gotrain industry
Registered Training Organisation

MSABLIC001 Licence to operate a standard boiler

Course Outline

NATIONALLY RECOGNISED TRAINING

USE OF THIS RESOURCE

The document is written for Students, to guide the Training and Assessment of the unit: **MSMBLIC001 License to operate a standard boiler**. Trainers/Assessors should also use this resource to assist with the delivery of their training and assessment in the unit.

MSMBLIC001 is a High Risk Work unit of training. The outcome of completion of this unit is the issue of a High Risk Work Licence to operate a Standard Boiler.

Safe Work Australia as the national regulator defines the assessment process. The current mechanism is the SWA 2015 BS assessment instrument.

The WorkCover authorities approve the RTO and its assessors who can issue the HRW licences.

The WorkCover authorities & SWA are the industry review and therefore consultation authority that GTI uses in ensuring that the requirements of this unit meet the required standards on an ongoing basis

The theory and training of this unit is delivered in a face to face format, for training delivery with assessment being conducted in a one-on-one practical verbal manner including a written assessment supplementing the practical skills assessment to the Trainer/Assessor. This Course Outline contains details of the unit structure and content, and the Practical and Written Assessments and, links to support services as applicable.

Students should use the information in this resource in close combination with the Learner Guide. The Learner Guide is a print document extracted from the Training Resource, which for this unit is a PowerPoint presentation. Your Trainer may also provide additional learning materials and documentation to supplement these resources.

By using this Course Outline and the learning and assessment resources together, Students will more effectively:

- Comprehend the key concepts and theories
- Review topics covered
- Prepare for the assessments
- Undertake their assessments

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UNIT OF COMPETENCY
MSABLIC001 License to operate a standard boiler.

UNIT DESCRIPTOR
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.

LEGISLATION

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

PREREQUISITE UNITS
You are not required to have completed any other National Unit of Competency prior to attempting this Unit.

ENTRY REQUIREMENTS
It is important that you are physically fit and have sufficient visual and audio capacity prior to participation in work in and around the rail environment. You therefore must have no medical condition that would affect your ability to work in the rail corridor.

All students must be over 18 years of age and must possess English language skills equivalent to a Yr 10 high school education.

EQUIPMENT AND RESOURCE REQUIREMENTS
To undertake your training and assessment in this unit, and to satisfactorily demonstrate your competency you will need to provide the following resources and equipment:

- Blue or Black pen
- Closed-toe work shoes or boots
- Long sleeve shirt and long trousers
- Riggers gloves and safety glasses
- Appropriate clothing or uniform for training outside

Any additional PPE and equipment will be provided by Go Train.

DURATION.
The classroom/theoretical training session for this unit will take approximately 6 hours for you to complete. This will include activities and written assessment questions. The practical component of the unit will take you approximately 2 hours to complete. This includes a practical demonstration of skills assessment.

Overall, the total time it will take to complete the unit will be approximately 6-9 hours.

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Where training and assessment is conducted in the Workplace, the time and speed at which you will complete this unit will depend on the level of access and flexibility you have to the required facilities and equipment.

ACADEMIC AND CAREER PATHWAYS

From an academic perspective, upon receiving a Statement of Attainment for this unit you could use it towards any elective unit in any other nationally recognised training qualification, where appropriate.

From a career perspective, you could use the skills and knowledge learnt to enhance your likelihood of employability in the general industry or power generation sectors.

ACCESS AND EQUITY

You are encouraged to speak to or contact your Trainer/Assessor and seek support as required. As a rule, to seek assistance with any of the training and assessment materials, and/or if you have any questions or queries with your assessment tasks, you should first make direct contact with your Trainer/Assessor.

When enrolling in the unit, we will have asked you questions which would identify any issues you may have relating to your physical ability, cultural or educational background that could pose a hurdle for you to comfortably complete this unit within the anticipated timeframe.

If you feel that you are at a disadvantage to other students, your Trainer/Assessor may be able make reasonable adjustments to how some of your Assessment Tasks can be demonstrated and/or submitted. Such adjustments are considered 'reasonable' if they do not impose an unjustifiable hardship on Go Train, and as long as they do not change the core outcomes of this unit and still satisfy the Critical Contexts of Assessment requirements from this units Training Package.

Language, Literacy & Numeracy

Candidates with Language, Literacy and Numeracy (LLN) barriers or learning disabilities, are encouraged to pursue their vocational education and training goals through participation in the programs offered by Go Train.

Details of student support services available for our courses are outlined on the Go Train website http://rms.gotrainrto.com or in the Student Handbook. Should you wish to contact a Student Support Officer to discuss your LLN needs, please email students@gotrain.com.au, or call our NSW office on: (02)43554595.

RECOGNITION OF PRIOR LEARNING (RPL)

RPL is not allowed for this unit.

DEMONSTRATING YOUR COMPETENCY

Competence means that you have the required knowledge and skills to do your job. These are described as 'competency standards'. Your training in this unit will be based on these competency standards to make sure that it is relevant to the needs of your job and yourself.

The classroom theoretical training of this unit is provided across 5 Sections that mirror the 5 Elements in the table below. After your training, your competence will be assessed against these criteria. You must achieve competency in these assessments to be deemed competent in the unit and gain your Statement of Attainment certificate. Details of your Assessments for this unit are outlined in the Assessments section of this Course Outline.

