



Australian Government

UEEEL0055 Overhaul and repair major switchgear and control gear

Release: 1

UEEEL0055 Overhaul and repair major switchgear and control gear

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 overhaul and repair switchgear and control gear rated in excess of 20 kiloamps (kA).

It includes planning and documenting the scope of service work required, arranging for the overhaul and repair to be carried out, verifying compliance of overhauled/repaired switchgear/control gear and completing the necessary service documentation.

The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).

Competency development activities in this unit are subject to regulations directly related to licensing. Where a licence or permit to practice is not held, a relevant contract of training, such as an Australian Apprenticeship, may be required.

Additional and/or other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

Pre-requisite Unit

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

UEECD0019 Fabricate, assemble and dismantle utilities industry components

UEECD0020 Fix and secure electrotechnology equipment

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

UEECD0043 Solve problems in direct current circuits

or

UEECD0044 Solve problems in multiple path circuits

UEECD0046 Solve problems in single path circuits

Competency Field

Electrical

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare for overhaul/repair of switchgear/control gear

PERFORMANCE CRITERIA

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

- 1.1** WHS/OHS processes and workplace procedures for a given work area are identified and applied
- 1.2** Existing WHS/OHS risk control measures and workplace procedures in preparation for work are followed
- 1.3** Safety hazards that have not previously been identified are noted on job safety assessments, risks assessed and risk control measures implemented
- 1.4** Workplace instructions on the scope of overhaul and/or repair work are received and expected outcomes of work discussed with appropriate person/s
- 1.5** Appropriate person/s is consulted to ensure the work is coordinated effectively with others involved on the worksite
- 1.6** Switchgear/control gear service and repair documentation is read and applied
- 1.7** Sources of materials required for work are determined in accordance with workplace procedures
- 1.8** Tools, equipment and testing devices needed for work are obtained in accordance with workplace procedures and checked for correct operation and safety
- 2 Overhaul switchgear/control gear**
 - 2.1** WHS/OHS risk control measures and workplace procedures for carrying out repair work are followed

- 2.2 Need to inspect, test or measure live electrical work is determined in accordance with WHS/OHS requirements and workplace procedures
 - 2.3 Circuits/machines/plant are checked and isolated in accordance with WHS/OHS requirements and workplace procedures
 - 2.4 Switchgear and control gear are dismantled, parts tagged and stored to prevent loss or damage
 - 2.5 Serviceability of switchgear/control gear components is determined by measurement tests and inspections and results recorded in accordance with workplace procedures
 - 2.6 Materials/replacement parts required to complete repair work are sourced and obtained in accordance with workplace procedures
 - 2.7 Repairs are inspected and tested in accordance with workplace procedures
 - 2.8 Overhaul/repair specifications and work instructions are documented in accordance with workplace procedures
- 3 Document overhaul/repair work**
- 3.1 WHS/OHS work completion risk control measures and workplace procedures are followed
 - 3.2 Reusable, faulty or worn components are tagged and despatched for repair in accordance with workplace procedures
 - 3.3 Repair work is documented in accordance with workplace requirements, stating whether the switchgear/control gear complies with the overhaul specifications and relevant industry standards

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.

overhauling and repair majoring switchgear and control gear must include at least two types of the following switchgear and control gear:

- low voltage (LV) switchgear and control gear rated above 20 kA
- any high voltage (HV) switchgear and control gear

Unit Mapping Information

This unit replaces and is equivalent to UEENEEG129A Overhaul and repair major switchgear and controlgear.

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 UEEEL0055 Overhaul and repair major switchgear and control gear

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, 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 and workplace procedures and practices, including using of risk control measures
- applying sustainable energy principles and practices
- documenting overhaul/repair work
- overhauling and repairing major switchgear/control gear, including:
 - completing service documentation correctly
 - dealing with unplanned events in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
 - determining the state/serviceability of switchgear/control gear correctly
 - interpreting service and repair documentation correctly
 - repairing switchgear/control gear in accordance with relevant industry standards
- preparing for overhaul/repair of switchgear/control gear.

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:

- types and applications of switchgear and control gear
- operating principles of switchgear and control gear
- interlocking systems, including:
 - external interlocking systems such as Castell key systems
 - internal interlocking systems for either safety or that operate in conjunction with Castell key systems
- control and protection of switchgear and control gear
- installation requirements, including:
 - operating specifications for equipment

- areas requiring repairs and maintenance
- determining if repairs/maintenance are to be carried in situ or in workshop environment
- relevant legislation and standards applicable to the installation
- WHS/OHS issues with regard to removing/re-installing heavy equipment
- electrical safety issues with regard to removing/re-installing equipment
- understanding of CFC units
- electrical switchgear and control gear protection methods, including:
 - the operation of switchgear when it opens under load
 - the settings and operation required for both magnetic short circuit and thermal overload with equipment
 - determining the earth fault-loop impedance requirements required to keep touch voltage values within requirements
 - thermal imaging techniques
 - time/current curves from manufacturer specifications
 - equipment to safely test switchgear after repairs or maintenance
 - effectiveness of arc suppression installed within the equipment
 - modern types of switchgear that are computer controlled and programmed
 - modern types of switchgear that are interconnected to other protective devices
 - certification process for any repair or maintenance work performed
 - phase-failure systems
 - verifying the correct fault-level for the installation is consistent with the kiloamp (kA) rating of the equipment
 - x-ray and ultrasonic detection systems with regard to metallurgy
 - different types of lubricants required for different locations, temperatures and humidity
- electrical safe working practices of working safely on or around electrical equipment, including:
 - determining safe working standards and codes of practice for equipment and installations over 20 kA
 - WHS/OHS requirements for equipment and installations over 20 kA
 - working knowledge of operating within the vicinity of live conductors, such as barriers
 - procedures for working on switchgear over 20 kA
 - risks and control measures associated with harmful dusts and airborne contaminants, including thermal insulation, fibrous cement materials and asbestos, and other fibre-reinforced switchboard materials
 - checks and storage methods for maintaining the safety of testing devices.

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 suitable 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, facilities, equipment and personal protective equipment (PPE) currently used in industry
- resources used reflect current industry practices in relation to overhauling and repairing major switchgear and control gear
- applicable documentation, including workplace procedures, equipment specifications, regulations, relevant industry standards, codes of practice and operation manuals.

Links

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