------|---------------------------|---------------------------------------------|
| <b>No: 6182</b>        | <b>SupervisionID</b> 6182 | <b>Name</b> ConverterLSIExternalFanCBOpenSx |
| <b>Log text</b>        | ConverterLSIExtFan1CBOpen |                                             |
| <b>Subsystem name</b>  | ConverterPanelAirCooling  |                                             |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>                  |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>                 |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>                  |
| - Stabilize period     | 10 second                 | <b>Category</b> Manufacturer                |

**Criteria:**

This warning supervises that the fan circuit breaker is closed.

This warning is raised when the circuit breaker is open

(\*\*IO.ConverterLSIExternalFanCBClosed\*\* is false) for \*\*FanCBStableTime\*\*.

The warning is auto acknowledged when the circuit breaker closes.

|                        |                               |                                  |
|------------------------|-------------------------------|----------------------------------|
| <b>No: 6187</b>        | <b>SupervisionID</b> 6187     | <b>Name</b> HydrPump3_CBOpenedSx |
| <b>Log text</b>        | HydrHighPressPump3CBOpenError |                                  |
| <b>Subsystem name</b>  | HydrStationVariant5           |                                  |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>        |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>       |
| - Allowed attempts     | Unlimited                     | - Max time disconnect <n/a>      |
| - Time window          | <n/a>                         | - Max time eliminate <n/a>       |
| - Stabilize period     | 3 second                      | <b>Category</b> Manufacturer     |

**Criteria:**

The warning is reported when the pump 3 Circuit Breaker (CB) is opened.

The warning is raised if the \*\*IO.HydrPump3CBClosed\*\* is false for more than \*\*PumpSupervisionDelay\*\* time.

This warning is auto acknowledged when \*\*IO.HydrPump3CBClosed\*\* is true.

**No: 6188**                      **SupervisionID** 6188                      **Name** HydrPump3\_NegativeFeedbackSx  
**Log text**                      HydrHighPressPump3NegFBError  
**Subsystem name**              HydrStationVariant5  
**Type**                          Warning                      **Timeout**                      <disabled>  
**Acknowledgement**              Auto                      **Shutdown type**              <n/a>  
- **Allowed attempts**              3                      - **Max time disconnect**              <n/a>  
- **Time window**                  1 hour                      - **Max time eliminate**              <n/a>  
- **Stabilize period**              2 minute                      **Category**                      Manufacturer  
**Criteria:**  
The warning is reported when there is a negative feedback on Pump3, i.e. the pump cannot be started.

The warning is reported when **\*\*IO.HydrPump3Start\*\*** is true, but **\*\*IO.HydrPump3ContactorClosed\*\*** is false for more than **\*\*PumpSupervisionDelay\*\*** time.

The warning is automatically acknowledged when **\*\*IO.HydrPump3ContactorClosed\*\*** matches **\*\*IO.HydrPump3Start\*\***, i.e. the signal values are the same.

**No: 6189**                      **SupervisionID** 6189                      **Name** HydrPump3\_PositiveFeedbackSx  
**Log text**                      HydrHighPressPump3PosFBError  
**Subsystem name**              HydrStationVariant5  
**Type**                          Warning                      **Timeout**                      <disabled>  
**Acknowledgement**              Auto                      **Shutdown type**              <n/a>  
- **Allowed attempts**              3                      - **Max time disconnect**              <n/a>  
- **Time window**                  1 hour                      - **Max time eliminate**              <n/a>  
- **Stabilize period**              2 minute                      **Category**                      Manufacturer  
**Criteria:**  
The warning is reported when there is a positive feedback on Pump3, i.e. the pump cannot be stopped.

The warning is reported when **\*\*IO.HydrPump3Start\*\*** is false, but **\*\*IO.HydrPump3ContactorClosed\*\*** is true for more than **\*\*PumpSupervisionDelay\*\*** time.

The warning is automatically acknowledged when **\*\*IO.HydrPump3ContactorClosed\*\*** matches **\*\*IO.HydrPump3Start\*\***, i.e. the signal values are the same.

**No: 6190**                      **SupervisionID** 6190                      **Name** HydrPump3\_ThermoFaultSx  
**Log text**                      HydrHighPressPump3ThermoError  
**Subsystem name**              HydrStationVariant5  
**Type**                          Warning                      **Timeout**                      <disabled>  
**Acknowledgement**              Auto                      **Shutdown type**              <n/a>  
- **Allowed attempts**              3                      - **Max time disconnect**              <n/a>  
- **Time window**                  1 hour                      - **Max time eliminate**              <n/a>  
- **Stabilize period**              2 minute                      **Category**                      Manufacturer  
**Criteria:**  
The warning is reported when Pump3 is overloaded.

The warning is reported when **\*\*IO.HydrPump3Overloaded\*\*** is true for than **\*\*PumpSupervisionDelay\*\*** time.

The warning is automatically acknowledged when **\*\*IO.HydrPump3Overloaded\*\*** is false.

|                        |                               |                                  |              |
|------------------------|-------------------------------|----------------------------------|--------------|
| <b>No: 6191</b>        | <b>SupervisionID</b> 6191     | <b>Name</b> HydrPump4_CBOpenedSx |              |
| <b>Log text</b>        | HydrHighPressPump4CBOpenError |                                  |              |
| <b>Subsystem name</b>  | HydrStationVariant5           |                                  |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                   | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>             | <n/a>        |
| - Allowed attempts     | Unlimited                     | - Max time disconnect            | <n/a>        |
| - Time window          | <n/a>                         | - Max time eliminate             | <n/a>        |
| - Stabilize period     | 3 second                      | <b>Category</b>                  | Manufacturer |

**Criteria:**

The warning is reported when the pump 4 Circuit Breaker (CB) is opened.

The warning is raised if the **\*\*IO.HydrPump4CBClosed\*\*** is false for more than **\*\*PumpSupervisionDelay\*\*** time.

This warning is auto acknowledged when **\*\*IO.HydrPump4CBClosed\*\*** is true.

|                        |                              |                                          |              |
|------------------------|------------------------------|------------------------------------------|--------------|
| <b>No: 6192</b>        | <b>SupervisionID</b> 6192    | <b>Name</b> HydrPump4_NegativeFeedbackSx |              |
| <b>Log text</b>        | HydrHighPressPump4NegFBError |                                          |              |
| <b>Subsystem name</b>  | HydrStationVariant5          |                                          |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                           | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                     | <n/a>        |
| - Allowed attempts     | 3                            | - Max time disconnect                    | <n/a>        |
| - Time window          | 1 hour                       | - Max time eliminate                     | <n/a>        |
| - Stabilize period     | 2 minute                     | <b>Category</b>                          | Manufacturer |

**Criteria:**

The warning is reported when there is a negative feedback on Pump4, i.e. the pump cannot be started.

The warning is reported when **\*\*IO.HydrPump4Start\*\*** is true, but **\*\*IO.HydrPump4ContactorClosed\*\*** is false for more than **\*\*PumpSupervisionDelay\*\*** time.

The warning is automatically acknowledged when **\*\*IO.HydrPump4ContactorClosed\*\*** matches **\*\*IO.HydrPump4Start\*\***, i.e. the signal values are the same.

|                        |                              |                                          |              |
|------------------------|------------------------------|------------------------------------------|--------------|
| <b>No: 6193</b>        | <b>SupervisionID</b> 6193    | <b>Name</b> HydrPump4_PositiveFeedbackSx |              |
| <b>Log text</b>        | HydrHighPressPump4PosFBError |                                          |              |
| <b>Subsystem name</b>  | HydrStationVariant5          |                                          |              |
| <b>Type</b>            | Warning                      | <b>Timeout</b>                           | <disabled>   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b>                     | <n/a>        |
| - Allowed attempts     | 3                            | - Max time disconnect                    | <n/a>        |
| - Time window          | 1 hour                       | - Max time eliminate                     | <n/a>        |
| - Stabilize period     | 2 minute                     | <b>Category</b>                          | Manufacturer |

**Criteria:**

The warning is reported when there is a positive feedback on Pump4, i.e. the pump cannot be stopped.

The warning is reported when **\*\*IO.HydrPump4Start\*\*** is false, but **\*\*IO.HydrPump4ContactorClosed\*\*** is true for more than **\*\*PumpSupervisionDelay\*\*** time.

The warning is automatically acknowledged when **\*\*IO.HydrPump4ContactorClosed\*\*** matches **\*\*IO.HydrPump4Start\*\***, i.e. the signal values are the same.

|                        |                               |                                     |              |
|------------------------|-------------------------------|-------------------------------------|--------------|
| <b>No: 6194</b>        | <b>SupervisionID</b> 6194     | <b>Name</b> HydrPump4_ThermoFaultSx |              |
| <b>Log text</b>        | HydrHighPressPump4ThermoError |                                     |              |
| <b>Subsystem name</b>  | HydrStationVariant5           |                                     |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                      | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect               | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                | <n/a>        |
| - Stabilize period     | 2 minute                      | <b>Category</b>                     | Manufacturer |

**Criteria:**

The warning is reported when Pump4 is overloaded.

The warning is reported when **\*\*IO.HydrPump4Overloaded\*\*** is true for than **\*\*PumpSupervisionDelay\*\*** time.

The warning is automatically acknowledged when **\*\*IO.HydrPump4Overloaded\*\*** is false.

|                        |                             |                                            |              |
|------------------------|-----------------------------|--------------------------------------------|--------------|
| <b>No: 6195</b>        | <b>SupervisionID</b> 6195   | <b>Name</b> SwitchgearOpenGridLowVoltageSx |              |
| <b>Log text</b>        | Swg open due to grid outage |                                            |              |
| <b>Subsystem name</b>  | SwitchGear                  |                                            |              |
| <b>Type</b>            | Warning                     | <b>Timeout</b>                             | <disabled>   |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b>                       | <n/a>        |
| - Allowed attempts     | Unlimited                   | - Max time disconnect                      | <n/a>        |
| - Time window          | <n/a>                       | - Max time eliminate                       | <n/a>        |
| - Stabilize period     | 0 second                    | <b>Category</b>                            | Manufacturer |

**Criteria:**

Switchgear open due to grid outage.

This warning is reported if Switchgear open due to grid low Voltage.

The warning can be acknowledged if Grid Voltage is normal or **\*\*IO.SwitchgearHVCBClosed\*\*** is true.

|                        |                           |                                |              |
|------------------------|---------------------------|--------------------------------|--------------|
| <b>No: 6198</b>        | <b>SupervisionID</b> 6198 | <b>Name</b> NacelleFan1ErrorSx |              |
| <b>Log text</b>        | NacelleFan1Error          |                                |              |
| <b>Subsystem name</b>  | NacelleTempCtrl           |                                |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                 | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>           | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect          | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate           | <n/a>        |
| - Stabilize period     | 30 second                 | <b>Category</b>                | Manufacturer |

**Criteria:**

This warning is raised if the external fan is not working as expected.

This warning is raised whenever the signal **\*\*IO.NacelleFan1Ok\*\*** is false for **\*\*FanOkStableTime\*\***.

The warning is auto acknowledged when the signal **\*\*IO.NacelleFan1Ok\*\*** is true.

|                        |                           |                                |              |
|------------------------|---------------------------|--------------------------------|--------------|
| <b>No: 6199</b>        | <b>SupervisionID</b> 6199 | <b>Name</b> NacelleFan2ErrorSx |              |
| <b>Log text</b>        | NacelleFan2Error          |                                |              |
| <b>Subsystem name</b>  | NacelleTempCtrl           |                                |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                 | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>           | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect          | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate           | <n/a>        |
| - Stabilize period     | 30 second                 | <b>Category</b>                | Manufacturer |

#### Criteria:

This warning is raised if the external fan is not working as expected.  
This warning is raised whenever the signal **\*\*IO.NacelleFan2Ok\*\*** is false for **\*\*FanOkStableTime\*\***.

The warning is auto acknowledged when the signal **\*\*IO.NacelleFan2Ok\*\*** is true.

|                        |                           |                                |              |
|------------------------|---------------------------|--------------------------------|--------------|
| <b>No: 6200</b>        | <b>SupervisionID</b> 6200 | <b>Name</b> NacelleFanCBOpenSx |              |
| <b>Log text</b>        | NacelleFan1CBOpen         |                                |              |
| <b>Subsystem name</b>  | NacelleTempCtrl           |                                |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                 | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>           | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect          | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate           | <n/a>        |
| - Stabilize period     | 10 second                 | <b>Category</b>                | Manufacturer |

#### Criteria:

This warning supervises that the fan circuit breaker is closed.  
This warning is raised if the circuit breaker is open (**\*\*IO.NacelleFanCBClosed\*\*** is false) for **\*\*FanCBStableTime\*\***.

The warning is auto acknowledged when the circuit breaker closes.

|                        |                           |                                      |              |
|------------------------|---------------------------|--------------------------------------|--------------|
| <b>No: 6215</b>        | <b>SupervisionID</b> 6215 | <b>Name</b> GearboxBearingTempHighSx |              |
| <b>Log text</b>        | GbxBearingTempHigh ____°C |                                      |              |
| <b>Subsystem name</b>  | Gearbox                   |                                      |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                       | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                 | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect                | <n/a>        |
| - Time window          | 24 hour                   | - Max time eliminate                 | <n/a>        |
| - Stabilize period     | 1 minute                  | <b>Category</b>                      | Manufacturer |

#### Criteria:

This warning is indicating that the temperature on the Gearbox Bearing is high.

The warning is raised when the Gearbox Bearing temperature (BearingTempMax) is above the maximum limit specified by **\*\*BearingHighTemp\*\*** within **\*\*TempSensorStableTime\*\***  
- The Gearbox Bearing temperature is calculated based on the maximum value from **\*\*IO.GearboxGenBearingNRETemp\*\*** and **\*\*IO.GearboxGenBearingRETemp\*\***

The warning is auto acknowledged when the Gearbox Bearing temperature (BearingTempMax) is below the limit defined by  
**\*\*BearingHighTemp\*\*** - **\*\*BearingHighTempHyst\*\***

|                        |                              |                                         |
|------------------------|------------------------------|-----------------------------------------|
| <b>No: 6216</b>        | <b>SupervisionID</b> 6216    | <b>Name</b> GearboxBearingTempTooHighSx |
| <b>Log text</b>        | GbxBearingTempTooHigh ____°C |                                         |
| <b>Subsystem name</b>  | Gearbox                      |                                         |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> PauseSlow          |
| - Allowed attempts     | 3                            | - Max time disconnect 9 second          |
| - Time window          | 24 hour                      | - Max time eliminate 10 second          |
| - Stabilize period     | 1 minute                     | <b>Category</b> Manufacturer            |

**Criteria:**

This alarm is indicating that the temperature on the Gearbox Bearing is too high.

The alarm is raised when the Gearbox Bearing temperature is above the maximum limit specified by **\*\*BearingTooHighTemp\*\*** within **\*\*TempSensorStableTime\*\***

- The Gearbox Bearing temperature is calculated based on the maximum value from **\*\*IO.GearboxGenBearingNRETemp\*\*** and **\*\*IO.GearboxGenBearingRETemp\*\***

The alarm is auto acknowledged when the Gearbox Bearing temperature is below the limit defined by

BearingHighTemp - BearingHighTempHyst

|                        |                           |                                      |
|------------------------|---------------------------|--------------------------------------|
| <b>No: 6217</b>        | <b>SupervisionID</b> 6217 | <b>Name</b> GearboxLubrOilTempHighSx |
| <b>Log text</b>        | GbxLubrOilTempHigh ____°C |                                      |
| <b>Subsystem name</b>  | Gearbox                   |                                      |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>            |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>           |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>          |
| - Time window          | 24 hour                   | - Max time eliminate <n/a>           |
| - Stabilize period     | 1 minute                  | <b>Category</b> Manufacturer         |

**Criteria:**

This warning is indicating that the temperature on the Gearbox Lubrication Oil is high.

The warning is raised when the Gearbox Lubrification Oil temperature is above the maximum limit specified by **\*\*LubrOilHighTemp\*\*** within **\*\*TempSensorStableTime\*\***

- The Gearbox Lubrification Oil temperature (LubrOilTempMax) is calculated based on the maximum value from **\*\*IO.GearboxLSSDrainOilTemp\*\***, **\*\*IO.GearboxIMSDrainOilTemp\*\***

The warning is auto acknowledged when the Gearbox Lubrification Oil temperature (LubrOilTempMax) is below the limit defined by

**\*\*LubrOilHighTemp\*\*** - **\*\*LubrOilHighTempHyst\*\***

|                        |                              |                                         |
|------------------------|------------------------------|-----------------------------------------|
| <b>No: 6218</b>        | <b>SupervisionID</b> 6218    | <b>Name</b> GearboxLubrOilTempTooHighSx |
| <b>Log text</b>        | GbxLubrOilTempTooHigh ____°C |                                         |
| <b>Subsystem name</b>  | Gearbox                      |                                         |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> PauseSlow          |
| - Allowed attempts     | 3                            | - Max time disconnect 9 second          |
| - Time window          | 24 hour                      | - Max time eliminate 10 second          |
| - Stabilize period     | 1 minute                     | <b>Category</b> Manufacturer            |

**Criteria:**

This warning is indicating that the temperature on the Gearbox Lubrication Oil is too high.

The warning is raised when the Gearbox Lubrification Oil temperature is above the maximum limit specified by **\*\*LubrOilTooHighTemp\*\*** within **\*\*TempSensorStableTime\*\***

- The Gearbox Lubrification Oil temperature (LubrOilTempMax) is calculated based on the maximum value from **\*\*IO.GearboxLSSDrainOilTemp\*\***, **\*\*IO.GearboxIMSDrainOilTemp\*\***

The warning is auto acknowledged when the Gearbox Lubrification Oil temperature (LubrOilTempMax) is below the limit defined by

**\*\*LubrOilTooHighTemp\*\*** - **\*\*LubrOilTooHighTempHyst\*\***

|                        |                                |                                          |
|------------------------|--------------------------------|------------------------------------------|
| <b>No: 6224</b>        | <b>SupervisionID</b> 6224      | <b>Name</b> TowAccResTowSecModeOscHighSx |
| <b>Log text</b>        | TowSecModeOscHI X_.__Y_.__m/s2 |                                          |
| <b>Subsystem name</b>  | SV                             |                                          |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                     |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> PauseSlow           |
| - Allowed attempts     | 3                              | - Max time disconnect 1 hour             |
| - Time window          | 1 hour                         | - Max time eliminate 1 hour              |
| - Stabilize period     | 60 second                      | <b>Category</b> Manufacturer             |

**Criteria:**

The purpose of this supervision is to monitor tower second mode resultant RMS using tower top accelerometer signals. Tower second mode resultant value is captured by filtering the tower top accelerometer signals of X and Y direction around tower second mode frequency.

The alarm is activated when the resultant second mode RMS content is above the threshold limit defined by the wind speeds. The alarm can be activated during all operating conditions including stand-still and normal operations.