At the conclusion of your training and assessment you will receive either a Competent (C) or a Not Yet Competent (NYC) grade. If you are deemed Competent in the unit, you will be provided either in person or by post a Statement of Attainment (SOA) Certificate.

If your Certificate is to be posted, it will be sent to your address as indicated on your Enrolment Form. Certificates are as a rule, not posted to your Employer.

Not Yet Competent
If you receive a NYC grade, your Trainer/Assessor will indicate to you which questions or tasks from the Assessments will require re-submission. You will be provided with every reasonable opportunity to attempt each of the questions or tasks to demonstrate your Competency.

If you are unable to demonstrate your competency within a reasonable timeframe, your Trainer/Assessor will either: organise another time for you to undertake the Assessments again; or request that you re-enrol in the unit and undertake the Training session again.

Note: If you are asked to re-enrol in the unit you will have to pay the enrolment fee in full prior to undertaking the Training session again.

Elements and Performance Criteria
Elements describe the essential outcomes of the unit, whilst the Performance Criteria describe the required performance needed to demonstrate achievement of the element.

ELEMENT	PERFORMANCE CRITERIA
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 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	Boiler is vented to atmosphere prior to start up
2.6	Pre-start up checks are carried out on the boiler with associated equipment and the boiler brought online safely according to procedures
2.7	Start up boiler according to procedures

2.8	Maintenance requirements and any visual faults are identified and reported 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
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
5. Store boiler in shut down 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

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The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria in the table above, and also include demonstration of applying:

- The Required Knowledge and Skills
- Relevant legislation and workplace procedures
- Relevant aspects of the range statement

Note: your Trainer/Assessor may also request additional Assessment tasks be performed; customise the assessment tools where access and equity issues are present or where your employer requests the practical tasks be tailored to your workplace needs.

REQUIRED KNOWLEDGE AND SKILLS

This describes the essential knowledge and skills and their level required for this unit.

The required skills include:

1. complying with legislation, Australian Standards, organisational workplace standards, policies, relevant codes of practice, and required safe practices and procedures for planning work, starting and monitoring a boiler, and shutting down and storing an advanced boiler
2. performing routine safety and operational procedures
3. reading and interpreting maintenance records, operating logs and safety data sheets (SDS)
4. communicating faults, malfunctions and workplace hazards accurately to appropriate personnel using suitable communication techniques
5. accurately completing reports, operational records and maintenance information in relation to advanced boiler operation
6. applying task instructions
7. using relevant tools, equipment and personal protection clothing safely
8. interpreting advanced boiler operation tables and figures
9. applying advanced boiler testing techniques and adjusting boiler water quality
10. verifying any problems and boiler faults, demonstrating appropriate response procedures
11. applying appropriate risk assessment and risk management techniques
12. demonstrating emergency operating procedures
13. identifying all boiler energy sources required to be isolated and made safe for maintenance, inspection and repairs
14. applying advanced boiler cleaning and storage techniques

Required knowledge includes:

1. Commonwealth, state and territory work health and safety (WHS) legislation, standards, codes of practice and advisory standards relevant to boiler operation
2. basic principles of heat transfer and thermodynamics in relation to boiler operations
3. boiler and steam equipment operating principles and operating methods, including advanced
4. types and characteristics of multiple fuel systems for advanced boilers
5. types and characteristics of feedwater systems and treatment, including de-aerator
6. type and use of equipment and fittings for operation and maintenance of boilers, including advanced
7. function, purpose and operation of:
    - pre-heater
    - super-heater
    - economiser
    - air heater
    - feedwater heater
    - attemperator
    - super-heater safety valves

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- economiser relief valves
- main steam stop valve

8. standard and advanced boiler and auxiliary equipment characteristics and capabilities
9. essential fittings required where more than one boiler is installed (e.g. battery of boilers)
10. processes for confirming operational status of a boiler
11. workplace communication techniques and procedures
12. responsibilities for checking and testing advanced boilers, including advanced
13. location and inspection procedures and techniques for inspection and explosion doors
14. steam and boiler hazards for cold start and handover
15. hierarchy of risk control
16. use and application of personal protective equipment
17. type and limitations of corrective action and/or adjustments that can be made in response to routine boiler operation problems and emergencies
18. various harmful energy sources in boiler operation and the means to effectively isolate these energy sources and make them safe, with particular consideration to advanced boilers
19. modes of standard and advanced boiler storage and procedures for storing boiler in open or closed condition
20. SDS and safe chemical handling and storage methods for boiler operation and cleaning
21. procedures for cleaning boilers internally and externally, including advanced
22. procedures for recording, reporting and maintenance of workplace records and information

ASSESSMENTS

To achieve competency in this unit you must satisfactorily complete the following 2 assessment tasks.

Your Trainer/Assessor will determine your competency on an overall basis – their role is to decide whether you have 'satisfactorily' demonstrated the Elements and Performance Criteria, Required Skills, and an understanding of the Knowledge to apply fatigue management strategies correctly in a workplace.

If your Assessor grades you as Not Yet Satisfactory in any or all of the tasks, they will provide you with either verbal or written feedback regarding where you did not meet the assessment criteria, and will instruct you to re-submit that part of the assessment again. This may include all or only some of the questions and tasks.

Note: the assessment has an 'Assessment Cover Sheet' which you must fill-in and sign before being permitted to undertake the Assessments.

1. Written Assessment

You must complete the National Assessment Instrument for this unit as defined by SafeWork Australia for High Risk Licences.

