

40454**Operate a gas turbine in an energy and chemical plant**

Kaupae Level	4
Whiwhinga Credit	20
Whāinga Purpose	<p>This skill standard is intended for people working as energy and chemical process operators in an energy and chemical plant.</p> <p>People credited with this skill standard are able to describe gas turbines and combustion in the energy and chemical industry; and operational responses to deviations and equipment malfunctions for gas turbines; and operate a gas turbine 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 gas turbines and combustion in the energy and chemical industry.	a. Describe gas turbines in terms of design, operating principles and operation.
	b. Identify components of gas turbines in terms of their purpose and operating principles.
	c. Describe auxiliary gas turbine systems in terms of their design and operating principles.
	d. Describe the combustion process in terms of the chemical reaction and the requirement for air.
	e. Explain how gas turbine operating parameters are impacted by the variations of fuel supply and quantity used in terms of the operation of the turbine.
	f. Compare the differences between gas and liquid hydrocarbon fuels in terms of the effect on the combustion process.
	g. Describe equipment protection systems for a gas turbine in terms of their purpose and operating principles.

Hua o te ako Learning outcomes	Paearu aromatawai Assessment criteria
2. Describe operational responses to deviations and equipment malfunctions for gas turbines in an energy and chemical plant.	a. Identify deviations from normal operating parameters that can occur in a gas turbine and describe the operational steps and techniques used to respond to each deviation.
	b. Identify equipment malfunctions that can occur in a gas turbine and describe the operational steps and techniques used to respond to each equipment malfunction.
3. Operate a gas turbine in an energy and chemical plant.	a. Locate gas turbine components and auxiliary equipment in accordance with organisational requirements.
	b. Operate the gas turbine using safe work practices in accordance with organisational requirements.
	c. Operate control systems for a gas turbine and its auxiliary systems in accordance with organisational requirements.
	d. Carry out checks and routine procedures in accordance with organisational requirements.
	e. Maintain operating parameters to ensure gas turbine efficiency in accordance with organisational requirements.
	f. Start up and shut down the gas turbine plant 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.
- 1b: components include but are not limited to – combustion chamber, igniter, starter, compressor, power turbine, reduction gear.
- 1c: evidence of six (6) is required.
- 1f: evidence of two (2) differences is required.
- 1g: equipment protection systems include but are not limited to – trip systems, vibration monitoring, fire protection, pressure protection, surge protection.
- 2a: evidence of three (3) deviations is required.
- 2b: evidence of three (3) equipment malfunctions 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

- Auxiliary gas turbine systems, such as – lubrication, cooling, gas fuel system, gas compressor, diesel fuel system, NOx suppression system, sprint water system, starting, anti-icing, fire protection.
- Deviations from normal gas turbine operating parameters such as– temperature, pressure, flows, vibration levels, fuel usage.
- Gas turbine control systems, such as– gas fuel system, gas compressor, diesel fuel system, NOx suppression system, sprint water system, lubrication, turning gear, cooling, starting, anti-icing, fire protection.

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 3053.		
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.