

Aim: to establish the skills transfer of ECI technicians across Wind Turbine Technicians. This was principally for the following reasons:

- To assist employers who already recognise the Connected Competence base technical standard for Electrical, Mechanical and Instrument & Control roles understand the cross-skilling requirements within their own organisation as they diversify their energy services portfolio into Wind.
- To respond to those Onshore and Offshore Wind Developers who wanted a common understanding as to the technical competence requirements of either a new internal wind turbine maintenance team or external maintenance contractors as their existing manufacturer's warranty comes to an end.
- To help workers demonstrate their technical competence in the activities relevant to a Wind Technician through digital badges
- To support the development of the NSTD Skills Passport Mutual Recognition Framework.

Approach:

- A detailed competence profile for a Wind Turbine Technician was developed as a common, standard profile did not exist.
- Through consultation with Industry, the individual requirements across the Electrical, Mechanical, Instrument & Control and Moving Loads disciplines were determined and once endorsed, established the competence assurance outcomes.
- After further consultation and endorsement, a mapping analysis has now been produced together with a Standard Industry Profile which demonstrates technician skills transfer across to Wind.



ROLE PROFILE Wind Turbine Technician

Occupational Area:	Asset/Site – Wind Installations, Onshore and Offshore
Job Role Examples:	Wind Turbine Technician – Ops & Maintenance
Role Overview:	
<p>Wind turbine technicians are responsible for the installation, inspection and testing, commissioning and diagnosis of faults in wind turbines and associated equipment. These activities are typically undertaken on equipment such as pumps, coolers, heating and fans, yaw systems, control panels, blade hydraulics, anemometers and wind vanes, vibration monitors, mechanical brakes, temperature sensors, control systems, motors, filter alarms, converter systems, phase compensators, low voltage systems and components, pneumatics, pitch systems, nacelle turning sensors.</p> <p>Wind turbine technicians are more commonly found performing testing and preventative maintenance, which is the process of carrying out systematic, planned maintenance of machinery and equipment. This enables the technician to identify and resolve potential problems through repair or replacement before they can result in a much larger, or catastrophic, failure. In addition to preventative maintenance, the technician is also required to perform non-scheduled maintenance because of machinery or equipment failure. In these circumstances, the technician should use root cause analysis to diagnose and resolve problems quickly and, where necessary, carry out a temporary repair until such time that a permanent solution can be implemented.</p> <p>Whilst Wind Turbine Technicians are required to use specialist tools and equipment, they also routinely use traditional hand tools and test equipment during the execution of their duties. Wind Turbine Technicians undertake these tasks on sites such as wind farms, which often necessitates them working in hazardous conditions. Due to the specific and distinct requirements associated with specialist manufacturer equipment when working with high voltage switchgear, SCADA systems and condition monitoring, these tasks are considered as relevant to the job role, but the competencies are not common across all sites and sectors.</p>	
Knowledge & Skills:	
<p>The Wind Turbine Technician will:</p> <ul style="list-style-type: none"> Have the required competencies to repair or replace, inspect, test, commission and diagnose faults in plant associated with wind turbines and associated cabling and equipment to the required standard while adhering to health, safety and environmental regulations and safe working practices, and taking into account environmental and sustainability considerations. Understand the relevant legislative, regulatory and local requirements or procedures and safe working practices, including their responsibilities with regards to reporting lines and procedures. Understand the preparation and reinstatement requirements in respect of the work area, materials and equipment, and the possible consequences of incorrect actions in these areas. Be able to read and interpret relevant engineering drawings, related specifications, quality standards and equipment manuals, and to follow work instructions and relevant plans and schedules. As necessary, put forward suggestions and develop modification requests to improve plant/equipment efficiency/safety of operations. Understand which tools and equipment to use and know when these are required. Relevant training and taught techniques should be demonstrated to ensure compliance to safety procedures and quality control at all times. Understand their responsibilities for ensuring the care and security of tools and equipment used. Understand the types of defects and faults that can occur, how to identify them, and what action to take. Be able to handle a range of digital information, technology and equipment to support work related tasks and to communicate information. 	
Technical Competencies:	
<ul style="list-style-type: none"> TIE08 - Installing AC Electrical Motors - install suitable cables, terminate and test a three-phase motor, using appropriate materials, equipment, tools and techniques. TEM06 - Inspect, Test and Maintain Industrial Switchgear Equipment - safely and competently inspect, test and maintain industrial circuit protective equipment using appropriate equipment, tools and techniques. TEM14 - Periodic Inspection of a Three-phase System - carry out the periodic inspection and testing of three-phase plant and equipment in an industrial environment, including visual inspection of associated equipment. 	

