40442 Manage the safe operation of an unattended steam or hot water boiler

Kaupae | Level	4
Whiwhinga | Credit	10
Whāinga | Purpose	This skill standard is intended for operators who are responsible for an unattended steam or hot water boiler in accordance with the requirements of a 'Responsible Person' as defined in the Code of Practice. People credited with this skill standard are able to: describe the requirements of the Code in relation to an unattended steam or hot water boiler; describe a site steam or hot water boiler; operate and monitor an unattended steam or hot water boiler; explain boiler water treatment principles, safety considerations, and system functions; and operate and monitor the boiler feedwater system for an unattended boiler. This skill standard can be used in the New Zealand Energy and Chemical qualifications at Level 4 and above.

Hua o te ako me Paearu aromatawai \| Learning outcomes and assessment criteria

Hua o te ako | Learning outcomes	**Paearu aromatawai** | Assessment criteria
1. Describe the requirements of the Code in relation to an unattended steam or hot water boiler.	a. Describe industry requirements for quality systems in accordance with the Code.
	b. Describe boiler classifications in accordance with the Code.
	c. Identify site boiler classification, compliance and site requirements to operate an unattended boiler in accordance with the Code.
	d. Describe the key roles of a ‘Responsible Person’ in accordance with the Code.
	e. Describe site specific safety and environmental procedures associated with the boiler in accordance with the Code.
	f. Describe on site procedures for accessing appropriate assistance in an emergency in accordance with the Code

Hua o te ako | Learning outcomes	**Paearu aromatawai** | Assessment criteria
2. Describe a site steam or hot water boiler.	a. Identify boiler in terms of design and describe its operating principles.
	b. Describe boiler mountings and equipment in terms of their purpose and in accordance with organisational requirements.
	c. Describe operational and safety controls in terms of their purpose and in accordance with organisational requirements.
	d. Identify and describe emergency shutdown devices in terms of their location and purpose and in accordance with organisational requirements.
	e. Identify and describe data on the boiler control panel in terms of boiler and auxiliary equipment operating status and in accordance with organisational requirements.
3. Operate and monitor an unattended steam or hot water boiler.	a. Identify the organisational standard operating procedures for boiler start-up, shutdown, and routine operation in accordance with organisational requirements.
	b. Carry out start-up and shutdown of the boiler in accordance with organisational requirements.
	c. Describe responses to alarms, and where applicable, take corrective action in accordance with organisational requirements.
	d. Carry out and document routine boiler operation procedures in accordance with the Code and organisational requirements.
	e. Carry out steam boiler gauge glass blowdown procedures in accordance with organisational requirements.
	f. Identify steam boiler gauge glass problems, evaluate the extent of the issue, and describe solutions in accordance with organisational requirements.
	g. Carry out routine testing of cut outs and alarms in accordance with organisational requirements.
	h. Carry out checks after shutdown in accordance with organisational requirements.
	i. Isolate the boiler for maintenance in accordance with organisational requirements.

Hua o te ako | Learning outcomes	**Paearu aromatawai** | Assessment criteria
4. Explain boiler water treatment principles, safety considerations, and system functions.	a. Identify site-specific water treatment systems and describe their purpose in terms of their effect on the quality of the feedwater.
	b. Identify site-specific chemicals used in the boiler feedwater system and describe their purpose in terms of their effect on the quality of the feedwater.
	c. Explain the potential hazards associated with each boiler water treatment chemical in terms of their effect on personnel, plant and the environment, consistent with Safety Data Sheet details.
	d. Describe the consequences of incorrect water treatment on safe operation of the boiler.
	e. Describe returned condensate systems in terms of the benefits and hazards.
	f. Describe spill handling procedures for each water treatment chemical in terms of precautions and actions to be taken.
5. Operate and monitor the boiler feedwater system for an unattended boiler.	a. Handle, dose, and store feedwater chemicals in accordance with suppliers' instructions regulations.
	b. Collect, analyse and log boiler water samples, identify deviations, and take corrective action.

