PR-NET-OSM-025

GENERAL SYSTEM OPERATING ARRANGEMENTS

OPERATIONAL SAFETY MANUAL - SECTION 4.1

Scottish & Southern Electricity Networks

	Name	Title
Author	N/A	Distribution SHE Team
Checked by	Peter Vujanic	Head of SHE Distribution
Approved by	Richard Gough	Designated Engineer

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1 Introduction

1.1 This document defines the **Approved** procedure for the operation and control of planned and unplanned work on the **System** energised at nominal voltages up to and including 132kV.

1.2 Notwithstanding the safety precautions defined in the **SSEN-D OSR**, compliance with the following procedures **Shall** enable staff to work safely and reduce the risk of injury to themselves and their colleagues.

2 Scope

The scope of this document **Shall** be limited to persons who are required to operate and control work on the **System**. By consistently applying the procedures herein, a number of key functions can be achieved:

- Maintain a consistent approach for the control and operation of the **System**
- Maintain the availability of control room staff and field staff to respond and engage to unplanned events
- Provide contingency arrangements for loss of any parts of the telecoms / control infrastructure

3 References

The documents detailed in Table 3.1 - Scottish and Southern Electricity Networks 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-021	Transfer of Control Responsibilities - Operational Safety Manual - Section 2.11
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)

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.**

4.2 **Control Engineer**

As defined in the **SSEN-D OSR**, may also be referred to **Distribution Control Engineer** (DCE).

4.3 **Field Control Engineer**

The person who by agreement with the **Control Engineer** takes responsibility for control of operations **on a System under Network Operations Procedure 2, 3 & 4.** May also be referred to as a **Field Controller.**

4.4 **Network Operations Procedures (NOP 1 – 4)**

These relate to planned and unplanned network operations and may be used with any **System** Control Procedure.

- **Network Operations Procedure 1 (NOP 1)** – is the procedure for direct control of **High Voltage Switching** by the **Control Engineer** with the issue of individual **Switching** instructions and/or a group of **Switching** instructions, (block release).
- **Network Operations Procedure 2 (NOP 2)** – allows the **Field Control Engineer** to take control of **Switching** and **Safety Documents**, working only to an agreed **Switching** schedule.
- **Network Operations Procedure 3 (NOP 3)** – allows the **Field Control Engineer** to take control of **Switching** and **Safety Documents** on an agreed section of **System** which has only a single source of **High Voltage** supply.
- **Network Operations Procedure 4 (NOP 4)** – extension of **NOP3** to include the whole or any part of a multi-source **High Voltage** network, normally up to a maximum of one feeder or circuit. Under emergency conditions staff authorised for full **NOP4** may also operate as a **Control Engineer** using procedure SCP 3.

4.5 **Operator**

The **Authorised Person** permitted to carry out **Switching** on the **System**.

4.6 **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**.

5 General Responsibilities

5.1 Persons who are required to operate and undertake work on the **System 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 Persons who are required to undertake control and **Switching** duties on the **System Shall** hold the appropriate competence and authorisation to carry out specified duties. In addition, persons who are required to act as a **Field Control Engineer** for a **System Shall** be assessed in accordance with the appropriate **SSEN-D Network Operating Procedure**.

6.2 Authorisation for **NOP 2**, **NOP 3** and **NOP 4** status **Shall** apply to the specific voltage level to which the **Authorised Person** can issue Safety Documents.

NOTE: Appendix A provides a guide to the level of NOP authorisation appropriate to a person's skills and experience.

7 Personal Protective Equipment

7.1 Persons who are required to work or carry out work or testing on or near the **System Shall** wear suitably **Approved** Personal Protective Equipment (PPE). Furthermore, where warning labels or signs identify the existence of a particular hazard, additional and appropriate PPE **Shall** be worn.

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

8 General Requirements

8.1 System Management Information

8.1.1 The control and **Switching** of the **System Shall** be carried out in relation to its operational state as depicted by an up-to-date **System** diagram. For the purpose of this procedure, "up to date" **Shall** signify:

- The controlled contingency plot issued by the control centre, or a print taken from the **Live** Network Control System within the last 24 hours (available on site at the time of control transfer or obtained by the **Field Control Engineer** before carrying out any operations), or
- Graphic Information System (GIS) being either a geographic or schematic print which has been validated with agreement from the **Distribution Control Engineer**, and by visual inspection on site. Visual inspection alone is not acceptable as a means of validation where there is any underground cable on the part of the **System** that is to be transferred by the **Distribution Control Engineer** to a **Field Control Engineer**

8.1.2 Normally the Network Control System will be used as the operational **System** diagram and record of dressing, for System Control Automation and Data Acquisition (SCADA) remote control, alarm monitoring and as a record of all **Switching** operations. The Network Control System will be operated in accordance with the Network Control System Operations Manual.

