



CS ENERGY OPERATIONS PROCEDURE FOR MAINTENANCE AND TESTING OF PORTABLE ELECTRICAL EQUIPMENT, RCDS AND TOOLS CS-OHS-33

Responsible Officer: Electrical Services Engineering Manager
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CONVENTIONS USED IN THIS DOCUMENT

Overview

The following conventions and icons are used throughout this document to draw attention to critical information.



Warnings

This displays critical information and must be followed.



Note

Additional information or tips.



Business Rules or Requirements

Highlights specific rules or requirements.



1 INTRODUCTION

Purpose The purpose of this procedure is to document the process of RCD testing and the testing and tagging of portable electrical equipment for the purpose of minimising exposure to the risk of electrical shock from the electrical equipment.

Scope This procedure applies to all specified electrical equipment, safety switches, and portable electrical equipment used at CS Energy workplaces. It details the inspection, testing and maintenance requirements of specified electrical equipment items - (electrical leads, power boards etc.), portable electrical tools and safety switches (residual current devices).

This Procedure does not apply to the testing and maintenance of electrical installations and as such, the CS-OHS-32 *Maintaining Electrical Installations Procedure* should be referred to for specific electrical installation information.

2 SPECIFIED ELECTRICAL EQUIPMENT

Introduction This section outlines the requirements for electrical tools across the power station sites.

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2.1 General

Overview

In Items of specified electrical equipment and portable electric tools are to be appropriately inspected, tested and tagged by a competent person to ensure they are electrically safe in accordance with the frequencies detailed in AS3760. *Attachment 1 – Testing and Inspection Intervals for Electrical Equipment* is an extract from the standard, however frequencies should be confirmed against the standard.

CS Energy

Any new items of specified electrical equipment are to be inspected, tested and tagged after procurement to ensure they are electrically safe and fit for use.



Note

AS/NZS 3760: In-service Safety Inspection and Testing of Electrical Equipment also details specific inspection and testing guidance information.

2.2 Identification

Overview

After electrical equipment is inspected and tested, a non-reusable and non-metallic durable tag is to be immediately attached to the equipment. The tag must state the following information:

- date the inspection and test was carried out
 - due date of next inspection and test to be carried out
 - identity of the competent person or electrical contractor who carried out the inspection and test
 - a reference to AS/NZS 3760
-

2.3 Inspection

Overview

As part of electrical equipment inspections, they are to be visually and physically checked for the following:

- obvious damage or defects in accessories, connectors, plugs or extension outlet sockets
 - damage to flexible leads
 - controls that are in good working order
-



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- covers and guards that are secured as per the manufacturer's specifications
 - safety facilities and devices that are in good working order
 - sockets on electrical leads are provided with a safety shroud or projection
 - ventilation inlets and exhaust areas that are unobstructed.
-

2.4 Double Adaptors and Multi-Outlet Boards

Overview

Double adaptors and piggyback plugs are not to be used at CS Energy workplaces. Multi-outlet boards with overload switches may be used outside construction areas.

2.5 Records

Overview

Each CS Energy workplace is to maintain electrical equipment records that include:

- a register of all equipment
- a record of formal inspection and tests
- a repair register
- a record of all faulty equipment showing details of services or corrective actions

These electrical equipment records are to be maintained to record the inspection and testing details for at least 7 years.

2.6 Defective Equipment

Overview

Items that are considered defective, not safe to use, non-compliant or out of test date are to be disconnected, withdrawn from use and tagged out of service. The tag shall indicate why the item has been removed from service. These items of equipment can only be returned to service and the out of service tag removed once they are inspected, tested and deemed as electrically safe and tagged by an electrical worker.

Where equipment is defective and not able to be repaired, it is to have the electrical lead/cable removed and the item to be disposed of.

2.7 Sale of Electrical Equipment

Overview

All electrical equipment offered for sale by CS Energy is to be checked by an electrical worker to determine that it is electrically safe. A tag identifying it is electrical safe is to be attached to the equipment prior to sale.

Where the equipment is not electrically safe the purchaser must be advised prior



to the sale of the unsafe condition/s associated with the equipment.

This can be done by attaching a tag to the equipment stating it is not electrically safe and noting on the tag the conditions. Where possible the equipment is to have the electrical lead/ plug removed or cut off to render it unusable until an electrical worker affects the repairs.

