Vestas®

Service Report

Turbine No./Id: 215372
Service Order: 60680835

PAD No.
BOURESSE E01

Turbine Type: V100
Start Date: 28.06.2023
End Date: 29.06.2023

Customer's Ref./P.O.No.:

Date & Time of Receipt
27.11.2022 19:30:25

Vestas Ref.:
IP1020221127

Customer's Address:
BOURESSE ENERGIES
29 RUE DES ROSATI
F-62000 ARRAS

Site's Address:
F-

Reason for Call Out: V100 2-2.2MW MK10C H - Service 6 Year

V100 2-2.2MW MK10C H - Service 6 Year

Work Performed

The service was well done according to the SIF.Do it 28/06/2023Pause 8:42Run 15:08Do it 29/06/2023Pause 7:42Run 11:42

Specification of Item Consumption

Item	Description	Serial Number	Quantity	UoM
109113	FILTER,AIR INSERT		2.000	EA
130539	FILTER SIZE 1000 10MY,DIN24550		2.000	EA
149156	GREASE,SHELL GADUS S5 T460 1.5,380G		1.000	EA
149264	GREASE KLÜBERPLEX AG 11-462 600G NOZZLE		1.000	EA
149266	GREASE KLÜBERPLEX BEM 41-132 540G NOZZLE		2.000	EA
198004	CLEANING PAPER TORK MULTI		4.000	EA
234900	ALCOHOL DENATURED 93% 1/2 LITRE		2.000	EA
360024	RITTAL COARSEFILTER 120x120x12		6.000	EA
707832	DISC. SPRING GUIDE, HDU 15/25		1.000	EA
753946	GROUND BRUSH W/CABLE TERMINAL		3.000	EA
754804	AIR FILTER F/SLIP RING		6.000	EA
763607	GREASE COLLECTING CAN 1L 95		10.000	EA
764365	QUICK ACTING COUPLING 12 MM		4.000	EA
877017	OIL SAMPLE KIT, 125ML BOTTLE		2.000	EA
14904740	SHELL RHODINA GREASE BBZ 4KG CARTRIDGE		2.000	EA
14913913	GREASE SKF LGWM 1 1.3KG CARTRIDGE		1.000	EA
14913950	GREASE SKF LGWM 1 5KG CARTRIDGE		1.000	EA
29008687	O-RING VITON D187,3x7 SH90		2.000	EA
29008759	SEAL VITON D191x8x2,3 SH70 THD		2.000	EA
29016726	HYDR FILTER 3mu DIN 24550-400		1.000	EA
29021210	MOBIL DTE 10 EXCEL 32 20L		20.000	L
29089384	BATT 12V 7Ah Longlife		3.000	EA

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Item	Description	Serial Number	Quantity	UoM
29092894	LUBRICANT STABYLAN W 880 SPRAY 400ML		3.000	EA
51624501	CT6245 BATTERY 3,6V	000C2LQVPN	1.000	EA
51624501	CT6245 BATTERY 3,6V	000C2JZAAK	1.000	EA
51624501	CT6245 BATTERY 3,6V	000C2LRDQH	1.000	EA
51624501	CT6245 BATTERY 3,6V	000C2LRCUV	1.000	EA
60014682	FILTER PAD 180-230M3/H		8.000	EA
60020252	OFFLINE FILTER		1.000	EA
60075951	COMPRESSED AIR SPRAY 200ML		1.000	EA
S092676	FILTERPAD PFANNENB. PFA 40.000		3.000	EA
S099128	FILTER 435x395 F. DOOR		2.000	EA