2. Practical Assessment

You must complete the National Assessment Instrument for this unit as defined by SafeWork Australia for High Risk Licences.

These assessments will take place in either our simulated workplace environment, in your workplace or in an actual environment. Your Trainer/Assessor will either ask you to perform each task or activity individually, or as a group, and will record their observations of your performance on the Observation Sheet. At the conclusion of the assessment you will be asked to sign the Observation Sheet, which will be used as evidence of your performance.

Performance Evidence

Evidence of competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria, and include demonstration of:

- following work instructions, SOPs and safe work practices
- complying with Commonwealth, state and territory work, health and safety (WHS) legislation and regulations
- complying with Australian and industry standards, organisation workplace standards, policies, relevant codes of practice requirements at all times
- planning and preparing for work, including identifying potential hazards and implementing appropriate risk control measures
- identifying the type of standard or advanced boiler and associated equipment
- reading and interpreting maintenance records, operating logs and safety data sheets (SDS)
- conducting the appropriate pre-start up checks, including identifying all maintenance requirements and visual faults
- using appropriate tools, equipment and PPE in accordance with procedures
- completing all maintenance and rectification requirements in accordance with manufacturers' and workplace procedures, including recording/reporting requirements
- completing the start-up procedures and bringing the boiler online
- monitoring the boiler and associated equipment, including conducting relevant tests and activities and adjusting boiler water quality in accordance with procedures
- interpreting advanced boiler operation tables and figures
- communicating handover of boiler status and associated equipment to appropriate personnel
- demonstrating emergency operating procedures
- identifying all boiler energy sources required to be isolated and made safe for maintenance, inspection and repairs
- applying advanced boiler cleaning and storage techniques.

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Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- safe work practices and procedures and use of PPE
- Commonwealth, state and territory WHS/OHS legislation and approved codes of practice relevant to standard boiler operation
- Australian and industry standards relevant to standard boiler operation
- basic principles of heat transfer and thermodynamics in relation to boiler operations
- boiler steam equipment operating principles and operating methods
- types and characteristics of feedwater systems and treatment
- types and use of equipment and fittings for operation and maintenance of boilers
- function, purpose and operation of main steam stop valve
- boiler auxiliary equipment characteristics and capabilities
- essential fittings required where more than one boiler is installed (e.g. battery of boilers)
- processes for confirming operational status of a boiler
- workplace communication techniques and procedures
- responsibilities for checking and testing boilers
- location and inspection procedures and techniques for inspection and explosion doors
- steam and boiler hazards for cold start and handover
- hierarchy of risk control
- type and limitations of corrective action and/or adjustments that can be made in response to routine boiler operation problems and emergencies
- various harmful energy sources in boiler operation and the means to effectively isolate these energy sources and make them safe
- modes of boiler storage and procedures for storing boiler in open or closed condition
- SDS and safe chemical handling and storage methods for boiler operation and cleaning
- procedures for cleaning boilers internally and externally, as required
- procedures for recording, reporting and maintenance of workplace records and information.

Assessment Conditions

- Assessments must be conducted by an assessor accredited for this high risk work (HRW) licence class in the Commonwealth/state/territory where the licence will be obtained (i.e. an assessor authorised by a Commonwealth/state/territory WHS/OHS regulator).
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and all assessments must be conducted in the English language.
- Where possible, assessment of performance should be undertaken in the workplace and/or under realistic workplace conditions that typically reflect:
  - the use of full-scale equipment
  - performing tasks/activities within timelines that would be expected in a workplace
  - standard and authorised work practices, safety requirements and environmental constraints.

- Where this is not possible or where personal safety, plant operation or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Accredited assessors are responsible for ensuring that candidates have access to all tools, equipment, PPE, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications.
- As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations (RTOs) current at the time of assessment.

STUDENT SURVEY & FEEDBACK

After you complete your training and before we issue your Certificate we will invite you to take part in a feedback survey to seek your views on the quality of our education and training. The survey is conducted to collect feedback from our students on their views about their learning and training experiences. The outcomes of the feedback process play an important role in developing and delivering future training at Go Train.

Your feedback counts. We use the feedback part of our continuous improvement processes. Also we must provide a summary report of feedback from Students to our Registering Body (the Australian Skills Quality Authority) to provide an indication of our performance and the satisfaction of our students. This is a condition of our registration as an RTO.

Participation in this survey is highly valued, but voluntary. You are free to withdraw consent at any time. We will protect your anonymity and the confidentiality of your response to the fullest possible extent within the limits of the law. The survey should take no longer than 10 minutes to complete.

GLOSSARY / RANGE STATEMENTS

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
  - 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

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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: • elimination • substitution • isolation • engineering controls • administrative controls • personal protective equipment (PPE)
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 • workplace procedures (e.g. work instructions, operating procedures or checklists)

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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 • pedestrian controls • adequate illumination • noise controls • signage • PPE

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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 • 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
- 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 • 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

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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 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 • open or closed position

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Assessment Plan: MSMBLIC001 – Operate a Standard Boiler

The following assessment plan applies to the following assessments conducted by SteamTraining and Go-Train Industry Pty Ltd relevant to pressure vessel High Risk Work assessment and licencing.

