

**Customer's Address:**

ESBI Engineering Ltd.  
St. Stephens Green 18-21  
Stephen Court  
IE-2 Dublin

**Site's Address**

UNITED KINGDOM  
Tlf.

**Turbine No./Id:**

41308

**Service Order:**

52538089

**PAD No.**

Fullabrook pos 002

**Turbine Type:**

V90

**Start Date: End Date:**

23.09.2015 26.11.2015

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

/

**Date of Receipt**

27.07.2014 19:04:48

**Vestas Ref.:**

IP1020140727

**Service Inspection Form****0010 V90-3.0MW F - Service 4 Year. AWP 202****0 eSIF**

0.01 0. DMS: 0047-2605 V00

**12 Oil Sampling**

12.01 Extract a gear oil sample within 25 minutes after turbine stop. OK

12.02 Extract a hydraulic oil sample within 25 minutes after turbine stop. OK

**13 Safety Functions in the Nacelle**

13.01 Check the vibration sensor. OK

13.02 Test the emergency stop buttons in the nacelle. OK

13.03 Test the brake. OK

13.04 Check the emergency rescue equipment. OK

Comment:

Performed by Certex

13.05 Check all eye wash bottles and first aid kits. OK

Comment:

Performed by Certex

**15 Checking the Air Filters in the Control**

15.01 Check the air filters in the controller cabinets and clean the fan grills. OK

**16 Generator**

16.01 Clean the generator drip pans. OK

16.02 Refill the automatic lubricator. OK

16.03 Test the automatic lubricator. OK

**17 Rotating Contacts on Generator**

17.01 Lock the rotor before opening the covers for the rotating contacts. OK

17.02 Disconnect the CBs. Check that the heating and internal fan are off. OK

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17.03	Check and clean the drive end brushes for generators without hybrid bearings. Minimum height = 55 mm,	OK	
17.04	Replace the two brushes normal operation.	OK	
17.05	Check and clean non-drive end brushes	OK	
17.06	Replace the springs for the slip ring with 10N clips if not already done.	OK	
17.07	Check the box for allowable brush length: 10N springs 24 mm, Otherwise 35 mm	OK	
17.08	Replace the worn phase brushes in the non-drive end (ND-end) if the 'available brush length' is less than the allowable brush length. Comment: None required		
17.09	Number of worn replaced brushes:	0,000	
17.10	Measure and note the 'available length', Available Brush Length [mm] (shortest brush):	54,000	mm
17.11	Check the ground contact in the non-drive end (ND-end)	OK	
17.12	Measure the 'available length' of the ground contact brushes (Shortest brush):	14,100	mm
17.13	Replace the worn ground contact brushes in the non-drive end (ND-end) if the 'available brush length' is less than 15 mm.	OK	
17.14	Number of worn replaced brushes:	3,000	
17.15	Check the surface of the slip rings.	OK	
17.16	Inlet filter and cooling fan for rotating contact ND-end: Clean the filter housing, replace the filter, and check the internal and external fans.	OK	
17.17	Replace the encoder.	OK	
17.18	Replace the external fan every 5th year or after 40.000 hours Comment: Neither limit reached yet		

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17.19	If not 5th year or 40.000 hours, then check the external fan and replace the fan in case of bearing noise.	OK
<b>18</b>	<b>Rotating Contact on Gearbox (Note: LT a</b>	
18.01	Disconnect the CBs Q27 and Q28 and secure against re-closing:	OK
18.02	Check the brushes, clean (vacuum) and carry out a visual inspection. Minimum brush height = 5mm.	OK
<b>19</b>	<b>Top Controller</b>	
19.01	Test Trip Q8.	OK
19.02	Test the Q7 breaker.	OK
<b>20</b>	<b>Generator Foundation</b>	
20.01	Visually inspect for cracks in welds at the generator foundation.	OK
<b>21</b>	<b>Composite Coupling</b>	
21.01	Check for cracks and delaminating in the reinforced area around the bolt holes.	OK
<b>22</b>	<b>Gear Oil Conditioning</b>	
22.01	Shut down the gear oil pumps.	OK
22.02	Only if the swarf alarm is activated: Check and clean metal shavings (swarf) indicators and magnets.	OK
22.03	Only if the swarf alarm is activated: Check the gear oil tank for contamination. Only if the swarf alarm is activated.	OK
22.04	Change the gear oil. According to analysis	OK
22.05	Change the breather filter (yearly or at oil change).	OK
22.06	Replace the inline filters. According to the 'Lubrication Chart'	OK
22.07	Replace the offline filters. According to the 'Lubrication Chart'	OK

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22.08	Check the inline/offline filter units and hose connections for leakage.	OK	
22.09	Test the emergency lubrication system.	OK	
22.10	Test the emergency lubrication battery and note the lowest voltage here:	23,800	V
22.11	Press the emergency stop button. Check that main lubrication pumps stop and that the emergency pump starts.	OK	
22.12	Check that the ball valves, Y1404, close.	OK	
22.13	Check that the emergency PLC display does not show Fault Valve X:	OK	
22.14	Measure and record the highest voltage	24,900	V
22.15	If the voltage is lower than 22 V: Replace the emergency lubrication battery. Comment: Above 22V		
<b>23</b>	<b>Gearbox</b>		
23.01	Check joints, seals, and covers for leakage.	OK	
23.02	Inspect the gearbox. At oil exchange	OK	
23.03	Clean the surface of the gearbox and check pumps for leakage.	OK	
23.04	Check the oil level.	OK	
<b>24</b>	<b>Cooling Circuit</b>		
24.01	Check the cooler seals and gaskets and check hoses for damage.	OK	
24.02	Check the pump units for leakage.	OK	
24.03	Check that the valves are open.	OK	
24.04	Check pipes, hoses, and hose clips for visible leaks.	OK	
24.05	Check the hoses to the expansion tanks.	OK	
24.06	Check the coolant level.	OK	
24.07	Check the condition of the coolant.	OK	
<b>25</b>	<b>Main Foundation</b>		
25.01	Check three M30 crane beam bolts at each	OK	