NORTHERN IRELAND ELECTRICITY NETWORKS LIMITED
('NIE NETWORKS')

SAFETY RULES

3rd Edition

IMPORTANT – when you receive your copy of these Safety Rules you must do two things without delay:

1. Read the Safety Rules and familiarise yourself with the structure and content of the rules. Being able to navigate successfully through these Safety Rules is a key requirement for all Persons; and

2. Register your ownership of the Safety Rule book using the QR Code or the URL link below.

NIE Networks Safety Rules Receipt

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NORTHERN IRELAND ELECTRICITY NETWORKS LIMITED
(NIE NETWORKS)

SAFETY RULES

3rd Edition

Operative from (August) 2024

Issued to: (*Write in CAPITALS*)

Name: ……

Employer: ……

Payroll Number/ National Insurance Number: ……

I acknowledge:

(1) Receipt of this 3rd edition of the NIE Networks Safety Rules (the 'Safety Rules') including the Safety Rules Instructions and the Safety Rules Guidance.

(2) That it is the duty of all Persons who may be concerned with the control of, and the carrying out of work on the System to which these Safety Rules apply to ensure that they are thoroughly familiar with these Safety Rules and the associated supporting documents.

…….. (*Signed)*

…… Date

Emergency Contact Numbers:

Distribution Control Centre……..……028 3836 8750

Transmission Control Centre..……028 9032 4850 / 028 9070 7505

Hazard Watch……028 3836 8585

This copy receipt is to be completed and retained in the recipient's Handbook

DOCUMENT CONTROL

Issue Date	Edition	Version	Author	Owner	Reviewer	Approved	Comments
08/2024	03	03.01	Mark Moore	Brain Sinclair	SRDG	EMSAC	Revised version of the Safety Rules Handbook

NORTHERN IRELAND ELECTRICITY NETWORKS LIMITED ('NIE NETWORKS')

SAFETY RULES 3rd EDITION

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INTRODUCTION

These Safety Rules are approved by the NIE Networks Electrical and Mechanical Safety Rules Approval Committee (EMSAC) following consultation with the NIE Networks Safety Rules Development Group (SRDG), and the NIE Networks Health and Safety Advisory Committee (HeSaC). They are designed to ensure that Persons working on plant and apparatus to which these Safety Rules apply are safeguarded from hazards arising from the System. This safeguarding is achieved by establishing a safe system of work through a systematic examination and risk assessment of tasks. These examinations and assessments aim to identify all hazards arising from the System and to define methods to ensure that those hazards are either eliminated or controlled so far as is reasonably practicable.

These mandatory Safety Rules apply throughout NIE Networks for any work on the System and apply to all employees of NIE Networks and by those contractors of NIE Networks working under a contract for work/services with NIE Networks.

Where an Independent Connections Provider (ICP) has entered into an appropriate agreement with NIE Networks they can work on the NIE System under the safety rules of the ICP provided that the ICP complies at all times with the terms of the agreement entered into with NIE Networks.

The Safety Rules are made up of *General Provisions* and *Basic Safety Rules* and also include sections dealing with *Procedures for Safety Documents and Keys*, *Responsibilities of Persons* and *Definitions*. They are supported by the sections containing *Safety Instructions* and *Specialised Procedures* and also by other mandatory documents such as Safety Rules Instructions, and Safety Rules Guidance.

A statement setting out the Policy, Philosophy and Principles which form the basis of these Safety Rules is also provided. This statement does not form part of the Safety Rules but it is included for the general information of those Persons concerned with the application of the Safety Rules.

SCOPE

These Safety Rules complement the NIE Network's Health and Safety Policy and are designed to provide safe systems of work when carrying out work or testing on or near to the System.

These Safety Rules are designed to safeguard persons from hazards arising from the System only and are not designed to safeguard against any dangers other than those inherent to the System.

The application of these Safety Rules ensures that preventative and protective measures are established and maintained. In addition to these Safety Rules, the impact of General Safety shall also be considered as part of the overall risk assessment of health and safety.

RESPONSIBILITIES

(1) Under the Health and Safety at Work (Northern Ireland) Order 1978, and the Regulations made thereunder, it is the responsibility of all employed persons to take reasonable care for the health and safety of themselves and for other persons who may be affected by their acts or omissions.

(2) The NIE Networks director with overall responsibility for Health & Safety within NIE Networks (the 'Director') is responsible for approving and/ or amending these Safety Rules following guidance from SRDG and the recommendation of EMSAC.

(3) Those NIE Networks directors with operational responsibility for Health & Safety within their own directorates will ensure that arrangements are in place to implement the Safety Rules and that the senior managers and staff within their directorate fully implement the Safety Rules (and the supporting documents) and audit compliance therewith. In line with the *NIE Networks Health and Safety Management System*, these directors will ensure that any deficiencies in the Safety Rules are highlighted to the Director who will then review and amend the Safety Rules as required. These directors will also ensure arrangements are in place to implement General Safety in line with the *NIE Networks Health and Safety Management System*.

(4) Persons have specific responsibilities as defined in *Part C - Responsibilities of Persons* and *Part D – Definitions* as well as outlined in the NIE Networks Health and Safety Policy (HSP-001).

(5) It is the duty of all Persons who may be concerned with the control, preparation and carrying out of work on the System to which these Safety Rules apply to:

- make themselves thoroughly familiar with the detail of the relevant Safety Rules and supporting documents;
- ensure that the requirements of the Safety Rules are met at all times;
- ensure that all General Safety requirements are met at all times;
- take positive steps, whether related to the Safety Rules or to General Safety, to understand the risks and to challenge any requirements to ensure that they fully understand the work or testing being undertaken and to ensure that a safe system of work has been established. Where any anomalies exist, these anomalies shall be resolved before any work or testing commences or continues. Any concerns regarding the application of these Safety Rules or a safe system of work shall be reported to the Person's manager or Engineer's Representative, whichever is appropriate.

(6) A copy of these Safety Rules and associated supporting documents shall be made available to all Persons as part of the authorisation process under these Safety Rules.

SPECIFIC INTERPRETATIONS

1 Shall

Where ‘shall’, with no qualification, is used in these Safety Rules a mandatory requirement is imposed, with no discretion permitted and no judgement to be made.

2 Shall, Where Practicable

Where ‘shall’, with the qualification ‘where practicable’, is used in these Safety Rules a slightly less stringent requirement is imposed. It means that where it is possible to achieve in the light of current knowledge and invention, but bearing in mind the hazards associated with the work to be undertaken, then the requirement shall be met. It cannot be avoided on the grounds of difficulty, inconvenience or cost.

3 Shall, Where Reasonably Practicable

Where ‘shall’, with the qualification ‘where reasonably practicable’, is used in these Safety Rules a judgement must be made as to what is reasonable, taking into account the magnitude of the risk on the one hand and the cost, time and trouble, or effort necessary for averting the risk on the other hand.

DEFINED TERMS

Terms which appear in bold print within these Safety Rules and associated documents, are generally terms which are defined in Part D of the Safety Rules. Any combination of defined terms shall have a meaning consistent with the definitions of the individual terms, which form the combination.

NOTE

Within the Safety Rules and associated documents:

(i) any reference to one particular gender shall be taken to include all genders,

(ii) any reference to the singular shall be taken to include the plural when appropriate and

(iii) any reference to ‘Northern Ireland Electricity’ or ‘NIE’ shall, where appropriate, be taken to be a reference to ‘Northern Ireland Electricity Networks Limited’.

POLICY, PHILOSOPHY AND PRINCIPLES OF THE SAFETY RULES

1 Policy

1.1 Under the Health and Safety at Work (Northern Ireland) Order 1978 and other legislation NIE Networks has an obligation to provide safe places of work and safe systems of work. These Safety Rules and associated supporting documents form part of such a safe system of work on NIE Networks systems for the transmission and distribution of electricity at high and low voltages. As at the date of issue, these Safety Rules and associated supporting documents align with the requirements of BS EN 50110.

These Safety Rules are not sufficient on their own to provide a complete safe system of work; rather they address safety of the individual from hazards inherent within the System. Additional precautions will be required in any particular circumstance to address specific danger arising from the working environment and not necessarily associated with the System. Such precautions should be arrived at following completion of a risk assessment by the persons who are responsible for carrying out the work.

1.2 Employees have a duty whilst at work to take reasonable care to avoid injury to themselves and others affected by their work activities and to cooperate with NIE Networks in meeting these statutory requirements. This includes absolute compliance with these Safety Rules and all supporting documents.

1.3 Safety officers are appointed to provide expertise to NIE Networks in relation to safety at work including advice on the application of safe systems of work, these Safety Rules, the Safety Rules Instructions, the Safety Rules Guidance and other supporting documents. They will be consulted as systems, rules and associated supporting documents are being formulated and shall be involved in the investigation of incidents including Near Miss events in accordance with the relevant NIE Networks policy.

2 Philosophy

2.1 The fundamental purpose of NIE Networks systems is to transmit or distribute electricity at high and low voltages and therefore contains inherent dangers. The System is designed so that when it is in normal operating mode, it may be operated without danger if routine procedures and suitable equipment are correctly used.

2.2 When work other than normal operation has to be carried out affecting the plant and apparatus and it is necessary to change from the normal operating mode or depart from routine operating procedures, it is then necessary to specify rules to achieve safety from the inherent dangers.

2.3 These Safety Rules are based on a philosophy that actions and practices which must be implemented are clearly specified. These must be followed to establish conditions in which persons, who have to carry out work on the plant and apparatus, will be safeguarded from the inherent dangers and to achieve safety from the system.

2.4 Whenever work is carried out affecting plant and apparatus which is part of the System, two types of danger may arise

(i) the first type is danger inherent in the System arising from the design function of the plant and apparatus. This philosophy requires that the Safety Rules, when implemented, will achieve the safety of persons at work from these inherent dangers at the commencement and during the course of work;

(ii) the second type is danger arising from the environment at and in the vicinity of the work point and not associated with the System. These Safety Rules are not designed to specify the means of establishing safety from these dangers which may arise from methods of work, or means of access or egress. This danger is managed by implementing suitable and sufficient risk assessments. The Safety Rules do however allocate responsibilities for achieving safety from this type of danger.

2.5 To carry out work affecting plant and apparatus within the System, the procedure to be observed may be divided into the following stages:

(i) making available the plant and apparatus for the work;

(ii) establishing suitable control measures to safeguard persons from the inherent dangers of the System;

(iii) execution of the work;

(iv) clearance of the plant and apparatus on completion or termination of the work;

(v) restoration of the plant and apparatus to its normal conditions within the System.

2.6 To achieve safety within the stages specified above, these Safety Rules require that defined persons be given responsibilities for:

(i) establishing safe conditions for either themselves or other persons to work on or adjacent to the plant and apparatus;

(ii) checking that safe conditions have been established for work on plant and apparatus which have been isolated from the System or, when work has to be carried out on plant and apparatus which remains energised, identifying the appropriate specialised procedures or approved procedures which are to be applied;

(iii) authorising the commencement of work and, on cessation of the work, to cancel the authorisation;

(iv) receiving the authorisation to commence work, thereafter to supervise safety during the course of the work and when the work is concluded to inform the person responsible for giving the authorisation.

Except where work is of a routine nature or is being carried out under the terms of a specialised or approved procedure, the authorisation shall be given and received in writing.

2.7 These Safety Rules for achieving the safety of persons at work from the inherent dangers of the System are limited therefore to specifying:

(i) the actions necessary to ensure safety during each of the stages above in which dangers may arise from the design function of the plant and apparatus:

(ii) the responsibilities of persons for ensuring safety during each of the stages above from dangers which may arise from the design function of the plant and apparatus,

and, in relation to the general dangers arising whenever work is performed, the Safety Rules are limited to:

(iii) identifying the person responsible for achieving safety from these general dangers.

2.8 These Safety Rules will be supported by associated supporting documents to specify procedures for implementing the Safety Rules effectively and efficiently and to ensure that they are applied in a consistent manner.

3 Principles

3.1 To fulfil the requirements of the Philosophy, the following principles have been adopted in formulating the Safety Rules:

(i) Safety Rules are concerned only with achieving safety for persons;

(ii) all persons authorised, who are required to apply the Safety Rules shall have the appropriate information, instruction, training, and supervision;

(iii) when work is to be carried out on high voltage apparatus, the primary means of achieving safety is by isolation, earthing and the issue of a Safety Document as defined in Part B of these Safety Rules. When justified, live work or testing may be completed with Specialised Procedures.

(iv) in the case of low voltage apparatus, the primary means of achieving safety is, where reasonably practicable, isolation from the System. If isolation is not reasonably practicable and when justified, live work or testing may be completed with Specialised Procedures;

(v) for all live work, justification shall be in accordance with the Electricity at Work Regulations (Northern Ireland) 1991, in particular Regulation 14, and where:

(a) it is unreasonable in all the circumstances for it to be dead; and

(b) it is reasonable in all the circumstances for a person to be on or near it while it is live; and

(c) suitable precautions (including where necessary the provision of suitable protective equipment) are taken to prevent injury;

(vi) when work is to be carried out on mechanical plant, the primary means of achieving safety is by isolation from the system(s) followed by draining, venting and purging as appropriate, except when the work requires the plant to be energised. For these exceptions the means of achieving safety is by the application of specialised procedures;

(vii) the fundamental means of protecting persons at work is the application and maintenance of the primary means of achieving safety specified in 3.1 (ii), (iii), (iv), (v) and (vi) supported by appropriate actions to maintain the effectiveness of the primary means, e.g. locking off isolating devices where practicable;

(viii) the nomination of Persons to carry out defined requirements under these Safety Rules is formal, although part of their normal responsibilities;

(ix) the application of these Safety Rules shall ensure that safe conditions exists across all control area boundaries and operational interfaces, be they totally or partially within the jurisdiction of NIE Networks;

(x) to achieve safety from the system, that is, from dangers which may arise from the design functions of the plant and apparatus, each of the five stages referred to in para 2.5 of the Philosophy will involve one or more of the following functions:

(a) 'Control' - which includes: before work commences, instructing actions to implement precautions and consenting to the issue of a Safety Document; after completion of work, acknowledging the cancellation of the Safety Document and instructing actions to restore plant and apparatus to service;

(b) 'Making Safe/Restoration of Plant and Apparatus' - which includes: before work commences, taking actions to make plant and apparatus safe for work and issuing a Safety Document; after completion of work and the cancellation of the Safety Document, taking actions to restore the plant and apparatus to service;

(c) 'Work' - which includes: receipt of a Safety Document, execution of the required work to its completion or termination and, after the work area has been cleared, clearance of the Safety Document.

3.2 The above three functions cover separate responsibilities that are distinct from each other and are treated distinctively in these Safety Rules.

3.3 These Safety Rules do not state the number of persons necessary to discharge the three functions. However, in order to implement these Safety Rules efficiently, it will frequently be necessary for two or more Persons to perform the three separate functions because of technical and geographical complexities in the System.

3.4 These Safety Rules do not preclude one individual from personally performing all three functions. Where appropriate, one Person could carry out the control function, prepare plant and apparatus to their own instructions, consent to and issue a Safety Document to themselves, execute the work, clear and cancel the Safety Document and restore the plant and apparatus to service. However, where appropriate, it is preferred that the Safety Document is issued to another member of the working party other than the issuer.

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GENERAL PROVISIONS

GP1 General Safety

Discharging responsibility for **General Safety** will be achieved as part of the normal pattern of management delegation and control by ensuring that all activities are in accordance with appropriate instructions and guidance. Within this General Provision, references to work shall be taken to include testing.

In addition to the requirements specified in these Safety Rules for establishing **Safety from the System**, the safety of persons shall also be achieved by maintaining **General Safety** at all times at and in the vicinity of the work area.

Before work is carried out:

- Supervisors shall ensure measures are taken to establish **General Safety**.
- **Persons** shall implement and comply with measures required to establish and maintain **General Safety.**
- A **Person** shall be identified to be in charge of the work.
- **Persons** shall complete a thorough visual inspection, pre-work checks and Risk Assessment of the work area, the work equipment to be used and all **Plant** and **Apparatus** identified for the work.

When work is being carried out, the **Person** identified as being in charge of the working party shall:

- Continue to coordinate and maintain conditions which ensure **General Safety**.
- Ensure that other work areas and members of the public are not adversely affected by the activities for which they are responsible.

GP2 Additional Safety Rules, Safety Rules Instructions, Procedures and supporting documents

In addition to these Safety Rules, the following list of associated supporting documents shall be complied with:

- Safety Instructions
- Specialised Procedures
- Policy Documents
- Apparatus Operational Restrictions (AORs)
- Clearances to AORs (CAOR)
- Critical Information (Safety and Operational)
- Work Manuals
- Other supporting documents classed as being relevant, including those issued by other authorities.
- Safety Rules and supporting documents issued by owners or operators of electrical installations or sites which are not covered by the definition of the **System** in these Safety Rules.

This list of examples is not intended to be exhaustive.

GP3 Special Instructions

Work on or testing of **Plant** and **Apparatus** to which these Safety Rules cannot be applied, or for special reasons should not be applied, shall be carried out in an **Approved** manner which shall be confirmed in writing.

GP4 Objections on Safety Grounds

Any **Person** receiving instructions in the application of these Safety Rules shall report to the **Person** issuing those instructions any objections on safety grounds to carrying them out. Any such objections shall then be dealt with in an **Approved** manner.

PART A

THE EIGHT BASIC SAFETY RULES

A1 APPLICATION OF RULES

A1.1 The fundamental protection for **Persons** working on or testing **Plant** and **Apparatus** from which **Danger** could arise if such work or testing was carried out with the **Plant** and **Apparatus** in its normal operating mode is the achievement of **Safety from the System. Safety from the System** shall be achieved by the fulfilment and maintenance of the safety precautions, procedures and responsibilities specified in these Safety Rules. These Safety Rules shall be applied, therefore, to enable work on and testing of **Plant** and **Apparatus** to take place without **Danger** from the **System**.

A1.2 **Plant** and **Apparatus** shall be added to and removed from the **System** only in accordance with an **Approved** procedure, which will also determine when these Safety Rules shall apply.

A2 APPROACH TO EXPOSED HIGH VOLTAGE CONDUCTORS/INSULATORS

A2.1 Objects

A2.1.1 When exposed **High Voltage** conductors are not **Isolated**, the only objects which shall be caused to approach them, or insulators supporting them, within the **Safety Distances** specified in A2.3. shall be **Approved** measuring devices or **Approved** insulated devices. The only exception is **Live** line working in accordance with an **Approved** procedure.

A2.1.2 When exposed conductors are **Isolated** but could be subject to **High Voltage**, the only objects which shall be caused to approach them, or insulators supporting them, within the **Safety Distances** specified in A2.3, shall be **Approved** voltage measuring devices, **Approved** insulated devices or **Earthing Devices**.

A2.2 Persons

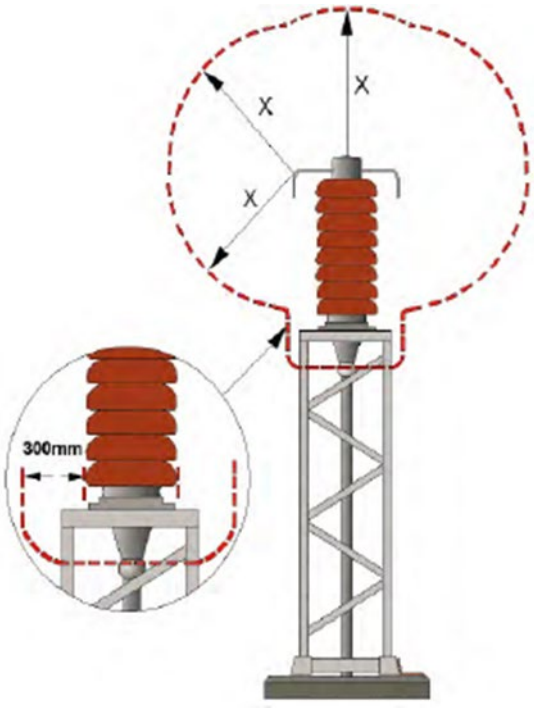
A2.2.1 Persons shall not allow any part of their body to approach exposed conductors designed for, and operated at, **High Voltage**, or insulators supporting such conductors, within the **Safety Distances** specified in A2.3, unless the conductors have been **Isolated** and **Danger** has been excluded. The only exception is **Live** line working in accordance with an **Approved** procedure.

A2.3 Safety Distances

Rated System Voltage kV	**Safety Distance** '**X**' from exposed **HV** conductors not **Earthed**	
	m	ft - in
Up to 33	0.8	2 – 8
110	1.2	4 – 0
275	2.4	7 – 11
400	3.1	10 – 2

A distance of 300mm (12 in) shall also be maintained from that portion of the insulators supporting exposed unearthed **High Voltage** conductors which is outside the appropriate **Safety Distance** from the conductors.

Typical Post Insulator illustrating Safety Distance from exposed High Voltage conductors not earthed



A3 SAFETY PRECAUTIONS FOR WORK ON OR ADJACENT TO PLANT AND HIGH VOLTAGE APPARATUS

A3.1 When work is to be carried out on or adjacent to **Plant** and/or **HV Apparatus** and the means of achieving **Safety from the System** is by limiting the work or the work area, instructions clearly defining the limits shall be given. When it is considered necessary to confirm instructions in writing, a **Limited Work Certificate** shall be issued.

A3.2 When limiting the work or the work area is insufficient to achieve **Safety from the System**, it shall be achieved by the application of the following precautions and, before work commences, a **Permit for Work** shall be issued:

(i) the **Plant** and/or **HV Apparatus** on which the work is to be carried out shall be defined;

(ii) the **Plant** and/or **HV Apparatus** shall be **Isolated**. When **Isolating Devices** are used, they shall, where practicable, be immobilised and **Locked**. **Caution Notices** shall be affixed at all points of isolation;

(iii) for work on **HV Apparatus**, **Primary Earths** shall be applied within the **Isolated** zone and, where reasonably practicable, immobilised and **Locked**;

(iv) the contents of the **Plant** and/or **HV Apparatus** shall be adjusted to a level which avoids **Danger** and where drains could give rise to **Danger** they shall, where practicable be **Locked** in the appropriate position;

(v) where **Danger** could arise from pressurisation, the **Plant** and/or **HV Apparatus** shall be **Vented** and where vents could give rise to **Danger** they shall, where practicable be **Locked** in the appropriate position;

(vi) where internal access is required, the **Plant** and/or **HV Apparatus** shall be **Purged** if the residue of contents could cause **Danger**;

(vii) where **Danger** could arise from the release of stored energy, action shall be taken to contain or dissipate this energy safely.

A3.3 When **Danger** from induced voltages or backfeeds from other sources could arise during the course of the work, **Drain Earths**, (and/or, where applicable, other appropriate precautions to achieve **Safety from the System**), shall be applied.

A3.4 The application of **Drain Earths** shall be in accordance with an **Approved** procedure, which may include the use of an **Earthing Schedule**. Any **Earthing Schedule** and the associated portable **Drain Earths** shall be issued with the **Permit for Work**.

A4 SAFETY PRECAUTIONS FOR TESTING PLANT AND HIGH VOLTAGE APPARATUS

A4.1 When testing is to be carried out on **Plant** and/or **HV Apparatus** and the means of achieving **Safety from the System** is by limiting the testing, instructions clearly defining the limits shall be given. When it is considered necessary to confirm instructions in writing, a **Limited Work Certificate** shall be issued.

A4.2 When limiting the testing or the test area is insufficient to achieve **Safety from the System**, it shall be achieved by the application of the following precautions and the issue of a **Sanction for Test** before testing is allowed to commence:

(i) the **Plant** and/or **HV Apparatus** on which the testing is to be carried out shall be defined;

(ii) the **Plant** and/or **HV Apparatus** shall be **Isolated**. When **Isolating Devices** are used to achieve **Safety from the System** they shall, where practicable, be immobilised and **Locked**. **Caution Notices** shall be affixed at all points of isolation, which are to be used to maintain **Safety from the System** until the **Sanction for Test** is cancelled. Essential testing supplies which are necessary for the testing to take place may be restored and shall be defined on the **Sanction for Test**;

(iii) for testing of **HV Apparatus**, **Primary Earths** shall be applied within the **Isolated System** when necessary to achieve **Safety from the System** and they shall, where reasonably practicable, be immobilised and **Locked**. Provided **Safety from the System** is maintained, and unless specified otherwise on the **Sanction for Test**, these earths may be removed or replaced to facilitate testing;

(iv) the contents of the **Plant** and/or **HV Apparatus** shall be adjusted to a level which avoids **Danger** and where drains could give rise to **Danger** they shall, where practicable be **Locked** in the appropriate position;

(v) where **Danger** could arise from pressurisation, the **Plant** and/or **HV Apparatus** shall be **Vented** and where vents could give rise to **Danger** they shall, where practicable be **Locked** in the appropriate position;

(vi) where internal access is required, the **Plant** and/or **HV Apparatus** shall be **Purged** if the residue of contents could cause **Danger**;

(vii) where **Danger** could arise from the release of stored energy, action shall be taken to contain or dissipate this energy safely.

A4.3 When **Danger** from induced voltages or backfeeds from other sources could arise during the course of the testing, **Drain Earths**, (and/or, where applicable, other appropriate precautions to achieve **Safety from the System**), shall be applied.

A4.4 The application of **Drain Earths** shall be in accordance with an **Approved** procedure, which may include the use of an **Earthing Schedule**. Any **Earthing Schedule** and the associated portable **Drain Earths** shall be issued with the **Sanction for Test**.

A4.5 Work of a minor nature essential to the completion of testing may be carried out under the terms of a **Sanction for Test**, provided that **Safety from the System** is maintained.

A5 SAFETY PRECAUTIONS FOR WORK ON OR TESTING OF LOW VOLTAGE APPARATUS

A5.1 When work or testing is to be carried out on or so near **LV Apparatus** that **Danger** may arise, precautions shall be taken to achieve **Safety from the System**.

A5.2 The **LV Apparatus** shall be **Isolated** unless it is deemed unreasonable to do so**.** When **Isolating Devices** are used, they shall, where reasonably practicable, be immobilised and **Locked**.

A5.3 When work or testing is to be carried out on **Isolated LV Apparatus**, **Caution Notices** shall, where reasonably practicable, be affixed at all points of isolation.

A5.4 Work on or testing of **Isolated LV Apparatus** shall be carried out under:

(i) normal routine instructions, or

(ii) oral instructions where these are considered sufficient, or

(iii) a **Limited Work Certificate**, which shall be issued when it is considered that oral instructions are insufficient, or

(iv) **Personal Supervision**.

A5.5 When it is unreasonable for the **LV Apparatus** to be **Isolated**, a suitable and sufficient risk assessment shall be completed to determine whether it is reasonable for a **Person** to carry out **Live** work or testing. If it is not reasonable for a **Person** to carry out **Live** work or testing, then the **Apparatus** shall be **Isolated** and A5.3 and A5.4 shall apply.

A5.6 When working on or testing **Live LV Apparatus**, suitable precautions shall be taken to prevent injury. Such work or testing shall be carried out in accordance with the relevant Specialised Procedure for **Live** working or testing under:

(i) normal routine instructions, or

(ii) oral instructions where these are considered sufficient, or

(iii) a **Limited Work Certificate**, specifying the method of dealing with those hazards, which shall be issued when it is considered that oral instructions are insufficient, or

(iv) **Personal Supervision**.

A6 OPERATION OF PLANT AND APPARATUS

A6.1 The operation of **Plant** and/or **Apparatus** to achieve **Safety from the System** shall never involve prearranged signals or the use of time intervals.

A7 DEMARCATION

A7.1 The work/test area shall be defined clearly and, where necessary, protected physically to prevent **Danger** to persons in the defined area from **System** hazards adjacent to the defined area.

A8 IDENTIFICATION OF PLANT AND APPARATUS

A8.1 Work or testing shall only be permitted to start on **Plant** and/or **Apparatus** which is readily identifiable or has fixed to it a means of identification which will remain effective throughout the course of the work or testing.

PART B

PROCEDURES FOR SAFETY DOCUMENTS AND KEYS

B1 GENERAL

B1.1 Part B of the Rules gives the procedures associated with the **Safety Documents** and **Keys**. **Persons** involved in these procedures shall ensure they understand and enact their respective roles correctly.

B1.2 These Safety Rules concern themselves with the principles of achieving safety from the inherent **Dangers** of **Plant** and **Apparatus**. The detailed manner in which the objectives, responsibilities and requirements of Part B are to be met shall be subject to mandatory safety instructions and supporting documentation.

B1.3 **Safety Documents** shall be retained personally by the recipient who takes over complete charge of the work and any persons working under the terms of the **Safety Document**. The procedure for the transfer of **Safety Documents** by a **Senior Authorised Person** who will give the re-issue procedure **Personal Supervision**.

B2 PERMIT FOR WORK

B2.1 Preparation

B2.1.1 On completion of the safety precautions taken to achieve **Safety from the System** and prior to the issue of the **Permit for Work**, the **Authorised Person(s)** responsible shall complete and sign a record of the safety precautions taken.

B2.1.2 The appropriate **Keys** shall be placed in a **Key Safe** which shall be **Locked** by a **Key Safe Key**. Where safety precautions have been taken at remote **Locations**, the appropriate **Keys** shall be **Locked** in a **Key Safe** at the remote **Locations** and the **Key Safe Key** retained in safe custody.

B2.1.3 The **Senior Authorised Person** shall, where appropriate, secure the local **Key Safe** by using the **Control Key**.

B2.1.4 When the **Senior Authorised Person** considers it necessary, a report shall be obtained from a **Selected Person** on any additional precautions to remove or prevent **Danger**.

B2.1.5 Any additional precautions to be taken during the course of the work or testing to maintain **Safety from the System** and/or to avoid **System** derived hazards, shall be stated by the **Senior Authorised Person** in Section 2 (ii) of the **Permit for Work**. These shall include any requirements for portable **Drain Earths** when an **Earthing Schedule** is not provided, and any precautions arising from a **Selected Person's** report.

B2.1.6 The **Senior Authorised Person** shall complete Sections 1 and 2 of the **Permit for Work**, obtaining from the appropriate **Control Person(s)** the details and confirmation of safety precautions taken. The **Senior Authorised Person** at the time of signing Section 2 shall inform the appropriate **Control Person(s)** of the relevant details of the **Permit for Work** in order that they may record these details and give **Consent** to the issue of the **Permit for Work**. The name of the appropriate **Control Person(s)** shall be recorded in Section 2.

B2.2 Issue and Receipt

B2.2.1 A **Senior Authorised Person** shall complete Section 3 of the **Permit for Work**.

B2.2.2 When an **Earthing Schedule** is provided the number of portable **Drain Earths** issued shall be recorded on the **Permit for Work**. The application of portable **Drain Earths** shall be in accordance with an **Approved** procedure.

B2.2.3 The number of **Circuit Identification** flags and wristlets issued shall be recorded on the **Permit for Work**.

B2.2.4 The **Senior Authorised Person** shall sign Section 3 of the **Permit for Work** and shall issue it together with a **Key Safe Key** from the **Key Safe**, except where the **Key Safe** is at a remote **Location**. They shall also issue those items listed on the **Permit for Work**.

B2.2.5 The recipient of the **Permit for Work** shall sign Section 4 of the document and take it into safe custody together with the appropriate items issued with, and listed on, the document.

B2.2.6 When a **Permit for Work** is issued the recipient of the **Permit for Work** shall retain it and the **Key Safe Key** in their possession, except where the **Key Safe** is at a remote **Location**.

When work defined on the **Permit for Work** is in progress, further **Competent Persons** may work under that **Permit for Work** only after they have been properly instructed by a **Nominated Supervisor** who has sufficient knowledge of the work to be carried out and of the **Permit for Work** and they have personally reported to the recipient of that **Permit for Work**.

The recipient of the **Permit for Work** shall satisfy themselves that they understand the limits of the work and requirements imposed by the **Permit for Work** before giving permission for them to commence work under their charge within their Working Party.

Each **Competent Person** shall report to the recipient of the **Permit for Work** the state of the work for which they are responsible when it is completed or discontinued.

B2.3 Transfer

B2.3.1 A **Permit for Work** shall be retained personally by the recipient.

B2.3.2 When work is to be continued by a **Competent Person** other than the recipient, then before work is resumed, the **Permit for Work** shall be transferred to the new recipient in the following manner:

(i) Part 1 of the **Transfer Record** shall be completed by the recipient of the **Permit for Work** who shall then surrender it to a **Nominated Supervisor** for retention in safe custody together with any documents, **Keys** and, as appropriate, items listed on the **Permit for Work**;

(ii) when the transfer procedure is to be enacted, a **Nominated Supervisor** shall hand to the **Competent Person** who is to become the recipient the **Permit for Work**, associated documents, **Keys** and appropriate items.

(iii) A **Senior Authorised Person** shall then discharge the same responsibilities to the new recipient of the **Permit for Work** as if the **Permit for Work** was being issued initially. The new recipient shall then complete their section of Part 3 of the **Transfer Record** in the presence of the **Senior Authorised Person**;

(iv) the **Senior Authorised Person** shall complete their section of Part 3 of the **Transfer Record** confirming **Personal Supervision** and completion of the transfer.

B2.4 Suspension and Subsequent Re-Issue

B2.4.1 When it is found necessary to temporarily discontinue work, a **Permit for Work** may be suspended by transferring it together with all documents, **Keys** and other appropriate items to a **Senior Authorised Person** who will retain them all in safe custody. Parts 1 and 2 of the **Transfer Record** shall be completed by the appropriate **Persons**.

B2.4.2 When work is to resumed, the safety precautions achieving **Safety from the System** shall first be confirmed by the **Senior Authorised Person** who is to re-issue the **Permit for Work**.

B2.4.3 The **Permit for Work** shall then be transferred by the **Senior Authorised Person** to the recipient together with all documents, **Keys** and other appropriate items and Part 3 of the **Transfer Record** shall be completed by the appropriate **Persons**. The **Senior Authorised Person** shall discharge the same responsibilities to the recipient of the **Permit for Work** as if the **Permit for Work** was being issued initially.

B2.5 Clearance and Cancellation

B2.5.1 When work has been completed or when a **Senior Authorised Person** requires the **Permit for Work** to be cancelled, a **Competent Person** shall sign Section 5 certifying that all persons working under the **Permit for Work** have been withdrawn from, and warned not to work on, the **Plant** and/or **Apparatus** described in Section 1, certifying whether or not the work site has been cleared of all tools, gear, **Drain Earths** and loose material and whether or not all guards and access doors have been replaced.
The **Permit for Work** together with any **Keys** issued with it, any **Earthing Schedule** and **Selected Person's** report shall be returned to a **Senior Authorised Person**. All **Circuit Identification** flags, wristlets and portable **Drain Earths** issued shall be accounted for or returned to a **Senior Authorised Person**.

B2.5.2 The **Senior Authorised Person** shall cancel the **Permit for Work** by informing the **Control Person(s)** that the precautions imposed in Section 2(i) need no longer be maintained, and signing Section 6. The **Senior Authorised Person** shall also advise the **Control Person(s)** whether or not the **Plant** and/or **Apparatus** may be returned to service and of any restrictions on returning the **Plant** and/or **Apparatus** to service.

B3 SANCTION FOR TEST

B3.1 Preparation

B3.1.1 On completion of the safety precautions taken to achieve **Safety from the System** and prior to the issue of the **Sanction for Test**, the **Authorised Person(s)** responsible shall complete and sign a record of the safety precautions taken.

B3.1.2 The appropriate **Keys** shall be placed in a **Key Safe** which shall be **Locked** by a **Key Safe Key**. Where safety precautions have been taken at remote **Locations**, the appropriate **Keys** shall be **Locked** in a **Key Safe** at the remote **Locations** and the **Key Safe Key** retained in safe custody.

B3.1.3 The **Senior Authorised Person** shall, where appropriate, secure the local **Key Safe** by using the **Control Key**.

B3.1.4 When the **Senior Authorised Person** considers it necessary, a report shall be obtained from a **Selected Person** on any additional precautions to remove or prevent **Danger**.

B3.1.5 Any additional precautions to be taken during the course of the testing to maintain **Safety from the System** and/or to avoid **System** derived hazards, shall be stated by the **Senior Authorised Person** in Section 2 (ii) of the **Sanction for Test**. These shall include precautions arising from a **Selected Person's** report.

B3.1.6 The **Senior Authorised Person** shall complete Sections 1 and 2 of the **Sanction for Test**, obtaining from the appropriate **Control Person(s)** the details and confirmation of safety precautions taken.

B3.2 Issue and Receipt

B3.2.1 The **Senior Authorised Person** shall complete Section 3 of the **Sanction for Test**.

B3.2.2 When an **Earthing Schedule** is provided the number of portable **Drain Earths** issued shall be recorded on the **Sanction for Test**. The application of portable **Drain Earths** shall be in accordance with an **Approved** procedure.

B3.2.3 The number of **Circuit Identification** flags and wristlets issued shall be recorded on the **Sanction for Test**.

B3.2.4 The **Senior Authorised Person** shall inform the appropriate **Control Person(s)** of the relevant details of the **Sanction for Test** in order that he may record these details and give **Consent** to the issue of the **Sanction for Test**. The name of the appropriate **Control Person(s)** shall be recorded in Section 3.

B3.2.5 The **Senior Authorised Person** shall sign Section 3 of the **Sanction for Test** and shall issue it together with a **Key Safe Key** from the **Key Safe**, except where a **Key Safe** is at a remote **Location**. They shall also issue, as appropriate, those items listed on the **Sanction for Test**.

B3.2.6 Those **Keys** which allow operation of **Plant** and/or **Apparatus** and the restoration of testing supplies defined on the **Sanction for Test** shall be handed to the recipient of the **Sanction for Test**.

B3.2.7 The recipient of the **Sanction for Test** shall sign Section 4 of the document and take it into safe custody together with the appropriate items issued with and listed on the document.

B3.3 Transfer

B3.3.1 When testing is to be continued by an **Authorised Person** other than the recipient of the **Sanction for Test**, it may be transferred to that **Person** by the recipient under the **Personal Supervision** of a **Senior Authorised Person** who shall discharge the same responsibilities to the new recipient of the **Sanction for Test** as if the **Sanction for Test** was being issued initially; or the **Sanction for Test** shall be cleared and cancelled and a new **Sanction for Test** issued.

B3.3.2 After the recipient has transferred the **Sanction for Test** together with any documents, **Keys** and, as appropriate, items listed on the **Sanction for Test** to the new recipient, Parts 1 and 3 of the **Transfer Record** shall be signed by the old and new recipients respectively.

B3.3.3 The **Senior Authorised Person** shall complete their section of Part 3 of the **Transfer Record** confirming **Personal Supervision** and completion of the transfer.

B3.4 Clearance and Cancellation

B3.4.1 When testing has been completed or when a **Senior Authorised Person** requires the **Sanction for Test** to be cancelled, an **Authorised Person** shall sign Section 5 certifying that all persons testing under the **Sanction for Test** have been withdrawn from, and warned not to continue testing on, the **Plant** and/or **Apparatus** described in Section 1, certifying whether or not the site of testing has been cleared of all tools, gear, **Drain Earths** and loose material and whether or not all guards and access doors have been replaced. Also, all exceptions to the condition of the **System** under test compared to the condition at the time of **Sanction for Test** issue shall be fully specified. The **Sanction for Test**, appropriate **Keys**, any **Selected Person's** report and **Earthing Schedule** with the correct number of portable **Drain Earths**, **Circuit Identification** flags and wristlets shall be returned to the **Senior Authorised Person**.

B3.4.2 The **Senior Authorised Person** shall cancel the **Sanction for Test** by informing the **Control Person(s)** that the safety precautions imposed in Section 2(i) need no longer be maintained, and signing Section 6. The **Senior Authorised Person** shall also advise the **Control Person(s)** of the operational state of the **Plant** and/or **Apparatus** concerned.

B4 LIMITED WORK CERTIFICATE

B4.1 Preparation

B4.1.1 On completion of such safety precautions which are considered to be necessary to achieve **Safety from the System** and prior to the issue of the **Limited Work Certificate**, the **Authorised Person(s)** responsible shall complete and sign a record of the safety precautions taken.