This alarm is activated if the following conditions are met:

1. Px\_TowSecMode\_ActivityLevel = 2
2. When the Tower Acceleration resultant RMS is greater than the threshold. The threshold value is calculated as follows:
  - a. by interpolation between TowSecMode\_TowAccRes1 and TowSecMode\_TowAccRes2 , if 15 m/s < **\*\*WindMeasurement.WindSpeed\*\*** <= 20 m/s
  - b. by interpolation between TowSecMode\_TowAccRes2 and TowSecMode\_TowAccRes3 , if 20 m/s < **\*\*WindMeasurement.WindSpeed\*\*** <= 25 m/s
  - c. by interpolation between TowSecMode\_TowAccRes3 and TowSecMode\_TowAccRes4 , if 25 m/s < **\*\*WindMeasurement.WindSpeed\*\*** <= 30 m/s
  - d. by interpolation between TowSecMode\_TowAccRes4 and TowSecMode\_TowAccRes5 , if 30 m/s < **\*\*WindMeasurement.WindSpeed\*\*** <= 35 m/s
  - e. by interpolation between TowSecMode\_TowAccRes5 and TowSecMode\_TowAccRes6 , if 35 m/s < **\*\*WindMeasurement.WindSpeed\*\*** <= 45 m/s

The **\*\*WindMeasurement.WindSpeed\*\*** is filtered by a low pass filter with time constant TowSecMode\_WindSpdFiltTauPx before interpolation



|                        |                              |                                            |
|------------------------|------------------------------|--------------------------------------------|
| <b>No: 6225</b>        | <b>SupervisionID</b> 6225    | <b>Name</b> CylinderAPressureOscillationSx |
| <b>Log text</b>        | HydPressOscBlAFilt_, __._bar |                                            |
| <b>Subsystem name</b>  | PiSP                         |                                            |
| <b>Type</b>            | Alarm                        | <b>Timeout</b> <n/a>                       |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> StopSlow              |
| - Allowed attempts     | 3                            | - Max time disconnect 3 second             |
| - Time window          | 1 hour                       | - Max time eliminate 9 second              |
| - Stabilize period     | 1 minute                     | <b>Category</b> Manufacturer               |

**Criteria:**

This supervision monitors the hydraulic pressure oscillations of blade A, PitchBlockACylinderPress. An alarm is raised if the oscillations become too high, showing the number of the filter, PitchBlockACylPressTriggeredFilter, and the pressure which triggered the alarm, PitchBlockACylinderPressTrigFilterPress.

The supervision is enabled if the following conditions are met:

- 1. **\*\*CylPressOscFilter1\\_ActivityLevel\*\*** = 2 or **\*\*CylPressOscFilter2\\_ActivityLevel\*\*** = 2 or **\*\*CylPressOscFilter3\\_ActivityLevel\*\*** = 2
- 2. PitchBlockACylinderPress Status is valid

The alarm is activated if one the following additional conditions are met:

- 1. PitchBlockACylinderPressOscFilter1 > **\*\*CylPressOsc\\_Filt1AlarmLevel\*\***
- 2. PitchBlockACylinderPressOscFilter2 > **\*\*CylPressOsc\\_Filt2AlarmLevel\*\***
- 3. PitchBlockACylinderPressOscFilter3 > **\*\*CylPressOsc\\_Filt3AlarmLevel\*\***

PitchBlockACylinderPressOscFilt1, PitchBlockACylinderPressOscFilt2 and PitchBlockACylinderPressOscFilt3 are calculated as the square root of a low pass filter, which has as input the squared value of the bandpass filtered PitchBlockACylinderPress.

Log text: "Hydraulic Pressure Oscillations on Blade A"

|                        |                                |                                            |
|------------------------|--------------------------------|--------------------------------------------|
| <b>No: 6226</b>        | <b>SupervisionID</b> 6226      | <b>Name</b> CylinderBPressureOscillationSx |
| <b>Log text</b>        | HydPressOscBlBFilt_, ___. _bar |                                            |
| <b>Subsystem name</b>  | PiSP                           |                                            |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                       |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> StopSlow              |
| - Allowed attempts     | 3                              | - Max time disconnect 3 second             |
| - Time window          | 1 hour                         | - Max time eliminate 9 second              |
| - Stabilize period     | 1 minute                       | <b>Category</b> Manufacturer               |

**Criteria:**

This supervision monitors the hydraulic pressure oscillations of blade B, PitchBlockBCylinderPress. An alarm is raised if the oscillations become too high, showing the number of the filter, PitchBlockBCylPressTriggeredFilter, and the pressure which triggered the alarm, PitchBlockBCylinderPressTrigFilterPress.

The supervision is enabled if the following conditions are met:

- 1. **\*\*CylPressOscFilter1\\_ActivityLevel\*\*** = 2 or **\*\*CylPressOscFilter2\\_ActivityLevel\*\*** = 2 or **\*\*CylPressOscFilter3\\_ActivityLevel\*\*** = 2
- 2. PitchBlockBCylinderPress Status is valid

The alarm is activated if one the following additional conditions are met:

- 1. PitchBlockBCylinderPressOscFilter1 > **\*\*CylPressOsc\\_Filt1AlarmLevel\*\***
- 2. PitchBlockBCylinderPressOscFilter2 > **\*\*CylPressOsc\\_Filt2AlarmLevel\*\***
- 3. PitchBlockBCylinderPressOscFilter3 > **\*\*CylPressOsc\\_Filt3AlarmLevel\*\***

PitchBlockBCylinderPressOscFilt1, PitchBlockBCylinderPressOscFilt2 and PitchBlockBCylinderPressOscFilt3 are calculated as the square root of a low pass filter, which has as input the squared value of the bandpass filtered PitchBlockBCylinderPress.

Log text: "Hydraulic Pressure Oscillations on Blade B"

|                        |                                |                                            |              |
|------------------------|--------------------------------|--------------------------------------------|--------------|
| <b>No: 6227</b>        | <b>SupervisionID</b> 6227      | <b>Name</b> CylinderCPressureOscillationSx |              |
| <b>Log text</b>        | HydPressOscBlcFilt_, ____._bar |                                            |              |
| <b>Subsystem name</b>  | PiSP                           |                                            |              |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>                             | <n/a>        |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b>                       | StopSlow     |
| - Allowed attempts     | 3                              | - Max time disconnect                      | 3 second     |
| - Time window          | 1 hour                         | - Max time eliminate                       | 9 second     |
| - Stabilize period     | 1 minute                       | <b>Category</b>                            | Manufacturer |

#### Criteria:

This supervision monitors the hydraulic pressure oscillations of blade C, PitchBlockCCylinderPress. An alarm is raised if the oscillations become too high, showing the number of the filter, PitchBlockCCylPressTriggeredFilter, and the pressure which triggered the alarm, PitchBlockCCylinderPressTrigFilterPress.

The supervision is enabled if the following conditions are met:

1. **\*\*CylPressOscFilter1\\_ActivityLevel\*\*** = 2 or **\*\*CylPressOscFilter2\\_ActivityLevel\*\*** = 2 or **\*\*CylPressOscFilter3\\_ActivityLevel\*\*** = 2
2. PitchBlockCCylinderPress Status is valid

The alarm is activated if one the following additional conditions are met:

1. PitchBlockCCylinderPressOscFilter1 > **\*\*CylPressOsc\\_Filt1AlarmLevel\*\***
2. PitchBlockCCylinderPressOscFilter2 > **\*\*CylPressOsc\\_Filt2AlarmLevel\*\***
3. PitchBlockCCylinderPressOscFilter3 > **\*\*CylPressOsc\\_Filt3AlarmLevel\*\***

PitchBlockCCylinderPressOscFilt1, PitchBlockCCylinderPressOscFilt2 and PitchBlockCCylinderPressOscFilt3 are calculated as the square root of a low pass filter, which has as input the squared value of the bandpass filtered PitchBlockCCylinderPress.

Log text: "Hydraulic Pressure Oscillations on Blade C"

|                        |                             |                                                        |              |
|------------------------|-----------------------------|--------------------------------------------------------|--------------|
| <b>No: 6228</b>        | <b>SupervisionID</b> 6228   | <b>Name</b> PowertrainLubrReleaseForProductionFailedSx |              |
| <b>Log text</b>        | PowertrainLubr startup fail |                                                        |              |
| <b>Subsystem name</b>  | PowerTrainLubrication       |                                                        |              |
| <b>Type</b>            | Alarm                       | <b>Timeout</b>                                         | <n/a>        |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b>                                   | PauseSlow    |
| - Allowed attempts     | 2                           | - Max time disconnect                                  | 9 second     |
| - Time window          | 1 hour                      | - Max time eliminate                                   | 10 second    |
| - Stabilize period     | 10 minute                   | <b>Category</b>                                        | Manufacturer |

#### Criteria:

This alarm indicates the lubrication pump was not able to deliver enough lubrication for power production.

The alarm is triggered **\*\*ReleaseForProductionTimeoutHyst\*\*** seconds after the following conditions are met:

1. **\*\*LubrMainState\*\*** is normal operation, i.e. dry sump lubrication is performed.
2. **\*\*IO.PowertrainLubrGearboxInletPress\*\*** is below **\*\*GearboxOilInletMinPress\*\*** in **\*\*GearboxOilInletMinPressStableTime\*\***, i.e. the pump is unable to deliver sufficient lubrication for power production.

The alarm can be acknowledged whenever the lubrication system stops operating in normal operation, i.e. **\*\*LubrSumpMode\*\*** is not NormalOperation.

|                        |                           |                                       |
|------------------------|---------------------------|---------------------------------------|
| <b>No: 6229</b>        | <b>SupervisionID</b> 6229 | <b>Name</b> PowertrainLubrPumpErrorSx |
| <b>Log text</b>        | PowertrainLubr pump error |                                       |
| <b>Subsystem name</b>  | PowerTrainLubrication     |                                       |
| <b>Type</b>            | Warning                   | <b>Timeout</b> 21 day                 |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow        |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second        |
| - Time window          | 1 hour                    | - Max time eliminate 10 second        |
| - Stabilize period     | 30 second                 | <b>Category</b> Manufacturer          |

#### Criteria:

The warning is raised when reset of the power-train lubrication pump has been unsuccessful after the pump has been failing.

The warning is raised if the following conditions are met:

1. **\*\*IO.PowertrainLubrPumpOk\*\*** is false within **\*\*PumpErrorStableTime\*\*** period
2. The number of resets performed is greater or equal to **\*\*PumpErrorResetRetries\*\***
3. As interval of **\*\*PumpErrorResetInterval\*\*** seconds has passed since the reset process has started.

The supervision can be acknowledged at any time.

|                        |                           |                                                                |
|------------------------|---------------------------|----------------------------------------------------------------|
| <b>No: 6230</b>        | <b>SupervisionID</b> 6230 | <b>Name</b> PowertrainLubrMainBearingDrainValveFeedbackErrorSx |
| <b>Log text</b>        | LubrMBDrainValveFBError   |                                                                |
| <b>Subsystem name</b>  | PowerTrainLubrication     |                                                                |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                                      |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>                                     |
| - Allowed attempts     | Unlimited                 | - Max time disconnect <n/a>                                    |
| - Time window          | <n/a>                     | - Max time eliminate <n/a>                                     |
| - Stabilize period     | 0 second                  | <b>Category</b> Manufacturer                                   |

#### Criteria:

The warning is raised when the main bearing drain valve feedback does not match the control signal.

The warning is reported when the main bearing drain valve feedback does not match the control signal, i.e. when at least one of the following conditions is met within

**\*\*DrainValvePositionFeedbackStableTime\*\***:

1. **\*\*IO.PowertrainLubrMainBearingDrainValveOpenRatio\*\*** is above **\*\*IO.PowertrainLubrMainBearingDrainValveActualPosition\*\* \* ( 1 + \*\*DrainValvePositionFeedbackError\*\* )**.
2. **\*\*IO.PowertrainLubrMainBearingDrainValveOpenRatio\*\*** is below **\*\*IO.PowertrainLubrMainBearingDrainValveActualPosition\*\* \* ( 1 - \*\*DrainValvePositionFeedbackError\*\* )**.

The warning can be acknowledged when the following conditions are met in

**\*\*DrainValvePositionFeedbackStableTime\*\***:

1. **\*\*IO.PowertrainLubrMainBearingDrainValveOpenRatio\*\*** is below **\*\*IO.PowertrainLubrMainBearingDrainValveActualPosition\*\* \* ( 1 + \*\*DrainValvePositionFeedbackError\*\* )**.
2. **\*\*IO.PowertrainLubrMainBearingDrainValveOpenRatio\*\*** is above **\*\*IO.PowertrainLubrMainBearingDrainValveActualPosition\*\* \* ( 1 - \*\*DrainValvePositionFeedbackError\*\* )**.

|                           |                           |                                               |
|---------------------------|---------------------------|-----------------------------------------------|
| <b>No: 6231</b>           | <b>SupervisionID</b> 6231 | <b>Name</b> PowertrainLubrDrySumpNotReachedSx |
| <b>Log text</b>           | LubrDrySumpErrorGbx:___1  |                                               |
| <b>Subsystem name</b>     | PowerTrainLubrication     |                                               |
| <b>Type</b>               | Warning                   | <b>Timeout</b> <disabled>                     |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b> <n/a>                    |
| - <b>Allowed attempts</b> | Unlimited                 | - <b>Max time disconnect</b> <n/a>            |
| - <b>Time window</b>      | <n/a>                     | - <b>Max time eliminate</b> <n/a>             |
| - <b>Stabilize period</b> | 1 minute                  | <b>Category</b> Manufacturer                  |

**Criteria:**

The warning is raised if dry sump mode cannot be obtained within acceptable time.

The warning is reported when **\*\*LubrSumpMode\*\*** has been in the state DrySumpEntering for more than **\*\*DrySumpEnteringTimeout\*\***, i.e. dry sump failed.

The warning can be acknowledged when **\*\*LubrSumpMode\*\*** is DrySump, i.e. DrySump mode is obtained.

|                           |                           |                                               |
|---------------------------|---------------------------|-----------------------------------------------|
| <b>No: 6232</b>           | <b>SupervisionID</b> 6232 | <b>Name</b> PowertrainLubrWetSumpNotReachedSx |
| <b>Log text</b>           | LubrWetSumpErrorGbx:___1  |                                               |
| <b>Subsystem name</b>     | PowerTrainLubrication     |                                               |
| <b>Type</b>               | Alarm                     | <b>Timeout</b> <n/a>                          |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b> PauseSlow                |
| - <b>Allowed attempts</b> | 3                         | - <b>Max time disconnect</b> 9 second         |
| - <b>Time window</b>      | 24 hour                   | - <b>Max time eliminate</b> 10 second         |
| - <b>Stabilize period</b> | 1 minute                  | <b>Category</b> Manufacturer                  |

**Criteria:**

The warning is raised if the powertrain wet sump mode cannot be obtained within acceptable time.

The warning is reported if any of the following conditions is met:

- \*\*IO.PowerSupplyOffGrid\*\*** is false and **\*\*LubrSumpMode\*\*** is WetSumpEntering within **\*\*WetSumpEnteringTimeout\*\***, i.e. power supply off grid is inactive and wet sump was not obtained withing acceptable time.
- \*\*IO.PowerSupplyOffGrid\*\*** is true and **\*\*LubrSumpMode\*\*** is WetSumpEntering within **\*\*WetSumpEnteringGridOffTimeout\*\***, i.e. power supply off grid is active and wet sump was not obtained within acceptable time.

The warning can be acknowledged at any time.

|                        |                        |                       |                                              |
|------------------------|------------------------|-----------------------|----------------------------------------------|
| <b>No: 6233</b>        | <b>SupervisionID</b>   | <b>Name</b>           | PowertrainLubrGearboxWetSumpOilLevelTooLowSx |
| <b>Log text</b>        | 6233                   |                       |                                              |
| <b>Subsystem name</b>  | LubrWetSumpGbxOilLo__1 |                       |                                              |
| <b>Type</b>            | PowerTrainLubrication  |                       |                                              |
| <b>Acknowledgement</b> | Warning                | <b>Timeout</b>        | <disabled>                                   |
| - Allowed attempts     | Auto                   | <b>Shutdown type</b>  | <n/a>                                        |
| - Time window          | Unlimited              | - Max time disconnect | <n/a>                                        |
| - Stabilize period     | <n/a>                  | - Max time eliminate  | <n/a>                                        |
|                        | 60 second              | <b>Category</b>       | Manufacturer                                 |

**Criteria:**  
The warning is raised when the oil level gets too low.

The oil level is considered too low when the following conditions are met in **\*\*WetSumpGearboxTooLowOilLevelStableTime\*\***:

1. **\*\*LubrSumpMode\*\*** is WetSump, i.e. The lubrication sump mode is wet.
2. **\*\*IO.PowertrainLubrMainTankOilTemp\*\*** value is above **\*\*WetSumpGearboxTooLowOilLevelMinTemp\*\***, i.e. main tank oil temperature is ok.
3. **\*\*GearboxSumpOilLevel\*\*** is below **\*\*WetSumpGearboxTooLowOilLevel\*\***, i.e. gearbox sump oil level is too low.

The warning can be acknowledged if **\*\*LubrSumpMode\*\*** is different from WetSump or **\*\*GearboxSumpOilLevel\*\*** is above **\*\*WetSumpGearboxTooLowOilLevel\*\*** + **\*\*WetSumpGearboxTooLowOilLevelHyst\*\***.

|                        |                              |                       |                                        |
|------------------------|------------------------------|-----------------------|----------------------------------------|
| <b>No: 6234</b>        | <b>SupervisionID</b>         | <b>Name</b>           | PowertrainLubrMainTankOilLevelTooLowSx |
| <b>Log text</b>        | 6234                         |                       |                                        |
| <b>Subsystem name</b>  | LubrMainTankOilLevelTooLo__1 |                       |                                        |
| <b>Type</b>            | PowerTrainLubrication        |                       |                                        |
| <b>Acknowledgement</b> | Alarm                        | <b>Timeout</b>        | <n/a>                                  |
| - Allowed attempts     | Auto                         | <b>Shutdown type</b>  | PauseSlow                              |
| - Time window          | 5                            | - Max time disconnect | 9 second                               |
| - Stabilize period     | 24 hour                      | - Max time eliminate  | 10 second                              |
|                        | 10 second                    | <b>Category</b>       | Manufacturer                           |

**Criteria:**  
The alarm is raised when main tank oil level is too low.

The main tank oil level is considered too low when **\*\*MainTankOilLevel\*\*** is below **\*\*MainTankTooLowOilLevel\*\*** in **\*\*MainTankTooLowOilLevelStableTime\*\***.

The alarm can be acknowledged when **\*\*MainTankOilLevel\*\*** is above **\*\*MainTankTooLowOilLevel\*\*** + **\*\*MainTankTooLowOilLevelHyst\*\***.

|                        |                                |                                               |
|------------------------|--------------------------------|-----------------------------------------------|
| <b>No: 6235</b>        | <b>SupervisionID</b> 6235      | <b>Name</b> PowertrainLubrWetSumpOilLeakageSx |
| <b>Log text</b>        | LubrWetSumpOilLeak Total ____1 |                                               |
| <b>Subsystem name</b>  | PowerTrainLubrication          |                                               |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                          |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> PauseSlow                |
| - Allowed attempts     | 3                              | - Max time disconnect 9 second                |
| - Time window          | 24 hour                        | - Max time eliminate 10 second                |
| - Stabilize period     | 60 second                      | <b>Category</b> Manufacturer                  |

**Criteria:**  
The alarm is reported whenever the oil volume is below acceptable limits while operating in wet sump mode.

The lubrication oil volume in wet sump mode is determined as the sum of the oil volume in the gearbox sump (\*\*GearboxSumpOilVolume\*\*) and the main tank (\*\*MainTankOilVolume\*\*).

Low oil level can be caused by leakage in the lubrication system.

The oil volume in wet sump mode is considered low when the following conditions are met in \*\*OilLeakageWetSumpMinVolumeStableTime\*\*:

1. Lubrication system is operating in wet sump mode, i.e. \*\*LubrSumpMode\*\* is WetSump
2. \*\*MainTankOilVolume\*\* + \*\*GearboxSumpOilVolume\*\* is below \*\*OilLeakageWetSumpMinVolume\*\*.

This alarm can be acknowledged when \*\*MainTankOilVolume\*\* + \*\*GearboxSumpOilVolume\*\* is above \*\*OilLeakageWetSumpMinVolume\*\* + \*\*OilLeakageWetSumpMinVolumeHyst\*\*.

|                        |                                |                                               |
|------------------------|--------------------------------|-----------------------------------------------|
| <b>No: 6236</b>        | <b>SupervisionID</b> 6236      | <b>Name</b> PowertrainLubrWetSumpOilSurplusSx |
| <b>Log text</b>        | LubrWetSumpOilSurp Total ____1 |                                               |
| <b>Subsystem name</b>  | PowerTrainLubrication          |                                               |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                          |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> PauseSlow                |
| - Allowed attempts     | 3                              | - Max time disconnect 9 second                |
| - Time window          | 24 hour                        | - Max time eliminate 10 second                |
| - Stabilize period     | 60 second                      | <b>Category</b> Manufacturer                  |

**Criteria:**  
The alarm is raised if there is any oil surplus in the power train system when in wet sump mode.

Oil surplus can be caused by leakage at the coolant liquid heat exchanger.

