



**Australian Government**

**UEENEEJ136A Evaluate and report on  
building services energy management  
systems**

Release 3

# **UEENEEJ136A Evaluate and report on building services energy management systems**

## **Modification History**

Not Applicable

## **Unit Descriptor**

### **Unit Descriptor**

1)

#### **1.1) Descriptor**

This unit covers evaluation of energy management building services plant and machinery. It encompasses working safely, setting up and conducting evaluation measurements, evaluating energy use from measured parameters and reporting results including recommending any resulting corrective actions.

## **Application of the Unit**

### **Application of the Unit** 4)

This unit is intended for competency development entry-level employment-based programs incorporated in approved contracts of training. It applies to any formal recognition for this standard at the aligned AQF 5 level or higher.

## Licensing/Regulatory Information

### 1.2) License to practice

The skills and knowledge described in this unit may require a license to practice in the workplace subject to regulations for undertaking of refrigeration or air conditioning work. Practice in workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control, lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical devices, site rehabilitation.
2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

## Pre-Requisites

**Prerequisite Unit(s)** 2)

### 2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEJ109A	Verify functionality and compliance of refrigeration and air conditioning installations
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE003B	Solve problems in extra-low voltage single path circuits

**Prerequisite Unit(s)** 2)

- UEENEEE105A Fix and secure electrotechnology equipment
- UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications
- UEENEEE137A Document and apply measures to control OHS risks associated with electrotechnology work
- UEENEEJ102A Prepare and connect refrigerant tubing and fittings
- UEENEEJ103A Establish the basic operating conditions of vapour compression systems
- UEENEEJ104A Establish the basic operating conditions of air conditioning systems
- UEENEEJ106A Install refrigerant pipe work, flow controls and accessories
- UEENEEJ107A Install air conditioning and refrigeration systems, major components and associated equipment
- UEENEEJ108A Recover, pressure test, evacuate, charge and leak test refrigerants
- UEENEEJ110A Select refrigerant piping, accessories and associated controls
- UEENEEJ111A Diagnose and rectify faults in air conditioning and refrigeration systems and components
- UEENEEJ113A Commission air conditioning and refrigeration systems
- UEENEEJ153A Find and rectify faults motors and associated controls in refrigeration and air conditioning systems
- UEENEEJ170A Diagnose and rectify faults in air conditioning and refrigeration control systems

**Prerequisite Unit(s) 2)**

- UEENEEJ194A Solve problems in low voltage refrigeration circuits
- UEENEEP012A Disconnect / reconnect composite appliances connected to low voltage installation wiring
- UEENEEP017A Locate and rectify faults in low voltage composite appliances using set procedures
- UEENEEP024A Attach cords and plugs to electrical equipment for connection to a single phase 230 Volt supply
- UEENEEP025A Attach cords, cables and plugs to electrical equipment for connection to 1000 Va.c. or 1500 Vd.c. supply

## **Employability Skills Information**

**Employability Skills 3)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

## **Elements and Performance Criteria Pre-Content**

- 6) Elements describe the essential outcomes of a unit      Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to evaluate and report on energy management.	1.1 OHS procedures for a given work area are identified, obtained and understood
	1.2 Established OHS risk control measures and procedures are followed in preparation for the work.
	1.3 The extent of evaluation is determined from specifications of building services plant and machinery and discussion with appropriate personnel.
	1.4 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
	1.5 Tools, testing devices, and materials needed to carry out the work are obtained and checked for correct operation and safety.
2 Evaluate energy management.	2.1 OHS risk control measures and procedures for carrying out the work are followed.
	2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3 In-depth knowledge of the energy management of building services plant and machinery is applied to the evaluation process
	2.4 Energy evaluation tests are set up in accordance with established test methods and procedures for each particular parameter under scrutiny.
	2.5 Energy evaluation tests are carried out methodically and results and comments systematically noted.
	2.6 Unexpected situations are dealt with safely and with the approval of an authorised person.
	2.7 Evaluation is carried out without damage to systems, circuits, the surrounding environment or services and using sustainable energy practices.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
3 Report on energy management	3.1 OHS work completion risk control measures and procedures are followed.
	3.2 Work site is cleaned and made safe in accordance with established procedures.
	3.3 Results of energy management evaluation are documented including recommendations and justification for improvements.
	3.4 Energy evaluation report is forwarded to appropriate person(s).

