



Australian Government

UEERA0026 Design mechanical ventilation/exhaust systems and select equipment

Release: 1

UEERA0026 Design mechanical ventilation/exhaust systems and select equipment

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 design mechanical ventilation/exhaust systems and select equipment.

It includes applying processes and methods of mechanical ventilation/exhaust systems, safety and relevant industry standards; developing alternative design schemes based on design brief and customer requirements; and documenting system designs.

The skills and knowledge described in this unit may, in some jurisdictions, require a licence or permit to practice in the workplace subject to regulations for undertaking refrigeration and air conditioning work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

No other licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

UEERA0022 Design heating, ventilation and air conditioning (HVAC) systems and select components

UEERA0004 Analyse vibration and noise in refrigeration and air conditioning systems

UEERA0042 Evaluate thermodynamic and fluid parameters of refrigeration systems

UEERA0001 Analyse the operation of HVAC air and hydronic systems

UEERA0002 Analyse the psychrometric performance of HVAC/R systems
and

UEERA0003 Analyse the thermodynamic performance of HVAC/R systems
or

UEERA0094 Verify functionality and compliance of refrigeration and air conditioning installations

UEECD0007 Apply work health and safety regulations, codes and practices in the workplace

UEECD0019 Fabricate, assemble and dismantle utilities industry components

UEECD0020 Fix and secure electrotechnology equipment

UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications

UEECD0016 Document and apply measures to control WHS risks associated with electrotechnology work

UEERA0059 Prepare and connect refrigerant tubing and fittings

UEERA0036 Establish the basic operating conditions of vapour compression systems

UEERA0035 Establish the basic operating conditions of air conditioning systems

UEERA0050 Install refrigerant pipe work, flow controls and accessories

UEERA0081 Select refrigerant piping, accessories and associated controls

UEERA0031 Diagnose and rectify faults in air conditioning and refrigeration control systems

UEERA0092 Solve problems in low voltage refrigeration and air conditioning circuits

UEERL0005 Locate and rectify faults in low voltage (LV) electrical equipment using set procedures

UEERL0004 Disconnect - reconnect electrical equipment connected to low voltage (LV) installation wiring

UEERL0001 Attach cords and plugs to electrical equipment for connection to a single phase 230 Volt supply

UEERL0002 Attach cords, cables and plugs to electrical equipment for connection to 1000 V a.c. or 1500 V d.c.

Competency Field

Refrigeration and air-conditioning

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to design mechanical ventilation/exhaust systems and select equipment

PERFORMANCE CRITERIA

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

1.1 WHS/OHS processes and procedures for a given work area are identified, obtained and applied

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|----------|------------|---|
| | 1.2 | WHS/OHS risk control measures and workplace procedures are followed in preparation for the work |
| | 1.3 | Scope of the proposed mechanical ventilation/exhaust system is determined from the design brief and/or consultations with relevant person/s |
| | 1.4 | Design development work is planned in accordance with workplace procedures for timelines in consultation with others involved |
| 2 | | Design mechanical ventilation/exhaust systems and select equipment |
| | 2.1 | Relevant mechanical ventilation/exhaust processes and methods are applied to the design |
| | 2.2 | Alternative concepts for design are evaluated in accordance with the design brief |
| | 2.3 | Safety, functionality and budgetary considerations are incorporated in the design specifications |
| | 2.4 | System design draft is checked for compliance in accordance with the design brief and relevant industry standards |
| | 2.5 | System design is documented for submission to relevant person/s for approval |
| | 2.6 | Unplanned events are dealt with in accordance with problem-solving techniques and workplace procedures |
| 3 | | Obtain approval for mechanical ventilation/exhaust systems design and equipment selection |
| | 3.1 | System design is presented to customer and/or relevant person/s in accordance with workplace procedures |
| | 3.2 | Requests for alterations to the design are negotiated with relevant person/s in accordance with workplace procedures |
| | 3.3 | Final design is documented and approval obtained from relevant person/s in accordance with workplace procedures |
| | 3.4 | Quality of work is monitored in accordance with workplace procedures and relevant industry standards |

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.

designing mechanical ventilation and exhaust systems must include at least the following:

- two different mechanical ventilation and exhaust systems

Unit Mapping Information

This unit replaces and is equivalent to UEENEEJ144A Design mechanical ventilation/exhaust systems and select equipment.

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 UEERA0026 Design mechanical ventilation/exhaust systems and select equipment

Modification History

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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 one occasion and include:

- developing outlines of alternative designs
- developing the design within the safety, regulatory, functional requirements and budget limitations
- documenting and presenting design effectively
- successfully negotiating design alteration requests
- obtaining approval for final design
- dealing with unplanned events
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including using risk control measures
- designing mechanical ventilation/exhaust systems and select equipment
- preparing to design mechanical ventilation/exhaust systems and select equipment.

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:

- exhaust systems design, safe working practices and relevant standards, codes and regulations, including:
 - relevant codes and regulations:
 - health and safety
 - noise
 - smoke
 - fire
 - hazard identification
 - system types:
 - applications
 - application flow charts

- system requirements
- hazard identification
- effluent types and removal
- relationship with smoke spill systems
- supply air dilution applications
- natural ventilation applications
- fan assisted exhaust applications
- replenishment of exhaust air
- system components
- duct design:
 - static, velocity and total pressure
 - pressure drop
 - fouling
 - transitions
 - elbows
 - fan position and mounting
 - noise and noise attenuation
 - requirements for access and maintenance
 - system integrity
- fan and motor selection:
 - applications
 - suitable fan types
 - motor rating and suitability
 - balancing the fan duct system
 - flame proofing
- filters and filter selection:
 - types and applications
 - capture velocity
- outlet design and location:
 - prevailing winds
 - position relative to air intakes
 - weather and bird proofing
- cycling/operation control:
 - applications
 - code/regulation requirements
 - monitoring of contaminants
 - contaminant detection
- problem-solving techniques
- relevant job safety assessments or risk mitigation processes
- relevant WHS/OHS legislated requirements

- relevant workplace budget, quality, policies and procedures
- relevant workplace documentation.

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 suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated suitable 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 simulations
- relevant and appropriate materials, tools, facilities and equipment currently used in industry
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

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