

## Apply design principles to industrial refrigeration systems

**Level** 5

**Credits** 15

**Purpose** This unit standard is for people who work, or intend to work, in the refrigeration and air conditioning sector of the engineering industry, and is intended for use in the training of installers of industrial refrigeration systems.

People credited with this unit standard are able to identify and confirm customer and system requirements; and prepare designs and plans to meet job requirements for industrial refrigeration systems.

**Subfield** Mechanical Engineering

**Domain** Refrigeration and Air Conditioning

**Status** Registered

**Status date** 20 June 2006

**Date version published** 20 June 2006

**Planned review date** 31 December 2011

**Entry information** Recommended: Unit 22705, *Apply design principles to RAC systems installation*, or demonstrate equivalent knowledge and skills.

**Accreditation** Evaluation of documentation and visit by NZQA and industry.

**Standard setting body (SSB)** Competenz

**Accreditation and Moderation Action Plan (AMAP) reference** 0013

This AMAP can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

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### Special notes

- 1 References  
Building Act 2004;  
Electricity Act 1992;  
Electricity Amendment Act 1997;  
Hazardous Substances and New Organisms Act 1996;

Health and Safety in Employment Act 1992;  
Ozone Layer Protection Act 1996;  
Electricity Regulations 1997;  
AS/NZS 1677:1998, *Refrigerating systems – Refrigerant classification*;  
AS/NZS 3000:2000, *Electrical installations*;  
*Code of Practice for the reduction of emissions of fluorocarbon refrigerants in refrigeration and air conditioning applications*. Institute of Refrigeration, Heating and Air Conditioning Engineers of New Zealand (IRHACE New Zealand), 2001. Available from IRHACE, 28 E Lambie Drive, Manukau City.

## 2 Definitions

*Industrial refrigeration systems* refers to single or multi-staged refrigeration systems (typically using ammonia refrigerant) used in the manufacturing process in areas such as freezing works, breweries, and chemical plants.

*Organisational procedures* refer to documents that include: organisational rules, codes, and practices; equipment operating instructions; production specifications; documented quality management systems; and health and safety requirements.

## 3 Range

Competence is to be demonstrated on applying design principles to three industrial refrigeration systems.

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## Elements and performance criteria

### Element 1

Identify and confirm customer and system requirements.

#### Performance criteria

1.1 Customer requirements and benefits sought are identified, evaluated, and quantified.

1.2 Customer's cost limitations are identified.

1.3 Site characteristics that may affect or limit design options are identified.

1.4 System specifications needed to meet job requirements are determined.

Range may include but is not limited to – type of product refrigerated, capacities, volumes, electrical requirements, other design parameters.

1.5 Implications, benefits, and estimated costs of alternative approaches are presented to customer for evaluation.

1.6 Approval is sought from customer to proceed with one approach.

1.7 Documentation is produced in accordance with organisational procedures.

Range may include but is not limited to – customer name, customer contact details; depth, clarity and accuracy of information; formatting.

## Element 2

Prepare designs and plans to meet job requirements.

### Performance criteria

- 2.1 Concepts are prepared, costings are estimated, and they are presented to customer.
- 2.2 Detailed designs, specifications, and costings are prepared.
- 2.3 Sketches and design specifications are prepared.
- 2.4 Designs and system specifications are in accordance with organisational procedures.
- 2.5 Project plans that guide assembly, installation, and commissioning of systems are prepared.
- 2.6 Liaison activities with associated tradespeople are identified and incorporated into the installation plan.
- 2.7 Project plans and instructions are in accordance with organisational procedures.

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### Please note

Providers must be accredited by the Qualifications Authority, or an inter-institutional body with delegated authority for quality assurance, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by the Qualifications Authority before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.

Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

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### Comments on this unit standard

Please contact Competenz [qualifications@competenz.org.nz](mailto:qualifications@competenz.org.nz) if you wish to suggest changes to the content of this unit standard.