PR-NET-OSM-066

GENERAL REQUIREMENTS FOR WORK ON THE LOW VOLTAGE SYSTEM

OPERATIONAL SAFETY MANUAL - SECTION 10.1

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 **Approved** procedure sets out the general arrangements for work and testing on or near **Low Voltage Apparatus** and **Conductors** and contains some general requirements for work on **Low Voltage** overhead and underground **Systems**.

1.2 The detail within the **Approved** procedure addresses the required process to justify **Live** working on **Low Voltage Apparatus** and **Conductors** and the requirements of various pieces of Legislation; namely:

- The Health and Safety at Work Act 1974, which requires that an employer (**SSEN-D**) carries out its works so as not to place at risk, its employees, contractors or members of the public
- The Electricity Safety, Quality and Continuity (ESQC) Regulations 2002, which places a specific duty to ensure that **SSEN-D**'s equipment is installed and maintained so as to prevent **Danger**
- The Electricity at Work Regulations 1989, in particular Regulation 14 which is associated with the justification for **Live** working
- HSE HS(R) 25 Memorandum of Guidance on the Electricity at Work Regulations 1989

2 Scope

2.1 This **Approved** procedure is provided in addition to Section 8 of the **Operational Safety Rules** and **Shall** be complied with by all persons working on the **Low Voltage System** owned by **SSEN-D**.

2.2 Dispensation from this requirement may only be provided by the **Designated Engineer** in accordance with an **Approved** procedure or agreement.

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-058	Management of Work and Access to Poles – Operational Safety Manual – Section 7.1
PR-NET-OSM-067	Work on Damaged or Faulty Low Voltage Cables - Operational Safety Manual - Section 10.2
PR-PS-842	Lone Working Procedure
TG-NET-OHL-139	Line Patrol Survey Instructions – LV Poles
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
EAWR	The Electricity at Work Regulations 1989
ESQCR	The Electricity Safety, Quality and Continuity (ESQC) Regulations 2002

Reference	Title
HASAWA	The Health and Safety at Work Act
HSE HS(R) 25	Memorandum of Guidance on the Electricity at Work Regulations 1989

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 **Operational Safety Rules**.

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.**

5 General Responsibilities

5.1 Persons who are required to operate and undertake work on the **Low Voltage 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 **Shall** 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.

5.3 In addition to the responsibilities of persons detailed within the **Operational Safety Rules**:

- The person in charge of the work on site **Shall** complete the pre-work risk assessment
- The person in charge of the work **Shall** inform all members of the **Working Party** of the identified risks and necessary control measures before signing the pre-work risk assessment and work commencing
- Any additional **Working Party** members **Shall** be fully briefed before signing the pre-work risk assessment and starting work
- All **Working Party** members **Shall** comply with the instructions and guidance provided by the Person in charge of the work.
- The person in charge of the work on site **Shall** comply with the current **Low Voltage** Control procedures.

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

6.3 Detailed authorisation requirements for **Low Voltage** working are shown in section 12.

7 Personal Protective Equipment

7.1 Persons who are required to work or carry out **Switching** 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 All work and testing on **Low Voltage Apparatus Shall** be carried out in accordance with **Operational Safety Rules** and the appropriate **Approved** procedure. The **Designated Engineer** may, by formal agreement prior to work commencing, agree alternative specific arrangements in accordance with **Approved** procedures.

8.2 The preferred method of working on **Low Voltage Systems** is with **Conductors Dead**, **Isolated** and where applicable **Earthed** (e.g. bonded together), in accordance with **OSR** 8.1.3.

8.3 Work **Shall** normally be carried out **Dead** when:

- To make the **System Dead** would have no effect on any connected consumers or essential services, or
- The on-site risk assessment for a particular **Live** working task indicates unacceptably high risks, or
- Appropriate **Approved** control measures for a particular **Live** working task cannot be taken; or
- The task can only be carried out under **Dead** conditions (see section 13 of this **Approved** Procedure)

8.4 All **Live** working on **Low Voltage Conductors Shall** be risk assessed in accordance with the guidance provided by this **Approved** Procedure.

NOTE: Regulation 14 of the Electricity at Work Regulations 1989 and the associated guidance within HSE HS(R) 25 Memorandum of Guidance to the Electricity at Work Regulations 1989, have been used to develop the detail of this **Approved** Procedure.

