

Substation Maintenance Instruction

Reactors

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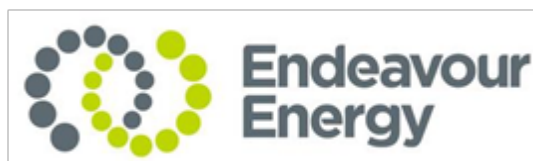
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SMI 154 Reactors

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1.0 PURPOSE

To set out in detail the standard for maintaining oil and dry type reactors.

2.0 SCOPE

This instruction is to be read in conjunction with Substation Maintenance Instruction SMI 100 - Minimum requirements for maintenance of transmission and zone substation equipment.

This instruction outlines the broad maintenance requirements for oil and dry type reactors.

3.0 REFERENCES

Board Policy (Environment) 4.0 – Environment
Company Policy (Environment) 4.3 – Prevention of Contamination
Company Policy 9.9.1 (Network) – Network Asset Maintenance
Company Procedure (Environment) GPE 0069 – Polychlorinated Biphenyl (PCB) Management
Company Procedure (Environment) GPE 0075 – Storage, Handling and Transport of Oil and Oil Filled Equipment
Company Procedure (Health & Safety) GSY 0003 – Hazardous Manual Tasks
Company Procedure (Health & Safety) GSY 0050 – Hazardous Chemicals Management
Company Procedure (Health & Safety) GSY 1066 – Worksite Hazard and Risk Assessment
Company Procedure (Health & Safety) GSY 1090 – Confined Spaces Risk Management
Company Procedure (Network) GAM 0001 – Production/Review of Design/Construction/Maintenance/Technical Specification/Environmental/Property and Metering Standards
Company Procedure (Network) GAM 0089 – Authorisations Governance and Management
Company Procedure (Network) GAM 0104 – Network Asset Information
Environmental Management Standard EMS 0007 – Waste management
Environmental Management Standard EMS 0008 – Environmental Incident Response and Management
Substation Maintenance Instruction SMI 100 – Minimum requirements for maintenance of transmission and zone substation equipment
Substation Maintenance Instruction SMI 103 – Testing of in-service insulating oil
Endeavour Energy Network Management Plan December 2013 Review
Endeavour Energy Electrical Safety Rules
Environmentally Hazardous Chemicals Act 1985
Protection of the Environment Operations Act 1997
Work Health and Safety Act 2011
Work Health and Safety Regulation 2011
AS 1028 - Power reactors and earthing transformers
AS/NZS 3000:2007 - Electrical installations
ENA National Electricity Network Safety Code (Doc 01-2008)

4.0 DEFINITIONS AND ABBREVIATIONS

SMI

Substation Maintenance Instruction

5.0 ACTIONS

All work is to be carried out in accordance with the manufacturer's instructions.

As a minimum, the routine maintenance requirement for oil and dry type reactors shall be as set out in the following table.

5.1 Reactors

Routine maintenance
1.0 Inspection
General
Visually inspect the equipment and report any defects.
Oil temperature indicators (Oil only, where fitted)
Ensure sensible values are being read.
Record the maximum temperature.
Tank (Oil only)
Inspect for oil leaks or spillage.
Check oil level in the conservator.
Inspect for rust, corrosion, poor paintwork condition or other defects.
Breather (Oil only)
Carry out breather inspection in accordance with SMI 156.
HV terminations
Inspect for signs of corrosion, burning, overheating or other defects.
Bushings
Inspect for cracks, treeing, tracking, visible effects of corona, or other defects.
Steelwork/hardware
Inspect for rust, corrosion, poor paintwork condition or other defects.
2.0 Major overhaul
Perform all tasks as per 1.0 Inspection
Tank (Oil only)
Test tank oil in accordance with SMI 103.
Repair oil leaks, check oil level - top up if required.
Bushings
Clean with recommended solvent.
Oil surge relay (Oil only, where fitted)
Inspect for oil leaks.
Check operation.
Oil temperature indicators (Oil only, where fitted)
Check operation.
Explosion vents (Oil only, where fitted)
Examine condition of diaphragm.
Steelwork/hardware
Repair rust, corrosion, poor paintwork condition or other defects.
HV terminations
Repair corrosion, burning, overheating or other defects.

Routine maintenance
Insulation resistance (Oil only)
Report ambient temperature and humidity during insulation resistance test. Report unit oil temperature during insulation resistance test. Perform insulation resistance at 2.5 kV DC. Record and report 1 min insulation resistances. The value of IR at one minute in M Ω must be greater than or equal to, $\frac{0.8 \times \text{Reactor voltage in volts}}{\text{square root (Reactor KVA)}}$ Internally earthed neutral earthing reactors do not require insulation resistance testing.

6.0 AUTHORITIES AND RESPONSIBILITIES

Chief Engineer has the authority and responsibility for approving this instruction.

Manager Primary Systems has the authority and responsibility for making recommendations to the Chief Engineer in respect to this instruction.

Network Maintenance Manager has the authority and responsibility for the content of this instruction and its relevance.

Operations Managers have the authority and responsibility for:

- meeting the requirements of this instruction within their area of responsibility;
- overseeing that Endeavour Energy employee and/or contractors engaged to perform the work have appropriate qualifications;
- overseeing that appropriate equipment details are entered into the Ellipse database as part of the work; and
- reporting any abnormalities found in the reactor to the Regional Transmission Manager.

Regional Transmission Manager has the authority and responsibility for:

- overseeing that Endeavour Energy employees engaged to perform the work have appropriate qualifications and are competent to carry out the work;
- monitoring reactor equipment at transmission and zone substations so that they are maintained to the requirements of this instruction and Substation Maintenance Instruction SMI 100; and
- providing appropriate equipment and training.

Endeavour Energy employees and/or contractors are responsible for:

- conducting themselves in a manner that meets the requirements of this instruction and Substation Maintenance Instruction SMI 100;
- working in accordance with local and statutory requirements;
- managing public safety so that it is not compromised; and
- working in accordance with Endeavour Energy's Electrical Safety Rules.

7.0 DOCUMENT CONTROL

Documentation content coordinator: Network Maintenance Manager, Primary
Systems

Documentation process coordinator: Branch Process Coordinator