The oil volume in wet sump mode is determined as ( \*\*GearboxSumpOilVolume\*\* + \*\*MainTankOilVolume\*\* ).

The oil volume in wet sump is considered high when the following conditions are met in \*\*OilLeakageWetSumpMaxVolumeStableTime\*\*:

1. Lubrication system is operating in wet sump mode, i.e. \*\*LubrSumpMode\*\* is WetSump.
2. \*\*MainTankOilVolume\*\* + \*\*GearboxSumpOilVolume\*\* is above \*\*OilLeakageWetSumpMaxVolume\*\*.

This alarm can be acknowledged when \*\*MainTankOilVolume\*\* + \*\*GearboxSumpOilVolume\*\* is below \*\*OilLeakageWetSumpMaxVolume\*\* - \*\*OilLeakageWetSumpMaxVolumeHyst\*\*.

|                           |                               |                                               |
|---------------------------|-------------------------------|-----------------------------------------------|
| <b>No: 6237</b>           | <b>SupervisionID</b> 6237     | <b>Name</b> PowertrainLubrDrySumpOilLeakageSx |
| <b>Log text</b>           | LubrDrySumpOilLeak Tank ____1 |                                               |
| <b>Subsystem name</b>     | PowerTrainLubrication         |                                               |
| <b>Type</b>               | Alarm                         | <b>Timeout</b> <n/a>                          |
| <b>Acknowledgement</b>    | Auto                          | <b>Shutdown type</b> PauseSlow                |
| - <b>Allowed attempts</b> | 3                             | - <b>Max time disconnect</b> 9 second         |
| - <b>Time window</b>      | 24 hour                       | - <b>Max time eliminate</b> 10 second         |
| - <b>Stabilize period</b> | 60 second                     | <b>Category</b> Manufacturer                  |

**Criteria:**

The alarm is reported whenever the oil volume is below acceptable limits while operating in dry sump mode.

Low oil volume can be caused by leakage in the lubrication system.

The oil volume in dry sump mode is determined only by the oil volume in the main tank.

The oil volume in dry sump is considered low when the following conditions are met:

1. **\*\*LubrSumpMode\*\*** is DrySump, i.e. lubrication system obtained dry sump mode.
2. **\*\*MainTankOilVolume\*\*** is below **\*\*OilLeakageDrySumpMinVolume\*\*** in **\*\*OilLeakageDrySumpMinVolumeStableTime\*\***, i.e. main tank oil volume is low.

This alarm can be acknowledged if the following conditions are met within **\*\*OilLeakageWetSumpMinVolumeStableTime\*\***:

1. **\*\*LubrSumpMode\*\*** is WetSump, i.e. lubrication system starts operating in wet sump mode.
2. PowertrainLubrWetSumpOilLeakage supervision is not reported.

|                           |                               |                                               |
|---------------------------|-------------------------------|-----------------------------------------------|
| <b>No: 6238</b>           | <b>SupervisionID</b> 6238     | <b>Name</b> PowertrainLubrDrySumpOilSurplusSx |
| <b>Log text</b>           | LubrDrySumpOilSurp Tank ____1 |                                               |
| <b>Subsystem name</b>     | PowerTrainLubrication         |                                               |
| <b>Type</b>               | Alarm                         | <b>Timeout</b> <n/a>                          |
| <b>Acknowledgement</b>    | Auto                          | <b>Shutdown type</b> PauseSlow                |
| - <b>Allowed attempts</b> | 3                             | - <b>Max time disconnect</b> 9 second         |
| - <b>Time window</b>      | 24 hour                       | - <b>Max time eliminate</b> 10 second         |
| - <b>Stabilize period</b> | 60 second                     | <b>Category</b> Manufacturer                  |

**Criteria:**

The alarm is raised if there is any oil surplus in the power train system when in dry sump mode.

Oil surplus can be caused by leakage at the coolant liquid heat exchanger.

The oil volume in dry sump mode is determined only as the oil volume in the main tank.

The oil volume in dry sump is considered high when the following conditions are met:

1. **\*\*LubrSumpMode\*\*** is DrySump, i.e. lubrication system is operating in dry sump mode.
2. **\*\*MainTankOilVolume\*\*** is above **\*\*OilLeakageDrySumpMaxVolume\*\*** in **\*\*OilLeakageDrySumpMaxVolumeStableTime\*\***, i.e. main tank oil volume is high.

This alarm can be acknowledged when the following conditions are met within **\*\*OilLeakageWetSumpMaxVolumeStableTime\*\***:

1. **\*\*LubrSumpMode\*\*** is WetSump, i.e. Lubrication system starts operating in wet sump mode.
2. PowertrainLubrWetSumpOilSurplus supervision is not reported.



|                        |                             |                                                 |
|------------------------|-----------------------------|-------------------------------------------------|
| <b>No: 6239</b>        | <b>SupervisionID</b> 6239   | <b>Name</b> PowertrainLubrMainTankOilTempHighSx |
| <b>Log text</b>        | LubrMainTankTempHigh ____°C |                                                 |
| <b>Subsystem name</b>  | PowerTrainLubrication       |                                                 |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                            |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> PauseSlow                  |
| - Allowed attempts     | 3                           | - Max time disconnect 9 second                  |
| - Time window          | 24 hour                     | - Max time eliminate 10 second                  |
| - Stabilize period     | 60 second                   | <b>Category</b> Manufacturer                    |

**Criteria:**

The alarm is raised when the temperature in the power train main oil tank is too high.

The power train main oil tank temperature is considered too high when  
**\*\*IO.PowertrainLubrMainTankOilTemp\*\*** is above **\*\*MainTankHighOilTemp\*\*** in  
**\*\*MainTankHighOilTempStableTime\*\***.

The alarm can be acknowledged when **\*\*IO.PowertrainLubrMainTankOilTemp\*\*** value is below  
**\*\*MainTankHighOilTemp\*\*** - **\*\*MainTankHighOilTempHyst\*\***.

|                        |                             |                                                     |
|------------------------|-----------------------------|-----------------------------------------------------|
| <b>No: 6240</b>        | <b>SupervisionID</b> 6240   | <b>Name</b> PowertrainLubrGearboxInletOilTempHighSx |
| <b>Log text</b>        | LubrGbxInletTempHigh ____°C |                                                     |
| <b>Subsystem name</b>  | PowerTrainLubrication       |                                                     |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                                |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> PauseSlow                      |
| - Allowed attempts     | 3                           | - Max time disconnect 9 second                      |
| - Time window          | 24 hour                     | - Max time eliminate 10 second                      |
| - Stabilize period     | 60 second                   | <b>Category</b> Manufacturer                        |

**Criteria:**

The alarm is raised when the gearbox oil inlet temperature gets too high.

The temperature at gearbox inlet is considered too high when  
**\*\*IO.PowertrainLubrGearboxInletTemp\*\*** value is above **\*\*GearboxInletHighOilTemp\*\*** in  
**\*\*GearboxInletHighOilTempStableTime\*\***.

The alarm can be acknowledged when **\*\*IO.PowertrainLubrGearboxInletTemp\*\*** value is below  
**\*\*GearboxInletHighOilTemp\*\*** - **\*\*GearboxInletHighOilTempHyst\*\***).

|                        |                            |                                                         |
|------------------------|----------------------------|---------------------------------------------------------|
| <b>No: 6241</b>        | <b>SupervisionID</b> 6241  | <b>Name</b> PowertrainLubrMainBearingInletOilTempHighSx |
| <b>Log text</b>        | LubrMBInletTempHigh ____°C |                                                         |
| <b>Subsystem name</b>  | PowerTrainLubrication      |                                                         |
| <b>Type</b>            | Alarm                      | <b>Timeout</b> <n/a>                                    |
| <b>Acknowledgement</b> | Auto                       | <b>Shutdown type</b> PauseSlow                          |
| - Allowed attempts     | 3                          | - Max time disconnect 9 second                          |
| - Time window          | 24 hour                    | - Max time eliminate 10 second                          |
| - Stabilize period     | 60 second                  | <b>Category</b> Manufacturer                            |

**Criteria:**

The alarm is raised when the main bearing inlet oil temperature is too high.

The temperature at main bearing inlet is considered too high when  
**\*\*IO.PowertrainLubrMainBearingInletTemp\*\*** value is above **\*\*MainBearingInletHighOilTemp\*\***  
in **\*\*MainBearingInletHighOilTempStableTime\*\***.

This alarm can be acknowledged when **\*\*IO.PowertrainLubrMainBearingInletTemp\*\*** value is  
below **\*\*MainBearingInletHighOilTemp\*\*** - **\*\*MainBearingInletHighOilTempHyst\*\***.

|                        |                       |                                                         |              |
|------------------------|-----------------------|---------------------------------------------------------|--------------|
| <b>No: 6242</b>        | <b>SupervisionID</b>  | <b>Name</b> PowertrainLubrMainBearingOilInletPressLowSx |              |
|                        | 6242                  |                                                         |              |
| <b>Log text</b>        | LubrMBInletPressLow   |                                                         |              |
| <b>Subsystem name</b>  | PowerTrainLubrication |                                                         |              |
| <b>Type</b>            | Alarm                 | <b>Timeout</b>                                          | <n/a>        |
| <b>Acknowledgement</b> | Auto                  | <b>Shutdown type</b>                                    | PauseSlow    |
| - Allowed attempts     | 3                     | - Max time disconnect                                   | 9 second     |
| - Time window          | 1 hour                | - Max time eliminate                                    | 10 second    |
| - Stabilize period     | 60 second             | <b>Category</b>                                         | Manufacturer |

**Criteria:**  
The alarm is reported when the main bearing oil inlet pressure is low and therefore there is a risk of insufficient lubrication.

The main bearing oil inlet presure is condered low when the following conditions are met:  
1. **\*\*LubrMainState\*\*** is in NormalOperation mode, i.e. dry sump lubrication is performed.  
2. **\*\*PumpMaxFlowControl\*\*** is true, i.e. a maximum PI regulated pump speed is requested.  
3. **\*\*IO.PowertrainLubrMainBearingInletPress\*\*** is below **\*\*MainBearingOilInletMinPress\*\*** in **\*\*MainBearingOilInletMinPressStableTime\*\***, i.e. main bearing oil inlet pressure is low.

This alarm can be acknowledged when any of the following conditions are met:  
1. **\*\*LubrMainState\*\*** is not NormalOperation  
2. **\*\*IO.PowertrainLubrMainBearingInletPress\*\*** is above **\*\*MainBearingOilInletMinPress\*\***.

|                        |                       |                                                          |              |
|------------------------|-----------------------|----------------------------------------------------------|--------------|
| <b>No: 6243</b>        | <b>SupervisionID</b>  | <b>Name</b> PowertrainLubrMainBearingOilInletPressHighSx |              |
|                        | 6243                  |                                                          |              |
| <b>Log text</b>        | LubrMBInletPressHigh  |                                                          |              |
| <b>Subsystem name</b>  | PowerTrainLubrication |                                                          |              |
| <b>Type</b>            | Warning               | <b>Timeout</b>                                           | <disabled>   |
| <b>Acknowledgement</b> | Auto                  | <b>Shutdown type</b>                                     | <n/a>        |
| - Allowed attempts     | 3                     | - Max time disconnect                                    | <n/a>        |
| - Time window          | 1 hour                | - Max time eliminate                                     | <n/a>        |
| - Stabilize period     | 60 second             | <b>Category</b>                                          | Manufacturer |

**Criteria:**  
The alarm is raised when the oil inlet pressure in main bearing is too high.  
  
Too high pressure indicates there is a blockage in the system.

The alarm is reported when **\*\*IO.PowertrainLubrMainBearingInletPress\*\*** is above **\*\*MainBearingOilInletMaxPress\*\*** in **\*\*MainBearingOilInletMaxPressStableTime\*\***.

The alarm can be acknowledged when the pressure is not high, i.e.  
**\*\*IO.PowertrainLubrMainBearingInletPress\*\*** is below **\*\*MainBearingOilInletMaxPress\*\***.

|                           |                           |                                               |              |
|---------------------------|---------------------------|-----------------------------------------------|--------------|
| <b>No: 6244</b>           | <b>SupervisionID</b> 6244 | <b>Name</b> PowertrainLubrOilInletPressHighSx |              |
| <b>Log text</b>           | LubrInletPressHigh        |                                               |              |
| <b>Subsystem name</b>     | PowerTrainLubrication     |                                               |              |
| <b>Type</b>               | Alarm                     | <b>Timeout</b>                                | <n/a>        |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b>                          | PauseSlow    |
| - <b>Allowed attempts</b> | 2                         | - <b>Max time disconnect</b>                  | 9 second     |
| - <b>Time window</b>      | 1 hour                    | - <b>Max time eliminate</b>                   | 10 second    |
| - <b>Stabilize period</b> | 10 minute                 | <b>Category</b>                               | Manufacturer |

**Criteria:**

The alarm is reported when the pressure before the inline filter is high.

It indicates there is a blockage in the system and a risk of bursting the lubrication system.

The bypass pressure is considered high if **\*\*IO.PowertrainLubrBeforeInlineFilterPress\*\*** is above **\*\*PowertrainOilInletMaxPress\*\*** in **\*\*PowertrainOilInletMaxPressStableTime\*\***.

This alarm can be acknowledged if **\*\*IO.PowertrainLubrBeforeInlineFilterPress\*\*** becomes lower than **\*\*PowertrainOilInletMaxPress\*\***.

|                           |                           |                                                     |              |
|---------------------------|---------------------------|-----------------------------------------------------|--------------|
| <b>No: 6245</b>           | <b>SupervisionID</b> 6245 | <b>Name</b> PowertrainLubrGearboxOilInletPressLowSx |              |
| <b>Log text</b>           | LubrGbxInletPressLow      |                                                     |              |
| <b>Subsystem name</b>     | PowerTrainLubrication     |                                                     |              |
| <b>Type</b>               | Alarm                     | <b>Timeout</b>                                      | <n/a>        |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b>                                | PauseSlow    |
| - <b>Allowed attempts</b> | 3                         | - <b>Max time disconnect</b>                        | 9 second     |
| - <b>Time window</b>      | 1 hour                    | - <b>Max time eliminate</b>                         | 10 second    |
| - <b>Stabilize period</b> | 60 second                 | <b>Category</b>                                     | Manufacturer |

**Criteria:**

The alarm is reported when the gearbox inlet pressure is low and therefore there is a risk of insufficient lubrication.

This alarm is reported if the following conditions are met in

**\*\*GearboxOilInletMinPressStableTime\*\***:

- \*\*LubrMainState\*\*** is ColdStartup or ShutDown or NormalOperation. If **\*\*LubrMainState\*\*** is NormalOperation, **\*\*PumpMaxFlowControl\*\*** has to be true. I.e. wet sump lubrication is performed or dry sump lubrication is performed with a pump operating at a regulated speed ratio.
- \*\*IO.PowertrainLubrGearboxInletPress\*\*** is below **\*\*GearboxOilInletMinPress\*\***, i.e. gearbox inlet pressure is low.

This alarm can be acknowledged when at least one of the following conditions is met:

- \*\*LubrMainState\*\*** is Stopped or Standby, i.e. wet sump lubrication can only be performed by the amount of oil in the sump or the wet sump level is maintained.
- \*\*IO.PowertrainLubrGearboxInletPress\*\*** is above **\*\*GearboxOilInletMinPress\*\***, i.e. gearbox inlet pressure is above the minimum limit.

|                        |                               |                                                   |
|------------------------|-------------------------------|---------------------------------------------------|
| <b>No: 6246</b>        | <b>SupervisionID</b> 6246     | <b>Name</b> PowertrainInlineFilterDiffPressHighSx |
| <b>Log text</b>        | LubrFiltPressHigh__°C, __. __ |                                                   |
| <b>Subsystem name</b>  | PowerTrainLubrication         |                                                   |
| <b>Type</b>            | Warning                       | <b>Timeout</b> 10 day                             |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> PauseSlow                    |
| - Allowed attempts     | 1                             | - Max time disconnect 9 second                    |
| - Time window          | 1 hour                        | - Max time eliminate 10 second                    |
| - Stabilize period     | 60 second                     | <b>Category</b> Manufacturer                      |

**Criteria:**  
The warning is raised when the pressure across the Powertrain Inline Filter is high.  
High levels of pressure may indicate the filter is partly clogged.  
The filter is considered partly clogged if the following conditions are met:  
1. **\*\*IO.PowertrainLubrMainTankOilTemp\*\*** is above **\*\*InlineFilterHighPressTemp\*\***  
2. **\*\*InlineFilterDiffPress\*\*** is above **\*\*InlineFilterHighPress\*\*** in **\*\*InlineFilterHighPressTime\*\*** time, i.e. the pressure differential over the filter is above the limit.

The warning can be acknowledged when any for the following conditions are met:  
1. **\*\*IO.PowertrainLubrMainTankOilTemp\*\*** is below **\*\*InlineFilterHighPress\*\***.  
2. The pressure across the filter (**\*\*InlineFilterDiffPress\*\***) is below **\*\*InlineFilterHighPress\*\***

|                        |                                |                                                      |
|------------------------|--------------------------------|------------------------------------------------------|
| <b>No: 6247</b>        | <b>SupervisionID</b> 6247      | <b>Name</b> PowertrainInlineFilterDiffPressTooHighSx |
| <b>Log text</b>        | LubrFiltPressTooHi__°C, __. __ |                                                      |
| <b>Subsystem name</b>  | PowerTrainLubrication          |                                                      |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                                 |
| <b>Acknowledgement</b> | Remote                         | <b>Shutdown type</b> PauseSlow                       |
| - Allowed attempts     | <n/a>                          | - Max time disconnect 9 second                       |
| - Time window          | <n/a>                          | - Max time eliminate 10 second                       |
| - Stabilize period     | <n/a>                          | <b>Category</b> Manufacturer                         |

**Criteria:**  
The alarm is raised when the pressure across the Powertrain Inline Filter is too high.  
Too high levels of pressure may indicate the filter is clogged.  
The alarm is raised when **\*\*InlineFilterDiffPress\*\*** is above **\*\*InlineFilterTooHighPress\*\*** in **\*\*InlineFilterTooHighPressTime\*\***, i.e. the differential pressure over the filter is high.  
This alarm can be acknowledged if **\*\*IO.PowertrainLubrMainTankOilTemp\*\*** is below **\*\*InlineFilterTooHighPress\*\***.

|                        |                               |                                                  |
|------------------------|-------------------------------|--------------------------------------------------|
| <b>No: 6248</b>        | <b>SupervisionID</b> 6248     | <b>Name</b> PowertrainInlineFilterDiffPressLowSx |
| <b>Log text</b>        | LubrFiltPressLow ____ °C, _._ |                                                  |
| <b>Subsystem name</b>  | PowerTrainLubrication         |                                                  |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                        |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                       |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                      |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>                       |
| - Stabilize period     | 30 second                     | <b>Category</b> Manufacturer                     |

#### Criteria:

The warning is raised when the pressure drop over the Powertrain Inline Filter is low.

A pressure drop indicates there is a malfunctioning oil filter.

This warning can be raised if the following pre conditions are met:

1. **\*\*IO.PowertrainLubrMainTankOilTemp\*\*** is above **\*\*InlineFilterLowPressMinTemp\*\***, i.e. the main tank oil temperature is not low.
2. **\*\*IO.PowertrainLubrMainTankOilTemp\*\*** is below **\*\*InlineFilterLowPressMaxTemp\*\***, i.e. the main tank oil temperature is not high.
3. **\*\*IO.GearboxOilInletPress\*\*** is above **\*\*InlineFilterGearboxOilInletMinPress\*\***, i.e. the gearbox oil inlet pressure is not low.
4. **\*\*InlineFilterDiffPress\*\*** is below **\*\*InlineFilterLowPress\*\*** in **\*\*InlineFilterLowPresstime\*\***, i.e. the differential pressure over the filter is low.