8.5 The Electricity at Work Regulations 1989 state: "*No person **Shall** be engaged in any work activity on, or so near any **Live Conductor** (other than one suitably covered with insulating material so as to prevent **Danger**) that **Danger** may arise unless*:

- *It is unreasonable in all the circumstances for the **Conductor(s)** to be **Dead**, and*
- *It is reasonable in all the circumstances for persons to work on or near **Live Conductors**; and*
- *Suitable precautions (including where necessary the provision of suitable protective equipment) are taken to prevent injury"*

8.6 **Live** working techniques **Shall** be used on **Low Voltage** underground cables even if the **Conductors** have been made **Dead** and **Isolated**. This approach is necessary because of the complexity and connectivity of the **Low Voltage** underground **System**, and to manage the risks associated with uncontrolled or inadvertent energisation of **Conductors**.

9 Identification

Apparatus on which work, or testing is to be carried out must be readily identifiable, or have fixed to it a means of identification that **Shall** remain effective throughout the course of the work or testing.

10 Justification Process for Live Working

10.1 In line with the general principles of this **Approved** Procedure, all **Live** working **Shall** be fully justified. When producing this justification, it is important to identify and assess all of the risks involved with the job.

10.2 The following three questions, which **Shall** always be asked, are based on the fundamental requirements of Regulation 14 of the Electricity at Work Regulations 1989:

Question 1

Is it unreasonable (not reasonably practicable) for the **Low Voltage Apparatus** to be made **Dead** and **Isolated**?

Examples of where it would be unreasonable to make **Conductors Dead** are:

- Where the risk associated with making **Dead** and isolating the **Low Voltage Apparatus** to be worked on is greater than the risk associated with working **Live** on the same **Apparatus**
- Where making the **Apparatus Dead** will introduce an unacceptable level of public / social risk, e.g. long interruptions to traffic lights, public buildings etc
- When protective measures in line with the requirements of the **Operational Safety Rules** cannot be applied to protect against the likelihood of **Conductors** becoming inadvertently **Live**, e.g. private generator connected to an underground cable **System**
- When isolation is not reasonably practicable to achieve due to ownership of shared assets, e.g. Public Lighting 5th Cores within **Low Voltage** distribution cables

Question 2

Is it reasonable to allow persons to work on or near **Live Low Voltage Apparatus**?

It is considered reasonable providing:

- Making the **System Dead** would have an effect on one or more connected customers and it is not considered reasonably practicable to provide an alternative temporary source of supply
- The assets to be worked upon are in a sound condition
- The ‘as designed’ integrity of the assets remains, e.g. presence and condition of phase barriers
- The person is trained and competent in the relevant **Live** working techniques
- The work is carried out in accordance with an **Approved** procedure
- Site conditions are suitable for **Live** working, e.g. adequate working space
- There is adequate lighting available

Question 3

Can suitable safety precautions be used to prevent injury? Suitable safety precautions **Shall** be determined and prescribed within all **Approved Live** working procedures.

Examples of such precautions are:

- Provision and use of adequate information about the work and **Apparatus**
- Correct use of **Approved** tools and testing devices
- Accompanied by another suitably trained **Competent Person**
- Effective control of the work area, e.g. limiting the number of persons allowed near to the **Live Apparatus**
- The use of barriers and screens
- The use of **Approved** insulated shrouds or shrouding
- The use of **Approved** insulated gloves
- The use of **Approved** Personal Protective Equipment, e.g. arc-resistant clothing (Class 2).

11 Requirements for Live Work

Where **Live** working is justified the following requirements **Shall** be met:

