



PORTABLE EARTHING FOR METAL-ENCLOSED SWITCHGEAR

OPERATIONAL SAFETY MANUAL - SECTION 4.9

PR-NET-OSM-033	Portable Earthing for Metal-Enclosed Switchgear - Operational Safety Manual - Section 4.9		Applies to	
			Distribution ✓	Transmission
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1 Introduction

- 1.1 This document defines the **Approved** procedure for the correct use of **Portable Earthing** equipment for metal-enclosed switchgear.
- 1.2 Compliance with the following procedure **Shall** enable staff to work safely and reduce the risk of injury to themselves and their colleagues.

2 Scope

- 2.1 The scope of this procedure shall be limited to persons who are authorised to operate on the **System**.
- 2.2 The procedures included herein have been developed to minimise incidents associated with human error by ensuring that:
- A consistent approach is maintained for the application of **Portable Earthing** equipment on the **System**
 - At all times consideration is given to the operating characteristics of the **System** and the **Dangers** imposed

3 References

The documents detailed in Table 3.1 - Scottish and Southern Electricity Networks Documents, and Table 3.2 - External Documents, should be used in conjunction with this document.

Table 3.1 - Scottish and Southern Electricity Networks Documents

Reference	Title
PR-NET-OSM-006	SSEN Distribution Operational Safety Rules - Operational Safety Manual – Section 1.1
PR-NET-OSM-028	Switching Terminology and Approved Abbreviations - Operational Safety Manual - Section 4.4
PR-NET-OSM-026	High Voltage Switching and Earthing - Operational Safety Manual – Section 4.2
SP-NET-OHL-002	Portable Earthing Equipment and Operating Rods for Use in High Voltage Substations up to and Including 132kV
TG-NET-SST-024	Portable Earth Requirements for use in Primary, Grid and Supergrid Substations
WI-NET-SST-074	Procedure for the Management of Test Prods
WI-NET-OSM-002	Personal Protective Equipment and Workwear for Live Environments
N/A	SSEN SHE Handbook (Held in Safety, Health and Wellbeing SharePoint Site)

Table 3.2 - External Documents

Reference	Title
ENA TS 41-21	Portable Earthing Equipment for Overhead Lines and Substations

4 Definitions

- 4.1 The words printed in bold text within this document are either headings or definitions. Definitions used within this **Approved** procedure are defined within the list presented immediately below, or within Section 2 of the **OSR**.

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4.2 Operational Safety Rules (OSR)

The **SSEN-D** Distribution set of rules, as read with related documents and procedures, that provide generic safe systems of work on the **System**, therefore ensuring the health and safety of all who are liable to be affected by any **Danger** that might arise from the **System**.

4.3 Portable Earthing

An **Approved HV Earthing** device that is either a manufacturer extension **Earth** (non-integral), or that made of transportable flexible leads and clamps.

5 General Responsibilities

5.1 Persons who are required to undertake work on the **System** or part thereof, **Shall** have a thorough understanding of the work and ensure on-site risks are suitably assessed and appropriate control measures put in place before, during and after all activities.

5.2 Persons must ensure that, at all times during the work (or associated testing), **General Safety** arrangements are maintained and that other work areas are not adversely affected by the activities for which they are responsible.

6 Authorisation

6.1 Application of **Portable Earthing** **Shall** be carried out by, or under the **Personal Supervision** of a suitably **Authorised Person**.

6.2 Competence and authorisation certificates **Shall** be retained personally and be made available upon request.

7 Personal Protective Equipment

7.1 The application of **Portable Earthing** is classed as a **Switching** operation.

7.2 Persons who are required to undertake the application of **Portable Earthing** on the HV **System** **Shall** wear suitably **Approved** Personal Protective Equipment (PPE).

7.3 As a minimum, PPE **Shall** meet the requirements of WI-NET-OSM-002.

7.4 When carrying applying **Portable Earthing** leads to metal-enclosed switchgear, insulating gloves **Shall** be worn by the operator before touching any **Apparatus**. The insulated gloves **Shall** only be removed following the completion of the operation and when the operator has moved away from the operating position.

7.5 The use of insulated gloves **Shall** meet the following minimum requirements:

- For **High Voltage Switching**, **Approved Class 1** gloves **Shall** be worn

7.6 Insulated gloves **Shall** be inspected before use to ensure they are within date and undamaged. Where concern exist, the gloves **Shall** be replaced before any operation is carried out.

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8 General Requirements

8.1 Types of Portable Earthing Equipment

8.1.1 **Earthing** of the **System**, or part thereof, **Shall** be achieved through the application of an **Approved Earthing** device with an adequately rated **Earthing** capacity.

