

Title	Demonstrate knowledge of heat transfer and exchange, and operate heat exchange equipment in an energy and chemical plant		
Level	4	Credits	7

Purpose	<p>This unit 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 unit standard are able to demonstrate knowledge of: heat transfer and heat exchange equipment in the energy and chemical industry, and activities to optimise heat exchanger operation; and operate heat exchange equipment in an energy and chemical plant.</p>
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Classification	Energy and Chemical Plant > Operation of Energy and Chemical Plant
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Available grade	Achieved
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Guidance Information

- 1 Legislation relevant to this unit 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.

- 2 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.

- 3 For the purposes of assessment:
 - evidence for the practical components of this unit standard must be supplied from the workplace.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of heat transfer and heat exchange equipment in the energy and chemical industry.

Performance criteria

1.1 Describe types of heat exchange equipment in terms of components and design concepts.

Range 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.

1.2 Describe heat transfer and process flows for heat exchangers in terms of their types.

Range heat exchangers include but are not limited to – contact, non-contact.

1.3 Describe factors that impact the efficient operation of heat exchange equipment in terms of the corrective action required for each factor.

Range factors include but are not limited to – fouling, blanketing, flooding, tube leaks, thermal stress, corrosion, erosion, temperature deviation, pressure deviation, gassing, ambient temperature.

Outcome 2

Demonstrate knowledge of heat exchange equipment used in an energy and chemical plant, and activities to optimise heat exchanger operation.

Performance criteria

2.1 Identify and describe types of heat exchange equipment in terms of their use in the process in accordance with organisational requirements.

Range evidence of three different examples is required.

2.2 Describe materials used in the construction of heat exchange equipment in terms of process conditions and product compatibility in accordance with organisational requirements.

Range evidence of two different heat exchanger types is required.

2.3 Describe activities used to optimise the heat exchanger operation in accordance with organisational requirements.

Range evidence of three examples is required.

Outcome 3

Operate heat exchange equipment in an energy and chemical plant.

Performance criteria

- 3.1 Use the relevant identification coding system to locate and identify heat exchange equipment in accordance with organisational requirements.
- 3.2 Operate heat exchange equipment using safe work practices in accordance with organisational requirements.
- 3.3 Carry out plant checks on heat exchange equipment in accordance with organisational requirements.
- 3.4 Complete all plant documentation related to the operation of heat exchange equipment in accordance with organisational requirements.

Planned review date	31 December 2024
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	8 November 1995	31 December 2014
Revision	2	15 December 1998	31 December 2014
Review	3	29 May 2000	31 December 2014
Revision	4	24 July 2002	31 December 2014
Review	5	27 June 2005	31 December 2014
Rollover and Revision	6	25 July 2006	31 December 2014
Review	7	22 May 2009	31 December 2016
Review	8	24 October 2014	31 December 2022
Review	9	27 February 2020	N/A

Consent and Moderation Requirements (CMR) reference	0079
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact the Primary Industry Training Organisation standards@primaryito.ac.nz if you wish to suggest changes to the content of this unit standard.