B4.1.2 Where appropriate **Keys** shall be placed in a **Key Safe** which shall be **Locked** by a **Key Safe Key**. The **Senior Authorised Person** shall in such cases, secure the **Key Safe** by using the **Control Key**.

B4.1.3 When the **Senior Authorised Person** considers it necessary, a report shall be obtained from a **Selected Person** on any additional precautions to remove or prevent **Danger**.

B4.1.4 Any additional precautions to be taken during the course of work or testing to maintain **Safety from the System** and/or to avoid **System** derived hazards**,** shall be stated by the **Senior Authorised Person** in Section 3(ii) of the **Limited Work Certificate**. These shall include precautions arising from a **Selected Person's** report.

B4.1.5 The **Senior Authorised Person** shall complete Sections 1, 2 and 3 of the **Limited Work Certificate** obtaining, where appropriate, from the **Control Person(s)** the details and confirmation of safety precautions taken. The **Senior Authorised Person** at the time of signing Section 3 shall inform such **Control Person(s)** of the relevant details of the **Limited Work Certificate** in order that he may record these details and give **Consent** to the issue of the **Limited Work Certificate**. The name of the appropriate **Control Person(s)** shall be recorded in Section 3.

B4.2 Issue and Receipt

B4.2.1 When the work or testing associated with a **Limited Work Certificate** could affect operating **Plant** and/or **HV Apparatus**, the agreement of the **Control Person(s)** to the issue of the **Limited Work Certificate** shall be obtained and recorded in Section 4.

B4.2.2 A **Senior Authorised Person** shall sign Section 4 of the **Limited Work Certificate** and shall issue it together with any **Keys** and, where necessary, a **Selected Person's** report.

B4.2.3 The recipient of the **Limited Work Certificate** shall sign Section 5 of the document and take it into safe custody together with the appropriate items issued with and listed on the document.

B4.2.4 When a **Limited Work Certificate** is issued the recipient shall retain it and any **Keys** in their possession. When work or testing under the **Limited Work Certificate** is in progress, further **Competent Persons** may carry out work or testing under that **Limited Work Certificate** only after they have been properly instructed by a **Nominated Supervisor** who has sufficient knowledge of the work or testing to be carried out and of the **Limited Work Certificate** and have personally reported to the recipient of that **Limited Work Certificate**. The recipient of the **Limited Work Certificate** shall satisfy themselves that they understand the limits of the work or testing and requirements imposed by the **Limited Work Certificate** before giving permission for them to commence work or testing under their charge within their working party. These **Competent Persons** shall report to the recipient of the **Limited Work Certificate** the state of the work or testing for which they are responsible when it is completed or discontinued.

B4.3 Transfer

B4.3.1 A **Limited Work Certificate** shall be retained personally by the recipient.

B4.3.2 When work or testing is to be continued by a **Competent Person** other than the recipient then, before work or testing is resumed, the **Limited Work Certificate** shall be transferred to the new recipient in the following manner;

(i) Part 1 of the **Transfer Record** shall be completed by the recipient of the **Limited Work Certificate** who shall then surrender it to a **Nominated Supervisor** for retention in safe custody together with any documents, **Keys** and, as appropriate, items listed on the **Limited Work Certificate**;

(ii) when the transfer procedure is to be enacted, a **Nominated Supervisor** shall hand to the **Competent Person** who is to become the recipient the **Limited Work Certificate**, associated documents, **Keys** and appropriate items. A **Senior Authorised Person** shall then discharge the same responsibilities to the new recipient of the **Limited Work Certificate** as if the **Limited Work Certificate** was being issued initially. The new recipient shall then complete section of Part 3 of the **Transfer Record** in the presence of the **Senior Authorised Person**.

(iii) the **Senior Authorised Person** shall complete section of Part 3 of the **Transfer Record** confirming **Personal Supervision** and completion of the transfer.

B4.4 Suspension and Subsequent Re-Issue

B4.4.1 When it is found necessary to temporarily discontinue work or testing, a **Limited Work Certificate** may be suspended by transferring it together with all documents, **Keys** and other appropriate items to a **Senior Authorised Person** who will retain them all in safe custody. Parts 1 and 2 of the **Transfer Record** shall be completed by the appropriate **Persons**.

B4.4.2 When work or testing is to be resumed, the safety precautions achieving **Safety from the System** shall first be confirmed by the **Senior Authorised Person** who is to re-issue the **Limited Work Certificate**.

B4.4.3 The **Limited Work Certificate** shall then be transferred by the **Senior Authorised Person** to the recipient together with all documents, **Keys** and other appropriate items. Part 3 of the **Transfer Record** shall be completed by the appropriate **Persons**. The **Senior Authorised Person** shall discharge the same responsibilities to the recipient of the **Limited Work Certificate** as if the **Limited Work Certificate** was being issued initially.

B4.5 Clearance and Cancellation

B4.5.1 When work or testing has been completed or when a **Senior Authorised Person** requires the **Limited Work Certificate** to be cancelled, a **Competent Person** shall sign Section 6 certifying that all persons working or testing under the **Limited Work Certificate** have been withdrawn from and warned not to continue working or testing on the **Plant** and/or **Apparatus** described in Section 1, certifying whether or not the site has been cleared of all tools, gear and loose material and whether or not all guards and access doors have been replaced. The **Limited Work Certificate** together with any **Keys**, documents or other items issued with it shall be returned to a **Senior Authorised Person**.

B4.5.2 The **Senior Authorised Person** shall cancel the **Limited Work Certificate** by informing, where appropriate, the **Control Person(s)** that the limitations or safety precautions imposed in Section 3(i) need no longer be maintained and by signing Section 7. Where appropriate, the **Senior Authorised Person** shall also advise the **Control Person(s)** whether or not the **Plant** and/or **Apparatus** may be returned to service and of any restrictions on returning the **Plant** and/or **Apparatus** to service.

B5 SAFETY DOCUMENT INSTRUCTIONS

B5.1 Work or testing under the authority of a **Safety Document** shall be limited to that specified in the document and only **Safety Documents** as defined in these Safety Rules shall be used.

B5.2 A **Permit for Work** shall be prepared, issued, cancelled and suspended by a **Senior Authorised Person** and, where applicable, its transfer shall be given **Personal Supervision** by a **Senior Authorised Person**.

B5.3 A **Permit for Work** shall be received, cleared and, surrendered by a **Competent Person**.

B5.4 A **Sanction for Test** shall be prepared, issued, cancelled and its transfer given **Personal Supervision** by a **Senior Authorised Person**.

B5.5 A **Sanction for Test** shall be received, cleared and surrendered by an **Authorised Person**.

B5.6 When a **Sanction for Test** is in force **Plant** and/or **HV Apparatus**, no other **Safety Document** shall be in force on the same items of **Plant** and/or **HV Apparatus**.

B5.8 A **Limited Work Certificate** shall be prepared, issued, cancelled and suspended by a **Senior Authorised Person** and, where applicable, its transfer shall be given **Personal Supervision** by a **Senior Authorised Person**.

B5.9 A **Limited Work Certificate** shall be received, cleared and, where applicable, transferred by a **Competent Person**.

B5.10 When, during transfer or suspension, a **Safety Document** is in the control of a **Senior Authorised Person** who finds that it is necessary to obtain access to a **Key Safe** using the **Key Safe Key** associated with that **Safety Document**, they shall, before doing so, cancel that **Safety Document**.

B6 FORM OF SAFETY DOCUMENTS

Northern Ireland Electricity Networks

SAFETY RULES

LIMITED WORK CERTIFICATE

No.

KEY SAFE **No. ***

1 (i) LOCATION: _____

(ii) PLANT/APPARATUS IDENTIFICATION: _____

_____

(iii) WORK/TESTING TO BE DONE: _____

_____

_____

_____

2 CONDITION OF PLANT/APPARATUS: _____

_____

3 (i) LIMITS OF WORK/TESTING OR WORK AREA OR OTHER PRECAUTIONS TAKEN TO ACHIEVE SAFETY FROM THE SYSTEM:

_____

_____

_____

_____

_____

_____

_____

_____

Caution Notices have been affixed at all points of isolation * _____

(ii) FURTHER PRECAUTIONS TO BE TAKEN DURING THE COURSE OF WORK/TESTING TO AVOID SYSTEM DERIVED HAZARDS: _____

_____

_____

_____

_____

_____

I have confirmed with the **Control Person(s)** _____ that the precautions in Section 3(i) have been carried out and that the **Control Person(s)** will maintain these until this Certificate is cancelled. I certify that the precautions in Section 3 are adequate to provide **Safety from the System** in respect of the work/testing in Section 1.

This certificate must only be transferred under the **Personal Supervision** of a **Senior Authorised Person**.

Signed _____ being a **Senior Authorised Person**. Time _____ Date _____

---

4 ISSUE: (i) **Key Safe Key (No.)** * _____ (ii) **Safety Keys** (No. off) * _____ (iii) **Selected Person's** Report (No.) * _____

Control Person(s) agreeing to the issue of this Document * _____

Signed _____ being the **Senior Authorised Person** responsible for the issue of this Document. Time _____ Date _____

---

5 RECEIPT: I understand and accept my responsibilities under this Document and acknowledge receipt of the items in Section 4.

Signed _____ Name (Block Letters) _____

being a **Competent Person** employed by Company. _____

Time _____ Date _____

---

* N/A if Not Applicable

SR-SD1/1

6 CLEARANCE: I certify that all persons working / testing under this Document have been withdrawn from, and warned not to continue working / testing on, the **Plant / Apparatus** in Section 1. All gear, tools, **Drain Earths** and loose material have been removed and
guards and access doors have been replaced, except for:

Signed _____ being the **Competent Person** responsible for clearing this Document. Time _____ Date _____

7 CANCELLATION: I certify that all items issued under Section 4 have been accounted for and the **Control Person(s)*** _____ _____ informed of the cancellation and of any restrictions on returning the **Plant/Apparatus** to service.

Signed _____ being the **Senior Authorised Person** responsible for cancelling this Document. Time _____ Date _____

* N/A if Not Applicable

TRANSFER RECORD

PART 1		PART 2		PART 3		
Person surrendering Document	Time Date	**Senior Authorised Person** receiving suspended Document	Time Date	**Person** receiving reissued Document	**Senior Authorised Person** reissuing Document	Time Date

Northern Ireland Electricity Networks

SAFETY RULES

PERMIT FOR WORK

No.

KEY SAFE

No. *

1 (i) LOCATION: _____

(ii) PLANT/APPARATUS IDENTIFICATION: _____

(iii) WORK/TESTING TO BE DONE: _____

2 (i) PRECAUTIONS TAKEN TO ACHIEVE SAFETY FROM THE SYSTEM: (State points at which **Plant/Apparatus** has been **Isolated** and specify position(s) of **Earthing Devices** applied. State actions taken to avoid **Danger** by draining, venting, purging and containment or dissipation of stored energy.)

Caution Notices have been affixed at all points of isolation *

(ii) FURTHER PRECAUTIONS TO BE TAKEN DURING THE COURSE OF WORK TO AVOID SYSTEM DERIVED HAZARDS:

_____

_____

_____

_____

I have confirmed with the **Control Person(s)** _____ that the precautions in Section 2(i) have been carried out and that the **Control Person(s)** will maintain these until this Permit is cancelled. I certify that the precautions in Section 2(i) together with the precautions in Section 2(ii) are adequate to provide **Safety from the System** in respect of the work in Section 1.

This **Permit for Work** must only be transferred under the **Personal Supervision** of a **Senior Authorised Person**.

Signed _____ being a **Senior Authorised Person**. Time _____ Date _____

---

3 ISSUE: (i) **Key Safe Key (No.)** * _____ (ii) **Earthing Schedule** (No.) * _____ (iii) Portable **Drain Earths** (No. off) * _____

(iv) **Selected Person's** Report (No.) * _____ (v) **Circuit Identification** Flags (No. off) * _____

(vi) **Circuit Identification** Wristlets (No. off) * and Colours/Symbols * _____

Signed _____ being the **Senior Authorised Person** responsible for the issue of this Document. Time _____ Date _____

---

4 RECEIPT: I understand and accept my responsibilities under this Document and acknowledge receipt of the items in Section 3.

Signed _____ Name (Block Letters) _____

being a **Competent Person** employed by Company. _____

Time _____ Date _____

---

* N/A if Not Applicable

SR-SD2/1

5 CLEARANCE: I certify that all persons working under this Document have been withdrawn from, and warned not to work on, the **Plant / Apparatus** in Section 1. All gear, tools, **Drain Earths** and loose material have been removed and guards and access doors have been replaced, except for:

Signed _____ being the **Competent Person** responsible for clearing this Document. Time _____ Date _____

6 CANCELLATION: I certify that all items issued under Section 3 have been accounted for and the **Control Person(s)*** _____ _____ informed of the cancellation and of any restrictions on returning the **Plant/Apparatus** to service.

Signed _____ being the **Senior Authorised Person** responsible for cancelling this Document. Time _____ Date _____

TRANSFER RECORD

PART 1		PART 2		PART 3		
Person surrendering Document	Time Date	**Senior Authorised Person** receiving suspended Document	Time Date	**Person** receiving reissued Document	**Senior Authorised Person** reissuing Document	Time Date

Northern Ireland Electricity Networks

SAFETY RULES

SANCTION FOR TEST

No.

KEY SAFE

No. *

1 (i) LOCATION: _____

(ii) PLANT/APPARATUS IDENTIFICATION: _____

_____

_____

_____

(iii) TESTING TO BE DONE: _____

_____

_____

_____

_____

---

2 (i) THE PLANT / APPARATUS HAS BEEN ISOLATED FROM THE REST OF THE SYSTEM AT THE FOLLOWING POINT(S):
(State point(s) of isolation which will be maintained until this Sanction is cancelled.)

_____

_____

_____

_____

_____

_____

Caution Notices have been affixed at all points of isolation *

(ii) THE CONDITION OF THE ISOLATED PLANT / APPARATUS: (State position(s) of **Earthing Devices**. State point(s) where supplies may be restored for testing purposes. State actions to avoid **Danger** by draining, venting, purging and containment or dissipation of stored energy.)

3 ISSUE: I have confirmed with the **Control Person(s)** _____

that the precautions in Section 2(i) have been carried out and that the **Control Person(s)** will maintain these until this Sanction is cancelled. I have also confirmed with the **Control Person(s)** that, for the purpose of testing the **Plant / Apparatus** detailed in Section 1, control is transferred to _____ with authority to change the conditions in Section 2(ii) unless specified otherwise.

(i) **Key Safe Key (No.)** * _____ (ii) **Earthing Schedule** (No.) * _____ (iii) Portable **Drain Earths** (No. off) * _____

(iv) **Selected Person's** Report (No.) * _____ (v) **Circuit Identification** Flags (No. off) * _____

(vi) **Circuit Identification** Wristlets (No. off) * and Colours/Symbols * _____

Signed _____ being the **Senior Authorised Person** responsible for the issue of this Document. Time _____ Date _____

4 RECEIPT: I understand and accept my responsibilities including those of the **Control Person** under this Document and acknowledge receipt of the items in Section 3.

Signed _____ Name (Block Letters) _____

being an **Authorised Person** in charge of the testing.

Time _____ Date _____

* N/A if Not Applicable

SR-SD4/1

5 CLEARANCE: I certify that all persons testing under this Document have been withdrawn from, and warned not to continue testing on the **Plant / Apparatus** in Section 1. All gear, tools, **Drain Earths** and loose material have been removed and guards and access doors have been replaced and the condition of the **Plant/Apparatus** is as in Section 2 (ii), except for:

_____

_____

Signed _____ being the **Authorised Person** responsible for clearing this Document. Time _____ Date _____

6 CANCELLATION: I certify that all items issued under Section 3 have been accounted for and the **Plant/Apparatus** detailed in Section 1 is returned to the control of _____ **Control Person(s)** in the condition detailed in section 5

Signed _____ being the **Senior Authorised Person** responsible for cancelling this Document. Time _____ Date _____

TRANSFER RECORD

PART 1		PART 2		PART 3		
Person surrendering Document	Time Date	**Senior Authorised Person** receiving suspended Document	Time Date	**Person** receiving reissued Document	**Senior Authorised Person** reissuing Document	Time Date

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PART C

RESPONSIBILITIES OF PERSONS

C1 GENERAL

C1.1 It is the responsibility of all **Persons** who may be concerned with work or testing on **Plant and Apparatus** to which these Safety Rules apply to implement the Safety Rules and the associated supporting documents.

C1.2 The responsibilities placed upon **Persons** for the successful implementation of these Safety Rules may include all or only part of those detailed in this Section, depending upon the role of the individual.

C1.3 The written authorisation given to **Persons** who require it to perform their appropriate role in implementing these Safety Rules shall indicate the extent of the authorisation.

C1.4 **Persons** involved in achieving **Safety from the System** to allow work or testing to commence on **Plant** and **Apparatus**, and its subsequent restoration to service, will be concerned in separate identifiable areas of responsibility. Broadly these are:

(i) 'Control' – which includes, before work commences, instructing activities to implement precautions and consenting to the issue of a **Safety Document** and, after completion of work, acknowledging the cancellation of the **Safety Document** and instructing actions to restore **Plant** and **Apparatus** to service.

(ii) 'Making Safe/Restoration of **Plant** and **Apparatus**' – which includes, before work commences, taking actions to make **Plant** and **Apparatus** safe for work and issuing a **Safety Document** and, after completion of work and the cancellation of the **Safety Document**, taking actions to restore the **Plant** and **Apparatus** to service.

(iii) 'Work' – which includes, receipt of a **Safety Document**, execution of the required work to its completion or termination and, after the work area has been cleared, clearance of the **Safety Document**.

C2 COMPETENT PERSONS

C2.1 The responsibilities of **Competent Persons** include those determined by their training, knowledge and experience, within the limits imposed by their Authorisation Certificate. They must ensure that these responsibilities, which form part of these Safety Rules, are implemented.

C2.1.1 **Competent Persons** shall comply with these Safety Rules when carrying out work or testing whether instructions have been issued orally or in writing.

C2.1.2 **Competent Persons** shall use safe methods of work, safe means of access and egress, personal protective equipment, clothing, tools and equipment which are provided for their safety.

C2.1.3 **Competent Persons** shall cease work if during the course of work or testing a hazard which could give rise to **Danger** arises or is suspected. The situation shall be reported immediately by the **Competent Person** as appropriate.

C2.1.4 **Competent Persons** when recipients of **Safety Documents** or when in charge of additional working parties under **Safety Documents**, shall:

(i) meet the requirements of Part B of these Safety Rules;

(ii) understand the contents and any subsequent actions arising from those contents. This shall apply also to a **Selected Person's** report, an **Earthing Schedule**, or any written instruction or procedure regarding the method of work or testing;

(iii) during the course of the work adhere to, or instruct others under their charge to adhere to, any conditions, instructions or limits specified on a **Safety Document**. This shall also apply to a **Selected Person's** report, an **Earthing Schedule** or any written instruction or procedure regarding the method or testing;

(iv) as appropriate, retain the **Safety Document** and associated documents and **Keys** in safe custody and correctly implement any written procedure to achieve this;

(v) provide **Immediate** or **Personal Supervision** as required by **Persons** or as instructed by a **Senior Authorised Person**

(vi) warn all persons as quickly as possible to withdraw from and not work on the **Plant** and **Apparatus** concerned until further notice if during the course of work or testing a hazard which could give rise to **Danger** arises or is suspected. This situation shall be reported immediately by the **Competent Person** to the **Person** who issued the **Safety Document** or to another **Senior Authorised Person**.

C2.1.5 **Competent Persons** intending to work under a **Safety Document** personally held by another **Competent Person** shall, after having been properly instructed by a **Nominated Supervisor**, inform the recipient of the **Safety Document** of their presence and intended work.

They shall report to the recipient of the **Safety Document** the state of the work or testing for which they are responsible when it is completed or discontinued.

C2.1.6 **Competent Persons** clearing a **Safety Document** shall only do so after all persons working under the **Safety Document** have been withdrawn from, and warned not to work on, the **Plant** and **Apparatus** concerned. Where appropriate, they shall ensure that all tools, gear and loose material have been removed, guards and access doors replaced, the work site left tidy and the appropriate exceptions noted in the clearance section of the **Safety Document**. Where appropriate, they shall also account for or return the correct number of **Drain Earths**, **Circuit Identification** flags and wristlets and associated **Keys** and documents.

C2.1.7 **Competent Persons** when participating in the procedure for the transfer or suspension of a **Safety Document**, shall ensure that:

(i) all persons working under the **Safety Document** have been withdrawn from and warned not to work on the **Plant** and **Apparatus** concerned, that all associated documents, **Keys** and appropriate items are surrendered or accounted for to a **Nominated Supervisor** when transferring a **Safety Document**, or to a **Senior Authorised Person** when suspending a **Safety Document** and that the appropriate section of the **Transfer Record** is signed;

(ii) as **Nominated Supervisors**, the **Safety Document**, all associated documents, **Keys** and appropriate items are held in safe custody until surrendered or accounted for to the new recipient and that the new recipient understands the requirement to complete the transfer procedure under the **Personal Supervision** of a **Senior Authorised Person**;

(iii) as the new recipient following the re-issue of a transferred or suspended **Safety Document**, such re-issue is enacted only under the **Personal Supervision** of a **Senior Authorised Person** and, as the recipient, the appropriate section of the Transfer Record is signed.

C3 AUTHORISED PERSONS

C3.1 In addition to responsibilities as a **Competent Person**, responsibilities of **Authorised Persons** include those determined by their training, knowledge and experience, within the limits imposed by their Authorisation Certificate. They must ensure that these responsibilities, which form part of these Safety Rules are implemented.

C3.1.1 Carry out **Switching** operations to the instruction of **Control Persons**, reporting back and recording the completion of these actions.

C3.1.2 When participating in achieving **Safety from the System**, correctly implementing specified procedures before work commences. These shall include:

(i) carrying out the instructions of the **Control Person** to apply safety precautions. Reporting back and recording the completion of these actions;

(ii) meeting the requirements of Part B of these Safety Rules;

(iii) in the case of overhead lines, advise the **Control Person** of the **Circuit Identification** if applicable.

C3.1.3 As the recipient of a **Sanction for Test**:

(i) meet the requirements of Part B of these Safety Rules;

(ii) be present during the testing and being responsible for all matters of safety concerned with the test;

(iii) give instructions for the removal and re-application of those safety precautions which may be disturbed while at the same time maintaining **Safety from the System**;

(iv) implement the control function as dictated by the test programme and consulting, as necessary, with **Control Persons** of other **Systems** to agree any actions which may be required to maintain **Safety from the System**.

C3.1.4 Carry out duties as specified in Safety Rules Instructions.

C4 SENIOR AUTHORISED PERSONS

C4.1 In addition to responsibilities as an **Authorised Person**, responsibilities of a **Senior Authorised Persons** include those determined by their training, knowledge and experience, within the limits imposed by their Authorisation Certificate. They must ensure that these responsibilities, which form part of these Safety Rules are implemented.

C4.1.1 Correctly implementing specified procedures to ensure that all safety precautions which achieve **Safety from the System** are completed. These procedures shall include the process of:

(i) confirming through the **Control Person** that safety precautions at remote **Locations** are complete;

(ii) meeting the requirements of Part B of these Safety Rules;

(iii) checking with the **Control Person(s)** to confirm that the safety precautions which have been taken are adequate for the work or testing to be carried out.

C4.1.2 Prior to the issue of a **Safety Document** deciding:

(i) whether **Drain Earths** are required and, if so, specifying the requirements relating to their application and where an **Earthing Schedule** is provided ensuring that the correct number of portable **Drain Earths** are issued together with the **Earthing Schedule**;

(ii) whether **Plant** and **Apparatus** shall be **Vented**, **Purged** and its contents adjusted to a level which avoids **Danger**, and any action to be taken to contain or dissipate stored energy;

(iii) whether to call upon a **Selected Person** to provide a report specifying any additional precautions to be taken and deciding the action to be taken to implement any recommendations made;

(iv) under what conditions the safety precautions applied are to be removed during the course of the work or testing and, where appropriate, specifying the manner in which safety precautions may be removed and re-applied such that **Safety from the System** is maintained;

(v) that **Safety from the System** has been achieved or will be achieved when the requirements of the **Safety Document** are completely implemented;

(vi) that the contents of the **Safety Document** to be issued are correct and unambiguous;

(vii) implement the procedure to ensure safe custody of a **Safety Document** and associated **Keys** when it is not to be issued immediately;

(viii) obtain the **Consent** of the **Control Person(s)**;

(ix) whether **Personal Supervision** is required.

C4.1.3 When issuing, or re-issuing after transfer or suspension, a **Safety Document**:

(i) inform the **Control Person(s)** when relevant;

(ii) ensure that the contents of the **Safety Document**, any **Earthing Schedule**, or any **Selected Person's** report to be issued with the **Safety Document** are fully explained to the recipient and satisfying themselves that the recipient understands those contents;

(iii) issue the **Safety Document** together with, as appropriate, any **Keys**, **Selected Person's** report, **Earthing Schedule**, portable **Drain Earths**, correct **Circuit Identification** flags and wristlets and deciding whether the work to be carried out under a **Permit for Work** or **Limited Work Certificate** shall be given the **Immediate** or **Personal Supervision** of the recipient.

C4.1.4 When providing **Personal Supervision** of the transfer of a **Safety Document**, discharging the same responsibilities to the new recipient as if the **Safety Document** was being issued initially.

C4.1.5 When a **Safety Document** is to be suspended:

(i) receive the **Safety Document** under the transfer procedure;

(ii) ensure that the **Safety Document**, **Key Safe Key** and any associated documents and **Keys** are placed in safe custody in a manner which secures the safety precautions during the period of suspension.

C4.1.6 When work or testing is to be resumed and the **Safety Document** is to be re-issued following suspension:

(i) check and confirm that the recorded safety precautions for the **Safety Document** are as stated and still valid;

(ii) transfer the **Safety Document** to a **Competent Person**, discharge the same responsibilities to the recipient as if the **Safety Document** was being issued initially.

C4.1.7 When cancelling a **Safety Document**:

(i) satisfy themselves that the requirements of the clearance section of the **Safety Document** have been correctly implemented;

(ii) check that all items issued with the **Safety Document** have been returned or accounted for;

(iii) satisfy themselves as to the operational state of the **Plant** and **Apparatus**;

(iv) when relevant, inform the **Control Person(s)** immediately of the cancellation and confirm to them the operational state of the **Plant** and **Apparatus**.

C4.1.8 When the means of achieving **Safety from the System** is by limiting the work or testing or the area in which they are to be carried out, deciding to issue a **Limited Work Certificate** in those situations where oral instructions may be insufficient.

C4.1.9 When work or testing is to be carried out outside **Safety Distance** from exposed **High Voltage** conductors, deciding whether to issue a **Limited Work Certificate** because of the close proximity of the limit of **Safety Distance**.

C4.1.10 For work or testing on **LV Apparatus** determining whether this is to be carried out:

(i) with the **Apparatus Live** and in accordance with the relevant Specialised Procedure;

(ii) by a **Competent Person** under normal routine instructions, or of a non-routine nature under oral instructions, a **Limited Work Certificate** or **Personal Supervision**.

C4.1.11 Decide, in those cases where it is not otherwise specified, the category of **Person** who shall provide **Personal Supervision** in situations where it is required.

C5 CONTROL PERSONS

C5.1 The responsibilities of **Control Persons** include those determined by their training, knowledge and experience, within the limits imposed by their Authorisation Certificate. They must ensure that these responsibilities, which form part of these Safety Rules, are implemented.

C5.1.1 Instruct **Switching** operations to **Authorised Persons** and confirm completion of these actions.

C5.1.2 Sanctioning the release of **Plant** and **Apparatus** from service.

C5.1.3 Before giving **Consent** to the issue of a **Safety Document**, implementing specified procedures which ensure the application of safety precautions which achieve **Safety from the System**. These procedures shall include the process of;

(i) implementing the control function for the **Location** in accordance with mandatory safety instructions and supporting documents;

(ii) consulting with **Control Persons** of other **Systems** to agree, initiate and record those actions necessary to establish and maintain safety precautions on **Plant** and **Apparatus** which is interconnected across control boundaries;

(iii) instructing **Authorised Persons** to carry out the necessary operations to establish the safety precautions which achieve **Safety from the System** and then obtaining confirmation that each instruction has been carried out;

(iv) checking with the **Senior Authorised Person** to confirm that the safety precautions which have been taken are adequate for the work or testing to be done.

C5.1.4 Checking that the **Safety Document** to be issued correctly defines the **Plant** and **Apparatus** which is to be released for work or testing together with the safety precautions taken.

C5.1.5 Checking, prior to giving **Consent** to the issue of a **Safety Document**, the accuracy of **Circuit Identification** as reported from **Locations** remote from the **Location** where a **Safety Document** is to be issued.

C5.1.6 Giving **Consent** to the issue and acknowledging the cancellation of **Permits for Work**, **Sanctions for Test** and, where appropriate, **Limited Work Certificates**.

C5.1.7 Implementing the necessary procedures to ensure that the safety precautions established to achieve **Safety from the System** are maintained during the period the **Safety Document** is in force.

C6 SELECTED PERSONS

C6.1 A **Selected Person** is responsible for using their appropriate technical knowledge and experience for making a report and recommendations to overcome hazards which may prevent work or testing being performed safely on **Plant** and **Apparatus** which has otherwise been made safe.

C6.2 If, prior to the issue of a **Safety Document** or during the progress of work, it is considered necessary to carry out a check on **Plant** and **Apparatus** or working areas for hazards, the **Selected Person** shall carry out any tests and examinations they consider necessary. A written report shall be prepared by the **Selected Person** who will be responsible for ensuring that its recommendations, when implemented, will ensure safe working conditions relating to the hazards.

C7 NOMINATED SUPERVISORS

C7.1 In addition to responsibilities as a **Competent Person**, responsibilities of **Nominated Supervisors** include those determined by their training, knowledge and experience, within the limits imposed by their Authorisation Certificate. They must ensure that these responsibilities, which form part of these Safety Rules, are implemented.

C7.1.1 Before setting persons or a working party to work, satisfy themselves that measures are taken to establish **General Safety** at and in the vicinity of the workplace and instructing **Competent Persons** in charge of the working party in respect of **General Safety** provisions that must be maintained throughout the work or testing.

C7.1.2 When work defined in a **Safety Document** is in progress, further **Competent Persons** may work under that **Safety Document** only after they have been properly instructed by a **Nominated Supervisor** who has sufficient knowledge of the work to be carried out and they have personally reported to the recipient of that **Safety Document** prior to commencing work.

C7.1.3 Retaining in safe custody **Safety Documents**, **Keys** and associated items which are surrendered for transfer, and, when work or testing is required to recommence, handing the relevant **Safety Document**, **Keys** and associated items to the **Competent Person** who is the new recipient and instructing the **Competent Person** to report to the **Senior Authorised Person** to enact the transfer procedure.

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PART D

DEFINITIONS

D1 Apparatus

All equipment forming part of the **System** in which electrical conductors are used, supported, or of which they may form a part, and for which NIE Networks has maintenance responsibility.

D2 Approved

Sanctioned by the Chairman of the Electrical & Mechanical Safety Advisory Committee (EMSAC) for use.

Authorised Person – see **Persons**

D3 Caution Notice

A notice in **Approved** form conveying a warning against interference.

D4 Circuit Identification

Colours and/ or symbols used to identify overhead line circuits.

Competent Person – see **Persons**

D5 Consent

Confirmation by the **Control Person** before the issue of a **Safety Document** that the **Plant** and **Apparatus** concerned has been released for work or testing and is correctly identified on the **Safety Document**, that their responsibilities in respect of safety precautions with which they are associated have been discharged and that procedures have been enacted which will maintain these safety precautions until the **Safety Document** is cancelled.

Control Person – see **Persons**

Control Key – see **Keys**

D6 Danger

A risk, to health or of bodily injury.

D7 Danger Notice

A notice in **Approved** form reading **'Danger'**.

Drain Earth – see **Earthing Device**

D8 Earthed

Connected to earth by means of an **Earthing Device**.

D9 Earthing Device

An **Approved** means of providing a connection between a conductor and earth, being one of the following:

(i) **Primary Earth** – A fixed or portable **Earthing Device** applied at a position defined in a **Safety Document**.

(ii) **Drain Earth** – A fixed or portable **Earthing Device** applied for the purpose of protection against the effects of induced or inadvertent voltages, and backfeeds from other sources.

(iii) **Live Line Equivalent Earth** – is an equivalent **Primary Earth** and shall be used when required for Live Line Work associated with making and breaking connections. A **Live Line Equivalent Earth** shall be applied to disconnected **Apparatus** on which it is required to work on as part of a Live Line Work procedure.

D10 Earthing Schedule

A schedule indicating the **Drain Earth** requirements for each stage of the work or testing.

D11 General Safety

The provision of safe access to and from the place of work, a safe place of work, safe methods of work and the use of correct equipment and protective clothing.

D12 High Voltage (HV)

A voltage exceeding 1000 volts.

Immediate Supervision – see **Supervision**

D13 Isolated

Disconnected from associated **Plant** and/ or **Apparatus** by an **Isolating Device** in the isolating position, or by adequate physical separation or sufficient gap.

D14 Isolating Device

A device for rendering **Plant** and **Apparatus Isolated**.

D15 Keys

Being one of the following:

(i) **Control Key** – A key capable of operating the control lock of a **Key Safe**.

(ii) **Safety Key** – A key unique at the **Location** capable of operating a lock which will cause an **Isolating Device**, **Earthing Device**, vent or drain device/valve to be **Locked**.

(iii) **Key Safe Key** – A key unique at the **Location** capable of operating a lock, other than the control lock, on a **Key Safe**.

D16 Key Safe

A device of an **Approved** device for the secure retention of **Keys**.

Key Safe Key – see **Keys**

Limited Work Certificate – see **Safety Documents**

D17 Live

Electrically charged.

D18 Location

Any place at which work or testing under these Safety Rules is carried out.

D19 Locked

A condition of **Plant** and/ or **Apparatus** that cannot be altered without the operation of a locking device which is of a standard acceptable to the Chairman of the Electrical & Mechanical Safety Advisory Committee (EMSAC)

D20 Low Voltage (LV)

A voltage not exceeding 1000 volts.

Permit for Work – see **Safety Documents**

Personal Supervision – see **Supervision**

D21 Persons

Being one of the following:

(i) **Competent Person** – A **Person** who has sufficient training, knowledge and experience to enable them to avoid **Danger** and carry out duties specified in writing, including receive, transfer and clear specified **Safety Documents**.

(ii) **Authorised Person** – A **Competent Person** who has been trained, assessed and authorised to carry out duties specified in writing, including **Switching** to the instruction of **Control Persons**.

(iii) **Senior Authorised Person** – An **Authorised Person** who has been trained, assessed and authorised to carry out duties specified in writing, including the preparation, issue and cancellation of specified **Safety Documents**.

(iv) **Control Person** – A **Person** who has been trained, assessed and authorised to be responsible for controlling and coordinating safety precautions necessary to achieve **Safety from the System** and instruct **Switching** operations to **Authorised Persons**.

(v) **Selected Person** – A **Person** qualified by technical knowledge and experience and trained, assessed and authorised to carry out tests and examinations and make recommendations regarding additional special precautions to be taken to safeguard persons.

(vi) **Nominated Supervisor –** A **Competent Person** who has been trained, assessed and authorised to set working parties to work or test and to supervise work activities within the confines of their technical knowledge and experience.

D22 Plant

Fixed and movable items of equipment, other than **Apparatus**, forming part of the **System**, for which NIE Networks has a maintenance responsibility.

Primary Earth – see **Earthing Device**

D23 Purged

A condition of **Plant** and/or **Apparatus** from which any dangerous contents have been removed.

D24 Safety Distance

The distance from the nearest exposed **High Voltage** conductor which is not **Earthed** or from an insulator supporting a **High Voltage** conductor which shall be maintained to avoid **Danger**.

D25 Safety Documents

Being one of the following:

(i) **Limited Work Certificate** – A **Safety Document** of a format indicated in these Safety Rules which defines the limits within which work or testing may be carried out and specifies necessary precautions.

(ii) **Permit for Work** – A **Safety Document** of a format indicated in these Safety Rules specifying the **Plant** and/or **Apparatus** to be worked on, the work to be carried out and the actions taken to achieve **Safety from the System**.

(iii) **Sanction for Test** – A **Safety Document** of a format indicated in these Safety Rules specifying the **Plant** and/or **Apparatus** to be tested, making known the conditions under which the testing is to be carried out and confirming actions which have been taken to achieve **Safety from the System**.

D26 Safety from the System

A condition which safeguards persons working on or testing **Plant** and/or **Apparatus** from the inherent **Dangers** in the **System**.

Safety Key – see **Keys**

Sanction for Test – see **Safety Documents**

Selected Person – see **Persons**

Senior Authorised Person – see **Persons**

D27 Supervision

Being one of the following:

(i) **Immediate Supervision** – **Supervision** by a **Person** who is continuously available at the **Location** where work or testing is in progress and who attends the work area as is necessary for the safe performance of the work.

(ii) **Personal Supervision** – **Supervision** by a **Person** such that the supervising **Person** is at all times during the course of the work or testing continuously observing and in the presence of the individual(s) being supervised with the ability to intervene.

When individual(s) are working at height, **Supervision** may be given at ground level providing verbal and visual communication is maintained at all times.

This level of **Supervision** shall ensure individual(s) are not exposed to **Danger**.

D28 Switching

The operation of circuit breakers, disconnectors/ isolators, fuses or other methods of making or breaking an electrical circuit, and/ or the application and removal of **Primary Earths**.

D29 System

Items of **Plant** and **Apparatus** which are used separately or in combination in any process associated with the generation, transmission or distribution of electricity.

D30 Transfer Record

The relevant section within a **Safety Document** used to record the details of the transfer of the **Safety Document**.

D31 Vented

Having an outlet open to the atmosphere and so arranged that pressure can equalise to atmospheric pressure.

SAFETY INSTRUCTIONS

SI 1 EARTHING HIGH VOLTAGE APPARATUS

These Safety Rules state that for work on or testing **HV Apparatus**, an **Earthing Device** shall be applied within the **Isolated** zone. The instructions given below describe how this principle shall be implemented.

SI 1.1 Primary Earths

(i) Where reasonably practicable, **Primary Earths** shall be applied between the point of work or testing and the point of isolation. Where this is not reasonably practicable, an **Approved** procedure shall be implemented.

(ii) Where a suitable circuit breaker or specially provided earth switch or fixed **Earthing Device** is installed, it shall, where reasonably practicable, be used to make the first earth connection and shall, where reasonably practicable, be the last earth connection removed.

(iii) When a moveable circuit breaker is used the automatic trip feature shall be rendered inoperative before closing. After closing, any means of opening the circuit breaker shall, where reasonably practicable, be **Locked**.

(iv) When a fixed circuit breaker is used the tripping functions shall be rendered inoperative after closing and where reasonably practicable, the circuit breaker **Locked** in the closed position.

(v) Where reasonably practicable, local closing of a circuit breaker to provide an earth shall be avoided.

(vi) Where **Primary Earths** are applied all phases shall be **Earthed.**

(vii) **Primary Earths** shall remain in position until the associated **Permit for Work** has been cancelled.

SI 1.2 Drain Earths

When work or testing is to be carried out on **HV Apparatus** under the terms of a **Permit for Work** or **Sanction for Test**, **Drain Earths** shall be applied when induced, or inadvertent voltages, and backfeeds from other sources may cause **Danger** at the point(s) of work. They shall be applied and removed, as necessary, during the course of the work or testing in accordance with an **Approved** procedure which may include the use of an **Earthing Schedule**.

SI 1.3 Portable Earths

(i) Prior to applying portable **Primary Earths**, an **Approved** voltage indicator shall be used to verify that the conductor to be **Earthed** is not **Live** at **System** voltage, unless the conductor can be seen to be continuous to a previously fitted **Earthing Device**. The voltage indicator shall be tested immediately before and immediately after use.

(ii) Portable **Earthing Devices** shall be applied to and removed from conductors using an **Approved** device.