Definitions

Pressure equipment operation
Boiler means: (a) a vessel, or an arrangement of vessels and interconnecting parts, in which steam or vapour is generated or in which water or other liquid is heated at a pressure above that of the atmosphere by the application of fire, the products of combustion, electrical power or similar high temperature means; and (b) the superheaters, reheaters, economisers, boiler piping, supports, mountings, valves, gauges, fittings, controls, boiler setting and other equipment directly associated with those vessels, It includes: (a) a fully flooded or pressurised system where water or another liquid is heated to a temperature lower than the normal atmospheric boiling temperature of the liquid; or (b) a boiler designed or manufactured to the following codes: (i) AMBSC Part 1—A*ustralian Miniature Boiler Safety Committee Code for Copper Boilers*; (ii) AMBSC Part 2—*Australian Miniature Boiler Safety Committee Code for Steel Boilers*; (iii) AMBSC Part 3—A*ustralian Miniature Boiler Safety Committee Code for Sub-Miniature Boilers*; (iv) AMBSC Part 3—*Australian Miniature Boiler Safety Committee Code for Duplex Steel Boilers*; (c)a direct fired process heater; and (d) boilers with less than 5 square metres heating surface or 150 kilowatt output; or (e) unattended boilers certified in compliance with AS 2593:2004 (Boilers—Safety management and supervision systems).
26. Standard boiler operation - Operation of a boiler with a single fuel source that does not have a pre-heater, superheater or economiser attached.

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Assessment Plan

Method of Assessment	Date and time of Assessment	Location of assessment	Candidate must provide	Standard expected for competent performance
Paperwork associated with Assessment and HRW licencing process	0800 - 0900	Normally your worksite training room or alternative TBA	• USI • RTO Enrolment Form • Pre-Assessment Questionnaire • ID &/or HRW licence • Practical Assignment • Logbook • Printed Certificate from online learning	Assessment cannot proceed without all documented information
Knowledge assessment	0900 - 1200	Candidates workplace	Pen & PPE	56 written questions – closed book – 3 hours All critical questions must be answered correctly for the candidate to be deemed competent. The designated pass mark for non- critical questions of 75% must be achieved.
Performance assessment	After 1230 45 minutes duration	Candidates workplace	Personal protective equipment (steel cap boots, helmet, high visibility clothing, eye and ear protection, etc)	Performance must be in accordance with the standard outlined in the unit of competency and by the assessor. If candidates act in a manner that endangers themselves, others, or equipment and property, during the observation of performance the assessment will cease immediately.

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Assessment Checklist

Evidence of competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria, and include demonstration of:

- following work instructions, SOPs and safe work practices
- complying with Commonwealth, state and territory work health and safety (WHS) legislation and regulations
- complying with Australian and industry standards, organisation workplace standards, policies and relevant codes of practice requirements at all times
- planning and preparing for work, including identifying potential hazards and implementing appropriate risk control measures
- identifying the type of standard boiler
- reading and interpreting maintenance records, operating logs and safety data sheets (SDS)
- conducting the appropriate pre-start up checks, including identifying all maintenance requirements and visual faults
- using appropriate tools, equipment and PPE in accordance with procedures
- completing all maintenance and rectification requirements in accordance with manufacturers' and workplace procedures, including recording/reporting requirements
- completing the start-up procedures and bringing the boiler online
- monitoring the boiler, including conducting relevant tests and activities and adjusting boiler water quality in accordance with procedures
- interpreting boiler operation tables and figures
- communicating handover of boiler status to appropriate personnel
- demonstrating emergency operating procedures
- identifying all boiler energy sources required to be isolated and made safe for maintenance, inspection and repairs
- applying boiler cleaning and storage techniques.

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Evidence must be provided that demonstrates knowledge of:

- safe work practices and procedures and use of PPE
- Commonwealth, state and territory WHS/OHS legislation and approved codes of practice relevant to standard boiler operation
- Australian and industry standards relevant to standard boiler operation
- basic principles of heat transfer and thermodynamics in relation to boiler operations
- boiler steam equipment operating principles and operating methods
- types and characteristics of feedwater systems and treatment
- types and use of equipment and fittings for operation and maintenance of boilers
- function, purpose and operation of main steam stop valve
- boiler auxiliary equipment characteristics and capabilities
- essential fittings required where more than one boiler is installed (e.g. battery of boilers)
- processes for confirming operational status of a boiler
- workplace communication techniques and procedures
- responsibilities for checking and testing boilers
- location and inspection procedures and techniques for inspection and explosion doors
- steam and boiler hazards for cold start and handover
- hierarchy of risk control
- type and limitations of corrective action and/or adjustments that can be made in response to routine boiler operation problems and emergencies
- various harmful energy sources in boiler operation and the means to effectively isolate these energy sources and make them safe
- modes of boiler storage and procedures for storing boiler in open or closed condition
- SDS and safe chemical handling and storage methods for boiler operation and cleaning
- procedures for cleaning boilers internally and externally, as required
- procedures for recording, reporting and maintenance of workplace records and information.

gotrain industry
Registered Training Organisation

MSABLIC002 Licence to operate an advanced boiler

Course Outline

NATIONALLY RECOGNISED TRAINING

USE OF THIS RESOURCE

The document is written for Students, to guide the Training and Assessment of the unit: **MSMBLIC002 License to operate an advanced boiler**. Trainers/Assessors should also use this resource to assist with the delivery of their training and assessment in the unit.

MSMBLIC002 is a High Risk Work unit of training. The outcome of completion of this unit is the issue of a High Risk Work Licence to operate a Standard Boiler.