- The person in charge of the work **Shall** carry out a pre-work risk assessment to determine the suitability for **Live** working
- Site conditions **Shall** be continually assessed by the person in charge of the work in order to maintain a safe working environment. Changes in conditions might require the work to cease, the **Apparatus** or **Conductors** to be made **Dead** or additional control measures to be introduced. Any changes **Shall** be communicated immediately to the **Working Party**
- The work **Shall** be completed in accordance with an **Approved Live** working procedure
- **Competent Persons** who work **Live** on **Low Voltage Apparatus Shall** be authorised in writing (see section 12).
- Adequate information about the work and **Apparatus** involved **Shall** be provided to the **Competent Persons** completing the work.
- In accordance with **Operational Safety Rule** 8.6.2, unless alternative **Approved** procedures allow, only one phase **Conductor Shall** be bared (exposed) at any one point in time. All other **Conductors** and metalwork **Shall** be insulated and mechanically protected as appropriate, with **Approved** insulating materials. Insulation includes shrouding of exposed **Live Conductors** and **Earthed** metalwork.
- **Approved Live** working procedures must avoid the risk of inadvertent contact with exposed **Live Conductors** or short-circuits. Site conditions and the environment where the work is to be completed must be considered and controlled. All conductive objects, e.g. metallic watch straps, that might pose a risk during **Live** working, **Shall** be removed from the operator's person.
- Work must be carried out using **Approved** insulated tools, equipment and the appropriate PPE as defined by the pre-work risk assessment and the **Approved** procedure.

12 Competence and Authorisation of Persons to Undertake Live Low Voltage Working

12.1 **Competent Persons** who work **Live** on **Low Voltage Apparatus Shall** hold written authorisation which details the **Apparatus** on which they are authorised to work **Live**, e.g. overhead, underground or substation.

12.2 Persons **Shall** be authorised in writing to work **Live** under **Personal Supervision** to gain experience. **Personal Supervision Shall** be provided by a person who is **Authorised** and experienced in the required **Live** working techniques.

12.3 All persons **Shall** complete the following requirements in numbered order before being provided with written authorisation to work **Live** on **Low Voltage Apparatus**:

1. All Persons who may be concerned with the operation of, or work upon the **SSEN-D Systems** and associated **Plant** and **Apparatus Shall** be trained in and be conversant with the treatment of electric shock, prior to holding an authorisation. This may be achieved through a suitable basic First Aid course
2. Attend and pass an **SSEN-D Approved** training course associated with the required level of authorisation, e.g. **Approved Live** working procedures, Craft Competencies - jointing, basic electrical competence, etc
3. Following successful completion of the **SSEN-D Approved** training course, the candidate **Shall** be issued with an authorisation certificate to enable on job experience to be gained under the **Personal Supervision** of a suitably **Authorised Person**. The authorisation certificate **Shall** carry the **Approved** restriction 'Under **Personal Supervision'**
4. During the period of on job experience, objectives specific to the authorisation **Shall** be completed in accordance with a structured training program following the guidance contained within the relevant **Approved** procedure. At the start of this period the candidate **Shall** be issued with an Operational Logbook (portfolio) where they **Shall** keep a history of all jobs they have been involved in
5. Before authorisation is granted, the person **Shall** complete a final **SSEN-D** technical assessment at an **Approved** training centre, to verify that the required level of competence for working **Live** has been achieved
6. Following completion of the appropriate training, the person **Shall** attend an Authorisation and Assessment interview prior to carrying out **Live Low Voltage** work without **Personal Supervision**. This **Shall** be in accordance with the relevant **Approved** procedure

13 Conditions Where Live Working Shall Not Take Place

Live Low Voltage working is forbidden in the following circumstances unless supported by an **Approved** Procedure:

- Replacement or repair of metal enclosed cut-outs
- Work within group service panels and metal enclosed cabinets
- Work on cut-outs mounted on paper insulated or lead covered cables.
- Work on phase concentric cables
- Work within metal lamp columns and street furniture

- The connection / disconnection of cables within distribution fuse boards / open frames
- The connection / disconnection of cables into 2 or 3 phase cut-outs
- Damaged or distressed **Apparatus**
- The opening of a cable end
- Where any operational restriction is in place to indicate no **Live** working

14 Live Working on Low Voltage Pillars, Open Frames, Cabinets and Link Boxes

14.1 Connecting and Disconnecting Cables in Low Voltage Pillars, Open Frames, Cabinets and Link Boxes.

14.1.1 No mains distribution or service cable **Shall** be connected or disconnected in a **Low Voltage** pillar, open frame board, cabinet or link box with any part of the unit **Live**, unless supported by an **Approved** procedure.

NOTE: This includes both sides of any incoming links located within the **Low Voltage** pillar. Isolation might therefore be required at **High Voltage** and the requirements of **Operational Safety Rule** 8.2.3 **Shall** be complied with.

14.1.2 Work on a single section of a multi-section board may be carried out in line with 14.1 provided the adjacent section(s) of the board are shrouded.