2.8 Leads, Portable Outlet Devices and Portable Electrical Tools

Overview

CS Energy and subcontractor personnel are to inspect for damage to the following parts of the lead prior to use:

- inner cores are not exposed or twisted
- leads are not damaged whilst stored or transported
- external sheaths are not cut, abraded, twisted or damaged to the extent that the insulation of the inner core is visible
- unprotected conductors or insulation tape are not evident

As deemed necessary, leads are to be appropriately anchored to equipment, plugs and cord extension sockets such that they remain tightly fitted during use.

In a construction environment, leads shall be:

- provided with suitable protection against, or located where they are not subjected to, mechanical damage, damage by liquids or high temperature, and
 - supported off the floor or ground on stands or hangers covered with material that is non-conducting and will prevent mechanical damage to the cable.
-

Double Insulation

Portable electric tools, appliances and equipment are to be double insulated (where practicable) and are to be connected to a portable RCD or electrical outlets protected by a safety switch on the circuit. Preference is to be given to double insulated tools in the purchasing of portable electrical equipment.

Warning Tags

Warning tags on portable outlet devices that indicate the maximum load to be connected are to be kept intact and legible.

2.9 CS Energy hired or loaned equipment

Hired Equipment Test Tags

Any hired electrical equipment is to be inspected prior to each time it is hired. It must have a current test tag and is to be checked to ensure it is current prior to use at the workplace.

2.10 Contractors equipment

Test Tag

Contractors bringing portable electrical equipment onto CS Energy workplaces



shall ensure it has a current test tag and is used with a RCD.

2.11 Residual Current Devices (RCDs)

Isolating Transformers

RCDs or isolating transformers are to be used with all electrical tools, appliances and equipment.

RCDs are to be Type I (10mA) or Type II (30mA) and comply with the following standards:

- AS 3190 – Approval and Test Specifications – Residual Current Devices (Current-operated Earth-leakage Devices), and
 - AS/NZS 3108 – Approval and Test Specification – Particular Requirements for Isolating Transformers and Safety Isolating Transformers.
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No Protection from RCDs

RCDs do not protect personnel where:

- there is no current path to earth
 - an appliance comes into contact with an alternate source of electricity
 - there is a risk of electric shock from the electrode or return leads when welding
 - an appliance is supplied from an isolating transformer
-

RCD Inspections

RCDs are to be inspected and tested to ensure they are electrically safe in accordance with the frequencies detailed in AS3760. An extract from the standard is shown in *Attachment 1 – Testing and Inspection Intervals for Electrical Equipment*.

Test tags/stickers identifying the RCD, next test due date, status and signature of the competent person are to be fixed to the switchboard panel.

The test tag on switchboards is to relate to all circuits for the board. As part of RCD testing, maximum tripping times are not to exceed the values shown in the table following.

RCD Type	A.C. RMS Test Current mA	Maximum Tripping Time mS
Type I	10	40
Type II	30	300

2.12 Testing Equipment

Test Instruments

All electrical test instruments used for testing electrical equipment on CS Energy Power Stations are:

- to be designed for and capable of correctly performing the required test
 - not expose users to a risk of electric shock during correct use
 - to be clearly and individually labeled with details of the last test date and next
-



test date due

- to be in good working order, clean and have no cracked or broken insulation
 - the terminals of test equipment should be shrouded
 - where appropriate, test leads and testing devices should be provided with over current protection
-

Hazardous Areas

Electrical test instruments that are used in hazardous areas (e.g. in or near explosive dusts and atmospheres) must be suitable for the use (intrinsically safe) and be clearly marked for use in such locations.

Calibration and Testing

Calibration and testing frequencies and procedures are to be undertaken in accordance with the manufacturer's requirements for each type of testing device used. Functional testing of all test equipment must be completed at a period not exceeding 6 months and results of tests must be kept for a period of 5 years.

Voltage Detectors

When voltage detectors such as voltage testers are used to prove de-energisation, they shall be tested for correct operation immediately before use, and again immediately after use, particularly if the test result indicates zero voltage, to confirm that the instrument is working correctly.

Testing Register

Each Power Station is to maintain a register or record of electrical testing devices that details the last test date and next test date due for each device. Test instruments are to be tagged to identify the currency of the item.

Office Equipment

Equipment that is in the offices across CS Energy that is fed from a circuit protected by a Type I or Type II RCD are exempt from test and tag. This is in line with the Electrical Safety Regulations Clauses 111 and 112 (b).

