



**Australian Government**

# **UEPOPS406 Operate and monitor D.C. electrical systems**

**Release: 1**

# UEPOPS406 Operate and monitor D.C. electrical systems

## Modification History

**Release 1.** This is the first release of this unit of competency in the UEP Generation Training Package.

## Application

This unit involves the skills and knowledge required to operate and monitor local and remote operation of Direct Current (D.C.) electrical system including switchgears, ring mains, switchboards, rectification and distribution systems.

Electrical systems in power generating facilities distribute electrical power to system components and provide electrical protection for power sources and components.

Competency in this unit requires the ability to plan switching operations work, carry out operation of switch gears, switch boards and rectification systems, test switch gear and rectification equipment operation, analyse switch gear and rectification system equipment faults, inspect and monitor switch gear and switch board systems and the completion of all documentation. Individuals will, in general, work under supervision, in a power generation facility as an operator.

Power generation plant operators are typically trained and authorised to isolate, prepare plant and issue permits to work.

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

### **Note: Workplace practice**

The application of the skills and knowledge described in this unit may require a licence or training permit to practice in the workplace where work is carried out on gas and electrical installations. Additional conditions may apply under state and territory legislative and regulatory licensing requirements.

## Pre-requisite Unit

There are no prerequisite units.

## Competency Field

Operations

## Unit Sector

Electricity generation

## Elements and Performance Criteria

### ELEMENTS

### PERFORMANCE CRITERIA

Elements describe the essential outcomes.

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

#### **1 Plan and prepare for switching operations**

- 1.1** Safety issues related to operating and monitoring Direct Current (D.C.) electrical system plant are identified, in accordance with workplace procedures and Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) regulations and legislative requirements
- 1.2** Work requirements are identified, in accordance with workplace procedures, from appropriate personnel and documentation
- 1.3** Documentation to determine D.C. electrical system plant status is assessed and evaluated, in accordance with workplace procedures
- 1.4** Equipment inspection, preoperational check and field preparation for D.C. electrical system service is carried out, in accordance with workplace procedures and manufacturers' recommendations procedures
- 1.5** Switchboard and equipment operational prerequisites and switching sequences are established, in accordance with workplace procedures and manufacturers' recommendations

#### **2 Carry out operation of switchgears, switchboards and rectification systems**

- 2.1** Operation of switchgear is carried out, in accordance with workplace procedures and manufacturers' recommendations
- 2.2** Isolation, removal and reinstatement of switchgear, switchboards and rectification systems are carried out, in accordance with workplace procedures and manufacturers' recommendations
- 2.3** Paralleling and balancing requirements are assessed, in accordance with workplace procedures, to meet D.C. electrical system stability
- 2.4** Rectification system is operated, isolated and reinstated, in accordance with workplace procedures and manufacturers' recommendations

#### **3 Test switchgear and rectification equipment**

- 3.1** Operational tests are performed, in accordance with

|                                                                        |                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>operation</b>                                                       | workplace procedures                                                                                                                                                                                                                       |
|                                                                        | <b>3.2</b> Switchgear and/or rectification system equipment is observed for correct operational response, in accordance with workplace procedures                                                                                          |
|                                                                        | <b>3.3</b> Corrective action is taken, in accordance with workplace procedures, when response does not meet with documentation, D.C. electrical system integrity or personnel safety requirements                                          |
|                                                                        | <b>3.4</b> Switchgear and/or rectification system equipment is returned to required operational status upon completion of testing, in accordance with workplace procedures                                                                 |
| <b>4 Analyse system, switchgear and rectification equipment faults</b> | <b>4.1</b> Causes of abnormal D.C. electrical system and switchgear operating conditions are identified, in accordance with workplace procedures, and by analysing technical and operational information                                   |
|                                                                        | <b>4.2</b> Corrective action is taken, in accordance with workplace procedures                                                                                                                                                             |
|                                                                        | <b>4.3</b> D.C. electrical system, and switchgear plant integrity and personnel safety are maintained, in accordance with workplace procedures, and in consultation with appropriate personnel and technical and operational documentation |
| <b>5 Inspect and monitor system and switchboards</b>                   | <b>5.1</b> D.C. electrical system and switchgear to be monitored and inspected is physically identified, in accordance with workplace procedures                                                                                           |
|                                                                        | <b>5.2</b> D.C. electrical system and switchgear is monitored and inspected, in accordance with workplace procedures, for normal operation or to detect deviations                                                                         |
|                                                                        | <b>5.3</b> Corrective action is taken, in accordance with workplace procedures                                                                                                                                                             |
|                                                                        | <b>5.4</b> Appropriate personnel are notified, in accordance with workplace procedures, when defects and abnormal operating conditions are detected                                                                                        |
| <b>6 Complete documentation</b>                                        | <b>6.1</b> Equipment problems and status are reported, in accordance with workplace procedures                                                                                                                                             |
|                                                                        | <b>6.2</b> Documentation is updated, 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 Companion Volume Implementation Guide.

## Unit Mapping Information

This unit replaces and is equivalent to UEPOPS406B Operate and monitor d.c. electrical systems.

## Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8>

# Assessment Requirements for UEPOPS406 Operate and monitor D.C. electrical systems

## Modification History

Release 1. This is the first release of this unit of competency in the UEP Generation Training Package.

## Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and includes:

- analysing system, switchgear and rectification equipment, D.C. electrical system and protection faults using diagnostic and test techniques
- applying Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) requirements including:
  - emergency procedure
  - risk control measures
  - safe working practices
- communicating with personnel
- completing documentation using recording procedures
- conducting switching, switchgear, switchboard and rectification system operations
- identifying D.C. electrical system plant status
- implementing legislation, industry standards, codes of practice and regulations
- interpreting manufacturers' specifications and manuals
- monitoring and inspecting equipment and D.C. electrical system operation
- operating switchgear and equipment
- organising resources
- preparing D.C. electrical system plant and/or equipment for operation
- recognising and responding to abnormal D.C. electrical system plant operating conditions
- testing D.C. electrical system, switchgear and rectification equipment operationally using data analysis techniques and tools
- working with permit to work system

## Knowledge Evidence

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

- D.C electrical system plant and equipment, its location and operating parameters

- D.C electrical system plant status
- D.C. switchgear types and characteristics
- legislation, industry standards, codes of practice and regulations
- manufacturers' specifications and manuals
- permit to work system
- typical arrangements of power production plant
- WHS/OHS legislated requirements including:
  - emergency procedure
  - risk control measures
  - safe working practices
- workplace documentation
- workplace policies and procedures

## Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

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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.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

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 currently used in industry
- applicable documentation including workplace procedures, industry standards,
- 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=1715b9fa-e7bd-441c-bb8d-cf22c9c825a8>