



European Qualification Profile

6. Maintenance and trouble-shooting - onshore

1. Production

2. Transport

3. Installation

4. Commissioning

5. Plant operation

6. Maintenance and trouble-shooting onshore

7. Maintenance and trouble-shooting offshore



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General assignment: Inspect the complete wind power installation using checklists and specified inspection routines and rectify any faults or malfunctioning of the machine.

Description/Scope of the assignment: Check individual components on the basis of checklists: inspect, adjust and/or replace components, replace and/or fill up lubricants, carry out functional checks. The work is to be performed at regular inspection intervals or in response to malfunctioning/fault reports registered by the operator

Key sub-assignments: The following key sub-assignments have been identified and specified in individual job profiles

6.1

Inspection and maintenance of electrical systems

6.2

Inspection and maintenance of mechanical and hydraulic systems

6.3

Inspection and maintenance of safety-relevant apparatus

6.4

Inspection and maintenance of rotor blades

6.5

Trouble-shooting and repair

6.6

Fire fighting

6.7

Rescue from heights

Job profile

Process stage 6 Maintenance and trouble-shooting onshore

Work assignment

6.2 Inspection, maintenance of mechanical and hydraulic systems

Description

Inspection, maintenance and repair of all mechanical and hydraulic systems and components in accordance with manufacturer's maintenance manual. Scope

Scope

The assignment is grouped into 10 sub-assignments:

1. Prepare the operation
2. Take safety precautions on site
3. Assess the work environment
4. Establish functional communication
5. Secure the installation
6. Carry out inspection
7. Carry out maintenance and repair
8. Clean the workplace and dispose of waste
9. Restart the turbine
10. Document work completed



Requirements					
	<i>Knowledge</i>	<i>Skills</i>	<i>Competences</i>	<i>EQF-level</i>	<i>NQF-Reference</i>
1. Preparation - Collect all information, documentation needed to carry out the operation	<ul style="list-style-type: none"> - Pre-knowledge of the particular turbine model and the installed equipment. - Knowledge of and experience in consulting turbine-specific operation manuals, checklists and operating instructions - Knowledge of and experience in using maintenance and operation manuals - Knowledge of the relevant safety data sheets 	<ul style="list-style-type: none"> - Systematic and orderly structuring and filing of documents - Ability to conduct emergency routines 	<ul style="list-style-type: none"> - Clarify scope and conditions of the work assignment and the sub-assignments with the work scheduler - Reliably assess complexity of work processes and plan accordingly - Ability to take necessary safety (precautionary) measures 	3	Technical journeyman – Mechaniker, Mechatroniker - (DE)
- Check tools and supply of lubricants and consumable materials	Operationa knowledge of all required tools	Mechanical skills	Ability to structure work assignments	3	
- Drive to site			Defensive driving skills	3	Drivers' liscence Additional safety training G25
2. Safety precautions - Inspect and carry out a functional check of personal	Knowlege of the PSE equipment and it functions	Reliable handling and harnessing of PSE equipment	Ability to carry out a functional check of PSE equipment	3	Health certificate G41, Certificate of training in use of PSE equipment



<p>safety equipment PSE to prevent falling from heights</p>					
<p>- Implement zone-specific safety precautions</p>	<ul style="list-style-type: none"> - Knowledge of installed equipment and zones - Ability to interpret country-specific signs, diagrammes and instructions 	<p>Mechanical and electrical skills</p>	<ul style="list-style-type: none"> - Methodical approach 	<p>3</p>	<p>Language training</p>
<p>- Rehearse rescue procedures</p>	<ul style="list-style-type: none"> - Operative knowledge of country-specific rescue and emergency procedures 	<ul style="list-style-type: none"> - Safe and reliable reactions to emergencies - High level of physical fitness 	<ul style="list-style-type: none"> - Responsibility - Ability to react reliably to emergency (stress) situations - communication skills within team and local emergency services 	<p>3-4</p>	<p>First aid training Rescue training</p>
<p>3. Assess the work environment: people in the vicinity of the installation, other work in process in the vicinity, weather conditions</p>	<p>Knowledge of possible sources of risk or danger and possible environmental influence factors on site, knowledge of weather conditions and symptoms</p>	<p>Routined access to metereological data</p>	<ul style="list-style-type: none"> - Ability to assess environmental and weather influences and risks, communicate with work scheduler in cases of uncertainty - Ability to anticipate risk situations - Social skills 	<p>4</p>	
<p>4. Establish communication structures and procedures within the team (on-site) and check</p>	<ul style="list-style-type: none"> - Command of and agreement on key vocal instructions and sign language - Command of the native language at the site location 	<p>Reliable handling of communication equipment</p>	<ul style="list-style-type: none"> - Ability to anticipate risk situations and assess these reliably - Sense of responsibility for oneself, the team and people in the vicinity of the 	<p>3</p>	<p>Training in use of communication equipment and command of standardised communication procedures, both</p>



