Australian Government

# MSMBLIC001 Licence to operate a standard boiler

**Release: 1**

# MSMBLIC001 Licence to operate a standard boiler

## Modification History

Release 1. Supersedes and is equivalent to MSABLIC001 Licence to operate a standard boiler.

## Application

This unit specifies the outcomes required to operate a standard boiler safely. This includes boiler start-up, handover, monitoring, shutdown and storage of a boiler that uses a single fuel source and does not have an air pre-heater, feed water heater, superheater, attempurator or desuperheater, simultaneous dual fuel firing capability or economiser attached.

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 |


© Commonwealth of Australia, 2020 Innovation and Business Skills Australia

| | | | |
|---|---|---|---|
| | | | risk control measures consistent with appropriate standards to ensure the safety of personnel and equipment |
| | | 1.4 | Locate and review appropriate records to prepare for boiler operation |
| | | 1.5 | Identify the type of boiler 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 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 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** | 3.1 | Diagnose operating status of the boiler |


© Commonwealth of Australia, 2020 Innovation and Business Skills Australia

| | | | |
|---|---|---|---|
| | **operation** | 3.2 | Maintain operating log clearly and accurately according to procedures |
| | | 3.3 | Monitor boiler, valves, fittings and pressure gauges 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 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 for inspection according to procedures, as required |
| | | 4.2 | Identify maintenance requirements and report any visual faults according to procedures |
| | | 4.3 | Complete isolations associated with in-service maintenance according to procedures |
| | | 4.4 | Clean boiler internally and externally to manufacturer recommendations and procedures, where required |
| | | 4.5 | Complete boiler operating log for shutdown |
| 5 | **Store boiler in** | 5.1 | Identify storage time and condition of storage, where |


© Commonwealth of Australia, 2020 Innovation and Business Skills Australia

| | |
|---|---|
| **shutdown mode** | required |
| | 5.2 Store boiler 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:** Fixed and modulating combustion controls and a single heat source. Operation includes a battery of boilers and boilers that have a single thermal or solar heat source.

**Note:** Boilers meeting the definition of 'advanced boiler' are excluded.

**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 means
- fixed and modulating combustion controls, fixed and modulated air supply, a single fuel source and will have:
  - boiler piping
  - supports
  - mountings


© Commonwealth of Australia, 2020 Innovation and Business Skills Australia

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

**Type of boiler includes one or more of the following:**

- fire tube
- water tube
- once through boilers
- waste heat
- electrically heated
- novel or unique

**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
- 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:


© Commonwealth of Australia, 2020 Innovation and Business Skills Australia

| | |
|---|---|
| | • elimination<br>• substitution<br>• isolation<br>• engineering controls<br>• administrative controls<br>• personal protective equipment (PPE) |
| **Appropriate standards include one or more of the following:** | • legislation<br>• codes of practice<br>• manufacturer specifications<br>• Australian Standards<br>• technical standards (International)<br>• industry standards (where applicable) |
| **Procedures include one or more of the following:** | • manufacturer guidelines (e.g. instructions, specifications or checklists)<br>• industry operating procedures<br>• workplace procedures (e.g. work instructions, operating procedures or checklists) |
| **Equipment includes one or more of the following:** | • gas monitoring equipment<br>• water testing equipment<br>• fire-fighting equipment<br>• workplace first aid equipment<br>• work platform and associated gear, including walkways |
| **Communication methods include one or more of the following:** | • verbal and non-verbal language<br>• written instructions<br>• signage<br>• hand signals<br>• listening<br>• questioning to confirm understanding<br>• appropriate worksite protocol |
| **Appropriate personnel includes one or more of the following:** | • production workers<br>• maintenance workers<br>• supervisors and managers<br>• other boiler operators |


© Commonwealth of Australia, 2020 Innovation and Business Skills Australia

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

**Communication equipment includes one or more of the following:**

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


© Commonwealth of Australia, 2020 Innovation and Business Skills Australia

- 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 system
- operation and position of boiler valves
- combustion air supply system
- boiler water level
- essential fittings and gauges
- selection of PPE
- 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

**Start-up includes:**

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

**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


© Commonwealth of Australia, 2020 Innovation and Business Skills Australia

- 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

**Diagnosed includes one or more of the following:**

- senses, including:
  - audio
  - smell
  - 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

**Monitored includes:**

- water supply system


© Commonwealth of Australia, 2020 Innovation and Business Skills Australia

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

**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


© Commonwealth of Australia, 2020 Innovation and Business Skills Australia

- 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 failure
- inadequate housekeeping
- explosion
- fire
- bomb threat
- 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


© Commonwealth of Australia, 2020 Innovation and Business Skills Australia

- open or closed position

## Unit Mapping Information

Release 1. Supersedes and is equivalent to MSABLIC001 Licence to operate a standard boiler.

## Links

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


© Commonwealth of Australia, 2020 Innovation and Business Skills Australia