Safe Work Australia as the national regulator defines the assessment process. The current mechanism is the SWA 2015 BA assessment instrument.

The WorkCover authorities approve the RTO and its assessors who can issue the HRW licences.

The WorkCover authorities & SWA are the industry review and therefore consultation authority that GTI uses in ensuring that the requirements of this unit meet the required standards on an ongoing basis

The theory and training of this unit is delivered in a face to face format, for training delivery with assessment being conducted in a one-on-one practical verbal manner including a written assessment supplementing the practical skills assessment to the Trainer/Assessor. This Course Outline contains details of the unit structure and content, and the Practical and Written Assessments and, links to support services as applicable.

Students should use the information in this resource in close combination with the Learner Guide. The Learner Guide is a print document extracted from the Training Resource, which for this unit is a PowerPoint presentation. Your Trainer may also provide additional learning materials and documentation to supplement these resources.

By using this Course Outline and the learning and assessment resources together, Students will more effectively:

- Comprehend the key concepts and theories
- Review topics covered
- Prepare for the assessments
- Undertake their assessments

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UNIT OF COMPETENCY
MSABLIC002 License to operate an advanced boiler.

UNIT DESCRIPTOR
This unit of competency covers the operation of an advanced boiler, including a standard boiler, which may have one or more of the following:

- multiple fuel sources
- pre-heater
- super-heater
- economiser.

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.

The 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. This unit in its current form meets state and territory high risk work licensing requirements. Any alteration to the content or outcomes would not be acceptable to regulators for the purpose of licensing.

LEGISLATION

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.

PREREQUISITE UNITS
You are not required to have completed any other National Unit of Competency prior to attempting this Unit.

ENTRY REQUIREMENTS
It is important that you are physically fit and have sufficient visual and audio capacity prior to participation in work in and around the rail environment. You therefore must have no medical condition that would affect your ability to work in the rail corridor.

All students must be over 18 years of age and must possess English language skills equivalent to a Yr 10 high school education.

EQUIPMENT AND RESOURCE REQUIREMENTS
To undertake your training and assessment in this unit, and to satisfactorily demonstrate your competency you will need to provide the following resources and equipment:

- Blue or Black pen
- Closed-toe work shoes or boots
- Long sleeve shirt and long trousers
- Riggers gloves and safety glasses

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- Appropriate clothing or uniform for training outside

Any additional PPE and equipment will be provided by Go Train.

DURATION.
The classroom/theoretical training session for this unit will take approximately 6 hours for you to complete. This will include activities and written assessment questions. The practical component of the unit will take you approximately 2 hours to complete. This includes a practical demonstration of skills assessment.

Overall, the total time it will take to complete the unit will be approximately 6-9 hours.

Where training and assessment is conducted in the Workplace, the time and speed at which you will complete this unit will depend on the level of access and flexibility you have to the required facilities and equipment.

ACADEMIC AND CAREER PATHWAYS
From an academic perspective, upon receiving a Statement of Attainment for this unit you could use it towards any elective unit in any other nationally recognised training qualification, where appropriate.

From a career perspective, you could use the skills and knowledge learnt to enhance your likelihood of employability in the general industry or power generation sectors.

ACCESS AND EQUITY
You are encouraged to speak to or contact your Trainer/Assessor and seek support as required. As a rule, to seek assistance with any of the training and assessment materials, and/or if you have any questions or queries with your assessment tasks, you should first make direct contact with your Trainer/Assessor.

When enrolling in the unit, we will have asked you questions which would identify any issues you may have relating to your physical ability, cultural or educational background that could pose a hurdle for you to comfortably complete this unit within the anticipated timeframe.

If you feel that you are at a disadvantage to other students, your Trainer/Assessor may be able make reasonable adjustments to how some of your Assessment Tasks can be demonstrated and/or submitted. Such adjustments are considered 'reasonable' if they do not impose an unjustifiable hardship on Go Train, and as long as they do not change the core outcomes of this unit and still satisfy the Critical Contexts of Assessment requirements from this units Training Package.

Language, Literacy & Numeracy
Candidates with Language, Literacy and Numeracy (LLN) barriers or learning disabilities, are encouraged to pursue their vocational education and training goals through participation in the programs offered by Go Train.

Details of student support services available for our courses are outlined on the Go Train website http://rms.gotrainrto.com or in the Student Handbook. Should you wish to contact a Student Support Officer to discuss your LLN needs, please email students@gotrain.com.au, or call our NSW office on: (02)43554595.

RECOGNITION OF PRIOR LEARNING (RPL)

RPL is not allowed for this unit.

DEMONSTRATING YOUR COMPETENCY
Competence means that you have the required knowledge and skills to do your job. These are described as 'competency standards'. Your training in this unit will be based on these competency standards to make sure that it is relevant to the needs of your job and yourself.

The classroom theoretical training of this unit is provided across 5 Sections that mirror the 5 Elements in the table below. After your training, your competence will be assessed against these criteria. You must achieve competency in these assessments to be deemed competent in the unit and gain your Statement of Attainment certificate. Details of your Assessments for this unit are outlined in the Assessments section of this Course Outline.

At the conclusion of your training and assessment you will receive either a Competent (C) or a Not Yet Competent (NYC) grade. If you are deemed Competent in the unit, you will be provided either in person or by post a Statement of Attainment (SOA) Certificate.

If your Certificate is to be posted, it will be sent to your address as indicated on your Enrolment Form. Certificates are as a rule, not posted to your Employer.