14.1.3 The connection and disconnection of auxiliary wiring to small wiring terminals may be completed with the **Low Voltage** pillar or open frame board **Live** following a full Risk Assessment and the implementation of the associated control measures.

14.1.4 Where there is the possibility of customer generation backfeeds, all **System Conductors** within the **Low Voltage** pillar or cabinet, **Shall** be **Earthed** or bonded together in accordance with an **Approved** procedure before work starts.

14.2 Cleaning and Greasing of Live Low Voltage Contacts

It is acceptable to clean and grease **Low Voltage Apparatus** contacts with **Conductors Live**. A **Competent Person** who has been trained to carry out this work must assess the job to ensure that there are no **Dangers** which preclude **Live** working. If **Live** working can commence it **Shall** be in accordance with an **Approved** procedure.

14.3 Minor Work Associated with Live Low Voltage pillars, Open Frames, Cabinets and Link Boxes

14.3.1 Work of a minor nature which does not include the dismantling of equipment supporting power circuits or the movement of **Conductors**, may be carried out with **System Conductors Live** providing that it is completed in accordance with an **Approved** procedure.

14.3.2 In the absence of such an **Approved** procedure, a comprehensive site-specific written risk assessment and safe method of working **Shall** be produced by a **Senior Authorised Person** who **Shall** provide **Personal Supervision** or issue a **Limitation-of-Access** (or **Permit-to-Work** if **High Voltage** isolation and **Earthing** is used).

15 Precautions for Work on Live Low Voltage Overhead Lines

There are additional hazards associated with **Low Voltage** Overhead lines, which might preclude **Live** working, unless covered by an **Approved** procedure, examples of these are:

- Where metalwork on the pole is bonded, e.g. pole bolts, brackets, stays
- Where the pre-work risk assessment indicates that there is insufficient room to work safely due to the number and position of **Conductors**
- Where the pole access procedures available are not appropriate for **Live Low Voltage** working.
- If the pole is suspect or contains rot
- When un-insulated mains **Conductors** are to be installed, removed or tensioned

15.1 Dangers

The main **Dangers** to personnel when working on **Low Voltage** overhead lines and supports are electric shock, burns or falls arising from:

- A Person confusing **Apparatus** and **Conductors** which have been made **Dead** with those which remain **Live**
- Inadequate precautions taken to control induced voltages from other adjacent **Live Apparatus**
- Touch potentials due to inadequate application of **Earths** and bonds
- Proximity of a lightning storm
- Inadequate clearance from **Live Apparatus**
- Insufficient allowance for insulator and **Conductor** movement caused by wind and gales when assessing **Safety Distances**
- Incorrect use of climbing aids and associated PPE

15.2 Additional Precautions

- Work **Shall** be carried out in a way to minimise any out-of-balance conditions and temporary stays must be applied where these **conditions** arise
- The release of tension and lowering of **Conductors Shall** be carried out in a controlled manner, to avoid any shock loading on the pole

15.3 Access to Poles

General:

- It **Shall** not be assumed that because of good superficial appearance, recent installation, testing or maintenance that a pole is safe to climb or for use as a personal support
- All structures **Shall** be inspected, tested and assessed by a **Competent Person** before being accessed. This **Shall** include checking for deterioration, decay, and damage due to woodpeckers and lightning strikes etc

- Access to concrete or metal poles **Shall** only be undertaken directly using ladders or off-pole using Mobile Work Equipment or a wood pole (being used to replace the existing pole). Bracings **Shall** not to be used to access such poles
- Only persons who have received asset management wood pole inspection training and are deemed competent to carry out enhanced testing and categorisation of wood pole condition, may fix 'D' labels when poles are identified as not fit to climb. In these cases, those persons **Shall** also update the pole asset record accordingly as soon as possible
- If the person making the assessment has not received the required asset management pole inspection training, then they must escalate via the 30 minute line at the earliest opportunity. The 30 minute report should detail the pole I.D, it's location and the fact that it has been assessed as not fit for access. The asset management team will then arrange for a timely formal condition assessment of the pole in accordance with TG-NET-OHL-139

NOTE: Steel poles fitted with **Approved** alternative climbing means **Shall** be accessed in accordance with associated **Approved** procedures.