The initial inspection upon first installation stands (see 2.3), however only in the event of the equipment being moved are further inspections required.

Where equipment is moved from the office to another area (construction zone / workshops / laboratories / etc), the requirements of the new area are to be applied.

2.13 Construction and Demolition Workplaces

Overview

Electrical equipment used on construction workplaces is to be installed, used, tested and maintained in accordance with the requirements of Australian Standard AS 3012 – Electrical Installations Construction and Demolition sites.

3 REFERENCES

Reference No	Reference Title	Author
Link to Act	Electrical Safety Act 2002 (Qld)	Qld Govt
Link to Regulation	Electrical Safety Regulation 2013 (Qld)	Qld Govt
SAI Global	AS/NZS 3000 – Electrical Installations	Standards Aust
SAI Global	AS/NZS 3008 – Electrical Installations – Selection of Cables	Standards Aust
SAI Global	AS/NZS 3017 – Electrical Installations – Verification Guidelines	Standards Aust
SAI Global	AS/NZS 3760 – In-service Safety Inspection and Testing of Electrical Equipment	Standards Aust
"B/D/11/30957"	Procedure - CS-OHS-31 - Electrical Safety Management	CS Energy
"B/D/11/30960"	Procedure - CS-OHS-34 - Selection, Maintenance and Use of Electrical Safety Equipment and PPE	CS Energy
"B/D/10/7377"	Procedure - CS-AM-010 - Plant Modification Procedure	CS Energy
"B/D/12/7183"	Form - S1975 - Electrical Certificate of Testing and Compliance (COT)	CS Energy
SAI Global	AS/NZS 3108 – Approval and Test Specifications – Particular Requirements for Isolating Transformers and Safety Isolating Transformers	Standards Aust
SAI Global	AS 3190 – Approval and Test Specifications – Residual Current Devices (Current-operated Earth-leakage Devices)	Standards Aust
"B/D/11/30958"	Procedure – CS-OHS-32 - Maintenance and Testing of Entity Works, Electrical Installations and Equipment	CS Energy

4 RECORDS MANAGEMENT

In order to maintain continual improvement, suitability, safety and effectiveness of the organisation, registered documents will be reviewed on a two yearly basis, or where it has been identified that there are changes in technology, legislation, standards, regulations or where experience identifies the need for alteration to the content. Registered documents should also be reviewed following an incident, change management process, modification or where directed as part of a risk assessment process.

CS Energy must ensure that records are retained according to accountability, legal, administrative, financial, commercial and operational requirements and expectations. In compliance with records retention and disposal, all documentation created in relation to CS Energy business must be retained in line with minimum retention periods as detailed in legal retention and disposal schedules.

5 ATTACHMENTS

5.1 Attachment 1 - Testing and Inspection Intervals for Electrical Equipment

Type of Class &/or Equipment	Interval Between Inspections/Tests						
	Insulation of Equipment		Residual Current Devices (RCDs)				Cord sets and power boards
	Not Insulated	Double Insulated	Push Button Test by User		Operating Time RCD Tester		
			Portable	Fixed	Portable	Fixed	
Class 1*	3 months	3 months	After connection to socket outlet & before use each day	After connection & at least every 1 months	3 months	12 months	3 months
Class 2	6 months	12 months	After connection to socket outlet & before use each day	After connection & at least every 6 months	12 months	12 months	6 months
Class 3	12 months	12 months	After connection to socket outlet & at least every 3 months	After connection & at least every 6 months	2 years	2 years	12 months
Class 4	5 years	5 years			2 years	2 years	5 years
Hire equipment	Inspect before each hire. Test and tag 3 monthly	Inspect before each hire. Test and tag 3 monthly	Prior to each hire. Test and tag 3 monthly	NA	Prior to each hire. Test and tag 3 monthly	Test and tag 12 months	Prior to hire
Repaired, serviced, or second-hand equipment	After repair or service which could affect electrical safety, or on re-introduction to service.						
Class 1 work	means construction work or work done in conjunction with construction work						
Class 2 work	means the assembly, fabrication, installation, maintenance, manufacturing, refurbishment or repair, but does not include work that is class 1 work						
Class 3 work	means work that is not class 1 work, class 2 work or class 4 work						
Class 4 work	means office work						
*	Class 1 equipment must also be compliant with AS/NZS 3012 - Electrical Installations – Construction and Demolition Sites requirements.						