



Australian Government

UEEIC0039 Solve problems in flow measurement components and systems

Release: 1

UEEIC0039 Solve problems in flow 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 solve problems in flow measurement components and systems.

It includes identifying and solving problems in flow measurement components and systems as they apply to various processes and control work functions. It also includes working safely and completing documentation.

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

Elements describe the essential outcomes.

1 Prepare to work on flow

PERFORMANCE CRITERIA

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

1.1 Work health and safety (WHS)/occupational health and

measurement components and system		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 flow measurement problem is identified from documentation and/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 a flow 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 work is determined in accordance with job requirements and workplace safety procedures
	2.3	Flow measurement apparatus is checked and isolated in accordance with WHS/OHS requirements and workplace procedures
	2.4	Relevant methods/techniques are used to solve measurement problems and calculated values as they apply to flow 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 document work activities	3.1	WHS/OHS work completion risk control measures and 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 flow measurement problem 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.

Flow 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 flow measuring system
- setting up and calibrating a flow measuring system
- altering an existing flow measuring system to comply with specified operating parameters
- developing a flow measuring system to comply with a specified function and operating parameters

Unit Mapping Information

This unit replaces and is equivalent to UEENEEI104A Solve problems in flow 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 UEEIC0039 Solve problems in flow measurement components and systems

Modification History

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

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 work practices
 - implementing risk control measures
- applying sustainable energy principles and practices
- completing work and documenting work activities
- connecting pneumatic, hydraulic and electric equipment
- dealing with unplanned events/situations in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- identifying flow measurement components and system
- identifying specifications, industry standards and equipment manuals
- solving problems in flow measurement systems.

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 flow measurement in closed conduits, including:
 - basic principles of fluid flow
 - International System of Units (SI) units pertaining to flow and conversion factors to SI units
 - volumetric and mass flow
 - Reynolds numbers
 - behaviour of fluid flow in pipes
 - correction methods
 - flow terminology
 - pressure loss

- integration
- uses of flow meters
- types and applications of flow transducers
- transducers input/outputs - measurement and evaluation
- transducer connections
- differential pressure flow measurement, including:
 - Bernoulli's theorem and square root head law
 - calculations of the differential pressure
 - calibration of the associated secondary instrument
 - installation and types of differential pressure flow meters and primary elements
- differential pressure flow measurement circuits, including define turndown and accuracy, output signals, square root extractors, scaling factors and signal scaling
- electromagnetic, vortex and ultrasonic flow meters, including:
 - construction, operating principles, performance, application and installation
 - installation of vortex and ultrasonic flow meters
 - operating principles and applications of ultrasonic flow meters
- flow measurement in closed conduits, including:
 - basic principles of fluid flow
 - behaviour of fluid flow in pipes
 - correction methods and flow terminology
 - integration, pressure loss, and Reynolds numbers
 - SI units pertaining to flow and conversion factors to SI units
 - types and applications of flow transducers, connections, and transducer input/outputs (I/O) - measurement and evaluation
 - uses of flow meters
 - volumetric and mass flow
- mass flow measurement and volumetric flow rate correction, including:
 - applications, installation, operating principles and performance of mass flow meters
 - calculations of corrected flow rate
 - calibration of corrected systems components
 - mass flow measurement
 - volumetric flow rate correction
- mechanical flowmeters for liquid service, including:
 - operating principles of mechanical flow meters
 - performance of mechanical flow meters
 - applications of mechanical flow meters
 - installation of mechanical flow meters
 - operating principles of gas flow meters
 - performance of gas flow meters
 - applications of gas flow meters

- installation of gas flow meters
- open-channel flow measurement and flow meter calibration, including:
 - calculations of the head generated
 - flow meter calibration
 - installation of open channel flow meters
 - non-linear head/flow relationships
 - open channel flow measurement
 - operating principles of secondary instruments
 - principles of fluid flow in open channels
 - principles of head/flow relationships
- problems in flow 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, including safe work practices
- specifications, industry standards and equipment manuals
- sustainable energy principles and practices
- variable area flow meters and turbine flow meters, including:
 - applications, installation, and operating principles and performance of variable area and turbine meters
 - density correction calculations and scaling factors
 - variable area meters performance factors.

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>