Not Yet Competent
If you receive a NYC grade, your Trainer/Assessor will indicate to you which questions or tasks from the Assessments will require re-submission. You will be provided with every reasonable opportunity to attempt each of the questions or tasks to demonstrate your Competency.

If you are unable to demonstrate your competency within a reasonable timeframe, your Trainer/Assessor will either: organise another time for you to undertake the Assessments again; or request that you re-enrol in the unit and undertake the Training session again.

Note: If you are asked to re-enrol in the unit you will have to pay the enrolment fee in full prior to undertaking the Training session again.

Elements and Performance Criteria
Elements describe the essential outcomes of the unit, whilst the Performance Criteria describe the required performance needed to demonstrate achievement of the element.

ELEMENT	PERFORMANCE CRITERIA
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 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	Boiler is vented to atmosphere prior to start up
2.6	Pre-start up checks are carried out on the boiler with associated equipment and the boiler brought online safely according to procedures
2.7	Start up boiler according to procedures
2.8	Maintenance requirements and any visual faults are identified and reported 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
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

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4.5	Complete boiler operating log for shutdown
5. Store boiler in shut down 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

The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria in the table above, and also include demonstration of applying:

- The Required Knowledge and Skills
- Relevant legislation and workplace procedures
- Relevant aspects of the range statement

Note: your Trainer/Assessor may also request additional Assessment tasks be performed; customise the assessment tools where access and equity issues are present or where your employer requests the practical tasks be tailored to your workplace needs.

REQUIRED KNOWLEDGE AND SKILLS

This describes the essential knowledge and skills and their level required for this unit.

The required skills include:

1. complying with legislation, Australian Standards, organisational workplace standards, policies, relevant codes of practice, and required safe practices and procedures for planning work, starting and monitoring a boiler, and shutting down and storing an advanced boiler
2. performing routine safety and operational procedures
3. reading and interpreting maintenance records, operating logs and safety data sheets (SDS)
4. communicating faults, malfunctions and workplace hazards accurately to appropriate personnel using suitable communication techniques
5. accurately completing reports, operational records and maintenance information in relation to advanced boiler operation
6. applying task instructions
7. using relevant tools, equipment and personal protection clothing safely
8. interpreting advanced boiler operation tables and figures
9. applying advanced boiler testing techniques and adjusting boiler water quality
10. verifying any problems and boiler faults, demonstrating appropriate response procedures
11. applying appropriate risk assessment and risk management techniques
12. demonstrating emergency operating procedures
13. identifying all boiler energy sources required to be isolated and made safe for maintenance, inspection and repairs
14. applying advanced boiler cleaning and storage techniques

Required knowledge includes:

1. Commonwealth, state and territory work health and safety (WHS) legislation, standards, codes of practice and advisory standards relevant to boiler operation
2. basic principles of heat transfer and thermodynamics in relation to boiler operations
3. boiler and steam equipment operating principles and operating methods, including advanced
4. types and characteristics of multiple fuel systems for advanced boilers

5. types and characteristics of feedwater systems and treatment, including de-aerator
6. type and use of equipment and fittings for operation and maintenance of boilers, including advanced
7. function, purpose and operation of:
    - pre-heater
    - super-heater
    - economiser
    - air heater
    - feedwater heater
    - attemperator
    - super-heater safety valves
    - economiser relief valves
    - main steam stop valve
8. standard and advanced boiler and auxiliary equipment characteristics and capabilities
9. essential fittings required where more than one boiler is installed (e.g. battery of boilers)
10. processes for confirming operational status of a boiler
11. workplace communication techniques and procedures
12. responsibilities for checking and testing advanced boilers, including advanced
13. location and inspection procedures and techniques for inspection and explosion doors
14. steam and boiler hazards for cold start and handover
15. hierarchy of risk control
16. use and application of personal protective equipment
17. type and limitations of corrective action and/or adjustments that can be made in response to routine boiler operation problems and emergencies
18. various harmful energy sources in boiler operation and the means to effectively isolate these energy sources and make them safe, with particular consideration to advanced boilers
19. modes of standard and advanced boiler storage and procedures for storing boiler in open or closed condition
20. SDS and safe chemical handling and storage methods for boiler operation and cleaning
21. procedures for cleaning boilers internally and externally, including advanced
22. procedures for recording, reporting and maintenance of workplace records and information

ASSESSMENTS

To achieve competency in this unit you must satisfactorily complete the following 2 assessment tasks.

Your Trainer/Assessor will determine your competency on an overall basis – their role is to decide whether you have 'satisfactorily' demonstrated the Elements and Performance Criteria, Required Skills, and an understanding of the Knowledge to apply fatigue management strategies correctly in a workplace.

If your Assessor grades you as Not Yet Satisfactory in any or all of the tasks, they will provide you with either verbal or written feedback regarding where you did not meet the assessment criteria, and will instruct you to re-submit that part of the assessment again. This may include all or only some of the questions and tasks.

Note: the assessment has an 'Assessment Cover Sheet' which you must fill-in and sign before being permitted to undertake the Assessments.

1. Written Assessment

You must complete the National Assessment Instrument for this unit as defined by SafeWork Australia for High Risk Licences.

2. Practical Assessment

You must complete the National Assessment Instrument for this unit as defined by SafeWork Australia for High Risk Licences.

