



Australian Government

UEECD0023 Identify effects of energy on machinery and materials in an energy sector environment

Release: 1

UEECD0023 Identify effects of energy on machinery and materials in an energy sector environment

Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Application

This unit involves the skills and knowledge required to identify effects of energy on machinery and materials in an energy sector environment.

It includes working safely and applying knowledge of the effects of energy on machinery and/or materials in an electrotechnology environment.

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

Pre-requisite Unit

Not applicable

Competency Field

Cross Discipline

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to identify effects of energy on machinery and/or materials

PERFORMANCE CRITERIA

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

- 1.1** Work instructions for identifying effects of energy on machinery or materials are communicated and applied to ensure clear understanding
- 1.2** Work health and safety (WHS)/occupational health and

- safety (OHS) requirements and workplace procedures are communicated, confirmed and applied
- 1.3 Tools, equipment and personal protective equipment (PPE) required for work are identified, scheduled and checked to ensure they work correctly and are safe to use in accordance with workplace procedures
 - 1.4 Relevant person/s is consulted to ensure effects of energy on machinery and/or materials are identified and coordinated effectively with others involved
 - 1.5 Resources and materials required for work are confirmed, scheduled and obtained in accordance with workplace procedures
 - 1.6 Schedule for identifying effects of energy on machinery and/or materials and practices for working safely are confirmed in accordance with work instructions and manufacturer specifications
- 2 Identify effects of energy on machinery and/or materials**
- 2.1 WHS/OHS requirements and workplace procedures are followed to eliminate or minimise incidents
 - 2.2 Schedule for identifying effects of energy on machinery and/or materials work is followed to ensure work is completed in accordance with timeframes, quality standards and minimum of waste
 - 2.3 Further instructions are sought from relevant person/s in the event of unplanned events and/or conditions
 - 2.4 Ongoing checks of work quality are undertaken in accordance with work instructions and manufacturer specifications
- 3 Check results of the effects of energy on machinery and/or materials**
- 3.1 Final checks are made to ensure the effects of energy on machinery and/or materials, as identified, conforms with work instructions and manufacturer specifications
 - 3.2 Relevant person/s is notified of completion of the calculations
 - 3.3 Tools, equipment, surplus resources and materials are cleaned, checked and returned to storage in accordance with workplace procedures

- 3.4 Work area is cleaned up, made safe and sustainable energy practices are followed
- 3.5 Relevant records are updated in accordance with work instructions and workplace procedures

Foundation Skills

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

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEENEEE146A Identify effects of energy on machinery and materials in an energy sector environment.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEECD0023 Identify effects of energy on machinery and materials in an energy sector environment

Modification History

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria on at least one occasion and include:

- understanding work instruction
- obtaining and checking tools and equipment
- following work schedules
- identifying the effects of energy appropriately
- returning tools and surplus resources as required
- updating work records
- dealing with unplanned events
- applying relevant work health and safety (WHS)/occupational health and safety (WHS/OHS) requirements, including using risk control measures
- cleaning work area, making safe and following sustainable energy practices.

Knowledge Evidence

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

- applied physics concepts, including:
 - 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:
 - vector form of Newton's second law of motion, Newton's second law of motion in terms of momentum, law of conservation of momentum

- electricity and magnetism encompassing:
 - electric fields:
 - 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 and electric fields near sharp points
 - the motion of charges particles in electric fields:
 - electric, potential difference, acceleration in a constant electric field, and motion of a charged particle in a constant electric field
 - magnetic fields:
 - magnetic fields and their pictorial representation, and magnetic force on a current-carrying conductor
 - the motion of charges particles in magnetic fields:
 - force on a charged particle in a magnetic field, and motion of a charged particle at right angles to a magnetic field
- light and matter:
 - electromagnetic waves:
 - characteristics of electromagnetic waves, speed, frequency and wavelength
 - the interference of light:
 - coherent wave sources, interference, two-source interference, diffraction, two-slit interference, transmission diffraction gratings and speckle
 - photons:
 - photons, the photoelectric effect and x-rays
 - wave behaviour of particles:
 - wave behaviour of particles, and experimental evidence for wave behaviour of particles
- atoms and nuclei:
 - the structure of the atom:
 - line emission spectrum, energy levels in atoms, spectrum of atomic hydrogen, ionization energy, continuous spectrum, line absorption spectrum, fluorescence and stimulated emission
 - the structure of the nucleus:
 - composition of nuclei, the nucleon force, isotopes, mass defect and binding energy, and conservation laws in nuclear reactions
 - radioactivity:
 - 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:
 - spontaneous and induced nuclear fission, and chain reaction
- skills:
 - experimental skills:
 - purpose and variables, procedure, observation, presentation and interpretation

- investigation design skills:
 - designing and investigation, evaluating and investigation
- information skills:
 - planning an information search, searching for information and evaluating information
- communication skills:
 - oral communication, written communication, and evaluation of oral and written communications
- problem-solving techniques
- relevant calculations
- relevant manufacturer specifications and operating instructions
- relevant job safety assessments or risk mitigation processes
- relevant tools, equipment and personal protective equipment (PPE)
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace quality, policies and procedures
- sustainable energy principles.

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 suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated suitable 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 simulations
- relevant and appropriate materials, tools, facilities, equipment and PPE currently used in industry
- resources that reflect current industry practices in relation to identifying effects of energy on machinery and materials in an energy sector environment
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

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