An Employer Wind Group reviewed the base technical requirements for a Wind Turbine Technician across Electrical, Mechanical, I&C and Moving Loads occupations for both Install and O&M Wind projects.

Based on these common activities, the technical competence outcomes were established and a standard role profile agreed. This can be viewed [here](#)

- TMM01 Maintaining hydraulic systems** - Disassemble, clean, inspect and repair a hydraulic gear pump as per manufacturers specification
- TMM05 Maintaining centrifugal pumps** - Strip down, check dimensions, replace seals, and rebuild a centrifugal pump
- TM14 - Flow measurement and control systems** - Recommission a differential pressure flow transmitter into a fully operational condition, and calibration check the transmitter.
- TM17 - Maintain, calibrate and commission a process control valve** – Repair / replace a process control valve positioner and actuator, replace valve stem gland packing and reassemble. Set up and stroke test to operate open/closed on a 4–20 mA control signal, complete full loop calibration.
- TSBT02 - Disassemble and reinstall SBT assemblies** - Identify faults and defects with SBT assemblies, disassemble SBT assemblies, rectify faults and defects and reinstall SBT assemblies by selecting and using the correct materials, tools, fittings, clamps and supports in accordance with P&ID and specification sheet
- TML03 - Move an uneven load safely through an obstructed area using a lift plan** – select equipment and lifting accessories to sling, lift and move an unequally weighted load through a restricted access to an identified location in accordance with appropriate industry regulations/procedures.

- Behaviours:**
- Establish and maintain effective working relationships, communicate effectively, and work inclusively to deliver work within given specifications.
 - Demonstrate team working skills and interact with team members in a positive and professional manner.
 - Work within an overall risk control strategy which has been developed by safety specialists and includes detailed criteria for identifying risks, together with clearly defined procedures for action which must be followed.
 - Take personal ownership of, and responsibility for, completing tasks and procedures. Follow procedures and relevant codes of conduct with integrity and rigour and complete actions and documents accurately and honestly.
 - Take responsibility for identifying and reporting instances where procedures or work instructions cannot be met or where a variation in them is required.
 - Deal promptly and effectively with problems within their control and report those that have been, and those that cannot be, solved.
 - Take responsibility for supervising and mentoring others where appropriate.
 - Demonstrate the ability to coordinate work scopes and SIMOPS (Simultaneous Operations) effectively within a wider team, as required.
 - Demonstrate effective handover of responsibility and equipment at the end of a task.
 - Take responsibility and ownership of personal development, set targets to plan on how these will be achieved.
 - Support operational requirements, achieve targets and maintain records as required, thereby minimising backlog and downtime.
 - Maintain compliance with legislative requirements and company policies, **procedures** and standards.
 - Maintain and demonstrate ongoing technical competence and skill set to current standards and updates.
 - Support innovation and development for improvements.

Determining Work scopes:
Other categories of workers may be mobilised to complete certain stand-alone activities/work scopes within the discipline. Relevant technical tests for those workers are identified below:

Electrical work scopes only	TIE08, TEM06, TEM14
Mechanical work scopes only	TMM01, TMM05
Instrument & Control work scopes only	TM14, TM17, SBT02
Rigging / Moving Loads work scopes only	TML03

Although appropriately qualified for these specific work scopes, it should be noted that without the full suite of electrical installation tests the person should not be deemed as demonstrating full 'currency of competence' across the electrical installation discipline.

The competence outcomes in the Wind Turbine Technician profile were mapped against the current Connected Competence test activities. **Green** tests denotes skills transfer from Connected Competence Technician Roles across to Wind Turbine Technician. **Red** denotes any gaps against the role profile. Site-specific competencies were not included but highlighted below.

