Australian Government

Assessment Requirements for UEEIC0047 Use instrumentation drawings, specifications, standards and equipment manuals

Release: 1

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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 risk control measures
- conveying instrumentation information and ideas using drawings and diagrams
- determining connections between pneumatic, hydraulic and electrical equipment
- determining location of equipment from instrumentation drawings and specifications
- identifying and using instrumentation drawings, specifications, industry standards and equipment manuals
- interpreting instrumentation drawings, specifications, industry standards and equipment manuals for process controls and instrumentation drawing layouts, conventions and symbols
- sketching of instrumentation and control drawings
- using instrumentation drawings, diagrams and manuals
- using workplace conventions in freehand drawings.

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:

- industrial instrumentation. including:
  - introduction to the purposes of measurement in industrial processes
  - instrument control loops
  - types of measurement in these processes
  - local and remote measurement
  - measurement signal methods
  - signal transmissions electrical standards
  - signal transmissions pneumatic standards
  - flow, temperature, pressure and other appropriate measurements
  - identification and purpose of instruments measuring processes directly and those

measuring indirectly
    - instrumentation and control components: sensors, transducers, converters and transmitters
- instrument standards, including:
    - instrumentation standards
    - relationship between standards
    - using standards
    - fluids in process piping colour coding
    - instruments symbols
- instrumentation terminology and International System of Units (SI), including:
    - SI base units
    - SI derived units
    - scientific and engineering notation
    - SI prefixes
    - instrumentation metric units
    - non-standard SI units - kg/cm2, and so on
    - conversion of units
    - instrumentation terminology:
        - span
        - range
        - accuracy
        - precision
        - errors
        - zero
        - repeatability
        - sensitivity
        - hysteresis
- calibration of link and lever instruments, including:
    - principles of levers and links and calibration of indicator recorder instrument
    - calibration terms
    - calibrate a link and lever instrument
    - interpret calibration data so as to identify the types of error displayed by an instrument and whether the instrument is within its specified accuracy
    - interpretation of graphs and tables associated with instrumentation
- instrumentation safe working practices, including:
    - identification of instrumentation and control hazards
    - risk control measures for instrumentation work
    - risk assessment
- instrumentation drawings, diagrams and manuals, including:
    - electrotechnology drawing symbols for instrumentation and control (electrical/electronic circuits, instrument circuits/diagrams, programmable logic controller (PLC) diagrams,

pneumatic and hydraulic)
- standards used in instrumentation drawings (ISA, ASME, Australian Standards (AS), and SAMA)
- drawings used in instrumentation - schematic, single line, wiring, PLC diagrams, process flow diagrams - brief instrument information, process loop diagrams - details, terminals and types of instruments
- manufacturers data sheets, manuals, specifications and test procedures - instrumentation manuals, catalogues and drawings, including:
  - interpretation of the specifications contained within instrumentation manuals, catalogues and drawings
  - interpretation of the test procedures contained within instrumentation manuals, catalogues and drawings
  - comparison of data presented in different forms for the same equipment.
  - identification of data relevant to instrumentation from a range of publicity material
  - extraction of information such as calibration, testing or installation procedures from manuals, specification sheets and drawings
- quantity take-offs and parts lists, including:
  - part numbers for components, assemblies and equipment
  - parts list for a specified project or installation from manuals, catalogues, specifications and drawings
  - list of equipment, required to undertake a specified project or installation, from manuals, catalogues, specifications and drawings
  - identification and extraction of a part number for an actual sample component or part from a manual, catalogue, specification and/or drawing
- sketching of instrumentation and control drawings, including:
  - sketching a schematic circuit diagram from a given circuit board layout diagram, wiring or installation drawing and installation or modification of a specified project using information contained within manuals
  - sketching a part or equipment layout needed to perform a specified task, such as installation or modification, from given manuals, catalogues, specifications and drawings
- principles of process control
- relevant instrument industry standards including fluids in process piping colour coding and instrument symbols
- relevant manufacturer specifications
- relevant safe work statements (SWMS)/job safety assessments or risk mitigation processes, including risk control measures and instrumentation safe working practices
- relevant WHS/OHS legislated requirements
- relevant workplace documentation, including catalogues, drawings, manufacturer's data sheets, manuals, specifications and test procedures
- instrumentation manuals, catalogues and drawings
- relevant workplace policies and procedures.

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