PR-NET-OSM-036

AUTOMATION SCHEMES AND DEVICES

OPERATIONAL SAFETY MANUAL - SECTION 4.12

Scottish & Southern Electricity Networks

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1 Introduction

1.1 **System Automation** has been and is currently being deployed across the **SSEN-D System** since circa 2007.

1.2 The operation of a protection scheme is an essential function of any automation scheme. It is required to safely disconnect parts of the **System** to prevent harm. Following the operation of a protection scheme, automation then takes over and seeks to restore as many customers as possible, as quickly as possible.

2 Scope

2.1 This **Approved** procedure provides guidance on the types of **System Automation** schemes and devices on the **SSEN-D System** and general safety precautions relating to them.

2.2 This **Approved** procedure applies to all staff and contractors working for or on behalf of **SSEN-D**.

2.3 This **Approved** procedure does not specify operating procedures for specific automation schemes.

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
WI-NET-OSM-002	Personal Protective Equipment and Workwear for Live Environments
PR-NET-OSM-026	High Voltage System Switching and Earthing - Operational Safety Manual – Section 4.2
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 **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 **System Automation**

A **System** connected to **Plant** or **Apparatus** on the **SSEN-D System** that can operate switchgear without manual intervention.

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 It **Shall** be the responsibility of the individual to ensure that any actions performed are within the bounds of their competency and authorisation level.

6.2 Any manual intervention to the operation of **System Automation Shall** only be carried out by persons authorised at the required voltage for the **Apparatus** they are operating. This does not prevent the operation of **System Automation** by a **Control Engineer** through the Network Management System.

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

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 Types of System Automation

8.1 **System Automation** can be categorised as 4 types:

- Protection
- Network Automation
- Active Network Management
- Actuators

8.2 Protection schemes are systems which detect abnormal or fault conditions and initiate actions to disconnect the minimum required section of the **System** to remove the fault, or take corrective action to return the network to a stable condition. These schemes are restricted to only opening switchgear to disconnect a section of the network – never closing switchgear.

8.3 Network automation schemes are systems which reconfigure or restore the **System** without human intervention, usually initiated by protection schemes. These can include:

- Auto-reclose schemes
- Bidoyngs

- Hard-wired auto-changeover schemes
- Restoration by bespoke logic scripts or by adaptive logic script systems such as Adaptive PowerOn Restoration System (APRS)

8.4 Active network management schemes are systems which issue dispatch instructions, without human intervention, to connected Distributed Energy Resources (DER) to manage the **System** within defined parameters. DER is mostly used in generation, but will start to include more demand in the future.

8.5 Actuators are devices fitted to switchgear to allow remote operation, either locally or through the Network Management System.

9 General Requirements

9.1 At all times when operating on **Plant** or **Apparatus** associated with **System Automation**, the **SSEN-D OSR** and PR-NET-OSM-026 High Voltage Switching and Earthing - Operational Safety Manual – Section 4.2 Shall apply.

9.2 **System Automation Shall** be disabled during **Switching** operations.

9.3 When points of isolation or **Earthing** are established on **Plant** and **Apparatus** that may be controlled by **System Automation**, any automatic functionality **Shall** be disabled, where locking facilities exist, they **Shall** be locked and appropriate notices applied.

9.4 The disabling or enabling of any **System Automation Shall** be a **Switching** instruction and noted accordingly on **Approved Switching** schedules and / or **Switching** log books.

9.5 When actuators have been re-enabled following manual **Switching**, where reasonably practicable they **Shall** be tested for correct remote operation, either through the local control unit or preferably via the **Control Engineer.**

9.6 Fault Passage Indicators (FPIs) and relay indications **Shall** be manually reset locally where required upon completion of **Switching** operations. Their positive indication and resetting **Shall** be noted in a **Switching** log book, and reported to the **Control Engineer** as required.

9.7 The Equipment Specification Managers **Shall** ensure that all appropriate specifications include a requirement for the drafting of operating instructions, and provision of training for all types of **System Automation**.

9.8 All automated **Plant** and **Apparatus Shall** be recorded and identified on the **SSEN-D** asset management system.

9.9 When entering substations or **Switching** stations where **System Automation** is present, persons **Shall** be aware that unexpected operations could occur.

9.10 If **System Automation** operates when a person or **Working Party** are on-site, they **Shall** leave the immediate vicinity of the affected **Plant** or **Apparatus** and inform the **Control Engineer**. The **Control Engineer Shall** inform the person or **Working Party** when they can resume.

9.11 When working for more than 30 minutes immediately adjacent to **Plant** or **Apparatus** with **System Automation**, where reasonably practicable it **Shall** be disabled for the duration of the work.

9.12 The decision to disable the **System Automation** schemes **Shall** be based on an assessment of the work being carried out and the risk of a fault occurring.

9.13 Each individual job **Shall** be risk-assessed by the responsible person organising or managing the work and the request to disable the **System Automation Shall** be based on the outcome. Where work extends over a number of days the scheme will normally be

restored to service whenever the **Working Party** leave site, rather than being left disabled for the duration of the job.

9.14 Examples of when a scheme **Shall** be disabled when:

- Persons are **Switching**, isolating or **Earthing** on, or in vicinity of busbars controlled by an auto-reclose scheme.
- Work in the vicinity of such busbars that involves a risk of accidental contact, e.g. with ladder etc.

10 Revision History

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