These assessments will take place in either our simulated workplace environment, in your workplace or in an actual environment. Your Trainer/Assessor will either ask you to perform each task or activity individually, or as a group, and will record their observations of your performance on the Observation Sheet. At the conclusion of the assessment you will be asked to sign the Observation Sheet, which will be used as evidence of your performance.

Performance Evidence

Evidence of competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria, and include demonstration of:

- following work instructions, SOPs and safe work practices
- complying with Commonwealth, state and territory work, health and safety (WHS) legislation and regulations
- complying with Australian and industry standards, organisation workplace standards, policies, relevant codes of practice requirements at all times
- planning and preparing for work, including identifying potential hazards and implementing appropriate risk control measures
- identifying the type of standard or advanced boiler and associated equipment
- reading and interpreting maintenance records, operating logs and safety data sheets (SDS)
- conducting the appropriate pre-start up checks, including identifying all maintenance requirements and visual faults
- using appropriate tools, equipment and PPE in accordance with procedures
- completing all maintenance and rectification requirements in accordance with manufacturers' and workplace procedures, including recording/reporting requirements
- completing the start-up procedures and bringing the boiler online
- monitoring the boiler and associated equipment, including conducting relevant tests and activities and adjusting boiler water quality in accordance with procedures
- interpreting advanced boiler operation tables and figures
- communicating handover of boiler status and associated equipment to appropriate personnel
- demonstrating emergency operating procedures
- identifying all boiler energy sources required to be isolated and made safe for maintenance, inspection and repairs
- applying advanced boiler cleaning and storage techniques.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- safe work practices and procedures and use of PPE
- Commonwealth, state and territory WHS/OHS legislation and approved codes of practice relevant to standard and advanced boiler operation
- Australian and industry standards relevant to standard and advanced boiler operation
- basic principles of heat transfer and thermodynamics in relation to standard and advanced boiler operation
- standard and advanced boiler operation steam equipment operating principles and operating methods
- types and characteristics of multiple fuel systems for standard and advanced boilers
- types and characteristics of feedwater systems and treatment, including de-aerator
- types and use of equipment and fittings for operation and maintenance of boilers
- function, purpose and operation of the following:
  - pre-heater
  - superheater
  - economiser
  - air heater
  - feedwater heater
  - attemperator
  - superheater safety valves
  - economiser relief valves
  - main steam stop valve
- standard and advanced boiler and auxiliary equipment characteristics and capabilities
- essential fittings required where more than one boiler is installed (e.g. battery of boilers)
- processes for confirming operational status of a boiler
- workplace communication techniques and procedures
- responsibilities for checking and testing advanced boilers
- location and inspection procedures and techniques for inspection and explosion doors
- steam and boiler hazards for cold start and handover
- hierarchy of risk control
- type and limitations of corrective action and/or adjustments that can be made in response to routine boiler operation problems and emergencies
- various harmful energy sources in standard and advanced boiler operation and the means to effectively isolate these energy sources and make them safe with particular consideration to advanced boilers
- modes of standard and advanced boiler storage and procedures for storing boiler in open or closed condition
- SDS and safe chemical handling and storage methods for boiler operation and cleaning
- procedures for cleaning boilers internally and externally, where required
- procedures for recording, reporting and maintenance of workplace records and information.

Assessment Conditions

- Assessments must be conducted by an assessor accredited for this high risk work (HRW) licence class in the Commonwealth/state/territory where the licence will be obtained (i.e. an assessor authorised by a Commonwealth/state/territory WHS/OHS regulator).
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and all assessments must be conducted in the English language.
- Where possible, assessment of performance should be undertaken in the workplace and/or under realistic workplace conditions that typically reflect:
  - the use of full-scale equipment
  - performing tasks/activities within timelines that would be expected in a workplace
  - standard and authorised work practices, safety requirements and environmental constraints.
- Where this is not possible or where personal safety, plant operation or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Accredited assessors are responsible for ensuring that candidates have access to all tools, equipment, PPE, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications.
- As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations (RTOs) current at the time of assessment.

STUDENT SURVEY & FEEDBACK

After you complete your training and before we issue your Certificate we will invite you to take part in a feedback survey to seek your views on the quality of our education and training. The survey is conducted to collect feedback from our students on their views about their learning and training experiences. The outcomes of the feedback process play an important role in developing and delivering future training at Go Train.

Your feedback counts. We use the feedback part of our continuous improvement processes. Also we must provide a summary report of feedback from Students to our Registering Body (the Australian Skills Quality Authority) to provide an indication of our performance and the satisfaction of our students. This is a condition of our registration as an RTO.

Participation in this survey is highly valued, but voluntary. You are free to withdraw consent at any time. We will protect your anonymity and the confidentiality of your response to the fullest possible extent within the limits of the law. The survey should take no longer than 10 minutes to complete.

GLOSSARY / RANGE STATEMENTS

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 vapor 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
  - 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
- 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

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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 • 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

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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
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 • main steam stop valve

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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
  - 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

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

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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 • 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

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Assessment Plan: MSMBLIC002 – Operate an Advanced Boiler

The following assessment plan applies to the following assessments conducted by SteamTraining and Go-Train Industry Pty Ltd relevant to pressure vessel High Risk Work assessment and licencing.