- There are currently no simple mechanical tests which can be used to assess the structural integrity of a concrete or metal pole prior to access, therefore a visual inspection **Shall** be used
- Structures which are covered with ivy or other vegetation cannot be correctly inspected or climbed safely and **Shall** therefore be regarded as defective until the vegetation has been removed and the structure assessed
- Wood poles no older than 5 years may be assumed to be rot-free and therefore require only a visual inspection and hammer test to check for other defects
- If any of the testing or inspection regimes determine that the pole is unfit to be climbed, then an alternative method of access **Shall** be used as detailed in Section 15.9
- Assessment of condition obtained from line inspections **Shall** not be used as proof of condition of the structure prior to climbing

NOTE: For specific information on accessing HV wood poles see PR-NET-OSM-058 Operational Safety Manual Section 7.1

15.4 Inspection of Poles

All poles **Shall** be inspected before access. Inspections **Shall** take into account the following:

- If the pole has been previously labelled as being defective
- Stability of pole foundations. If the foundations appear inadequate or defective or have been disturbed, e.g. any excavations adjacent to the pole base
- Any alterations in ground clearance which would decrease the depth of the foundation
- Abnormal ground conditions such as shrinkage of clay
- Visual check of **Conductor** and stay security, trees or third-party encroachment, **Plant** and **Apparatus** integrity
- The pole is not overloaded, e.g. as a result of broken **Conductors**
- Confirm, using the gouge mark (birthmark), that the pole is buried to the correct depth
- From the ground, visually inspect the pole for physical damage, impacts, lightning damage, crushing, vermin and woodpecker damage, etc

- From the ground visually inspect the top of the pole for damaged components that could fall
- Age of the pole from the date mark
- Damage to poles due to lightning and woodpeckers **Shall** always be treated with caution. It is not usually possible from ground level to establish the total amount of damage done to the pole. Careful assessment **Shall** be made and the use of alternative **Approved** climbing methods should be used as detailed in Section 15.9
- Where 'D' labels are to be applied and the defect is due to rot or woodpecker damage high up the pole, then the 'D' label should be fitted preferably out of reach. This will make it clear that the 'D' is not to be removed in error at the next inspection
- A QA (quality assurance) work order will then be raised by the inspections team and the pole to ensure that a decay and/or damage assessment of 4 is entered. This will ensure that an asset replacement defect work order is raised in Maximo
- Where no damage is found the pole **Shall** be checked for decay

15.5 Checks for Decay

- If the age of the pole has been positively established from the date mark as being no older than 5 years, then a hammer test only may be carried out
- Where the date cannot be positively established, e.g. the date mark is hidden or unreadable or the pole does not have a date mark, then full testing for decay **Shall** be carried out
- Poles **Shall** be checked visually and by using the hammer and prod method as specified in Section 15.6. Where a pole fails the prod test, then it **Shall** be deemed unfit to climb and an alternative method of gaining access **Shall** be used
- Where no decay or damage is found, the pole is fit to be climbed
- Where decay is found the procedures in Section 15.9 **Shall** apply
- Where an 'S' or 'D' label is fitted to the pole and no decay is detected, then decay **Shall** be assumed to have been found by earlier inspections, unless positively proved otherwise, the provisions of Section 15.9 **Shall** apply
- An S' label was traditionally used for 'suspect' poles. 'S' labels are no longer used to classify poles. All redundant/inaccurate pole labels, such as 'S', must be removed and replaced with the appropriated label at the time of discovery by the person carrying out the inspection
- Where a 'P' label has been fitted then decay has been detected and the pole **Shall** be thoroughly tested, using the hammer and prod technique, before climbing

15.6 Hammer and Prod Test

The following procedure **Shall** be used to determine the condition of a pole before access or whilst undertaking a routine inspection:

1. Undertake a prodding test by pushing a thin screwdriver or bradawl (minimum length 75 mm) into the surface of the pole. An indication that the pole is sound is when the screwdriver or bradawl is resisted by firm fibre
2. If the pole is not resistive to the pressure of the screwdriver or bradawl and spongy or weak fibre is detected to a depth of 50 mm at one point of test, or 25 mm at multiple points of test around the circumference of the pole, then the pole is unfit to climb

3. Undertake a hammer test by using a 2lb hammer to strike the pole, at regular intervals at least 300 mm apart, in a spiral motion from ground level to arms reach. Where a pole has had a pole repair sleeve fitted then testing **Shall** be carried out from the top of the sleeve to at least 1 m above it

Note: Where a pole is frozen a hammer test may not give the correct indication of pole condition, therefore frozen poles must be accessed by a method other than climbing i.e., a MEWP, or "A" Frame ladder.

