

COGPEM51

Diagnose and determine the causes of faults in electrical plant and equipment



Overview

This unit is about your competence in diagnosing and finding faults within electrical plant and equipment. You will be required to select the most appropriate fault finding technique and tools to locate the fault and on completion notify the appropriate people. To record the results you will follow company procedures and your organisations safe working practices at all times and working within the work permit procedures.

This unit deals with the following:

- 1 Diagnose and determine the causes of faults in electrical plant and equipment

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

Previous Version:

Adapted from Unit E3.3 of Process Engineering Maintenance NOS – version February 2004. This unit is a contextualised version of a unit produced by the OSC Eng Engineering Competence Standards which was originally designated ECS 6.08 which was originally designed MPS Elec 9.

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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 review and use all relevant information on the symptoms and problems associated with the products or assets
- P3 investigate and establish the most likely causes of the faults
- P4 select, use and apply diagnostic techniques, tools and aids to locate faults
- P5 complete the fault diagnosis within the agreed time and inform the appropriate people when this cannot be achieved
- P6 determine the implications of the fault for other work and for safety considerations
- P7 use the evidence gained to draw valid conclusions about the nature and probable cause of the fault
- P8 record details on the extent and location of the faults in an appropriate format

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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 fault diagnostic aids. This could be expected to include electrical test equipment, historical data and schematic drawings
- K4 you must have a working knowledge and understanding of fault finding methods and techniques. This should include how to investigate problems, how to identify the extent and location of problems and what to do when causes are difficult to find, and which actions can be taken to deal with the fault
- K5 you must have a working knowledge and understanding of analysis method and techniques. This could be expected to include historical data, comparison, and circuit measurements
- K6 you must have a working knowledge and understanding of company procedures and manufacturers guidelines for the operating and care of test equipment and control procedures
- K7 you must have a working knowledge and understanding of assessing the likely risks arising from faults such as fire, electric shock and damage to plant
- K8 you must have a working knowledge and understanding of maintenance reporting documentation and control procedures and how descriptions should be presented, why it is important to record results of the diagnosis, and why it is important to relay conclusions on to others in a timespan appropriate to the nature of the problem
- K9 you must have a working knowledge and understanding of your responsibilities with regard to the reporting lines and procedures in your working environment

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Additional Information

Scope/range related to performance criteria

- 1 The level and extent of responsibility extends to determination and follow up of the information needed to support a clear and accurate definition of the problem and the selection and analysis of diagnostic procedures appropriate to the problem as identified. In some cases, you may still be expected to refer to others for final authorisations, even though you remain responsible for identifying and implementing decisions.
- 2 The types of plant and equipment may be single or multiple technology. Typical plant and equipment could be:
 - 2.1 Rotating equipment and tools
 - 2.2 Protection methods
 - 2.3 Electrical distribution systems.
- 3 The type of fault finding techniques or procedures, diagnostic aids and equipment could include:
 - 3.1 Function testing
 - 3.2 Comparison diagnosis
 - 3.3 Substitution
 - 3.4 Examination of failed components
 - 3.5 Operational performance testing
 - 3.6 Timed monitoring
 - 3.7 Sectional isolation.
- 4 The type and range of problems and faults may arise from environmental factors such as exposure to sudden temperature changes and/or from human error and/or from materials that have been used in or by the plant and equipment and/or from inherent features of the product/asset such as design aspects, age, and/or natural wear and tear.
- 5 The level and complexity of diagnosis can be achieved by applying procedures which are formally specified or which are devised by the candidate in response to the symptoms of the fault.
- 6 The record keeping systems and procedures to include:
 - 6.1 Test results
 - 6.2 Data sheets
 - 6.3 Company procedures

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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

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