



Australian Government

Department of Education, Employment and Workplace Relations

UEENEEE146A Identify effects of energy on machinery and materials in an energy sector environment

Release: 1

UEENEEE146A Identify effects of energy on machinery and materials in an energy sector environment

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit covers effects of energy on machinery and/or materials used in an energy sector environment are identified and completed in an agreed time, to a quality standard and using appropriate technology mediums, where required. It encompasses working safely, applying knowledge of identifying the effects of energy on machinery and materials in an electrotechnology environment.

Application of the Unit

Application of the Unit 2)

This unit shall apply to persons entering work in energy sector and may be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit do not require a license to practice in the workplace. However practice in this unit is subject to regulations directly related to occupational health and safe and contracts of training such as new apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant,

License to practice

3)

machinery and equipment such as elevating work platforms, powder operated fixing tools, and 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 apparatus and 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)

4)

Competencies

4.1)

There are no prerequisite competencies for this unit.

Literacy and numeracy skills

4.2)

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 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills

5)

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 competency standard 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 identify effects of energy on machinery and materials.	1.1 Instructions for identifying effects of energy on machinery or materials are communicated and confirmed to ensure clear understanding.
	1.2 OHS policies and procedures are communicated and confirmed to ensure they are understood as they apply to the carrying out of the work.
	1.3 Tools, equipment and personnel protective equipment necessary for the work are identified, scheduled and checked to ensure they work correctly as intended and are safe to use in accordance with established procedures.
	1.4 Appropriate personnel are consulted to ensure effects of energy on machinery or materials are identified and coordinated effectively with others involved.
	1.5 Resources and materials needed to do the work are confirmed, scheduled and obtained in accordance with established procedures.
	1.6 Schedule for identifying effects of energy on machinery or materials including practices for working safely are confirmed in accordance with instructions and requirements.
2 Identify effects of energy on machinery and materials.	2.1 OHS policies and procedures and safe work practices are followed to eliminate or minimise incidents.
	2.2 Schedule for identifying effects of energy on machinery or materials work is followed to ensure work is completed in an agreed time, to a quality standard and with a minimum of waste.

ELEMENT	PERFORMANCE CRITERIA
3 Check results of the effects of energy on machinery and materials.	2.3 Further instructions are sought from appropriate personnel in the event of unplanned happenings or conditions.
	2.4 Ongoing checks of work quality are undertaken in accordance with instructions and requirements.
	3.1 Final checks are made to ensure the effects of energy on machinery or materials as identified conforms with instructions and to requirements.
	3.2 Appropriate personnel are notified of completion of the computations.
	3.3 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures.
	3.4 Work area is cleaned up and made safe and sustainable energy practices are followed.
	3.5 Appropriate records are updated in accordance with instructions and established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) 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 identifying effects of energy on machinery and materials in an energy sector environment.

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

KS01-EE146A Applied physics concepts

Evidence shall show an understanding of applied physics concepts to an extent indicated by the following aspects:

T1 Motion in two dimensions encompassing:

- vertical and horizontal components of velocity
- determination of the vertical component of velocity
- resolution of velocity into components
- time of flight, range, effect of air resistance
- centripetal acceleration, force causing the centripetal acceleration
- Newton's law of universal gravitation
- satellites in circular orbits
- Momentum in two dimensions

Note:

Examples are: vector form of Newton's second law of motion, Newton's second law of motion in terms of momentum, law of conservation of momentum

T2 Electricity and magnetism encompassing:

- Electric fields

Note:

Examples are: Coulomb's law, principle of superposition, electric field, pictorial representation of electric fields, superposition of electric fields, electric field due to one or two charged plates, electric fields and conductors, electric field inside a hollow conductor, electric fields near sharp points

- The motion of charges particles in electric fields

Note:

Examples are: electric, potential difference, acceleration in a constant electric field, motion of a charged particle in a constant electric field

- Magnetic fields

Note:

Examples are: magnetic fields and their pictorial representation, magnetic force on a current-carrying conductor

- The motion of charges particles in magnetic fields

Note:

Examples are: force on a charged particle in a magnetic field, motion of a charged

REQUIRED SKILLS AND KNOWLEDGE

particle at right angles to a magnetic field

T3 Light and matter

- Electromagnetic waves

Note:

Examples are: characteristics of electromagnetic waves, speed, frequency and wavelength

The interference of light

Note:

Examples are: coherent wave sources, interference, two-source interference, diffraction, two-slit interference, transmission diffraction gratings, speckle

- Photons

Note:

Examples are: photons, the photoelectric effect, x-rays

- Wave behaviour of particles

Note:

Examples are: wave behaviour of particles, experimental evidence for wave behaviour of particles

T4 Atoms and nuclei

- The structure of the atom

Note:

Examples are: line emission spectrum, energy levels in atoms, spectrum of atomic hydrogen, ionization energy, continuous spectrum, line absorption spectrum, fluorescence, stimulated emission

- The structure of the nucleus

Note:

Examples are: composition of nuclei, the nucleon force, isotopes, mass defect and binding energy, conservation laws in nuclear reactions

- Radioactivity

Note:

Examples are: stable and unstable nuclei, types of decay of unstable nuclei, alpha decay, beta minus decay, beta plus decay, half-life and activity

- Nuclear fission and fusion

Note:

Examples are: spontaneous and induced nuclear fission, chain reaction

T5 Skills

- Experimental skills

Note:

Examples are: purpose and variables, procedure, observation, presentation, interpretation

- Investigation design skills

REQUIRED SKILLS AND KNOWLEDGE

Note:

Examples are: designing and investigation, evaluating and investigation

- Information skills

Note:

Examples are: planning an information search, searching for information, evaluating information

- Communication skills

Note:

Examples are: oral communication, written communication, evaluation of oral and written communications

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 the 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. It is recognised that, 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 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 have a bearing on the decision as to how much and how detailed 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 – UEE11'. 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:
 - 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, policies and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
- Identify effects of energy on machinery and materials in an energy sector environment as described in 8) and including:

- A Understanding work instruction.
- B Obtaining and checking tools and equipment.
- C Following work schedules.
- D Identifying the effects of energy appropriately.
- E Returning tools and surplus resources as required.
- F Updating work records.
- G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

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 in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment,

conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to identifying effects of energy on machinery and materials in an energy sector environment.

**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 that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended 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

10) 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 shall be demonstrated in relation to identifying effects of energy on machinery and materials in energy sector environments in any of the following disciplines:

- Appliances
- Business equipment
- Computers
- Data Communications
- Electrical
- Electrical Machines
- Electronics
- Fire protection
- Instrumentation
- Refrigeration and Air Conditioning
- Renewable / sustainable energy
- Security technology

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

Competency Field	11)
	Electrotechnology