Specification of Time Consumption

Person Name	Date	Start	End	Hours	Activity type
VAMOT	28.06.2023	07:00:00	07:30:00	0.50	MOB / DE-MOB
VAMOT	28.06.2023	08:00:00	08:40:00	0.67	Travel Time
VLEDU	28.06.2023	08:00:00	08:30:00	0.50	MOB / DE-MOB
VLEDU	28.06.2023	08:30:00	08:40:00	0.17	Travel Time
VLEDU	28.06.2023	08:50:00	12:00:00	3.17	Work Time
VAMOT	28.06.2023	09:15:00	12:00:00	2.75	Work Time
VAMOT	28.06.2023	12:15:00	15:10:00	2.92	Work Time
VLEDU	28.06.2023	12:15:00	15:10:00	2.92	Work Time
VAMOT	28.06.2023	15:20:00	15:50:00	0.50	MOB / DE-MOB
VLEDU	28.06.2023	15:20:00	15:50:00	0.50	MOB / DE-MOB
VLEDU	29.06.2023	06:45:00	07:15:00	0.50	MOB / DE-MOB
VAMOT	29.06.2023	07:00:00	07:30:00	0.50	MOB / DE-MOB
VLEDU	29.06.2023	07:15:00	07:40:00	0.42	Travel Time
VAMOT	29.06.2023	07:30:00	07:40:00	0.17	Travel Time
VLEDU	29.06.2023	07:40:00	12:00:00	4.33	Work Time
VAMOT	29.06.2023	07:40:00	12:00:00	4.33	Work Time

Total Time Consumption: 24.85

Service Inspection Form

0010 6 Year Service

0 eSIF

0.01 0. DMS: 0042-4218 V32

1 Prepare for service

1.01	Do a check of the warning log.	OK
1.02	Tightening torque.	OK

2 Functional safety test

2.01	Tower: Do a test of the emergency stop function from the tower.	OK
2.02	To do a test of the emergency stop buttons in the tower: Do the test of the emergency stop buttons -610-02-S1 for the tower control cabinet.	OK
2.03	Do the test of the emergency stop buttons -610-02-S6A for the tower top in the tower.	OK
2.04	Do the test of the emergency stop buttons -610-02-S6B for the tower top in the tower.	OK
2.05	Nacelle: Do a test to see if the emergency stop activates the brake.	OK
2.06	To do a test of the emergency stop buttons in the nacelle: Do the test of the emergency stop buttons -610-02-S3 for the yaw control cabinet.	OK
2.07	Do the test of the emergency stop buttons -610-02-S4 for the main shaft (LSS).	OK
2.08	Do the test of the emergency stop buttons -610-02-S5 for the nacelle control cabinet.	OK
2.09	Do a check of the vibration sensor.	OK
2.10	Hub and blades: To do a test of the emergency stop buttons in the hub:	OK

	Do the test of the emergency stop buttons -135-S1 for the hub control cabinet.		
2.11	Do the test of the emergency stop buttons -135-S2 for the hub I/O box.	OK	

3 Safety equipment

3.01	Do a check of the emergency rescue equipment according to the checklist in the rescue box.	OK	
3.02	Examine the fire extinguishers.	OK	
3.03	Note the date for the next inspection of the fire extinguishers. Date of inspection:		06/2024
3.04	Service technician's initials:		
			Not Applicable
3.05	Do a check of the first-aid kits according to the procedure mentioned in the manual supplied along with the first-aid kits.	OK	
3.06	Fall arrest equipment (rail): Visually examine the fall protection rail and the ladder for dents, holes, and cracks.	OK	
3.07	Examine all the bolts on the fall protection rail.	OK	
3.08	Fall arrest equipment (wire): Examine the safety cable.	OK	
3.09	Examine the bottom bracket.	OK	
3.10	Examine the ladder, the cable, and the cable guides.	OK	
3.11	Examine the top bracket.	OK	
3.12	Do a check of the anchor points in the tower, nacelle, inside nacelle roof and hub.	OK	

4 Rotor

4.01	Hub: ++05 Hub control cabinet: Do a check of the heating element.	OK	

4.02	Visually check the hub control cabinet and the support brackets for loose bolts or cracks in the brackets.	OK	
4.03	Do a test of the RCCB in the hub controller.	OK	
4.04	Replace the 12 V backup battery in the ++05 hub control cabinet.	OK	
4.05	Visually examine the 12 V batteries for leakage.	OK	
4.06	Hub cover: Do a check of the fibreglass connections for loose bolts.	OK	
4.07	Examine the nose cone for cracks in the fibreglass around the bolted connections.	OK	
4.08	Blade bearing: Do a check of the blade bearing seals for leakage.		Leakage
4.09	Semi-automatic lubrication system: To check the grease hoses: Do a check of the grease hoses for cracks and wear.	OK	
4.10	Do a check of the grease hoses and their attachments for tightness.	OK	
4.11	Do a check of the grease distribution block assembly and its attachment for tightness.	OK	
4.12	Do a check of the grease collecting cans.	OK	
4.13	Lubricate the blade bearings.	OK	
4.14	Blades: Examine the blades.	OK	
4.15	Do a check of the blade collar.	OK	
4.16	Do an internal inspection of the structural shell blade.	OK	
4.17	Do a check of the LCTU.	OK	
4.18	Pitch system: Do a visual check to make sure that the blade pitch lock is activated.	OK	

