



Australian Government

MEM23143 Apply energy management principles

Release: 1

MEM23143 Apply energy management principles

Modification History

Release 1. Supersedes and is equivalent to MEM23143A Apply energy management principles.

Application

This unit of competency defines the skills and knowledge required to determine an implementation strategy for an energy management program for monitoring, fault-finding and managing a building management system (BMS).

It applies to technicians in organisations designing, manufacturing, installing, servicing or maintaining heating, ventilation, air conditioning and refrigeration (HVACR) equipment who are required to determine or audit energy management procedures for a building.

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

Pre-requisite Unit

MEM23004 Apply technical mathematics

MEM23006 Apply fluid and thermodynamics principles in engineering

Competency Field

Engineering science

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Determine energy sources used in HVACR and their primary function in building energy management programs	1.1 Obtain and implement work health and safety (WHS) and environmental requirements for the work area 1.2 Identify passive energy characteristics in the building design and predict their impact on energy management 1.3 Identify common energy sources, their standard units and local supply authorities, and evaluate for safe usage 1.4 Establish the operating functions of all principal hardware components in a BMS 1.5 Identify energy requirements for major system components

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	operating within their normal range 1.6 Consult with appropriate personnel to ensure that work is coordinated effectively with others
2. Monitor a building management system	2.1 Check and monitor equipment status using energy management functions and data from BMS 2.2 Use BMS software to access, monitor and control system components 2.3 Check status of monitored BMS for compliance with specified normal operating parameters and environmental requirements 2.4 Predict the annual consumption of major system components 2.5 Consult on any contingencies and unexpected situations and take appropriate action based on specifications, codes and standards, and organisational procedures
3. Conduct an energy audit for a building	3.1 Determine objectives of a HVACR maintenance management system 3.2 Evaluate energy costs and tariffs for local supply authorities 3.3 Determine methodology for the auditing process, including data gathering techniques 3.4 Prepare appropriate energy audit documentation and implementation strategy for an energy management program in a multi-storey building
4. Plan efficient energy management operations	4.1 Incorporate requirements of an energy efficient plant control system into building operation procedures, including suitable contingency and suitable risk management procedures 4.2 Compile plant operating annual reporting timetable 4.3 Advise on staff awareness-raising policy for energy conservation in a multi-storey building

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

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

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

WHS requirements include:	• legislation • protective equipment • material safety management systems • hazardous substances and dangerous goods code • local safe operation procedures • awards provisions.
Environmental requirements include:	• relevant legislation, regulations and codes • correct handling and disposal of liquid and solid waste • elimination or minimisation of gas, fume, vapour and smoke emissions, including fugitive emissions • dust elimination, minimisation and control • minimisation of energy and water use • elimination or control of excessive noise • use and recycling of refrigerants.
Appropriate personnel include:	• supervisor, leading hand, foreman or manager • engineer • technician • trainer or mentor • team member • customer.
Common energy sources include:	• electricity • steam • hot water • high temperature hot water • natural gas • liquefied petroleum gas (LPG) • solar • waste heat • petrol • diesel.
Organisational procedures include:	• use of tools and equipment • instructions, including job sheets, plans, drawings and designs • reporting and communication • manufacturer specifications

	• operational procedures • industry standards.
Energy management includes:	• night cycles • optimum stop and/or start • time and event programs • night purge • outside air percentage control • enthalpy • power demand control • duty cycle • presence detection • lighting control.
Auditing process includes:	• reviewing energy costs and tariffs • reviewing energy consumption • predicting future costs • plotting consumption trends • considering historical data • collecting information using surveys • comparisons of actual to recorded usage • determining energy balance • using instrumentation • using BMS • estimating savings potential.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM23143A Apply energy management principles.

Links

Companion Volume Implementation Guides are available on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM23143 Apply energy management principles

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Performance Evidence

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

- interpreting drawings and specifications
- implementing work health and safety (WHS) workplace procedures and practices including the use of risk control measures
- demonstrating the ability to apply energy management principles
- monitoring building management systems (BMSs)
- conducting energy audits on at least two occasions
- planning efficient energy management operations on at least two occasions
- communicating technical and procedural requirements to others
- dealing with unexpected situations.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- WHS requirements
- appropriate personnel
- organisational procedures
- units of measurement, characteristics and supply for common energy sources
- typical energy sources, characteristics and uses
- energy usage within a multi-storey building
- energy auditing process
- system operation for energy efficiency and relevant standards
- implementing energy management procedures for a building
- building management system (BMS) attributes including functions, hardware, inputs and outputs
- energy management principles
- environmental considerations.
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Assessment Conditions

- Assessors must:
 - have vocational competency in applying energy management principles at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015 or its replacement* and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.
- 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.
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