



Australian Government

**Assessment Requirements for UEERA0032
Diagnose and rectify faults in complex air
conditioning/refrigeration systems**

Release: 1

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Modification History

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

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:

- applying logical diagnostic methods
- using fault scenarios to test the cause of system faults
- identifying faults and competency needed to rectify them
- rectifying faults in system controls
- verifying that the system operates correctly
- dealing with unplanned events
- applying relevant legislations, industry standards, codes of practice and regulations
- applying relevant work health and safety (WHS)/occupational health and safety (WHS/OHS) requirements, including:
 - applying safe working practices
 - hazard identification and reporting
 - implementing risk control measures
- completing and reporting fault diagnosis and rectification activities
- determining need to test or measure live work
- isolating circuits/machines/plant
- using relevant tools, equipment and testing devices.

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:

- complex refrigeration and air conditioning system fault finding and repair, safe working practices and relevant standards, codes and regulations, including:
 - fault-finding techniques including:
 - factors to consider in clarifying the nature of a fault:
 - initial fault report

- confirmation of symptoms of the fault
- comparison of symptoms with normal operation
- effect to cause reasoning — assumptions of possible causes
- methods for testing assumptions encompassing:
 - visual inspection
 - sectional testing
 - split-half tests
 - component isolation
- dealing with intermittent faults
- causes of intermittent faults are vibration, shock, changes in temperature and electromagnetic interference
- refrigeration system analysis, including:
 - pressure enthalpy definitions:
 - high pressure and low-pressure refrigerants
 - triple point of new refrigerants
 - glide of trinary blends
 - differential evaporation of refrigerant blends
 - variable refrigerant volume
- refrigeration cycle, including:
 - expansion process
 - vaporising process
 - compression process
 - condensing process
 - compression ratio
- enthalpy processes, including:
 - co-efficient of performance
 - effect of suction temperature on cycle efficiency
 - effect of condensing temperature on cycle efficiency
- actual refrigerating cycles, including:
 - design operating conditions
 - effects of superheating suction vapour
 - superheating without useful cooling
 - superheating that produces useful cooling
 - superheating in suction piping outside the refrigerated space
 - superheating the vapour inside the refrigerated space
 - effects of subcooling the liquid
 - effects liquid - suction heat exchangers
 - effects of pressure losses resulting from friction
- refrigeration cycle faults, including:
 - symptoms and causes

- measurements and fault confirmation tests
- air conditioning system analysis, including:
 - psychrometric chart, including:
 - properties, definitions and units
 - plotting conditions:
 - RA, SA, OA and MA
 - psychrometric processes, including:
 - heating
 - cooling only
 - cooling and dehumidification
 - cooling, dehumidification and reheat
 - design operating conditions, including:
 - indoor and outdoor wet and dry bulb temperatures
 - volume flow rate supply, return and outdoor air
 - air conditioning system faults, including:
 - symptoms and causes
 - measurements and fault confirmation tests
 - power and control system analysis, including:
 - power and control circuit diagrams
 - sequence of operation
 - manufacturers diagrams, specifications and instructions
 - power and control circuit faults:
 - symptoms and causes
 - measurements and fault confirmation tests
 - relevant measurements and estimations
 - relevant risk mitigation processes
 - relevant WHS/OHS legislated requirements, including:
 - environmental and sustainable energy principles and practices
 - safe working practices
 - relevant workplace 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 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, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - -

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