4.19	Visually examine the hub for leakage.	OK		
4.20	Do a check of the nitrogen pre-charge pressure in the pitch accumulators.			
				Not Applicable
4.21	Measured value:		bar	
				Not Applicable
4.22	New value after adjustment:		bar	
				Not Applicable
4.23	Measured value:		bar	
				Not Applicable
4.24	New value after adjustment:		bar	
				Not Applicable
4.25	Measured value:		bar	
				Not Applicable
4.26	New value after adjustment:		bar	
				Not Applicable
4.27	Measured value:		bar	
				Not Applicable
4.28	New value after adjustment:		bar	
				Not Applicable
4.29	To do a check of the cylinder holder bolts: Do a check of every third bolt on each cylinder holder.	OK		
4.30	Torque:		Nm	
				Not Applicable
4.31	Do a check of all the bolts in the rod-end flange.	OK		
4.32	Torque	50,000	Nm	

4.33	Do a check for the loose bolts in the wedge for automatic blade lock in all 3 blades.	OK
4.34	Do a check of the hydraulic cylinder piston rod for wear and damage.	OK
4.35	Do a check of the rod-protection covers on the piston rods for tear and holes	OK
4.36	To do a check of the slide bushings for the cylinders: Do a visual and audio inspection of the axial clearance.	OK
4.37	To do a check of the clearance in the bearing between the torque arm shaft and the hydraulic cylinder: Do a visual and audio inspection of the radial clearance.	OK

5 Hydraulic systems

5.01	Nacelle hydraulics: Examine the hoses, the seals, the connections in the nacelle, the main shaft, the hydraulic pump for hydraulic oil leakage.	OK
5.02	Examine the hydraulic oil level.	OK
5.03	Extract a sample of the hydraulic oil.	OK
5.04	Replace the filter element of the return line filter.	OK
5.05	Flush the hydraulic system after the filter change.	OK
5.06	Replace the air breather filter element.	OK
5.07	Brake system: Do a test of the brake.	OK
5.08	To do a visual inspection of the brake callipers: Do a visual inspection of the brake callipers for cracks and other damage.	OK
5.09	Do the visual inspection of the brake callipers, the pipes, and the hoses for oil leakage.	OK
5.10	Visually examine all the hydraulic piping inlets and outlets.	OK

5.11	Do a check of the brake pads for thickness of the brake lining.	OK
5.12	Do a check to make sure that the wiring to the brake wear and heat sensors in the brake pads is not damaged.	OK

6 Gearbox and gear oil system

6.01	Gearbox: Do a check of the gear oil level.	OK
6.02	Do a check of the joints, seals (pitch tube, input shaft, and output shaft) and covers (including split line, ring gear flange on the rotor end side, and non-rotor end side) for leakage.	OK
6.03	Do an inspection of the gearbox for debris.	OK
6.04	Extract the gear oil sample.	OK
6.05	Replace the filter cartridge in the air filter housing.	OK
6.06	Gear oil system: Do a visual inspection of the gear oil hoses for damage or leakage.	OK
6.07	Replace the offline filter and the O-rings in the gearbox.	OK
6.08	To replace the 2 inline 10 µm gear oil filters (filter block HG1270): Replace the 2 inline 10 µm gear oil filters and the O-rings.	OK
6.09	Visually examine all the fittings, components on the filter block, and the pumps for leakage.	OK
6.10	Main shaft arrangement: Examine the bearing for unusual noise.	OK
6.11	To lubricate the main bearings: Lubricate the main bearing without an automatic grease lubrication system.	OK
6.12	Lubricate the main bearing with an automatic grease lubrication system.	OK
6.13	Do a check and adjust the LSS or RPM sensors.	OK

