



Australian Government

Department of Education, Employment and Workplace Relations

SUGPOTB2A Operate a turbine

Release: 1

SUGPOTB2A Operate a turbine

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This is a Specialist unit. It covers the skills and knowledge required to for continuous and short term operation of a turbine and for start up and shut down after a prolonged break.

This unit is based on the following Worksafe Australia Standards for Users and Operators of Industrial Equipment - NOHSC 1006 (2001):- Start steam turbine, Operate and monitor turbine, and Shut down turbine. Turbine operators holding a ticket from the relevant state regulatory authority will be granted equivalence in this unit SUGPOTB2A Operate a turbine for the purpose of issuing a qualification.

Application of the Unit

Not applicable.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

Element	Performance criteria
1. Prepare the turbine for operation	1.1 Pre-operational checks are conducted 1.2 Health and safety hazards / maintenance requirements are identified and reported to appropriate personnel according to workplace reporting procedures
2. Start and monitor turbine operation	2.1 The turbine is started and brought on line safely according to workplace procedures and manufacturer's recommendations 2.2 Plant is operated within limits of manufacturer's specifications to meet workplace requirements 2.3 Equipment is monitored to confirm operating condition 2.4 The workplace meets housekeeping standards
3. Analyse and respond to abnormal performance	3.1 Operating data and plant operating conditions are analysed to identify causes of abnormal performance 3.2 Corrective action is taken in accordance with workplace procedures in response to Hazards and abnormal plant performance 3.3 Emergency procedures are implemented as required according to workplace procedures and manufacturer's recommendations
4. Handover turbine operations	4.1 Workplace records are maintained in accordance with statutory requirements and workplace procedures 4.2 Handover is carried out according to workplace procedure 4.3 Turbine operators are aware of turbine status and related equipment at completion of handover
5. Shutdown the turbine	5.1 The turbine is operationally shut down according to workplace procedures and manufacturer's recommendations 5.2 Valves and fittings are removed in preparation for maintenance as required 5.3 The turbine is stored in shut down mode 5.4 Maintenance requirements are identified and reported according to workplace reporting procedure

Required Skills and Knowledge

Not applicable.

Evidence Guide

Evidence guide

The assessment process must address all of the following items of evidence.

Ability to:

1. Access workplace information on operating requirements
2. Select, fit and use personal protective clothing and/or equipment
3. Handle chemicals safely. This includes following correct handling and storage procedures and use of appropriate protective clothing and equipment
4. Identify and report hazards and potential hazards in the work area
5. Confirm status of turbine and related services including availability of steam
6. Conduct pre-start checks. This typically include checking:
 - cooling water supply
 - overspeed trip
 - emergency stop
 - operation and position of valves, fittings, steam traps and steam line purge systems
 - lubrication system
 - drainage system
 - steam quality and pressure
 - heat input
 - free rotation of turbine
 - reticulation line pressure and system warm up
7. Liaise with other work areas to advise of turbine status
8. Demonstrate set up and start up procedures in both manual and automatic modes and for both a hot start and cold start
9. Monitor turbine operation. This typically includes monitoring:
 - bearing temperature
 - pressures
 - speeds
 - glands
 - water filters
 - oil levels
 - equipment condition including noise and vibration
 - steam reticulation line pressure
 - lubrication system
 - condenser operation (where fitted)
10. Take corrective action in response to abnormal or unacceptable performance
11. Report and/or record corrective action as required
12. Demonstrate shift handover procedure and confirm that replacement operators are aware of equipment status and operating requirements prior to completing handover
13. Demonstrate procedure to take turbine off line
14. Demonstrate procedure to prepare the turbine for a prolonged shut down. This includes removal of valves and fittings
15. Demonstrate emergency trip procedure and related re-start
16. Record operating information
17. Maintain work area to meet housekeeping standards

May include ability to:

18. Use process control systems

Knowledge of:

19. Relevant state OHS legislation, standards and codes of practice relating to work responsibilities
20. Safety features of the turbines. These include relief and over-speed trip valves
21. Safe work procedures including awareness of health and safety hazards related to turbine operation and associated control measures. Hazards typically include handling chemicals, working around hot surfaces, working around moving equipment, manual handling, fuel and steam leaks.
22. Hierarchy of hazard control measures
23. Duty of care of the turbine operator
24. Purpose and limitations of protective clothing and equipment
25. Purpose and basic principles of turbines. This includes properties of steam
26. Turbine system layout and steam cycle
27. Relationship to other processes. This includes suppliers and users of steam across the site
28. The effect of steam quality on turbine operation
29. The effect of low steam pressure on turbine operation
30. Methods used to render equipment safe to inspect, maintain and/or clean including lock-out, tag-out and isolation procedures
31. Equipment purpose and basic operating principles of turbine and related equipment
32. Operating requirements and parameters
33. Procedures for responding to emergency situations. This includes safe operational shutdown procedure
34. Handover and long term shut down and storage procedures
35. Environmental issues and controls
36. Housekeeping standards for the work area
37. Reporting and recording systems. This includes both statutory and workplace requirements

May include knowledge of:

38. Basic operating principles of process control where relevant. This includes the relationship between control panels and systems and the physical equipment

Relationship with other standards

Pre-requisite units

There are no pre-requisite units for this competency standard.

Co-assessment of related units

Other units of competency relevant to the work role should be assessed in conjunction with this unit. This may include:

- SUGZPCI2A Operate a process control interface

Resources required for assessment

Assessment must occur in a real or simulated workplace where the assessee has access to:

- Turbine and related equipment
- Relevant codes and standards
- Operating procedures and related advice on equipment operation
- Personal protective clothing and equipment
- Communication systems and equipment

- Housekeeping standards and procedures
- Workplace information recording systems, requirements and procedures

Assessment requirements

For assessment advice where the turbine operation is not a certified occupation, refer to the Assessment Guidelines for this Training Package. Where turbine operation is a certificated occupation, refer to the appropriate NOHSC competency standards, available from National Occupational Health and Safety Commission.

Range Statement**Range statement**

The range statement indicates the context for demonstrating competence. This statement is a guide and unless otherwise indicated, items may or may not apply as required by the work context.

- Work is carried out in accordance with company policies and procedures, licensing requirements, manufacturer's recommendations, legislative requirements, codes of practice and industrial awards and agreements. Codes of practice include the Sugar Milling Operations Industry Code of Practice
- Workplace information can include Standard Operating Procedures (SOPs) and manufacturer's specifications
- Confirming equipment status involves conducting relevant pre-start checks, confirming that cleaning standards are met, all safety guards and manholes are in place and equipment is operational
- Turbines and related equipment may include turbines and pass-out turbines, condensers, oil coolers, vacuum pumps and filters
- Operation and monitoring of equipment and processes typically requires the use of control panels and systems
- Services may include steam, water, mill and instrumentation air and power
- Tests may include trip tests
- Work may require the ability to work within a team environment
- Information systems may be print or instrumentation based
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Unit Sector(s)

Not applicable.