40444 Operate pumps in an energy and chemical plant

Kaupae | Level	4
Whiwhinga | Credit	8
Whāinga | Purpose	This skill standard is intended for people working as boiler operators and energy and chemical process operators in an energy and chemical plant. People credited with this skill standard are able to: describe pumps used in an energy and chemical plant; and operate pumps in an energy and chemical plant. 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 pumps used in an energy and chemical plant.	a. Describe pumps in terms of operating and design concepts, and types.
	b. Describe components of pumps in terms of their purpose.
	c. Describe functions of pumps in terms of fluid and process operations, the pump duty and properties of the material being pumped.
	d. Describe pump systems in terms of their design concepts.
2. Operate pumps in an energy and chemical plant.	a. Describe pump operational deviations in terms of their causes.
	b. Describe control and protection systems in terms of their purpose.
	c. Identify the location of pumps in accordance with the site-specific asset tagging system and organisational requirements.
	d. Operate pumps using safe work practices in accordance with organisational requirements.
	e. Start up and shut down pumps in accordance with organisational requirements.
	f. Carry out plant checks on pumps in accordance with organisational requirements.
	g. Complete all plant documentation related to the process and equipment operation 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: pumps include but are not limited to – single stage centrifugal, multistage centrifugal, axial flow, reciprocating, positive displacement.
- 1b: components include but are not limited to – coupling, casing, shaft, impeller, bearings, mechanical seals, non-mechanical seals, instrumentation.
- 1c: pumps include but are not limited to – single stage centrifugal, multistage centrifugal, axial flow, reciprocating, positive displacement.
- 1d: design concepts include but are not limited to – net positive suction head, static head, non-return valve location, duty/standby set up, minimum flow provision, staging, pulsation dampers, lubrication system, cooling system.
- 2a: operational deviations include but are not limited to – cavitation, vibration, suction pressure variations, discharge pressure variations, overheating, overloading.
- 2b: evidence of two (2) control and three (3) protection systems is required.
- Learning outcome 2: evidence of two (2) positive displacement and two centrifugal pumps 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 21465		
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.