



Australian Government

UEERA0065 Repair and service ammonia refrigeration systems

Release: 1

UEERA0065 Repair and service ammonia refrigeration systems

Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Application

This unit involves the skills and knowledge required to repair and service ammonia refrigeration systems.

It includes servicing and repairing refrigeration equipment using ammonia as the refrigerant. It also includes applying safe working practice and refrigeration principles that apply to ammonia; following service manuals; testing, locating and rectifying faults and defective components, and completing necessary service documentation.

The skills and knowledge in this unit will be applied by refrigeration and air conditioning technicians during the service and repair of refrigeration systems using ammonia refrigerant.

The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).

Competency development activities in this unit are subject to regulations directly related to licensing. Where a licence or permit to practice is not held, skills and knowledge described in this unit require a relevant contract of training, such as an Australian Apprenticeship.

Additional and/or other conditions may apply in some jurisdictions subject to regulations related to refrigeration, air conditioning or electrical work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

Permits may also be required for some work environments, such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

Pre-requisite Unit

UEERA0005 Apply safety awareness and legal requirements for ammonia refrigerant

UEERA0053 Install, commission, service and maintain medium temperature systems

Competency Field

Refrigeration and air-conditioning

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to service ammonia refrigeration system

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.1 WHS/OHS hazards, risk control methods, relevant standards, codes and legislation are obtained and applied

1.2 Safety hazards which have not been previously identified are reported, risk assessed and advice on risk control measures sought from work supervisor

1.3 Nature of work is obtained from documentation or from work supervisor to determine the scope of work to be undertaken

1.4 Advice is sought from work supervisor to ensure the work is coordinated effectively with others

1.5 Sources of materials required for the refrigeration work are accessed in accordance with workplace and procedures

1.6 Tools, equipment and testing devices needed to carry out refrigeration work are obtained and checked for correct operation and safety

2 Service and repair ammonia refrigeration system

2.1 Measuring system operating parameters are conducted in accordance with WHS/OHS requirements and workplace safety procedures

2.2 Refrigeration inspection and checks are carried out to ensure the system or component parts are isolated in accordance with WHS/OHS requirements and workplace procedures

2.3 Refrigerant is removed from system safely in accordance with regulatory requirements, industry standards and practices

2.4 Precautions are taken to prevent damage to components

while pressure testing the refrigeration system

- 2.5 Pressure testing is conducted at a pressure compatible with ammonia and in accordance with industry standards
- 2.6 Refrigeration leaks are located and rectified using testing methods appropriate to the system and in accordance with industry standards and practices
- 2.7 Oil is removed from an operational ammonia refrigeration system in accordance with industry standards and practices
- 2.8 Refrigeration system is charged safely with ammonia and compatible lubricants in accordance with industry standards and practices
- 2.9 Actual and specified range of operating conditions are determined from measured and calculated values as they apply to ammonia vapour compression and liquid recirculation systems in accordance with workplace procedures and industry standards
- 2.10 Unplanned situations are dealt with safely in accordance with workplace procedures and with approval of an authorised person/s in a manner that minimises risk to personnel and equipment
- 2.11 Operating conditions are determined without damage to apparatus, circuits, the surrounding environment or services using sustainable energy practices

3 Complete and report servicing and repairing ammonia refrigeration system

- 3.1 Worksite is cleaned and made safe in accordance with workplace procedures
- 3.2 Contaminated refrigerant and lubricant are dealt with in accordance with legislative/regulatory requirements and industry standards
- 3.3 Operation conditions are documented and include identification of any parameter that is not within the specified range for the system
- 3.4 Work supervisor is notified of the completion of the work in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

- Servicing and repairing ammonia refrigeration systems must include at least the following:
- one ammonia refrigerant refrigeration system, including the following:
 - determining operating conditions using measurement and basic calculation methods:
 - suction and discharge pressures
 - ambient
 - evaporator and condensing temperatures
 - evaporator and condenser temperature differences
 - discharging/recovering refrigerant, replacing components, testing pressure, evacuating, charging and leak testing an ammonia refrigerant system in a safe and environmentally responsible manner

Unit Mapping Information

This unit replaces and is equivalent to UEENEEJ179A Repair and service ammonia refrigeration systems.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEERA0065 Repair and service ammonia refrigeration systems

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and include:

- applying relevant work health and safety (WHS)/occupational health and safety (WHS/OHS) requirements and workplace procedures and practices, including using risk control measures
- applying sustainable energy principles and practices
- dealing with unplanned events/situations in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- decontaminating and evacuating the system
- discharging/charging refrigerant/lubricants and pressure testing the system without damage to components
- documenting operating conditions correctly
- identifying the conditions of the ammonia (R717) refrigerant at various locations in the vapour compression and liquid recirculation system
- locating and rectifying leaks
- recording measurements
- selecting and using appropriate measuring devices correctly
- servicing, pressure testing, charging/discharging refrigerant/lubricants and determining the operating conditions of ammonia vapour compression and liquid recirculation refrigeration system
- using calculation methods accurately.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- ammonia refrigeration systems and operating conditions, including:
 - cascade systems
 - direct expansion systems
 - flooded systems

- liquid recirculation systems
- multi-staged systems
- revision of vapour compression cycle
- single staged systems
- types of ammonia systems
- vapour compression systems
- properties of ammonia
- safe handling of ammonia
- ammonia refrigeration system's major components, flow controls and ancillary components
- relevant job safety assessments or risk mitigation processes hazards associated with ammonia refrigeration systems
- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- relevant workplace documentation, including service manuals and service documentation
- relevant workplace policies and procedures, including workplace emergency response plan
- servicing and repairing techniques for ammonia refrigeration systems, including:
 - adding refrigerant
 - leak detection methods
 - removing refrigerant.
 - servicing procedures.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, emergency response plan, equipment specifications, regulations, codes of practice and operation manuals.

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