6.14	To examine the rotor locking pins: Do a visual inspection of the rotor locking pins and the rotor lock disc holes for damage.	OK		
6.15	Lubricate the rotor locking pins.	OK		
6.16	Torque arm system: Do a check of the 4 bolts in the integrated torque arm or gear connection on each side.			
				Not Applicable
6.17	Torque:		Nm	
				Not Applicable
6.18	Pressure:		bar	
				Not Applicable
6.19	Do a check of both the integrated torque arms for visible cracks.	OK		
6.20	Do a check of the upper and the lower rubber vibration elements or rubber dampers for visible cracks on both the torque arms.	OK		
6.21	Do a check for play in the vibration elements or the rubber dampers.	OK		
6.22	Visually examine to make sure that the earthing cables that connects the gearbox and main foundation not damaged.	OK		

7 Generator and coupling

7.01	Generator: Do a check of the bearings for unusual noise.	OK	
7.02	Do a check of the automatic lubrication system.	OK	
7.03	Do a check to see if the grease return pipe is blocked.	OK	
7.04	Do a check of the lubrication pump for tightness.	OK	
7.05	Do a check of the power slip ring system.	OK	
7.06	Measure all ground brushes:	OK	
7.07	Ground brush – 1:	95,000	mm

7.08	Ground brush – 2	81,000	mm	
7.09	Ground brush – 3	95,000	mm	
7.10	Ground brush – 4:	78,000	mm	
7.11	Ground brush – 5:	70,000	mm	
7.12	Ground brush – 6:	80,000	mm	
7.13	Do a check of the form and function of the ground brushes.	OK		
7.14	Identify the power brush type: Mersen			Not Applicable
7.15	Identify the power brush type: BGB	OK		
7.16	Measure the most worn power brush:	OK		
7.17	Measurement:	55,000	mm	
7.18	Do a check of the form and function of the power brushes.	OK		
7.19	Identify the slip ring unit type: Mersen			Not Applicable
7.20	Identify the slip ring unit type: BGB	OK		
7.21	Do a check of the slip ring surfaces.	OK		
7.22	Do a check and measure the groove depth for the power brushes.	OK		
7.23	Power brush – 1:	4,700	mm	
7.24	Power brush – 2:	3,600	mm	
7.25	Power brush – 3:	3,500	mm	
7.26	To check the suction fan and the filter for the PSRS: Do a check of the	OK		

suction fan, the filter, and the exhaust hose fitting.

7.27	HS coupling: Do a check of the connecting tube.	OK
7.28	Do a check of the discs.	OK
7.29	Examine the tightness of all the bolts.	OK

8 Cooling and conditioning

8.01	To do a check of the liquid cooling system: Do a visual inspection of the circulation pump -690-02-G1 for leakage in the shaft seal.	OK
8.02	Do a check of the 2 hoses in the front end for incipient cracks, wear, and leakage.	OK
8.03	Do a check of the 2 hoses in the ILU pipe system for incipient cracks, wear, and leakage.	OK
8.04	Do a check of the 5 hoses in the pump area for incipient cracks, wear, and leakage.	OK
8.05	Do a check of the 2 hoses on column 3 (right-hand side) for incipient cracks, wear, and leakage.	OK
8.06	Do a check of the 3 hoses for the roof section for incipient cracks, wear, and leakage.	OK
8.07	Do a check of the 2 hoses in the rear end for incipient cracks, wear, and leakage.	OK
8.08	CoolerTop®: Do a check of the CoolerTop® ladder for loose or missing bolts.	OK
8.09	Visually examine the fibreglass for cracks along the leading edge.	OK
8.10	Visually examine the cooler elements on the CoolerTop® for damage through the skylight.	OK