(iii) Portable **Earthing Devices** shall only be applied in any cell or cubicle when all exposed conductors are **Isolated** from the **System**.

(iv) When a portable **Earthing Device** is to be applied, the earth end of each earthing connection shall be attached to metal which is electrically bonded to earth before the conductor end clamp is applied, except when carrying out insulated working on cables. When multiple earthing connections are to be used and two or more earth end clamps will be beside each other, the earth end clamps of all these earthing connections shall be attached before any of the conductor end clamps are applied.

(v) When a portable **Earthing Device** is to be removed, the conductor end clamp connection shall be removed before the earth end clamp, except when carrying out insulated working on cables. When multiple earthing connections have been used and two or more conductor end or earth end clamps are in close proximity to each other, the conductor end clamps of all these earthing connections shall be removed before any of the earth end clamps. At no time shall the conductor end clamp of a portable **Earthing Device** be allowed to remain connected when its earth end clamp has become detached. If such a disconnected portable **Earthing Device** is the only earth on the conductor at that point, an additional portable **Earthing Device** shall be connected between earth and that conductor before the conductor end clamp of the detached portable **Earthing Device** is removed. In all cases, before the earth end clamp is re-connected, the conductor end clamp shall first be removed.

(vi) Where bundle conductors are being **Earthed**, each individual conductor shall be **Earthed** unless they are solidly bonded electrically at or near the point of earthing.

SI 1.4 High Voltage Metalclad Switchgear with Spouts

(i) When work is to be carried out on the busbar spouts of a multi-panel switchboard, **Primary Earths** shall be applied to the busbar at one of the panels. Work can proceed after proving that each spout is at or about zero potential by means of an **Approved** voltage indicator being applied immediately before it is worked on. The voltage indicator shall be tested immediately before and immediately after use.

(ii) When withdrawable **Apparatus** has been removed from its service position, and **Danger** could arise from contact with electrically conducting parts, it shall be immediately electrically discharged to earth, after which a **Primary Earth** or **Drain Earth** need not be applied.

SI 1.5 Break or Connection in a Conductor

Before a break is made in a conductor or a connection is made across a break, **Danger** which could arise from voltage difference shall be excluded. If **Danger** cannot otherwise be excluded, then the conductors shall be **Earthed** on both sides of the point where a break or connection is to be made.

SI 2 NOT IN USE

SI 3 VENTING OF PLANT AND APPARATUS

SI 3.1 When **Plant** and/or **Apparatus** is to be **Vented** before work or testing commences, the venting shall be carried out in a controlled manner to ensure that:

(i) there is no **Danger** to persons from any emission from the vent;

(ii) the venting process is completed and atmospheric pressure is established internally in the **Plant** and/or **Apparatus**.

SI 3.2 Precautions shall be taken to maintain the established safe conditions during the work or testing.

SI 4 PURGING OF PLANT AND APPARATUS

SI 4.1 When **Plant** and/or **Apparatus** is to be **Purged**, the purging shall be carried out in a controlled manner to ensure that:

(i) there is no **Danger** to persons from any emission during the purging process;

(ii) the purging process is completed and normal atmospheric conditions exist internally in the **Plant** and/or **Apparatus**.

SI 4.2 Precautions shall be taken to maintain the established safe conditions during the work or testing.

SI 5 NOT IN USE

SI 6 NOT IN USE

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SPECIALISED PROCEDURES
INSTRUCTIONS FOR WORK, TESTING AND ADJUSTMENTS ON LIVE HIGH AND LOW VOLTAGE APPARATUS

SP1 LIVE LOW VOLTAGE WORK

Live Low Voltage work must be justified by a suitable **Person** who can make reasoned judgements for each job to be undertaken as required by the Electricity at Work Regulations (NI) 1991. When it is unreasonable for the **Low Voltage Apparatus** to be **Isolated** and reasonable in all circumstances for **Persons** to be at work on or near **Live Low Voltage Apparatus**. Work may be carried out with the **Apparatus Live** under the following conditions:

(i) The **Apparatus** shall be treated as **Live** and **Live Low Voltage** work Procedures shall be followed at all times.

(ii) **Live Low Voltage** work shall only be carried out by a **Competent Person** who has completed an appropriate course of training, been assessed and is Authorised to do so.

(iii) Before work commences on **Live Low Voltage Apparatus** it shall be visually inspected for soundness by a **Competent Person**. **Live Low Voltage** work shall not be carried out on **Apparatus** which is damaged or faulty to the extent where it has been assessed and is considered dangerous.

(iv) Before work commences, **Persons** who are required to carry out work on **Live Apparatus** shall remove any metallic objects such as wristwatches, pendants, pens, etc. which could cause **Danger** if they accidentally come into contact with **Live** conductors.

(v) Where necessary to prevent **Danger**, barriers, warning notices, etc. shall be used to prevent access to the work area by other persons.

(vi) Except where unaccompanied working has been **Approved** for specified activities, no **Person** shall work on **Live Low Voltage Apparatus** unless accompanied by another **Person** who shall have the necessary competence to avoid **Danger** and to render and obtain assistance in the event of an emergency.

(vii) When working on **Live Low Voltage Apparatus** there shall be adequate working space and means of access, free from **Danger**. Suitable lighting shall be used to illuminate the work area and the **Apparatus** on which work is to be carried out.

(viii) Where necessary to prevent **Danger** from contact with, or between, **Live Low Voltage** conductors, or between **Live Low Voltage** conductors and adjacent metalwork, either:

(a) insulated screening or shrouding shall be suitably arranged to screen **Live Low Voltage** conductors and all metalwork adjacent to the point of work, or

(b) work shall be carried out in accordance with an **Approved** procedure.

(ix) When work is carried out on **Live Low Voltage** conductors either:

(a) precautions shall be taken to ensure that only one **Live Low Voltage** conductor is exposed at any one time, or

(b) work shall be carried out in accordance with an **Approved** procedure.

(x) Where necessary to prevent **Danger**, **Approved** insulated tools and equipment, as appropriate, shall be used.

(xi) The appropriate **Approved** Personal Protection Equipment shall be used.

(xii) Metallic sheaths of cables shall be bonded to each other with an **Approved** insulated conductor before jointing and before cutting to ensure the continuity of the electrical circuit through the sheaths.

SP2 TESTING AND ADJUSTMENTS ON LIVE LOW VOLTAGE APPARATUS

SP2.1 **Live Low Voltage** testing shall be justified by a suitable **Person** who can make reasoned judgements for each job to be undertaken as required by the Electricity at Work Regulations (NI) 1991.

SP2.2 Before testing commences on **Live Low Voltage Apparatus** it shall be visually inspected for soundness by a **Competent Person**. **Live** testing shall not be completed on **Apparatus** which is damaged or faulty, to an extent where it is considered dangerous.

SP2.3 **Approved** insulated tools shall be used when testing and adjustments are to be made with the **Apparatus Live**.

SP2.4 If the testing or adjustments require the removal of **Live** or metallic components, the requirements of SP1 for working on **Live Low Voltage Apparatus** shall be met.

SP2.5 Where the testing or adjustments require covers to be removed so that **Low Voltage** terminals or connections which are **Live**, or can be made **Live**, are exposed, then precautions shall be taken to prevent unauthorised access to, or interference with, the **Live Low Voltage Apparatus**. Such precautions shall include, where necessary, **Personal Supervision** and/or the erection of suitable barriers and the displaying of **Danger Notices**.

SP3 LIVE LINE WORK ON 6.6kV and 11kV OVERHEAD LINES

SP3.1 **Live** line work shall only be carried out by **Persons** who have been trained, assessed and authorised for the appropriate **Live** line procedures.

SP3.2 **Live** line work shall only be undertaken under the **Personal Supervision** of an **Authorised Person**.

SP3.3 **Live** line work shall be justified by an appointed **Person** who can make reasoned judgements for each job to be undertaken as required by SRG 9 'Live Working on the NIE High Voltage (6.6/11kv) System Safety Justification'.

SP3.4 Where applicable, auto-reclosing equipment on circuit breakers controlling the circuit concerned shall be rendered and remain inoperative while **Live** line working is in progress. The circuit shall not be reclosed in the event of it tripping until the **Control Person** has obtained the agreement with **Authorised Person** in charge of the **Live** line work.

SP3.5 Before **Live** line work commences, the **Authorised Person** shall inform the **Control Person** of their intent to proceed, obtain their consent and record appropriate details on the Live Line Working Record.

A channel of communication shall be available between the **Authorised Person** and the **Control Person** during the course of the work.

SP3.6 If unexpected delays, including adverse weather, occur during the course of the **Live** line work, the **Authorised Person** in charge of the **Live** line work shall inform the **Control Person** and agree if the **Live** line work can proceed, is suspended or is cancelled.

SP3.7 Where **Live** line work is not completed on the day it is commenced, all **Persons** shall be withdrawn and the **Control Person** advised. Before work proceeds again, the provisions of SP3.5 shall apply.

SP3.8 All tools and equipment used for **Live** line work shall be of an **Approved** type and shall be maintained and used in an **Approved** manner. If **Authorised Persons** are to infringe the **Safety Distance** during hot glove work, they shall wear **Approved** insulating gloves and sleeves. All tools and equipment shall be examined immediately prior to use and if suspected or assessed to be defective shall not be used.

SP3.9 Only vehicles, equipment or **Persons** directly associated with the **Live** line work shall be allowed in the work area. Further access to the work area by any other persons shall only be allowed with the permission of the **Authorised Person** in charge of the **Live** line work.

SP3.10 On suspension or completion of **Live** line work, all **Persons** must be withdrawn and the **Control Person** advised of

(i) the details of the work done (including any uncompleted works) and,
(ii) that no further work is to be undertaken.

The Live Line Working Record shall be completed.

SP3.11 This Specialised Procedure shall be used in conjunction with,

(i) SRI 300 '6.6kV and 11kV Live Line Working'
(ii) SRG 9 'Live Working on the NIE High Voltage (6.6/11kV) System Safety Justification'
(iii) Section 1 'General Information' – HV Live Line Manual
(iv) Section 2 'Safety Notes' – HV Live Line Manual

SP3.12 Any amendments required to Section 1 'General Information' or Section 2 'Safety Notes' of the High Voltage Live Line Manual shall be approved by EMSAC.

SP4 NOT IN USE

SP5 NOT IN USE

NORTHERN IRELAND ELECTRICITY SAFETY RULES INSTRUCTIONS

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HIGH VOLTAGE SWITCHING

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HIGH VOLTAGE SWITCHING

1 SCOPE

This Safety Rules Instruction sets down the procedures to be adopted when carrying out **High Voltage (HV) Switching** operations on the Northern Ireland Electricity **System** and other **System(s)** operated by Northern Ireland Electricity other than under the terms of a **Sanction for Test**.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purpose of this Safety Rules Instruction the following additional definition applies:

Emergency Switching - **Switching** by an **Authorised Person** without receiving instructions from the appropriate **Control Person**. (Such action shall only be taken where, in the opinion of the **Authorised Person**, delay in obtaining instructions from the **Control Person** may result in **Danger** or in serious damage to equipment where this could lead to **Danger**.)

3 IDENTIFICATION

Apparatus on which **Switching** is to be carried out shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the **Switching**. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel **Switching** on the **High Voltage System** are:

- Electric shock
- Burns
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) The operation of **Apparatus** or a fixed **Earthing Device** which has an abnormality.

(ii) The application of earths to **Live HV Apparatus**.

(iii) Poorly connected and/or insecure **Earthing Devices**.

(iv) The incorrect sequence or method of application or removal of portable **Earthing Devices**.

(v) The inadvertent earthing of **Live HV Apparatus** due to the loss of control or difficulty in the handling of portable earthing equipment.

(vi) Falling.

5 PREPARATION FOR SWITCHING

5.1 All **HV Switching**, including the application and removal of fixed and portable **Primary Earths**, but excluding *Emergency Switching*, shall be carried out to the instructions of the appropriate **Control Person** or, provided that the requirements of Clause 5.9 are met, to the instructions of a **Person** under training.

5.2 Before issuing **HV Switching** instructions, the **Control Person** shall consult with the **Control Person(s)** of any **System(s)** which may be affected by the proposed **Switching**. This consultation shall include Persons controlling networks and systems not operated by Northern Ireland Electricity which may be affected. Details of the above consultation shall be recorded in the **Switching** log.

5.3 The sequence of instructions shall be such that all **Switching** causing the **Apparatus** to be **Isolated** from all points of supply, including voltage and auxiliary transformers and common neutral earthing equipment from which the **Apparatus** may become **Live**, is confirmed by the **Authorised Person** to the **Control Person** as having been completed before the **Control Person** issues any earthing instructions. When restoring **Apparatus** to service, the sequence of instructions shall be such that all **Switching** causing **Earthing Devices** to be opened or removed is confirmed by the **Authorised Person** to the **Control Person** as having been completed before the **Control Person** issues any de-isolation instructions. **SR A3** **SR A4**

5.4 **HV Switching** instructions shall be given direct by a **Control Person** to the **Authorised Person** who is going to carry out the operation or, for the application and removal of portable **Primary Earths**, to the **Senior Authorised Person** who is going to carry out or personally supervise the operation, or to a **Person** under training provided that the requirements of Clause 5.8 are met. If the **Person** receiving the **Switching** instructions has any objections or queries at any stage of the instructions, they shall raise them with the **Control Person** immediately.

5.5 **HV Switching** instructions shall be given in two parts as detailed in Clauses 5.5.1 and 5.5.2.

5.5.1 The **Control Person** shall give an explanation of the objective of the subsequent operations, including the identity and **Location** of the **Apparatus** involved, to the **Person** who is going to carry out the instruction. It is not necessary to record this part of the instruction.

5.5.2 The **Control Person** shall then give the formal precise instruction, which shall be recorded in a **Switching** log before issue and shall follow a standard pattern and include:

(i) The time of the instruction.

(ii) The **Location** at which the **Apparatus** operates.

(iii) The name of the **Person** who is going to carry out the operations.

(iv) The actual operational requirement, including identification and nomenclature of the **Apparatus** involved.

This part of the instruction shall be recorded by the **Control Person** in an **Approved** manner and the record shall also contain the date and the signature or where appropriate an electronic identification of the **Control Person**.

5.6 A **Switching** schedule may be used where appropriate. Where a **Switching** schedule is used, instructions may be given by referring to items enumerated in the schedule. When the schedule has been amended, the amendment shall be read out in full and agreed before the **Switching** commences.

5.7 The **Person** receiving the **Switching** instructions shall record the instructions in a **Switching** log, including the name of the **Control Person**. At the termination of the message the instructions shall be read back to the **Control Person** in full and signed.

5.8 When **HV Switching** is to be carried out by a **Person** under training, he shall be under the **Personal Supervision** of the **Authorised Person** responsible for the operations. Before **Switching** instructions are issued to a **Person** under training, the **Authorised Person** responsible for the operations shall receive from the **Control Person** an explanation of the objective of the subsequent operations, including the identity and **Location** of the **Apparatus** involved. The **Control Person** shall at this stage record the name of the supervising **Authorised Person** responsible for the operations. The **Switching** instructions shall then be given by the **Control Person** direct to the **Person** under training and shall be given and received in accordance with Clauses 5.5.1, 5.5.2 and 5.7 of this Safety Rules Instruction. At the termination of the **Switching** instructions to the **Person** under training, the **Control Person** shall repeat the **Switching** instructions to the supervising **Authorised Person** responsible for the operations and obtain confirmation that they have been recorded correctly by the **Person** under training or, if appropriate, the supervising **Authorised Person** responsible for the operations shall confirm to the **Control Person** that he had overheard the **Switching** instructions issued to the **Person** under training and they have been recorded correctly by the **Person** under training.

5.9 When **HV Switching** instructions are to be issued by a **Person** under training he shall be under the **Personal Supervision** of the **Control Person** responsible for the issue of such instructions. Before **Switching** instructions are issued by a **Person** under training, the supervising **Control Person** shall give to the **Authorised Person** who is going to carry out the operations, an explanation of the objective of the subsequent operations, including the identity and **Location** of the **Apparatus** involved. The **Authorised Person** who is going to carry out the operations shall at this stage record the name of the supervising **Control Person**. The **Switching** instructions shall then be given by the **Person** under training direct to the **Authorised Person** who is going to carry out the operations and shall be given and received in accordance with Clauses 5.5.1, 5.5.2 and 5.7 of this Safety Rules Instruction. The supervising **Control Person** shall ensure that **Switching** instructions issued by a **Person** under training are correct and that the instructions read back to the **Person** under training by the **Authorised Person** who is going to carry out the operations are as issued.

6 HIGH VOLTAGE SWITCHING - OTHER THAN FOR EMERGENCY CONDITIONS

6.1 After receiving **HV Switching** instructions, the **Person** carrying out the operations shall observe the following requirements:

(i) He shall be deliberate, neither rushing nor causing undue delay, and shall take nothing for granted.

(ii) He shall take with him the **Switching** log, consulting it and checking that he is on the correct **Apparatus** before taking any action.

(iii) He shall then pause to consider the consequences of his proposed action and re-check it before carrying it out.

(iv) When a switch or similar piece of **Apparatus** shows any signs of abnormality, its condition shall be reported immediately to the **Control Person**. When the abnormality is of such severity that the **Apparatus** shall not be operated, any automatic feature shall, where practicable, be rendered inoperative and when necessary all persons shall be kept clear of such **Apparatus**, and **HV Switching** shall be effected as soon as possible to remove the **Apparatus** concerned from service without it being operated.

(v) After carrying out each operation he shall record the time of that operation and check by all means readily available that it has been satisfactorily completed.

(vi) If he has any objections or queries at any stage of the operations, he shall raise them with the **Control Person** immediately. **Switching** shall stop until the objections or queries are resolved.

(vii) When operating switchgear the operator shall wear the appropriate recommended personal protective equipment (PPE).

(viii) When an overhead line earth switch is closed, he shall note the **Circuit Identification**, where applicable, and add it to his **Switching** instruction.

(ix) A switch shall only be unlocked immediately before being operated and **Locked** in position immediately after it has been operated. **SR A3**

6.2 The **Person** carrying out the operations shall, on completion, comply with the following requirements:

(i) Record the time of completion of the operation or sequence of operations together with any **Circuit Identification**.

(ii) Report back to the **Control Person** without undue delay the operations carried out and the time of completion and any **Circuit Identification** involved.

(iii) Record the name of the **Control Person**.

6.3 Where isolation is effected by the opening of **Isolating Devices**, the integrity of which is dependent on the presence of SF_6 gas at the design pressure, the pressure of the gas shall be monitored throughout the period of the work to ensure that the integrity of the isolation is maintained. Any loss of gas pressure shall immediately be reported to the appropriate **Control Person** who shall take the following action.

6.3.1 Where a **Safety Document** has been issued, the recipient shall be informed by the **Control Person** and the work suspended until the change in pressure has been investigated by a **Senior Authorised Person**. Work shall not be resumed until normal conditions are re-established, or a **Senior Authorised Person** deems it safe. The **Control Person** shall where reasonably practicable, also notify the **Senior Authorised Person** who issued the **Safety Document**.

6.3.2 Where no **Safety Document** has been issued, any work or proposed work shall be stopped until normal conditions have been re-established as in 6.3.1 above.

6.4 On receiving confirmation of the completion of **Switching**, the **Control Person** shall record the time of completion, the time of receipt, any **Circuit Identification** and add his signature or electronic identification to the record. He shall give the **Person** confirming completion of **Switching** the time of receipt in order that he may record it. He shall also acknowledge by repeating any relevant additional information passed to him by the **Person** confirming completion of **Switching**.

6.5 In the event that a **Switching** instruction issued by the **Control Person** cannot be completed, then all related uncompleted **Switching** instructions shall be cancelled before any remedial action is initiated. The time of withdrawal of the **Switching** instruction, together with the names of both the **Control Person** and the **Authorised Person** shall be recorded in the same manner as any other **Switching** instruction.

6.6 All recorded entries shall be legible and indelible. Records, together with copies of **Switching** instructions and **Switching** schedules shall be retained in accordance with SRI 600 – 'Application of the Safety Rules'.

6.7 Before any **HV** equipment on which work or testing has been carried out is returned to service, the **Competent Person** clearing the **Safety Document** shall confirm with the **Senior Authorised Person** cancelling the **Safety Document** the operational condition of the **HV** equipment. The **Senior Authorised Person** shall advise the **Control Person** of the operational condition of the **HV** equipment.

6.8 The **Control Person** shall at all times update and maintain the appropriate control diagram.

6.9 When the **Control Person** is aware that work or testing involves the rearrangement of conductors he shall ensure that, when the **System** is being restored, sufficient checks are carried out to prove that the **System** phases out.

7 HIGH VOLTAGE SWITCHING - EMERGENCY CONDITIONS

7.1 Where *Emergency Switching* has taken place the **Authorised Person** shall inform the **Control Person** as soon as possible after the operations. All relevant details shall be recorded.

7.2 When a switch or similar piece of **Apparatus** shows any signs of abnormality, its condition shall be reported immediately to the **Control Person**. When the abnormality is of such severity that the **Apparatus** shall not be operated, any automatic feature shall, where practicable, be rendered inoperative and when necessary all persons shall be kept clear of such **Apparatus**, and **HV Switching** shall be effected as soon as possible to remove the **Apparatus** concerned from service without it being operated.

7.3 When operating switchgear the operator shall wear the appropriate recommended personal protective equipment (PPE).

8 HIGH VOLTAGE SWITCHING - FAULT CONDITIONS

8.1 When a switch opens under fault conditions, the **Authorised Person** shall cancel any audible alarms and immediately report to the **Control Person** the time of the switch operation and details of annunciations together with relay indications. These details shall be recorded. If any relay indications are not readily available to the **Authorised Person**, he shall report this to the **Control Person** who will decide where these indications are to be obtained. The annunciator display and relay indications shall be recorded before re-setting the relays.

8.2 When the **Control Person** gives instructions to restore a circuit which was opened under fault conditions, the **Authorised Person** receiving the instructions shall ensure that the trip relays requiring manual resetting are reset before attempting to close any circuit breaker.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 2

[Issue 1]

EARTHING HIGH VOLTAGE APPARATUS

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EARTHING HIGH VOLTAGE APPARATUS

FOREWORD

Earthing of high voltage apparatus is carried out as part of the safety precautions to protect persons working on or testing such apparatus against the effects of inadvertent re-energisation, backfeed and induced voltages. The protection afforded by earthing is dependent upon the combination of:

(i) The efficiency of the connection of primary earths and their capability to carry the fault current until the electrical protective devices operate.
(ii) The speed of operation of electrical protective devices in service called upon to operate in such circumstances.
(iii) The system voltage, voltage gradient to the point of earthing and the fault level at the point of work.

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and the Safety Instructions to give guidance on the positioning of **Earthing Devices** to achieve **Safety from the System** for personnel requiring to work on or test **High Voltage (HV) Apparatus**.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 IDENTIFICATION

Apparatus to which an **Earthing Device** is to be applied shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the application and removal of the **Earthing Device**. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel applying earths to **HV Apparatus** are:

– Electric shock

– Burns

– Other bodily injury.

4.2 These **Dangers** arise from:

(i) The application of earths to **Live HV Apparatus**.

(ii) Poorly connected and/or insecure **Earthing Devices**.

(iii) The incorrect sequence or method of application or removal of portable **Earthing Devices**.

(iv) The inadvertent earthing of **Live HV Apparatus** due to the loss of control or difficulty in the handling of portable earthing equipment.

(v) Falling.

5 GENERAL EARTHING REQUIREMENTS

The requirements detailed below shall be met with regard to earthing of **HV Apparatus**:

5.1 **Primary Earths** shall be applied within the **Isolated** zone and, where reasonably practicable, be positioned between the point of work and all point(s) of isolation excluding **Low Voltage (LV)** connections but including, where applicable, the point of isolation from common neutral earthing equipment. **SI 1**

5.2 **Primary Earths** shall be of adequate cross-sectional area and be efficiently connected between earth and the **Isolated HV Apparatus** so as to discharge safely the resultant fault current due to any inadvertent energisation. Portable **Primary Earths** for use on exposed busbars at substations shall have a cross-section of not less than 65 mm^2 (0.1 in^2) copper equivalent. Portable **Primary Earths** for use on overhead lines shall have a cross-section of not less than 32 mm^2 (0.05 in^2) copper equivalent.

5.3 Where a suitable circuit breaker or specially provided earth switch or fixed **Earthing Device** is installed, it shall, where reasonably practicable, be used to make the first earth connection and shall, where reasonably practicable, be the last earth connection removed. **SI 1**

5.4 Where it is not reasonably practicable to apply a **Primary Earth** between the point of work and a point of isolation, it may be placed in an alternative position so as to have a similar electrical effect to that which would occur if it was placed between the point of work and the point of isolation. Such a position could be:

(i) on a permanent connection teed between the point of work and the point of isolation at a distance not exceeding 9m (30 ft) from the tee-point, or

(ii) at a point not more than 9m (30 ft) beyond the point of work from the point of isolation, or

(iii) for work on "High Voltage Metalclad Switchgear with Spouts and Associated Withdrawable Apparatus" as detailed in SRI 3

(iv) as dictated in an alternative **Approved** procedure. **SI 1**

5.5 When compliance with the above requirements does not give adequate protection from induced voltages and inadvertent backfeed at the point of work, **Drains Earths** shall be applied in accordance with an **Approved** procedure which may include the use of an **Earthing Schedule**. **SR A3** **SRI 4**

5.6 It is not necessary to earth every part of the **HV Apparatus** within an **Isolated** zone provided that the requirements of the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and Safety Instructions have been met. **SR A3** **SI 1**

5.7 The application and removal of fixed **Primary Earths**, including the closing and opening of earth switches and fixed **Earthing Devices** when used as **Primary Earths**, shall be carried out by the **Authorised Person** who has received instruction from the **Control Person**, except that a **Person** under training may carry out these functions provided that the requirements of SRI 1 - 'High Voltage Switching' are met. Under the terms of a **Sanction for Test**, however, the recipient of the **Sanction for Test** may, if specified on the **Sanction for Test**, remove, replace, or instruct to be removed or replaced, fixed **Primary Earths**.

5.8 Portable **Earthing Devices** shall be examined immediately before use by the **Person** responsible for the application of such **Earthing Devices**. A defective portable **Earthing Device** shall be withdrawn from service immediately. Portable **Earthing Devices** should also be examined quarterly.

5.9 The **Senior Authorised Person** responsible for the earthing shall take all reasonably practicable steps, including making arrangements with the **Control Person** for switching out additional equipment if necessary, to ensure that earthing by means of a portable **Earthing Device** using an **Approved** pole is carried out in situations where clearances from adjacent **Live HV Apparatus** are adequate to prevent **Danger**, should control of the pole be lost.

5.10 As an additional precaution the **Senior Authorised Person** in charge of applying portable **Primary Earths** shall, before doing so, ensure so far as is reasonably practicable that adequate protective devices are in service on busbars and circuits in the vicinity of the earthing operation, in case of inadvertent earthing of adjacent **HV Apparatus**.

5.11 Where portable **Primary Earths** are to be used, care shall be taken to ensure that the points at which the portable **Primary Earths** are to be applied to the **HV Apparatus** are of adequate capacity, so as to safely discharge the resultant fault current due to any inadvertent energisation after they have been secured in position.

5.12 The points of application of portable **Primary Earths** shall not be such as to inhibit the operation of any protective devices or other ancillary equipment which is in service and which may be required to operate.

5.13 The application and removal of portable **Primary Earths** shall be carried out by the **Senior Authorised Person** who has received instruction from the **Control Person**, or by a **Competent Person** acting under the **Personal Supervision** of that **Senior Authorised Person**, except that a **Person** under training may carry out these functions provided that the requirements of SRI 1 - 'High Voltage Switching' are met. Under the terms of a **Sanction for Test**, however, the recipient of the **Sanction for Test** may, if specified on the **Sanction for Test**, remove, replace, or instruct to be removed or replaced, portable **Primary Earths**.

5.14 During the application and removal of portable **Primary Earths** in substations containing open type **HV Apparatus**, two **Persons** shall be present, one of whom shall be a **Senior Authorised Person** and the other a **Competent Person** acting under the **Personal Supervision** of that **Senior Authorised Person**, except that, for the removal and re-application of portable **Primary Earths** under a **Sanction for Test**, one **Person** may be the recipient of the **Sanction for Test** and the other a **Competent Person** acting under the **Personal Supervision** of the recipient of the **Sanction for Test**.

5.15 If the **Primary Earths** through which the **HV Apparatus** is **Earthed** are not close to and visible from the points of work, the **HV Apparatus** shall be **Earthed** by means of **Drain Earths** at those points of work, unless there can be no reasonable doubt as to the correct **Apparatus** to be worked on and that no **Danger** from inadvertent backfeed or induction can arise at the points of work. However, in the case of metalclad switchgear spouts, SRI 3 - 'High Voltage Metalclad Switchgear with Spouts and Associated Withdrawable Apparatus' shall apply. (The purpose of this clause is to avoid the necessity of requiring that a **Drain Earth** be applied to **Apparatus** on one side of a wall, e.g. when the **Apparatus** has a **Primary Earth** connected to it on the other side of the wall, and there cannot be any possibility of error of identification or of **Danger** from inadvertent backfeed or induction.)

5.16 Portable **Drain Earths** shall have a cross-section of not less than:

16 mm^2 (0.025 in^2) copper equivalent for distribution (up to 33kV) lines;
or
25 mm^2 (0.04 in^2) copper equivalent for transmission (exceeding 33kV) lines.

5.17 **Drain Earths** in connection with a **Permit for Work** shall be applied and removed:

(i) on a distribution voltage wood pole overhead line by an **Authorised Person** in accordance with the requirements of an **Approved** procedure, or

(ii) on all other **HV Plant** and **Apparatus** by a **Competent Person** in accordance with the requirements of an **Approved** procedure which may include the use of an **Earthing Schedule**. **SR A3**

5.18 Before portable **Drain Earths** are fitted to distribution overhead lines, a voltage indicator shall be used to prove that it is safe to do so. The voltage indicator shall be tested immediately before and immediately after use. If from a point of application of portable **Drain Earths** the conductors can be seen to be **Earthed** and visibly traced to an **Earthing Device**, the use of a voltage indicator may be dispensed with.

5.19 During the application and removal of portable **Drain Earths** in connection with a **Permit for Work** in substations containing open type **HV Apparatus**, two **Competent Persons** shall be present, one of whom shall be the recipient of the **Permit for Work**.

5.20 **Drain Earths** in connection with a **Sanction for Test** shall be applied and removed by an **Authorised Person** or by a **Competent Person** acting under the **Personal Supervision** of an **Authorised Person**. The **Drain Earths** shall be applied and removed in accordance with the requirements of an **Approved** procedure which may include the use of an **Earthing Schedule**. **SR A3**

5.21 During the application and removal of portable **Drain Earths** in connection with a **Sanction for Test** in substations containing open type **HV Apparatus**, two **Persons** shall be present, one of whom shall be an **Authorised Person** and the other a **Competent Person**.

5.22 When either the **Primary Earths** or **Drain Earths** would prevent access to the points of work, the **HV Apparatus** on which work is to be done shall be efficiently connected to earth at the nearest points to the points of work where access can be obtained, except as provided for in SRI 3 - 'High Voltage Metalclad Switchgear with Spouts and Associated Withdrawable Apparatus'. **Drain Earths** shall also be applied at the points of work and these **Drain Earths** may be removed in turn when work is to be done, but each earth so removed shall be replaced before another earth is removed.

5.23 When **HV Apparatus** has been disconnected from all supplies and bodily removed from its service position, the use of **Primary Earths** on that **HV Apparatus** is not necessary, provided that the **HV Apparatus** is electrically discharged in accordance with the requirements of SRI 3 – 'HV Metalclad Switchgear with Spouts and Associated Withdrawable Apparatus'.

5.24 When contractors are working in **High Voltage** enclosures where **Drain Earths** are required and which may be applied or moved by the contractors within a defined work area, the **Drain Earths** may be issued to the contractors' nominated **Competent Person** and recorded on his **Permit for Work**. At the discretion of the **Senior Authorised Person** issuing the **Permit for Work**, these **Drain Earths** may be issued to a Northern Ireland Electricity **Competent Person** who may be supervising the work and shall then be recorded on his **Permit for Work**.

5.25 When **Drain Earths** are required for work by contractors on overhead lines, they shall be issued and applied in accordance with SRI 4 - 'High Voltage Overhead Lines'.

6 TYPICAL EXAMPLES OF THE APPLICATION AND POSITIONING OF EARTHING DEVICES

Examples of the application and positioning of **Earthing Devices** on **HV Apparatus** are given below.

6.1 Substations Containing Open Type High Voltage Apparatus

6.1.1 Before commencing work on busbars or their associated isolators, it is generally possible to apply **Primary Earths** between the point of work and point(s) of isolation using two or three earthing positions. In some cases the most convenient point of application may be on a spur to the busbar. This is permissible provided the requirements of Clauses 5.11 and 5.12 are met. **SR A3 SI 1**

6.1.2 In some substations the layout of the busbars makes it dangerous to apply earths between the point of work and point(s) of isolation, because earthing positions are above circuits which may be **Live**. In such situations, the requirements of the Safety Instructions are not reasonably practicable. To meet the requirements of the Safety Rules the busbar shall be earthed at at least one point and, in some cases, the most convenient point of application may be on a spur to the busbar. This is permissible provided the requirements of Clauses 5.11 and 5.12 are met. **SR A3 SI 1**

6.2 Mesh Substations

When working on a mesh corner it is possible that the operation of a switch or disconnector/isolator during maintenance will disconnect the **Primary Earth** from the point of work. This is permissible provided that the basic requirement of a **Primary Earth** being between the point of work and point(s) of isolation is maintained and **Danger** from induced voltages is excluded. In some cases, the most convenient point of permissible application may be on a spur to the busbar. This is permissible provided the requirements of Clauses 5.11 and 5.12 are met. **SR A3 SI 1**

6.3 Transformers and Reactors

Transformers and reactors will require to be **Earthed** between the windings and all **HV** points of isolation, but earthing is not required on the **LV** connections of transformers. Where applicable, transformers shall also be **Earthed** where there is a point of isolation from common neutral earthing equipment. In some cases, the most convenient point of application may be on a spur to the busbar. This is permissible provided the requirements of Clauses 5.11 and 5.12 are met. See also SRI 6 - 'High Voltage Transformers'. **SR A3 SI 1**

6.4 Metalclad Withdrawable Switchgear

For the application of **Earthing Devices** to busbar spouts, voltage transformer spouts and circuit spouts of metalclad switchgear - see SRI 3 - 'High Voltage Metalclad Switchgear with Spouts and Associated Withdrawable Apparatus'.

6.5 Metalclad Non-Withdrawable Switchgear

Before work is commenced on any **HV** part of **Apparatus**, **Primary Earths** shall be applied between the point of work and the point(s) of isolation from the **HV System**. When the work requires access to the switch compartment **Primary Earths** shall be applied to the incoming circuit at a point remote from the switchgear.

6.6 Overhead Lines

For the application of **Earthing Devices** to overhead lines - see SRI 4 - ‘High Voltage Overhead Lines’.

6.7 Cables

For the application of **Earthing Devices** to cables - see SRI 5 - ‘High Voltage Cables’.

6.8 Capacitors

For the application of **Earthing Devices** to AC Filters and Capacitors - see SRI 7 - ‘AC Filters and Capacitor Banks’.

APPENDIX 1

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL & MECHANICAL)

APPROVED PROCEDURE

SRAP 1

[Issue 1]

EARTHING HIGH VOLTAGE APPARATUS - CONTINUOUS SECTION OF BUSBAR

SCOPE This procedure details the application of **Primary Earths** on a continuous section of **High Voltage** busbars, where it is agreed with the appropriate **Control Person** that it is not reasonably practicable to apply **Primary Earths** between the point of work and all points of isolation to the busbar. The procedure meets the requirements of Safety Instruction SI 1 - 'Earthing of High Voltage Apparatus' (Clause SI 1.1(ii)) and Clause 5.4 of Safety Rules Instruction SRI 2 – 'Earthing High Voltage Apparatus'.

DEFINITIONS Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

GENERAL PRINCIPLES The positioning of **Primary Earths** specified in this procedure shall comply with all the General Earthing Requirements contained within Section 5 of Safety Rules Instruction SRI 2 - 'Earthing High Voltage Apparatus'.

APPLICATION When agreed with the appropriate **Control Person,** the application of one **Primary Earth** to a continuous section of busbar should be considered as having a similar electrical effect to that which would occur if **Primary Earths** were placed between the point of work and all points of isolation associated with that busbar.

POSITIONING The positioning of this single **Primary Earth** will be determined by the configuration of the busbar and may be applied using a fixed or portable **Earthing Device** fitted:

(i) directly to the busbar, or

(ii) via a closed isolator to the busbar, or

(iii) on a permanent teed connection to the busbar at a distance not exceeding 9m (30 ft) from the tee-point.

APPENDIX 2

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL & MECHANICAL)

APPROVED PROCEDURE

SRAP 2

[Issue 1]

EARTHING HIGH VOLTAGE APPARATUS - DISTRIBUTION OVERHEAD LINES

SCOPE This procedure applies within an isolated zone where work is at one point only. It details the application of **Primary Earths** on a continuous section of **High Voltage** conductors, where the **Senior Authorised Person** decides that it is not reasonably practicable to apply more than one **Primary Earth** between the point of work and all points of isolation. The procedure meets the requirements of Clause 2(ii) of Safety Rule A3 – 'Safety Precautions for Work on or adjacent to Plant and High Voltage Apparatus' and Clause 5.1 of Safety Rules Instructions SRI 2 -'Earthing High Voltage Apparatus'.

DEFINITIONS Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical & Mechanical).

GENERAL PRINCIPLES The positioning of **Primary Earths** specified in this procedure shall comply with all the General Earthing Requirements contained within Section 5 of Safety Rules Instruction SRI 2 - 'Earthing High Voltage Apparatus'.

APPLICATION When the **Senior Authorised Person** decides that the application of one **Primary Earth** to a continuous section of **High Voltage** conductor can be considered as having a similar electrical effect to that which would occur if **Primary Earths** were fitted between the point of work and all points of isolation associated with that conductor.

POSITIONING At least one **Primary Earth** shall always be fitted at the point of work. The positioning of the **Primary Earths** will be determined by the **Senior Authorised Person** on consideration of the following:

(i) Work at intermediate poles: one **Primary Earth** required.

(ii) Work at section poles:
jumpers not to be broken – one **Primary Earth** required;
jumpers to be broken – **Primary Earths** to be fitted where appropriate.

(ii) During fault repairs the **Senior Authorised Person** shall consider the electrical continuity of the **High Voltage** conductor or device and fit additional **Primary Earths** where appropriate.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 3

[Issue 1]

HIGH VOLTAGE METALCLAD SWITCHGEAR WITH SPOUTS AND ASSOCIATED WITHDRAWABLE APPARATUS

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HIGH VOLTAGE METALCLAD SWITCHGEAR WITH SPOUTS AND ASSOCIATED WITHDRAWABLE APPARATUS

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and Safety Instructions to achieve **Safety from the System** for personnel working on busbar spouts, voltage transformer spouts and circuit spouts of **High Voltage (HV)** metalclad switchgear. It also covers working on withdrawable **Apparatus** when removed from the service position.

This Safety Rules Instruction is not intended for situations where the **Apparatus** to be worked on has been **Isolated** and **Earthed** by **Switching** at remote **Locations** thus rendering the **Apparatus** completely **Isolated** and **Earthed**.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 IDENTIFICATION

Apparatus on which work is to be carried out shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the work. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel working on or applying earths to metalclad switchgear are:

- Electric shock
- Burns
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) The application of **Earthing Devices** to **Live Apparatus**.

(ii) The incorrect sequence and method of application or removal of **Earthing Devices**.

(iii) Gaining access to **Live** conductors.

(iv) The incorrect sequence and method of application of the equipment used to discharge the withdrawable **Apparatus** to earth.

(v) Poorly or incorrectly fitted equipment used to discharge the withdrawn **Apparatus**.

(vi) Failure to adequately contain or dissipate stored energy.

