



Australian Government

Assessment Requirements for UEERA0004 Analyse vibration and noise in refrigeration and air conditioning 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 the noise and vibration issues
- forming effective strategies for analysing refrigeration and air conditioning systems performance
- obtaining noise and vibration parameters, specifications and performance requirements appropriate to each situation
- evaluating the results of the analysis
- documenting analysis details of all findings, calculations and assumptions
- documenting justification of actions to be implemented in accordance with professional standards
- dealing with unplanned events
- applying problem-solving procedures, including using appropriate theorems
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures and practices, including using risk control measures
- applying sustainable energy principles and practices.

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:

- noise and vibration in refrigeration and air conditioning systems, safe working practices and relevant standards, codes and regulations, including:
 - fundamentals of sound:
 - frequency
 - decibels
 - octave bands
 - direct sound
 - velocity

- sound pressure level
- sound power level
- sound meters
- noise and people:
 - physical measurement of sound
 - weighting networks
 - NR curves
 - noise damage to hearing
 - evaluate daily noise exposures
 - peak noise levels
 - attenuation for hearing protectors
 - excess noise levels permissible
 - noise abatement Acts
 - advanced noise and vibration control
- sound in confined and unconfined spaces:
 - inverse square laws
 - direct and reflective sound
 - reverberation time
 - Sabine's formula
 - absorption coefficients of surfaces
 - types of absorbers and their operation
 - insulation performances of partitions
- identification and analysis of problems:
 - one-dimensional sound waves
 - standing waves
 - energy in a sound wave
 - sources
 - effects of air turbulence
 - transmitters
 - amplifiers
 - absorptivity
 - reflectivity
 - room characteristics
 - acoustic design in buildings
 - fan and air noise transmission in ducts
- methods of control:
 - natural attenuation
 - sound absorbing materials and placement
 - duct lining

- lined plenums
- lined duct splitters
- duct attenuators
- white noise
- vibration isolators
- acoustic specifications:
 - attenuator ratings
- sound insulation:
 - plant room breakout
 - controlling plant room noise
- duct borne noise:
 - sound power spectra for fans
 - noise attenuation in ducts and fittings
 - reducing fan noise transmission
 - regeneration noise
 - sources of regenerated noise
 - use tables to estimate regenerative noises
 - breakout situations
 - fan noise breakout
 - list methods of controlling breakout
- controlling the cost:
 - economical use of attenuation
- vibration:
 - simple harmonic motion (SHM)
 - period
 - frequency
 - amplitude
 - estimate frequencies for fans, pumps and refrigeration plant
 - estimate transmission of vibration
 - vibration control for building structures
 - use transmissibility graphs to select springs, vibration eliminators and pads
 - types of isolation materials and mounting devices
 - select isolation and mounting devices
 - inertia blocks
- noise and vibration analysis computer software packages
- relevant job safety assessments or risk mitigation processes
- relevant technique, process or measurement methods to obtain sound, noise and vibration data, including problem-solving procedures and appropriate theorems
- relevant WHS/OHS legislated requirements
- relevant workplace documentation

- relevant workplace policies and 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, 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>