9 Nacelle

9.01	Safety functions: Examine the parking brake.	OK
9.02	Do a test of the shock sensor.	OK
9.03	Nacelle controller cabinets: To do a check of the ++03 CON A controller section: Do a test of the heating element.	OK
9.04	Do a test of the safety system batteries.	OK
9.05	Do a check of the fan and the air filters.	OK
9.06	To do a check of the ++53 CON B controller section: Do a test of the heating element.	OK
9.07	Do a check of the fan and the air filters.	OK
9.08	Replace the safety system batteries.	OK
9.09	To do a check of the ++04++3 busbar cabinet: Do a test of the heating element.	OK
9.10	Do a check of the fan and the air filters.	OK
9.11	Do a test of the main circuit breakers (-405-04-F1, -400-04-F1, and -660-02-F4).	OK
9.12	To do a check of the ++04++1 VCS converter cabinet: Do a test of the heating element.	OK
9.13	Do a check of the air filter.	OK
9.14	Rotating transfer unit: To do a check of the slip ring unit (BGB): Visually examine the slip ring unit for burns and excessive dust.	OK
9.15	Do a visual check of the brushes for burns and wear.	OK
9.16	To do a check of the slip ring unit (REKOFA): Visually examine the slip ring unit for burns and excessive dust.	

Not Applicable

9.17	Do a visual check of the brushes for burns and wear.	OK
9.18	Nacelle cover: Do a check of the bolts in the nacelle cover assembly for any loose or missing bolts.	OK
9.19	Do a check of all the fittings to the nacelle cover for cracks.	OK
9.20	Do a check of the fibreglass for cracks around the fittings.	OK
9.21	Do a check of the fibreglass very carefully for cracks at points of attachment.	OK
9.22	To do a check of the anchor points: Do a check of the anchor points.	OK
9.23	Do a check of all the bolted connections of the outer anchor points.	OK
9.24	Do a check of the anchor points for cracks.	OK
9.25	Wind sensor: Clean the wind sensor.	OK
9.26	Visually examine the cables for damage and wear.	OK
9.27	Examine all the wind sensor equipment, the brackets, and the masts for severe damage.	OK
9.28	Do a check of all the wind sensor equipment, the brackets, and the masts for tightness.	OK

10 Yaw system

10.01	Yaw bearing system: Measure the radial backlash.	OK
10.02	Claw beam number 1: CW end:	0,050
10.03	Claw beam number 1: CCW end:	0,050
10.04	Claw beam number 2: CW end:	0,050
10.05	Claw beam number 2: CCW end:	0,050

10.06	Claw beam number 3: CW end:	0,050
10.07	Claw beam number 3: CCW end:	0,050
10.08	Claw beam number 4: CW end:	0,050
10.09	Claw beam number 4: CCW end:	0,050
10.10	Claw beam number 5: CW end:	0,050
10.11	Claw beam number 5: CCW end:	0,050
10.12	Claw beam number 6: CW end:	0,050
10.13	Claw beam number 6: CCW end:	0,050
10.14	Claw beam number 7: CW end:	0,050
10.15	Claw beam number 7: CCW end:	0,050
10.16	Claw beam number 8: CW end:	0,050
10.17	Claw beam number 8: CCW end:	0,050
10.18	Claw beam number 9: CW end:	0,050
10.19	Claw beam number 9: CCW end:	0,050
10.20	Claw beam number 10: CW end:	0,050
10.21	Claw beam number 10: CCW end:	0,050
10.22	Claw beam number 11: CW end:	0,050
10.23	Claw beam number 11: CCW end:	0,050
10.24	Sum: CW end:	0,550
10.25	Sum: CCW end:	0,550

10.26	Do a check of the bolts for the end-stop (brass or aluminium piece) for the radial slide plates.	OK
10.27	Do a check of spring packages on each yaw beam.	OK
10.28	Do a check of the yaw teeth for wear and damage.	OK
10.29	Yaw lubrication system: Manually lubricate the yaw sliding surface.	OK
10.30	Do a check of the automatic lubrication of the yaw sliding surface.	OK
10.31	To do the automatic lubrication of the yaw teeth: Fill the grease reservoir on the lubrication pump.	OK
10.32	Do a check of the lubrication system.	OK
10.33	Examine if all the lubrication wheels are in engagement with the yaw pinion or the yaw ring.	OK
10.34	Yaw gear and motor: Do a check of the oil level in the planetary gears and in the worm gears.	OK
10.35	Do a check and adjust the brake torque of 2 of the 6 yaw gear motors.	
10.36	Measured value before adjustment: Left front	Not Applicable
10.37	Measured value before adjustment: Right front	Not Applicable
10.38	Measured value before adjustment: Left rear	Not Applicable
10.39	Measured value before adjustment: Right rear	Not Applicable
10.40	Measured value before adjustment: Left middle	Not Applicable

