

## Overview

This standard is for people who inspect and test electrical systems (ac/dc) and equipment.

The person carrying out this work must be able to comply with the processes and procedures for initial and periodic inspection and testing of an electrical system in accordance with the current versions of the appropriate industry standards and regulations, the specification, industry recognised working practices, the working environment and the natural environment.

They must know, understand and apply the correct methods and procedures for the inspection and testing of electrical systems and equipment, including the:

- identification and use of the correct instruments
- completion of the relevant documentation
- recording of relevant data and information.

## Performance criteria

- You must be able to:*
1. confirm a programme of work with the relevant people in accordance with organisational procedures
  2. determine and obtain the resources required, as relevant, to undertake:
    - initial inspection and testing
    - periodic inspection and testing
  3. select the instruments to be used for carrying out the relevant tests
  4. confirm that the instruments are fit for purpose and have a current calibration certificate
  5. conduct a visual inspection on the enclosures for cables, conductors and wiring systems to confirm they are:
    - located and secured correctly
    - electronically and mechanically sound
  6. conduct a visual inspection on the electrical cable, conductor and wiring systems to confirm they are:
    - located and secured correctly
    - identified and/or labelled correctly
  7. conduct a visual inspection on the equipment, accessories and components to confirm they are:
    - located and secured correctly
    - identified and/or labelled correctly
  8. comply with industry practices and organisational procedures to ensure the co-ordination of site services and the activities of other trades affected by:
    - the inspection process and procedures
    - the testing process and procedures
  9. identify the correct means of electrical isolation prior to commencing the inspection and/or testing process
  10. complete safe isolation as and when required to ensure the safe inspection and testing of electrical cables, conductors and/or wiring system and the associated equipment, accessories and components

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11. perform the appropriate tests for periodic testing that ensure safe and efficient operation of the electrical system
12. perform the test in the correct sequence for initial testing that ensure safe and efficient operation of the electrical system
13. comply with organisational procedures for:
  - completion of the relevant documentation
  - the recording of relevant data and information
  - informing relevant people
  - addressing issues and problems identified

## Knowledge and understanding

*You need to know and understand:*

1. the operation, applications, advantages and limitations of different electrical systems
2. the organisational procedures to confirm a programme of work with the relevant people
3. how to determine and obtain the resources required, as relevant, to undertake:
  - initial inspection and testing
  - periodic inspection and testing
4. how to select the instruments to be used for carrying out relevant tests
5. how to confirm that the test instruments are fit for purpose and have a current calibration certificate
6. the methods and procedures for conducting a visual inspection on the enclosures for cables, conductors and wiring systems to confirm they are:
  - located and secured correctly
  - electrically and mechanically sound
7. the methods and procedures for conducting a visual inspection on the electrical cable, conductor and wiring systems to confirm they are:
  - located and secured correctly
  - identified and/or labelled correctly
8. the methods and procedures for conducting a visual inspection on the equipment, accessories and components to confirm they are:
  - located and secured correctly
  - identified and/or labelled correctly
9. the industry practices and organisational procedures to ensure the co-ordination of site services and the activities of other trades affected by:
  - the inspection process and procedures
  - the testing process and procedures

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10. the correct procedures for safe isolation
11. the methods and processes to carry out correctly the tests that ensure safe and efficient operation of the electrical system
12. the organisational procedures for:
  - completion of the relevant documentation
  - the recording of relevant data and information
  - informing relevant people
  - addressing issues and problems identified

**Scope/range related to performance criteria**    **Working environments (internal and/or external)**

- domestic
- non-domestic
  - commercial
  - industrial
  - agricultural
  - horticultural
  - leisure and entertainment
  - residential medical and care facilities
  - public highways and parks
  - public services establishments
  - pre-1919 traditional/historic buildings

**Electrical system**

An electrical system (ac/dc), internal and/or external, in a building/structure that has an extra low voltage and/or low voltage single and/or multi-phase supply, circuits, equipment and components to provide:

- control
- communication
- heating
- lighting
- power

**Organisation procedures**

- information management
- project management
- risk assessment
- risk management
- implementing and monitoring health and safety requirements and issues
- implementing and monitoring issues relating to the natural environment
- customer services
- accident reporting
- emergencies
- communication with relevant people

**Resources**

- labour
- plant and equipment
- instruments
- finance
- IT
- materials and other consumables

**Site services**

- electricity
- water
- gas
- oil
- drainage
- telecommunications
- data transmission either underground or overhead

**Relevant people**

- customers/clients
- client representatives
- supervisors
- site/contract manager
- other contractors/trades
- members of the public
- work colleagues

**Tests**

- continuity of CPC
- continuity of ring final circuits
- insulation resistance
- polarity
- earth fault loop impedance
- prospective fault current
- RCD operation
- phase rotation
- functional testing

**Enclosures for cables, conductors and wiring systems**

- PVC and steel conduit
- PVC and steel trunking
- cable tray
- basket and ladder systems
- ducting systems
- bus-bar trunking
- pre-fabricated conductor, cable and wiring systems

### **Electrical cable, conductors and wiring systems**

- thermosetting insulated cables including flexes
- single and multicore thermoplastic and thermosetting insulated cables
- flat profile cable
- mineral insulated cables
- single wire armoured cables
- armoured/braided flexible cables and cords
- data cables
- pre-fabricated conductor, cable and wiring systems
- fibre optic cable
- fire resistant cable
- bus-bar trunking

### **Equipment, accessories and components**

- consumer units
- distribution boards and/or panels
- isolators
- circuit breakers
- fuses
- switches
- socket-outlets
- earthing protection
- luminaries
- motor control equipment
- control panels – alarms; emergency lighting; environmental control
- control devices – electrical; electronic; electro-mechanical
- solar photovoltaic panels – control equipment, components and accessories
- micro-wind turbine control equipment



- cable glands

### **Documentation**

- electrical installation certificates
- electrical installation condition reports
- minor electrical installation works certificates
- schedules of inspections
- schedules of test results

## Inspect and test electrical systems and equipment

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