Definitions

Pressure equipment operation
Boiler means: (a) a vessel, or an arrangement of vessels and interconnecting parts, in which steam or vapour is generated or in which water or other liquid is heated at a pressure above that of the atmosphere by the application of fire, the products of combustion, electrical power or similar high temperature means; and (b) the superheaters, reheaters, economisers, boiler piping, supports, mountings, valves, gauges, fittings, controls, boiler setting and other equipment directly associated with those vessels, It includes: (a) a fully flooded or pressurised system where water or another liquid is heated to a temperature lower than the normal atmospheric boiling temperature of the liquid; or (b) a boiler designed or manufactured to the following codes: (i) AMBSC Part 1—A*ustralian Miniature Boiler Safety Committee Code for Copper Boilers*; (ii) AMBSC Part 2—*Australian Miniature Boiler Safety Committee Code for Steel Boilers*; (iii) AMBSC Part 3—A*ustralian Miniature Boiler Safety Committee Code for Sub-Miniature Boilers*; (iv) AMBSC Part 3—*Australian Miniature Boiler Safety Committee Code for Duplex Steel Boilers*; (c)a direct fired process heater; and (d) boilers with less than 5 square metres heating surface or 150 kilowatt output; or (e) unattended boilers certified in compliance with AS 2593:2004 (Boilers—Safety management and supervision systems).
27. Advanced boiler operation - Operation of a boiler, including a standard boiler, which may have one or more of the following: (a) multiple fuel sources; (b) pre-heater; (c) superheater; (d) economiser.

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Assessment Plan 2 : MSMBLIC002 – Operate an Advanced Boiler

Method of Assessment	Date and time of Assessment	Location of assessment	Candidate must provide	Standard expected for competent performance
Paperwork associated with Assessment and HRW licencing process	0800 - 0900	Normally your worksite training room or alternative TBA	• USI • RTO Enrolment Form • Pre-Assessment Questionnaire • ID &/or HRW licence • Practical Assignment • Logbook • Printed Certificate from online learning	Assessment cannot proceed without all documented information
Knowledge assessment	0900 - 1200	Candidates workplace	Pen & PPE	76 written questions – closed book – 3 hours All critical questions must be answered correctly for the candidate to be deemed competent. The designated pass mark for non- critical questions of 75% must be achieved.
Performance assessment	After 1230 45 minutes duration	Candidates workplace	Personal protective equipment (steel cap boots, helmet, high visibility clothing, eye and ear protection, etc)	Performance must be in accordance with the standard outlined in the unit of competency and by the assessor. If candidates act in a manner that endangers themselves, others, or equipment and property, during the observation of performance the assessment will cease immediately.

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Assessment Checklist

Evidence of competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria, and include demonstration of:

- following work instructions, SOPs and safe work practices
- complying with Commonwealth, state and territory work, health, and safety (WHS) legislation and regulations
- complying with Australian and industry standards, organisation workplace standards, policies, relevant codes of practice requirements always
- planning and preparing for work, including identifying potential hazards and implementing appropriate risk control measures
- identifying the type of standard or advanced boiler and associated equipment
- reading and interpreting maintenance records, operating logs, and safety data sheets (SDS)
- conducting the appropriate pre-start up checks, including identifying all maintenance requirements and visual faults
- using appropriate tools, equipment, and PPE in accordance with procedures
- completing all maintenance and rectification requirements in accordance with manufacturers' and workplace procedures, including recording/reporting requirements
- completing the start-up procedures and bringing the boiler online
- monitoring the boiler and associated equipment, including conducting relevant tests and activities and adjusting boiler water quality in accordance with procedures
- interpreting advanced boiler operation tables and figures
- communicating handover of boiler status and associated equipment to appropriate personnel
- demonstrating emergency operating procedures
- identifying all boiler energy sources required to be isolated and made safe for maintenance, inspection, and repairs
- applying advanced boiler cleaning and storage techniques.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- safe work practices and procedures and use of PPE
- Commonwealth, state and territory WHS/OHS legislation and approved codes of practice relevant to standard and advanced boiler operation
- Australian and industry standards relevant to standard and advanced boiler operation
- basic principles of heat transfer and thermodynamics in relation to standard and advanced boiler operation
- standard and advanced boiler operation steam equipment operating principles and operating methods
- types and characteristics of multiple fuel systems for standard and advanced boilers
- types and characteristics of feedwater systems and treatment, including de-aerator
- types and use of equipment and fittings for operation and maintenance of boilers
- function, purpose and operation of the following:
  - pre-heater
  - superheater
  - economiser
  - air heater

  - feedwater heater
  - attemperator
  - superheater safety valves
  - economiser relief valves
  - main steam stop valve
- standard and advanced boiler and auxiliary equipment characteristics and capabilities
- essential fittings required where more than one boiler is installed (e.g. battery of boilers)
- processes for confirming operational status of a boiler
- workplace communication techniques and procedures
- responsibilities for checking and testing advanced boilers
- location and inspection procedures and techniques for inspection and explosion doors
- steam and boiler hazards for cold start and handover
- hierarchy of risk control
- type and limitations of corrective action and/or adjustments that can be made in response to routine boiler operation problems and emergencies
- various harmful energy sources in standard and advanced boiler operation and the means to effectively isolate these energy sources and make them safe with consideration to advanced boilers
- modes of standard and advanced boiler storage and procedures for storing boiler in open or closed condition
- SDS and safe chemical handling and storage methods for boiler operation and cleaning
- procedures for cleaning boilers internally and externally, where required
- procedures for recording, reporting and maintenance of workplace records and information.