8.1.2 Where **Portable Earthing** equipment is used to apply an **Earth** on the **System**, it **Shall** conform with the following designs:

- An extension (non-integral) **Earthing** device **Approved** for use with metal-enclosed switchgear being one of the following:
 - Multi-piece extension device attachment
 - One piece extension device
 - Separate **Earthing** carriage
- Portable flexible leads and clamps

8.1.3 **Portable Earthing equipment Shall** be fit for the purpose for which it is to be used, having a minimum short circuit current rating of 17.5kA for 2 seconds.

8.2 Identification

Portable Earthing equipment for use with metal-enclosed switchgear **Shall** be uniquely identified by means of an appropriate identification mark/asset number in accordance with **SSEN-D** policy.

8.3 Storage and Inspection

8.3.1 **Portable Earthing** equipment for use with metal-enclosed switchgear **Shall** be stored in a suitable area. This storage area **Shall** be clean, dry and where practicable, segregated and protected to prevent damage to the **Portable Earthing** equipment. Atmospheric conditions should be controlled to minimise the degradation of insulation on **Portable Earthing** equipment.

8.3.2 The inspection of **Portable Earthing equipment Shall** be carried out by:

- An appointed inspector.
- Competent and appropriately authorised persons as per requirements of TG-NET-SST-024

8.3.3 The appointed inspector **Shall** have sufficient training, knowledge and experience to carry out their duties. Should the inspector be out-sourced they are required to be a member of an accredited test body, recognised by **SSEN-D**.

8.3.4 In addition to carrying out the examination of **Portable Earthing** equipment, the inspector may be required to repair, affix prohibition labels and/or warning labels, and transfer equipment from a designated quarantine area to a designated maintenance/test area.

8.3.5 The examination and where applicable testing of **Portable Earthing** equipment **Shall** be carried out by the appointed inspector at frequencies defined by **SSEN-D**.

8.3.6 Competent and appropriately authorised persons who are required to apply **Portable Earthing** equipment on the **System Shall** examine the equipment immediately before and after use.

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8.3.7 Defective equipment **Shall not** be used, and **Shall** be withdrawn from service immediately. At the earliest opportunity, the defective equipment **Shall** be quarantined and the relevant body notified for record and follow-up actions.

9 Application and Disconnection of Portable Earthing Equipment

9.1 The application of **Earthing** on the **System Shall** be in accordance with the **Earthing** hierarchy specified in OSR 4.3.1(c). **Portable Earthing** equipment for use with metal-enclosed switchgear complies with this requirement.

9.2 Prior to use each **Portable Earth Shall** be examined immediately before use by a visual inspection of the **Earthing** lead, its connections and clamps.

9.3 A defective **Earth Shall not** be used, but **Shall** be repaired on site where possible or otherwise withdrawn from service.

9.4 Where it is not reasonably practicable to apply an **Earth** using a circuit breaker (including a circuit breaker with accessory earthing facilities) or **Earthing** switch, the following procedure **Shall** be applied:

1. **High Voltage Apparatus** and **Conductors Shall** be verified that they are not **Live** by means of an **Approved** voltage testing device. The **Authorised Person Shall** test this device immediately before and after application. Following verification, the **Apparatus** and **Conductors** can then be **Earthed** using **Portable Earthing** equipment.
2. Regardless of the work to be carried out, the **Authorised Person Shall** ensure that all phases are **Earthed**. **Portable Earthing** leads **Shall** be connected to the conductive mass of **Earth** before being connected to any phase Conductors. An **Approved Earthing** pole or **Approved** appliance must be used to make this connection. The **Authorised Person Shall** ensure a good connection is made and that all **Portable Earthing** leads are, clearly visible so far as reasonably practicable.
3. For the purpose of **Earthing** on spout contacts of metal-enclosed switchgear, only **Approved** appliances **Shall** be used. The insertion of the hand or any tool into contact spouts for this purpose is forbidden.
4. **Portable Earthing** leads **Shall not** be applied in any cell or compartment in which there is any exposed metal **Live** at **High Voltage** which may be a potential source of **Danger**.
5. When removing **Portable Earthing** leads from the **System**, the removal process **Shall** involve each lead being disconnected individually from the appropriate **Conductor** and by means of an **Approved Earthing** pole or other **Approved** appliance. The disconnection from a **Conductor Shall** be carried out fully before the **Earthing** lead is removed from the **Earth** connection point.
6. Where **Portable Earthing** equipment is used and left unattended, consideration **Shall** be given to the duration of the work and accessibility by third parties.

10 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New document created	TBC	1.00	Richard Gough
02				