4. During this test a resonant ringing sound **Shall** be listened for to indicate a sound section of pole and the hammer should rebound sharply. Decay pockets will be indicated by sounds which are hollow, boxy or dull, or a less pronounced hammer rebound. It should be noted that cable guards or other equipment fitted to a pole may affect the sound produced.

5. If decay is suspected at ground level, but, not to the extent that the pole is unfit to climb, then the pole must be excavated and the tests continued to a depth of 300 mm

6. Where decay is detected, but not to the extent that the pole is unfit to be accessed, then further tests **Shall** be carried out as the pole is accessed up to the safe climbing limit (where **Conductors** are **Live**). Where it is not possible to climb to the pole top due to safety restrictions, the pole **Shall** be visually examined to ensure that there is no decay or damage in the vicinity of the pole top

7. If the pole is declared unfit at any stage, the pole **Shall** be descended and an alternative **Approved** method of gaining access used.

15.7 Metal Pole Inspection

15.7.1 Metal poles can consist of either a lattice type structure or rolled steel column. These structures can either have a foundation enclosed in concrete in the ground or be direct buried in the ground without additional foundations.

15.7.2 The following checks **Shall** be used to determine the condition of a metal pole before climbing or whilst undertaking a routine inspection:

- Check visually at ground level for signs of rusting resulting in reduction in area of the metal at the ground line. If necessary, dig down for 150 mm and inspect. If deterioration is found do not use ladders to climb the pole
- Check visually at ground level for signs of disturbance of the foundations. If found do not use ladders to climb the pole
- Check visually from ground level for signs of rusting resulting in reduction in area of the metal pole and the **Conductor** fittings. If found do not use ladders to climb the pole
- Check unstayed angles for signs of bowing. If only slight erect the ladder in position such that the bend will be reduced. If severe do not use ladders to climb the pole
- Check visually for alterations in ground clearance which would decrease the depth of the foundation
- Check visually for **Conductor** and stay security, third party damage, **Plant** and equipment integrity
- Check that the risk assessment addresses the additional loads to be imposed on poles found defective to climb. If necessary, these poles will need to be replaced

15.8 D' Labels fitted to Concrete or Metal Poles

'D' labels fitted to concrete and metal structures **Shall** be secured using cable ties, binding wire or equivalent

15.9 Access to Defective Poles

15.9.1 Where access to a defective pole is required, then one of the following methods **Shall** be used:

- A vehicle mounted hydraulic platform of an **Approved** type used by competent staff
- A replacement pole **Shall** be erected next to the defective pole and the defective pole lashed to the newly erected pole for stability. All work carried out by the climber **Shall** be from the sound pole or from a platform mounted on the sound pole
- A self-supported scaffold tower installed by competent staff or competent scaffold contractors
- In situations where none of the above can be applied then poles **Shall** have their residual strength assessed using an **Approved** pole testing device. Should this assessment be acceptable and provided the pole is not subject to any other form of defect it may be accessed, providing a written risk assessment has been carried out detailing why other methods cannot be utilised. The risk assessment **Shall** be discussed with the Team Manager prior to commencement of work

15.9.2 Where access to a defective pole is required and cannot be risk managed using one of the above methods, then a written risk assessment **Shall** be made taking into account the work to be done and the safe methods of working. This additional risk assessment and method **Shall** only be used in consultation with a member of the Occupational Safety Team.

15.10 Approved Procedure for Unaccompanied Access up to 2 m

15.10.1 **OSR** Sections 3.4.2 reads as follows:

*"All **Persons** gaining access to and during work on towers, poles and high structures **Shall** make proper use of **Approved** safety equipment and **Shall** be in visual range of another **Person**, in a position to immediately render effective assistance, where necessary. All **Persons** concerned **Shall** be fully conversant with **Approved** rescue procedures. Unaccompanied access is allowed for **Switching** or testing when it is of limited duration and is covered by an **Approved** procedure."*

15.10.2 The following **Approved** procedure **Shall** apply where an unaccompanied operational person intends to access a pole or structure up to a height of two metres (feet position) above ground for **Switching** or testing purposes of limited duration.

