40460 Operate product separation equipment in an energy and chemical plant

Kaupae | Level	4
Whiwhinga | Credit	10
Whāinga | Purpose	People credited with this skill standard are able to: explain the function, design and safe management of separation equipment; separate product; and identify corrective actions for process deviations in a product separation process, 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. Explain the function, design, and safe management of separation equipment in an energy and chemical plant.	a. Identify separation equipment in terms of its purpose.
	b. Explain the selection of materials used in the construction of separation equipment in terms of their properties and process suitability.
	c. Describe separation equipment in terms of causes and effects of corrosion, erosion, expansion, and thermal stress.
	d. Describe the basic principles of design and operation of the separation vessel and its auxiliary equipment.
	e. Describe the requirements for certification of separation equipment.
	f. Identify potential hazards of incorrect operation and describe the steps to avoid them.
	g. Describe preventative maintenance and routine procedures for separation equipment.
	h. Describe storage of separation equipment in terms of the principles of long, medium, and short-term storage.

Hua o te ako | Learning outcomes	**Paearu aromatawai** | Assessment criteria
2. Separate product in an energy and chemical plant.	a. Assess upstream and downstream effects of the separation to determine operating requirements.
	b. Identify automatic control system function for separation equipment and auxiliary systems.
	c. Identify equipment protection systems in terms of their purpose, and inputs.
	d. Operate separation equipment to achieve optimum efficiency and safety in accordance with organisational requirements.
	e. Report and log separation actions.
3. Identify corrective actions for process deviations in a product separation process in an energy and chemical plant.	a. Identify corrective actions for any deviations from stable operating conditions.
	b. Identify and describe emergency situations and procedures.

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 for all outcomes must be presented in accordance with organisational requirements.
- 1a: evidence of at least ten is required.
- 1b: mild steel, alloy steels, non-ferrous metals, ceramics.
- 1d: distillation, centrifugal, density, chemical, low temperature (Joule-Thomson effect).
- 1f: flooding, carry over, low residence time, poor separation.
- 1h: nitrogen capping, dry storage, chemical storage.
- 2b: flow, pressure, temperature, level.
- 2c: trip systems, purge systems, over and under pressure relief, instrumentation, fire protection systems.
- 2d: start, shut down, isolate, control, product specifications, product throughout, environmental impact, product quality.
- 3a: flooding carry over, low residence time, poor separation, blockages.

Definitions:

Energy and chemical plant may be in – energy and chemical, 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

- Separation equipment, such as – towers, columns, strippers, absorbers, accumulators, scrubbers, tanks, condensers, centrifuges, steam separators, precipitators, coalescer, interface separators, phase separators, knockout pots and cyclones.

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 9587.		
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.