<p>emergency / rescue functions</p>			<p>installation - Preparedness and ability to act responsibly in emergency situations</p>		<p>documented by certificates</p>
<p>5. Secure the installation</p> <ul style="list-style-type: none"> - Inform manufacturer via hotline and the operator of work in process - Shut down the installation - Disconnect remote data transmission (service switch) and check disconnection 	<ul style="list-style-type: none"> - Pre-knowledge of the particular turbine model and the technology installed. - Knowledge of and experience in using the relevant maintenance and operation manuals, command of specific operation instructions for the particular turbine 	<p>Establish clear communication with all persons with remote access to the turbine</p>	<ul style="list-style-type: none"> - Reach reliable understanding with external bodies - Ability to detect and assess possible risk situations - Sense of responsibility for oneself, the team and people in the vicinity of the installation - Preparedness and ability to act responsibly in emergency situations 	<p>3-4</p>	<p>Turbine-specific training including training in rotor and gearlocks, both documented by certificates</p>
<p>6. Inspection</p>	<p>Detailed zone- and component-specific knowledge of installed equipment</p>	<ul style="list-style-type: none"> - Access to all relevant manuals and operating instructions 	<ul style="list-style-type: none"> - Detect and assess damages - Ability to react reliably in emergency situations 	<p>3</p>	<p>Service technician</p>
<ul style="list-style-type: none"> - Assess state of individual components and any damage 	<ul style="list-style-type: none"> - Detailed knowledge of individual processes - Nominal loads - Safety regulations 	<ul style="list-style-type: none"> - Mechanical and electrotechnical skills 	<ul style="list-style-type: none"> - Methodical approach - Work safety awareness 	<p>3</p>	



- Assess corrosion and rectify if necessary	Chemical processes related to deployed materials	Mechanical skills	Safety and environmental protection procedures	3-4	
- Check screw connections and torque	Functions and physical characteristics of screw connections	Techniques for applying torque	Systems knowledge	3	
- Check levels of lubricants, coolants and hydraulic systems, take samples	Nominal conditions Technical specifications	Mechanical skills	Strict adherence to manual	3	
- Check seals, leaks, abrasion, fractures and cracks, moisture, noise levels and other symptoms of overloading	- Processes installed - Knowledge of materials	Mechanical skills	Compare nominal and actual conditions	3	
- Carry out functional checks of safety devices	Mastery of mechanical-hydraulic functions	Mechanical skills	Read and understand electrical manuals and diagrammes Social skills Awareness of limits	3-4	
7. Maintenance	- knowledge of possible types of component damage	- swift access to all relevant operational	- ability to assess level of damage	3	Service technician



<p>and repair Maintain components and repair damage in accordance with professional standards</p>	<p>- knowledge of authorized repair techniques</p>	<p>instructions and guidelines</p>	<p>- ability to select technically appropriate and authorized repair technique - Ability to select most economical repair procedure - ability to select authorized waste management options for waste materials</p>		
<p>- Hoist spares and replacement parts, lubricants, tools and devices needed for repair work</p>	<p>- Operational knowledge of regulations relating to working from raised platforms, hydraulic lifts and hoisting cages</p>	<p>- Mechanical skills - Operation of hoisting equipment</p>	<p>Ability to select appropriate transport/hoisting equipment</p>	<p>3</p>	<p>Documented instruction on operating different types of hoisting equipment</p>
<p>- Carry out oil change, change of dust filter and drying agents</p>	<p>Material specifications</p>	<p>Mechanical skills</p>	<p>Strict adherence to manual</p>	<p>3</p>	
<p>- Check and replace wear and tear parts</p>	<p>Nominal conditions Technical specifications</p>	<p>Mechanical skills</p>	<p>Ability to assess wear on components</p>	<p>3-4</p>	
<p>- Fill up lubricants coolants and hydraulic systems</p>	<p>Nominal values</p>	<p>Mechanical skills</p>	<p>Strict adherence to manual</p>	<p>3</p>	

- Lubricate and grease according to service plan	Characteristics of lubricants	Mechanical skills	Systematic approach	3	
- Align and adjust sensors and actuators	- Overview of components - nominal values	Adjustment procedures Handling of measuring devices		3	
- Service hydraulic systems, actuators and valves	Operational functions of hydraulic systems, risks and physical properties	Mechanical skills		3	
- Locate and rectify identified malfunctioning	Systems knowledge (interdependencies) Interpret fault codes	Mechanical skills	- Logical approach - Ability to read/understand technical documentation - Communication skills, - Social skills	4-5	
8. Cleaning and waste disposal	- Properties of cleaning agents (safety data sheets) - Instructions for use of cleaning agents - Waste disposal regulations - Waste transport regulations - Regulations on dangerous substances	- Handling of cleaning agents - Safe separation and packaging of waste	- Awareness of importance of orderly workplace - Environmental awareness	3	- Documented instruction on dangerous substances - Documented instruction on waste disposal procedures and regulations
9. Restart the turbine - Start up the turbine operation - Inform remote	- Nominal loads - Knowledge of and experience in using the relevant maintenance and operation manuals, command of specific operation instructions	- Mechanical handling	- Overview and understanding of interlinked processes	4	Experienced service technician



<p>operator and manufacturer</p>	<p>for the particular turbine - Prescribed safety routines and procedures</p>				
<p>10. Documentation</p>	<p>Documentation system</p>	<ul style="list-style-type: none"> - Access to all documentation templates and forms - PC skills 	<ul style="list-style-type: none"> - Logical approach - Understanding of documentation structure - Ability to formulate precise descriptions of damages found - Ability to communicate repercussions of identified damage - Mastering of professional terminology 	<p>3</p>	<p>Documented training in documentation procedures and requirements</p>