5 BUSBAR SPOUTS OF A MULTI-PANEL SWITCHBOARD

5.1 Work Without Using Metalclad Switchgear Movable Earths

When work is to be carried out on the busbar spouts without using **Metalclad Switchgear Movable Earths** the following operations shall be carried out in strict sequence:

(i) The section of busbars associated with the busbar spouts on which work is to be carried out shall be **Isolated** from all points of supply, including voltage transformers, from which it can be made **Live**, and the isolation arrangements **Locked** with a Safety Lock and **Caution Notices** affixed. **SR A3**

(ii) The shutters of spouts which are, or may become, **Live** shall be **Locked** shut with a Safety Lock. Means of access to all other spouts shall also be **Locked** shut with a Safety Lock, except for the busbar spouts on which work is to be carried out and the busbar spouts of one other panel on the **Isolated** section at which the **Primary Earths** are to be applied.

(iii) The busbar spouts of the panel at which **Primary Earths** are to be applied shall be checked by means of an **Approved** voltage indicator to verify that they are safe to earth. The indicator itself shall be tested immediately before and immediately after the verification. The **Primary Earths** shall then be applied at this panel and, if reasonably practicable, shall be **Locked** with a Safety Lock in the **Earthed** position. The insertion of the hand or any tool into contact spouts for the purpose of applying **Primary Earths** is forbidden. **SR A3** **SI 1**

(iv) **Danger Notices** shall be attached where applicable on, or adjacent to, the **Live Apparatus** at the limits of the work area.

(v) A **Permit for Work** shall be issued.

(vi) Work on the busbar spouts shall then be carried out under the **Personal Supervision** of an **Authorised Person** who shall prove each spout at or near zero potential by means of an **Approved** voltage indicator immediately before the spout is worked on. The voltage indicator itself shall be tested immediately before and immediately after use. **SI 1**

(vii) If it is necessary to carry out work on the spouts of the panel at which the **Primary Earths** have been applied, then after the work on the available busbar spouts has been completed, the **Permit for Work** shall be cleared and cancelled and the **Primary Earths** removed. **Primary Earths** shall be applied on the busbar spouts of another panel on the **Isolated** section of busbar in accordance with (iii) above. The procedure described in (v) and (vi) above shall then be carried out.

5.2 Work Using Metalclad Switchgear Movable Earths

When work is to be carried out on the busbar spouts using **Metalclad Switchgear Movable Earths**, the following operations shall be carried out in strict sequence:

(i) The section of busbars associated with the busbar spouts on which work is to be carried out shall be **Isolated** from all points of supply, including voltage transformers, from which it can be made **Live**, and the isolation arrangements **Locked** with a Safety Lock and **Caution Notices** affixed. **SR A3**

(ii) The shutters of spouts which are, or may become, **Live** shall be **Locked** shut with a Safety Lock. Means of access to all other spouts shall also be **Locked** shut with a Safety Lock, except for the busbar spouts on which work is to be carried out and the busbars spouts of one other panel on the **Isolated** section at which the **Primary Earths** are to be applied.

(iii) The busbar spouts of the panel at which **Primary Earths** are to be applied shall be checked by means of an **Approved** voltage indicator to verify that they are safe to earth. The indicator itself shall be tested immediately before and immediately after the verification. The **Primary Earths** shall then be applied at this panel and, if reasonably practicable, shall be **Locked** with a Safety Lock in the **Earthed** position. The insertion of the hand or any tool into contact spouts for the purpose of applying **Primary Earths** is forbidden. **SR A3 SI 1**

(iv) The busbar spouts on which work is to be carried out shall be checked by means of an **Approved** voltage indicator to verify that they are safe to earth. The indicator itself shall be tested immediately before and immediately after the verification. **Metalclad Switchgear Movable Earths** shall then be applied to all phases at the points of work.

(v) **Danger Notices** shall be attached where applicable on, or adjacent to, the **Live Apparatus** at the limits of the work area.

(vi) A **Permit for Work** shall be issued. **SR A3**

(vii) To enable the work to be carried out, the **Competent Person** who is to carry out the work may remove the **Metalclad Switchgear Movable Earths** one phase at a time. Each phase earth so removed shall be replaced by the **Competent Person** before another phase earth is removed.

(viii) If it is necessary to carry out work on the spouts of the panel on which the **Primary Earths** have been applied, then after the work on the available busbar spouts has been completed, the **Permit for Work** shall be cleared and cancelled and the **Primary Earths** removed. **Primary Earths** shall be applied on the busbar spouts of another panel on the **Isolated** section of busbar in accordance with (iii) above. The procedure described in (iv), (v), (vi) and (vii) above shall then be carried out.

6 BUSBAR SPOUTS OF SINGLE PANEL SWITCHBOARD, CIRCUIT AND VOLTAGE TRANSFORMER SPOUTS OF MULTI-PANEL OR SINGLE PANEL SWITCHBOARDS

6.1 Work Without Using Metalclad Switchgear Movable Earths

When work is to be carried out on circuit spouts, voltage transformer spouts and single panel busbar spouts without using **Metalclad Switchgear Movable Earths**, the following operations shall be carried out in strict sequence:

(i) The spouts on which work is to be carried out shall be **Isolated** from all points of supply from which the spouts can be made **Live** and, where practicable, the isolation arrangements **Locked** with a Safety Lock and **Caution Notices** affixed. **SR A3**

(ii) The shutters of spouts which are, or may become, **Live** shall be **Locked** shut with a Safety Lock. Shutters of spouts on which work is not to be done shall also be **Locked** shut with a Safety Lock.

(iii) The spouts on which **Primary Earths** are to be applied shall be checked by means of an **Approved** voltage indicator to verify that they are safe to earth. The voltage indicator itself shall be tested immediately before and immediately after the verification. **Primary Earths** shall be applied at each point of work and, where practicable, at all points of isolation except where such a point of isolation is on the **Low Voltage** side of a transformer. Insertion of the hand or any tool into contact spouts for this purpose is forbidden. If reasonably practicable, all **Primary Earths** shall be **Locked** with a Safety Lock in the **Earthed** position. **SR A3 SI 1**

(iv) Where the work to be carried out will involve the removal of the **Primary Earths** at the point of work, then before a **Permit for Work** is issued alternative **Primary Earths** shall be applied as close as is reasonably practicable to the point of work. However, if alternative **Primary Earths** cannot be applied, then whilst this work is in progress no other work shall be carried out on the circuit connected to the spouts being worked on. When **Danger** from induced voltages or inadvertent backfeed could arise during the course of the work, **Drain Earths** shall be applied as near as practicable to the point of work where access to the conductors can safely be obtained. **SR A3 SI 1**

(v) **Danger Notices** shall be attached where applicable on, or adjacent to, the **Live Apparatus** at the limits of the work area. **SR A3**

(vi) A **Permit for Work** shall be issued.

(vii) Work on the spouts shall then be carried out under the **Personal Supervision** of an **Authorised Person** who shall prove each spout contact at or near zero potential by means of an **Approved** voltage indicator immediately before the spout is worked on. The voltage indicator itself shall be tested immediately before and immediately after the verification. **SI 1**

6.2 Work Using Metalclad Switchgear Movable Earths

When work is to be carried out on the circuit spouts, voltage transformer spouts and single panel busbar spouts using **Metalclad Switchgear Movable Earths**, the following operations shall be carried out in strict sequence:

(i) The spouts on which work is to be carried out shall be **Isolated** from all points of supply, including voltage transformers, from which the spouts can be made **Live** and, where practicable, the isolation arrangements **Locked** with a Safety Lock and **Caution Notices** affixed. **SR A3**

(ii) The shutters of spouts which are, or may become, **Live** shall be **Locked** shut with a Safety Lock. Shutters of spouts on which work is not to be done shall also be **Locked** shut with a Safety Lock.

(iii) The spouts on which **Primary Earths** are to be applied shall be checked by means of an **Approved** voltage indicator to verify that they are safe to earth. The indicator itself shall be tested immediately before and immediately after the verification. **Primary Earths** shall be applied to the circuit at each point of work and, where practicable, at all points of isolation except where such a point of isolation is on the **Low Voltage** side of a transformer. Insertion of the hand or any tool into contact spouts for this purpose is forbidden. **SR A3**
SI 1

(iv) On the spouts on which work is to be carried out, the **Primary Earths** shall be replaced by **Metalclad Switchgear Movable Earths**.

(v) If there are no other **Primary Earths** left on the circuit connected to the spouts being worked on, then while this work is in progress no other work shall be carried out on that circuit. Where **Danger** from induced voltages or inadvertent backfeed could arise during the course of the work, **Drain Earths** shall be applied as near as practicable to the point of work where access to the conductors can safely be obtained.

(vi) **Danger Notices** shall be attached where applicable on, or adjacent to, the **Live Apparatus** at the limits of the work area. **SR A3**

(vii) A **Permit for Work** shall be issued.

(viii) To enable the work to be carried out, a **Competent Person** may remove the **Metalclad Switchgear Movable Earths** one phase at a time. Each phase earth so removed shall be replaced by the **Competent Person** before another phase earth is removed.

7 WORK ON WITHDRAWABLE APPARATUS

Where it is necessary to electrically discharge withdrawn **HV Apparatus** to earth the following requirements shall be met:

(i) Immediately after the withdrawal of the **Apparatus** from the service position, and before any locks and **Caution Notices** are affixed, the **Authorised Person** shall discharge to earth the withdrawn **Apparatus**.

(ii) The equipment used for discharging the withdrawn **Apparatus** to earth shall have an insulated flexible conductor with a cross-section of not less than 2.5 mm^2 copper equivalent with a clamp at the earth-end and an insulated probe at the other.

(iii) The earth-end of the equipment shall be attached to metal which is electrically bonded to earth before the insulated probe is applied to each of the electrically conducting parts.

After withdrawable **Apparatus** has been removed from its service position and where appropriate electrically discharged to earth, a **Safety Document** is unnecessary for the purpose of working on the **Apparatus**. If required, a **Limited Work Certificate** may be issued to confirm oral instructions. The **Senior Authorised Person** shall ensure that the means of access to any available spout in the switchroom which is, or shall be considered to be, **Live** has been **Locked** shut with an operational lock. Where applicable, action shall to taken to contain or dissipate any stored energy, the release of which could give rise to **Danger**.

8 WORK ON AUXILIARY EQUIPMENT

When work is to be carried out on auxiliary equipment, such as a circuit breaker truck, voltage transformer truck, relay, control or other equipment associated with **Live High Voltage** metalclad switchgear and there is a need to specify restriction on the access to be granted, a **Limited Work Certificate** shall be issued.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 4

[Issue 2]

HIGH VOLTAGE OVERHEAD LINES

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Attachments

No. 1 - Fitting and Removal of Portable Drain Earths on Wood Pole Type Overhead Lines

No. 2 - Fitting and Removal of Portable Drain Earths on Steel Tower Type Overhead Lines

HIGH VOLTAGE OVERHEAD LINES

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and the Safety Instructions to achieve **Safety from the System** for personnel requiring to carry out *work* on **High Voltage (HV)** overhead line **Apparatus**. Reference is also made to line patrols.

To prevent **Danger** from leakage currents on unearthed poles or structures supporting **Live HV Apparatus** it is deemed adequate, that precautions are taken before touching unearthed poles or structures above 3.7m (12 ft) from ground level along with precautions taken to reduce the possibility of **Danger** from leakage currents caused by any *work* being carried out.

The likelihood of insulators and/or associated equipment failing of their own accord during *work* above 3.7m (12 ft) is considered to be outside the area of probability indicated by the word “adequate” above. *Work*-related precautions therefore will be adequately covered by the application of the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), related Safety Rules Instructions and **Approved** procedures.

Work on **Apparatus** (conductors, insulators and fittings) of **Live** circuits is outside the scope of this document and is covered by Specialised Procedures SP 3, SP 4 & SP 5 in the Safety Rules Handbook.

Attachments 1 and 2 to this Safety Rules Instruction give in detail the requirements for applying and removing portable **Drain Earths** to meet certain *work* situations. The requirements of the Attachments apply equally to multi-circuit *working* and to single circuit *working*.

When *work* is adjacent to **Live** overhead lines then consideration should also be given to Section 11 of the Overhead Line Manual.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purpose of this Safety Rules Instruction the following additional definition applies:

Work – Any activity that involves **Persons** changing, moving or making adjustments to (erection or lowering) **Plant** or **Apparatus.**

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Working Party - The **Persons** under the **Supervision** of a **Competent Person** or an **Authorised Person** and includes a **Competent Person** or **Authorised Person** when *working* by himself. A *Working Party* may also include a person *working* under the **Personal Supervision** of a **Competent Person**.

3 IDENTIFICATION

Apparatus on which *work* is to be carried out shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the *work*. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel *working* on overhead lines are:

- Electric shock
- Burns
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) Personnel mistaking that part of **High Voltage Apparatus** on which it is not safe to apply an **Earthing Device** or *work*, for that on which it is safe to do so, thus inadvertently infringing **Safety Distance**.

(ii) Inadequate precautions to suppress or safely discharge any induced or other impressed voltages in the conductors and associated fittings.

(iii) Falling.

(iv) Breakdown of the insulation on **Live Apparatus** which is supported on an unearthed pole or structure.

5 GENERAL REQUIREMENTS FOR WORK ON TOWERS, POLES AND HIGH STRUCTURES

5.1 All **Persons** *working* on towers, poles and high structures shall wear and make proper use of **Approved** safety harnesses, fall arrest systems and other safety equipment and clothing which is provided for their safety and protection. This equipment shall be examined by the user on each occasion before use. **SR C2 (C2.1.2)**

5.2 Any **Person** *working* on a tower, pole or high structure shall be in visual range of at least one other **Person**. All **Persons** concerned shall be conversant with rescue procedures.

5.3 Before any wood pole is climbed, it shall be inspected and sounded. Any pole or structure, the stability of which is in doubt due to decay, damage, defective foundation or other causes, shall not be climbed without the permission of the **Competent Person** in charge. He shall decide whether the pole or structure requires to be supported by **Approved** means and restrict as necessary the number of **Persons** climbing the pole or structure. Alternatively, access to the top of the pole or structure shall be provided by **Approved** means independent of the pole or structure. SRI 21

5.4 Where a **Person** is *working* on a tower, pole or high structure, no *work* shall be carried out which may affect the stability of the tower, pole or high structure.

5.5 The release of tension in, and the lowering of, conductors and stays will be carried out in a controlled manner

6 WORK ON OVERHEAD LINE CONDUCTORS, INSULATORS AND FITTINGS

6.1 Single or Multiple Circuit HV Overhead Lines Where All Circuits are to be Isolated and Earthed

6.1.1 Where *work* on overhead conductors, insulators or associated fittings is to be carried out, all circuit(s) shall be **Isolated**, including all possible backfeeds from transformers of an interconnected **System**, and all voltage and auxiliary transformers and common neutral earthing equipment from which the overhead conductors or associated fittings on which *work* is to be done may become **Live**. **Primary Earths** shall be applied where reasonably practicable between the point of *work* and all points of **HV Isolation** including where applicable the point of **Isolation** from common neutral earthing equipment. Where it is not reasonably practicable to apply **Primary Earths** between the point of *work* and all points of **HV Isolation**, the requirements of SRI 2 - 'Earthing High Voltage Apparatus' (Clause 5.4) shall be met. **SR A3 SI 1**

6.1.2 Before issuing a **Permit for Work**, the **Senior Authorised Person** shall identify the circuit(s) to be *worked* on and, where fitted, check the **Circuit Identification** colours/symbols. When informing the **Control Person** of the details of the **Permit for Work** he shall confirm the **Circuit Identification**, if applicable. Where **Circuit Identification** colours/symbols are not fitted, the circuits(s) shall be identified at the point of *work*. **SR B2 (B2.1.6)**

6.1.3 The **Senior Authorised Person** shall determine whether portable **Drain Earths** are required and, if so, specify the requirements for their application on the **Permit for Work** or **Earthing Schedule**. **SR C4 (C4.1.2)**

6.1.4 The **Senior Authorised Person** shall issue a **Permit for Work** to the **Competent Person** in charge of each *Working Party* and shall ensure that the recipient knows the exact location of the places where the *Working Party* is or may be required to carry out *work* under the **Permit for Work**. Refer also to Safety Rules Guidance SRG 2 – 'Complex Planned Work - Setting **Persons** to Work'.

6.1.5 The **Senior Authorised Person** issuing the **Permit for Work** shall also issue to the recipient the following items:

(i) Where **Circuit Identification** plates are fitted, sufficient **Circuit Identification** wristlets for each member of the *Working Party*.

(ii) Sufficient green flags and **Circuit Identification** staffs which fit the sockets or brackets on the towers, poles or structures to be climbed, where appropriate.

(iii) Subject to Clause 6.1.3, sufficient portable **Drain Earths** and, where provided, an associated **Earthing Schedule** to meet the requirements of the appropriate earthing Scheme detailed in Attachment 2.

(iv) The keys to any locks on the gates of the anti-climbing guards of the towers to be climbed.

6.1.6 The recipient of the **Permit for Work** shall ensure that for each circuit to be *worked* on, where applicable, a **Circuit Identification** staff and flag is fitted to the appropriate socket or bracket on each tower, pole or structure to be climbed, and that each **Person** is in possession of a **Circuit Identification** wristlet before allowing that **Person** to climb the tower, pole or structure.

6.1.7 Each **Person** climbing the tower, pole or structure shall, where applicable:

(i) check that the green flag and **Circuit Identification** staff are fitted correctly;

(ii) wear the **Circuit Identification** wristlet in such a manner that it will at all times be readily visible to him whilst climbing;

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(iii) ensure that the wristlet matches the **Circuit Identification** on the circuit on which he is to *work*.

6.1.8 When portable **Drain Earths** are specified on the **Permit for Work** then, before *work* commences on the circuit(s), an **Authorised Person** or a **Competent Person** under the **Personal Supervision** of an **Authorised Person** shall, where reasonably practicable, prove by means of an **Approved** voltage indicator that it is safe to apply the **Drain Earths**. The voltage indicator shall be tested immediately before and immediately after use. If, from the point of application of portable **Drain Earths**, the conductors can be seen to be **Earthed** and visibly traced to an **Earthing Device**, use of a voltage indicator may be dispensed with.

6.1.9 When **Drain Earths** are being fitted on a distribution overhead line the **Authorised Person** shall ensure that the **Drain Earths** are fitted to all conductors in accordance with SRI 4 Att.1. When **Drain Earths** are being fitted to any other overhead line construction type a **Competent Person** shall ensure that the **Drain Earths** are fitted to all conductors (which includes the sub-conductors of all phases, if appropriate) at the points specified on the **Permit for Work** and any **Earthing Schedule**.

6.1.10 The **Authorised Person(s)** or **Competent Person(s)** fitting and removing the **Drain Earths** shall do so in the manner instructed by Safety Instruction SI 1 in order to avoid **Danger**. **SI 1**

6.1.11 The **Authorised Person(s)** or **Competent Person(s)** fitting and removing the **Drain Earths** shall be under the observation of another **Competent Person** who shall be able to warn that **Person(s)** of any possible infringement of **Safety Distance**.

6.1.12 **Drain Earths** and, where fitted, **Circuit Identification** staffs and flags shall remain in position throughout the progress of the *work* on the tower, pole or structure. **Drain Earths** shall be removed on completion of the *work* only after all other members of the *Working Party* have descended the tower, pole or structure.

6.1.13 On completion of the *work* the recipient of the **Permit for Work** shall ensure that all **Drains Earths** have been removed before he clears the **Permit for Work**.

6.2 Double Circuit HV Overhead Lines With One Circuit Live

6.2.1 *Work* on a double circuit line with one circuit **Live** may be carried out only on those towers, poles or structures with **Circuit Identification** plates and sockets or brackets.

6.2.2. The *work* may be carried out by a **Competent Person** provided that the following precautions are taken in addition to those of Section 6.1, except that the requirements of Clauses 6.1.1, 6.1.8 and 6.1.9 only apply to the circuit to be *worked* on:

(i) The *work* carried out on the **Isolated** circuit shall be such that there is no possibility of infringement of **Safety Distance**. **SR A2**

(ii) At tee-off, terminal and large angle towers, poles and structures, reduced clearance to **Live** conductors can occur. When *work* is being carried out on such supports the **Senior Authorised Person** preparing the **Permit for Work** shall decide what special arrangements are to be undertaken and whether the *work* shall be carried out under the **Personal Supervision** of an **Authorised Person**. **SR A2**

(iii) The recipient of the **Permit for Work** shall at the point of *work* personally identify the circuit to be *worked* upon. He shall ensure that **Circuit Identification** staffs and flags are placed in the sockets on the **Isolated** circuit side of the towers, poles or structures.

(iv) No **Person** shall, at a point more than 3.7m (12 ft) from ground level, touch any unearthed pole or structure supporting **Live High Voltage Apparatus** unless the unearthed metalwork has been tested by means of an **Approved** instrument or the requirements of Section 10 of this SRI are met. The testing shall be carried out by the recipient of the **Permit for Work** or a **Competent Person** under his **Personal Supervision**.

(v) The recipient of the **Permit for Work** shall ensure that red pennants are fixed to draw attention to the **Danger** from the **Live** circuit. In the case of steel towers the pennants shall be fixed to the crossarms supporting the conductors not to be *worked* on, at the junction of these crossarms with the tower body. In the case of wood poles the pennants shall be fixed at the centre of the horizontal members of the bracing panel(s) and crossarms. The pennants shall remain in position until all *work* on the tower or pole has been completed and be removed after removal of the **Drain Earths**. **SI 1**

(vi) The **Competent Person(s)** fixing and removing red pennants shall be under the observation of another **Competent Person** who shall be able to warn that **Person(s)** of any possible infringement of **Safety Distance**.

(vii) The recipient of the **Permit for Work** shall ensure that **Drains Earths** are fitted to any unearthed metalwork on the tower, pole or structure in accordance with the appropriate Attachment.

6.3 Quadruple Circuit HV Overhead Lines With One or More Circuits Live

Work may be carried out by a **Competent Person** on either circuit on one side of the tower, provided the requirements of Section 6.2 are applied to both those circuits.

7 WORK ON TOWERS, POLES AND STRUCTURES SUPPORTING LIVE HV CONDUCTORS WHERE THE WORK DOES NOT REQUIRE CONTACT WITH ANY CONDUCTORS, INSULATORS OR ASSOCIATED FITTINGS (EXCLUDING WORK ON EARTH WIRES)

Painting, inspection and other *work* on towers, poles or structures not involving contact with conductors, insulators or associated fittings shall only be carried out under the conditions given below.

Ref

7.1 A **Competent Person** may have access, without a **Safety Document**, below any conductor on any tower, pole or structure carrying **Live HV** conductors provided no part of the body, conducting equipment or tool extends beyond:

(i) 4.6m (15ft) above ground level, in the case of a tower; or

(ii) 3.7m (12 ft) above ground level, in the case of a pole; and

provided that **Safety Distance** is not infringed. In assessing **Safety Distance** consideration shall be given to insulator and conductor movement due to wind conditions. **SR A2**

7.2 *Work* may be carried out above the positions specified in Clause 7.1 or where there may be a risk of infringing **Safety Distance**, provided the following precautions are taken:

(i) A **Limited Work Certificate** shall be issued. **SR A3**

(ii) The **Safety Distance** shall not be infringed. **SR A2**

(iii) At tee-off, terminal and large angle towers, poles and structures, reduced clearance to **Live** conductors can occur. When *work* is being carried out on such supports, the **Senior Authorised Person** preparing the **Limited Work Certificate** shall decide what special arrangements are to be undertaken and whether the *work* shall be carried out under the **Personal Supervision** of an **Authorised Person**. **SR A2**

(iv) No **Person** shall, at a point more than 3.7m (12 ft) from ground level, touch any unearthed pole or structure supporting **Live High Voltage Apparatus** unless the unearthed metalwork has been tested by means of an **Approved** instrument or the requirements of Section 10 of this SRI are met. The testing shall be carried out by the recipient of the **Limited Work Certificate** or a **Competent Person** under his **Personal Supervision**. **SR A2**

(v) Where there is a risk of infringing **Safety Distance** the **Senior Authorised Person** preparing the **Limited Work Certificate** shall specify the position at which red pennants or limit markers shall be fixed to define the limits of access. The recipient of the **Limited Work Certificate** shall ensure that before any **Person** is allowed to start *work* the red pennants or limit markers have been so fixed. **SR A2**

(vi) The **Competent Person(s)** fixing and removing the pennants or limit markers and carrying out the *work* shall be under the observation of another **Competent Person** who shall be able to warn that **Person(s)** of any possible infringement of **Safety Distance**. **SR A2**

(vii) The step bolts of steel towers may be used, provided that **Safety Distance** to any part of the climber's body, or anything being carried, is not infringed. Where the appropriate **Safety Distance** cannot be maintained whilst using step bolts, climbing shall be within the body of the tower or on the face of the tower at right angles to the conductors.

(viii) In assessing **Safety Distance**, consideration shall be given to insulator and conductor movement due to wind conditions.

8 WORK ON EARTH WIRES

8.1 *Work* on earth wires involving the erection or lowering of the wires, or any other *work* likely to cause a significant increase in the normal sag of the earth wire in any span, should only be carried out with all associated circuits **Isolated** and **Earthed**. Where, due to special circumstances, it is not possible to isolate and earth all associated circuits, the *work* shall be carried out in accordance with the appropriate Method Statement.

8.2 For any *work* other than that referred to in Clause 8.1 and where **Safety Distance** can be maintained, the *work* shall be carried out under a **Limited Work Certificate**. Any restrictions shall be stated on the **Limited Work Certificate** and include the requirement that, during the course of such *work*, the connection to earth and the electrical continuity of the earth wire at the point of *work* are maintained. **SR A3**

8.3 In assessing **Safety Distance**, consideration shall be given to insulator and conductor movement due to wind conditions.

8.4 Step bolts may be used provided that **Safety Distance** to any part of the climber's body, or anything being carried, is not infringed. Where the appropriate **Safety Distance** cannot be maintained whilst using step bolts, climbing shall be within the body of the tower or on the face of the tower at right angles to the conductors.

8.5 At tee-off, terminal and large angle towers, poles and structures, reduced clearances to **Live** conductors can occur. When *work* is being carried out on such supports, the **Senior Authorised Person** preparing the **Limited Work Certificate** shall decide what special arrangements are to be undertaken and whether the *work* shall be carried out under the **Personal Supervision** of an **Authorised Person**. **SR A2**

9 LINE CROSSINGS

9.1 Where new conductors are to be run over or under an existing overhead line, the line shall either be **Isolated** and **Earthed** or other adequate precautions as detailed in the appropriate Method Statement shall be taken to prevent **Danger** during the running out and permanent securing of the new conductors. When an **HV** overhead line has been **Isolated** and **Earthed**, a **Permit for Work** shall be issued.

9.2 Where existing conductors cross over or under a **Live HV** overhead line, and are to be unbound from the insulator or released from the terminations for lowering or other purposes, the overhead line shall be **Isolated** and **Earthed**, or other adequate precautions as detailed in the appropriate Method Statement shall be taken to prevent **Danger**, during the period the conductors are not permanently secured. When an **HV** line has been **Isolated** and **Earthed**, a **Permit for Work** shall be issued.

9.3 When disconnecting conductors or fittings on transmission voltage lines, which cross over or under a **Live** overhead line, the precautions detailed in the appropriate Method Statement shall be taken.

9.4 Method Statements in 9.1 and 9.2 shall be in accordance with Section 11 of the Overhead Line Manual.

10 PROCEDURE FOR PREVENTION OF DANGER FROM LEAKAGE CURRENTS ON UNEARTHED POLES OR STRUCTURES SUPPORTING LIVE HV APPARATUS

Before touching an unearthed pole or structure above 3.7m (12 ft) from ground level, all insulators, fittings and steelwork supporting **Live HV Apparatus** shall be visually inspected for signs of damage or distress which may give rise to **Danger** from leakage currents.

If such signs are found, or suspected, climbing shall be suspended and the signs of damage or distress reported immediately to a **Senior Authorised Person**. The **Senior Authorised Person** shall assess the degree of suspected damage or distress and decide if climbing above 3.7m (12 ft) on that pole or structure can be allowed with the **HV Apparatus Live**.

If such climbing is not allowed, then climbing above 3.7m (12 ft) shall only be allowed on that pole or structure when the **HV Apparatus** has been proved to be not **Live**. Where practicable, in order to prove that the **HV Apparatus** is not **Live** at the point of climbing, it shall be checked by means of an **Approved** voltage indicator. If this entails climbing above 3.7m (12 ft) then the checking shall be carried out at the nearest pole or structure on the same line, where visual inspection indicates that the pole or structure is safe to climb.

When *work* is carried out above 3.7m (12 ft) on an unearthed pole or structure it shall be carried out in accordance with the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and related Safety Rule Instructions and **Approved** procedures.

11 CESSATION OF WORK

If a *Working Party* leaves a line at any time then, before *work* is re-started, the recipient of the **Safety Document** shall identify the line, shall verify that the **Drain Earths** are in position and shall re-instruct the *Working Party* on the *work* covered by the **Safety Document**.

12 COMPLETION OF WORK

Anti-climbing devices shall be secured when *work* is completed or when **Persons** have descended from the tower, pole or structure and the site is left unattended.

13 ADVERSE WEATHER CONDITIONS

In the event of, or the near approach of, a lightning storm, all *work* on overhead lines shall cease immediately the *Working Party* shall sign off the sign on sheet. The **Control Person** shall be informed and, as appropriate, he shall inform other **Persons** who could be exposed to **Danger** from the lightning.

When putting Persons back to *work* agreement shall be reached with the **Control Person** and precautions should be checked. The *Working Party* shall sign back onto the sign on sheet.

14 PATROLS

14.1 A **Person** shall not patrol an overhead line alone when visibility is dangerously impaired by fog or snow or when snowdrifts or similar hazards exist.

14.2 If overhead lines are to be patrolled during the hours of darkness, use shall be made of suitable lighting equipment.

15 WORK ON CONDUCTORS OF AN OVERHEAD LINE WHICH IS NOT PART OF THE SYSTEM

15.1 Where *work* is to be carried out on the conductors of an overhead line which has never been connected to the **System**, or where an overhead line can be seen to be permanently disconnected from the **System** and there is no hazard from any adjacent part of the **System**, precautions shall be taken to suppress and safely discharge any atmospherically induced or other impressed voltages in the conductors and associated fittings.

15.2 The **Competent Person** in charge of the *Working Party* shall ensure that Earthing Devices similar to **Drain Earths** are applied to the conductors before *work* commences, or as soon as practicable after new conductors have been run out, and that these Earthing Devices remain in position for the duration of the *work*.

15.3 On completion of *work* the **Competent Person** in charge of the *Working Party* shall ensure that the Earthing Devices are removed.

ATTACHMENT 1

[Issue 2]

TO

SAFETY RULES INSTRUCTION SRI 4

FITTING AND REMOVAL OF PORTABLE DRAIN EARTHS ON WOOD POLE TYPE OVERHEAD LINES

1 SCOPE

1.1 This Attachment details the requirements for the placing of portable **Drain Earths** in preparation for work on wood pole type distribution and transmission lines. These requirements may be supplemented if considered necessary in particular job circumstances. In complying with these requirements, the relevant Clauses of SRI 4 - 'High Voltage Overhead Lines' and SRI 22 – 'Backfeeds from Other Sources' shall be met.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 GENERAL REQUIREMENTS FOR DRAIN EARTHS

3.1 Portable **Drain Earths** shall have a cross-section of not less than:

16 mm^2 (0.025 in^2) copper equivalent for distribution (up to 33kV) lines;

or

25 mm^2 (0.04 in^2) copper equivalent for transmission (exceeding 33kV) lines.

3.2 Before portable **Drain Earths** are fitted to distribution overhead lines, an **Approved** voltage indicator shall be used to prove that it is safe to do so. The voltage indicator shall be tested immediately before and immediately after use. If, from a point of application of portable **Drain Earths**, the conductors can be seen to be **Earthed** and visibly traced to an **Earthing Device**, the use of a voltage indicator can be dispensed with.

3.3 Where practical a **Drain Earth** shall be fitted at the point of work unless a **Primary Earth** is fitted at that point, or the conductors can be seen to be continuous from the point of work to a previously applied **Earthing Device**. Where this is not practical a **Drain Earth** shall be fitted at the nearest practical point within the **Isolated** and **Earthed** zone defined on the **Permit For Work**. Where a customer's installation remains connected to the conductors, a **Drain Earth** shall be fitted and maintained between that customer's installation and the point of work unless a **Primary Earth** is fitted at that position.

3.4 If the **Authorised Person** decides that:

(i) it is not reasonably practicable to apply more than one **Drain Earth** between the point of work and connected customer installations,

and

(ii) where the application of one **Drain Earth** to a continuous section of **High Voltage** conductor can be considered as having a similar electrical effect to that which would occur if **Drain Earths** were fitted between the point of work and customer's installations connected to that conductor,

then **Drain Earths** shall be positioned as determined by the **Authorised Person** on consideration of the following:

(a) Work at intermediate poles; one **Drain Earth** required

(b) Work at poles carrying jumpers:
jumpers not to be broken – one Drain Earth required;
jumpers to be broken – Drain Earths to be fitted as required in Clause 3.5 below.

3.5 Where conductors are to be disconnected, portable **Drain Earths** shall be fitted on each side of the intended break before the conductors are disconnected. Where conductors are to be reconnected across an existing break, portable **Drain Earths** shall be fitted on each side of the break before the conductors are reconnected.

3.6 Where line conductors are to be let down, portable **Drain Earths** shall be fitted to the conductors at the nearest support where the conductors are still secured to the insulators.

3.7 On poles with insulated conductors, portable **Drain Earths** shall be fitted at the nearest practicable point under the **Personal Supervision** of an **Authorised Person**.

4 EXAMINATION OF PORTABLE DRAIN EARTHS PRIOR TO FITTING

4.1 The **Person** responsible for fitting the portable **Drain Earth** shall examine the equipment for defects immediately before use. Particular attention should be given to the integrity of the flexible conductors at the compression terminals. Equipment found to be defective shall not be used.

4.2 All bolted connections shall be checked and tightened if necessary.

5 FITTING AND REMOVAL OF PORTABLE DRAIN EARTHS ON DISTRIBUTION LINES

5.1 The **Person** should attach a 12mm (½ in) diameter rope to his safety harness and climb the pole to a position such that the portable **Drain Earth** can be fitted without encroaching on the **Safety Distance**. The rope should be controlled by a **Person** at ground level to ensure that it does not encroach on **Safety Distance**.

5.2 The **Person** should ensure that his fall arrest system and/or pole strap are secured on the pole before raising the portable **Drain Earth** by means of the rope. The rope should be controlled by a **Person** at ground level to ensure that neither it nor the equipment encroaches on **Safety Distance** during the raising.

5.3 For poles with unearthed steelwork, a connection to earth shall first be made. This shall be achieved by inserting a minimum of one earth spike of the portable **Drain Earth** into the ground to a minimum depth of 300mm at a minimum distance of 3m (10 ft) from the base of the pole.

5.4 For poles with **Earthed** steelwork, the permanent earth lead on the pole may be used as an alternative to the arrangement in Clause 5.3, provided the integrity of the fixed earthing is checked and complies with Policy Documents 2/011 B – Earthing of 11kV and 6.6kV Ground Mounted Distribution Substations and 2/011 C – Earthing of 11kV and 6.6kV Pole Mounted Substations and Pole Mounted Equipment.

5.5 The conductor clamps of the portable **Drain Earth** are then attached and tightened onto each phase conductor in turn. On single phase lines, the third conductor clamp shall also be fitted to one of the phase conductors.

5.6 The portable **Drain Earths** shall not be removed until after the work on the pole is completed.

5.7 The removal of portable **Drain Earths** shall be carried out in the reverse order to fitting.

6 FITTING AND REMOVAL OF PORTABLE DRAIN EARTHS ON TRANSMISSION LINES (PORTAL)

6.1 The procedures in Clauses 5.1, 5.2, 5.6 and 5.7 shall be followed.

6.2 The Fitting and removal of portable **Drain Earths** on transmission lines (Portal) shall be in accordance with RAMS **NIE-TOHL-RAMS-043 Fitting & Removal of Drain Earths on Portal Construction.**

ATTACHMENT 2

[Issue 1]

TO

SAFETY RULES INSTRUCTION SRI 4

FITTING AND REMOVAL OF PORTABLE DRAIN EARTHS ON STEEL TOWER TYPE OVERHEAD LINES

1 SCOPE

1.1 The Schemes detailed in this Attachment indicate the requirements for the placing of portable **Drain Earths** and *Field Equipment Earths* in preparation for various work procedures. The Schemes shown relate to the conventional steel tower type of overhead line construction, however the earthing principles depicted apply equally to other types of construction. The methods detailed are normal requirements and may be supplemented if considered necessary in particular job circumstances. In applying the Schemes, the requirements of the relevant clauses in SRI 4 - 'High Voltage Overhead Lines' and Clause 3 below shall be met.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purpose of this Attachment the following additional definitions apply:

(i) *Earthing Party* - A party consisting of a **Competent Person** in charge accompanied by one or more **Competent Persons** whose duty it is to apply and remove portable **Drain Earths** on overhead line conductors and red pennants on towers.

(ii) *Bridging Earth*)
Running Earth) - All being forms of portable
Trailing Earth) **Drain Earth**
Earthing Bridle)

(iii) *Field Equipment Earth* - **Approved** connection for bonding items of field equipment to earth. The Earth is distinctively marked to identify it from a **Drain Earth** and is not included on an **Earthing Schedule**.

3 GENERAL REQUIREMENTS FOR EARTHING OVERHEAD LINE CONDUCTORS

3.1 Portable **Drain Earths** shall have a cross-section of not less than 25mm^2 (0.04 in^2) copper equivalent and shall be effectively applied to the sub-conductors of all phases of the circuits concerned.

3.2 For circuits having a nominal voltage up to and including 33kV, the *Earthing Party* shall prove by means of an **Approved** voltage indicator that it is safe to apply **Drain Earths** to the conductors. The voltage indicator itself shall be tested immediately before and immediately after the verification. If, from the point of application of portable **Drain Earths**, the conductors can be seen to be **Earthed** and visibly traced to an **Earthing Device**, use of a voltage indicator may be dispensed with.

3.3 The *Earthing Party* shall secure safety harnesses and fall arrest systems to a suitable anchorage before applying or removing portable **Drain Earths**.

3.4 When raising earthing equipment to crossarm level, particular care shall be taken at tee-off, terminal and large angle towers to avoid encroaching on **Safety Distances**.

3.5 The *Earthing Party* should preferably carry all earthing equipment up the towers. Ropes or other equipment should not be placed on towers until portable **Drain Earths** have been fixed by the *Earthing Party*.

3.6 As an alternative to Clause 3.5, and for ease of working on 275kV towers where greater clearances exist, the earthing equipment may be raised to crossarm level using the following procedures:

(i) The *Earthing Party* shall climb the tower on the 'dead side' or safe route, taking a snatch block and a 12mm (½ in) diameter nylon/polypropylene rope. The block should be attached to the safety harness of a member of the *Earthing Party*, the rope being passed through the block and suspended to ground. Whilst this member of the *Earthing Party* is climbing to crossarm level, the rope shall be controlled by personnel at ground level and kept as near to the tower climbing leg as possible.

(ii) The snatch block shall then be fitted to the top crossarm not more than 0.6m (2 ft) from the body of the tower on the 'dead side'.

(iii) The rope shall be made 'endless' (at ground level) and then used to hoist the earthing equipment to the tower crossarms. The portable **Drain Earths** shall be coiled and tied before lifting.

(iv) When raising the equipment, care shall be taken by personnel at ground level to ensure that the rope and equipment does not infringe **Safety Distance** to **Live** conductors on an adjacent circuit, or to the unearthed conductors of the circuit on which work is to be carried out.

3.7 Portable **Drain Earths** shall be applied in accordance with the following:

(i) Before uncoiling portable **Drain Earths**, each earth-end clamp shall first be attached to the tower steelwork and screwed up tightly so that the tip of the clamping screw penetrates any paint film and provides a good electrical and mechanical connection. When all earth-end clamps are secured, the portable **Drain Earths** can then be uncoiled and the conductor-end clamps firmly applied to the conductors.

