



Australian Government

Assessment Requirements for UEERA0015 Design carbon dioxide refrigerated 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:

- understanding required operating functions and parameters from the design specification
- developing the design within the safety, regulatory and functional requirements and budget limitations
- documenting and presenting design effectively
- negotiating design alteration requests successfully
- obtaining approval for final design
- dealing with unplanned events
- applying relevant work health and safety (WHS)/occupational health and safety (WHS/OHS) requirements, including using risk control measures
- designing carbon dioxide (CO₂) refrigeration systems
- preparing to design CO₂ refrigeration systems.

Knowledge Evidence

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

- CO₂ refrigeration system design requirements, components and piping design requirements, safe working practices and relevant standards, codes and regulations, including:
 - technical standards, regulations and codes for carbon dioxide refrigeration systems:
 - standard philosophy and format
 - standards, regulations and codes that apply to CO₂ refrigeration systems
 - equipment manufacturer's specifications
 - CO₂ refrigeration system design requirements:
 - possible areas of applications of CO₂ refrigeration systems:
 - mobile air conditioner
 - heat pump water heater

- commercial refrigeration
- thermodynamic properties of CO₂:
 - CO₂ phase diagram
 - CO₂ properties tables and chart
- conventional refrigeration cycle versus CO₂ refrigeration cycle:
 - T-s and p-h diagram representations
 - isentropic efficiency
 - volumetric efficiency
- types of CO₂ refrigeration system configurations:
 - sub-critical operation
 - trans-critical operation
 - cascade systems
- performance analysis of CO₂ refrigeration systems
 - sub-critical cycle
 - trans-critical cycle
 - cascade systems
- CO₂ refrigeration system components and piping:
 - design preliminaries:
 - system operating parameters
 - project specifications
 - equipment selection criteria
 - selection tables, charts and catalogues
 - heat exchanger selection:
 - selection of evaporators
 - selection of condensers
 - selection of coolers
 - compressor selection
 - liquid expansion devices selection
 - system load balance point
 - refrigeration line design and sizing
 - automatic controls
 - safety devices
- 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.

Links

Companion Volume implementation guides are found in VETNet - -

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