# 40462 Control normal and abnormal process conditions in an energy and chemical plant

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| **Kaupae** \| Level | 5 |
| **Whiwhinga** \| Credit | 30 |
| **Whāinga** \| Purpose | This skill standard is intended for experienced people working as boiler operators, energy and chemical process operators, and senior managers in an energy and chemical plant.<br><br>People credited with this skill standard are able to describe: the distributed control system and alarms used; and the control of process conditions to optimise efficiency and output, in an energy and chemical plant. They are also able to: control normal process conditions to ensure process efficiencies and product quality; determine implications of abnormal process conditions; control abnormal process conditions; and evaluate the response to abnormal process conditions, in an energy and chemical plant.<br><br>This skill standard can be used in the New Zealand Energy and Chemical qualifications at Level 5. |

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

| **Hua o te ako \|** Learning outcomes | **Paearu aromatawai** \| Assessment criteria |
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| 1. Describe the distributed control system, and alarms used in an energy and chemical plant. | a. Describe the distributed control system in terms of its configuration. |
| | b. Describe the control logic used in the distributed control system in terms of purpose and use. |
| | c. Describe alarms in terms of their types and priorities. |
| 2. Describe the control of process conditions to optimise efficiency and output in an energy and chemical plant. | a. Describe key performance indicators for process efficiencies, product quantity and product quality for each plant unit. |
| | b. Describe consequences of any deviations from each key performance indicator. |
| | c. Describe corrective actions for deviations from each key performance indicator. |

| **Hua o te ako** \| Learning outcomes | **Paearu aromatawai** \| Assessment criteria |
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| 3. Control normal process conditions to ensure process efficiencies and product quality in an energy and chemical plant. | a. Establish data gathering processes and monitor real-time trends to detect deviations and ensure process stability and efficiency. |
| | b. Analyse real-time information and implement process adjustments to maintain efficiency and product quality within required limits. |
| | c. Ensure compliance with regulatory and legislative requirements for process operation. |
| | d. Complete all plant documentation related to process and equipment operation in relation to normal process conditions. |
| 4. Determine implications of abnormal process conditions in an energy and chemical plant. | a. Conduct longer-term data analysis and trend evaluation to identify, assess, and determine the significance of abnormal process conditions. |
| | b. Gather and incorporate field personnel insights into the identification and analysis of abnormal process conditions. |
| | c. Determine implications of the abnormal process conditions on upstream and downstream operations and communicate to relevant stakeholders. |
| 5. Control abnormal process conditions in an energy and chemical plant. | a. Select the most appropriate action to control abnormal process conditions based on analysis of the information available. |
| | b. Communicate the plan of action to the process operations team. |
| | c. Implement the plan of action to bring the process into a stable and safe condition, including subsequent corrective measures. |
| | d. Evaluate the status of the process after the response to determine effectiveness and identify any further actions required. |
| | e. Communicate progress to relevant stakeholders. |
| | f. Complete all plant documentation related to process and equipment operation in relation to abnormal process conditions. |

| **Hua o te ako** \| Learning outcomes | **Paearu aromatawai** \| Assessment criteria |
|---|---|
| 6. Evaluate the response to abnormal process conditions in an energy and chemical plant. | a. Review process data and field information from the response to determine the accuracy of the diagnosis of cause(s) and the effectiveness of the corrective action. |
| | b. Identify and document improvements that can be made to the response to abnormal conditions. |

**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: system includes but is not limited to – operating system, inputs and outputs, backup or redundancy system, integration with other plant systems.
- 1b: evidence of three (3) examples is required.
- 1c: alarms include but are not limited to – alarm warning (advisory or critical), alarm tolerance.
- 6b: evidence of two (2) suggested improvements is required.

Definitions:

*Abnormal process conditions* – process deviations outside normal operating parameters which if left to develop will impact on upstream or downstream processes, the integrity of the plant, product quality, compliance with consents, personnel or plant safety.

*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

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| **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 28163. | | |
| **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.