			Not Applicable
10.41	Measured value before adjustment: Right middle		
			Not Applicable
10.42	New value after adjustment: Left front		
			Not Applicable
10.43	New value after adjustment: Right front		
			Not Applicable
10.44	New value after adjustment: Left rear		
			Not Applicable
10.45	New value after adjustment: Right rear		
			Not Applicable
10.46	New value after adjustment: Left middle		
			Not Applicable
10.47	New value after adjustment: Right middle		
			Not Applicable
10.48	Do a check for noise or vibration from the yaw gear bearing.	OK	
10.49	Do a check if the yaw gears run smoothly.	OK	

11 Service crane

11.01	Examine the service crane.	OK

12 High voltage

12.01	Do an inspection of the transformer, the transformer room, and the HV switchgear.	OK

13 Service lift and climb assistance

13.01	Do a check of the service lift and the climb assistance according to the supplier's user manual.	OK

14 Tower

14.01	Tower: Visually examine the grout and concrete for cracks, scaling, and such like on the outer and inner side of the tower.	OK
14.02	To do a check of the anchor bolts in the anchor cage foundation: Visually examine the bolt protection caps.	OK
14.03	Visually examine all the anchor bolts for corrosion and/or visible damage.	OK
14.04	To do an inspection of the tower flange bolts: Visually examine for missing, broken, or loose tower flange bolts, corrosion protection on the tower flange bolts and in the tower flange area, and water leakage in the tower flanges.	OK
14.05	Do a visual check of the ventilation filter at the door of the tower.	OK
14.06	Do a check of the tower inside and outside for damage.	OK
14.07	To do a visual inspection of the middle section liquid damper (optional): Do a visual inspection of the liquid level in the barrels.	Not Applicable
14.08	Do a visual inspection of the barrels for liquid leakage.	Not Applicable
14.09	Do a visual inspection of the mechanical components of the damper units and wires.	OK
14.10	To do a check of the functionality of the dehumidifier (optional): Do a check of the function, filter, installation, and state of the connection hose if the tower is installed with a dehumidifier.	Not Applicable
14.11	Do a check for possible corrosion and dust (in the steel components).	OK
14.12	Tower surface treatment: Do a check of the surface protection of the tower.	OK

14.13	Cable and earthing system: Visually examine the cables for damage and wear.	OK
14.14	Do a check of the Vestas earthing system.	OK
14.15	++06 UPS cabinet: Do a check of the settings of the timers and the temperature control devices according to the relay setting document. See 0052-0741 'Relay setting for V100/V110 2,2 MW VCS/VCSS Mk 10C'.	OK
14.16	Do a check of the MCBs.	OK
14.17	Visually examine the UPS battery cartridges and the UPS battery packs for leakage.	OK
14.18	To do a test of the UPS batteries: Do a test of the UPS batteries.	OK
14.19	Replace the UPS batteries, if necessary. Date (as a comment)	Not Applicable
14.20	Replace the UPS, if necessary. Date (as a comment).	Not Applicable
14.21	Do a check of the heating elements.	OK
14.22	Examine the fan.	OK
14.23	Do a check of the air filters in the UPS cabinet.	OK
14.24	++01 Ground control cabinet: Do a test of all processor backup batteries in all the cabinets.	OK
14.25	Examine if the heating elements are activated.	OK
14.26	Do a test of the ++01-300-F1, ++01-660-12-F10, and ++01-660-10-F11 RCBOs and RCCBs.	OK
14.27	Do a check of the contactor switching counter for contactors -695-02-Q1 and -695-04-Q1 for number of switching.	Not Applicable

14.28	Number of switching:	
		Not Applicable
14.29	++51 Light box: Examine the RCCB ++51-640-02-03-F1 inside the ++51 light system control panel.	OK
14.30	Visually examine the 12 V batteries for leakage.	OK
14.31	Examine the function of the emergency light and the 12 V batteries.	OK
14.32	Do a check of the air filter in the light box cabinet.	OK

15 Finish work

15.01	Clean the cabinets, the covers, and the other surfaces for grease spots and finger marks.	OK
15.02	Clean grease from the checker plates and the other surfaces.	OK
15.03	Remove the collected grease from the yaw top teeth.	OK
15.04	Clean the tower basement and tower from inside.	OK