Title	**Demonstrate knowledge of commercial RAC system maintenance and servicing**		
Level	**3**	**Credits**	**8**

Purpose	This unit standard is for people working in the refrigeration and air-conditioning (RAC) industry. People credited with this unit standard are able to: explain the need for routine maintenance on RAC systems and equipment; and describe maintenance, servicing, and testing procedures for RAC systems.

Classification	Mechanical Engineering > Refrigeration and Air Conditioning

Available grade	Achieved

Guidance Information

1 Legislation and standards
Health and Safety at Work Act 2015;
Building Act 2004;
Climate Change Response Act 2002;
Electricity (Safety) Regulations 2010;
Electricity Act 1992;
Hazardous Substances and New Organisms Amendment Act 2015;
Ozone Layer Protection Act 1996;
AS/NZS 5149:2016 *Parts 1:5 Refrigerating Systems and Heat pumps – Safety and environment requirements;*
AS/NZS 817:2016 *Refrigerants – Designation and safety classification*;
AS/NZS 3000:2007 *Electrical installations (known as the Australian/New Zealand Wiring Rules)*;
and any subsequent amendments.

2 References
Althouse, Turnquist, Bracciano. *Modern Refrigeration and Air Conditioning*. 19th edition. Tinley Park, Illinois: The Goodhouse-Willcox Company Inc. ISBN 1-59070-280-8.
Institute of Refrigeration, Heating and Air Conditioning Engineers of New Zealand (IRHACE New Zealand). 2001 *Code of Practice for the reduction of emissions of fluorocarbon refrigerants in refrigeration and air conditioning applications*. Available from IRHACE, http://www.irhace.org.nz/.

3 All worksite practices must meet recognised codes of practice and documented safety procedures and safety plans (where these exceed the code) for personal and worksite safety, and obligations required under current legislation.

Outcomes and performance criteria

Outcome 1

Explain the need for routine maintenance on RAC systems and equipment.

Performance criteria

1.1 Illnesses and/or discomfort to humans that can result from inadequate air conditioning system maintenance are identified.

Range may include but are not limited to –respiratory infections, Legionnaires disease, hypersensitivity pneumonitis, sinus congestion, eye and skin irritation, headaches, fatigue.

1.2 Air condition and air borne contaminants that can cause health risks or discomfort to humans are described in terms of their sources within RAC systems

Range air condition – temperature, humidity, aerosolised particles; contaminants – dust, pollen, bacteria, fungal spores, allergens, microbial growth, debris build up, refrigerant; sources – cooling towers, evaporators, condensers, ducting, air intakes, filters, drain trays.

1.3 The benefits of routine maintenance are described in terms of RAC system serviceability and costs.

Outcome 2

Describe maintenance, servicing, and testing procedures for RAC systems.

Performance criteria

2.1 Testing procedures and frequencies, to identify contaminants within RAC systems are described.

Range tests may include but are not limited to – bacterial, legionella, pH, total alkalinity, free chlorine.

2.2 Maintenance activities and their frequency, to mitigate health risks to humans from RAC systems are described.

Range activities may include but are not limited to – use of biocides; cleaning, disinfection, pre-chlorination; disassembly, cleaning, and reassembly of components; post-chlorination; total dissolved solids (TDS) bleed off.

2.3 Routine maintenance and servicing activities to ensure ongoing serviceability of RAC systems are described in terms of standard industry practices.

Range inspection, cleaning, disassembly, repair, parts replacement, assembly, corrosion protection, testing, adjusting, lubricating, replenishment of refrigerant and lubricating oils, completion of documentation and records.

2.4 Common RAC system faults are described in terms of their symptoms, causes and rectification.

Range examples of common faults include but are not limited to – loss of electrical power, loss of temperature and/or humidity control, loss of refrigerant, excessive vibration, excessive noise.

Replacement information	This unit standard and unit standard 28964 replaced unit 22704.

Planned review date	31 December 2020

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	18 June 2015	N/A
Revision	2	17 September 2015	N/A
Revision	3	22 October 2020	N/A

Consent and Moderation Requirements (CMR) reference	0013

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

Comments on this unit standard

Please contact Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.