Australian Government

MSMBLIC002 Licence to operate an advanced boiler

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSABLIC002 Licence to operate an advanced boiler

Application

This unit specifies the outcomes required to operate an advanced boiler safely. This includes boiler start-up, handover, monitoring, shutdown and storage of a boiler.

This unit also covers the preparation for inspection procedures as specified in manufacturer recommendations, identification of maintenance requirements and relevant risk control measures.

This unit is based on the licensing requirements of Part 4.5 of the Model Work Health and Safety (WHS) Regulations, High Risk Work, and meets Commonwealth, state and territory high risk work licensing requirements. Any alteration to the unit content or outcomes would result in a unit that is not acceptable to WHS/Occupational Health and Safety (OHS) regulators for the purpose of licensing.

Pre-requisite Unit

Nil

Competency Field

Unit Sector

Boiler operation (licensed)

Elements and Performance Criteria

Elements describe the essential outcomes		Performance criteria describe the performance needed to demonstrate achievement of the element	
1	**Plan and prepare for work**	1.1	Follow standard operating procedures (SOPs)
		1.2	Comply with work health and safety (WHS) requirements at all times
		1.3	Identify potential workplace hazards and appropriate risk control measures consistent with appropriate standards to ensure the safety of personnel and

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			equipment
		1.4	Locate and review appropriate records to prepare for boiler operation
		1.5	Identify the type of boiler with associated equipment and plan boiler operations according to procedures
		1.6	Identify appropriate personal protective equipment (PPE) in accordance with SOPs
		1.7	Identify suitable communication methods and confirm with appropriate personnel
2	**Start up boiler**	2.1	Apply risk prevention and risk control measures to the work area according to procedures
		2.2	Select communication equipment and inspect for serviceability
		2.3	Select all necessary equipment and inspect for operational effectiveness according to procedures, including establishing water level
		2.4	Check boiler and associated equipment visually for any damage or defects and report and record any found according to procedures with appropriate action taken
		2.5	Vent boiler to atmosphere prior to start-up, as required
		2.6	Carry out pre-start up checks on the boiler and bring the boiler and associated equipment online safely according to procedures
		2.7	Start up boiler according to procedures
		2.8	Identify maintenance requirements and any visual faults and report according to procedures
		2.9	Confirm, complete and log all maintenance and/or repairs and associated isolations and make the equipment serviceable
3	**Monitor boiler operation**	3.1	Diagnose operating status of the boiler and associated equipment

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		3.2	Maintain operating log clearly and accurately according to procedures
		3.3	Monitor boiler, valves, fittings, pressure gauges combustion management systems, air heaters, superheaters and economisers (where fitted) according to procedures
		3.4	Blow boiler water level gauges through both steam and water sides
		3.5	Test standby plant and equipment according to procedures
		3.6	Conduct boiler water quality tests, where required, and record the results according to procedures
		3.7	Adjust boiler water chemicals after tests, where appropriate and required, according to procedures and notify downstream users, if necessary
		3.8	Activate the automatic blowdown and, where required, boiler is blown down to adjust total dissolved solids (TDS) levels to recommendations
		3.9	Communicate handover information regarding boiler status and associated equipment and operation clearly to relevant personnel according to procedures
		3.10	Respond immediately to any boiler emergency in accordance with procedures
4	**Shut down boiler**	4.1	Shut down the boiler and associated equipment for inspection according to procedures, as required
		4.2	Identify maintenance requirements and report any visual faults according to procedures
		4.3	Clean boiler and associated equipment internally and externally to manufacturer recommendations and procedures, where required
		4.4	Complete isolations associated with in-service maintenance according to procedures
		4.5	Complete boiler operating log for shutdown

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5	**Store boiler in shutdown mode**	5.1	Identify storage time and condition of storage, where required
		5.2	Store boiler and associated equipment in safe condition for access in accordance with manufacturer recommendations and procedures
		5.3	Test stored boiler water and chemicals, where required, and handle in accordance with procedures, where storage is for extended periods

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Boiler includes: Boilers covered by this unit are standard boilers and advanced boilers, including boilers defined in *AS 2593:2004 Safety management and supervision systems* and *AS 3873:2001 Pressure equipment – Operation and maintenance* and typically have a modulating combustion air supply and heat source.