(ii) The fitting of the conductor-end clamps should normally be carried out by personnel positioned on the tower crossarms as far from the conductors as reasonably practicable and in no case closer than 1.5m (5 ft) from unearthed metal.

(iii) At tension towers, provided the jumper is connected at both ends and earthed, the fitting of the clamps to the line side of tension insulators may be carried out using an operating pole from a suitable working position at the line end of the insulator set.

(iv) Portable **Drain Earths** should first be applied to the bottom conductor(s), then to the middle conductor(s) and finally to the top conductor(s) at the tower.

(v) If at any time it is found that an earth connection is defective, no attempt shall be made to touch such a connection until a further earth has been connected in parallel with the defective earth. When this has been done, the conductor-end clamp of the faulty earth shall be removed and the earth lead coiled back to the earth-end clamp and secured to the tower. This earth-end clamp shall remain in position until all conductor-end clamps have been removed.

3.8 Portable **Drain Earths** shall be removed in accordance with the following:

(i) Except when tower painting, portable **Drains Earths** shall not be removed until after the work is completed or when they have been replaced by other earth connections. When tower painting, the portable **Drain Earths** may be removed in sequence as the work proceeds down the tower.

(ii) The removal of portable **Drain Earths** should be carried out in the reverse order of application given in Clause 3.7(iv) i.e. first top, then middle, then bottom conductor(s).

(iii) The removal of the conductor-end clamps should normally be carried out by personnel positioned on the tower crossarms as far from the conductors as reasonably practicable and in no case closer than 1.5m (5 ft) from metal which will become unearthed when the conductor-end clamps are removed.

(iv) At tension towers, provided the jumper is connected at both ends and earthed, the removal of the clamps from the line side of tension insulators may be carried out using an operating pole from a suitable working position at the line end of the insulator set.

(v) No earth-end clamp on a crossarm shall be removed until all the associated conductor-end clamps have been disconnected using the operating pole, and the portable **Drain Earths** coiled and temporarily secured to the crossarm.

(vi) The coiled and tied portable **Drain Earths** and earthing pole shall then be lowered to the ground by reversing the raising procedures described in Clause 3.5 or Clause 3.6 as appropriate.

4 EARTHING SCHEMES

4.1 Where the earthing procedures involve the fitting of extra earth connections during the course of the work, the procedure is detailed through to the stage where conductors remain **Earthed** on completion of the work. The final removal of **Drain Earths** is the responsibility of the *Earthing Party* as detailed in Clause 3.8.

4.2 Except where otherwise stated, the Schemes detailed in this Attachment apply to both single circuit and double circuit towers and the conductor arrangement can be single or twin. However, to clarify the drawings, only single conductors have been shown in all Schemes, except in Figure 6.3 of Scheme 6. (See overleaf for Index of Earthing Schemes.)

4.3 Index of Earthing Schemes

Scheme 1 Work on Towers not Involving the Connection or Disconnection of Conductors.

Scheme 2 Temporary Disconnection and Re-making of Bolted Type Jumper Terminals at Tension Towers.

Scheme 3 Disconnection of Bolted Jumper Terminals and Lowering Conductors to the Ground at Tension Towers.

Scheme 4 Raising Conductors to Crossarm at Tension Towers and Connecting Bolted Jumper Terminals.

Scheme 5 Removal of Jumpers to Provide Permanent Electrical Isolation or Sectioning.

Scheme 6 Cross-jumpering on Double Circuit Tension Towers.

Scheme 7 Lowering and Raising Conductors at Suspension Towers Without Using Trailing Earth Connections.

Scheme 8 Lowering and Raising Conductors at Suspension Towers Using Trailing Earth Connections.

Scheme 9 Cutting and Jointing Conductors.

Scheme 10 Replacing Damaged Conductor.

Scheme 11 Running out, Sagging and Clamping Conductors on a Section or Part-Section of Line.

Scheme 12 Working on Conductors or Spacers from a Conductor Trolley.

Scheme 13 Replacement of a Section Length of Conductor Using Continuous Tension Stringing Method.

Scheme 14 Installation and Use of Approved Insulator Access Platform on Tension Towers.

SCHEME 1

WORK ON TOWERS NOT INVOLVING THE CONNECTION OR DISCONNECTION OF CONDUCTORS

1 WORK ON CONDUCTORS, LINE-END FITTINGS OR INSULATORS

This Scheme details the earthing requirements for work on conductors, line-end fittings and insulators which does not involve the connection or disconnection of the conductors.

1.1 Work on Suspension Towers

1.1.1 **Drain Earths** shall be fitted to each conductor on the top, middle and bottom phases of the circuit at the tower where work is to be done (see Fig. 1.1).

1.2 Work on Tension Towers

1.2.1 **Drain Earths** shall be fitted to each jumper on the top, middle and bottom phases of the circuit at the tower where work is to be done (see Fig. 1.2).

2 Painting and Inspection of Towers

This Section of the Scheme details the earthing requirements where the work may require access within **Safety Distance**, but not closer than 1m (3ft 3in), to conductors which may be subject to induced voltages.

2.1 **Drain Earths** shall be fitted to each conductor, or jumper, on the top, middle and bottom phases of each circuit to which the work may require access within the **Safety Distance**, as illustrated in Figs. 1.1 and 1.2.

2.2 If a distance of 1m (3 ft 3in) can be maintained from the conductors, the **Drain Earths** may be fitted up to 10 spans apart, such that earths are positioned on each side of the point of work.

SCHEME 1

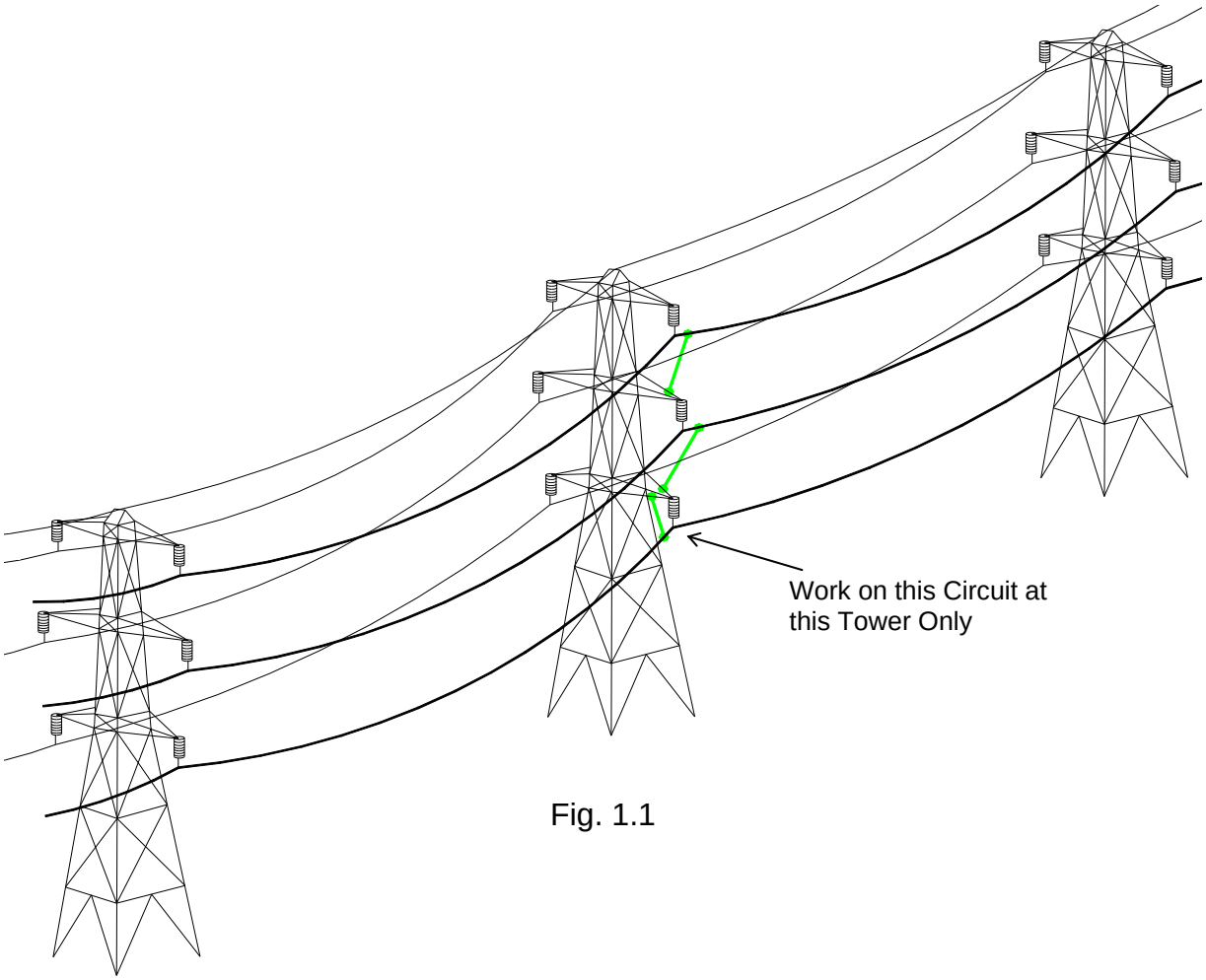


Fig. 1.1

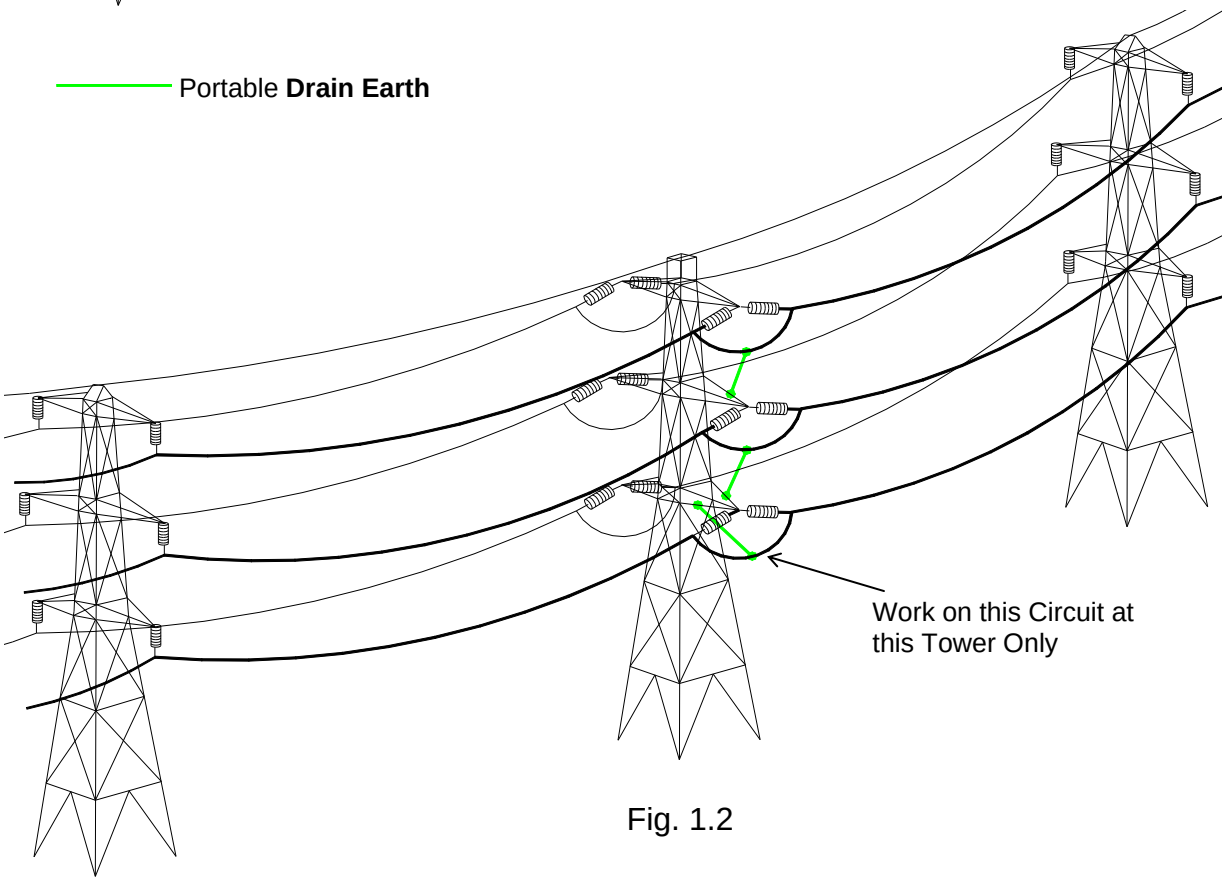


Fig. 1.2

SCHEME 2

TEMPORARY DISCONNECTION AND RE-MAKING OF BOLTED TYPE JUMPER TERMINALS AT TENSION TOWERS

This Scheme details the earthing requirements for the temporary removal and replacement of jumpers only.
(For permanent removal of jumpers - see Scheme 5.)

1 DISCONNECTION OR REMOVAL OF JUMPERS

1.1 **Drain Earths** shall be fitted to all conductors of the circuit to be worked on at the tension tower and at the nearest tower on each side. At tension towers, these **Drain Earths** shall be fitted to the jumpers.

1.2 **Drain Earths** shall then be fitted to the conductor(s) on the line side of the anchor clamp(s) at which the jumper terminal(s) is to be disconnected.

1.3 Where it is not reasonably practicable to apply the earth connections in Clause 1.2 to bundle conductors from the crossarm, the earths may be applied using the following procedure provided that **Drain Earths** are already fitted to the jumpers and at the nearest tower on each side:

(i) The linesman, taking one end of a light sash line, should move out to a suitable working position at the line end of the insulator set, and secure his safety harness, in accordance with the appropriate procedure.

(ii) Using the sash line, he should pull out from the crossarm a 0.6m (2 ft) operating pole fitted with the conductor-end clamp of a **Drain Earth**, the earth-end clamp having already been secured to the tower steelwork.

(iii) The conductor-end clamp shall then be secured to the conductor using the operating pole and without the linesman coming into contact with the clamp or pole socket.

(iv) Where more than one sub-conductor requires to be earthed, the operating pole should be returned to the crossarm and the procedure repeated as necessary.

1.4 If disconnection of one end of a jumper is required (see Fig. 2.1), the jumper terminal may then be disconnected but the **Drain Earth** connection on the jumper shall not be removed.

1.5 If complete removal of the jumper is required (see Fig. 2.2), the jumper may be disconnected at both ends.

1.6 If it is necessary to lower the jumper to the ground, the **Drain Earth** conductor-end clamp shall be removed from the jumper and the **Drain Earth** coiled back and secured to the crossarm.

2 RE-MAKING OF JUMPERS

2.1 A check shall be made that **Drain Earths** are still fitted at the tension tower and at the nearest tower on each side.

2.2 If reconnection of one end of the jumper only is required, a check shall be made that **Drain Earths** are fitted to the jumper and to the conductor on the line side of the anchor clamp to which the jumper is to be attached. The jumper terminal may then be reconnected.

2.3 If a complete jumper is to be refitted, a check shall be made that **Drain Earths** are fitted to the conductors on the line side of the anchor clamps to which the jumper is to be attached. The jumper terminals may then be reconnected and a **Drain Earth** applied to the jumper.

2.4 The **Drain Earths** applied under Clause 1.2 may then be removed.

2.5 Where it is not reasonably practicable to remove the earth connections applied in Clause 1.2 from bundle conductors from the crossarm, the earths may be removed using the following procedure provided that **Drain Earths** are already fitted to the jumpers and at the nearest tower on each side:

(i) The linesman, taking one end of a light sash line, may move out to a suitable working position at the line end of the insulator set, and secure his safety harness, in accordance with the appropriate procedure.

(ii) Using the sash line, he should pull out from the crossarm a 0.6m (2 ft) operating pole.

(iii) The conductor-end clamp shall then be removed from the conductor, using the operating pole, and the pole and clamp returned to the crossarm without the linesman coming into contact with the clamp or pole socket.

(iv) Where earths are to be removed from more than one sub-conductor, the operating pole should be returned and the procedure repeated as necessary.

2.6 The *Earthing Party* shall not detach the earth-end clamps and remove the coiled **Drain Earths** until all other **Drain Earths** connected to the same crossarm have been disconnected from the conductors.

SCHEME 2

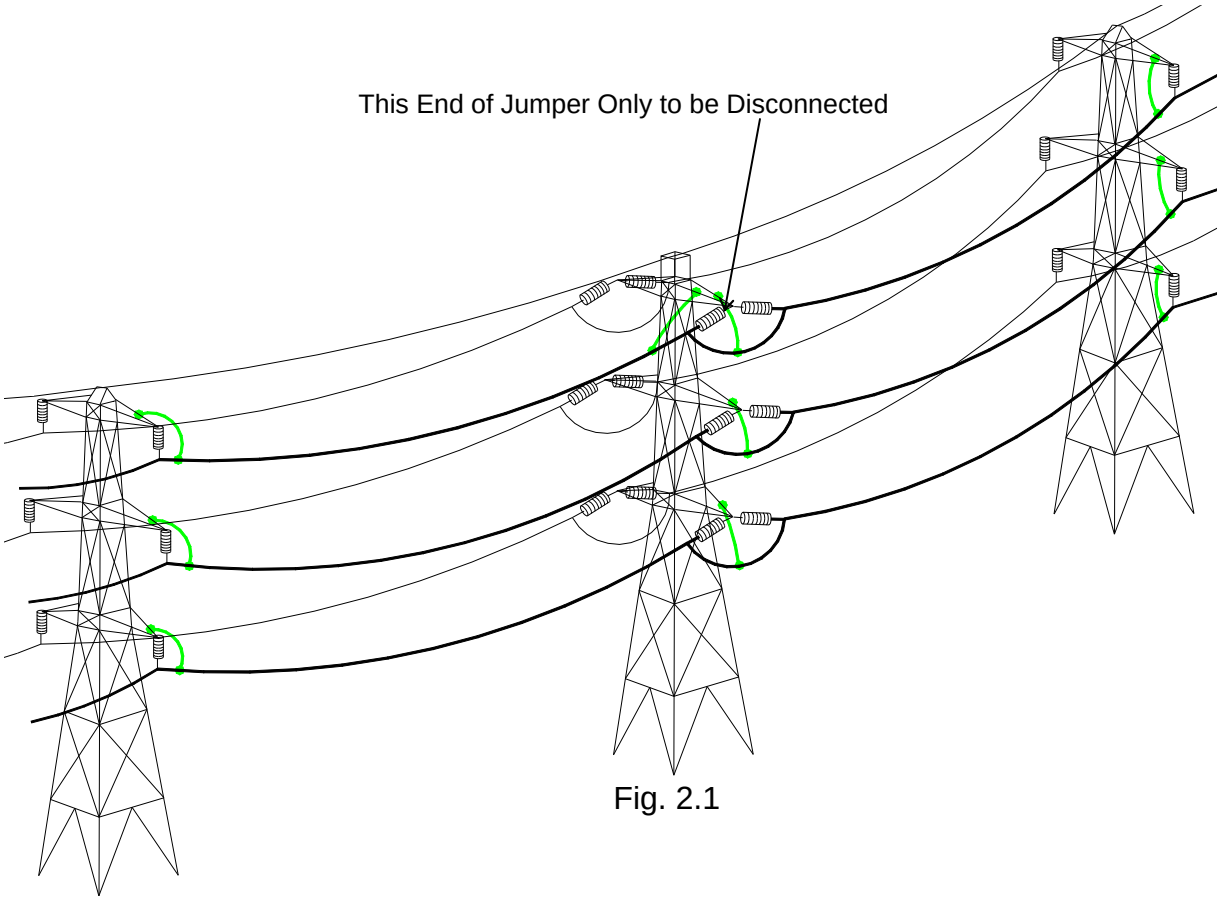


Fig. 2.1

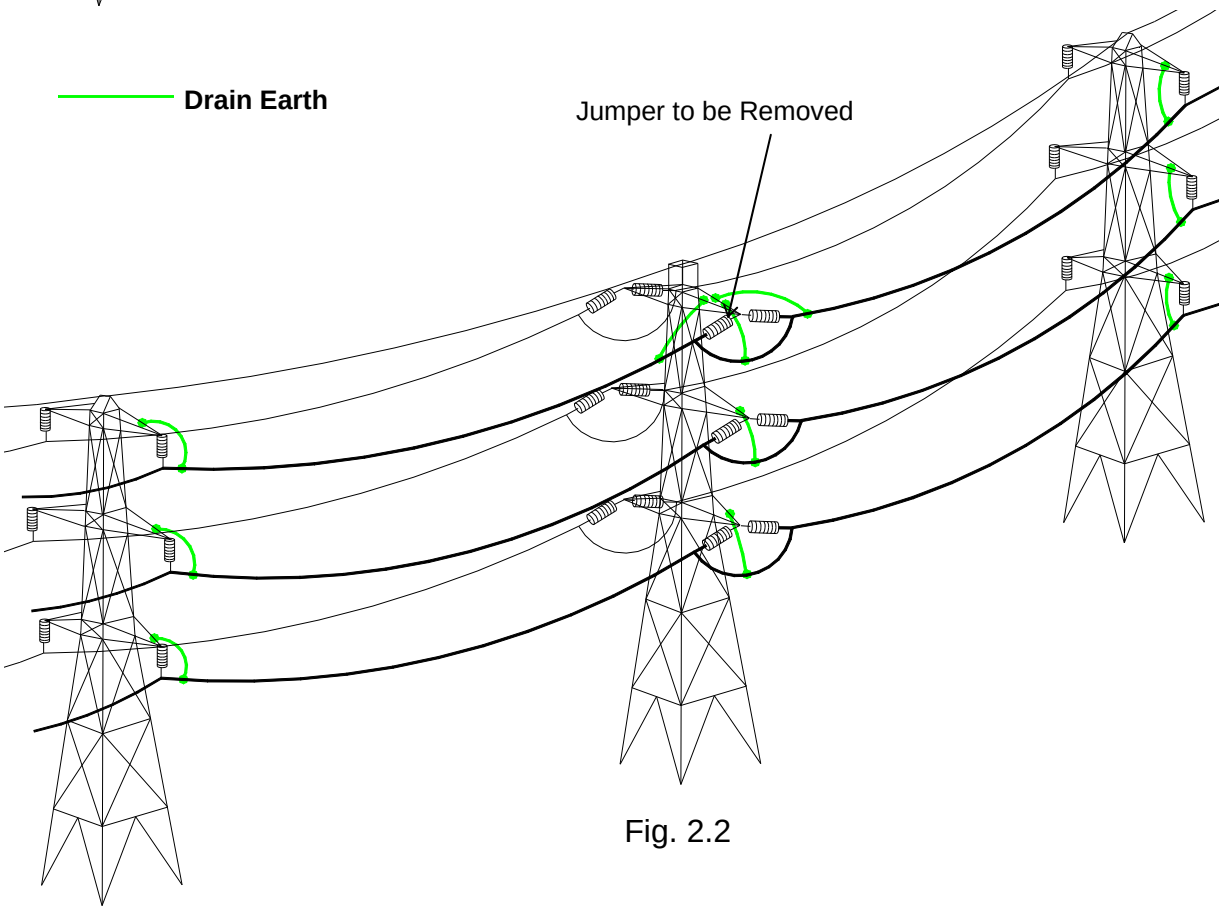


Fig. 2.2

SCHEME 3

DISCONNECTION OF BOLTED JUMPER TERMINALS AND LOWERING CONDUCTORS TO THE GROUND AT TENSION TOWERS

This Scheme details the earthing requirements to enable conductors to be lowered at tension towers.

1 DISCONNECTION OF JUMPERS

1.1 **Drain Earths** shall be fitted to all conductors of the circuit to be worked on at the tension tower and at the nearest tower on each side. At tension towers these **Drain Earths** shall be fitted to the jumpers.

1.2 A *Bridging Earth* shall be fitted across each tension insulator string which is to be lowered by first bolting the earth-end lug of the *Bridging Earth* to the ball-ended fitting, then attaching the conductor-end clamp to the conductor on the line side of the anchor clamp.

For a tension insulator string supporting more than one conductor, a *Bridging Earth* shall be applied to each conductor.

1.3 Where it is not reasonably practicable to apply the earth connections in Clauses 1.2 and 1.5 to bundle conductors from the crossarm, the earths may be applied using the following procedure, provided that **Drain Earths** are already fitted to the jumpers and at the nearest tower on each side:

(i) The linesman, taking one end of a light sash line, may move out to a suitable working position at the line end of the insulator set, and secure his safety harness, in accordance with the appropriate procedure.

(ii) Using the sash line, he should pull out from the crossarm a 0.6m (2 ft) operating pole fitted with the conductor-end clamp of a **Drain Earth**, the earth-end clamp having already been secured to the tower steelwork or insulator ball-ended fitting.

(iii) The conductor-end clamp shall then be secured to the conductor using the operating pole and without the linesman coming into contact with the clamp or pole socket.

(iv) Where more than one sub-conductor requires to be earthed, the operating pole should be returned to the crossarm and the procedure repeated as necessary.

1.4 The jumper ends should be detached from the conductors to be lowered and the detached ends temporarily secured to the crossarm or, on bundle conductor lines when not all conductors of the bundle are to be lowered, to the adjacent conductors. The earth connections to the jumper(s) should not normally be removed.

1.5 If it is necessary to remove the jumper(s) and lower it to the ground, **Drain Earths** shall be fitted to the line side of the anchor clamps at which the jumper(s) is to be disconnected where *Bridging Earths* are not fitted. The jumper(s) may then be removed, the **Drain Earth** conductor-end clamps detached from the jumper(s) and the **Drain Earths** coiled back and secured to the crossarm.

1.6 If the jumper(s) is not to be reconnected, the coiled **Drain Earths** shall not be disconnected and lowered to the ground by the *Earthing Party* until all other **Drain Earths** connected to the same crossarm have been removed from the conductors and similarly coiled up.

2 LOWERING CONDUCTORS TO THE GROUND

2.1 Before hauling out the winch rope, the chassis of the winching vehicle shall be bonded to the tower steel work or to an earthing spike by a *Field Equipment Earth*.

2.2 The winch rope may then be raised up the tower and rigged for taking up conductor tension (see Fig. 3.1).

2.3 After lowering the conductors with insulators and before the winch rope is disconnected, **Drain Earths** shall be fitted to the conductor(s) using a 2.5m (8 ft) operating pole. This earth connection may be to lower steelwork or to an earthing spike (see Fig. 3.2).

2.4 The *Bridging Earths* across the insulators on the ground may then be removed if necessary.

SCHEME 3

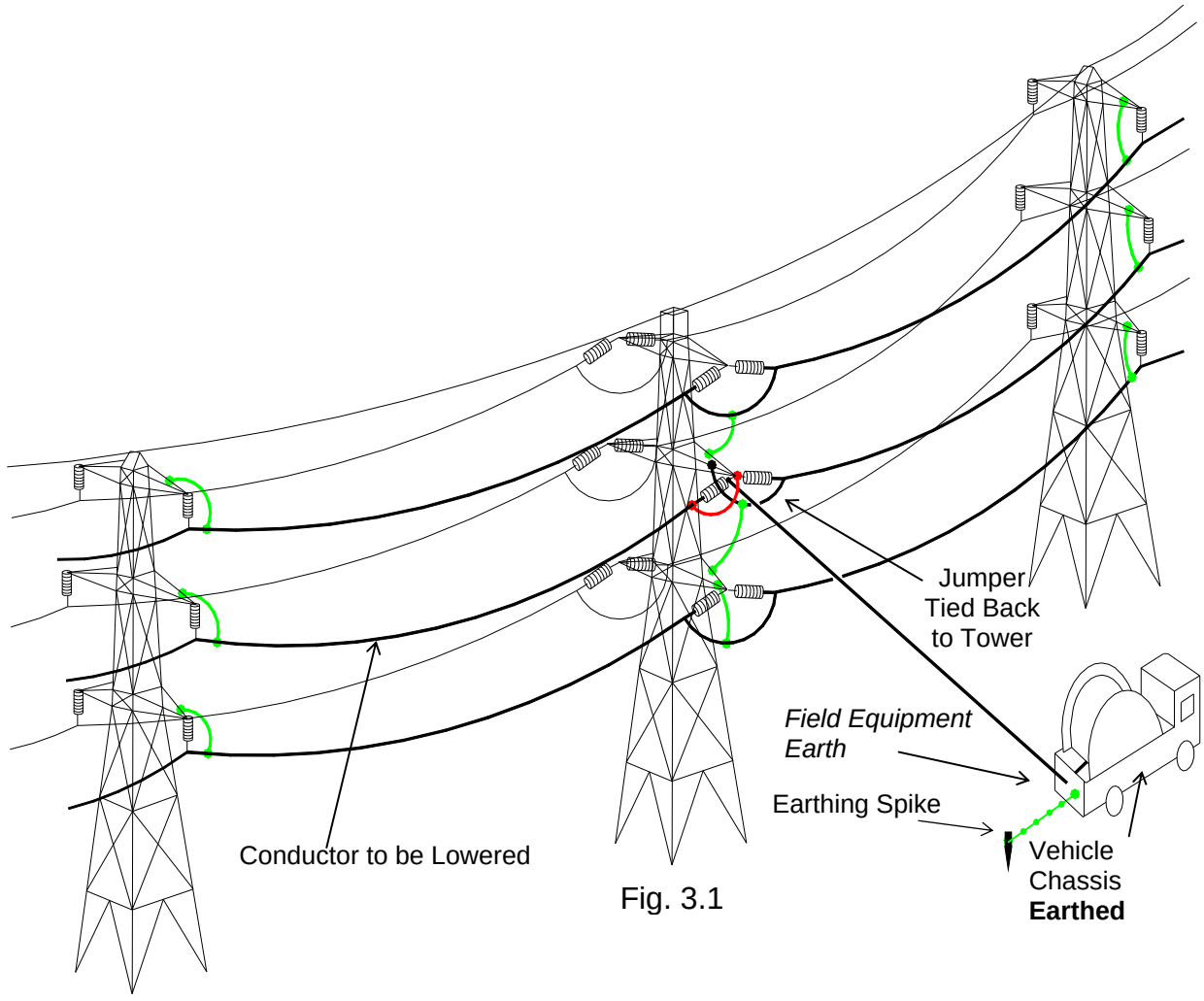


Fig. 3.1

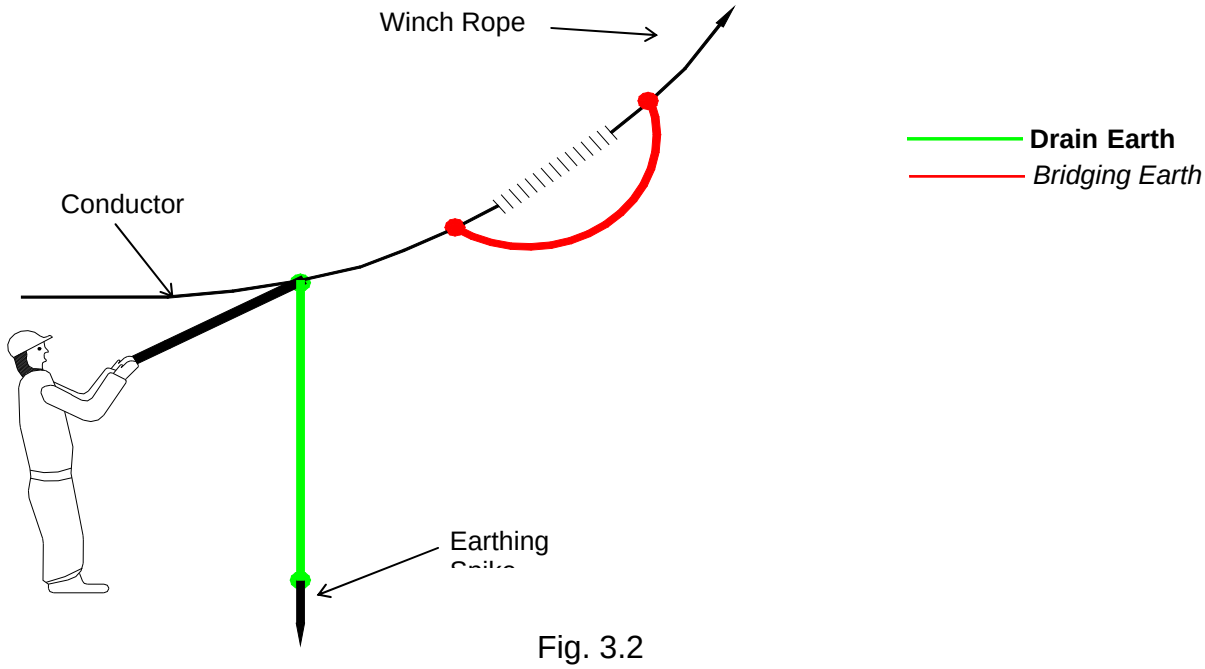


Fig. 3.2

SCHEME 4

RAISING CONDUCTORS TO CROSSARM AT TENSION TOWERS AND CONNECTING BOLTED JUMPER TERMINALS

This Scheme details the earthing requirements to enable conductors to be raised and jumpers connected at tension towers.

1 RAISING CONDUCTORS TO CROSSARM

1.1 **Drain Earths** shall be fitted to all conductors of the circuit to be worked on:

(i) At the tension tower.

(ii) At the nearest tower on each side.

(iii) To the conductor on the ground which may be earthed to tower steelwork, or to an earthing spike.

1.2 Before raising the winch rope to the crossarm and rigging to lift the conductor, the chassis of the winch vehicle shall be bonded to tower steelwork or to an earthing spike by means of a *Field Equipment Earth*.

1.3 A *Bridging Earth* shall be fitted across each tension insulator string to be raised, as detailed in Clause 1.2 of Scheme 3.

1.4 After taking up tension in the winch rope to lift the tension insulator string clear of the ground, the conductor-end clamp of the **Drain Earth** applied in Clause 1.1 (iii) shall be removed using a 2.5m (8 ft) operating pole (see Fig. 4.2).

2 CONNECTION OF JUMPERS

2.1 After landing the conductors and insulators on the crossarm, a check shall be made that the conductors are fitted with *Bridging Earths* adjacent to anchor clamps to which the jumper is to be connected. Suitable earthing arrangements are detailed in Figs. 4.1, 4.3 and 4.4.

2.2 The jumper may be connected and a **Drain Earth** attached to the jumper.

2.3 The *Bridging Earth* shall be removed from the conductor and then the earth-end lug unbolted from the insulator ball-ended fitting.

2.4 Where appropriate, the conductor-end clamps of other **Drain Earths** on the line side of anchor clamps should be removed, the **Drain Earths** coiled back and secured to the tower crossarm.

2.5 Where it is not reasonably practicable to remove the earth connections in Clauses 2.3 and 2.4 from the bundle conductors from the crossarm, the earths may be removed using the procedure detailed in Clause 2.5 of Scheme 2, provided that **Drain Earths** are already fitted to the jumpers and at the nearest tower on each side.

2.6 The *Earthing Party* shall not detach the earth-end clamps and remove the coiled **Drain Earths** until all other **Drain Earths** connected to the same crossarm have been disconnected from the conductors.

SCHEME 4

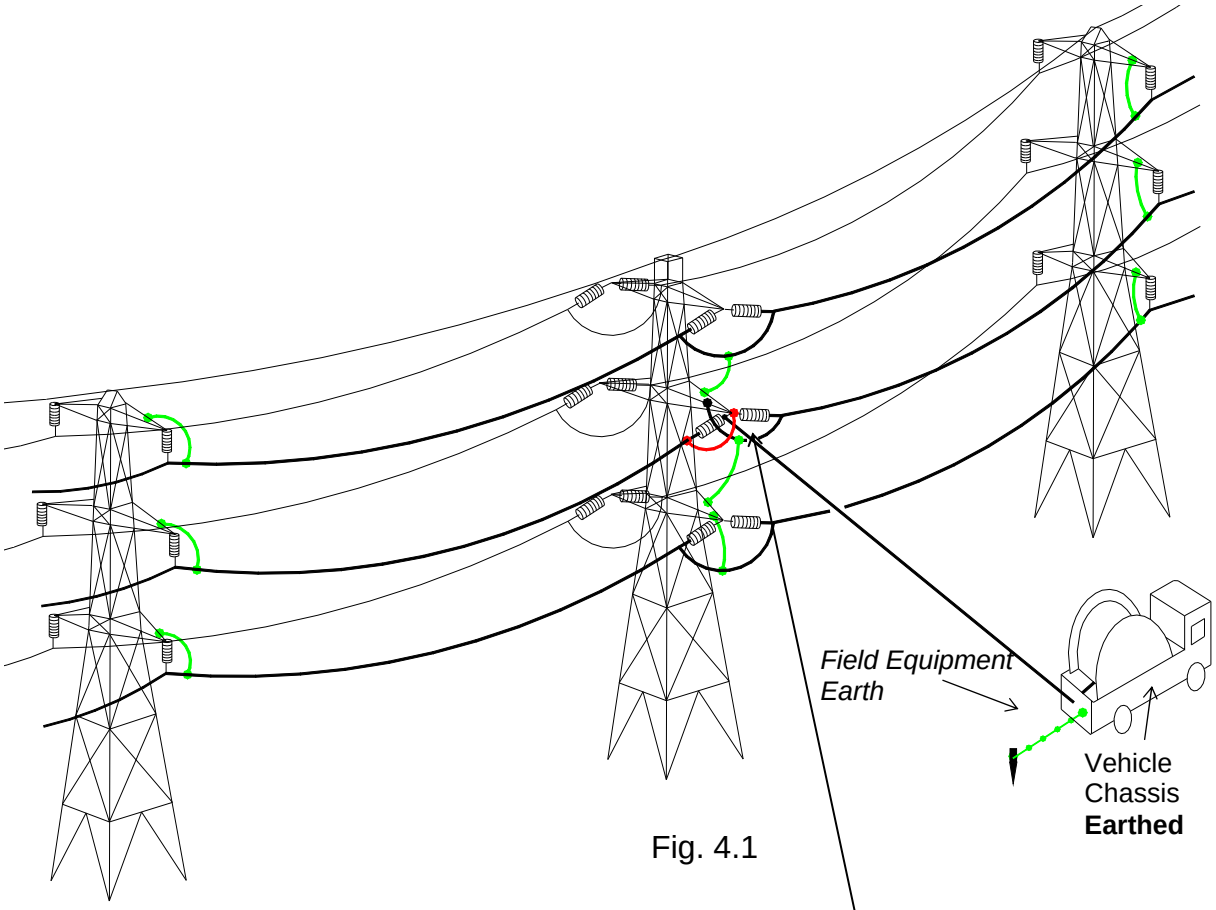


Fig. 4.1

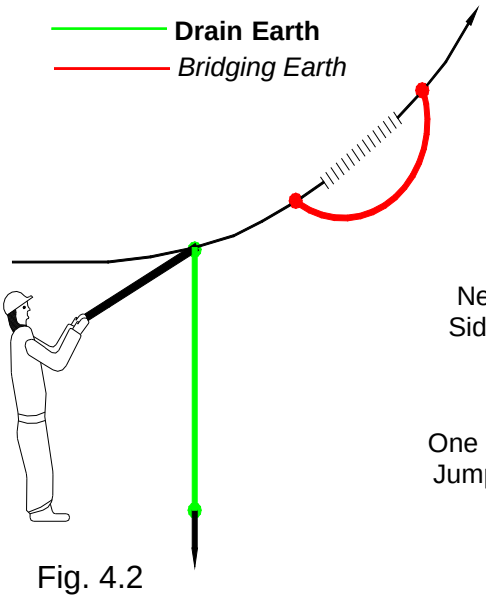


Fig. 4.2

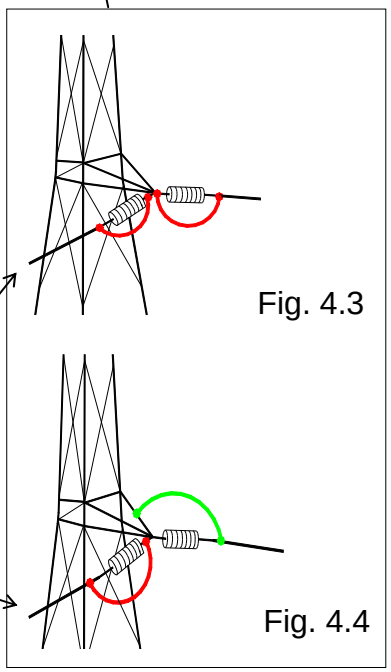


Fig. 4.3

Fig. 4.4

ALTERNATIVE EARTHING
ARRANGMENTS

SCHEME 5

REMOVAL OF JUMPERS TO PROVIDE PERMANENT ELECTRICAL ISOLATION OR SECTIONING

This Scheme details the earthing requirements to permit the permanent removal of jumpers to enable the line to be energised in one direction from the tower whilst the line remains **Earthed** in the other direction.

