

COGPEM56 - SQA Unit Code FP4T 04

Replace components in electrical plant and equipment



Overview

This unit is about your competence in replacing components in Electrical plant and equipment. You will be required to ensure the replaced components meet the required specifications, protect them from damage, replace using the appropriate tools and techniques and making any final adjustments. You will be following your organisation's safe working practices and working within the work permit procedures.

This unit deals with the following:

1. Replace components in electrical plant and equipment

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Previous Version:

Adapted from Unit E3.8 of Process Engineering Maintenance NOS – version February 2004. This unit has been tailored from an electrical unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS5.04) which was originally designated MPS Elec 6

Performance criteria

- You must be able to:*
- P1 work safely at all times, complying with health and safety and other relevant regulations and guidelines
 - P2 obtain all the required components and ensure that they are in a suitable condition for replacement and fit for purpose
 - P3 ensure that any replacement components used meet the required specification
 - P4 take adequate precautions to prevent damage to components, tools and equipment during replacement
 - P5 replace the components in the correct sequence using appropriate tools and techniques
 - P6 make any necessary settings or adjustments to the components to ensure they will function correctly
 - P7 deal promptly and effectively with problems within your control and report those that cannot be solved
 - P8 maintain documentation in accordance with organisational requirements

Knowledge and understanding

You need to know and understand:

- K1 you must have a working knowledge and understanding of what your responsibilities are in respect of Health, Safety and Environment. This should include the limits of your personal responsibility, your legal responsibility for your own health and safety and the health and safety of others
- K2 you must have a working knowledge of the relevant regulations and the safe working practices and procedures required within your work area
- K3 you must have a working knowledge and understanding of the engineering drawings and related specifications to which you will be expected to work, including technical drawings (component, assembly, general arrangements, isometrics, 1st and 3rd angle projections), method statements and product worksheets, tolerances
- K4 you must have a working knowledge and understanding of the component replacement methods and techniques including the types of reconnection that have to be made, and which tools, equipment and methods can be used to replace specific components in specific plant and equipment
- K5 you must have a working knowledge and understanding of handling equipment, methods and techniques. This could be expected to include manual handling pressure and thermal methods and techniques
- K6 you must have a working knowledge and understanding of what your responsibilities are for the tool and equipment care and control procedures thereby ensuring the security of tools and equipment that you use. This could be expected to include ingress protection ratings, explosion protection rating, corrosion, portable appliance testing, heating and ventilation and permit systems
- K7 you must have a working knowledge and understanding of your responsibilities with regard to the reporting lines and procedures in your working environment

Additional Information

Scope/range related to performance criteria

- 1 The level and extent of responsibility will involve you being responsible for ensuring the equipment and work site is safe for others or yourself to work in by following defined procedures. You will be accountable for the integrity of the work site and ensuring the work is recorded in a formal manner. Authorisation for proceeding with the work will be given by authorized signatories within the PTW system

- 2 Equipment to be worked on could include:
 - 2.1 Rotating equipment and tools
 - 2.2 Protection methods
 - 2.3 Electrical distribution systems

- 3 The type of components to be replaced may be robust or fragile. Robust components are those which are resistant to most forms of damage or disruption during their working lives. Fragile components are those which are easily disrupted or damaged. Damage or disruption could be due to physical, chemical or other forces (e.g. Electro-magnetic). Typical robust components could be:
 - 3.1 Components of power/lighting transmission
 - 3.2 Motors/Components of motors
 - 3.3 Components of process control systems
 - 3.4 Heat exchangers
 - 3.5 Components of electrical back-up systems

Typical fragile components could be:

 - 3.6 Components of electrical circuit protectors
 - 3.7 Electrical metering devices
 - 3.8 Circuit boards
 - 3.9 Safety/protection devices
 - 3.10 Components of electrical panels

- 4 The assembly methods and techniques may require a sequential series of steps to complete the removal. The component may be difficult to access and may be surrounded by other fragile/valued components and may need specialised tooling requirements. The specifications to which a candidate would be expected to work to could include:
 - 4.1 Product worksheets
 - 4.2 Technical drawings (components, assembly, general arrangement, isometrics).
 - 4.3 Method statements
 - 4.4 Maintenance schedules

- 5 The assembly operations may be simple or complex. Simple replacement of components refers to situations where the component is quickly and easily removed from its position. Typical examples could include lifting out of plug- in components and undoing threaded fasteners to release the component. Complex replacements refers to situations where the components can only be replaced by disrupting the surrounding areas e.g. by cutting or de- soldering and/or where replacement of one component necessitates replacements of other interacting components
- 6 The quality standards and accuracy to be achieved are as set down in the work specifications

Scope/range related to knowledge and understanding

The Knowledge and Understanding levels expressed indicate the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression "working knowledge and understanding" indicates you are able to:

- 1 Identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials
- 2 Describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "Chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information confirm any additional required detail
- 3 Interpret and apply the information obtained to your role, your working practice and in your expected working environment

COGPEM56 - SQA Unit Code FP4T 04

Replace components in electrical plant and equipment

Developed by Cogent

Version number 1

Date approved May 2010

Indicative review date May 2012

Validity Current

Status Tailored

Originating organisation Cogent

Original URN E3.8

Relevant occupations Engineering Professionals; Engineering and manufacturing technologies; Manufacturing technologies

Suite Process Engineering Maintenance

Key words replace, components, electrical, process, plant, equipment