This warning can be acknowledged when **\*\*InlineFilterDiffPress\*\*** is above **\*\*InlineFilterLowPress\*\***, i.e. when the differential pressure over the filter is not low anymore.

|                        |                               |                                        |
|------------------------|-------------------------------|----------------------------------------|
| <b>No: 6271</b>        | <b>SupervisionID</b> 6271     | <b>Name</b> ManualFunc_Alarm_HighSpdSx |
| <b>Log text</b>        | Alarm during ManFun & HighSpd |                                        |
| <b>Subsystem name</b>  | SV                            |                                        |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> PauseFast         |
| - Allowed attempts     | 3                             | - Max time disconnect 8 second         |
| - Time window          | 1 hour                        | - Max time eliminate 1 hour            |
| - Stabilize period     | 1 minute                      | <b>Category</b> Manufacturer           |

#### Criteria:

This supervision monitors when manual functions are active while a PauseSlow alarm is also active. This is to allow some manual functions activity with PauseSlow alarms active at the same time.

**\*\*GeneratorTachoSpeed\*\*** (measured on the high speed side) and reacts when it exceeds a negative speed limit defined as a ratio of nominal speed.

An alarm is issued if following conditions are met:

1. **\*\*SV\\_MFunAlarmHighSpd\\_ActivityLevel\*\*** = 2
2. **\*\*MFunRM.MFunRM\\_ManualFunctionsActive\*\*** = true
3. **\*\*PSC\\_ShutDownType\*\*** = PauseSlow
4. **\*\*GeneratorTachoSpeed\*\*** is above **\*\*SV\\_MFunAlarmHighSpd\\_LimitRatio\*\*** \* nominalSpeed

|                        |                           |                                                |              |
|------------------------|---------------------------|------------------------------------------------|--------------|
| <b>No: 6272</b>        | <b>SupervisionID</b> 6272 | <b>Name</b> TransformerWarmInColdEnvironmentSx |              |
| <b>Log text</b>        | TrafoLiquidWarmAtColdCond |                                                |              |
| <b>Subsystem name</b>  | Transformer               |                                                |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                                 | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                           | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect                          | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate                           | <n/a>        |
| - Stabilize period     | 60 second                 | <b>Category</b>                                | Manufacturer |

**Criteria:**  
If the environment temperature is not warm and a power derate is active, it will indicate that there is a failure on the turbine.

This warning is raised when (\*\*Turbine.GlobalIceDetection.EnvironmentTemp\*\*) is bellow the parameter \*\*EnvironmentHighTempLimit\*\* minus a margin level \*\*WarmEnvironmentMargin\*\*.

The warning can be acknowledged when the environment temperature is less than \*\*EnvironmentHighTempLimit\*\* minus a margin level \*\*WarmEnvironmentMargin\*\* plus a hysteresis level \*\*WarmEnvironmentHyst\*\*.

|                        |                           |                                         |              |
|------------------------|---------------------------|-----------------------------------------|--------------|
| <b>No: 6273</b>        | <b>SupervisionID</b> 6273 | <b>Name</b> TransformerLiquidTempHighSx |              |
| <b>Log text</b>        | TrafoLiquidTempHigh       |                                         |              |
| <b>Subsystem name</b>  | Transformer               |                                         |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                          | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                    | PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect                   | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate                    | 10 second    |
| - Stabilize period     | 10 minute                 | <b>Category</b>                         | Manufacturer |

**Criteria:**  
This warning supervises the transformer core temperature.

This warning is raised when (IO.TransformerCoreTemp1 or IO.TransformerCoreTemp2) are higher than the temperature given by the parameter \*\*LiquidHighTemp\*\* for an amount of time given by parameter \*\*LiquidHighTempStableTime\*\*.

The warning can be auto acknowledged when the core temperature is less than \*\*LiquidHighTemp\*\* minus an hysteresis level \*\*LiquidHighTempHyst\*\*.

|                        |                           |                                            |              |
|------------------------|---------------------------|--------------------------------------------|--------------|
| <b>No: 6274</b>        | <b>SupervisionID</b> 6274 | <b>Name</b> TransformerLiquidTempTooHighSx |              |
| <b>Log text</b>        | TrafoLiquidTempTooHigh    |                                            |              |
| <b>Subsystem name</b>  | Transformer               |                                            |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                             | <n/a>        |
| <b>Acknowledgement</b> | Local                     | <b>Shutdown type</b>                       | StopFast     |
| - Allowed attempts     | <n/a>                     | - Max time disconnect                      | 0.9 second   |
| - Time window          | <n/a>                     | - Max time eliminate                       | 3600 second  |
| - Stabilize period     | <n/a>                     | <b>Category</b>                            | Manufacturer |

**Criteria:**  
This warning supervises the transformer liquid temperature.

This warning is raised when (\*\*IO.TransformerLiquidTemp1\*\* or \*\*IO.TransformerLiquidTemp2\*\*) are higher than the temperature given by the parameter \*\*LiquidTooHighTemp\*\* for an amount of time given by parameter \*\*LiquidTooHighTempStableTime\*\*.

This alarm needs to be acknowledged locally.

|                        |                           |                                       |
|------------------------|---------------------------|---------------------------------------|
| <b>No: 6275</b>        | <b>SupervisionID</b> 6275 | <b>Name</b> TransformerCoreTempHighSx |
| <b>Log text</b>        | TrafoCoreTempHigh         |                                       |
| <b>Subsystem name</b>  | Transformer               |                                       |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                  |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow        |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second        |
| - Time window          | 1 hour                    | - Max time eliminate 10 second        |
| - Stabilize period     | 10 minute                 | <b>Category</b> Manufacturer          |

**Criteria:**

This warning supervises the transformer core temperature.

This warning is raised when (\*\*IO.TransformerCoreTemp1\*\* or \*\*IO.TransformerCoreTemp2\*\*) are higher than the temperature given by the parameter \*\*CoreHighTemp\*\* for an amount of time given by parameter \*\*CoreHighTempStableTime\*\*.

The warning can be auto acknowledged when the core temperature is less than \*\*CoreHighTemp\*\* minus an hysteresis level \*\*CoreHighTempHyst\*\*.

|                        |                           |                                          |
|------------------------|---------------------------|------------------------------------------|
| <b>No: 6276</b>        | <b>SupervisionID</b> 6276 | <b>Name</b> TransformerCoreTempTooHighSx |
| <b>Log text</b>        | TrafoCoreTempTooHigh      |                                          |
| <b>Subsystem name</b>  | Transformer               |                                          |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                     |
| <b>Acknowledgement</b> | Local                     | <b>Shutdown type</b> StopFast            |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 0.9 second         |
| - Time window          | <n/a>                     | - Max time eliminate 3600 second         |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer             |

**Criteria:**

This warning supervises the transformer core temperature.

This warning is raised when (\*\*IO.TransformerCoreTemp1\*\* or \*\*IO.TransformerCoreTemp2\*\*) are higher than the temperature given by the parameter \*\*CoreTooHighTemp\*\* for an amount of time given by parameter \*\*CoreTooHighTempStableTime\*\*.

This alarm needs to be acknowledged locally.

|                        |                                |                                                       |
|------------------------|--------------------------------|-------------------------------------------------------|
| <b>No: 6277</b>        | <b>SupervisionID</b> 6277      | <b>Name</b> TransformerLiquidCoolingPumpThermoFaultSx |
| <b>Log text</b>        | TrafoLiquidCoolPumpThermoFault |                                                       |
| <b>Subsystem name</b>  | Transformer                    |                                                       |
| <b>Type</b>            | Warning                        | <b>Timeout</b> <disabled>                             |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> <n/a>                            |
| - Allowed attempts     | 3                              | - Max time disconnect <n/a>                           |
| - Time window          | 1 hour                         | - Max time eliminate <n/a>                            |
| - Stabilize period     | 120 second                     | <b>Category</b> Manufacturer                          |

**Criteria:**

This warning is raised when the thermo protection feedback of the liquid Pump is active.

If the pump is overloaded (\*\*IO.TransformerLiquidPumpOverloaded\*\*), a supervision must be reported, and the pump must be stopped.

The warning is auto acknowledged when the overloaded condition disappears.

|                        |                               |                                                            |              |
|------------------------|-------------------------------|------------------------------------------------------------|--------------|
| <b>No: 6278</b>        | <b>SupervisionID</b> 6278     | <b>Name</b> TransformerLiquidCoolingPumpNegativeFeedbackSx |              |
| <b>Log text</b>        | TrafoLiquidCoolPumpNegFBError |                                                            |              |
| <b>Subsystem name</b>  | Transformer                   |                                                            |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                                             | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                                       | <n/a>        |
| - Allowed attempts     | 3                             | - Max time disconnect                                      | <n/a>        |
| - Time window          | 1 hour                        | - Max time eliminate                                       | <n/a>        |
| - Stabilize period     | 120 second                    | <b>Category</b>                                            | Manufacturer |

**Criteria:**

This warning is indicating that the contactor for the transformer liquid cooling pump does not close when the control output is activated.

The warning is raised if **\*\*IO.TransformerLiquidPumpContactorClosed\*\*** does not change to true within the time **\*\*PumpFeedbackTime\*\*** after **\*\*IO.TransformerLiquidPumpStart\*\*** has changed from false to true.

The warning is auto acknowledged when the two signals **\*\*IO.TransformerLiquidPumpStart\*\*** and **\*\*IO.TransformerLiquidPumpContactorClosed\*\*** are aligned at either true or false level.

|                        |                           |                                                  |              |
|------------------------|---------------------------|--------------------------------------------------|--------------|
| <b>No: 6279</b>        | <b>SupervisionID</b> 6279 | <b>Name</b> TransformerLiquidCoolingPumpCBOpenSx |              |
| <b>Log text</b>        | TrafoLiquidCoolPumpCBOpen |                                                  |              |
| <b>Subsystem name</b>  | Transformer               |                                                  |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                                   | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                             | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect                            | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate                             | <n/a>        |
| - Stabilize period     | 120 second                | <b>Category</b>                                  | Manufacturer |

**Criteria:**

This warning supervises that the pump circuit breaker is closed. If the circuit breaker is open (**\*\*IO.TransformerLiquidPumpCBClosed\*\*** is false) a warning is raised.

The warning is auto acknowledged when the circuit breaker closes.

|                        |                           |                                      |              |
|------------------------|---------------------------|--------------------------------------|--------------|
| <b>No: 6280</b>        | <b>SupervisionID</b> 6280 | <b>Name</b> TransformerGasLevelLowSx |              |
| <b>Log text</b>        | TrafoGasLevelLow          |                                      |              |
| <b>Subsystem name</b>  | Transformer               |                                      |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                       | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                 | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect                | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate                 | <n/a>        |
| - Stabilize period     | 10 minute                 | <b>Category</b>                      | Manufacturer |

**Criteria:**

This warning indicates that the transformer gas level is low, which can also indicate that the liquid level is getting low.

This warning is raised when (**\*\*IO.TransformerGasLevelOk\*\***) is false.

This warning is automatically acknowledged.



|                        |                           |                                                          |
|------------------------|---------------------------|----------------------------------------------------------|
| <b>No: 6281</b>        | <b>SupervisionID</b> 6281 | <b>Name</b> TransformerInsulationLiquidLevelExtremeLowSx |
| <b>Log text</b>        | TrafoLiquidExtremeLow     |                                                          |
| <b>Subsystem name</b>  | Transformer               |                                                          |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                                     |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> PauseFast                           |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 8 second                           |
| - Time window          | <n/a>                     | - Max time eliminate 3600 second                         |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer                             |

**Criteria:**

This warning indicates that the insulation liquid level is extremely low.

This warning by the safety system.

This alarm must be manually acknowledged.

|                        |                           |                                  |
|------------------------|---------------------------|----------------------------------|
| <b>No: 6282</b>        | <b>SupervisionID</b> 6282 | <b>Name</b> TransformerErrorSx   |
| <b>Log text</b>        | TrafoError                |                                  |
| <b>Subsystem name</b>  | Transformer               |                                  |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>             |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> PauseFast   |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 8 second   |
| - Time window          | <n/a>                     | - Max time eliminate 3600 second |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer     |

**Criteria:**

This warning indicates that the transformer has an internal fault.

This warning is raised by the safety system.

This alarm must be manually acknowledged.

|                        |                               |                                                            |
|------------------------|-------------------------------|------------------------------------------------------------|
| <b>No: 6283</b>        | <b>SupervisionID</b> 6283     | <b>Name</b> TransformerLiquidCoolingPumpPositiveFeedbackSx |
| <b>Log text</b>        | TrafoLiquidCoolPumpPosFBError |                                                            |
| <b>Subsystem name</b>  | Transformer                   |                                                            |
| <b>Type</b>            | Warning                       | <b>Timeout</b> <disabled>                                  |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> <n/a>                                 |
| - Allowed attempts     | 3                             | - Max time disconnect <n/a>                                |
| - Time window          | 1 hour                        | - Max time eliminate <n/a>                                 |
| - Stabilize period     | 120 second                    | <b>Category</b> Manufacturer                               |

**Criteria:**

This warning is indicating that the contactor for the transformer liquid cooling pump does not open when the control output is deactivated.

The warning is raised if **\*\*IO.TransformerLiquidPumpContactorClosed\*\*** does not change to false within the time **\*\*PumpFeedbackTime\*\*** after **\*\*IO.TransformerLiquidPumpStart\*\*** has changed from true to false.

The warning is auto acknowledged when the two signals **\*\*IO.TransformerLiquidPumpStart\*\*** and **\*\*IO.TransformerLiquidPumpContactorClosed\*\*** are aligned at either true or false level.

|                        |                           |                          |              |
|------------------------|---------------------------|--------------------------|--------------|
| <b>No: 6284</b>        | <b>SupervisionID</b> 6284 | <b>Name</b> TestActiveSx |              |
| <b>Log text</b>        | EMC valves test active    |                          |              |
| <b>Subsystem name</b>  | PitchValvesTestFunction   |                          |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>           | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>     | PauseSlow    |
| - Allowed attempts     | 5                         | - Max time disconnect    | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate     | 10 second    |
| - Stabilize period     | 0 second                  | <b>Category</b>          | Manufacturer |

**Criteria:**  
This alarm is raised if a Turbine Test Function is scheduled to run automatically or run manually.

Even though this is an alarm, it indicates normal operation of the turbine. It is only used for correct downtime calculation for the turbine. It does not require any special service attention.

The alarm will be auto acknowledged when the test function has completed.

This alarm is raised if the Test Emergency Pitch Valves test function is run manually or automatically.

|                        |                           |                          |              |
|------------------------|---------------------------|--------------------------|--------------|
| <b>No: 6285</b>        | <b>SupervisionID</b> 6285 | <b>Name</b> TestActiveSx |              |
| <b>Log text</b>        | Blade loads calib. Active |                          |              |
| <b>Subsystem name</b>  | BladeLoads                |                          |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>           | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>     | PauseSlow    |
| - Allowed attempts     | 5                         | - Max time disconnect    | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate     | 10 second    |
| - Stabilize period     | 0 second                  | <b>Category</b>          | Manufacturer |

**Criteria:**  
This alarm is raised if a Turbine Test Function is scheduled to run automatically or run manually.

Even though this is an alarm, it indicates normal operation of the turbine. It is only used for correct downtime calculation for the turbine. It does not require any special service attention.

The alarm will be auto acknowledged when the test function has completed.

This alarm is raised if the Blade Loads Calibration Variant2 test function is run manually or automatically.

|                        |                           |                                |
|------------------------|---------------------------|--------------------------------|
| <b>No: 6286</b>        | <b>SupervisionID</b> 6286 | <b>Name</b> TestActiveSx       |
| <b>Log text</b>        | Brake test active         |                                |
| <b>Subsystem name</b>  | BrakeTestFunction         |                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow |
| - Allowed attempts     | 5                         | - Max time disconnect 9 second |
| - Time window          | 1 hour                    | - Max time eliminate 10 second |
| - Stabilize period     | 0 second                  | <b>Category</b> Manufacturer   |

**Criteria:**  
This alarm is raised if a Turbine Test Function is scheduled to run automatically or run manually.

Even though this is an alarm, it indicates normal operation of the turbine. It is only used for correct downtime calculation for the turbine. It does not require any special service attention.

The alarm will be auto acknowledged when the test function has completed.

This alarm is raised if the Brake test function is run manually or automatically.

|                        |                               |                                |
|------------------------|-------------------------------|--------------------------------|
| <b>No: 6287</b>        | <b>SupervisionID</b> 6287     | <b>Name</b> TestActiveSx       |
| <b>Log text</b>        | OverspeedTestFullSpeed active |                                |
| <b>Subsystem name</b>  | OverspeedTestFullSpeed        |                                |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> PauseSlow |
| - Allowed attempts     | 5                             | - Max time disconnect 9 second |
| - Time window          | 1 hour                        | - Max time eliminate 10 second |
| - Stabilize period     | 0 second                      | <b>Category</b> Manufacturer   |

**Criteria:**  
This alarm is raised if a Turbine Test Function is scheduled to run automatically or run manually.

Even though this is an alarm, it indicates normal operation of the turbine. It is only used for correct downtime calculation for the turbine. It does not require any special service attention.

The alarm will be auto acknowledged when the test function has completed.

This alarm is raised if the Overspeed Test Full Speed test function is run manually.

|                        |                           |                                |
|------------------------|---------------------------|--------------------------------|
| <b>No: 6288</b>        | <b>SupervisionID</b> 6288 | <b>Name</b> TestActiveSx       |
| <b>Log text</b>        | DeIcing active            |                                |
| <b>Subsystem name</b>  | DeIcing                   |                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow |
| - Allowed attempts     | 5                         | - Max time disconnect 9 second |
| - Time window          | 1 hour                    | - Max time eliminate 10 second |
| - Stabilize period     | 0 second                  | <b>Category</b> Manufacturer   |

**Criteria:**  
This alarm is raised if a Turbine Test Function is scheduled to run automatically or run manually.

Even though this is an alarm, it indicates normal operation of the turbine. It is only used for correct downtime calculation for the turbine. It does not require any special service attention.

The alarm will be auto acknowledged when the test function has completed.

This alarm is raised if the DeIcing Variant1 test function is run manually or automatically.

|                        |                           |                                |
|------------------------|---------------------------|--------------------------------|
| <b>No: 6290</b>        | <b>SupervisionID</b> 6290 | <b>Name</b> TestActiveSx       |
| <b>Log text</b>        | Pitch accu. test active   |                                |
| <b>Subsystem name</b>  | HydraulicTestFunction     |                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow |
| - Allowed attempts     | 5                         | - Max time disconnect 9 second |
| - Time window          | 1 hour                    | - Max time eliminate 10 second |
| - Stabilize period     | 0 second                  | <b>Category</b> Manufacturer   |

**Criteria:**  
This alarm is raised if a Turbine Test Function is scheduled to run automatically or run manually.

Even though this is an alarm, it indicates normal operation of the turbine. It is only used for correct downtime calculation for the turbine. It does not require any special service attention.

The alarm will be auto acknowledged when the test function has completed.

This alarm is raised if the Pitch Accumulators test function is run manually or automatically.

|                        |                           |                          |              |
|------------------------|---------------------------|--------------------------|--------------|
| <b>No: 6293</b>        | <b>SupervisionID</b> 6293 | <b>Name</b> TestActiveSx |              |
| <b>Log text</b>        | Pitch valves test active  |                          |              |
| <b>Subsystem name</b>  | PitchValvesTestFunction   |                          |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>           | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>     | PauseSlow    |
| - Allowed attempts     | 5                         | - Max time disconnect    | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate     | 10 second    |
| - Stabilize period     | 0 second                  | <b>Category</b>          | Manufacturer |

**Criteria:**  
This alarm is raised if a Turbine Test Function is scheduled to run automatically or run manually.

Even though this is an alarm, it indicates normal operation of the turbine. It is only used for correct downtime calculation for the turbine. It does not require any special service attention.