1 REMOVAL OF JUMPERS

1.1 **Drain Earths** shall be fitted to all conductors of the circuit to be worked on at the tension tower and at the nearest tower on each side. At tension towers, these **Drain Earths** shall be fitted to the jumpers.

1.2 **Drain Earths** shall be fitted to the conductors on the line side of the anchor clamps at which the jumper terminals are to be disconnected. On the side where the conductors are to remain **Earthed**, *Bridging Earths* shall be used (see Fig. 5.1).

1.3 Where it is not reasonably practicable to apply the earth connections in Clause 1.2 to bundle conductors from the crossarm, the earths may be applied using the procedure detailed in Clause 1.3 of Scheme 3, provided that **Drain Earths** are already fitted to the jumpers and at the nearest tower on each side.

1.4 The jumpers may then be disconnected and removed, the **Drain Earth** conductor-end clamps removed from the jumpers and the **Drain Earths** coiled back and secured to the crossarm.

1.5 The jumpers may then be lowered to the ground or secured within the body of the tower for re-use.

2 REMOVAL OF EARTHS TO PERMIT RE-ENERGISING OF LINE

When the jumpers have been removed from all three phases, the *Earthing Party* shall remove the **Drain Earths** from the line side of the anchor clamps which are to be re-energised, using an earthing pole from the tower crossarm (see Fig. 5.2).

3 ALTERNATIVE PROCEDURE IF DRAIN EARTH CONDUCTOR CLAMPS CANNOT BE REMOVED FROM THE TOWER CROSSARM POSITION

If it is not reasonably practicable to remove earths from the line side of the anchor clamps using an earthing pole horizontally from the tower crossarm, as in Clause 2 of this Scheme, the following procedure shall be followed after completing Clause 1.5:

(i) Suspend a weighted pilot suspension insulator from the sag adjuster maintenance hole, supporting a half-jumper from the anchor clamps on the line side which is to be re-energised.

(ii) Apply a **Drain Earth** to the half-jumpers (see Fig. 5.3).

(iii) Provided that **Drain Earths** are already fitted to the half-jumpers and *Bridging Earths* are placed on that side of the line where the conductors are to remain **Earthed**, as detailed in Clause 1.2, the procedure detailed in Clause 1.3 may be adapted in order to remove the **Drain Earth** conductor-end clamps from the line side of the anchor clamps where the conductors are to be re-energised.

(iv) After removing the **Drain Earth** conductor-end clamps, the **Drain Earths** shall be coiled back and secured to the crossarm.

(v) The *Earthing Party* shall not detach the earth-end clamps and remove the coiled **Drain Earths** until all other earths attached to the same crossarm have been disconnected from the conductors.

(vi) The *Bridging Earths* shall not be removed from the conductors on the side which is to remain 'dead' and **Earthed**.

SCHEME 5

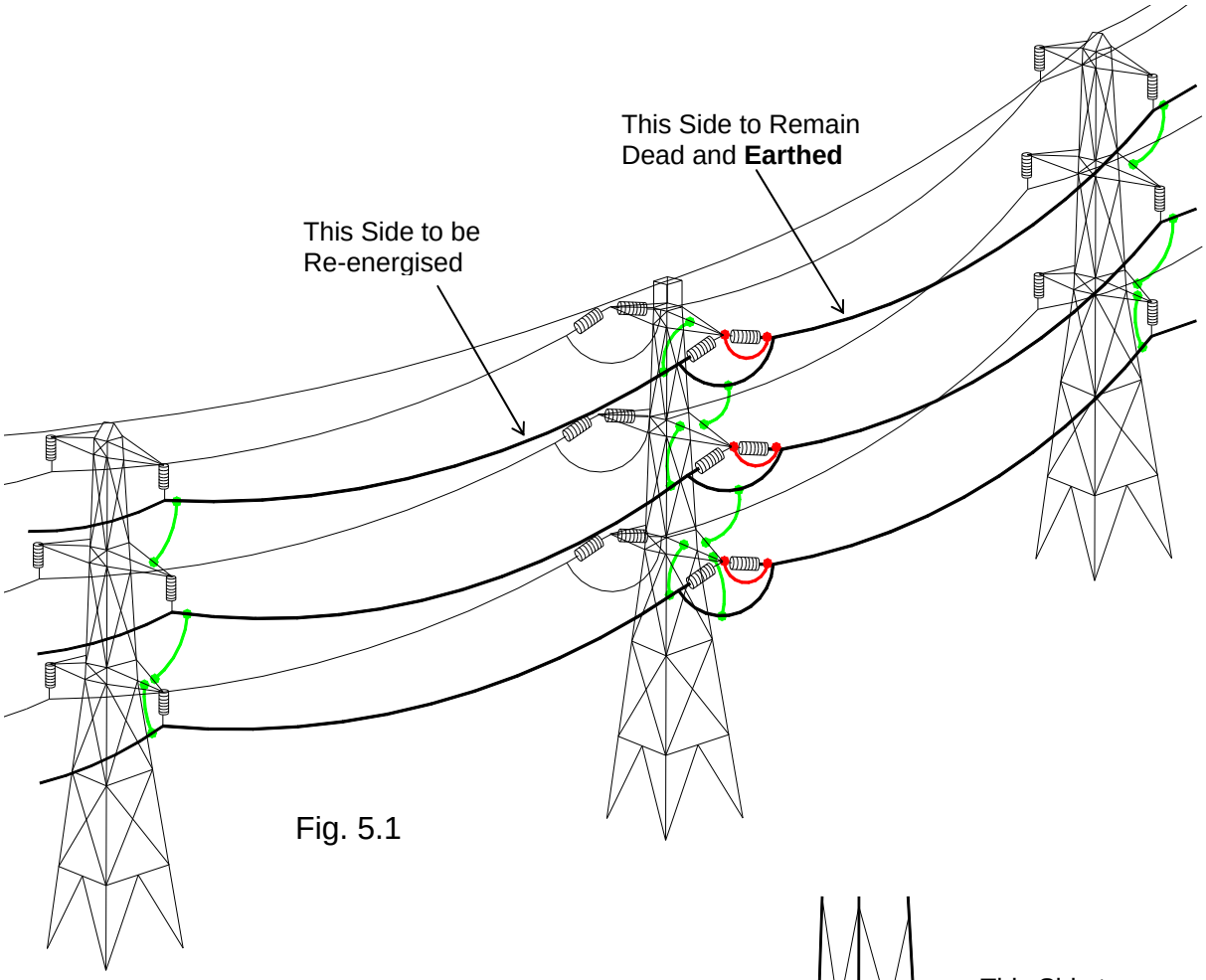


Fig. 5.1

Drain Earth
Bridging Earth

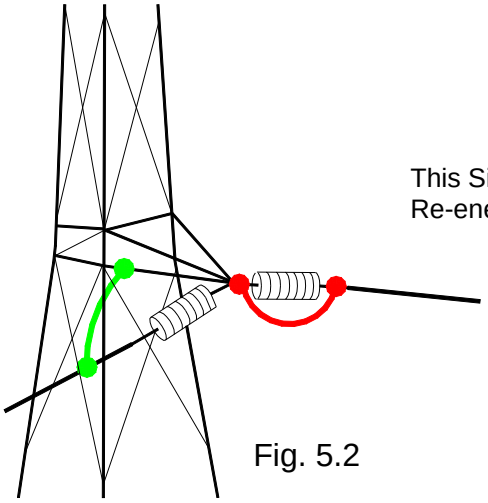


Fig. 5.2

This Earth to be Removed Using an Earthing Pole from the Crossarm of the Tower

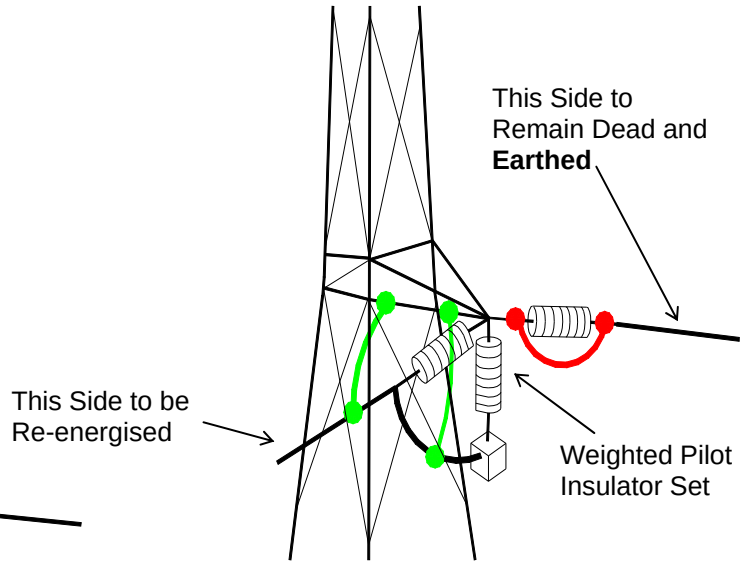


Fig. 5.3

SCHEME 6

CROSS-JUMPERING ON DOUBLE CIRCUIT TENSION TOWERS

This Scheme details the earthing requirements for the fitting and removal of cross-jumpers.

1 REMOVAL OF JUMPERS

1.1 **Drain Earths** shall be fitted to all conductors of both circuits to be worked on at the tension tower and at the nearest tower on each side. At tension towers, these **Drain Earths** shall be fitted to the jumpers.

1.2 **Drain Earths** shall be fitted across each tension insulator string on both circuits. On the sides where the conductors are to remain **Earthed**, *Bridging Earths* shall be used (see Fig. 6.1).

1.3 Where it is not reasonably practicable to apply the earth connections in Clause 1.2 to bundle conductors from the crossarm, the earths may be applied using the procedure detailed in Clause 1.3 of Scheme 3, provided that **Drain Earths** are already fitted to the jumpers and at the nearest tower on each side.

1.4 The jumpers on both circuits may then be disconnected and removed, the **Drain Earth** conductor-end clamps removed from the jumpers and the **Drain Earths** coiled back and secured to the crossarm.

1.5 The jumpers shall then be removed from the tower.

2 FITTING CROSS-JUMPERS

2.1 Cross-jumpers should be connected between the two circuits. On bundle conductors, a compression spacer should be fitted in the cross-jumper to facilitate earthing.

2.2 A **Drain Earth** shall be fitted to the cross-jumpers (see Figs. 6.2 and 6.3).

2.3 The conductor-end clamps of the **Drain Earths** on the line side of the anchor clamps which are to be re-energised may then be removed and the **Drain Earths** coiled back and secured to the crossarm.

2.4 Where it is not reasonably practicable to remove the earth connection in Clause 2.3 from bundle conductors from the crossarm, the earths may be removed using the procedure detailed in Clause 2.5 of Scheme 2.

2.5 The **Drain Earths** fitted to the cross-jumpers under Clause 2.2 may then be removed as required.

2.6 The *Earthing Party* shall not detach the earth-end clamps and remove the coiled **Drain Earths** until all other earths attached to the same crossarm have been disconnected from the conductors.

2.7 The *Bridging Earths* fitted under Clause 1.2 shall remain in position until jumpers are reconnected and have been **Earthed**.

3 REMOVAL OF CROSS-JUMPERS

3.1 **Drain Earths** shall be fitted to all conductors of both circuits at the nearest tower on each side of the tension tower.

3.2 A **Drain Earth** shall be fitted to the cross-jumpers from the tower body (see Figs. 6.2 and 6.3).

3.3 **Drain Earths** shall be fitted across each tension insulator string on both circuits. *Bridging Earths* across tension strings on the side of the tower remote from the cross-jumpers should already be fitted and earthing should now be as illustrated in Fig. 6.2.

3.4 The earthing requirements for Clause 3.3 may be carried out in accordance with the details set down in Clause 1.3.

3.5 The cross-jumpers may then be disconnected from both circuits and removed, the **Drain Earth** conductor-end clamps removed from the jumpers and the **Drain Earth** coiled back and secured to the tower.

4 REFITTING OF JUMPERS

4.1 A check shall be made that **Drain Earths** are fitted to the line side of all anchor clamps to which jumpers are to be connected, and at the adjacent towers.

4.2 The jumpers may then be fitted and **Drain Earths** attached.

4.3 The conductor-end clamps of the **Drain Earths** and *Bridging Earths* on the line side of the anchor clamps shall then be removed and the **Drain Earths** coiled back and secured to the crossarm.

4.4 Where it is not possible to remove the earth connections in Clause 4.3 from bundle conductors from the crossarm, the earths may be removed using the procedure detailed in Clause 2.5 of Scheme 2.

4.5 The *Earthing Party* shall not detach the earth-end clamps and remove coiled **Drain Earths** until all other earths attached to the same crossarm have been disconnected from the conductors.

SCHEME 6

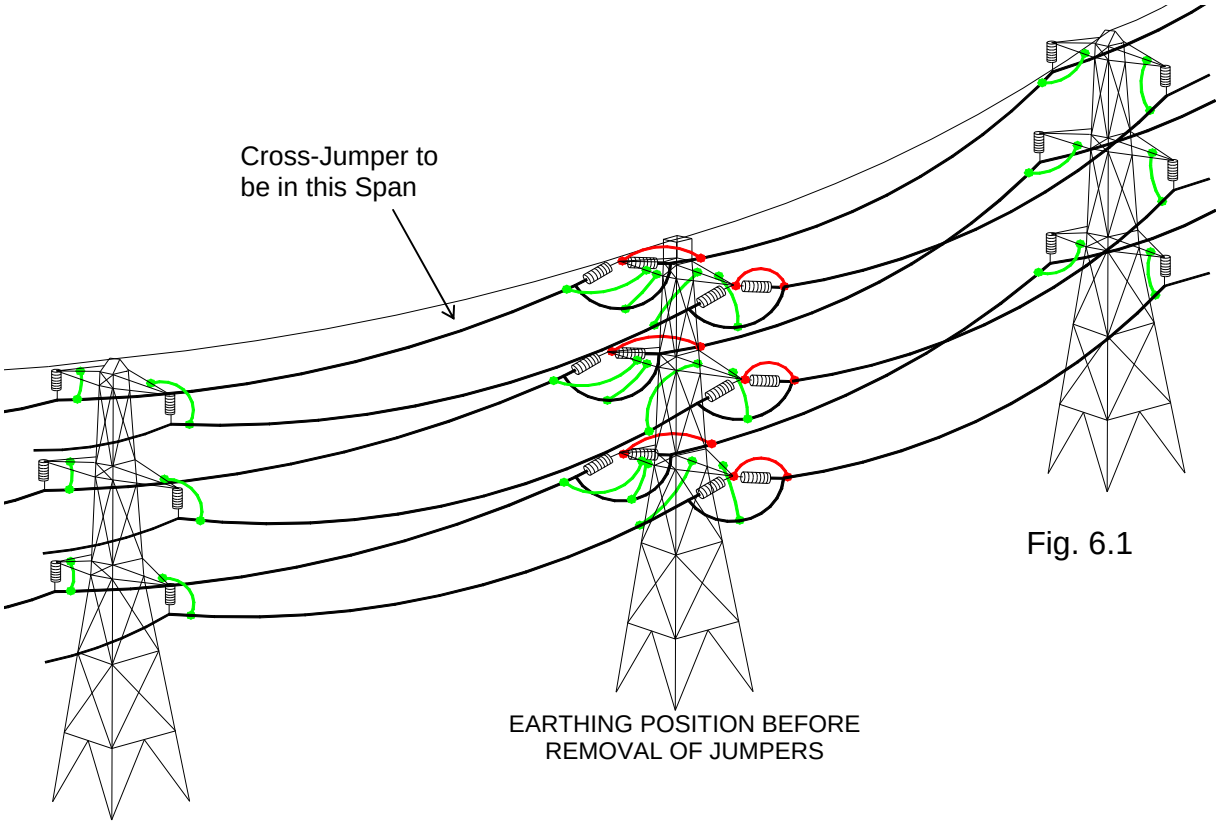


Fig. 6.1

EARTHING POSITION BEFORE
REMOVAL OF JUMPERS

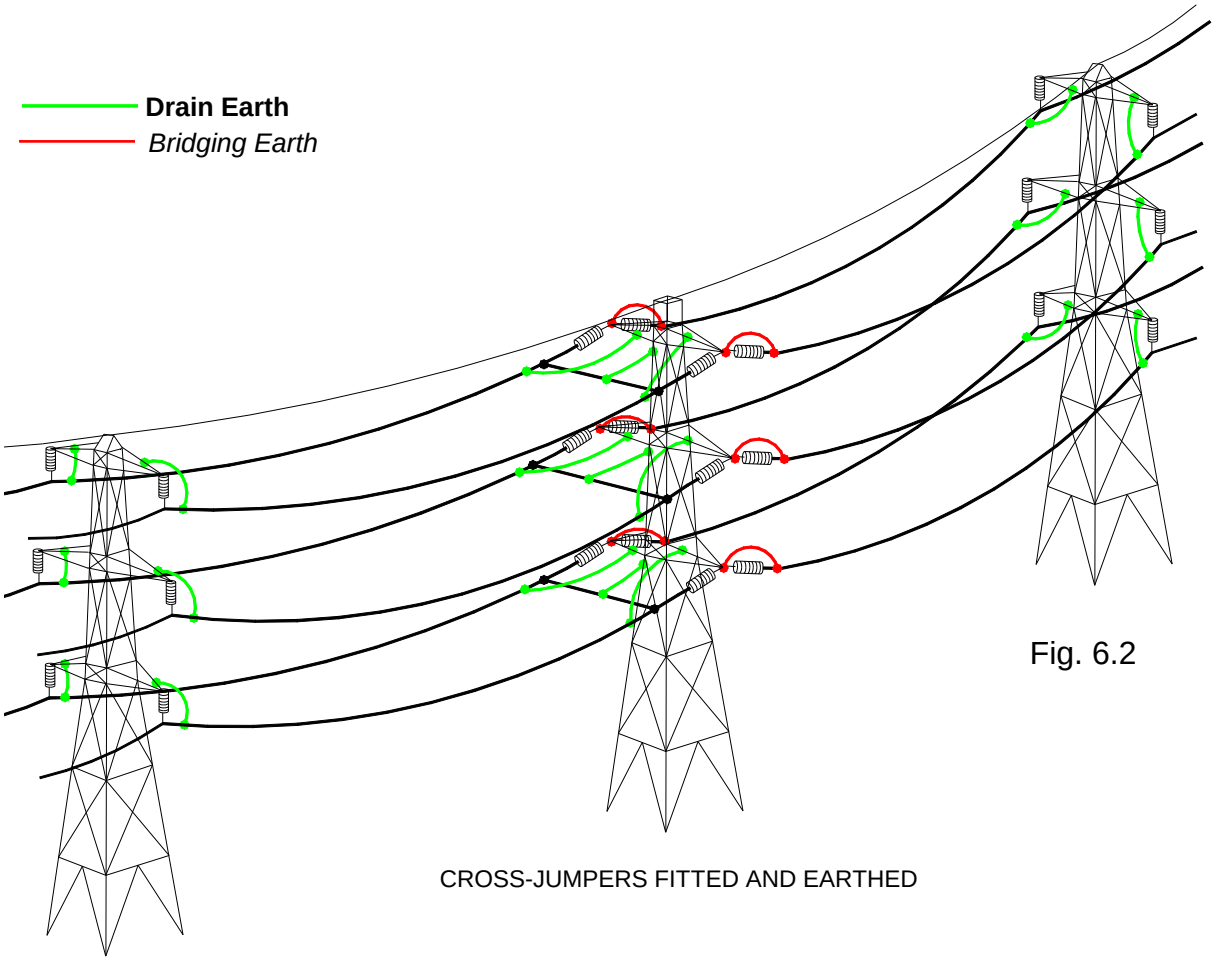
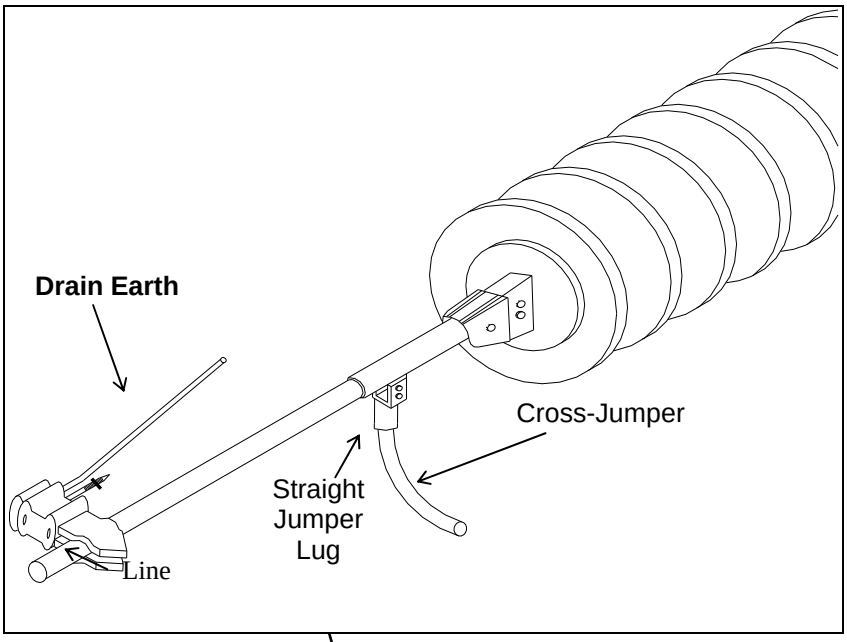


Fig. 6.2

CROSS-JUMPERS FITTED AND EARTHED

SCHEME 6 (cont'd)



PREFERRED METHOD
OF CONNECTING
CROSS-JUMPERS

Drain Earth

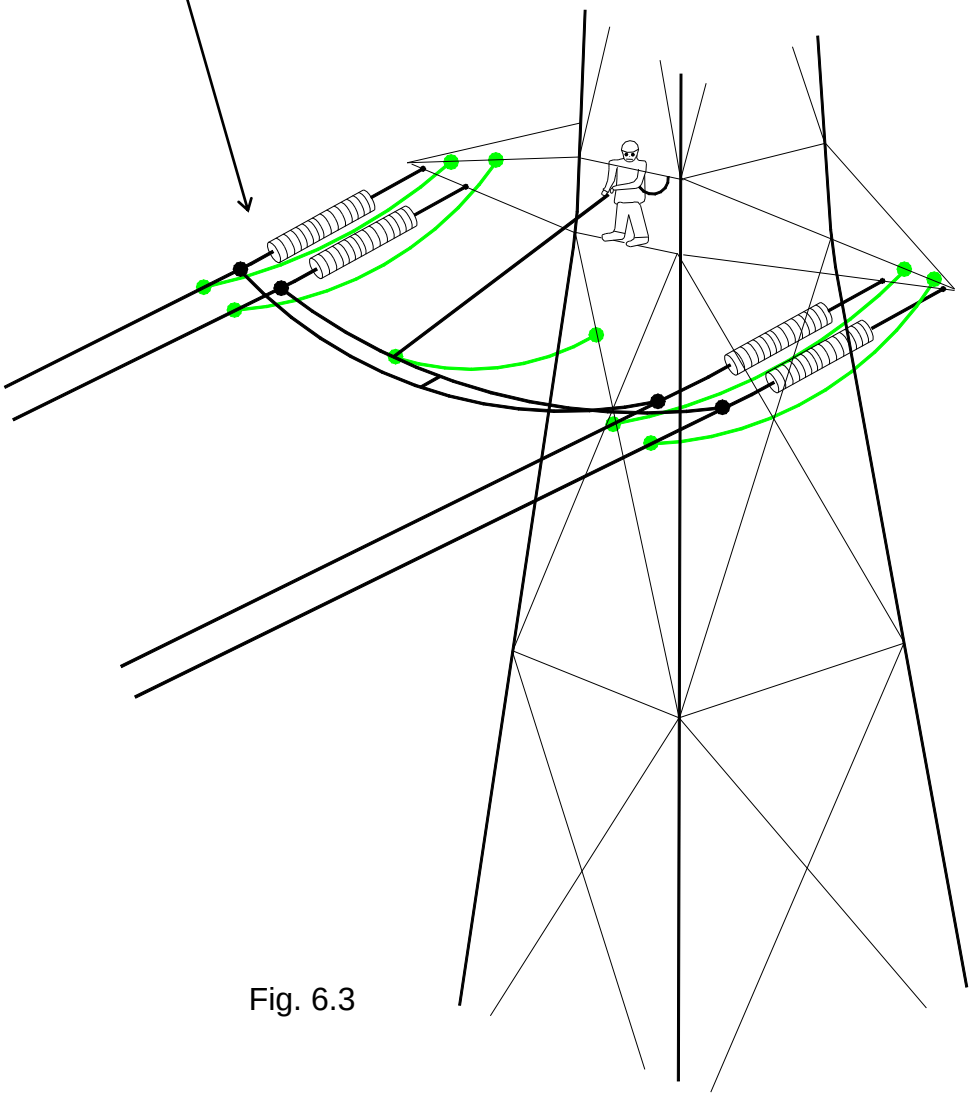


Fig. 6.3

SCHEME 7

LOWERING AND RAISING CONDUCTORS AT SUSPENSION TOWERS WITHOUT USING TRAILING EARTH CONNECTIONS

This Scheme details the earthing requirements to enable conductors to be lowered and raised at suspension towers, without using *Trailing Earths*.

1 LOWERING CONDUCTORS

1.1 **Drain Earths** shall be fitted to all conductors of the circuit to be worked on at the suspension tower and at the nearest tower on each side. At tension towers these **Drain Earths** shall be fitted to the jumpers.

1.2 Where conductors are to be lowered complete with their insulator strings, a *Bridging Earth* shall be fitted across the insulator string to provide a connection through the winch rope to earth (see Fig. 7.3).

1.3 Before raising the winch rope to the crossarm and rigging to lower the conductor, the chassis of the winch vehicle shall be bonded to tower steelwork or to an earthing spike by means of a *Field Equipment Earth*.

1.4 After taking the conductor weight on the winch rope, the conductor-end clamp of the **Drain Earth** should be removed from the conductor to be lowered, and the **Drain Earth** coiled back and secured to the crossarm.

1.5 After lowering the conductor and before the winch rope is disconnected, a **Drain Earth** shall be fitted to the conductor using a 2.5m (8 ft) operating pole. This earth connection may be to tower steelwork or to an earthing spike (see Fig. 7.2).

2 RAISING CONDUCTORS

2.1 **Drain Earths** shall be fitted to all conductors of the circuit to be worked on:

(i) At the suspension tower.

(ii) At the nearest tower on each side.

(iii) To the conductor on the ground which shall be **Earthed** to tower steel work or to an earthing spike.

2.2 Where conductors are to be raised complete with their insulator strings, a *Bridging Earth* shall be fitted across the insulator string to provide a connection through the winch rope to earth (see Fig. 7.3).

2.3 Before raising the winch rope to the crossarm and rigging to lift the conductor, the chassis of the winch vehicle shall be bonded to tower steelwork or to an earthing spike by means of a *Field Equipment Earth*.

2.4 After taking up tension in the winch rope to lift the conductor clear of the ground, the conductor-end clamp of the **Drain Earth** attached to tower steelwork or to an earthing spike shall be removed from the conductor, using a 2.5m (8 ft) operating pole at ground level.

2.5 When the conductor has been raised to the crossarm, a **Drain Earth** shall be attached to the conductor which can then be 'clamped-in'.

SCHEME 7

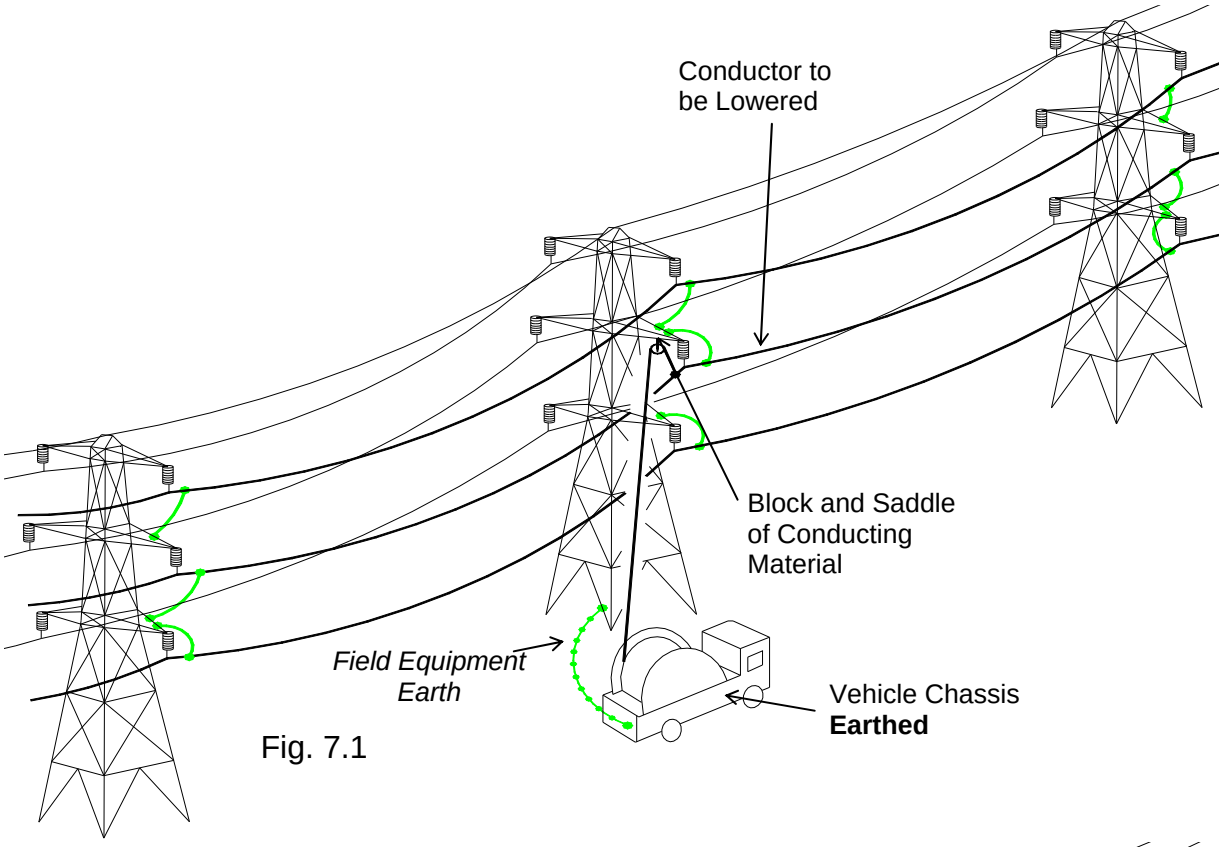


Fig. 7.1

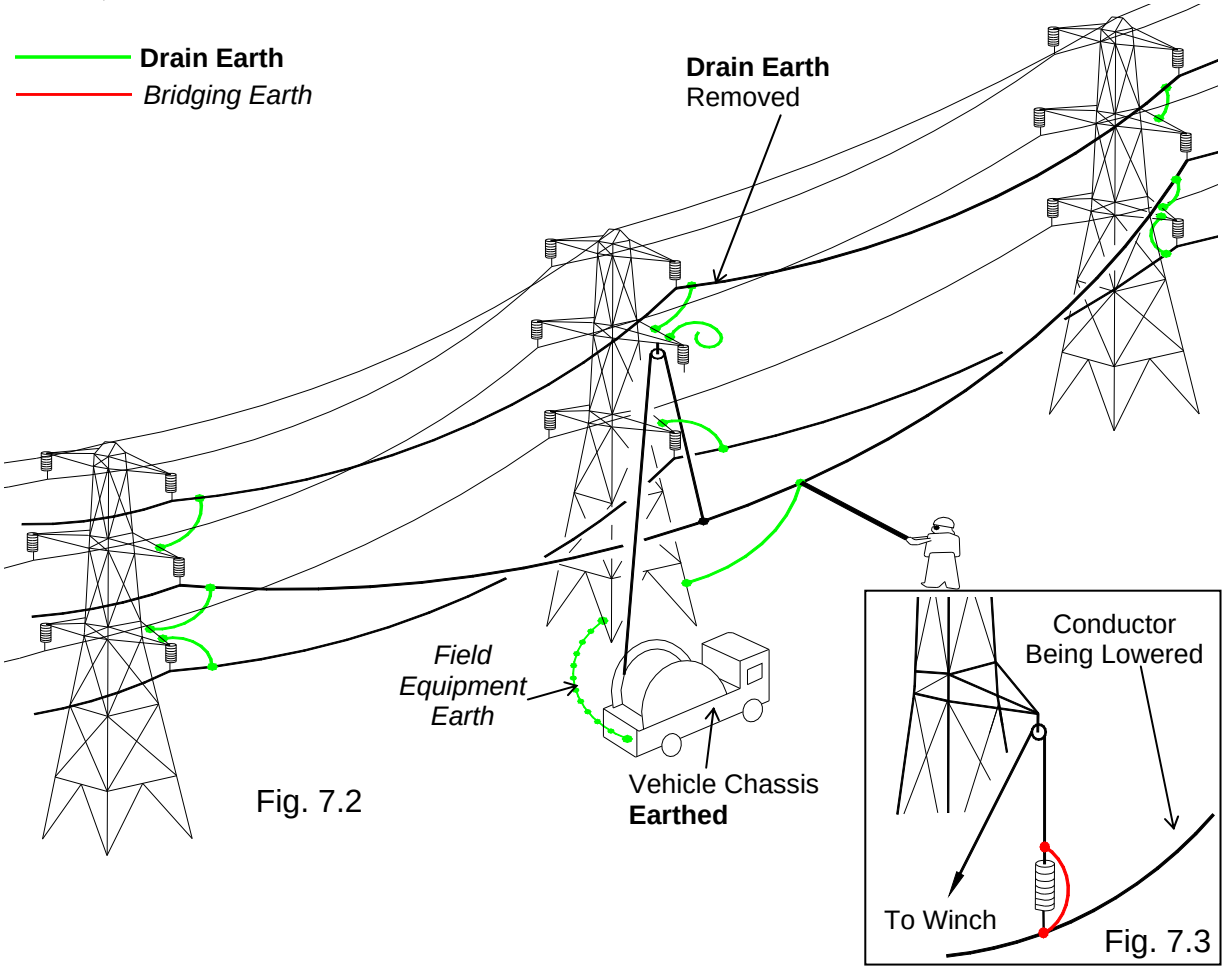


Fig. 7.2

Fig. 7.3

SCHEME 8

LOWERING AND RAISING CONDUCTORS AT SUSPENSION TOWERS USING TRAILING EARTH CONNECTIONS

This Scheme details the earthing requirements to enable conductors to be lowered and raised at suspension towers, using T*railing Earths*.

1 LOWERING CONDUCTORS

1.1 **Drain Earths** shall be fitted to all conductors of the circuit to be worked on at the suspension tower and at the nearest tower on each side. At tension towers these **Drain Earths** shall be fitted to the jumpers.

1.2 A *Trailing Earth* shall be fitted between tower steelwork and the conductor to be lowered (see Fig. 8.1). This *Trailing Earth* shall not be removed until the **Drain Earth** on the tower crossarm referred to in Clause 1.4 is refitted.

1.3 Before raising the winch rope to the crossarm and rigging to lower the conductor, the chassis of the winch vehicle shall be bonded to tower steelwork or to an earthing spike by means of a *Field Equipment Earth*.

1.4 The conductor-end clamp of the **Drain Earth** shall be removed from the conductor to be lowered, the **Drain Earth** coiled back and secured to the crossarm (see Fig. 8.2).

1.5 The conductor may then by lowered.

2 RAISING CONDUCTORS

2.1 **Drain Earths** shall be fitted to all conductors of the circuit to be worked on at the suspension tower and at the nearest tower on each side. At tension towers these **Drain Earths** shall be fitted to the jumpers.

2.2 A *Trailing Earth* shall be fitted between tower steelwork and the conductor on the ground (see Fig. 8.2).

2.3 Before raising the winch rope to the crossarm and rigging to lift the conductor, the chassis of the winch vehicle shall be bonded to tower steelwork or to an earthing spike by means of a *Field Equipment Earth*.

2.4 After the conductor has been raised to the crossarm, a **Drain Earth** shall be attached to the conductor which can then be 'clamped-in'.