15.10.3 The scope of the definition **Switching** when used in this **Approved** procedure, is limited to the operation of fixed fuse units and ancillary control equipment that is associated with remotely controlled equipment. The breaking / making of **Conductor** jumpers as a **Switching** operation is not included.

15.10.4 pre-work risk assessment **Shall** be carried out prior to unaccompanied access up to 2 m. Figure 15.1 illustrates the process to be followed.

15.10.5 The process does not include standard working requirements, e.g. assessment of equipment before use and testing poles before climbing. The process assumes that such requirements are done in addition to these requirements. Where defined in the process, the term 'Additional Controls' means that there is a need for the operative to deploy additional

controls to operate safely, e.g. an extra person required to help remove an anti-climbing guard.

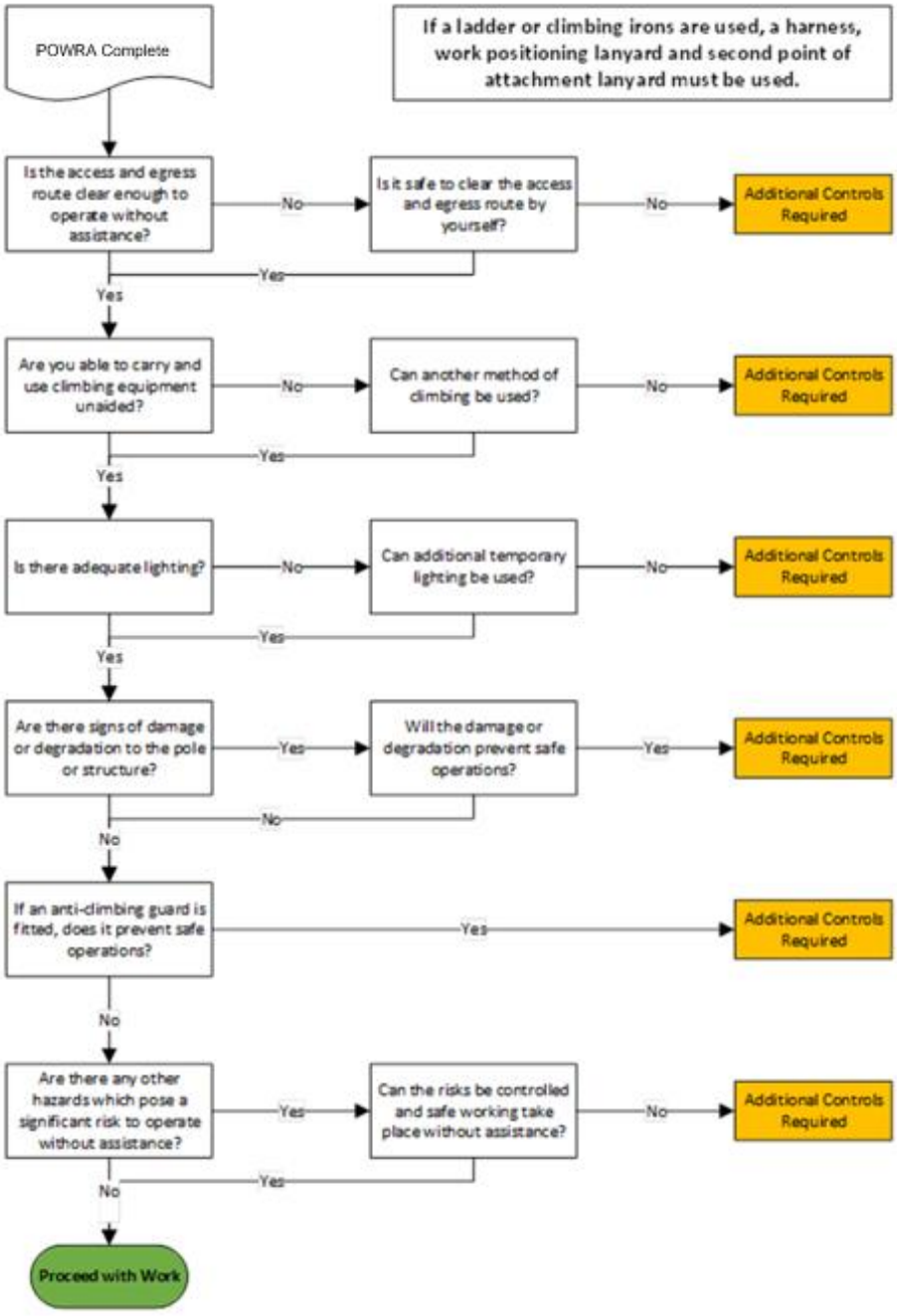

Figure 15.1 - Risk Assessment for Unaccompanied Work up to 2 m

16 Additional Precautions for Work on Low Voltage Underground Cables

16.1 Work on Damaged and Faulty cables **Shall** be carried out in accordance with the **Operational Safety Rules** and PR-NET-OSM-067 Work on Damaged or Faulty Low Voltage Cables - Operational Safety Manual – Section 10.2.

16.2 Ducts containing cables **Shall** be accessed in accordance with an **Approved** procedure.

16.3 To prevent the inadvertent energisation of cut or capped cables, all **Low Voltage** underground cables **Shall**, when installed or decommissioned, be fitted with an **Approved** cable shorting device or cable joint at every end. This **Shall** be completed in accordance with an **Approved** procedure.

16.4 The installation of a shorting cap-end may be omitted where, when working on a **Low Voltage** underground cable providing the work is continuous and all cable joints are completed on that day as part of that job.

16.5 So far as reasonably practicable, all **Low Voltage** cables installed in the ground (laid direct or in ducts) **Shall** be backfilled with either sand or another **Approved** aggregate. If laid direct, they **Shall** be marked using an **Approved** cable marking system (tiles or tape for example) before any part of the cable is energised via another part of the **System**.

16.6 In addition to the requirements of 16.5, the Person responsible for energising the **Low Voltage** cable **Shall**:

- Ensure that the reinstatement is completed at the earliest opportunity
- Consider the use of additional road signs and barriers to warn / guard the general public
- Use **Danger Notices** fixed to the cable at various intervals (no more than 10m apart) throughout the length of the open excavation
