

40453 Operate heat exchange equipment in an energy and chemical plant

Kaupae Level	4
Whiwhinga Credit	7
Whāinga Purpose	<p>This skill standard is intended for people working as boiler operators and energy and chemical process operators in an energy and chemical plant.</p> <p>People credited with this skill standard are able to: describe heat transfer and heat exchange equipment in the energy and chemical industry, and explain the role and construction of heat exchange equipment in an energy and chemical plant. They are also able to operate heat exchange equipment efficiently in an energy and chemical plant.</p> <p>This skill standard can be used in the New Zealand Energy and Chemical qualifications at Level 4 and above.</p>

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

Hua o te ako Learning outcomes	Paearu aromatawai Assessment criteria
1. Describe heat transfer and heat exchange equipment in the energy and chemical industry.	a. Describe types of heat exchange equipment in terms of components and design concepts.
	b. Describe heat transfer and process flows for heat exchangers in terms of their types.
	c. Describe factors that impact the efficient operation of heat exchange equipment in terms of the corrective action required for each factor.
2. Describe the role and construction of heat exchange equipment in an energy and chemical plant.	a. Describe types of heat exchange equipment in terms of their use in the process in accordance with organisational requirements.
	b. Describe materials used in the construction of heat exchange equipment in terms of process conditions and product compatibility in accordance with organisational requirements.

Hua o te ako Learning outcomes	Paearu aromatawai Assessment criteria
3. Operate heat exchange equipment efficiently in an energy and chemical plant.	a. Locate heat exchange equipment and site-specific asset tagging system in accordance with organisational requirements.
	b. Operate heat exchange equipment using safe work practices in accordance with organisational requirements.
	c. Carry out plant checks on heat exchange equipment in accordance with organisational requirements.
	d. Make necessary adjustments to optimise the heat exchanger operation in accordance with organisational requirements.
	e. Complete all plant documentation related to the operation of heat exchange equipment in accordance with organisational requirements.

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.
- 1a: types include but are not limited to – shell and tube exchangers, fin fans, plate exchangers, cooling towers; components may include but are not limited to – shell, tubes, baffles, distributors, impingement plates.
- 1b: heat exchangers include but are not limited to – contact, non- contact.
- 1c: factors include but are not limited to – fouling, blanketing, flooding, tube leaks, thermal stress, corrosion, erosion, temperature deviation, pressure deviation, gassing, ambient temperature.
- 2a: evidence of three (3) different examples is required.
- 2b: evidence of two (2) different heat exchanger types is required.

Definitions:

Energy and chemical plant may be in – petrochemical, agri-nutrient, power generation, dairy processing, meat processing, and wood fibre manufacturing, or other plants that operate with a combination of high temperatures, pressures, steam and/or chemicals in gas, liquid or solid form.

Organisational requirements – documented policies and procedures. These may include: equipment manufacturers' procedures; plant procedures; suppliers' instructions; site signage; codes of practice; company health and safety plans; on site briefings; and supervisor's instructions. This includes all regulatory and legislative obligations that apply to the plant.

Plant – the operational unit, equipment and/or workplace at which the person is working.

Ngā momo whiwhinga | Grades available

Achieved

Ihirangi waitohu | Indicative content

None

Rauemi | Resources

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

- Health and Safety at Work Act 2015;
 - Hazardous Substances and New Organisms Act 1996;
 - Resource Management Act 1991;
- 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 3051.		
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.