2.5 The *Trailing Earth* may then be removed.

SCHEME 8

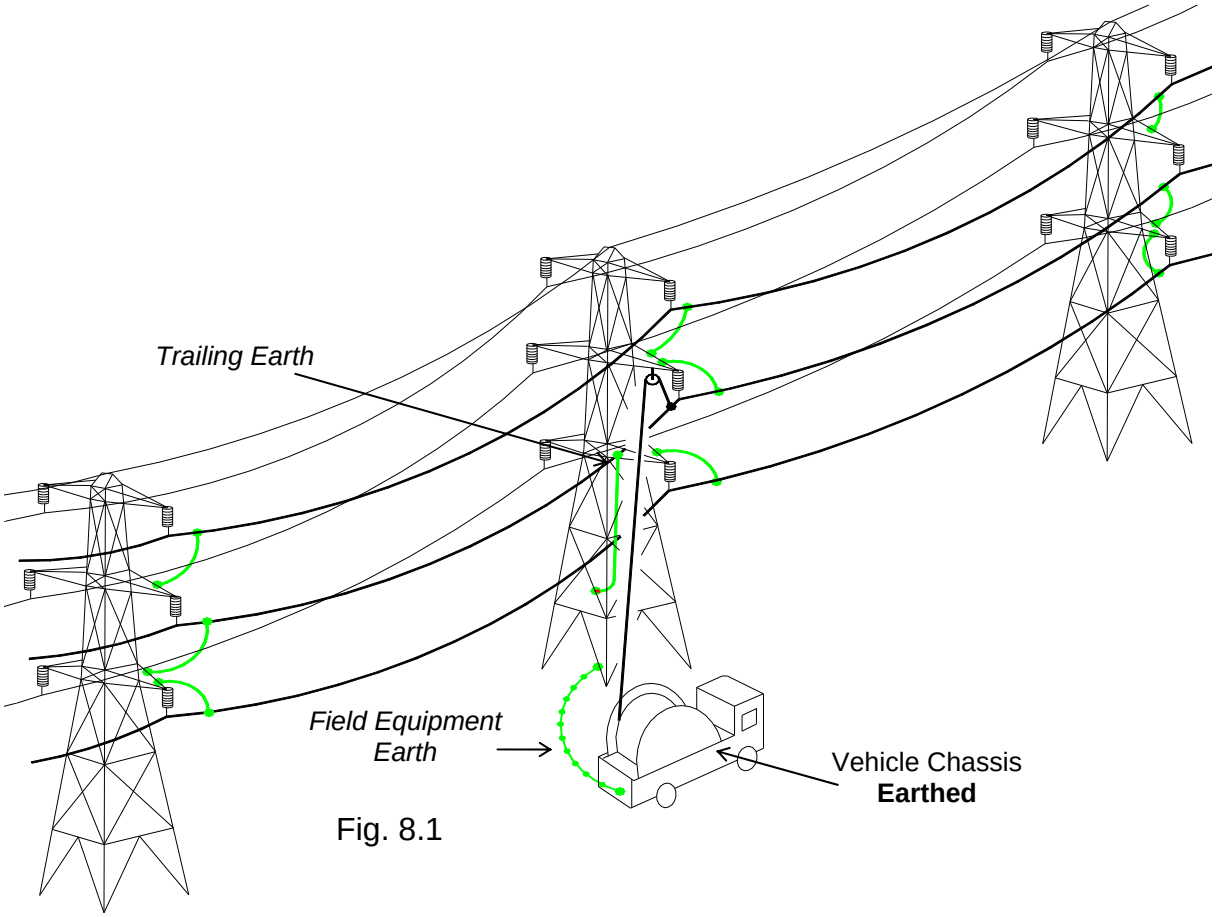


Fig. 8.1

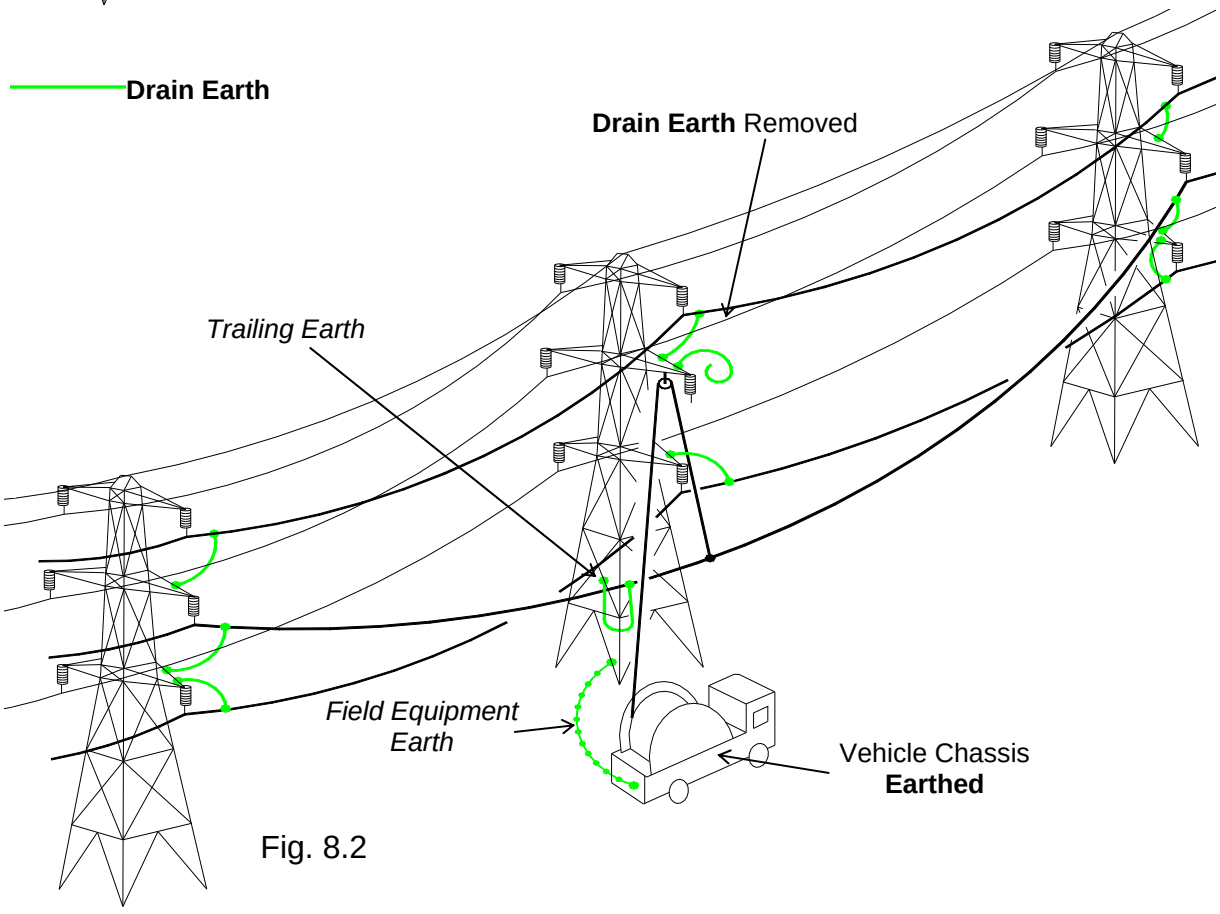


Fig. 8.2

SCHEME 9

CUTTING AND JOINTING CONDUCTORS

This Scheme details the earthing requirements when cutting and jointing conductors.

1 CUTTING AND JOINTING CONDUCTOR

1.1 The conductors to be cut shall be lowered to the ground in accordance with Scheme 3, 7 or 8, as appropriate.

1.2 An *Earthing Bridle*, connected to tower steelwork or to an earthing spike, shall be fitted across the point on the conductor where the cut is to be made. The *Earthing Bridle* shall not be removed until the conductor is jointed.

1.3 Figs. 9.1 and 9.2 illustrate the arrangements at tension towers and suspension towers respectively.

2 RAISING CONDUCTOR AFTER JOINTING

2.1 The *Earthing Bridle* may be removed after jointing and the conductor then raised using Scheme 4, 7 or 8, as appropriate.

SCHEME 9

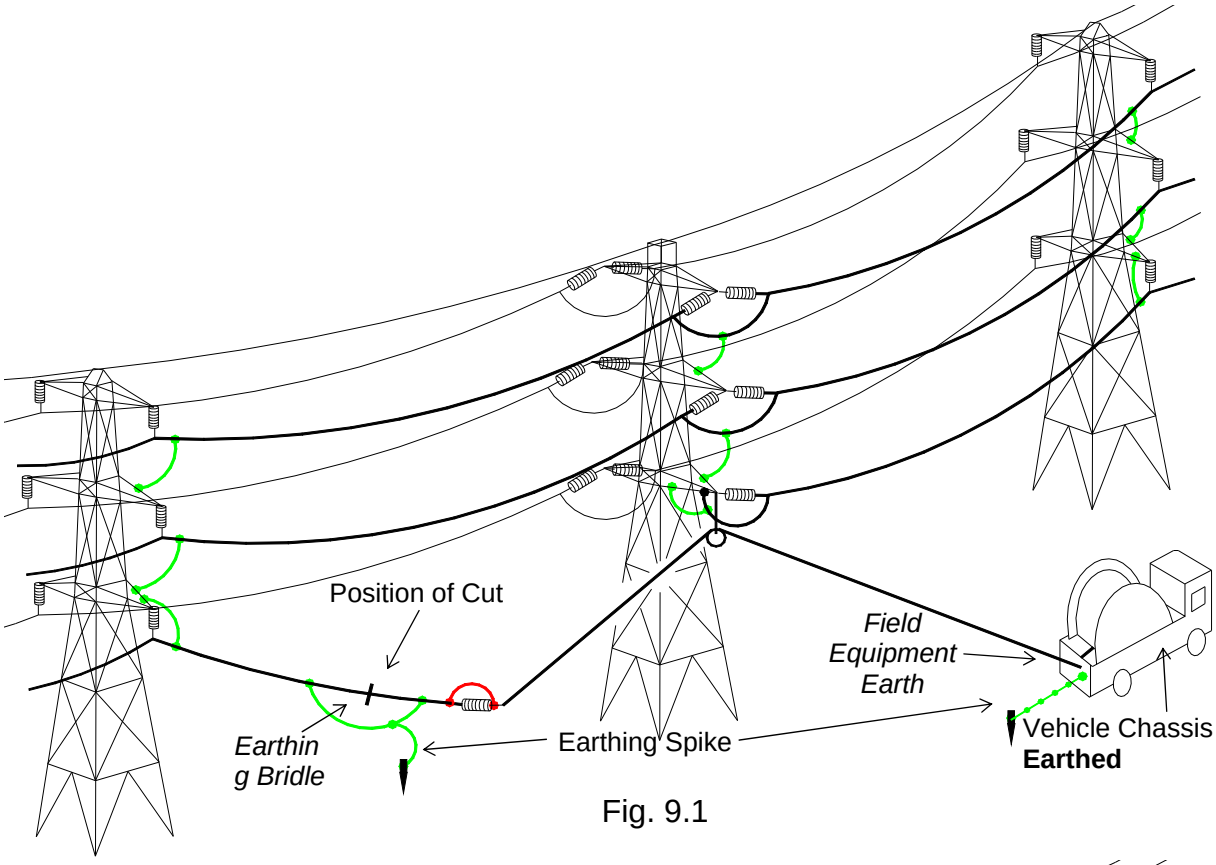


Fig. 9.1

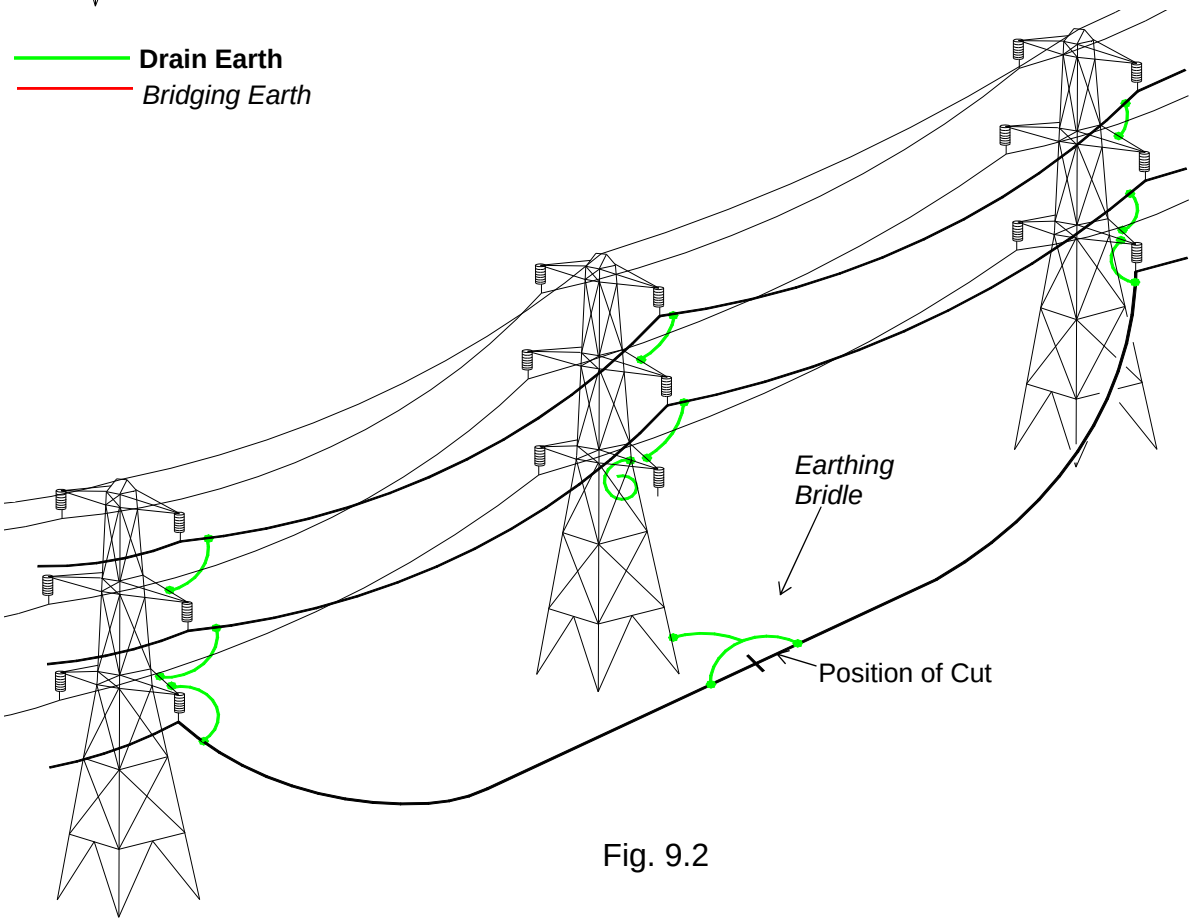


Fig. 9.2

SCHEME 10

REPLACING DAMAGED CONDUCTOR

This Scheme details the earthing requirements for replacing a length of damaged conductor.

1 REPLACING A LENGTH OF DAMAGED CONDUCTOR (UP TO TWO SPANS' LENGTH)

1.1 The damaged conductor shall be lowered to the ground in accordance with Scheme 3, 7 or 8, as appropriate.

1.2 A new length of conductor should be run out and an *Earthing Bridle* fitted between each end of the new conductor and the damaged conductor, beyond the position where joints are to be made. The *Earthing Bridles* shall be connected to tower steelwork or to an earthing spike and shall not be removed from the conductor until the conductor is jointed at both ends of the new length (see Figs. 10.1, 10.2 and 10.3).

2 RAISING CONDUCTOR AFTER JOINTING

2.1 The **Drain Earth** shall be transferred from the damaged conductor to the new conductor.

2.2 The *Earthing Bridles* should be disconnected from the conductor which may then be raised using Scheme 4, 7 or 8, as appropriate.

SCHEME 10

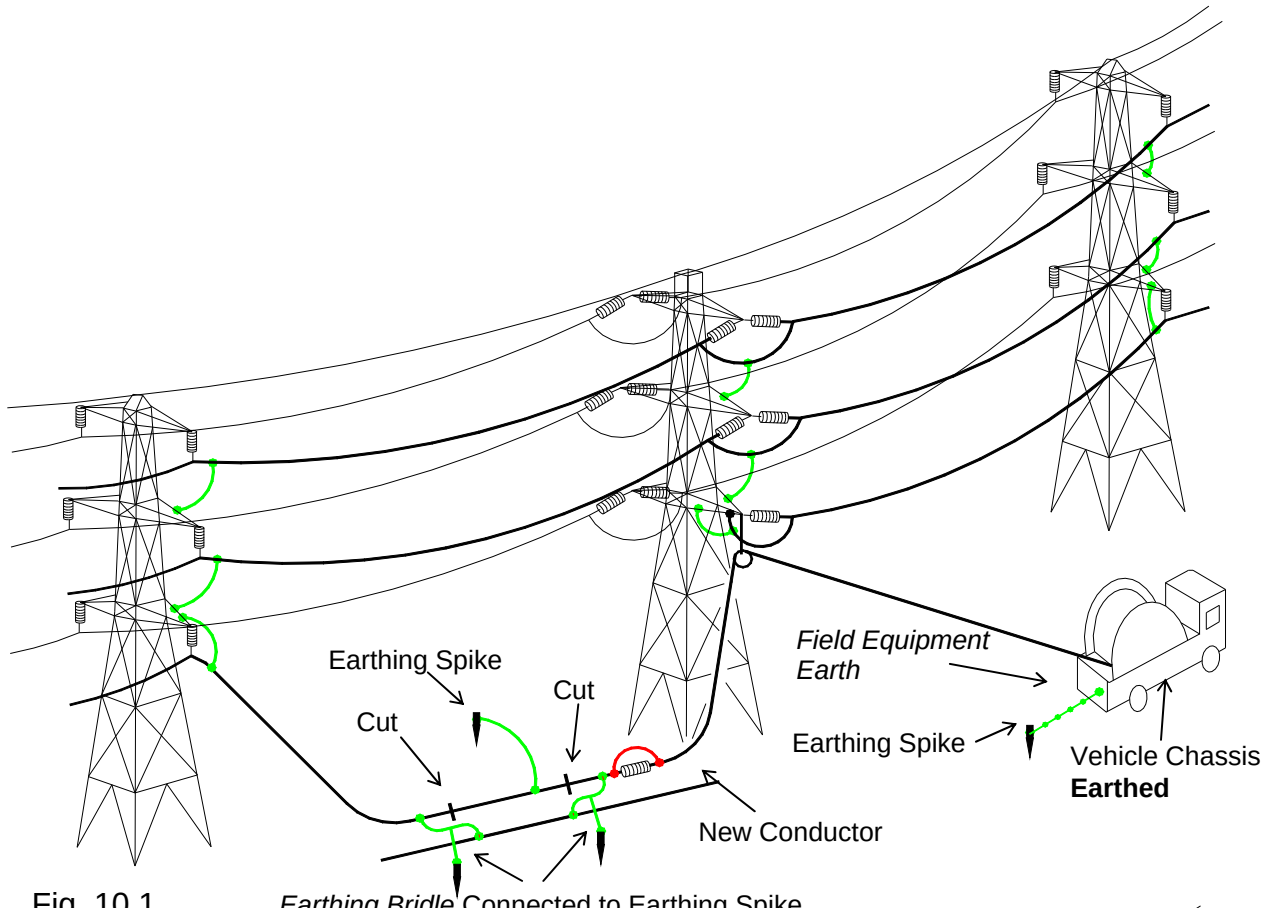


Fig. 10.1

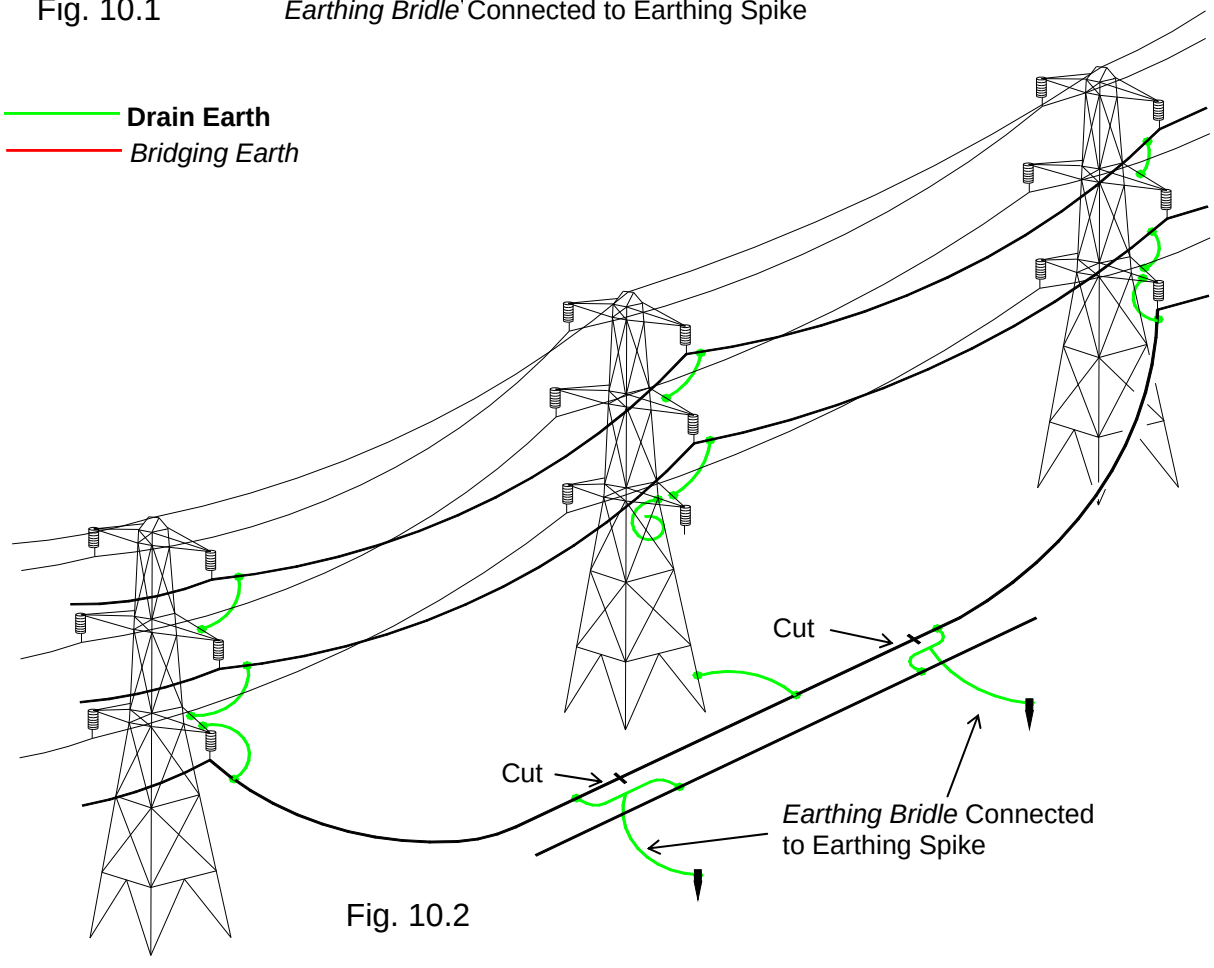


Fig. 10.2

SCHEME 10 (cont'd)

Drain Earth

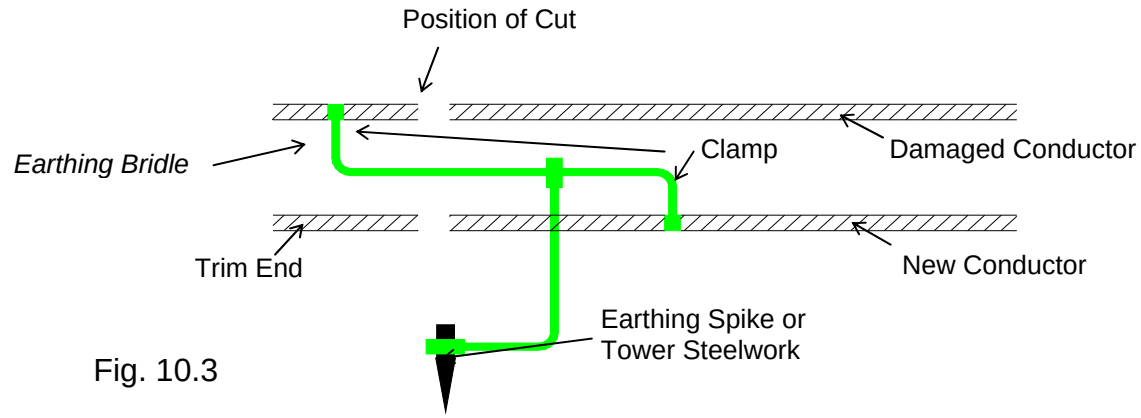


Fig. 10.3

SCHEME 11

RUNNING OUT, SAGGING AND CLAMPING CONDUCTORS ON A SECTION OR PART-SECTION OF LINE

This Scheme details the earthing requirements for the above operations and applies to work on any circuit subject to induced voltages from any other **Live** circuit.

1 RUNNING OUT CONDUCTOR (see Fig. 11.1)

1.1 **Drain Earths** shall be fitted from the crossarm to the earthing boss on conductor running blocks which are supported by suspension insulators. (If the conductor running block is suspended by a steel wire rope sling from the tower crossarm, an efficient earth path from the conductor or pilot wire to the tower will be provided and a **Drain Earth** need not be fitted.)

1.2 A *Running Earth* shall be applied to the conductor or pilot wire adjacent to the conductor or pilot wire drum, and bonded to tower steelwork or to an earthing spike.

1.3 Prior to hauling out the winch rope, a *Field Equipment Earth* shall be attached to the chassis of the winch vehicle and bonded to tower steelwork or to an earthing spike.

1.4 When conductor is run out a **Drain Earth**, bonded to tower steelwork or to an earthing spike, shall be connected to the conductor prior to disconnecting the hauling or pilot wire.

2 BACK - HANGING TENSION INSULATORS (See Fig. 11.2)

2.1 After jointing and assembly of the insulator set, *Bridging Earths* shall be fitted across each tension insulator string. These *Bridging Earths* shall not be removed until jumpers are fitted and **Earthed**.

2.2 Prior to raising the winch rope to crossarm level, a *Field Equipment Earth* shall be attached to the chassis of the winch vehicle and bonded to tower steelwork or to an earthing spike.

2.3 After taking up tension in the winch rope to lift the tension insulator string clear of the ground, the **Drain Earth** fitted in Clause 1.4 shall be removed from the conductor, using a 2.5m (8 ft) operating pole at ground level.

3 SAGGING CONDUCTOR (See Fig. 11.3)

3.1 Before raising the winch rope to crossarm level, a *Field Equipment Earth* shall be attached to the chassis of the winch vehicle and bonded to tower steelwork or to an earthing spike.

3.2 Before removing the *Running Earth* and cutting off surplus conductor in preparation for sagging, a **Drain Earth** shall be connected to the conductor and bonded to tower steelwork or to an earthing spike.

3.3 After taking up tension in the winch rope, the **Drain Earth** fitted in Clause 3.2 shall be removed from the conductor, using a 2.5m (8 ft) operating pole at ground level.

4 LANDING CONDUCTORS (See Fig. 11.4)

4.1 When lowering conductors, after sagging, and as the conductor approaches the ground, a **Drain Earth**, bonded to tower steelwork or to an earthing spike, shall be applied to the conductor, using a 2.5m (8 ft) operating pole at ground level. The conductor clamp of this **Drain Earth** shall be fitted to the conductor, on the remote side of the intended position of the anchor clamp when viewed from the tension tower.

4.2 After jointing and assembly of the insulator set, *Bridging Earths* shall be fitted across each tension insulator string. These *Bridging Earths* shall not be removed until jumpers are fitted and **Earthed**.

4.3 After taking up tension in the winch rope to lift the tension insulator clear of the ground, the **Drain Earth** fitted in Clause 4.1 shall be removed from the conductor, using a 2.5m (8 ft) operating pole at ground level.

5 CLAMPING-IN CONDUCTOR AT SUSPENSION TOWERS

5.1 A **Drain Earth** shall be attached to the conductor. If a **Drain Earth** is attached to the earthing boss on the conductor running block, the conductor-end clamp of this **Drain Earth** may be transferred from the earthing boss to the conductor using an operating pole from the crossarm. Other **Drain Earths** may be required to earth each sub-conductor.

5.2 The conductor may then be transferred from the running block to the suspension clamps and 'clamped-in'.

5.3 On completion of 'clamping-in' of all three phases at a suspension tower, the *Earthing Party* may, if required, remove the **Drain Earths** before proceeding to the next tower.

SCHEME 11

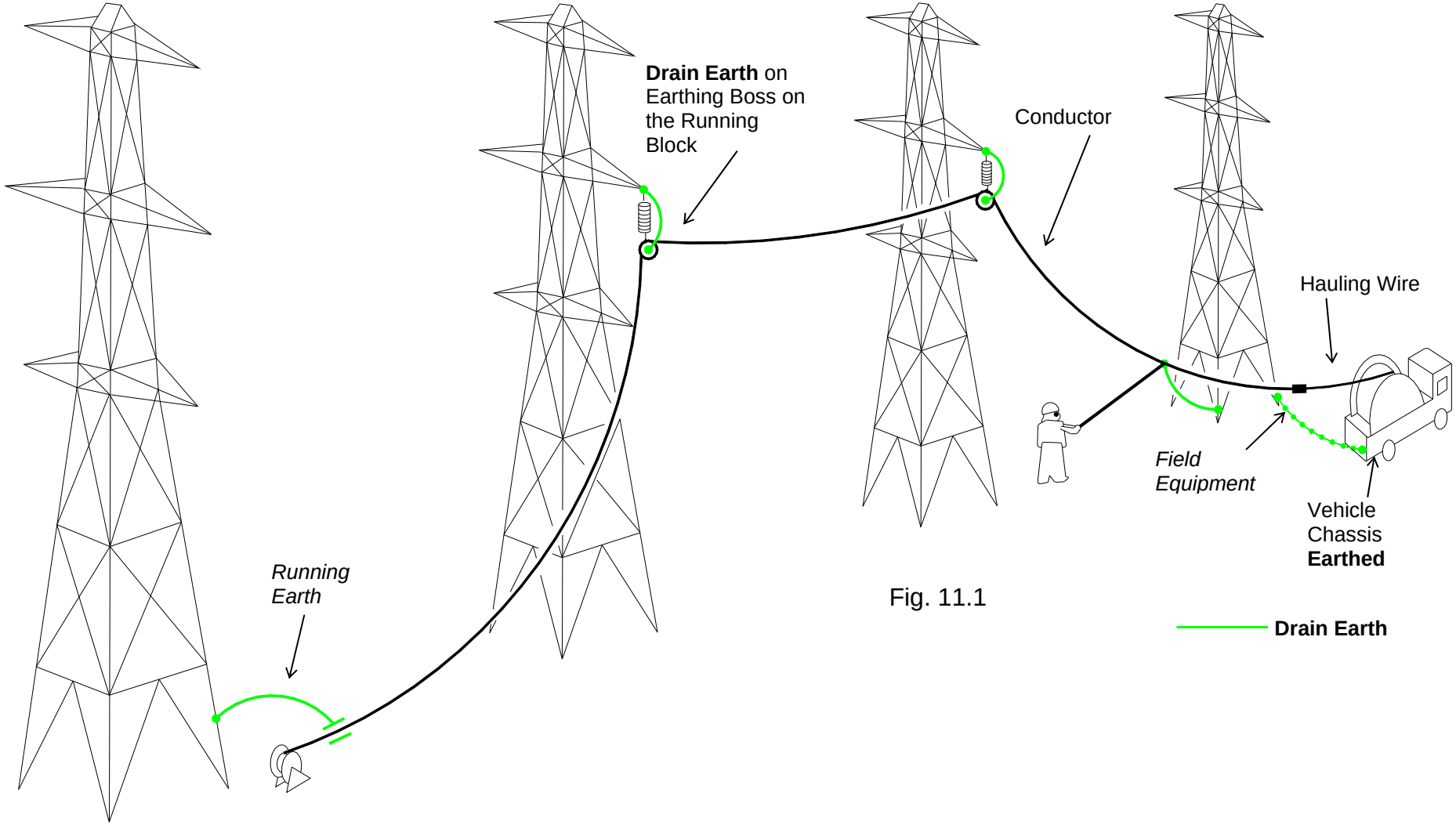


Fig. 11.1

SCHEME 11 (cont'd)

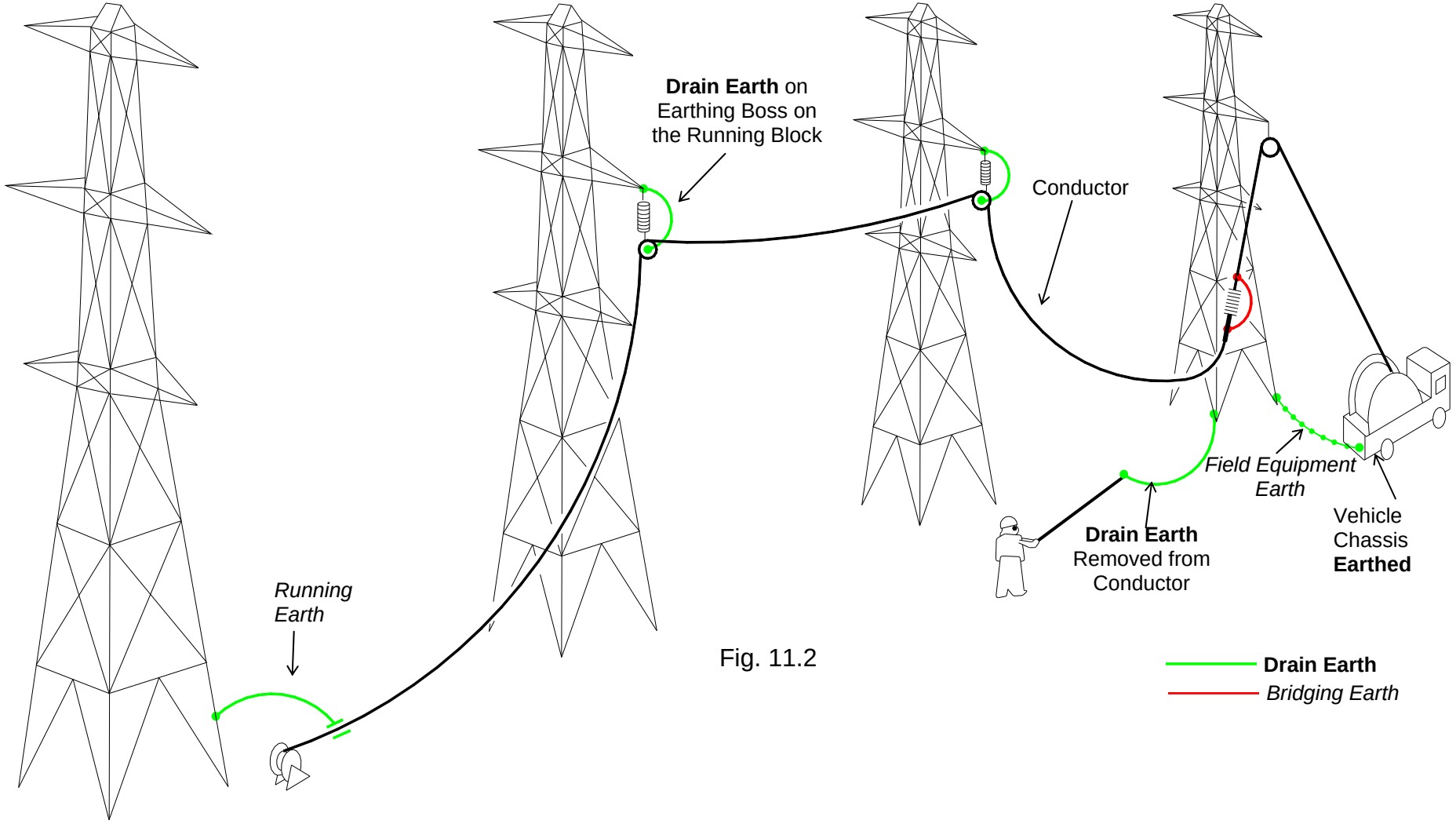


Fig. 11.2

SCHEME 11 (cont'd)

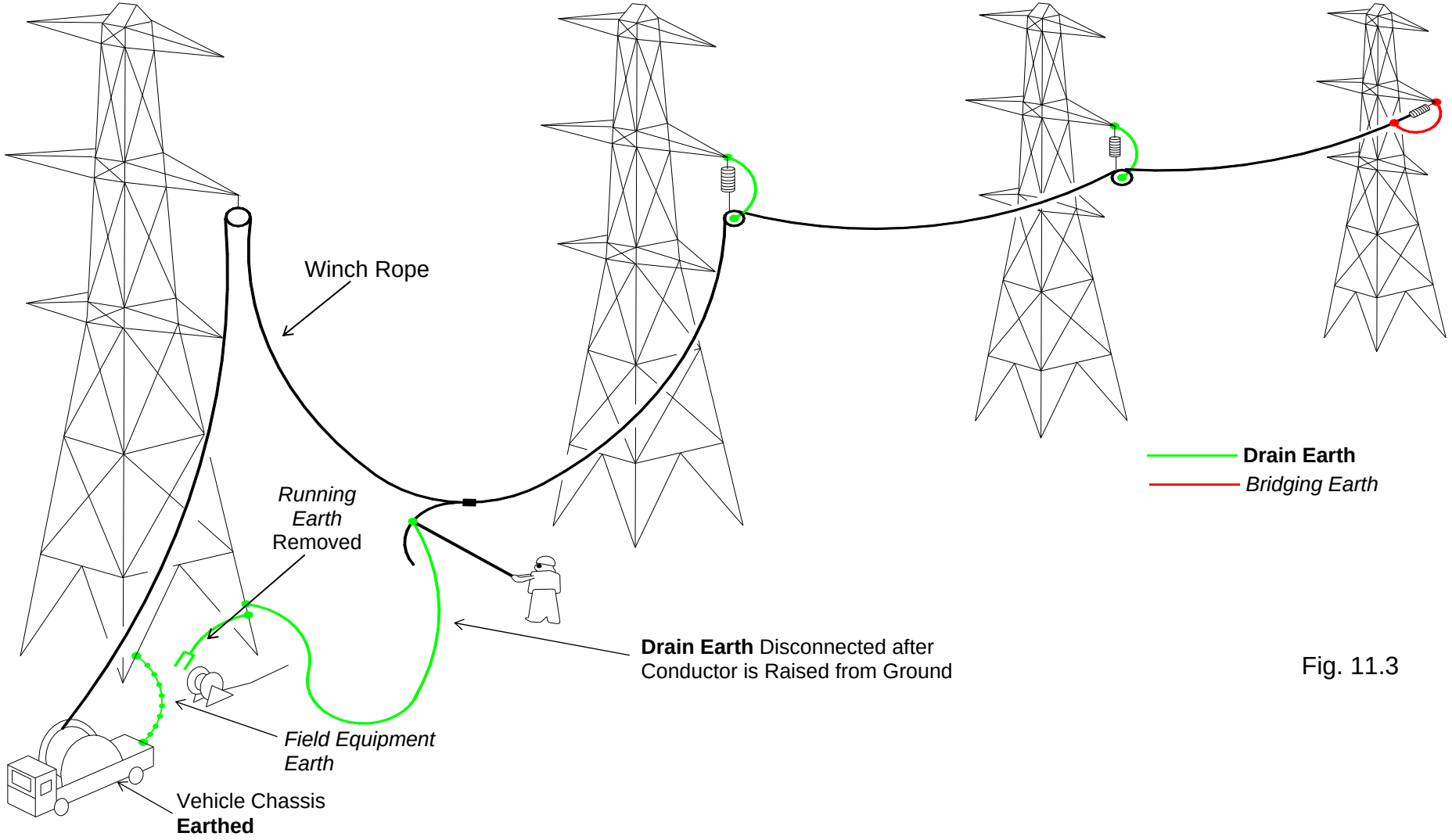


Fig. 11.3

SCHEME 11 (cont'd)

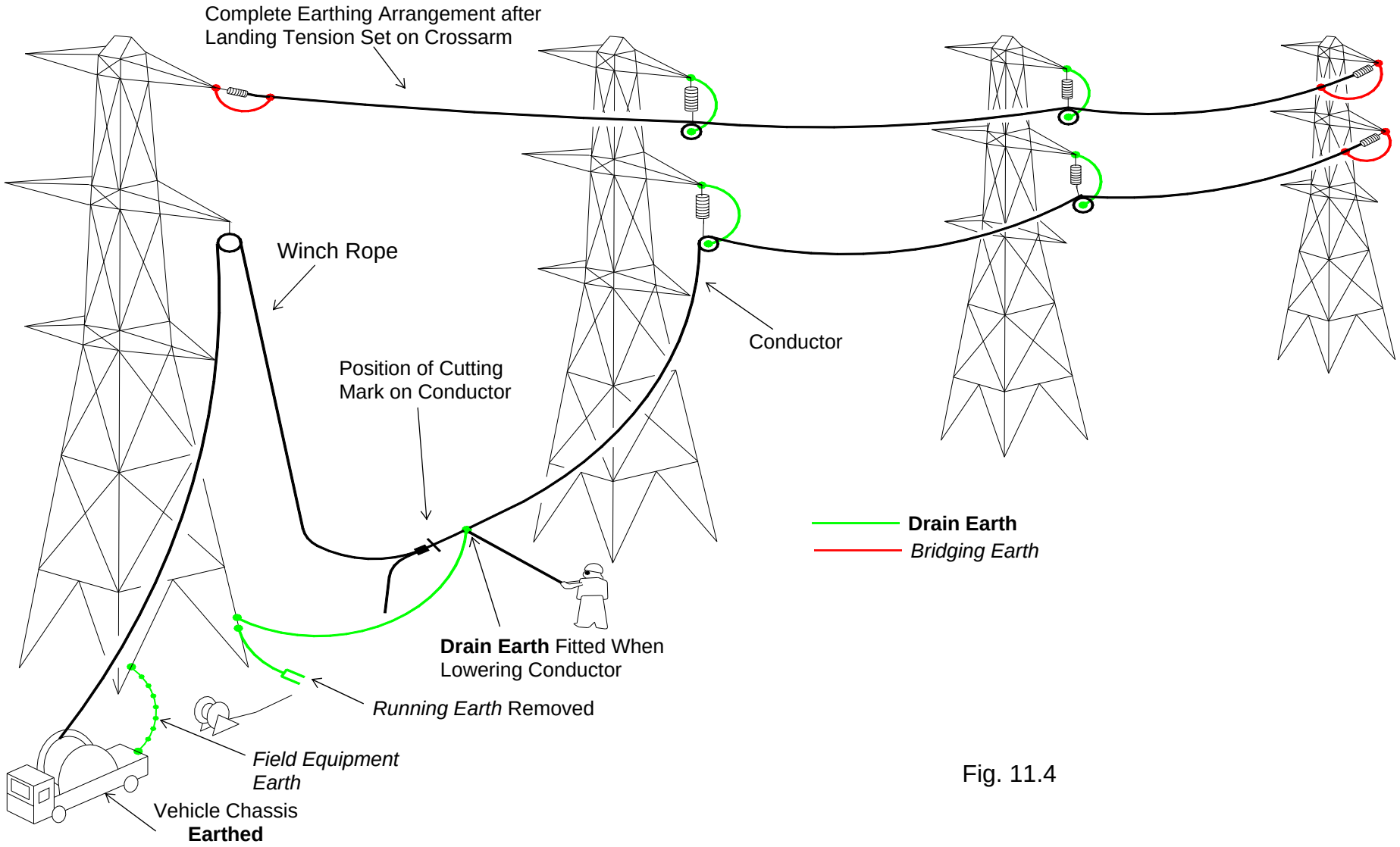


Fig. 11.4

SCHEME 12

WORKING ON CONDUCTORS OR SPACERS FROM A CONDUCTOR TROLLEY

This Scheme details the earthing requirements when landing conductor trolleys on conductors.