The alarm will be auto acknowledged when the test function has completed.

This alarm is raised if the Pitch Valves test function is run manually or automatically.

|                        |                                   |                          |              |
|------------------------|-----------------------------------|--------------------------|--------------|
| <b>No: 6295</b>        | <b>SupervisionID</b> 6295         | <b>Name</b> TestActiveSx |              |
| <b>Log text</b>        | Tower nat. freq. test active      |                          |              |
| <b>Subsystem name</b>  | TowerNaturalFrequencyTestFunction |                          |              |
| <b>Type</b>            | Alarm                             | <b>Timeout</b>           | <n/a>        |
| <b>Acknowledgement</b> | Auto                              | <b>Shutdown type</b>     | PauseSlow    |
| - Allowed attempts     | 5                                 | - Max time disconnect    | 9 second     |
| - Time window          | 1 hour                            | - Max time eliminate     | 10 second    |
| - Stabilize period     | 0 second                          | <b>Category</b>          | Manufacturer |

**Criteria:**  
This alarm is raised if a Turbine Test Function is scheduled to run automatically or run manually.

Even though this is an alarm, it indicates normal operation of the turbine. It is only used for correct downtime calculation for the turbine. It does not require any special service attention.

The alarm will be auto acknowledged when the test function has completed.

This alarm is raised if the Brake test function is run manually or automatically.

|                        |                                |                                      |
|------------------------|--------------------------------|--------------------------------------|
| <b>No: 6305</b>        | <b>SupervisionID</b> 6305      | <b>Name</b> OverspeedDetectionTestSx |
| <b>Log text</b>        | MaxGeneratorRPM Test ____._RPM |                                      |
| <b>Subsystem name</b>  | SV                             |                                      |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>                 |
| <b>Acknowledgement</b> | Remote                         | <b>Shutdown type</b> StopSlow        |
| - Allowed attempts     | <n/a>                          | - Max time disconnect 3 second       |
| - Time window          | <n/a>                          | - Max time eliminate 9 second        |
| - Stabilize period     | <n/a>                          | <b>Category</b> Manufacturer         |

**Criteria:**

This is an alarm which as default is deactivated but gets activated during the test of the overspeed test function.

1. Supervision is activated using the manual functions interface
2. \*\*GeneratorTachoSpeed\*\* is above \*\*SV\\_GenSpdHighTest\\_LimitRatio\*\* \* nominalSpeed

|                        |                                |                                                           |
|------------------------|--------------------------------|-----------------------------------------------------------|
| <b>No: 6318</b>        | <b>SupervisionID</b> 6318      | <b>Name</b> LightningDetectorBladeAHighPeakCurrentErrorSx |
| <b>Log text</b>        | Lightning Det BldA Pek Cur Err |                                                           |
| <b>Subsystem name</b>  | LightningDetector              |                                                           |
| <b>Type</b>            | Warning                        | <b>Timeout</b> <disabled>                                 |
| <b>Acknowledgement</b> | Local                          | <b>Shutdown type</b> <n/a>                                |
| - Allowed attempts     | <n/a>                          | - Max time disconnect <n/a>                               |
| - Time window          | <n/a>                          | - Max time eliminate <n/a>                                |
| - Stabilize period     | <n/a>                          | <b>Category</b> Manufacturer                              |

**Criteria:**

This warning is raised if high peak current is detected on the lightning detector sensor at blade A greater than Prm\_LightningDetectorHighPeakCurrent for Prm\_LightningDetectorHighCurrentStableTime.

|                        |                                |                                                           |
|------------------------|--------------------------------|-----------------------------------------------------------|
| <b>No: 6319</b>        | <b>SupervisionID</b> 6319      | <b>Name</b> LightningDetectorBladeBHighPeakCurrentErrorSx |
| <b>Log text</b>        | Lightning Det BldB Pek Cur Err |                                                           |
| <b>Subsystem name</b>  | LightningDetector              |                                                           |
| <b>Type</b>            | Warning                        | <b>Timeout</b> <disabled>                                 |
| <b>Acknowledgement</b> | Local                          | <b>Shutdown type</b> <n/a>                                |
| - Allowed attempts     | <n/a>                          | - Max time disconnect <n/a>                               |
| - Time window          | <n/a>                          | - Max time eliminate <n/a>                                |
| - Stabilize period     | <n/a>                          | <b>Category</b> Manufacturer                              |

**Criteria:**

This warning is raised if high peak current is detected on the lightning detector sensor at blade B greater than Prm\_LightningDetectorHighPeakCurrent for Prm\_LightningDetectorHighCurrentStableTime.

**No: 6320**      **SupervisionID**      **Name** LightningDetectorBladeCHighPeakCurrentErrorSx  
6320  
**Log text**      Lightning Det BldC Pek Cur Err  
**Subsystem name**      LightningDetector  
**Type**      Warning      **Timeout**      <disabled>  
**Acknowledgement**      Local      **Shutdown type**      <n/a>  
- Allowed      <n/a>      - Max time disconnect      <n/a>  
**attempts**  
- Time window      <n/a>      - Max time eliminate      <n/a>  
- Stabilize      <n/a>      **Category**      Manufacturer  
**period**  
**Criteria:**  
This warning is raised if high peak current is detected on the lightning detector sensor at blade C greater than Prm\_LightningDetectorHighPeakCurrent for Prm\_LightningDetectorHighCurrentStableTime.

**No: 6321**      **SupervisionID**      **Name** LightningDetectorBladeAHighSpecificEnergyErrorSx  
6321  
**Log text**      Lightning Det BldA Spe Eny Err  
**Subsystem name**      LightningDetector  
**Type**      Warning      **Timeout**      <disabled>  
**Acknowledgement**      Local      **Shutdown type**      <n/a>  
- Allowed      <n/a>      - Max time disconnect      <n/a>  
**attempts**  
- Time window      <n/a>      - Max time eliminate      <n/a>  
- Stabilize      <n/a>      **Category**      Manufacturer  
**period**  
**Criteria:**  
This warning is raised if high specific energy is detected on the lightning detector sensor at blade A greater than Prm\_LightningDetectorHighSpecificEnergy for Prm\_LightningDetectorHighCurrentStableTime.

**No: 6322**      **SupervisionID**      **Name** LightningDetectorBladeBHighSpecificEnergyErrorSx  
6322  
**Log text**      Lightning Det BldB Spe Eny Err  
**Subsystem name**      LightningDetector  
**Type**      Warning      **Timeout**      <disabled>  
**Acknowledgement**      Local      **Shutdown type**      <n/a>  
- Allowed      <n/a>      - Max time disconnect      <n/a>  
**attempts**  
- Time window      <n/a>      - Max time eliminate      <n/a>  
- Stabilize      <n/a>      **Category**      Manufacturer  
**period**  
**Criteria:**  
This warning is raised if high specific energy is detected on the lightning detector sensor at blade B greater than Prm\_LightningDetectorHighSpecificEnergy for Prm\_LightningDetectorHighCurrentStableTime.

**No: 6323****SupervisionID****Name** LightningDetectorBladeCHighSpecificEnergyErrorSx

6323

**Log text**

Lightning Det BldC Spe Eny Err

**Subsystem name**

LightningDetector

**Type**

Warning

**Timeout**

&lt;disabled&gt;

**Acknowledgement**

Local

**Shutdown type**

&lt;n/a&gt;

**- Allowed**

&lt;n/a&gt;

**- Max time disconnect**

&lt;n/a&gt;

**attempts****- Time window**

&lt;n/a&gt;

**- Max time eliminate**

&lt;n/a&gt;

**- Stabilize**

&lt;n/a&gt;

**Category**

Manufacturer

**period****Criteria:**

This warning is raised if high specific energy is detected on the lightning detector sensor at blade C greater than Prm\_LightningDetectorHighSpecificEnergy for Prm\_LightningDetectorHighCurrentStableTime.

**No: 6324****SupervisionID****Name** LightningDetectorBladeAHighChargeSensorErrorSx

6324

**Log text**

Lightning Det BldA Chg Snr Err

**Subsystem name**

LightningDetector

**Type**

Warning

**Timeout**

&lt;disabled&gt;

**Acknowledgement**

Local

**Shutdown type**

&lt;n/a&gt;

**- Allowed**

&lt;n/a&gt;

**- Max time disconnect**

&lt;n/a&gt;

**attempts****- Time window**

&lt;n/a&gt;

**- Max time eliminate**

&lt;n/a&gt;

**- Stabilize**

&lt;n/a&gt;

**Category**

Manufacturer

**period****Criteria:**

This warning is raised if high charge is detected on the lightning detector sensor at blade A greater than Prm\_LightningDetectorHighCharge for Prm\_LightningDetectorHighCurrentStableTime.

**No: 6325****SupervisionID****Name** LightningDetectorBladeBHighChargeSensorErrorSx

6325

**Log text**

Lightning Det BldB Chg Snr Err

**Subsystem name**

LightningDetector

**Type**

Warning

**Timeout**

&lt;disabled&gt;

**Acknowledgement**

Local

**Shutdown type**

&lt;n/a&gt;

**- Allowed**

&lt;n/a&gt;

**- Max time disconnect**

&lt;n/a&gt;

**attempts****- Time window**

&lt;n/a&gt;

**- Max time eliminate**

&lt;n/a&gt;

**- Stabilize**

&lt;n/a&gt;

**Category**

Manufacturer

**period****Criteria:**

This warning is raised if high charge is detected on the lightning detector sensor at blade B greater than Prm\_LightningDetectorHighCharge for Prm\_LightningDetectorHighCurrentStableTime.



|                                                                                                                                                                                            |                                |                       |                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------|------------------------------------------------|
| <b>No: 6326</b>                                                                                                                                                                            | <b>SupervisionID</b>           | <b>Name</b>           | LightningDetectorBladeCHighChargeSensorErrorSx |
|                                                                                                                                                                                            | 6326                           |                       |                                                |
| <b>Log text</b>                                                                                                                                                                            | Lightning Det BldC Chg Snr Err |                       |                                                |
| <b>Subsystem name</b>                                                                                                                                                                      | LightningDetector              |                       |                                                |
| <b>Type</b>                                                                                                                                                                                | Warning                        | <b>Timeout</b>        | <disabled>                                     |
| <b>Acknowledgement</b>                                                                                                                                                                     | Local                          | <b>Shutdown type</b>  | <n/a>                                          |
| - Allowed                                                                                                                                                                                  | <n/a>                          | - Max time disconnect | <n/a>                                          |
| <b>attempts</b>                                                                                                                                                                            |                                |                       |                                                |
| - Time window                                                                                                                                                                              | <n/a>                          | - Max time eliminate  | <n/a>                                          |
| - Stabilize                                                                                                                                                                                | <n/a>                          | <b>Category</b>       | Manufacturer                                   |
| <b>period</b>                                                                                                                                                                              |                                |                       |                                                |
| <b>Criteria:</b>                                                                                                                                                                           |                                |                       |                                                |
| This warning is raised if high charge is detected on the lightning detector sensor at blade C greater than Prm_LightningDetectorHighCharge for Prm_LightningDetectorHighCurrentStableTime. |                                |                       |                                                |

|                                                                                                                                                                                                        |                                |                       |                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------|--------------------------------------------------|
| <b>No: 6327</b>                                                                                                                                                                                        | <b>SupervisionID</b>           | <b>Name</b>           | LightningDetectorBladeATooHighPeakCurrentErrorSx |
|                                                                                                                                                                                                        | 6327                           |                       |                                                  |
| <b>Log text</b>                                                                                                                                                                                        | Lightning Det BldA Pek Cur Err |                       |                                                  |
| <b>Subsystem name</b>                                                                                                                                                                                  | LightningDetector              |                       |                                                  |
| <b>Type</b>                                                                                                                                                                                            | Alarm                          | <b>Timeout</b>        | <n/a>                                            |
| <b>Acknowledgement</b>                                                                                                                                                                                 | Local                          | <b>Shutdown type</b>  | StopSlow                                         |
| - Allowed                                                                                                                                                                                              | <n/a>                          | - Max time disconnect | 3 second                                         |
| <b>attempts</b>                                                                                                                                                                                        |                                |                       |                                                  |
| - Time window                                                                                                                                                                                          | <n/a>                          | - Max time eliminate  | 9 second                                         |
| - Stabilize                                                                                                                                                                                            | <n/a>                          | <b>Category</b>       | Manufacturer                                     |
| <b>period</b>                                                                                                                                                                                          |                                |                       |                                                  |
| <b>Criteria:</b>                                                                                                                                                                                       |                                |                       |                                                  |
| This alarm is raised if high peak current is detected on the lightning detector sensor at blade A greater than Prm_LightningDetectorTooHighPeakCurrent for Prm_LightningDetectorHighCurrentStableTime. |                                |                       |                                                  |

|                                                                                                                                                                                                        |                                |                       |                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------|--------------------------------------------------|
| <b>No: 6328</b>                                                                                                                                                                                        | <b>SupervisionID</b>           | <b>Name</b>           | LightningDetectorBladeBTooHighPeakCurrentErrorSx |
|                                                                                                                                                                                                        | 6328                           |                       |                                                  |
| <b>Log text</b>                                                                                                                                                                                        | Lightning Det BldB Pek Cur Err |                       |                                                  |
| <b>Subsystem name</b>                                                                                                                                                                                  | LightningDetector              |                       |                                                  |
| <b>Type</b>                                                                                                                                                                                            | Alarm                          | <b>Timeout</b>        | <n/a>                                            |
| <b>Acknowledgement</b>                                                                                                                                                                                 | Local                          | <b>Shutdown type</b>  | StopSlow                                         |
| - Allowed                                                                                                                                                                                              | <n/a>                          | - Max time disconnect | 3 second                                         |
| <b>attempts</b>                                                                                                                                                                                        |                                |                       |                                                  |
| - Time window                                                                                                                                                                                          | <n/a>                          | - Max time eliminate  | 9 second                                         |
| - Stabilize                                                                                                                                                                                            | <n/a>                          | <b>Category</b>       | Manufacturer                                     |
| <b>period</b>                                                                                                                                                                                          |                                |                       |                                                  |
| <b>Criteria:</b>                                                                                                                                                                                       |                                |                       |                                                  |
| This alarm is raised if high peak current is detected on the lightning detector sensor at blade B greater than Prm_LightningDetectorTooHighPeakCurrent for Prm_LightningDetectorHighCurrentStableTime. |                                |                       |                                                  |

|                        |                                |                       |                                                  |
|------------------------|--------------------------------|-----------------------|--------------------------------------------------|
| <b>No: 6329</b>        | <b>SupervisionID</b>           | <b>Name</b>           | LightningDetectorBladeCTooHighPeakCurrentErrorSx |
|                        | 6329                           |                       |                                                  |
| <b>Log text</b>        | Lightning Det BldC Pek Cur Err |                       |                                                  |
| <b>Subsystem name</b>  | LightningDetector              |                       |                                                  |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>        | <n/a>                                            |
| <b>Acknowledgement</b> | Local                          | <b>Shutdown type</b>  | StopSlow                                         |
| - Allowed attempts     | <n/a>                          | - Max time disconnect | 3 second                                         |
| - Time window          | <n/a>                          | - Max time eliminate  | 9 second                                         |
| - Stabilize period     | <n/a>                          | <b>Category</b>       | Manufacturer                                     |

**Criteria:**  
This alarm is raised if high peak current is detected on the lightning detector sensor at blade C greater than Prm\_LightningDetectorTooHighPeakCurrent for Prm\_LightningDetectorHighCurrentStableTime.

|                        |                                |                       |                                                     |
|------------------------|--------------------------------|-----------------------|-----------------------------------------------------|
| <b>No: 6330</b>        | <b>SupervisionID</b>           | <b>Name</b>           | LightningDetectorBladeATooHighSpecificEnergyErrorSx |
|                        | 6330                           |                       |                                                     |
| <b>Log text</b>        | Lightning Det BldA Spe Eny Err |                       |                                                     |
| <b>Subsystem name</b>  | LightningDetector              |                       |                                                     |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>        | <n/a>                                               |
| <b>Acknowledgement</b> | Local                          | <b>Shutdown type</b>  | StopSlow                                            |
| - Allowed attempts     | <n/a>                          | - Max time disconnect | 3 second                                            |
| - Time window          | <n/a>                          | - Max time eliminate  | 9 second                                            |
| - Stabilize period     | <n/a>                          | <b>Category</b>       | Manufacturer                                        |

**Criteria:**  
This alarm is raised if high specific energy is detected on the lightning detector sensor at blade A greater than Prm\_LightningDetectorTooHighSpecificEnergy for Prm\_LightningDetectorHighCurrentStableTime.

|                        |                                |                       |                                                     |
|------------------------|--------------------------------|-----------------------|-----------------------------------------------------|
| <b>No: 6331</b>        | <b>SupervisionID</b>           | <b>Name</b>           | LightningDetectorBladeBTooHighSpecificEnergyErrorSx |
|                        | 6331                           |                       |                                                     |
| <b>Log text</b>        | Lightning Det BldB Spe Eny Err |                       |                                                     |
| <b>Subsystem name</b>  | LightningDetector              |                       |                                                     |
| <b>Type</b>            | Alarm                          | <b>Timeout</b>        | <n/a>                                               |
| <b>Acknowledgement</b> | Local                          | <b>Shutdown type</b>  | StopSlow                                            |
| - Allowed attempts     | <n/a>                          | - Max time disconnect | 3 second                                            |
| - Time window          | <n/a>                          | - Max time eliminate  | 9 second                                            |
| - Stabilize period     | <n/a>                          | <b>Category</b>       | Manufacturer                                        |

**Criteria:**  
This alarm is raised if high specific energy is detected on the lightning detector sensor at blade B greater than Prm\_LightningDetectorTooHighSpecificEnergy for Prm\_LightningDetectorHighCurrentStableTime.

**No: 6332**

|                 | SupervisionID                  | Name                                                |
|-----------------|--------------------------------|-----------------------------------------------------|
| Log text        | 6332                           | LightningDetectorBladeCTooHighSpecificEnergyErrorSx |
| Subsystem name  | Lightning Det BldC Spe Eny Err |                                                     |
| Type            | LightningDetector              |                                                     |
| Acknowledgement | Alarm                          | Timeout <n/a>                                       |
| - Allowed       | Local                          | Shutdown type StopSlow                              |
| attempts        | <n/a>                          | - Max time disconnect 3 second                      |
| - Time window   | <n/a>                          | - Max time eliminate 9 second                       |
| - Stabilize     | <n/a>                          | Category Manufacturer                               |

period

**Criteria:**

This alarm is raised if high specific energy is detected on the lightning detector sensor at blade C greater than Prm\_LightningDetectorTooHighSpecificEnergy for Prm\_LightningDetectorHighCurrentStableTime.

**No: 6333**

|                 | SupervisionID                  | Name                                              |
|-----------------|--------------------------------|---------------------------------------------------|
| Log text        | 6333                           | LightningDetectorBladeATooHighChargeSensorErrorSx |
| Subsystem name  | Lightning Det BldA Chg Snr Err |                                                   |
| Type            | LightningDetector              |                                                   |
| Acknowledgement | Alarm                          | Timeout <n/a>                                     |
| - Allowed       | Local                          | Shutdown type StopSlow                            |
| attempts        | <n/a>                          | - Max time disconnect 3 second                    |
| - Time window   | <n/a>                          | - Max time eliminate 9 second                     |
| - Stabilize     | <n/a>                          | Category Manufacturer                             |

period

**Criteria:**

This alarm is raised if high charge is detected on the lightning detector sensor at blade A greater than Prm\_LightningDetectorTooHighCharge for Prm\_LightningDetectorHighCurrentStableTime.

