



Australian Government

UEEIC0038 Solve problems in density/level measurement components and systems

Release: 1

UEEIC0038 Solve problems in density/level measurement components and systems

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 set up density/level measurement components and systems and provide solutions to a problem as it applies to a process and control work function.

It includes working safely, setting up and calibrating density/level measuring components and systems, applying problem-solving techniques, using of a range of measuring devices, and providing solutions derived from measurements and calculations to problems in density/level measurement components and systems.

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

Pre-requisite Unit

UEECD0007 Apply work health and safety regulations, codes and practices in the workplace

UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications

UEEIC0047 Use instrumentation drawings, specifications, standards and equipment manuals

UEEIC0041 Solve problems in pressure measurement components and systems

Competency Field

Instrumentation & Control

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential Performance criteria describe the performance needed to

outcomes.

demonstrate achievement of the element.

1 Prepare to work on density/level measurement components and system

- 1.1** Work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures for a given work area are obtained and applied
- 1.2** Hazards are identified, risks assessed and control measures implemented
- 1.3** Nature of the density/level measurement problem is identified from documentation or appropriate person/s to determine the scope of work to be undertaken
- 1.4** Appropriate person/s is consulted to ensure work is coordinated effectively with others
- 1.5** Materials required for the work are determined in accordance with workplace procedures
- 1.6** Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety in accordance with workplace procedures

2 Solve density/level measurement problems

- 2.1** WHS/OHS risk control work measures and workplace procedures are followed
- 2.2** Need to inspect, test or measure electrical components of live electrical work is determined in accordance with job requirements and workplace safety procedures
- 2.3** Density/level measurement apparatus is checked and isolated in accordance with WHS/OHS requirements and workplace procedures
- 2.4** Relevant methods are used to solve measurement problems from tests and calculated values as they apply to density/level measurement systems
- 2.5** Unplanned situations are responded to in accordance with workplace procedures and with the approval of an authorised person/s
- 2.6** Problems are resolved using sustainable energy principles and without damage to apparatus, the surrounding environment or services in accordance with workplace procedures

3 Complete work and

- 3.1** WHS/OHS work completion risk control measures and

document work activities

workplace procedures are followed

- 3.2** Worksite is cleaned and made safe in accordance with workplace procedures
- 3.3** Justification for solutions used to resolve density/level measurement problems is documented
- 3.4** Work completion is documented and appropriate person/s notified in accordance with 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.

Density/level measurement apparatus and system, fault finding, maintenance or development work functions must include at least three of the following:

- determining the operating parameters of a density/level measuring system
- setting up and calibrating a density/level measuring system
- altering an existing density/level measuring system to comply with specified operating parameters
- developing a density/level measuring system to comply with a specified function and operating parameters

Unit Mapping Information

This unit replaces and is equivalent to UEENEEI103A Solve problems in density/level measurement components and systems.

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 UEEIC0038 Solve problems in density/level measurement components and systems

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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, performance criteria and range of conditions on at least two separate occasions and include:

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including applying safe working practices
- applying sustainable energy principles and practices
- cleaning and making work site safe
- completing work and documenting work activities
- dealing with unplanned events/situations in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- documenting completed work
- implementing risk control measures
- obtaining tools, equipment and testing devices
- determining work on density/level measurement components and systems
- solving density/level measurement problems
- solving problems in density/level measurement systems
- working with density/level apparatus.

Knowledge Evidence

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

- introduction to level/density measurement. including:
 - definitions density and relative density (sg)
 - application
 - factors affecting density
 - density measurement
 - Archimedes principle
 - density calculations
 - types and applications of level/density transducers

- transducers input/outputs (I/O) - measurement and evaluation
- transducer connections
- level/density measurement techniques sight type, including:
 - dipstick and hook gauges
 - tubular and flat glass gauges
 - accuracy of flat glass gauges
 - magnetically coupled gauges
 - float level measuring devices
 - application of float devices
- level/density measurement - force type techniques, including:
 - comparison of float and displacement type systems
 - interface sensing devices
 - torque tube type displacer operation
 - torque tube type displacer construction
 - pneumatic and electronic transmitters
- level/density measurement - pressure-type techniques, including:
 - diaphragm level detectors
 - applications of diaphragm level detectors
 - differential pressure cells advantages and disadvantages
 - density measurement using D/P cells
- level/density measurement - electrical type techniques, including:
 - application of conductance probes
 - operation of a conductivity-level controller
 - resistance tapes level detectors
 - capacitance probes level detectors
 - ultrasonic level detectors
 - microwave-based level detectors
 - nucleonic-type level sensors
 - load cells used for level measurement
- level/density measurement - non-intrusive type techniques, including:
 - radiation-type density sensor
 - hydrometer element used for density measurement
 - vibrating tube type liquid density meter
- level/density measurement calibration for:
 - D/P cell calculations
 - D/P calibration
 - open tank installation level measurement
- problem solutions in density/level measurement systems
- relevant job safety assessments or risk mitigation processes, including risk control measures
- relevant manufacturer specifications

- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace policies and procedures
- safe working practices.

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 workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated 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 other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - -

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