Title | Demonstrate knowledge of turbine governors used in electricity power plant

Level | 4

Credits | 10

Purpose | People credited with this unit standard are able to: describe the purpose of a turbine governor in an electricity generating power plant; describe different types of turbine governors used in an electricity generating power plant; describe the operation of a turbine governor; and identify and describe the components, and describe the function, of a pressure oil supply system for a turbine governor.

Classification | Electricity Supply > Electricity Supply - Power System Management

Available grade | Achieved

Guidance Information

1 Safety of personnel and plant must be a priority throughout the assessment. If the safety requirements are not met the assessment must stop and the candidate will be assessed as not yet competent.

2 Performance and work practices in relation to the outcomes and performance criteria must comply with all current legislation, in particular:
   - the Electricity Act 1992 and any subsequent amendments, and any regulations, codes of practice recognised under that statute;
   - the Health and Safety at Work Act 2015;
   - the Resource Management Act 1991, and their subsequent amendments,

3 Assessment against this unit standard includes the whole turbine governor system, from the speed sensing device out to, and including the main servo motor/s.

4 Reference
Outcomes and performance criteria

Outcome 1

Describe the purpose of a turbine governor in an electricity generating power plant.

Range output power, permanent speed droop, stability, frequency, load change.

Performance criteria

1.1 The purpose of a turbine governor is described with reference to automatic control systems.

Range start up, synchronising, power regulation, shut down, supplying isolated network.

1.2 Reference is made to accuracy and reliability of supply.

Range Electricity Industry Participation Code: part 8 – Common quality.

1.3 The relationship between turbine and load characteristics is described.

Outcome 2

Describe turbine governors used in an electricity generating power plant.

Range may include – mechanical, electronic, analogue or digital governors, electro-hydraulic; evidence of two different types of turbine governors is required.

Performance criteria

2.1 Turbine governor components are described.

2.2 Labelled block diagrams are produced describing all components.

Outcome 3

Describe the operation of a turbine governor.

Performance criteria

3.1 The function of turbine governor components is described.
Range may include but is not limited to – hydro – pilot valve, main distributing valve, dither, speed sensing, servomotors, return motion/feedback, gate limiter, protection shut down device, pressure rise limiting devices, control power amplification;
thermal – emergency stop valves, governor/intercept valves, gas valves, inlet guide vanes, combustor bypass valves, variable bleed valves, variable stator valves.

3.2 Governor operation in response to changes in load and required power output is explained with the aid of diagrams.

Range speed droop and protection shutdown.

Outcome 4

Identify and describe the components, and describe the function, of a pressure oil supply system for a turbine governor.

Range accumulator tank and oil and air level regulation, pressure relief valve, sump tank, oil pump/s, unloader valve/s, non-return valve/s, oil level indication, oil pressure indication, oil filtration, oil coolers.

Performance criteria

4.1 Components of a pressure oil supply system are identified and described by means of diagrams.

4.2 The function of a pressure oil supply system is described by means of diagrams.

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Consent and Moderation Requirements (CMR) reference 0120

Comments on this unit standard

Please contact the Infrastructure ITO (Connexis) qualifications@connexis.org.nz if you wish to suggest changes to the content of this unit standard.