Technician Skills Transfer across a Wind Turbine Technician Profile

Electrical

TIE04 - Install Electrical Distribution Final Systems

TIE08 – Installing AC Electrical Motors

TIE15 – Installing Support Systems

TIE16* - Installing cables in an Intrinsically Safe system

TIE17 / TIE17(Ex)*- Install, Gland and Terminate Power Cables

TEM03 - Testing Portable Equipment

TEM05 - Battery and UPS Systems

TEM06 - Inspect, Test & Maintain Industrial switchgear equipment

TEM10* - Hazardous area inspection of electrical equipment

TEM14 - Periodic Inspection of a 3-phase system

Mechanical (inc Hydraulic)

TMF01 - Mechanical Precision measurement

TMF07 - Aligning, levelling and setting plant and equipment

TMM01- Maintaining hydraulic systems

TMM02 - Maintaining pneumatic systems

TMM05 - Maintaining centrifugal pumps

TMM10 - Dismantle, Assemble and Hand Torque Flanged Joints

Moving Loads

TML03 - Move an uneven load safely through an obstructed area using a lift plan**

Instrument & Control

TMI01 - Pressure measurement and control systems

TMI02 - Level measurement and control systems

TMI04 - Temperature measurement and control systems

TMI14 - Flow measurement and control systems

TMI17 - Maintain, calibrate and commission a process control valve

TSBT02 - Disassemble and reinstall SBT assemblies

Gap Analysis

- **Single fault diagnosis**

Out of scope

ie. site-specific or manufacturer-specific technical competencies

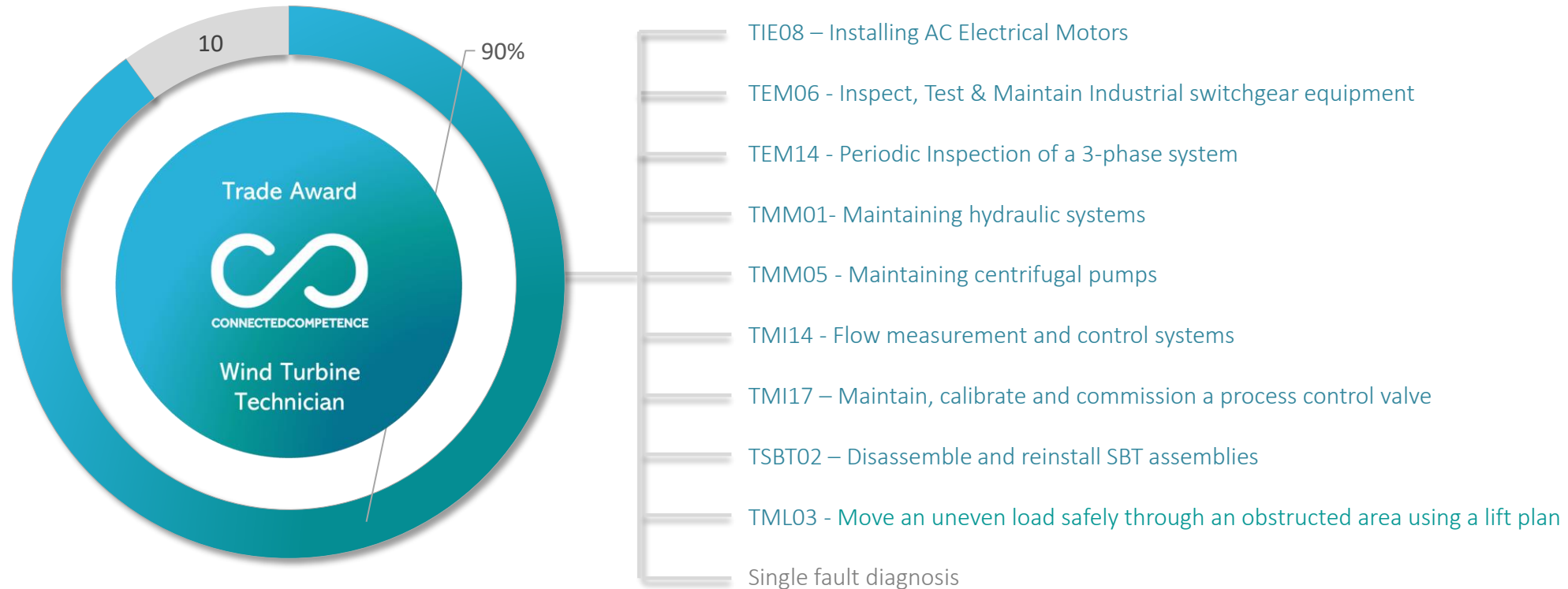
- SCADA
- HV Switchgear
- Conditioning Monitoring

*Or CompEx Equivalent

** Or OPITO Rigger Stage 3 or 4 Equivalent

Common Skills & Competence Transfer

The mapping demonstrates a 90% common skills transfer from existing Connected Competence activities to a Wind Turbine Technician Profile. Site specific technical competence and sector-specific safety training is excluded from the analysis.



Site Specific Competencies NOT INCLUDED • SCADA • Condition Monitoring • HV Switchgear