**No: 6334**

|                 | SupervisionID                  | Name                                              |
|-----------------|--------------------------------|---------------------------------------------------|
| Log text        | 6334                           | LightningDetectorBladeBTooHighChargeSensorErrorSx |
| Subsystem name  | Lightning Det BldB Chg Snr Err |                                                   |
| Type            | LightningDetector              |                                                   |
| Acknowledgement | Alarm                          | Timeout <n/a>                                     |
| - Allowed       | Local                          | Shutdown type StopSlow                            |
| attempts        | <n/a>                          | - Max time disconnect 3 second                    |
| - Time window   | <n/a>                          | - Max time eliminate 9 second                     |
| - Stabilize     | <n/a>                          | Category Manufacturer                             |

period

**Criteria:**

This alarm is raised if high charge is detected on the lightning detector sensor at blade B greater than Prm\_LightningDetectorTooHighCharge for Prm\_LightningDetectorHighCurrentStableTime.

**No: 6335**

| SupervisionID                           | Name                                              |
|-----------------------------------------|---------------------------------------------------|
| 6335                                    | LightningDetectorBladeCTooHighChargeSensorErrorSx |
| Log text Lightning Det BldC Chg Snr Err |                                                   |
| Subsystem name LightningDetector        |                                                   |
| Type Alarm                              | Timeout <n/a>                                     |
| Acknowledgement Local                   | Shutdown type StopSlow                            |
| - Allowed attempts <n/a>                | - Max time disconnect 3 second                    |
| - Time window <n/a>                     | - Max time eliminate 9 second                     |
| - Stabilize period <n/a>                | Category Manufacturer                             |

**Criteria:**

This alarm is raised if high charge is detected on the lightning detector sensor at blade C greater than Prm\_LightningDetectorTooHighCharge for Prm\_LightningDetectorHighCurrentStableTime.

**No: 6348**

| SupervisionID                         | Name                                          |
|---------------------------------------|-----------------------------------------------|
| 6348                                  | PowerSupplyYawPrimaryContactorFeedbackErrorSx |
| Log text Yaw Prim Cont Feedback Error |                                               |
| Subsystem name PowerSupply            |                                               |
| Type Alarm                            | Timeout <n/a>                                 |
| Acknowledgement Auto                  | Shutdown type PauseSlow                       |
| - Allowed attempts 3                  | - Max time disconnect 9 second                |
| - Time window 1 hour                  | - Max time eliminate 10 second                |
| - Stabilize period 60 second          | Category Manufacturer                         |

**Criteria:**

This Alarm is indicating that a Yaw safety primary contactor feedback error.

**No: 6349**

| SupervisionID                        | Name                                            |
|--------------------------------------|-------------------------------------------------|
| 6349                                 | PowerSupplyYawSecondaryContactorFeedbackErrorSx |
| Log text Yaw Sec Cont Feedback Error |                                                 |
| Subsystem name PowerSupply           |                                                 |
| Type Alarm                           | Timeout <n/a>                                   |
| Acknowledgement Auto                 | Shutdown type PauseSlow                         |
| - Allowed attempts 3                 | - Max time disconnect 9 second                  |
| - Time window 1 hour                 | - Max time eliminate 10 second                  |
| - Stabilize period 60 second         | Category Manufacturer                           |

**Criteria:**

This Alarm is indicating that a Yaw safety secondary contactor feedback error.

**No: 6350**

| SupervisionID                           | Name                                            |
|-----------------------------------------|-------------------------------------------------|
| 6350                                    | PowerSupplyOtherPrimaryContactorFeedbackErrorSx |
| Log text Other Prim Cont Feedback Error |                                                 |
| Subsystem name PowerSupply              |                                                 |
| Type Alarm                              | Timeout <n/a>                                   |
| Acknowledgement Auto                    | Shutdown type PauseSlow                         |
| - Allowed attempts 3                    | - Max time disconnect 9 second                  |
| - Time window 1 hour                    | - Max time eliminate 10 second                  |
| - Stabilize period 60 second            | Category Manufacturer                           |

**Criteria:**

This Alarm is indicating that a Other safety primary contactor feedback error.

**No: 6351**

|                        | <b>SupervisionID</b>          | <b>Name</b>                                       |              |
|------------------------|-------------------------------|---------------------------------------------------|--------------|
| <b>Log text</b>        | 6351                          | PowerSupplyOtherSecondaryContactorFeedbackErrorSx |              |
| <b>Subsystem name</b>  | Other Sec Cont Feedback Error |                                                   |              |
| <b>Type</b>            | PowerSupply                   |                                                   |              |
| <b>Acknowledgement</b> | Alarm                         | <b>Timeout</b>                                    | <n/a>        |
| - Allowed              | Auto                          | <b>Shutdown type</b>                              | PauseSlow    |
| <b>attempts</b>        | 3                             | - Max time disconnect                             | 9 second     |
| - Time window          | 1 hour                        | - Max time eliminate                              | 10 second    |
| - Stabilize            | 60 second                     | <b>Category</b>                                   | Manufacturer |
| <b>period</b>          |                               |                                                   |              |
| <b>Criteria:</b>       |                               |                                                   |              |

This Alarm is indicating that a Other safety secondary contactor feedback error.

**No: 6352**

|                        | <b>SupervisionID</b>          | <b>Name</b>                                    |              |
|------------------------|-------------------------------|------------------------------------------------|--------------|
| <b>Log text</b>        | 6352                          | PowerSupplyHydrPrimaryContactorFeedbackErrorSx |              |
| <b>Subsystem name</b>  | Hydr Prim Cont Feedback Error |                                                |              |
| <b>Type</b>            | PowerSupply                   |                                                |              |
| <b>Acknowledgement</b> | Alarm                         | <b>Timeout</b>                                 | <n/a>        |
| - Allowed              | Auto                          | <b>Shutdown type</b>                           | PauseSlow    |
| <b>attempts</b>        | 3                             | - Max time disconnect                          | 9 second     |
| - Time window          | 1 hour                        | - Max time eliminate                           | 10 second    |
| - Stabilize            | 60 second                     | <b>Category</b>                                | Manufacturer |
| <b>period</b>          |                               |                                                |              |
| <b>Criteria:</b>       |                               |                                                |              |

This Alarm is indicating that a Hydr safety primary contactor feedback error.

**No: 6353**

|                        | <b>SupervisionID</b>         | <b>Name</b>                                      |              |
|------------------------|------------------------------|--------------------------------------------------|--------------|
| <b>Log text</b>        | 6353                         | PowerSupplyHydrSecondaryContactorFeedbackErrorSx |              |
| <b>Subsystem name</b>  | Hydr Sec Cont Feedback Error |                                                  |              |
| <b>Type</b>            | PowerSupply                  |                                                  |              |
| <b>Acknowledgement</b> | Alarm                        | <b>Timeout</b>                                   | <n/a>        |
| - Allowed              | Auto                         | <b>Shutdown type</b>                             | PauseSlow    |
| <b>attempts</b>        | 3                            | - Max time disconnect                            | 9 second     |
| - Time window          | 1 hour                       | - Max time eliminate                             | 10 second    |
| - Stabilize            | 60 second                    | <b>Category</b>                                  | Manufacturer |
| <b>period</b>          |                              |                                                  |              |
| <b>Criteria:</b>       |                              |                                                  |              |

This Alarm is indicating that a Hydr safety secondary contactor feedback error.

**No: 6354****SupervisionI****Name**

D 6354

PowerSupplyConvGenWaterCoolingPrimaryContactorFeedbackErrorSx

**Log text**

Conv Prim Gen WCool Cont Fb Er

**Subsystem name**

PowerSupply

**Type**

Alarm

**Timeout**

&lt;n/a&gt;

**Acknowledgement**

Auto

**Shutdown type**

StopSlow

**t****- Allowed**

3

**- Max time disconnect**

3 second

**attempts****- Time window**

1 hour

**- Max time eliminate**

9 second

**- Stabilize**

60 second

**Category**

Manufacturer

**period****Criteria:**

This Alarm is indicating that a ConvGenWaterCooling safety primary contactor feedback error.

**No: 6355****SupervisionI****Name**

D 6355

PowerSupplyConvGenWaterCoolingSecondaryContactorFeedbackErrorSx

**Log text**

Conv Sec Gen WCool Cont Fb Er

**Subsystem name**

PowerSupply

**Type**

Alarm

**Timeout**

&lt;n/a&gt;

**Acknowledgement**

Auto

**Shutdown type**

StopSlow

**t****- Allowed**

3

**- Max time disconnect**

3 second

**attempts****- Time window**

1 hour

**- Max time eliminate**

9 second

**- Stabilize**

60 second

**Category**

Manufacturer

**period****Criteria:**

This Alarm is indicating that a ConvGenWaterCooling safety secondary contactor feedback error.

**No: 6375****Supervision****Name**

ID 6375

PowerSupplyConvGenWaterCoolingBackupPrimaryContactorFeedbackErrorSx

**Log text**

Conv/GenWaterCool pri cont err

**Subsystem name**

PowerSupply

**Type**

Alarm

**Timeout**

&lt;n/a&gt;

**Acknowledgement**

Auto

**Shutdown type**

StopSlow

**t****- Allowed**

3

**- Max time disconnect**

3 second

**attempts****- Time window**

1 hour

**- Max time eliminate**

9 second

**- Stabilize**

60 second

**Category**

Manufacturer

**period****Criteria:**

This Alarm is indicating a ConvGenWaterCooling backup safety primary contactor feedback error.

No: 6376

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Supervision ID 6376

PowerSupplyConvGenWaterCoolingBackupSecondaryContactorFeedbackErrorSx

Conv/GenWaterCool sec cont err

PowerSupply

Alarm

Auto

3

1 hour

60 second

Name

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

<n/a>

StopSlow

3 second

9 second

Manufacturer

Criteria:

This Alarm is indicating a ConvGenWaterCooling backup safety secondary contactor feedback error.

No: 6401

Log text

Subsystem name

Type

Acknowledgement

- Allowed attempts

- Time window

- Stabilize period

Supervision ID 6401

HydrInitPressMissing\_\_bar\_\_°C

HydrStationVariant5

Alarm

Auto

1

1 hour

1 minute

Name

Timeout

Shutdown type

- Max time disconnect

- Max time eliminate

Category

HydrInitialPressureMissingSx

<n/a>

StopSlow

3 second

9 second

Manufacturer

Criteria:

The alarm indicates that it has taken too long time to build up initial hydraulic pressure, which might indicate an oil leakage or a failing hydraulic component.

The alarm is raised if it has taken more than the time, given in the parameter **\*\*BuildInitialPressMaxTime\*\***, to build up initial hydraulic pressure (**\*\*IO.HydrMainOilPress\*\*** > **\*\*InitialPressLimit\*\***) and heating is not active (**\*\*IO.HydrHeatingValveOpen\*\*** is false) after one of the following events:

1. The turbine has been in state 'Stopped'.
2. Safety circuit has been opened
3. Active alarm from the hydraulic system.
4. Emergency feathering.

The alarm is a one-shot and can will be automatically acknowledged immediatly after reporting.

|                        |                                 |                                 |
|------------------------|---------------------------------|---------------------------------|
| <b>No: 6402</b>        | <b>SupervisionID</b> 6402       | <b>Name</b> HydrMainPressHighSx |
| <b>Log text</b>        | HydrMainPressHigh:____bar____°C |                                 |
| <b>Subsystem name</b>  | HydrStationVariant5             |                                 |
| <b>Type</b>            | Alarm                           | <b>Timeout</b> <n/a>            |
| <b>Acknowledgement</b> | Remote                          | <b>Shutdown type</b> PauseSlow  |
| - Allowed attempts     | <n/a>                           | - Max time disconnect 9 second  |
| - Time window          | <n/a>                           | - Max time eliminate 10 second  |
| - Stabilize period     | <n/a>                           | <b>Category</b> Manufacturer    |

**Criteria:**

This alarm is raised if the hydraulic main pressure is above a certain limit.

This alarm is raised if **\*\*IO.HydrMainOilPress\*\*** is greater than **\*\*MainOilPressHigh\*\*** in the time **\*\*MainOilPressHighTime\*\***.

This alarm can be acknowledged if **\*\*IO.HydrMainOilPress\*\*** is less than **\*\*MainOilPressHigh\*\***.

|                        |                                |                                |
|------------------------|--------------------------------|--------------------------------|
| <b>No: 6403</b>        | <b>SupervisionID</b> 6403      | <b>Name</b> HydrMainPressLowSx |
| <b>Log text</b>        | HydrMainPressLow:____bar____°C |                                |
| <b>Subsystem name</b>  | HydrStationVariant5            |                                |
| <b>Type</b>            | Alarm                          | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> StopSlow  |
| - Allowed attempts     | 3                              | - Max time disconnect 3 second |
| - Time window          | 2 hour                         | - Max time eliminate 9 second  |
| - Stabilize period     | 10 minute                      | <b>Category</b> Manufacturer   |

**Criteria:**

The alarm indicates that the Hydraulic Main Oil Pressure drops below a certain limit.

The alarm is raised if the Hydraulic Main Oil Pressure (**\*\*IO.HydrMainOilPress\*\***) drops below the LOWER\_LIMIT for more than **\*\*MainOilPressLowTime\*\*** time.

This alarm is only monitored if the following conditions are met:

1. Hydraulic oil is heated and initial pressure has been build up (**\*\*PitchHydrSupplyReady\*\***).
2. Safety circuit is closed and power supply is OK (**\*\*HydrPowerSupplyOK\*\***).
3. No active alarms/warnings from the hydraulic system (**\*\*HydrPressureControlOk\*\***).

The alarm is auto acknowledged, if the Hydraulic Main Oil Pressure is equal or above the parameter **\*\*MainOilPressLow\*\***.



|                        |                           |                              |              |
|------------------------|---------------------------|------------------------------|--------------|
| <b>No: 6404</b>        | <b>SupervisionID</b> 6404 | <b>Name</b> HydrOilLeakageSx |              |
| <b>Log text</b>        | HydraulicOilLeakage       |                              |              |
| <b>Subsystem name</b>  | HydrStationVariant5       |                              |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>               | <disabled>   |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b>         | <n/a>        |
| - Allowed attempts     | <n/a>                     | - Max time disconnect        | <n/a>        |
| - Time window          | <n/a>                     | - Max time eliminate         | <n/a>        |
| - Stabilize period     | <n/a>                     | <b>Category</b>              | Manufacturer |

**Criteria:**  
The warning indicates that the Hydraulic Oil leakage flow is above a certain limit.

The warning is raised when the hydraulic oil leakage is above the value given by the parameter **\*\*HydraulicLeakageHigh\*\***.

This hydraulic leakage is monitored when the hydraulic station is in normal operation (**\*\*HydrNormalOperation\*\***).

The warning can be acknowledged, if the Hydraulic Oil leakage flow is equal or below the parameter **\*\*HydraulicLeakageHigh\*\***.

|                        |                           |                                  |              |
|------------------------|---------------------------|----------------------------------|--------------|
| <b>No: 6405</b>        | <b>SupervisionID</b> 6405 | <b>Name</b> HydrOilLevelTooLowSx |              |
| <b>Log text</b>        | HydrOilLevelTooLow:____m  |                                  |              |
| <b>Subsystem name</b>  | HydrStationVariant5       |                                  |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>                   | <n/a>        |
| <b>Acknowledgement</b> | Local                     | <b>Shutdown type</b>             | StopSlow     |
| - Allowed attempts     | <n/a>                     | - Max time disconnect            | 3 second     |
| - Time window          | <n/a>                     | - Max time eliminate             | 9 second     |
| - Stabilize period     | <n/a>                     | <b>Category</b>                  | Manufacturer |

**Criteria:**  
The alarm is reported when the hydraulic oil level in the tank is critically low.

The alarm is reported when **\*\*IO.HydrOilLevelRaw\*\*** is below the value given by parameter **\*\*OilLevelLowCriticalLimit\*\*** for more than **\*\*OilLevelLowDelay\*\*** time and indicates that the oil level is too low to maintain normal operation of the HPU.

The alarm will be acknowledged automatically when the signal **\*\*IO.HydrOilLevelRaw\*\*** is above **\*\*OilLevelLowCriticalLimit\*\***.

**No: 6406****SupervisionID** 6406**Name** HydrOilLevelLowSx**Log text**

HydrOilLevelLow:\_\_\_\_m

**Subsystem name**

HydrStationVariant5

**Type**

Warning

**Timeout**

&lt;disabled&gt;

**Acknowledgement**

Auto

**Shutdown type**

&lt;n/a&gt;

**- Allowed attempts**

3

**- Max time disconnect**

&lt;n/a&gt;

**- Time window**

1 hour

**- Max time eliminate**

&lt;n/a&gt;

**- Stabilize period**

2 minute

**Category**

Manufacturer

**Criteria:**

The warning is reported when the hydraulic oil level in the tank is low.

The warning is reported when **\*\*IO.HydrOilLevelRaw\*\*** is below the value given by parameter **\*\*OilLevelLowSoftLimit\*\*** for more than **\*\*OilLevelLowDelay\*\*** time and indicates missing oil in the tank. Normal operation of the HPU is still possible at this level.

The warning will be automatically acknowledged when the signal **\*\*IO.HydrOilLevelRaw\*\*** is above **\*\*OilLevelLowSoftLimit\*\***.

**No: 6407****SupervisionID** 6407**Name** HydrOilTempHighSx**Log text**

HydrOilTempHigh\_\_\_\_°C

**Subsystem name**

HydrStationVariant5

**Type**

Alarm

**Timeout**

&lt;n/a&gt;

**Acknowledgement**

Auto

**Shutdown type**

PauseSlow

**- Allowed attempts**

3

**- Max time disconnect**

9 second

**- Time window**

1 hour

**- Max time eliminate**

10 second

**- Stabilize period**

10 minute

**Category**

Manufacturer

**Criteria:**

The alarm is reported when the hydraulic oil temperature is higher than the allowed limit.

The alarm is raised if the hydraulic oil temperature (**\*\*IO.HydrOilTemp\*\***) is higher than the limit given by the parameter **\*\*OilTempHighLimit\*\*** for more than **\*\*OilTempHighTime\*\*** time.

The alarm is auto acknowledged when the hydraulic oil temperature (**\*\*IO.HydrOilTemp\*\***) is less than **\*\*OilTempHighLimit\*\*** - **\*\*OilTempHighHyst\*\***.

|                        |                           |                                |
|------------------------|---------------------------|--------------------------------|
| <b>No: 6408</b>        | <b>SupervisionID</b> 6408 | <b>Name</b> HydrOilTempLowSx   |
| <b>Log text</b>        | HydrOilTempLow____°C      |                                |
| <b>Subsystem name</b>  | HydrStationVariant5       |                                |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow |
| - Allowed attempts     | 3                         | - Max time disconnect 9 second |
| - Time window          | 1 hour                    | - Max time eliminate 10 second |
| - Stabilize period     | 1 minute                  | <b>Category</b> Manufacturer   |

**Criteria:**

The alarm is reported when the hydraulic oil temperature is lower than the allowed limit.

The alarm is raised if the hydraulic oil temperature (\*\*IO.HydrOilTemp\*\*) is below the limit given by the parameter \*\*OilTempLowLimit\*\* for more than \*\*OilTempLowTime\*\* time.

The alarm is only monitored if \*\*HydrMainState\*\* is either BuildupInitialPressure or NormalOperation

The alarm is auto acknowledged if the hydraulic oil temperature (\*\*IO.HydrOilTemp\*\*) is higher than \*\*OilTempLowLimit\*\* + \*\*OilTempLowHyst\*\*.

|                        |                           |                                  |
|------------------------|---------------------------|----------------------------------|
| <b>No: 6409</b>        | <b>SupervisionID</b> 6409 | <b>Name</b> HydrOilTempTooHighSx |
| <b>Log text</b>        | HydrOilTempTooHigh____°C  |                                  |
| <b>Subsystem name</b>  | HydrStationVariant5       |                                  |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>             |
| <b>Acknowledgement</b> | Remote                    | <b>Shutdown type</b> StopSlow    |
| - Allowed attempts     | <n/a>                     | - Max time disconnect 3 second   |
| - Time window          | <n/a>                     | - Max time eliminate 9 second    |
| - Stabilize period     | <n/a>                     | <b>Category</b> Manufacturer     |

**Criteria:**

The alarm is reported when the hydraulic oil temperature higher than the allowed limit.