- Decide if increased inspections of the work area are required
- Consider on-site security if there is deemed to be an increased risk of interference

17 Testing and Energising the Low Voltage System

17.1 Initially Energising New Equipment

17.1.1 Prior to the initial energisation of a **Low Voltage** circuit, where this is by either jointing, connection to an overhead line or the insertion of fuses, it is essential to establish the integrity of the circuit.

17.1.2 The minimum testing to be carried out **Shall** ensure that:

- The cores are not connected either to **Earth** or (in the case of a cable) to the **Earthed** screen/sheath
- The cores on multi-phase cables are not connected with one another; and
- That where both ends of the cable to be connected to one another or energised are exposed, the cores are continuous

17.1.3 Where any of these conditions indicate that the circuit is not suitable for energising, then the cause of the adverse indication **Shall** be identified and rectified before continuing with the energisation activity.

17.1.4 Following satisfactory testing, the **Low Voltage** circuit may be made **Live**.

17.2 Re-Energising Previously In-Service Equipment and Fault Repairs

17.2.1 Where load remains connected and the circuit is to be re-energised, either by jointing, connection to an overhead line or the insertion of fuses, it may not be practicable to carry out the testing detailed above. Under these conditions the re-energising **Shall** be carried out as follows:

- **Low Voltage** circuits that are suspected to be faulty or following post fault repairs **Shall**, where practicable, be re-energised using an **Approved** Fault Re-energising Device.

NOTE: Use of a re-energising device mitigates the **Dangers** associated with further faults downstream from any initial fault repair.

- If a **Low Voltage** circuit has been **Dead** for a period greater than 24 hours an **Approved** Fault Re-energising Device **Shall**, where reasonably practicable, be used to energise the **Low Voltage** circuit.

17.2.2 Where work or testing has involved the initial connection or re-arrangement of **Conductors**, the supply to a customer **Shall** not be given until the appropriate testing has been completed. In addition, after the circuit has been energised, and where practicable, a test **Shall** be completed at the closest open point to confirm that **System** phasing is correct.

18 Revision History

No	Overview of Amendments	Previous Document	Revision	Authorisation
01	New document created	N/A	1.00	Richard Gough
02	Minor revisions made	PR-NET-OSM-066 (Rev1.00)	1.01	Richard Gough
03				