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and evaluating and reporting on energy management.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

#### **KS01-EJ136A**

#### **Energy management fundamentals**

Evidence shall show an understanding of energy management fundamentals, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1 Typical energy sources and characteristics

- supply authorities
- standard units of measurement
- electricity
- steam
- hot water
- high temperature hot water
- town gas
- LP Gas
- solar
- waste heat
- petrol
- diesel

T2 Energy Usage

- office lighting
- air conditioning systems
- refrigeration systems
- security systems
- computer systems
- standby/emergency systems
- lifts and escalators

T3 Energy auditing process

- energy costs and tariffs



## **REQUIRED SKILLS AND KNOWLEDGE**

- energy consumption
- predicting future costs
- plotting consumption trends
- historical data
- collecting information using surveys
- comparisons of actual to recorded usage
- energy balance
- instrumentation
- building management systems
- estimating savings potential

### **T4 System operation for energy efficiency**

- types of systems
- efficiency in building structures
- operation of a vehicle fleet
- proportion total energy consumption against individual systems
- passive building design
- preventative maintenance procedures
- monitoring building management systems
- operation of major and minor plant
- inappropriate energy management procedures
- building plant control systems
- Australian standards/local authority requirements
- case studies

### **T5 Implementing energy management procedures for a building**

- recording base year data
- climatic conditions for locality
- establishing energy costs and tariffs
- building and systems surveys
- payback period
- survey analysis
- energy conservation procedures
- informing stockholders
- recommendations and documentation
- implementation issues
- monitoring, evaluation and follow up

## **KS02-EJ136A**

## **Building management systems**

Evidence shall show an understanding of building management systems, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

## **REQUIRED SKILLS AND KNOWLEDGE**

### **T1 Functions of a BMS**

- autonomous Functions
- input
- output
- general I/O
- installation management items
- energy management
- risk management
- information processing
- objectives
- building running costs
- smoke control as per AS 1668 part 1

### **T2 BMS hardware**

- system architecture
- communication devices
- substations
- PC's
- interfaces with other systems

### **T3 Input and output functions**

- digital inputs/outputs
- digital output with status feedback
- analogue input/output
- sensors
- alarms

### **T4 Energy management**

- night cycle
- optimum stop/start
- time and event programs
- night purge
- outside air percentage control
- enthalpy control
- power demand control
- duty cycle
- presence detection
- lighting control

### **T5 Information processing functions**

- computer systems
- central system management

## REQUIRED SKILLS AND KNOWLEDGE

- programs
- system configuration and security
- operator - machine interface
- data points

### T6 Risk and maintenance management

- system files
- fire, intruder control
- access control

## Evidence Guide

### EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package. .

The Evidence Guide forms an integral part of this Unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

### Overview of Assessment

#### 9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical

## EVIDENCE GUIDE

equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work influence decisions about how/how much the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

### **Critical aspects of evidence required to demonstrate competency in this unit**

#### **9.2)**

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:

## EVIDENCE GUIDE

- Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Evaluate and report on energy management as described in 8) and including:
    - A Determining the extent of the evaluation.
    - B Setting up and conducting appropriate examinations and tests.
    - C Reporting evaluation including recommendation for improving energy efficiency
    - D Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items

## EVIDENCE GUIDE

### **Context of and specific resources for assessment**

#### **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

Evidence should show demonstrated competency in evaluating and reporting on energy management.

### **Method of assessment**

#### **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

### **Concurrent assessment and relationship with other units**

#### **9.5)**

There are no concurrent assessment recommendations for this unit.

## Range Statement

### RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to at least two different types of building services plant and machinery.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

## Unit Sector(s)

Not Applicable

## Competency Field

### 2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	5	Writing	5	Numeracy	5
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### 2.2) Literacy and numeracy skills

Competency Field            5)

Refrigeration and Air Conditioning