8.2 Operation of Switchgear

8.2.1 The control and **Switching** of the **System Shall** be undertaken in accordance with the **SSEN-D OSR** and related documents and **Approved** procedures.

8.2.2 Regardless of application, switchgear **Shall** only be operated within its normal and short circuit rating. Switchgear having inadequate rating will be subject to an Operational Limitation.

8.2.3 Account must be taken of any temporary increase of fault level when grid or primary substations are paralleled. In such cases, and following agreement with the **Control Engineer**, pre-**Switching** in order to maintain the symmetrical fault level below the switchgear rating **Shall** be carried out.

8.2.4 Labels of a standard size and design **Shall** be permanently affixed to switchgear and be used as a means of identification which **Shall** remain effective throughout **Switching** duties.

8.2.5 Switchgear **Shall**, so far as reasonably practicable, be operated in accordance with the hierarchy defined in **OSR 3.6.7**. Switchgear (including associated equipment) which is to be operated locally on site **Shall** be visually inspected immediately before any **Switching** operation to check its condition is satisfactory. In the case the switchgear shows signs of distress, its condition **Shall** be reported immediately to the **Control Engineer**. The switchgear **Shall** be thoroughly examined before a decision is made about further operation.

8.2.6 **High Voltage Switching Shall** not be carried out without the authority of the **Control Engineer**, except in emergency and other **Approved** cases. **High Voltage Switching Shall**, where practicable, be carried out using a prepared and checked **Switching** schedule. Where a **Switching** schedule cannot be used, for example fault restoration, messages relating to the operation of the **System Shall** be written down. Every such message **Shall** be read back to the sender to ensure that it has been accurately received.

8.2.7 **Switching** schedule requirements **Shall** comply with those of the **OSR**. Where appropriate **NOP**s may be used in relation to a **Switching** schedule. **Switching** schedule operations **Shall** normally be carried out in strict sequence unless a change in sequence is authorised by the **Control Engineer**. The **Control Engineer** may in appropriate cases instruct operations to be carried out simultaneously, by different **Operators**, where such operations do not interact with other operations on the **Switching** schedule.

8.3 Operating Procedures

8.3.1 Where there is a requirement for control of the **System** to be transferred from the **Control Engineer** to a **Field Controller**, this **Shall** be done in accordance with **Network Operating Procedures NOP 1**, **NOP 2**, **NOP 3** and **NOP 4**, as defined in PR-NET-OSM-021 Transfer of Control Procedures - Operational Safety Manual - Section 2.11.

8.3.2 Each individual **NOP** defines and limits the specific duties which a **Field Control Engineer** may undertake.

8.3.3 The use of **NOP 2**, **NOP 3** and **NOP 4 Shall** be recorded as separate items on a **Switching** schedule. Additionally, in the case of **NOP 3** and **NOP 4** the use of a Control Transfer Certificate is desirable.

8.3.4 Under **NOP 2**, **NOP 3,** and **NOP 4** procedures the **Field Control Engineer** can sanction the issue of **Safety Documents** by other suitably **Authorised Persons**. The **Field Control Engineer Shall** hold the authorisation for the **Safety Document** they are sanctioning.

8.3.5 Safety precautions **Shall** be taken where **Switching** is required across control/ownership boundaries. In addition to the safety precautions defined in the **SSEN-D OSR** Planned **Switching** on any **Network** which crosses a control boundary, including a customer's own **High Voltage Network**, **Shall** be done under NOP 1.

8.3.6 Under **NOP 2**, **NOP 3,** and **NOP 4** status the **Field Control** Engineer **Shall** record:

- **Switching** operations carried out on the **System**
- The application and removal of **Circuit Main Earths**
- The issue and cancellation of **Safety Documents**

8.3.7 Irrespective of who carries out **Switching** on the **System**, all **Switching** operations **Shall** be recorded.

8.3.8 On the completion of fault restoration work on the **System** and in the cases of **NOP 2**, **NOP 3** and **NOP 4** status, details of the work and any relevant interruption/restoration times **Shall** be verified by the **Control Engineer** to facilitate the update of the Energy Network Association National Fault and Interruption Reporting Scheme (NaFIRS) and the **SSEN-D** outage management system (SIMS).

8.3.9 For planned work, details of **System** alterations and where applicable substation **Plant**, **Shall** be submitted to the Network Management Centre at least 5 working days in advance to facilitate the update of the **SSEN-D** System diagram. Changes made to the **System** under **NOP 2**, **NOP 3** and **NOP 4** status **Shall** be formally confirmed to the **Control Engineer** at the instant where the **NOP** ends.

