



Australian Government

Department of Education, Employment and Workplace Relations

SUGPOBA3A Operate a boiler - advanced

Revision Number: 1

SUGPOBA3A Operate a boiler - advanced

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

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

This unit is based on the boiler competency standards from the Worksafe Australia Standards for Users and Operators of Industrial Equipment NOHSC 1006 (2001). It should be selected where boiler operation is a certificated occupation.

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 boiler for operation	1.1 Health and safety hazards / maintenance requirements are identified and reported to appropriate personnel according to workplace reporting procedures 1.2 The boiler is purged according to workplace procedure 1.3 Services are confirmed and available 1.4 Pre-operational checks are conducted to confirm operational status of boiler and related equipment
2. Start and monitor boiler operation	2.1 The boiler is started and brought on line safely according to workplace procedures and manufacturer's specifications 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 Water quality is tested and adjusted as required 2.5 Sluice water is circulated to remove ash from boiler according to specification 2.6 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, out-of-specification test results and/or plant performance 3.3 Emergency procedures are implemented as required according to workplace procedures and manufacturer's recommendations
4. Handover boiler 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 Boiler operators are aware of boiler status and related equipment at completion of handover
5. Carry out an operational shutdown	5.1 The boiler is shut down according to workplace procedures and manufacturer's recommendations 5.2 Maintenance requirements are identified and reported according to workplace reporting procedure

Element	Performance criteria
6. Shutdown the boiler and prepare for an internal inspection	6.1 The boiler is shut down according to workplace procedures and manufacturer's recommendations 6.2 The boiler is cleaned internally and externally according to workplace procedures and manufacturer's recommendations 6.3 Valves and fittings are removed in preparation for maintenance
7. Store boiler in shutdown mode	7.1 The boiler is stored in the appropriate storage mode according to workplace procedures and manufacturer's recommendations
8. Record information	8.1 Workplace information is recorded according to workplace recording requirements

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 combustion and operating requirements
2. Select, fit and use personal protective clothing and/or equipment
3. Identify and report hazards and potential hazards in the work area
4. Confirm status of boiler and related equipment including the fuel supply system, ash removal and services
5. Demonstrate purge procedure
6. Conduct pre-start checks. This typically include checking:
 - feed water supply and system
 - fuel supply system
 - fans and dampers
 - inspection doors
 - boiler valves - operation and position
 - combustion air supply system
 - boiler water level
7. Liaise with other work areas to advise of boiler status
8. Demonstrate set up and start up procedures in both manual and automatic modes
9. Monitor boiler operation. This typically includes monitoring:
 - steam reticulation line pressure
 - boiler steam pressure
 - steam supply/usage
 - condensate tank level
 - bagasse levels
 - feedwater levels and pressure
 - fuel levels
 - boiler load
 - water quality
 - furnace pressure
 - ash pit level and removal system
 - balance draft system
 - superheater temperature
 - drum levels
 - equipment condition
10. Conduct water quality test
11. Take corrective action in response to out-of-specification results
12. Report and/or record corrective action as required
13. Demonstrate shift handover procedure and confirm that replacement operators are aware of all relevant issues prior to completing handover
14. Demonstrate procedure to take boiler off line
15. Demonstrate procedure to shut down and clean the boiler
16. Demonstrate removal of valves and fittings to prepare the boiler for inspection
17. Demonstrate procedure to store boiler

18. Demonstrate emergency procedures and related re-start. This includes use of emergency fuel supply
19. Maintain workplace records
20. Maintain work area to meet housekeeping standards

May include ability to:

21. Use process control systems

Knowledge of:

22. Relevant state OHS legislation, standards and codes of practice relating to work responsibilities
23. Safe work procedures including awareness of health and safety hazards related to boiler operation and associated control measures. Hazards typically include working around hot surfaces, manual handling, fuel and steam leaks
24. Purpose and limitations of protective clothing and equipment
25. Hierarchy of hazard control measures
26. Duty of care of the boiler operator
27. Purpose and basic principles of combustion and boiler operation. This includes principles of heat transfer and properties of steam
28. Boiler system layout and steam cycle
29. The purpose of purging a boiler
30. The effect of fuel quality on boiler operation
31. Impact of ash removal on efficient boiler operation and impact of sluice water flow
32. Relationship to other processes. This includes an understanding of the impact of sudden load changes on boiler pressure and plant operation
33. Purpose and limitations of protective clothing and equipment
34. Methods used to render equipment safe to inspect, maintain and/or clean including lock-out, tag-out and isolation procedures
35. Water quality test procedures
36. Typical causes of water/condensate contamination and corrective action required
37. Equipment purpose and basic operating principles. This includes high pressure feed pumps, fuel supply system and dual fuel systems as required by boiler type
38. Operating requirements and parameters
39. Procedures for responding to emergency situations. This includes safe shutdown procedure
40. Handover and long term shut down and storage procedures
41. Cleaning procedures and grate dumping
42. Environmental issues and controls. This includes an understanding of sluice water usage.
43. Requirements to liaise/advise related work areas
44. Housekeeping standards for the work area
45. Reporting and recording systems. This includes both statutory and workplace requirements

May include knowledge of:

46. 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:

- Boiler and related equipment. This includes fuel supply, grate cleaning and ash removal systems
- 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

Boiler operators holding a ticket in Advance Boiler Operation from the relevant state regulatory authority will be granted equivalence in this unit SUGPOBA3A Operate a boiler - advanced for the purpose of issuing a qualification.

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
- Boiler (advanced) covers boilers with the same features as Intermediate Boilers - that is they may have any or all of the following features: - modulating combustion air supply, modulating heat source, superheaters, and economisers. However Advanced boilers must also have multiple fuel types which may be fired simultaneously during normal operation. This does not include boilers that change fuel type during start sequence.
- Operation and monitoring of equipment and processes typically requires the use of control panels and systems
- Services can include fuel supply of bagasse, coal, gas, oil or other fuel types, steam, mill and instrumentation air, cooling water, general mill water supply and cooling water
- 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

- Internal cleaning is carried out in accordance with statutory requirements regarding confined space entry and does not typically include chemical cleaning
- Work may require the ability to work within a team environment
- Information systems may be print or screen based
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Unit Sector(s)

Not applicable.