



Australian Government

Department of Education, Employment and Workplace Relations

FDFSUG217A Operate a turbine

Release: 1

FDFSUG217A Operate a turbine

Modification History

New Unit based on *SUGPOTB2A Operate a turbine*.

Unit Descriptor

This unit describes the outcomes required 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 *FDFSUG230A Operate a turbine* for the purpose of issuing a qualification.

Application of the Unit

This unit has application in the sugar milling industry.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

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

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare the turbine for operation	1.1 Personal protective clothing and equipment is selected and used 1.2 Pre-operational checks are conducted 1.3 Run warm up sequence of turbine in preparation for handover to console 1.4 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

This section describes the skills and knowledge required for this unit.

Required skills includes:

Ability to:

- access workplace information on operating requirements
- select, fit and use personal protective clothing and/or equipment
- handle chemicals safely. This includes following correct handling and storage procedures and use of appropriate protective clothing and equipment
- identify and report hazards and potential hazards in the work area
- confirm status of turbine and related services including availability of steam
- 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
 - condensate drainage system
 - steam quality and pressure
 - heat input rate
 - free rotation of turbine
 - reticulation line pressure and system warm up
- liaise with other work areas to advise of turbine status
- demonstrate set up and start up procedures in both manual and automatic modes and for both a hot start and cold start
- monitor turbine operation. This typically includes monitoring:
 - bearing temperature
 - steam pressures
 - speeds
 - glands
 - water filters
 - oil levels and flows
 - equipment condition including noise and vibration
 - steam reticulation line pressure
 - lubrication system
 - condenser operation (where fitted)
- take corrective action in response to abnormal or unacceptable performance
- report and/or record corrective action as required
- demonstrate shift handover procedure and confirm that replacement operators are aware of equipment status and operating requirements prior to completing handover

- demonstrate procedure to take turbine off line
- demonstrate procedure to prepare the turbine for a prolonged shut down. This includes removal of valves and fittings
- demonstrate emergency trip procedure and related re-start
- record operating information
- maintain work area to meet housekeeping standards

Required knowledge includes:

Knowledge of:

- relevant state OHS legislation, standards and codes of practice relating to work responsibilities
- safety features of the turbines. These include relief and over-speed trip valves
- 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, oil and steam leaks.
- hierarchy of hazard control measures
- duty of care of the turbine operator
- purpose and limitations of protective clothing and equipment
- turbine system layout and steam cycle
- relationship to other processes. This includes suppliers and users of steam across the site
- the effect of steam quality on turbine operation
- the effect of low steam pressure on turbine operation
- methods used to render equipment safe to inspect, maintain and/or clean including lock-out, tag-out and isolation procedures
- equipment purpose and basic operating principles of turbine and related equipment including the properties of steam
- operating requirements and parameters
- procedures for responding to emergency situations. This includes safe operational shutdown procedure
- handover and long term shut down and storage procedures
- environmental issues and controls
- housekeeping standards for the work area
- reporting and recording systems. This includes both statutory and workplace requirements

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment must be carried out in a manner that recognises the cultural and literacy requirements of the assessee and is appropriate to the work performed.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of ability to: • confirm status of turbine and related services including availability of steam • conduct pre-start checks • liaise with other work areas to advise of turbine status • demonstrate set up and start up procedures • monitor turbine operation • take corrective action in response to abnormal or unacceptable performance • demonstrate shift handover procedure • demonstrate procedure to take turbine off line • demonstrate procedure to prepare the turbine for a prolonged shut down • demonstrate emergency trip procedure and related re-start.
Context of and specific resources 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.
Method of assessment	Other units of competency relevant to the work role should be assessed in conjunction with this unit.
Guidance information for assessment	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. To ensure consistency in one's performance, competency should be demonstrated on more than one occasion over a period of time in order to cover a variety of circumstances, cases and responsibilities, and where possible, over a number of assessment activities.
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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Policies and procedures	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	Codes of practice include the Sugar Milling Operations Industry Code of Practice.
Workplace information	Workplace information can include: • Standard Operating Procedures (SOPs) • manufacturer's specifications.
Equipment status	Confirming equipment status involves • conducting relevant pre-start checks • confirming that housekeeping standards are met • all safety guards are in place • equipment is operational.
Turbines and related equipment	Turbines and related equipment may include • turbines and pass-out turbines • condensers • oil coolers • vacuum pumps • filters.
Equipment operation and monitoring	Operation and monitoring of equipment and processes typically requires the use of control panels and systems.
Services	Services may include: • steam • water • mill • instrumentation air and power.
Tests	Tests may include trip tests.
Teamwork	Work may require the ability to work within a team environment.

Information systems	Information systems may be print or screen based.
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Unit Sector(s)

Sugar Milling.