8.3.10 **High Voltage** cable identification and spiking **Shall** be carried out in accordance with an **Approved** procedure. The **Control Engineer Shall** agree to any spiking operation and be informed before and immediately after any cable is spiked.

8.3.11 Where an operational incident or **Switching** error occurs, no further **Switching Shall** be carried out. The **Control Engineer Shall** be informed verbally of the circumstance and operational state of the **System**. The **Control Engineer Shall** then decide whether any further **Switching** can be carried out under the relevant **NOP** and ensure that the details of the incident are escalated appropriately.

8.3.12 Completed field schedules and **Safety Documents**, detailing all **Switching** times and relevant details, must be returned for audit in accordance with local Region / Business Unit arrangements.

8.3.13 Contingency plans may be required, depending on data system security. These plans must detail contact arrangements and location of **Safety Documents** to achieve agreed return to service times.

8.4 Live-Line Work

8.4.1 **Live**-line work can be carried out under **NOP 1**, **NOP 2**, **NOP 3**, and **NOP 4** status. Prior to any **Live**-line work being undertaken from ground level or at height, direct communication between the **Control Engineer** and each on-site **Working Party Shall** be established and verified functioning satisfactorily..

8.4.2 Under **NOP 1** status, the **Live**-line **Working Party Shall** remain in open contact with the **Control Engineer** during the completion of each individual **Live**-line instruction.

8.4.3 In addition, the following **Live**-line requirements **Shall** apply to the individually defined **NOP** status:

- **Under NOP 2**, **3 & 4** statuses and in the case of remedial work at a series of locations, the part of the **System** to be worked on **Shall** be agreed between the **Control Engineer** and the **Field Controller**
- Under **NOP 2** status, the **Field Controller Shall,** where practicable, carry out **Switching** operations to establish an operational zone of work up to a single de-energisation point
- Under **NOP 2** status, the remote setting of Circuit Breakers (ground mounted and pole mounted) for **Live**-line working **Shall** be carried out by the **Control Engineer** prior to the start of **NOP 3** or **NOP 4** status, or by the **Field Controller** after **NOP 4** status has commenced
- Under **NOP 3** and **NOP 4** status, **Apparatus** located outside the zone of work **Shall** be operated for **Live**-line working by the **Field Controller** providing that the **Switching** operation has been sanctioned under the 'Special Conditions' of the Control Transfer Certificate
- Direct communication between each **Working Party** and the **Control Engineer Shall**, where practicable, be maintained by the designated persons in charge of each **Working Party**. Communication **Shall** be made using **Approved** devices such as mobile telephones or private mobile radios (PMRs)
- Where communication is not available at a specific work location, a contingency **Shall** be introduced whereby the person in charge of that **Working Party Shall**, from a reliable signal area, communicate directly with the **Control Engineer** both before and following **Live**-line work activities
- Under **NOP 4** status, **Live**-line work **Shall** be restricted to fault repair and/or planned work. In such cases work **Shall** only be undertaken on **Apparatus** and **Conductors**

installed above ground level up to their connection point with any exposed and visually traceable underground part of a **System**. Work involving cable identification and/or spiking of underground cables **Shall** not be carried out under **NOP 4** status

9 Revision History

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

Appendix A Network Operating Procedure Training and Authorisation Matrix

The training/authorisation of **SSEN-D** staff for the user of **Network Operating Procedures** should be in accordance with the following matrix:

Skill Level	NOP 1	NOP 2	NOP 3	NOP 4R	NOP 4	SCP 3
Level One (e.g. craftsmen/newly authorised team managers or retraining)	**Y**					
Level Two (e.g. craftsmen/team managers with increased experience)	**Y**	**Y**				
Level Three (e.g. experienced craftsmen/team managers)	**Y**	**Y**	**Y**	**Y**		
Level Four (e.g. highly experienced craftsmen/team managers)	**Y**	**Y**	**Y**	**Y**	**Y**	**(Y)**

Key:

NOP **Network Operating Procedure**

SCP **System** Control Procedure

SCP 3 – managing the control of a part of the **System** by a **Control Engineer** using contingency/paper diagrams from a suitable location.

Notes:

* Generally, staff at level three will be training and authorised for **NOP 4R** earlier than **NOP 3**.

Where appropriate all current authorisations should be reviewed in line with the above matrix.

Future authorisations to **NOP 4** should only be **Approved** for staff capable of taking control of complete feeders and operating to SCP 3 in emergencies.

The suitability of individuals for authorisation at Levels One to Four will depend on their aptitude and experience.