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)
16	12/3/2019	Updated to software release 2019.13.xx (build no 2019.13.37)
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 GlobalTM 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 avereged 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
/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/TargetParameters/MaximumYawError/MaxYaw_YawErrorPoint3Px
/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/TargetParameters/MaximumYawError/MaxYaw_WindSpdFiltTauPx
/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/TargetParameters/MaximumYawError/MaxYaw_YawErrorFiltTauPx
/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 hysterisis 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 hysterisis 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 filtred 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 hysterisis 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 (TestAnemometerRPMPx) of syncrone speed (120 * GridFreq / 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_SyncGenSpdPx
/Turbine/ProdCtrl/Turbine/ProdCtrl/SV/GeneratorSpeedHighInLowWind/LowWindGen_LowWindSpdLimitPx
/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