Standard boiler includes:

- vessel or an arrangement of vessels and interconnecting parts in which steam and vapour is generated or in which water or other liquid is heated above that of the atmospheric pressure by the application of:
  - fire
  - the products of combustion
  - electrical power
  - similar high temperature means
- fixed and modulating combustion controls, fixed and modulated air supply, a single fuel source and will have:
  - boiler piping
  - supports

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- mountings
- valves
- gauges
- fittings
- controls
- boiler settings and associated equipment

Advanced boiler includes:

- vessel or an arrangement of vessels and interconnecting parts in which steam and vapour is generated or in which water or other liquid is heated above that of the atmospheric pressure by the application of:
  - fire
  - the products of combustion
  - electrical power
  - similar high temperature means
- fixed and modulating combustion controls, fixed and modulated air supply, multiple fuel sources, pre-heaters, superheaters and economisers and will have:
  - boiler piping
  - supports
  - mountings
  - valves
  - gauges
  - fittings
  - controls
  - boiler settings and directly associated equipment

Hazards include one or more of the following:

- asbestos lagging
- chemical hazards
- thermal hazards
- manual handling hazards
- machinery guard requirements
- hot exposed steam pipe
- leakage of steam
- leakage of fuel
- odour of gas
- fumes from a liquid chemical spill
- faulty/broken ladder or hand rail
- working at heights
- flammable liquids

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- fire and explosion
- electrical hazards
- work area, including:
  - illumination
  - excessive noise from machinery
  - spillage of oil
  - rubbish and combustibles
  - obstruction

Risk control methods include:

Risk control methods refer to the systematic process of eliminating or reducing the risk to personnel and property through the application of controls.

It includes the application of the hierarchy of control:

- elimination
- substitution
- isolation
- engineering controls
- administrative controls
- personal protective equipment (PPE)

PPE includes one or more of the following:

- thermally insulated gloves
- hard hat protection
- ear protection (muffs or plugs)
- chemical resistant gloves and apron
- respiratory devices
- eye protection
- working protective gloves
- whole body fire-resistant clothing

Appropriate standards include one or more of the following:

- legislation
- codes of practice
- manufacturer specifications
- Australian Standards
- technical standards (International)
- industry standards (where applicable)

Procedures include one or more of the following:

- manufacturer guidelines (e.g. instructions, specifications or checklists)
- industry operating procedures

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	• workplace procedures (e.g. work instructions, operating procedures or checklists)
Equipment includes one or more of the following:	• gas monitoring equipment • water testing equipment • fire-fighting equipment • workplace first aid equipment • work platform and associated gear, including walkways
Communication methods include one or more of the following:	• verbal and non-verbal language • written instructions • signage • hand signals • listening • questioning to confirm understanding • appropriate worksite protocol
Appropriate personnel includes one or more of the following:	• production workers • maintenance workers • supervisors and managers • other boiler operators • suppliers • colleagues
Records include one or more of the following:	• operating log books • maintenance records • records of faults and potential faults • isolation procedures • safe operating procedures • daily operating inspections • repairs carried out according to manufacturer recommendations and operating procedures • workplace record keeping requirements • details of any daily or periodic maintenance work • details of yearly programmed or additional maintenance work
Risk control measures include one or more of the following:	• barricades and controls • machine guarding • fall prevention

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- pedestrian controls
- adequate illumination
- noise controls
- signage
- PPE

Communication equipment includes one or more of the following:

- two-way radios
- mobile phones
- intercoms
- landline telephones
- pagers
- satellite phones
- computers

Pre-start up checks include:

- testing warning lamps or visual warning indicators
- control panel checks
- checks of feedwater supply system
- fuel supply/heat source systems
- operation and position of boiler valves
- combustion air supply system
- boiler water level
- essential fittings and gauges
- selection of personal protective equipment
- inspection and location of inspection and explosion doors (where applicable)
- identification of hazards and management of risks and maintenance problems
- fire-fighting equipment
- manufacturer recommendations and checklists
- relevant records and logs

Associated equipment includes one or more of the following:

- multiple fuel sources
- pre-heater
- superheater
- economiser
- superheater safety valves
- economiser relief valves
- air heater
- feedwater heater
- attemperator

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- main steam stop valve

Start-up includes:

- purge boiler furnace
- heat input
- warm-up reticulation system
- venting the boiler of air, as required
- steam traps and steam line purge system operations
- reticulation line pressure
- steam usage and supply
- superheater
- air heater
- feedwater heater
- economiser

Maintenance includes:

- leaking steam pipe
- pressure gauge accuracy
- exposed electrical wiring
- defective illumination in the workplace
- leaking fuel pump gland
- leaks in high pressure feed line
- leaking gauge glass mounting
- leaking safety valve
- isolation procedures, hardware and equipment

Faults include one or more of the following:

- abnormal operating conditions
- boiler tube failure
- feedwater supply and/or other major auxiliary loss
- wet steam
- high dissolved oxygen
- pH of water
- high conductivity
- actuator or valve mechanical or electrical fault/failure
- instrument failure
- steam leak
- associated equipment failure

Diagnosed includes one or more of the following:

- senses, including:
  - audio
  - smell

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- touch
- visual
- remote or local indicators and recorders
- computers and alarms, including:
  - visible
  - audible

Operating log includes:

- date and time of checking
- each check, examination and results
- printed and signed name of person who performed the checks
- date and time of any lockout or equipment malfunction
- results of tests on boiler or feedwater
- changes in operation

Valves and fittings include one or more of the following:

- safety valves
- gauge glasses
- main steam stop valve
- feedwater stop valve
- feed check valve
- blowdown valve
- steam side/line drain valves
- flame failure detection device
- water level controller
- boiler steam pressure gauge
- economiser relief valve
- superheater safety valve

Monitored includes:

- water supply system
- checks of steam reticulation line pressure
- usage and supply of steam
- quality of steam
- combustion/heat source system and management
- feedwater system and condensate returns
- fuel system
- combustion air supply
- water level
- boiler steam pressure
- boiler and steam manifold valves
- soot blowers
- operation of control/safety devices, including control panels

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Tested includes one or more of the following:

- response checks
- standby plant 'cut in' tests
- valve operating checks
- hydrostatic tests
- performance tests
- alarm and protection tests

Tests include one or more of the following:

- pH levels
- conductivity
- oxygen
- TDS
- hardness
- other contaminants

Chemicals include one or more of the following:

- oxygen scavenger
- feedwater additives
- other chemicals
- hardness
- condensate chemicals
- pH buffers

Handover includes:

- previous load requirements
- maintenance issue, including equipment isolated for maintenance
- operational incidences
- read operating log
- general inspection of boiler to detect any defects
- accept responsibility of boiler
- noted equipment malfunctions
- required equipment tests

Emergencies include one or more of the following:

- tube failure
- loss of water level
- power failures
- inadequate housekeeping
- explosion
- fire
- bomb threat

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	• terrorism • personal accidents • chemical spills • major steam leaks • major water leaks and flooding • natural disasters • oil spills
Appropriate emergency response measures include one or more of the following:	• identification of emergency • isolation of heat source • selection and application of appropriate fire-fighting equipment and PPE • notification of downstream users • operation of boiler only when safe to do so • notification of appropriate regulatory authorities, including Commonwealth, state, territory and boiler manufacturer
Shutdown includes:	• checks of water level • cooling down process • valve settings • equipment isolation • boiler pressure/vacuum • fuel/heat source isolation in accordance with manufacturer recommendations • boiler post-purge
Storage mode includes:	• wet and dry storing • open or closed position

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet - https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=d1287d36-dff4-4e9f-ad2c-9d6270054027

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