Pārongo aromatawai me te taumata paearu | Assessment information and grade criteria

Assessment specifications

- evidence for the practical components of this skill standard must be supplied from the workplace.
- evidence should be aligned with the competencies outlined by the statutory safety inspector and the Approved Code of Practice.
- 1b: classifications include but are not limited to – unattended steam or unattended hot water.
- 1c: site requirements – supervisory and attendance.
- 1d: evidence of at least three (3) roles is required.
- 1f: On-Call qualified operator, approved maintenance contractor, boiler controller; evidence of at least three (3) types of assistance is required.
- 3d: includes – monitoring, water testing, water treatment, blowdown.
- 3f: includes – leakage, blockage, breakage, false reading.
- 3g: includes – water level control, low-level alarms and cut out, standby feed pump.
- 4a: includes but is not limited to – water softener.
- 4d: includes – scale, corrosion, foaming, carry over.

- 4e: evidence of at least two (2) benefits and two (2) hazards is required.

The Environmental Protection Authority (EPA) is responsible for assessing and approving hazardous substances and, where appropriate, setting controls on the way the substance is used.

Definitions:

Boiler means a device – (i) Most of which is an arrangement of pressure containment parts; and (ii) The purpose of which is to generate steam - (A) By the use of a directly applied combustion process; or (B) By the application of heated gases; and (C) Includes any of the following: (i) Boiler piping: (ii) Combustion equipment: (iii) Combustion management systems: (iv) Controls: (v) Economisers: (vi) Fans: (vii) Feed and circulating pumps: (viii) Pressure fittings: (ix) Reheaters: (x) Superheaters: (xi) Supports: (xii) Water level management systems; but does not include a hot water boiler.

Code refers to the current Approved Code of Practice for the Design, Safe Operation, Maintenance and Servicing of Boilers, Occupational Safety and Health Service, 2000.

Regulations refers to the Health and Safety at Work (Hazardous Substances) Regulations 2017.

Organisational requirements – documented policies and procedures or other directions provided to staff for boiler start up, operation, and shut down. These may include: manufacturers' procedures; plant procedures; suppliers' instructions; site signage; legislative requirements; codes of practice; company health and safety plans; on site briefings; and supervisor's instructions.

Site boiler refers to the boiler at the plant or unit at which the person is employed.

Ngā momo whiwhinga | Grades available

Achieved

Ihirangi waitohu | Indicative content

- Key roles of a 'Responsible Person', such as – general supervision, routine testing requirements for subject boiler, feedwater quality monitoring, record maintenance, start-up and shutdown operations, and emergency procedures.
- Boiler mountings and equipment, such as – instrumentation, gauge glasses, safety devices, fuel system, burners, fans, valves, dosing system, feedwater system, safety valves, blowdown system, combustion air system.
- Operational and safety controls, such as – water level monitoring and control strategy, first and second low-level protection devices, high water level cut-out, high steam pressure cut-out, condensate monitoring, flame failure protection device, combustion chamber thermal protection device; feedwater availability protection device, low pressure protection device.

Rauemi | Resources

Legislation and the code relevant to this skill standard includes but is not limited to:

- Health and Safety at Work Act 2015;
- Health and Safety in Employment Pressure Equipment Cranes and Passenger Ropeways Regulations 1999.
- Resource Management Act 1991(RMA);
- Hazardous Substances and New Organisms Act 1996;

- *Approved Code of Practice for the Design, Safe Operation, Maintenance and Servicing of Boilers,* Occupational Health and Safety Service, 2000;

  and any subsequent amendments.

Pārongo Whakaū Kounga | Quality assurance information

Ngā rōpū whakatau-paerewa | Standard Setting Body	Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council
Whakaritenga Rārangi Paetae Aromatawai | DASS classification	Manufacturing > Energy and Chemical Plant > Operation of Energy and Chemical Plant
Ko te tohutoro ki ngā Whakaritenga i te Whakamanatanga me te Whakaōritenga | CMR	0079

Hātepe | Process	**Putanga** | Version	**Rā whakaputa** | Review Date	**Rā whakamutunga mō te aromatawai** | Last date for assessment
Rēhitatanga | Registration	1	24 April 2025	N/A
Kōrero whakakapinga | Replacement information	This skill standard replaced unit standard 21460.		
Rā arotake | Planned review date	31 December 2029		

Please contact Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council at qualifications@hangaarorau.nz to suggest changes to the content of this skill standard.