The alarm is raised if the hydraulic oil temperature (\*\*IO.HydrOilTemp\*\*) is higher than the limit given by the parameter \*\*OilTempExtremeHighLimit\*\* for more than \*\*OilTempExtremeHighTime\*\* time.

The alarm can be acknowledged if the hydraulic oil temperature (\*\*IO.HydrOilTemp\*\*) becomes less than \*\*OilTempExtremeHighLimit\*\* - \*\*OilTempExtremeHighHyst\*\*.

|                        |                           |                                  |
|------------------------|---------------------------|----------------------------------|
| <b>No: 6410</b>        | <b>SupervisionID</b> 6410 | <b>Name</b> HydrPump1_CBOpenedSx |
| <b>Log text</b>        | HydrPump1CBOpened         |                                  |
| <b>Subsystem name</b>  | HydrStationVariant5       |                                  |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>       |
| - Allowed attempts     | Unlimited                 | - Max time disconnect <n/a>      |
| - Time window          | <n/a>                     | - Max time eliminate <n/a>       |
| - Stabilize period     | 3 second                  | <b>Category</b> Manufacturer     |

**Criteria:**

The warning is reported when the pump 1 Circuit Breaker (CB) is opened.

The warning is raised if the \*\*IO.HydrPump1CBClosed\*\* is false for more than \*\*PumpSupervisionDelay\*\* time.

This warning is auto acknowledged when \*\*IO.HydrPump1CBClosed\*\* is true.

|                        |                           |                                          |
|------------------------|---------------------------|------------------------------------------|
| <b>No: 6411</b>        | <b>SupervisionID</b> 6411 | <b>Name</b> HydrPump1_NegativeFeedbackSx |
| <b>Log text</b>        | HydrPump1NegFBError       |                                          |
| <b>Subsystem name</b>  | HydrStationVariant5       |                                          |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>               |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>              |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>               |
| - Stabilize period     | 2 minute                  | <b>Category</b> Manufacturer             |

**Criteria:**  
The warning is reported when there is a negative feedback on Pump1, i.e. the pump cannot be started.

The warning is reported when **\*\*IO.HydrPump1Start\*\*** is true, but **\*\*IO.HydrPump1ContactorClosed\*\*** is false for more than **\*\*PumpSupervisionDelay\*\*** time.

The warning is automatically acknowledged when **\*\*IO.HydrPump1ContactorClosed\*\*** matches **\*\*IO.HydrPump1Start\*\***, i.e. the signal values are the same.

|                        |                           |                                          |
|------------------------|---------------------------|------------------------------------------|
| <b>No: 6412</b>        | <b>SupervisionID</b> 6412 | <b>Name</b> HydrPump1_PositiveFeedbackSx |
| <b>Log text</b>        | HydrPump1PosFBError       |                                          |
| <b>Subsystem name</b>  | HydrStationVariant5       |                                          |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>                |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>               |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>              |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>               |
| - Stabilize period     | 2 minute                  | <b>Category</b> Manufacturer             |

**Criteria:**  
The warning is reported when there is a positive feedback on Pump1, i.e. the pump cannot be stopped.

The warning is reported when **\*\*IO.HydrPump1Start\*\*** is false, but **\*\*IO.HydrPump1ContactorClosed\*\*** is true for more than **\*\*PumpSupervisionDelay\*\*** time.

The warning is automatically acknowledged when **\*\*IO.HydrPump1ContactorClosed\*\*** matches **\*\*IO.HydrPump1Start\*\***, i.e. the signal values are the same.

|                        |                           |                                     |
|------------------------|---------------------------|-------------------------------------|
| <b>No: 6413</b>        | <b>SupervisionID</b> 6413 | <b>Name</b> HydrPump1_ThermoFaultSx |
| <b>Log text</b>        | HydrPump1ThermoEffor      |                                     |
| <b>Subsystem name</b>  | HydrStationVariant5       |                                     |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>           |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>          |
| - Allowed attempts     | 3                         | - Max time disconnect <n/a>         |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>          |
| - Stabilize period     | 2 minute                  | <b>Category</b> Manufacturer        |

**Criteria:**  
The warning is reported when Pump1 is overloaded.

The warning is reported when **\*\*IO.HydrPump1Overloaded\*\*** is true for than **\*\*PumpSupervisionDelay\*\*** time.

The warning is automatically acknowledged when **\*\*IO.HydrPump1Overloaded\*\*** is false.

|                           |                           |                                  |              |
|---------------------------|---------------------------|----------------------------------|--------------|
| <b>No: 6414</b>           | <b>SupervisionID</b> 6414 | <b>Name</b> HydrPump2_CBOpenedSx |              |
| <b>Log text</b>           | HydrPump2CBOpened         |                                  |              |
| <b>Subsystem name</b>     | HydrStationVariant5       |                                  |              |
| <b>Type</b>               | Warning                   | <b>Timeout</b>                   | <disabled>   |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b>             | <n/a>        |
| - <b>Allowed attempts</b> | Unlimited                 | - <b>Max time disconnect</b>     | <n/a>        |
| - <b>Time window</b>      | <n/a>                     | - <b>Max time eliminate</b>      | <n/a>        |
| - <b>Stabilize period</b> | 3 second                  | <b>Category</b>                  | Manufacturer |

**Criteria:**

The warning is reported when the pump 2 Circuit Breaker (CB) is opened.

The warning is raised if the **\*\*IO.HydrPump2CBClosed\*\*** is false for more than **\*\*PumpSupervisionDelay\*\*** time.

This warning is auto acknowledged when **\*\*IO.HydrPump2CBClosed\*\*** is true.

|                           |                           |                                          |              |
|---------------------------|---------------------------|------------------------------------------|--------------|
| <b>No: 6415</b>           | <b>SupervisionID</b> 6415 | <b>Name</b> HydrPump2_NegativeFeedbackSx |              |
| <b>Log text</b>           | HydrPump2NegFBError       |                                          |              |
| <b>Subsystem name</b>     | HydrStationVariant5       |                                          |              |
| <b>Type</b>               | Warning                   | <b>Timeout</b>                           | <disabled>   |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b>                     | <n/a>        |
| - <b>Allowed attempts</b> | 3                         | - <b>Max time disconnect</b>             | <n/a>        |
| - <b>Time window</b>      | 1 hour                    | - <b>Max time eliminate</b>              | <n/a>        |
| - <b>Stabilize period</b> | 2 minute                  | <b>Category</b>                          | Manufacturer |

**Criteria:**

The warning is reported when there is a negative feedback on Pump2, i.e. the pump cannot be started.

The warning is reported when **\*\*IO.HydrPump2Start\*\*** is true, but **\*\*IO.HydrPump2ContactorClosed\*\*** is false for more than **\*\*PumpSupervisionDelay\*\*** time.

The warning is automatically acknowledged when **\*\*IO.HydrPump2ContactorClosed\*\*** matches **\*\*IO.HydrPump2Start\*\***, i.e. the signal values are the same.

|                           |                           |                                          |              |
|---------------------------|---------------------------|------------------------------------------|--------------|
| <b>No: 6416</b>           | <b>SupervisionID</b> 6416 | <b>Name</b> HydrPump2_PositiveFeedbackSx |              |
| <b>Log text</b>           | HydrPump2PosFBError       |                                          |              |
| <b>Subsystem name</b>     | HydrStationVariant5       |                                          |              |
| <b>Type</b>               | Warning                   | <b>Timeout</b>                           | <disabled>   |
| <b>Acknowledgement</b>    | Auto                      | <b>Shutdown type</b>                     | <n/a>        |
| - <b>Allowed attempts</b> | 3                         | - <b>Max time disconnect</b>             | <n/a>        |
| - <b>Time window</b>      | 1 hour                    | - <b>Max time eliminate</b>              | <n/a>        |
| - <b>Stabilize period</b> | 2 minute                  | <b>Category</b>                          | Manufacturer |

**Criteria:**

The warning is reported when there is a positive feedback on Pump2, i.e. the pump cannot be stopped.

The warning is reported when **\*\*IO.HydrPump2Start\*\*** is false, but **\*\*IO.HydrPump2ContactorClosed\*\*** is true for more than **\*\*PumpSupervisionDelay\*\*** time.

The warning is automatically acknowledged when **\*\*IO.HydrPump2ContactorClosed\*\*** matches **\*\*IO.HydrPump2Start\*\***, i.e. the signal values are the same.

|                        |                           |                                     |              |
|------------------------|---------------------------|-------------------------------------|--------------|
| <b>No: 6417</b>        | <b>SupervisionID</b> 6417 | <b>Name</b> HydrPump2_ThermoFaultSx |              |
| <b>Log text</b>        | HydrPump2ThermoEffor      |                                     |              |
| <b>Subsystem name</b>  | HydrStationVariant5       |                                     |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                      | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                | <n/a>        |
| - Allowed attempts     | 3                         | - Max time disconnect               | <n/a>        |
| - Time window          | 1 hour                    | - Max time eliminate                | <n/a>        |
| - Stabilize period     | 2 minute                  | <b>Category</b>                     | Manufacturer |

#### Criteria:

The warning is reported when Pump2 is overloaded.

The warning is reported when **\*\*IO.HydrPump2Overloaded\*\*** is true for than **\*\*PumpSupervisionDelay\*\*** time.

The warning is automatically acknowledged when **\*\*IO.HydrPump2Overloaded\*\*** is false.

|                        |                           |                              |              |
|------------------------|---------------------------|------------------------------|--------------|
| <b>No: 6418</b>        | <b>SupervisionID</b> 6418 | <b>Name</b> HydrPumpsNotOkSx |              |
| <b>Log text</b>        | HydrPumpsNotOk            |                              |              |
| <b>Subsystem name</b>  | HydrStationVariant5       |                              |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>               | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>         | StopSlow     |
| - Allowed attempts     | 3                         | - Max time disconnect        | 3 second     |
| - Time window          | 1 hour                    | - Max time eliminate         | 9 second     |
| - Stabilize period     | 2 minute                  | <b>Category</b>              | Manufacturer |

#### Criteria:

The alarm is reported if there is at least one active supervision on each installed pump at the same time.

The alarm is reported when none of the installed pumps are functional (due to supervisions) and normal operation of HPU cannot be maintained.

The alarm is automatically acknowledged when at least one of the installed pumps are functional, i.e. no supervisions are active for those pumps.

|                        |                               |                                             |              |
|------------------------|-------------------------------|---------------------------------------------|--------------|
| <b>No: 6427</b>        | <b>SupervisionID</b> 6427     | <b>Name</b> IceDetectorSystemErrorWarningSx |              |
| <b>Log text</b>        | IceDetectorSystem Warning Err |                                             |              |
| <b>Subsystem name</b>  | IceDetector                   |                                             |              |
| <b>Type</b>            | Warning                       | <b>Timeout</b>                              | <disabled>   |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                        | <n/a>        |
| - Allowed attempts     | Unlimited                     | - Max time disconnect                       | <n/a>        |
| - Time window          | <n/a>                         | - Max time eliminate                        | <n/a>        |
| - Stabilize period     | 10 second                     | <b>Category</b>                             | Manufacturer |

#### Criteria:

This Warning is triggered if there is IceThrowRisk (low temperature with rotation), and if one of the following warning conditions are valid.

- Sx\_IceDetectorCommError is triggered
- Sx\_IceDetectorSystemNotAlive is triggered

The Warning can be acknowledged when none of the above warning conditions are valid

|                        |                           |                              |              |
|------------------------|---------------------------|------------------------------|--------------|
| <b>No: 6476</b>        | <b>SupervisionID</b> 6476 | <b>Name</b> YawSpeedTooLowSx |              |
| <b>Log text</b>        | Yaw Speed Low ____        |                              |              |
| <b>Subsystem name</b>  | YawPositionVariant3       |                              |              |
| <b>Type</b>            | Alarm                     | <b>Timeout</b>               | <n/a>        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>         | PauseSlow    |
| - Allowed attempts     | 3                         | - Max time disconnect        | 9 second     |
| - Time window          | 1 hour                    | - Max time eliminate         | 10 second    |
| - Stabilize period     | 30 second                 | <b>Category</b>              | Manufacturer |

**Criteria:**

This alarm is raised if the yaw speed of the nacelle is slower than a given limit.

The alarm may be caused if **\*\*YawMotorsStarted\*\*** is true, but the nacelle is not yawing. This may indicate that the yaw sensor is not connected to the yaw rim or that the drive shaft of the sensor is broken or that the cable to the sensor is defective. All of which may indicate that the **CableTwistProtectionStop** function in the safety system is impaired.

The alarm is triggered if ALL the following conditions are true for **YawSpeedIntervalTime** time:  
\* **\*\*YawMotorsStarted\*\*** is true  
\* **\*\*YawDemand\*\*** is "YawCW" or "YawCCW"  
\* YawDistance is smaller than  
**\*\*YawMoveEvalThresholdGain\*\*\*\*\*YawSpeedNominal\*\*\*\*\*YawMoveEvalDelayTime\*\***

The supervision collects data for a period of **\*\*YawMoveEvalResetTime\*\*** seconds. Every time the turbine begins to yaw, the supervision will wait for **\*\*YawMoveDelayTime\*\*** seconds before data is collected for evaluation.

YawDistance is found by integrating **\*\*YawSpeed\*\***. YawDistance is then compared to a percentage of the of the nominal yaw distance, defined by **\*\*YawMoveEvalThresholdGain\*\***. The expected nominal yaw distance is found by multiplying **\*\*YawSpeedNominal\*\*** with **\*\*YawMoveEvalDelayTime\*\***, which is the collected active Yaw time required for the evaluation to begin.

The timeout period **\*\*YawMoveEvalResetTime\*\*** defines the time before the supervision resets and start over the evaluation process.

|                        |                           |                                               |
|------------------------|---------------------------|-----------------------------------------------|
| <b>No: 6482</b>        | <b>SupervisionID</b> 6482 | <b>Name</b> SmokeDetectorCommunicationErrorSx |
| <b>Log text</b>        | SmokeDetector Com. Error  |                                               |
| <b>Subsystem name</b>  | SmokeDetector             |                                               |
| <b>Type</b>            | Warning                   | <b>Timeout</b> 48 hour                        |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> PauseSlow                |
| - Allowed attempts     | 5                         | - Max time disconnect 9 second                |
| - Time window          | 1 hour                    | - Max time eliminate 10 second                |
| - Stabilize period     | 10 second                 | <b>Category</b> Manufacturer                  |

**Criteria:**

This warning indicates an error in the Smoke Detector System.

This warning indicates a CAN bus communication error in the Smoke Detector System.

This warning is raised if **\*\*IO.FireProtectionSensorError\*\*** and **\*\*IO.FireProtectionSensorSoiled\*\*** and **\*\*IO.FireProtectionSmokeDetected\*\*** and **\*\*IO.FireProtectionDiscoveryBusOk\*\*** signal status is not Valid.

This warning is automatically acknowledged if **\*\*IO.FireProtectionSensorError\*\*** or **\*\*IO.FireProtectionSensorSoiled\*\*** or **\*\*IO.FireProtectionSmokeDetected\*\*** or **\*\*IO.FireProtectionDiscoveryBusOk\*\*** signal status become Valid.

|                        |                              |                                         |
|------------------------|------------------------------|-----------------------------------------|
| <b>No: 6483</b>        | <b>SupervisionID</b> 6483    | <b>Name</b> SmokeDetectorSensorSoiledSx |
| <b>Log text</b>        | Smoke Detector Sensor Soiled |                                         |
| <b>Subsystem name</b>  | SmokeDetector                |                                         |
| <b>Type</b>            | Warning                      | <b>Timeout</b> 90 day                   |
| <b>Acknowledgement</b> | Auto                         | <b>Shutdown type</b> PauseSlow          |
| - Allowed attempts     | 5                            | - Max time disconnect 9 second          |
| - Time window          | 12 hour                      | - Max time eliminate 10 second          |
| - Stabilize period     | 60 second                    | <b>Category</b> Manufacturer            |

**Criteria:**

This warning supervises whether the Smoke Detector System has detected sensor errors and indicates that an error is seen in the sensor.

This warning is raised if the Smoke Detector System is in Operating mode (**\*\*IO.FireProtectionInOperatingMode\*\*** is true for **\*\*StartupTime\*\***) AND an the sensor is soiled (**\*\*IO.FireProtectionSensorSoiled\*\*** is true).

This warning is automatically acknowledged if the sensor is not soiled (**\*\*IO.FireProtectionSensorSoiled\*\*** is false).



|                        |                             |                                        |              |
|------------------------|-----------------------------|----------------------------------------|--------------|
| <b>No: 6484</b>        | <b>SupervisionID</b> 6484   | <b>Name</b> SmokeDetectorSensorErrorSx |              |
| <b>Log text</b>        | Smoke Detector Sensor Error |                                        |              |
| <b>Subsystem name</b>  | SmokeDetector               |                                        |              |
| <b>Type</b>            | Warning                     | <b>Timeout</b>                         | 90 day       |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b>                   | PauseSlow    |
| - Allowed attempts     | 5                           | - Max time disconnect                  | 9 second     |
| - Time window          | 1 hour                      | - Max time eliminate                   | 10 second    |
| - Stabilize period     | 60 second                   | <b>Category</b>                        | Manufacturer |

#### Criteria:

This warning supervises whether the Smoke Detector System has detected sensor errors and indicates that one or more sensors does not function.

This warning is raised if the Smoke Detector System is in Operating mode (\*\*IO.FireProtectionInOperatingMode\*\* is true for \*\*StartupTime\*\*) AND an error is detected in the sensor (\*\*IO.FireProtectionSensorError\*\* is true).

This warning is automatically acknowledged if there are no more errors seen in the Smoke Detector Sensor (\*\*IO.FireProtectionSensorError\*\* is false).

|                        |                           |                                            |              |
|------------------------|---------------------------|--------------------------------------------|--------------|
| <b>No: 6485</b>        | <b>SupervisionID</b> 6485 | <b>Name</b> PowerManagementActiveWarningSx |              |
| <b>Log text</b>        | PSManPowerMangActiveWar   |                                            |              |
| <b>Subsystem name</b>  | PowerSupply               |                                            |              |
| <b>Type</b>            | Warning                   | <b>Timeout</b>                             | <disabled>   |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b>                       | <n/a>        |
| - Allowed attempts     | Unlimited                 | - Max time disconnect                      | <n/a>        |
| - Time window          | <n/a>                     | - Max time eliminate                       | <n/a>        |
| - Stabilize period     | 0 second                  | <b>Category</b>                            | Manufacturer |

#### Criteria:

This warning working on version of turbine where \*\*IdlePowerGenerationEnabled\*\* is true

This warning is raised if power management is activated on the turbine.

The power management is active if either the \*\*PowerSaveActive\*\* or the \*\*PowerRestrictionActive\*\* signals are activated.

If power save mode is activated the turbine will reduce power consumption as much as possible and therefore motors, heaters and other power consuming actuators which are not critical for the turbine are stopped.

Power save is not allowed if the turbine is in production.

In restricted power mode the turbine must be connected to SCADA in order to request power when needed.

Power save is activated in restricted power mode.

Restricted power mode is allowed if all the following conditions are met:

- \* \*\*PowerSupplyRestrictedExternalPowerEnabled\*\* is true
- \* Turbine is supplied from external generator, i.e. \*\*PowerBackupSource\*\* is external
- \* Service mode is none

If service mode is entered during restricted power mode, restricted power is deactivated but the turbine remains in power save.

