



Australian Government

MEM23143A Apply energy management principles

Release: 1

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Modification History

Release 1 (MEM05v9).

Unit Descriptor

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

Application of the Unit

The unit applies to technicians in enterprises designing, manufacturing, installing, servicing or maintaining heating, ventilation, air conditioning and refrigeration (HVAC/R) equipment who are required to determine or audit energy management procedures for a building. The unit assumes that the building has a BMS.

Licensing/Regulatory Information

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

Pre-Requisites

MEM23004A	Apply technical mathematics
MEM23006A	Apply fluid and thermodynamics principles in engineering

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

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| 1 | Determine energy sources used in HVAC/R and their primary function in building energy management programs | 1.1 | Obtain and implement work health and safety (WHS) and environmental requirements for a given 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 principle hardware components in a BMS |
| | | 1.5 | Identify energy requirements for major system components 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 as required on any contingencies and unexpected situations and take appropriate action based |

on specifications, codes and standards, and enterprise procedures

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| 3 | Conduct an energy audit for a building | 3.1 | Determine objectives of a HVAC/R 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 |
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| 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 |

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- monitoring data of a BMS
- implementing energy management procedures for a building
- planning and conducting an energy audit
- using relevant software tools effectively
- interpreting drawings and specifications
- communicating effectively with others
- working in teams with others
- communicating technical and procedural requirements to others
- dealing effectively with unexpected situations

Required knowledge

Required knowledge includes:

- units of measure, 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
- BMS attributes, such as functions, hardware, inputs and outputs

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently: • implement WHS workplace procedures and practices, including the use of risk control measures
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	• demonstrate essential knowledge and skills as described in this unit • demonstrate competency within a timeframe typically expected of the discipline, work function and industrial environment • demonstrate the ability to apply energy management principles, monitor building management systems, conduct energy audits and plan efficient energy management operations.
Context of and specific resources for assessment	• This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. • The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.
Method of assessment	• Assessment must satisfy the endorsed Assessment Guidelines of the MEM05 Metal and Engineering Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure correct interpretation and application. • Assessment may be applied under project-related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is not only able to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

WHS requirements	WHS requirements include: • legislation • protective equipment • material safety management systems • hazardous substances and dangerous goods code • local safe operation procedures • awards provisions
Environmental requirements	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	Appropriate personnel may include: • supervisor • leading hand • foreman • manager • engineer • technician • trainer • mentor • team member • customer • client
Common energy sources	Common energy sources include: • electricity • steam • hot water

	• high temperature hot water • natural gas • liquefied petroleum gas (LPG) • solar • waste heat • petrol • diesel
Enterprise procedures	Enterprise procedures may include: • the use of tools and equipment • instructions, including job sheets, plans, drawings and designs • reporting and communication • manufacturer specifications • operational procedures • industry standards
Energy management	Energy management may include: • night cycles • optimum stop/start • time and event programs • night purge • outside air percentage control • enthalpy • power demand control • duty cycle • presence detection • lighting control
Auditing process	Auditing process may include: • energy costs and tariffs • energy consumption • predicting future costs • plotting consumption trends • historical data • collecting information using surveys • comparisons of actual to recorded usage • energy balance • instrumentation • BMS • estimating savings potential

Unit Sector(s)

Competency field

Unit sector Engineering science

Custom Content Section

Not applicable.