The warning is auto acknowledged when power management is deactivated.

|                        |                                  |                                              |
|------------------------|----------------------------------|----------------------------------------------|
| <b>No: 6486</b>        | <b>SupervisionID</b> 6486        | <b>Name</b> StatusSignalWarningWithTimeoutSx |
| <b>Log text</b>        | SignalErrorTimeout. _____, _____ |                                              |
| <b>Subsystem name</b>  | StatusSignalSupervision          |                                              |
| <b>Type</b>            | Warning                          | <b>Timeout</b> 1 hour                        |
| <b>Acknowledgement</b> | Auto                             | <b>Shutdown type</b> PauseSlow               |
| - Allowed attempts     | 3                                | - Max time disconnect 1 hour                 |
| - Time window          | 1 hour                           | - Max time eliminate 1 hour                  |
| - Stabilize period     | 60 second                        | <b>Category</b> Manufacturer                 |

**Criteria:**

This warning is raised on failure of any Status Signal in Application - Framework. If warning times out it will turn into an alarm.

|                        |                             |                                            |
|------------------------|-----------------------------|--------------------------------------------|
| <b>No: 6488</b>        | <b>SupervisionID</b> 6488   | <b>Name</b> MSCHighSumCurrent_IntraStackSx |
| <b>Log text</b>        | MSCHighSumCurrentIntraStack |                                            |
| <b>Subsystem name</b>  | CubePower                   |                                            |
| <b>Type</b>            | Alarm                       | <b>Timeout</b> <n/a>                       |
| <b>Acknowledgement</b> | Auto                        | <b>Shutdown type</b> StopSlow              |
| - Allowed attempts     | 3                           | - Max time disconnect 3 second             |
| - Time window          | 1 hour                      | - Max time eliminate 9 second              |
| - Stabilize period     | 60 second                   | <b>Category</b> Manufacturer               |

**Criteria:**

Alarm due to High Sum Current IMSC inside power module.

RMS of the sum of the instantaneous currents are calculated for each MSC active power module (1,2,3,4). If the summation current is above Typical = 0.01 (SumCurrent\_LimPx) of nominal module current (IG\_NOM\_ModulePx = 1247A), the protection is active.

If this condition goes on for typical = 3s (HighSumCurrentTimePx) the turbine will be stopped.

The supervision can be disabled by (EnableMSCIntraStackHighSumCurrentPx=0).

Limits, rated values and duration can vary on different turbine types.

It is reported in par1 which winding (some generator variants can have more than one) and which PSC module is with the supervision active. In par2 the value of the summation current that triggered the error is presented.

Par1 : Generator winding-set(1=Winding1, 2=Winding2).Power module(1=ModuleA, 2=ModuleB, 3=ModuleC, 4=ModuleD)

Par2 : IMSC\_Summation\_ModuleX\_RMS (A)

**Possible fault reasons:**

The error is expected to be generated if a sensor error is present or a PSC module is not working correct (IGBTs, drivers, cabling etc.).

Leakage current to ground (bad insulation)

Hardware parts not inside specifications (PSC, generator, Gate drivers etc.)

|                        |                           |                                         |
|------------------------|---------------------------|-----------------------------------------|
| <b>No: 6489</b>        | <b>SupervisionID</b> 6489 | <b>Name</b> AsymMSCCurrent_IntraStackSx |
| <b>Log text</b>        | AsymMSCCurrentIntraStack  |                                         |
| <b>Subsystem name</b>  | CubePower                 |                                         |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow           |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second          |
| - Time window          | 1 hour                    | - Max time eliminate 9 second           |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer            |

**Criteria:**

The Machine Side Converter (MSC) currents of an individual PSC module are unbalanced.

The mean value of three-phase currents RMS (e.g., (IConv1A\_RMS + IConv2A\_RMS + IConv3A\_RMS)/3) are calculated for each active power module (ABCD).

The protection is evaluating that each phase current is not larger or smaller than the mean current by typical = 12% (AsymMSCCurrent\_LimPx) of the rated module current of typical = 1135A (IG\_NOM\_ModulePx).

If this condition goes on for typical = 3s (AsymMSCCurrentTimePx) the turbine will be stopped.

The supervision can be disabled by (EnableMSCIntraStackAsymCurrentPx=0).

Limits, rated values and duration can vary on different turbine types.

It is reported in par1 which winding (some generator variants can have more than one) and which PSC module is with the supervision active. In par2 the phase is presented.

Par1 : Generator winding-set(1=Winding1, 2=Winding2).Power module(1=ModuleA, 2=ModuleB, 3=ModuleC, 4=ModuleD)

Par2 : Phase (1=Phase1, 2=Phase2, 3=Phase3)

**Possible fault reasons:**

The error is expected to be generated if a sensor error is present or a PSC module is not working correct (IGBTs, drivers, cabling etc.).

If faults (between cables or cable to ground) occure (also, bad insulation on cables, generator, PSC, etc.).

Generator outside specifications.

|                        |                               |                                              |              |
|------------------------|-------------------------------|----------------------------------------------|--------------|
| <b>No:</b> 6490        | <b>SupervisionID</b> 6490     | <b>Name</b> AsymStatorVoltage_IntraWindingSx |              |
| <b>Log text</b>        | AsymStatorVoltageIntraWinding |                                              |              |
| <b>Subsystem name</b>  | CubePower                     |                                              |              |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>                               | <n/a>        |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                         | StopSlow     |
| - Allowed attempts     | 3                             | - Max time disconnect                        | 3 second     |
| - Time window          | 1 hour                        | - Max time eliminate                         | 9 second     |
| - Stabilize period     | 10 minute                     | <b>Category</b>                              | Manufacturer |

#### Criteria:

The stator(generator) voltages, which are measured in each winding-set, are asymmetrical. The check is performed when the stator sensor is closed and the generator speed is above (AsymSpeedCheckLevel\*Gen\_Nom\_Speed).

The mean voltage (f.x., (US1\_RMS+ US2\_RMS+ US3\_RMS)/3) is calculated inside each winding-set, and if one phase voltage is deviating too much (AsymStatVoltHighLim\_IntraWindingPx, AsymStatVoltLowLim\_IntraWindingPx) from the mean value for a defined time (AsymStatVoltTimePx) the alarm will be raised.

Par1: Generator winding-set(1=Winding1, 2=Winding2).Generator Phase(1=Phase1, 2=Phase2, 3=Phase3)

Par2: System state

#### Possible fault reasons:

The error is expected to be generated if there is a voltage sensor error, a sensor contactor or VPC malfunction. So, check the sensor path.

Short circuit faults between stator cables may also cause this error.

Generator degraded or out of the specifications.

|                        |                               |                                              |              |
|------------------------|-------------------------------|----------------------------------------------|--------------|
| <b>No:</b> 6491        | <b>SupervisionID</b> 6491     | <b>Name</b> AsymStatorVoltage_InterWindingSx |              |
| <b>Log text</b>        | AsymStatorVoltageInterWinding |                                              |              |
| <b>Subsystem name</b>  | CubePower                     |                                              |              |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>                               | <n/a>        |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b>                         | StopSlow     |
| - Allowed attempts     | 3                             | - Max time disconnect                        | 3 second     |
| - Time window          | 1 hour                        | - Max time eliminate                         | 9 second     |
| - Stabilize period     | 10 minute                     | <b>Category</b>                              | Manufacturer |

#### Criteria:

The stator(generator) voltages between two winding-sets are asymmetrical. The check is performed when the stator sensor is closed and the generator speed is above (AsymSpeedCheckLevel\*Gen\_Nom\_Speed). The supervision could be disabled by (EnableInterWindingsAsymStatorVoltageSupervPx=0).

The mean voltage of the same phase (f.x., (US1\_RMS+US1\_2\_RMS)/2) is calculated between two winding-sets, and if the measured phase voltages are deviating too much (AsymStatVoltHighLim\_InterWindingPx, AsymStatVoltLowLim\_InterWindingPx) from the mean value for a defined time (AsymStatVoltTimePx) the alarm will be raised.

Par1: Generator winding-set(1=Winding1, 2=Winding2).Generator Phase(1=Phase1, 2=Phase2, 3=Phase3)

Par2: System state

#### Possible fault reasons:

The error is expected to be generated if there is a voltage sensor error, a sensor contactor or VPC malfunction. So, check the sensor path.

Short circuit faults between stator cables may also cause this error.

Generator degraded or out of the specifications.

|                           |                              |                                         |              |
|---------------------------|------------------------------|-----------------------------------------|--------------|
| <b>No: 6492</b>           | <b>SupervisionID</b> 6492    | <b>Name</b> StatorBEMFVoltageCheckErrSx |              |
| <b>Log text</b>           | StatorBackEMFVoltageCheckErr |                                         |              |
| <b>Subsystem name</b>     | CubePower                    |                                         |              |
| <b>Type</b>               | Alarm                        | <b>Timeout</b>                          | <n/a>        |
| <b>Acknowledgement</b>    | Auto                         | <b>Shutdown type</b>                    | StopSlow     |
| - <b>Allowed attempts</b> | 1                            | - <b>Max time disconnect</b>            | 3 second     |
| - <b>Time window</b>      | 24 hour                      | - <b>Max time eliminate</b>             | 9 second     |
| - <b>Stabilize period</b> | 60 second                    | <b>Category</b>                         | Manufacturer |

#### Criteria:

The stator(generator) voltages, which are measured in each winding-set, are out of the expected values according to the generator speed.

The check is performed when the stator sensor is closed and the generator speed is above (AsymSpeedCheckLevel\*Gen\_Nom\_Speed). The supervision could be disabled by (EnableStatBEMFVoltSupervisionPx=0).

For each phase of each winding, the voltage is compared with a curve of expected voltage according to the generator speed.

The expected voltage curve is taken from a look-up-table defined by the parameters (VoltageVsSpeed\_Speedx, VoltageVsSpeed\_VoltagePx, in which x=1..5). A linear interpolation is made between the points defined.

The tolerance in pu of nominal speed (Gen\_Nom\_Speed) is also defined by a curve (VoltageVsSpeedTol\_Speedx, VoltageVsSpeedTol\_VoltagePUx, in which x=1..5).

If the measured voltage is out of the tolerance for a defined time (StatBEMFVoltLimTimePx) the alarm will be raised.

Par1: Generator winding-set(1=Winding1, 2=Winding2).Generator Phase(1=Phase1, 2=Phase2, 3=Phase3)

Par2: System state

#### Possible fault reasons:

The error is expected to be generated if there is a voltage sensor error, a sensor contactor or VPC malfunction. So, check the sensor path.

Short circuit faults between stator cables may also cause this error.

Generator degraded or out of the specifications.

|                        |                           |                                         |
|------------------------|---------------------------|-----------------------------------------|
| <b>No: 6493</b>        | <b>SupervisionID</b> 6493 | <b>Name</b> StatorVoltageSummationErrSx |
| <b>Log text</b>        | StatorVoltageSumErr       |                                         |
| <b>Subsystem name</b>  | CubePower                 |                                         |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>                    |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow           |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second          |
| - Time window          | 1 hour                    | - Max time eliminate 9 second           |
| - Stabilize period     | 10 minute                 | <b>Category</b> Manufacturer            |

**Criteria:**

Alarm due to high RMS sum stator voltages inside Winding.

RMS of the sum of the instantaneous stator voltages (f.x., (US1 + US2 + US3)) inside each winding-set is calculated. If the RMS voltage summation is above the limit (SumStatVoltHighLimPx \* NominalVoltagePx) for a defined time (SumStatVoltHighTimePx) the alarm will be raised.

The supervision could be disabled by (EnableIntraWindingHighSumStatorVoltageSupervPx=0).

Par1: Generator winding-set(1=Winding1, 2=Winding2)

Par2: System state

Possible fault reasons:

The error is expected to be generated if there is a voltage sensor error, a sensor contactor or VPC malfunction. So, check the sensor path.

|                        |                           |                                 |
|------------------------|---------------------------|---------------------------------|
| <b>No: 6494</b>        | <b>SupervisionID</b> 6494 | <b>Name</b> HighGenCurrLevellSx |
| <b>Log text</b>        | HighGenCurrentLevell      |                                 |
| <b>Subsystem name</b>  | CubePower                 |                                 |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>            |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopSlow   |
| - Allowed attempts     | 3                         | - Max time disconnect 3 second  |
| - Time window          | 1 hour                    | - Max time eliminate 9 second   |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer    |

**Criteria:**

Too high generator current is detected.

The alarm has a limit (StatorCurrentLimFactor1Px) which is a factor of the stator nominal current, and a time (HighGeneratorCurrentTime1Px).

Par1 : Generator winding-set(1=Winding1, 2=Winding2).Generator phase(1=Phase1, 2=Phase2, 3=Phase3)

Par2 : RMS Generator Winding Current [A]

The alarm evaluates the generator winding currents (based on converter currents), and if they are above the limit (StatorCurrentLimFactor1Px \* MaxNoOfPowerModulesPerStatorWindingPx \* Stator\_Current\_Nom\_ModulePx) for a predefined time (HighGeneratorCurrentTime1Px) the alarm is raised.

The supervision can be disabled by (EnableHighGenCurrSupervLevellPx=0).

|                        |                           |                                  |
|------------------------|---------------------------|----------------------------------|
| <b>No: 6495</b>        | <b>SupervisionID</b> 6495 | <b>Name</b> HighGenCurrLevel2Sx  |
| <b>Log text</b>        | HighGenCurrentLevel 2     |                                  |
| <b>Subsystem name</b>  | CubePower                 |                                  |
| <b>Type</b>            | Alarm                     | <b>Timeout</b> <n/a>             |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> StopFast    |
| - Allowed attempts     | 3                         | - Max time disconnect 0.9 second |
| - Time window          | 24 hour                   | - Max time eliminate 1 hour      |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer     |

**Criteria:**

Too high generator current is detected.

The alarm has a limit (StatorCurrentLimFactor2Px) which is a factor of the stator nominal current, and a time (HighGeneratorCurrentTime2Px).

Par1 : Generator winding-set(1=Winding1, 2=Winding2).Generator phase(1=Phase1, 2=Phase2, 3=Phase3)

Par2 : RMS Generator Winding Current [A]

The alarm evaluates the generator winding currents (based on converter currents), and if they are above the limit (StatorCurrentLimFactor2Px \* MaxNoOfPowerModulesPerStatorWindingPx \* Stator\_Current\_Nom\_ModulePx) for a predefined time (HighGeneratorCurrentTime2Px) the alarm is raised.

The supervision can be disabled by (EnableHighGenCurrSupervLevel2Px=0).

|                        |                               |                                              |
|------------------------|-------------------------------|----------------------------------------------|
| <b>No: 6496</b>        | <b>SupervisionID</b> 6496     | <b>Name</b> AsymStatorCurrent_InterWindingSx |
| <b>Log text</b>        | AsymStatorCurrentInterWinding |                                              |
| <b>Subsystem name</b>  | CubePower                     |                                              |
| <b>Type</b>            | Alarm                         | <b>Timeout</b> <n/a>                         |
| <b>Acknowledgement</b> | Auto                          | <b>Shutdown type</b> StopSlow                |
| - Allowed attempts     | 3                             | - Max time disconnect 3 second               |
| - Time window          | 1 hour                        | - Max time eliminate 9 second                |
| - Stabilize period     | 60 second                     | <b>Category</b> Manufacturer                 |

**Criteria:**

Alarm due to RMS phase current asymmetry between two winding-sets.

The mean of the same phase RMS currents (f.x., (ISW1\_1\_RMS + ISW2\_1\_RMS)\*0.5) is calculated between two winding-sets, and if the phase RMS currents (f.x., ISW1\_1\_RMS or ISW2\_1\_RMS) are deviating too much (AsymStatCurrHighLim\_InterWindingPx, AsymStatCurrLowLim\_InterWindingPx) from the mean value for a defined time (AsymStatCurrTimePx) the alarm will be raised.

The supervision could be disabled by (EnableInterWindingAsymPhaseCurrentSupervPx=0).

Par1: Generator winding-set(1=Winding1, 2=Winding2).Generator Phase(1=Phase1, 2=Phase2, 3=Phase3)

Par2: RMS Generator Winding Current [A]

Possible fault reason:

The error is expected to be generated if a sensor error is present or a PSC module is not working correct.

A fault between cables (from generator to MS converter) can raise this error.

Hardware parts not inside specifications (PSC, chokes, Gate drivers etc.)

Generator outside specifications

|                        |                                |                                         |
|------------------------|--------------------------------|-----------------------------------------|
| <b>No: 6497</b>        | <b>SupervisionID</b> 6497      | <b>Name</b> PiSV_EdgeSVSafeModeActiveSx |
| <b>Log text</b>        | PiSVSafeMode _ PowDerate:_____ |                                         |
| <b>Subsystem name</b>  | ProdCtrl                       |                                         |
| <b>Type</b>            | Warning                        | <b>Timeout</b> 90 day                   |
| <b>Acknowledgement</b> | Auto                           | <b>Shutdown type</b> PauseSlow          |
| - Allowed attempts     | 1000                           | - Max time disconnect 1 hour            |
| - Time window          | 1 minute                       | - Max time eliminate 1 hour             |
| - Stabilize period     | 0 second                       | <b>Category</b> Manufacturer            |

**Criteria:**  
This supervision detects if the PitchSupervision (PiSV) is requesting a Safe Mode.

The PitchSupervision can request a safe mode for one or more of the following reasons and might be accompanied by PiSV warnings

- 1. Two out of three blade edge sensors malfunctions
- 2. Edge sensor is not installed but Edge SV are active

The warning is activated if the following conditions are met

- 1. **\*\*LDO\\_PiSVEdgeSVSafeMode\\_Enable\*\*** = 1
- 2. **\*\*PitchCtrl.PiSV\\_EdgeSVSafeModeRequest\*\*** changes its value to 2

|                        |                           |                                        |
|------------------------|---------------------------|----------------------------------------|
| <b>No: 6596</b>        | <b>SupervisionID</b> 6596 | <b>Name</b> UnavailableEnvTempSensorSx |
| <b>Log text</b>        | EnvTempSensorUnavailable  |                                        |
| <b>Subsystem name</b>  | GID                       |                                        |
| <b>Type</b>            | Warning                   | <b>Timeout</b> <disabled>              |
| <b>Acknowledgement</b> | Auto                      | <b>Shutdown type</b> <n/a>             |
| - Allowed attempts     | 5                         | - Max time disconnect <n/a>            |
| - Time window          | 1 hour                    | - Max time eliminate <n/a>             |
| - Stabilize period     | 60 second                 | <b>Category</b> Manufacturer           |

**Criteria:**  
This warning indicates that **\*\*IO.EnvironmentTempRaw\*\*** is unavailable.  
This entails a possible problem or malfunction of the Environment Temperature Sensor.

This warning is active when the Environment Temperature Sensor has been unavailable for more than Px\_SensorTempStatusTau minutes.  
After this warning has been triggerred the turbine will, if possible, run for more Px\_TrustEstTempTau hours on a rough estimation of the Environment Temperature.

This warning will be acknowledged when the Environment Temperature Singal (**\*\*IO.EnvironmentTempRaw\*\***) becomes available.

This warning can be Enabled/Disabled by setting the parameter Px\_EnvTempSensorUnavailableSupervisionEnabled.



|                        |                               |                                       |              |
|------------------------|-------------------------------|---------------------------------------|--------------|
| <b>No: 6876</b>        | <b>SupervisionID</b> 632      | <b>Name</b> GearboxBearingsTempHighSx |              |
| <b>Log text</b>        | High temp.Gear bear.___,___°C |                                       |              |
| <b>Subsystem name</b>  | Gearbox                       |                                       |              |
| <b>Type</b>            | Alarm                         | <b>Timeout</b>                        | <n/a>        |
| <b>Acknowledgement</b> | Remote                        | <b>Shutdown type</b>                  | PauseFast    |
| - Allowed attempts     | <n/a>                         | - Max time disconnect                 | 8 second     |
| - Time window          | <n/a>                         | - Max time eliminate                  | 1 hour       |
| - Stabilize period     | <n/a>                         | <b>Category</b>                       | Manufacturer |

**Criteria:**

This alarm indicates that the temperature of one or more of the gear bearings is too high.

Most likely caused by missing lubrication or worn bearings.

The alarm is raised if the maximum bearing temperature (\*\*GearboxBearingsMaxTemp\*\*) gets above the upper limit \*\*GearBearingsMaxTemp\*\*.

The alarm can be acknowledged, when \*\*GearboxBearingsMaxTemp\*\* changes below \*\*GearBearingsMaxTemp\*\* - \*\*GearBearingsMaxTempHyst\*\*.