1 **Drain Earths** shall be fitted to all conductors on top, middle and bottom phases on towers each side of the span to be worked on.

2 When more than one span is to be worked on during any session, it is permissible for the **Drain Earths** to be fitted at every tension tower, provided the **Drain Earths** are not more than ten spans apart.

3 When fitted at a suspension tower and to enable a conductor trolley to by-pass the insulator sets, the **Drain Earths** shall be fitted to each phase from its supporting crossarm only.

4 On completion of the earthing the conductor trolley(s) may be landed on the phase(s) to be worked on.

5 Whilst in use the wheels of the conductor trolley shall provide an electrical contact with the conductors on which they are running.

6 In the event that egress is required from a trolley to the crossarm of a tower where **Drain Earths** are not already fitted, the *Earthing Party* shall first fit **Drain Earths** to all conductors on the top, middle and bottom phases on that tower.

7 When work has been completed and the conductor trolley and personnel removed from the conductors to a safe position on the tower, the **Drain Earths** may be removed.

SCHEME 13

REPLACEMENT OF A SECTION LENGTH OF CONDUCTOR USING CONTINUOUS TENSION STRINGING METHOD

This Scheme details the earthing requirements when conductors are to be replaced using the continuous tension stringing method and applies to work on any circuit subject to induced voltages from any other **Live** circuit.

1 PREPARATION FOR RUNNING NEW CONDUCTOR

1.1 **Drain Earths** shall be fitted to all conductors of the circuit to be worked on at all towers in the section and at the nearest tower on each side. At tension towers, these **Drain Earths** shall be fitted to the jumpers.

1.2 **Drain Earths** shall then be fitted to the conductor(s) on the line side of the anchor clamp(s) at which the jumper terminal(s) is to be disconnected.

If work is being carried out from an **Approved** insulator access platform, see Scheme 14, otherwise the procedure detailed in Clause 1.3 of Scheme 2 shall be applied.

1.3 At suspension towers, after transferring the conductors into running blocks, the **Drain Earths** on each conductor shall be transferred to the earthing boss on the conductor running block using an **Approved** device from the crossarm.

1.4 When the puller and tensioner machines are in position, *Field Equipment Earths* shall be attached to their chassis and bonded to tower steelwork or to an earthing spike.

1.5 *Running Earths* shall be fitted to the conductor adjacent to the puller and tensioner, and bonded to tower steelwork, an earthing spike, or the earthed puller or tensioner machines.

At the puller, the *Running Earth* shall be applied to the hauling wire rope, or spare length of conductor reeved on to the puller machine, prior to raising it up for connection to the existing conductor. At the tensioner the *Running Earth* shall be applied to the new conductor prior to raising it up the tower for connection to the existing conductor.

1.6 When the conductor is connected continuously between puller and tensioner machines the **Drain Earths** fitted in Clause 1.2 may be removed.

If work is being carried out from an **Approved** insulator access platform, see Scheme 14, otherwise the procedure detailed in Clause 2.5 of Scheme 2 shall be applied and the **Drain Earths** shall be coiled up and secured to the tower crossarm.

2 FITTING OF MID-SPAN JOINTS

2.1 An *Earthing Bridle* shall be fitted in accordance with the procedure in Clause 1.2 of Scheme 9 across the joint position prior to removal of the temporary joint and fitting of mid-span type compression joint.

Where the joint is being made close to the tensioner machine which is **Earthed**, and between the tensioner and the *Running Earth* fitted under Clause 1.5, it is not necessary to fit an *Earthing Bridle* in addition.

3 AFTER RUNNING OUT THE NEW CONDUCTOR

3.1 At tension towers adjacent to the puller and tensioner machines, **Drain Earths** shall be fitted to the conductor before the conductor is cut between the tensioner or puller machines and these towers, or the *Running Earths* adjacent to these machines are disconnected.

For conductors with wedge type anchor clamps, **Drain Earths** shall be fitted to the tower crossarm and applied to the conductor tails which will form part of the jumper.

For conductors with compression type anchor clamps, **Drain Earths** shall be fitted to the tower crossarm and applied to the conductors at the line side of the anchor clamp position and shall not be removed until the jumper is fitted and **Earthed**. If work is being carried out from an **Approved** insulator access platform, see Scheme 14, otherwise the procedure detailed in Clause 1.3 of Scheme 2 shall be applied.

3.2 Clamping-in of conductors at suspension towers shall be carried out in accordance with the procedure detailed in Clause 5 of Scheme 11. **Drain Earths** shall not be removed from towers adjacent to tension towers until the jumpers have been completed and any **Drain Earths** on the line side of anchor clamps have been removed (see Clause 3.1).

4 REMOVAL OF A LENGTH OF OLD CONDUCTOR (SAMPLING)

Where it is required to remove a length of conductor from an existing line for sample analysis the procedure laid down in Scheme 10 shall be used.

5 INSTALLING A CONTINUOUS JUMPER AT TENSION TOWER

5.1 **Drain Earths** shall be applied in accordance with Clauses 1.1 and 1.2.

5.2 **Drain Earths** shall be fitted to conductor running blocks fitted at the tension tower unless the blocks are supported by metallic slings from the crossarms.

5.3 **Drain Earths** fitted under Clause 3.1 at the line end of tension sets may now be removed using the procedure in Clause 1.6.

5.4 After the conductor is run and sagged, the **Drain Earths** shall be fitted to the tower crossarm and applied to the conductor which is to form the jumper, prior to the removal of the running blocks and installation of tension insulator sets at the tower.

SCHEME 14

INSTALLATION AND USE OF APPROVED INSULATOR ACCESS PLATFORM ON TENSION TOWERS

This Scheme details the requirements for **Drain Earths** for the installation and use of an **Approved** insulator access platform on tension towers and applies to work on any circuit subject to induced voltage from any other **Live** circuit.

1 RAISING OR LOWERING THE PLATFORM

1.1 **Drain Earths** shall be fitted in accordance with the procedure detailed in Clause 1.1 of Scheme 2 or Clause 1.2.1 of Scheme 1, as appropriate.

1.2 Prior to hauling out the steel wire winch rope, a *Field Equipment Earth* shall be attached to the chassis of the winch vehicle and bonded to the tower steelwork or to an earthing spike.

1.3 As soon as the platform is raised to the working position and before the winch rope is disconnected, a **Drain Earth** shall be applied to the platform using an **Approved** device from the tower crossarm.

1.4 When the platform is to be lowered and after the steel wire winch rope is connected to the steel wire rope lifting sling on the platform, the **Drain Earth** connection on the platform shall be disconnected using an **Approved** device from the tower crossarm.

2 WORK INVOLVING DISCONNECTION OR CONNECTION OF JUMPERS

When the work involves disconnection or connection of jumpers the following procedures shall be applied after fitting of **Drain Earths** in accordance with the procedure detailed in Clause 1.1 of Scheme 2 and Clause 1.3 above.

Note: This Scheme shall not be used for removal of jumpers to provide electrical isolation - Scheme 5 shall be adopted.

2.1 **Drain Earths** shall be fitted to the conductors on the line side of anchor clamps at which the jumper terminals are to be disconnected or connected.

(i) These **Drain Earths** shall be applied with an **Approved** device* which may be used from the platform.

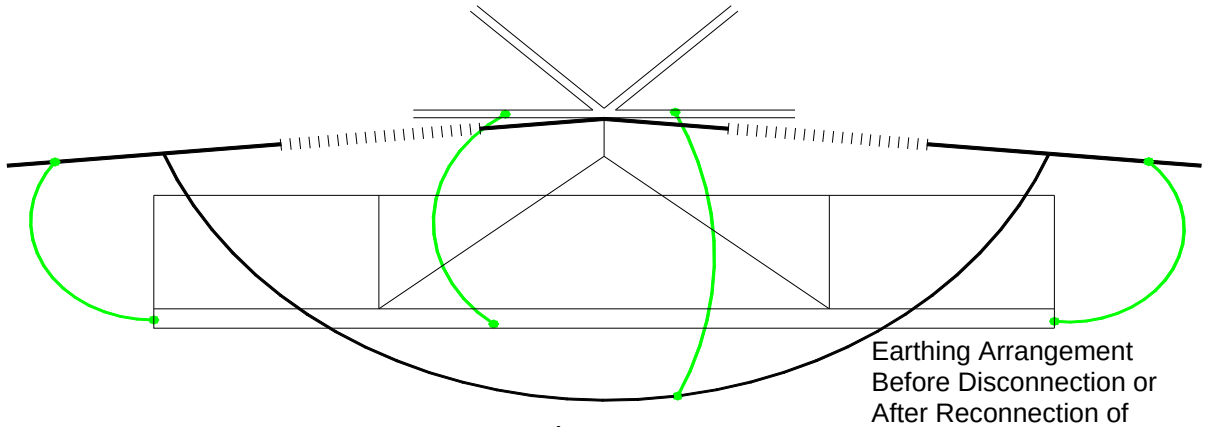
* An **Approved** 600 mm operating pole may be used for this purpose.

(ii) Where these **Drain Earths** are required to be removed before the platform is lowered, the earth-end clamps may be attached to the platform (see Figs. 14.1 and 14.2). On completion of work these **Drain Earths** shall be removed with an **Approved** device* which may be used from the platform; the **Drain Earths** shall be coiled up and secured to the platform before it is lowered.

(iii) Where these **Drain Earths** need to remain when the platform is lowered, the earth-end clamps shall be attached to the crossarm (see Fig. 14.3).

* An **Approved** 600 mm operating pole may be used for this purpose.

SCHEME 14



Earthing Arrangement Before Disconnection or After Reconnection of Jumper

Fig. 14.1

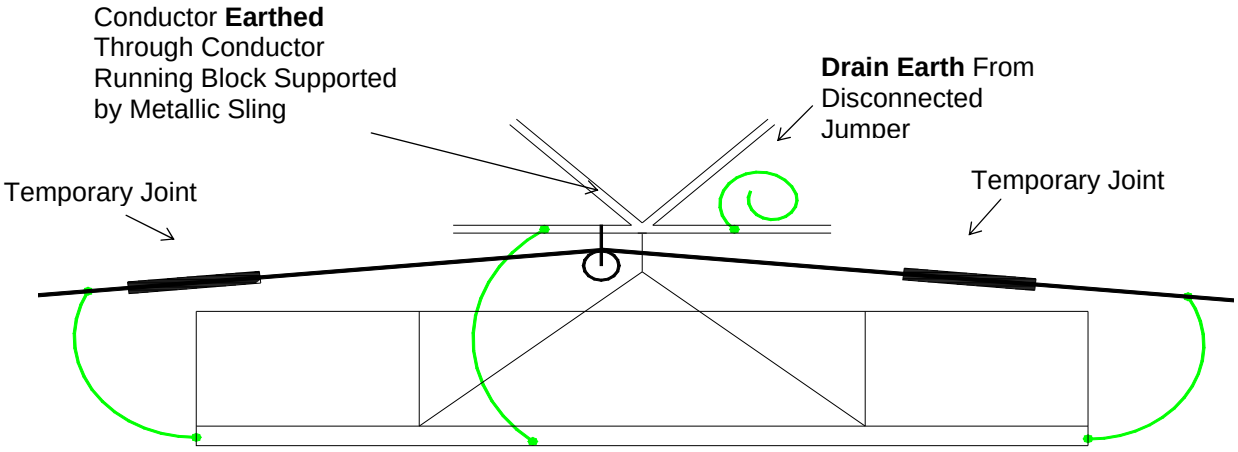


Fig. 14.2

Drain Earth

Earthing Arrangement Prior to Removal of **Drain Earths** From Conductors to be Winched

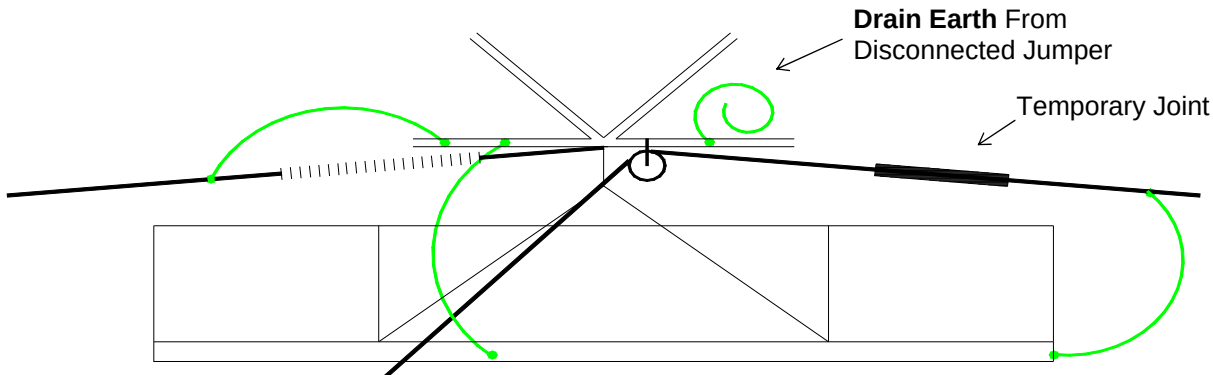
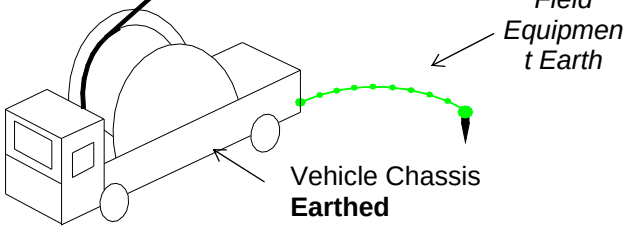


Fig. 14.3

Earthing Arrangement Prior to Removal of **Drain Earth** From Conductor to be Winched



NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 5

[Issue 2]

HIGH VOLTAGE CABLES

Contents **Page**

HIGH VOLTAGE CABLES

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and the Safety Instructions to achieve **Safety from the System** for personnel working on or testing **High Voltage (HV)** cables and ancillary equipment.

Power and auxiliary cables, even when **Isolated** from the **System** and **Earthed**, can be subject to dangerous voltages arising either from parallelism with adjacent **Live High Voltage** circuits or from the passage of high fault currents. The Attachment to this Instruction specifies precautions to be taken when working on cables and ancillary equipment subject to such voltages.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purposes of this document the following additional definition will apply:

Insulated Blanking Plugs – Plugs designed for voltage proofing the vacant socket.

3 IDENTIFICATION

3.1 **Apparatus** associated with the cables on which work or testing is to be carried out shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the work or testing. **SR A8**

3.2 Cables shall be identified at their terminations by means of the permanent identification label on the **Apparatus** to which they are connected or by their appropriate circuit identification.

3.3 At other points on cable runs where work or testing is to be carried out, after positive identification by means of reference to cable records and testing methods in accordance with Clauses 6 and 7 of this Instruction, the cables on which work or testing is to be done shall be marked by paint or tape or similar means which will clearly identify the cable throughout the course of the work or testing. On the completion of the work or testing such identification shall be removed or obliterated.

4 DANGERS

4.1 The main **Dangers** to personnel working on or testing **High Voltage** cables are:

- Electric shock
- Burns
- Asphyxiation
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) Personnel mistaking **HV** cables on which it is not safe to work for those on which it is safe to work under the conditions laid down.

(ii) Voltage differences when the sheath or cores at the point of work are connected to a different earthing area from the one at the point of work, and an earth fault occurs in one of these earthing areas.

(iii) Induced voltages from **HV** circuits which run physically parallel to the cable being worked on carrying fault current, or from the cable being worked on being normally connected to an overhead line circuit.

(iv) Proximity of exposed **Live Apparatus**, other cables or services.

(v) Physical conditions in the vicinity of the point of work due to deep excavations or working at a height.

(vi) Chemicals, gases and fumes from fluxes and other sources.

(vii) The sudden release of oil from pressurised cables.

5 EXCAVATION TO EXPOSE HIGH VOLTAGE CABLES

5.1 In order to safely excavate at the appropriate position, reference shall be made to records of the cable(s) and recognition shall be given to the possible presence of other services. Use should be made of **Approved** detection instruments to determine the position of the required cable(s) and other cables and services.

Allowance should be made for the possibility of errors or inaccuracies in the records, or changes in local geography which have not been recorded and for the possibility of movement of the cable(s) by other Authorities.

5.2 When carrying out excavations for this purpose within the boundaries of a power station or a substation which contains **HV Apparatus** a **Limited Work Certificate** shall be issued. Where Northern Ireland Electricity is not the Occupier, consideration should be given to a possible requirement by the Occupier for other safety documents to be obtained and other safety procedures followed in addition to those which are necessary to comply with the Northern Ireland Electricity rules and procedures.

5.3 Care should be taken in deciding the extent to which mechanical means of excavation may be used, in order to avoid **Danger** from, or damage to, cables or other services.

5.4 If cable tiles or other cable markers or protectors are exposed during excavation, it should not be assumed that they are in their correct position directly above the cable(s) they were originally intended to mark or protect. Previous excavations and careless backfilling may have displaced such cable markers or protectors. The position of a cable is not certain until it is uncovered and identified.

5.5 As excavations progress, precautions should be taken to prevent collapse of the trench or hole by shuttering or similar means. Should the depth of the excavation be such that a fall might bury or strike and injure anyone in, or in the vicinity of, the trench the excavation and surrounding parts shall be suitably supported. Special attention should be given to supporting excavations in the vicinity of walls, particularly retaining walls where a landslip, whether it is initiated by the digging of the trench or not, may cause **Danger**.

In addition to the above precautions, all excavations shall be in compliance with the legislation [1] and any plant, equipment or material that could affect the safety of the excavation shall be inspected in accordance with the current legislation. Any significant defect found at any time shall be reported without delay to the person in charge of the excavation and, where appropriate, it shall be rectified immediately.

5.6 As work progresses, the work area shall be defined and precautions taken to adequately sign, fence, guard and illuminate the area, as necessary, so as to give proper warning of the excavation to employees, the walking public, road users and other persons.

5.7 The excavation should be made large enough to expose all the cables, pipes and ducts necessary to establish the position of the required cable(s).

[1] **Construction (Design & Management) Regulations (NI) 2007**

5.8 Reference should also be made to guidance documentation [2] when excavating to expose **HV** cables.

6 IDENTIFICATION AND PROVING SAFETY FROM THE SYSTEM BEFORE WORKING ON HIGH VOLTAGE CABLES

6.1 Identification Procedures

6.1.1 Cable records should be used to assist in locating the cable to be worked on.

The appropriate cable route records may be used to positively identify cables at locations where there is only one cable present in the immediate geographic area.

The cable shall be **Isolated** and **Earthed** before the sequence given in Clause 6.2.2 below is followed

6.1.2 Where a cable is exposed and can be visibly traced from one termination to the point of work, no additional means of identification is required.

Identification through visual tracing is not acceptable if the cable is hidden from view for any distance, no matter how short.

6.1.3 Where a cable cannot be readily identified as described in Clauses 6.1.1 or 6.1.2 above then it shall be **Isolated** and **Earthed**, a **Sanction for Test** issued and the following procedure should normally be carried out:

(i) The **Primary Earths** at one end may be removed and an **Approved** cable identifier connected to the cable phase conductors to positively identify the cable at the point of work.
In some circumstances the signal from the transmitter may be induced into adjacent cables. A positive identification should be made by exposing the adjacent cables and checking with the receiver which cable has the strongest signal.

(ii) Where it is still not possible to positively identify the cable then, where **Safety from the System** can still be maintained, the signal should be applied to two of the phase conductors free from earth. This may be completed by connecting two phases together at one end, then applying an **Approved** cable identifier across the same two phases at the other end.

[2] Health and Safety Executive guidance document – 'Avoiding Danger from Underground Services' (Ref. No. HSG47)

6.1.4 Where it is not possible to positively identify the cable to be worked on at the point of work, the **Senior Authorised Person** shall notify the **Control Person** that the cable cannot be positively identified and shall cancel the **Sanction for Test**. The sequence given in Clause 6.2.2 shall then be followed.

6.2 Proving Safety From The System

Normally, no work shall be carried out on an **HV** cable unless it has been previously spiked.

6.2.1 Where a positively identified cable is to be spiked the following sequence applies:

(i) The **Authorised Person** in charge of the cable spiking operation shall be in receipt of an appropriate **Sanction for Test**.

(ii) Spiking gun cartridges should be in the custody of the **Authorised Person** prior to the operation.

(iii) An **Approved** spiking gun shall be fitted under the **Personal Supervision** of the **Authorised Person**.

(iv) The **Authorised Person** shall notify the **Control Person** at a Control Centre that it is now his intention to spike the cable.

(v) With any identifier still connected, the cable shall be spiked, normally the spike to remain in position until the cable is cut.

(vi) The **Authorised Person** shall advise the **Control Person** at a Control Centre that the cable has been spiked. The **Control Person** shall log the time of spiking and relate this to any system occurrence of which he may be aware.

(vii) Where applicable the **Authorised Person** shall check for the identifier signal each side of the spike. (The signal should disappear or diminish on the side of the spike remote from the identifier transmitter.)

(viii) Where applicable the **Authorised Person** shall remove any cable identifier and re-apply **Primary Earths** to all phase conductors at the circuit ends, in which he may be assisted by a **Competent Person** under his **Personal Supervision**.

(ix) The cable shall be cut and the spiking gun removed under the **Personal Supervision** of the **Authorised Person** in receipt of the **Sanction for Test**. The **Authorised Person** in receipt of the **Sanction for Test** may decide to first remove the spiking gun to enable the cable to be cut at the point of spiking.

6.2.2 Where there is only one cable present in the immediate geographic area or a cable that cannot be positively identified is to be spiked the following sequence applies:

(i) Cartridges should be in the custody of the **Senior Authorised Person** prior to the operation.

(ii) An **Approved** spiking gun shall be fitted under the **Personal Supervision** of the **Senior Authorised Person**.

(iii) The **Senior Authorised Person** shall notify the **Control Person** at a Control Centre that it is now his intention to spike the cable.

(iv) The cable shall be spiked.

(v) The **Senior Authorised Person** shall advise the **Control Person** at a Control Centre that the cable has been spiked. The **Control Person** shall log the time of spiking and relate this to any system occurrence of which he may be aware.

(vi) The spiking gun shall be removed under the **Personal Supervision** of the **Senior Authorised Person**.

6.2.3 Cable phase identification if required shall be carried out under a **Sanction for Test**.

7 DISPENSATION FROM SPIKING

7.1 In exceptional circumstances, where spiking is not be carried out, the "Request for Outage and/or Programmed Work" form shall be endorsed as follows:

7.1.1 "No cable spiking will be carried out";

and, where appropriate,

7.1.2 "Cable not to be opened".

7.2 In such cases, before the Request for Outage and/or Programmed Work form is sent to the Control Centre, a **Senior Authorised Person** shall be satisfied that the reasons for not spiking are acceptable and shall endorse the system outage request to signify his agreement. The **Senior Authorised Person** shall, where applicable, state the method of proving terminal **Apparatus** not to be **Live** on the "Request for Outage and/or Programmed Work" form.

Examples where spiking may be omitted are:

7.2.1 Pressure assisted cables.

7.2.2 Work at a termination where a **Primary Earth** is applied or the terminal **Apparatus** has been proved not to be **Live** and is clearly identified.

7.2.3 The cable can be visually traced over its whole length from the point of work to a termination where a **Primary Earth** is applied or the terminal **Apparatus** has been proved not to be **Live** and is clearly identified.

7.2.4 A point on the cable which has previously been identified and the conductors worked on, after which work this cable has not been made **Live**.

7.2.5 Moving **HV** cables.

7.2.6 When a **HV** cable is to be repaired or in circumstances where it is not desirable to spike the cable.

7.2.7 A newly laid **HV** cable that has not been energised. If there is any doubt over the cable identification it shall be spiked.

7.3 Where cable spiking is not carried out, the cable shall be opened under the **Personal Supervision** of the **Senior Authorised Person** issuing the **Safety Document**.

8 WORK ON HIGH VOLTAGE CABLES

8.1 Work shall not commence on any **HV** cable unless the **Person** in charge of the work is in receipt of a **Safety Document** and has been personally instructed at the point of work by the **Senior Authorised Person** issuing the **Safety Document**.

8.2 Unless the work is restricted to that which can be done under a **Limited Work Certificate**, the circuit shall be **Isolated** and **Primary Earths** fitted where reasonably practicable between all points of isolation and the point of work and, dependent on the requirements of Clause 8.3, a **Permit for Work** issued. **SR A3**

8.3 When any **HV** cable is to be cut or any **HV** cable joint or chamber opened, the **Senior Authorised Person** issuing the **Safety Document** shall identify the cable, joint or chamber as that covered by the **Safety Document** and on which it is safe to work. Identification and proving 'dead' shall be carried out in accordance with Clauses 6 and 7.

Where removal of **Primary Earths** is necessary to enable electrical identification tests to be carried out, a **Sanction for Test** shall be issued and the issue of a **Permit for Work** deferred until completion of the tests and the cancellation of the **Sanction for Test**.

8.4 Work on cables which connect two separate earthing systems or where there is a need to protect **Persons** against dangerous induced voltages or differences in earth potential, should be carried out in accordance with the Attachment to this Instruction after a **Safety Document** has been issued.

8.5 When work is to be done on an **HV** cable or cable terminations and that cable lies wholly within one earthing system and the cable is directly connected to an overhead line, **Danger** from induced voltage on the overhead line may be excluded from the cable by using the following procedure after issuing a **Permit for Work** for its execution:

8.5.1 **HV** cable or remote termination -

Apply **Drain Earths** at the cable sealing ends.

8.5.2 **HV** cable termination at connection with the overhead line -

(i) Apply **Drain Earths** at the cable sealing ends and on the overhead line circuits at a point as close as practicable to the terminal tower or support structure.

(ii) Remove the cable/overhead line circuit connections between the applied **Drain Earths**.

(iii) Remove the **Drain Earths** from the cable sealing ends.

9 GENERAL REQUIREMENTS FOR TESTING HV CABLES

9.1 Where applicable, testing on any **HV** cable shall be in accordance with SRI 11 - 'Testing High Voltage Apparatus'. Testing shall not commence unless the **Person** in charge of the testing is in receipt of a **Safety Document**.

10 WITHDRAWABLE CABLE PLUGS

10.1 HV Cables connected to **Plant** / **Apparatus** using cable plug connections or similar shall where practicable be readily identifiable, using the designated cable identification or associated switchgear identification, or have fixed to it a means of identification that shall remain effective throughout the period of work or testing. Where fitted, continuous voltage indicators shall be utilised, these shall where reasonably practicable be tested before and after use, and left in place on the adjacent **Live** cables.

10.2 Withdrawal and insertion of the withdrawable cable plugs from **Plant** / **Apparatus** with multiple or single connections to a common point, i.e. a shared circuit breaker, isolator or cable end box, shall be carried out under a **Permit for Work** with all associated **Plant** / **Apparatus Isolated** and **Earthed**. Work on the cable ends, cable plug connections or cable repair close to the termination etc., can be carried out under this **Permit for Work**.

10.2.1 If the withdrawal of the cable plugs is to create a point of isolation, then the work to be done shall include the fitting of *Insulated Blanking Plugs* and the application of an **Earthing Device** to the withdrawn cable plugs. The **Senior Authorised Person** shall cancel the **Permit for Work** and inform the **Control Person**. The **Control Person** shall confirm Isolation, which shall be the *Insulated Blanking Plugs*. On confirmation of Isolation, i.e. **Caution Notice**(s) applied, the **Control Person** shall confirm **Primary Earth** applied to the withdrawn cable plugs, Primary Earth band applied. On confirmation of Earthing, a **Permit for Work** can now be issued for the associated work for which the cable plugs where withdrawn, the other associated **Plant** / **Apparatus**, on which work is not to take place, may now be restored to service.

10.2.2 If the **Primary Earth** is to be removed for the purposes of testing, then the **Permit for Work** shall be cancelled and a **Sanction for Test** issued. The application and removal of the **Primary Earth**, under the **Sanction for Test**, shall be carried out by or under the **Personal Supervision** of a **Senior Authorised Person**.

10.2.3 On completion of the work for which the cable plugs were withdrawn the **Permit for Work** shall be cleared and cancelled. The conditions in 10.2 shall be established on the associated **Plant** / **Apparatus**; prior to the issue of the **Permit for Work** to insert the cable plugs the **Control Person** shall confirm that the Primary Earth Band has been removed, and then that the **Caution Notice**(s) at the *Insulated Blanking Plugs* are removed. The **Permit for Work** to insert the cable plugs can now be issued, the work to be done shall include the removal of the **Earthing Device** from the cable plugs and removal of the *Insulated Blanking Plugs*. On completion of the work the **Permit for Work** can be cleared and cancelled, the **Senior Authorised Person** shall confirm the condition of the **Plant** / **Apparatus** to the **Control Person**.

10.3 Where cable Isolators and Earth Switches, i.e. (*/2 & */3), are installed then it is not generally required to withdraw and insert the cable plugs. Work on the cable plugs, Pfisterer connections or cable repair close to the termination etc., which requires withdrawal and insertion shall be part of the work to be done on the **Permit for Work**, with Isolation and Earthing at the */2 or */3 Isolator and Earth Switch at that point and at any remote connected **Location**.

10.3.1 If testing is required, where */2 & */3 Isolators and Earth Switches are installed, then any **Permit for Work** shall be cancelled and a **Sanction for Test** issued. It may be necessary to withdraw and insert the cable plugs for the purposes of the testing for the following reasons; due to the lack of test probes, due to significant additional switching as */2 or */3 Earth Switches are interlocked with the Circuit Breaker Earth Switch or due to switchgear manufacturers directive not to unduly stress the switchgear, or as determined by the **Sanction for Test** recipient. The withdrawal and insertion for this purpose can be undertaken under the conditions of the **Sanction for Test**. On completion of testing the **Senior Authorised Person** shall confirm the condition of the **Plant** / **Apparatus** to the **Control Person**.

ATTACHMENT

[Issue 1]

TO

SAFETY RULES INSTRUCTION SRI 5

INDUCED VOLTAGE WORKING

1 FOREWORD

A cable which has been isolated from the system can become live with dangerous high voltages by induction from adjacent cables, overhead lines or by natural phenomena. These induced voltages are most severe when high fault currents flow in the inducing circuits.

Differences in earth potential can also occur during fault conditions and these can appear at the point of work between any conducting components such as conductors, sheaths, metallic pipes, etc., and also between these components and the local earth.

High voltage gradients can also appear across any break in a conductive path when that path is isolated and earthed at its remote ends.

Danger from such voltages can be eliminated by the use of approved earthing procedures or by the provision of an insulated work environment.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purpose of this Attachment, the following additional definitions apply:

(i) *Induced Voltage Working* - the method of working which employs the procedures set down in this Instruction to protect persons against dangerous induced voltages or differences in earth potential.

(ii) *Earthed Working* - the method of working where all **Apparatus** and conductive materials which are exposed in the work area are effectively bonded together and **Earthed** at the point of work.

(iii) *Insulated Working* - the method of working where the **Person**, using **Approved** equipment, is insulated from contact with objects at different potentials.

(iv) *Adequate Earth* - a common point of connection for establishing an equipotential throughout the area of work.

(v) *Bridging Earth* - a form of **Drain Earth** applied at *Link Boxes*, joint bays or other points of work to provide an efficient connection to earth or to eliminate differences in potential. *Bridging Earths* include Triflex and Uniflex earths.

(vi) *Link Box* – a link box, kiosk or pillar containing cable sheath disconnecting links and/or Sheath Voltage Limiters (SVLs).

(vii) *Cautionary Notice* - a notice reading 'Safety Precautions have been taken to conform to SRI 5 for work on cables'.

3 APPLICATION

3.1 This Attachment supplements the requirements of SRI 5 and shall be applied, as appropriate, for work or testing on power or auxiliary cables where there is a possibility that such cables could be subject to dangerous voltages arising either from induced voltages from parallel circuits or from the passage of high fault currents.

3.2 This Attachment need not be applied in any of the following circumstances:

(i) Where it has been established by calculation, test or existing knowledge that there is no possibility of dangerous voltages arising;

(ii) When all adjacent circuits are limited to **Systems** having resistance earthing in which the fault level does not exceed 2.5kA;

(iii) When working on British Telecom cables where other codes of practice apply.

When considering (i) above, two conditions pertaining to electromagnetic induction and rise in earth potential can arise and the appropriate recommended voltage limits are:

(a) 60 volts for steady state, i.e. continuous induced voltages.

(b) 650 volts for fault conditions where the fault current can be cleared within 0.2s or 430 volts where clearance times are more than 0.2s.

3.3 Precautions relating to *Induced Voltage Working* are not generally required when working on **HV** cables sited wholly within one **Earthed System**. However, there are situations where the circuit configurations within the same **Earthed System** can, under certain conditions, produce induced voltages in excess of the recommended limit and each **Location** shall therefore be assessed accordingly.

3.4 It should be noted that it is possible for induced voltages to appear on the terminal connections and sheath of, for example, an **HV** motor cable which runs physically parallel and close to other **HV** single core cables when a fault occurs on one of them. The magnitude of the induced voltages will be mainly dependent on:

(i) The value of fault current.

(ii) The length of the physical parallel run.

(iii) The path of the return fault current.

3.5 Where *Induced Voltage Working* is necessary:

3.5.1 For power cables, *Earthed Working* should generally be applied but where this is not reasonably practicable, or is undesirable, *Insulated Working* may be adopted as an alternative.

3.5.2 For auxiliary cables, as it is impracticable to develop effective means for earthing the conductors which can be guaranteed to sustain the passage of the resulting high value of induced current, *Insulated Working* should generally be applied. However, at non-insulated, metalclad terminal boxes a combination of *Insulated Working* and *Earthed Working* may have to be employed.

4 PHILOSOPHY OF CABLE AND SHEATH EARTHING REMOTE FROM THE POINT OF WORK

4.1 Where it can be shown that *Induced Voltage Working* is not necessary, earths would normally be applied to the cable cores at each end. There would be no specific requirements for earthing the cable sheaths or re-arrangement of cable sheath bonding links remote from the point of work.

4.2 Where *Induced Voltage Working* is necessary, the normal method should be for earths to be applied and maintained on the cable cores at each end and within the **Isolated** zone. However, it is recognised that safe working conditions can still be achieved by adhering to the Schemes set out in this Attachment, but with the cable cores being 'earth free' at each end, by the cables being physically disconnected from the earths applied at the points of isolation. Regardless of the method used, there would be no specific requirement for cable sheath earthing or re-arrangement of cable sheath bonding links remote from the point of work, except when changing *Link Boxes*.

5 APPROVED EQUIPMENT

5.1 All equipment used shall be of a type that is **Approved** by Northern Ireland Electricity.

5.2 As an alternative to the use of an Insulated Platform use may be made, as appropriate, of a combination of at least two of any of the following **Approved** items:

(i) Insulating mat

(ii) Insulating boots

(iii) Insulating gloves

(iv) Insulated tools.

5.3 All equipment shall be inspected for damage or defect before use and any equipment found faulty shall immediately be withdrawn from service.

6 WORK ON HIGH VOLTAGE CABLES UNDER INDUCED VOLTAGE CONDITIONS

6.1 The relevant precautions set down in SRI 5 - Clauses 3 - 'Identification'; 5 - 'Excavation to Expose High Voltage Cables'; 6 - 'Identification and Proving Safety from the System before Working on High Voltage Cables'; 7 - 'Dispensation from Spiking' and 8 - 'Work on High Voltage Cables' - shall be observed.

6.2 It is recommended that as many low impedance connections as practicable be established between terminal station earths. Such connections may be by a conductor or sheath of the circuit on which work is being carried out.

6.3 If the work area has no local earth, an earth rod(s) sufficient to provide an *Adequate Earth* shall be installed adjacent to the point of work and the rod(s) then efficiently connected to a common earth bar. Any subsequent earthing to the cable shall be taken from this bar.

6.4 If any part of the work is to be carried out using *Earthed Working*, an earth mat, connected to the common earth bar, shall be provided to extend outside the work area at the point of access for a distance of at least one metre. All exposed cable sheaths, metallic pipes, bracings, etc., shall be connected to the common earth bar (see Fig. 1).

6.5 If the work is to be carried out using *Insulated Working*, the precautions given below shall be applied.

6.5.1 With the exception of the conductors or sheaths to be worked on, all exposed metallic pipes, bracings, etc., within the work area and with which contact is possible, shall be wrapped with suitable insulation and an Insulated Platform provided when required within the work area (see Fig. 2).

6.5.2 Before using an Insulated Platform, the insulation resistance shall be measured across the supporting insulators connected in parallel. The resistance shall be not less than 10 megohms measured with a 1kV 'Megger'.

6.5.3 In damp environments where it would not be possible to obtain the required insulation level under the prevailing conditions, a dry environment shall be created at the point of work to achieve the required insulation level.

6.5.4 Under conditions of induced voltage or rise of earth potential, the potential of the work area earth system may rise above that of the local mass of earth. If metallic connections such as cables or pipes extend from within the work area earth system to equipment outside that earth system, a hazard could exist to persons inside and outside the work area. All such metallic connections shall have an insulating section so that a person cannot make simultaneous contact with two earth systems. A typical **HV** cable joint bay situation is shown in Fig. 3.

6.5.5 Metalwork on the work area side of the insulating section shall be connected to the common earth bar. Metalwork on the external side of the insulating section shall be connected to a separate, external earth system.

6.5.6 External insulation should be applied to exposed metalwork and pipes near the boundary of the work area earth mat so that persons in contact with the earth mat cannot make simultaneous contact with metalwork connected to the separate, external earth system. Alternatively, the earth mat near the boundary can be covered with an insulating mat.

6.5.7 **Persons** carrying out *Insulated Working* shall not accept materials from, or make physical contact with, any person(s) not in the same insulated environment.

6.6 Electrical supplies into the work area shall be via an isolating transformer.

6.7 Work should now proceed in accordance with the relevant Scheme.

7 ADDITIONAL REQUIREMENTS FOR TESTING HIGH VOLTAGE CABLES

7.1 Where conductor dielectric testing is necessary, the joint barriers and any Sheath Voltage Limiters (SVLs) fitted in *Link Boxes* along the route should be short circuited and **Earthed** for the period of the tests (see Fig. 4).

7.2 When testing oversheaths and joint barriers on insulated sheath systems and *Induced Voltage Working* is not required, any SVLs fitted in *Link Boxes* along the route should be disconnected for the period of the tests. The SVLs may then also be tested.

7.3 Before cancelling the final **Safety Document**, the **Senior Authorised Person** should satisfy himself that all links and earthing arrangements are returned to the correct operational mode.

8 WORK ON, OR TESTING AT, POWER CABLE SHEATH DISCONNECTING LINK BOXES UNDER INDUCED VOLTAGE CONDITIONS

8.1 The relevant precautions set down in SRI 5 - Clauses 3 - 'Identification'; 6 - 'Identification and Proving Safety from the System before Working on High Voltage Cables'; 7 - 'Dispensation from Spiking'; 8 - 'Work on High Voltage Cables' and 9 - 'General Requirements for Testing HV Cables' - shall be observed.

8.2 In some cases the carcase of a *Link Box* may be **Earthed** to a local earth and not connected to the earth associated with the cable sheaths. Before work is carried out on the cable sheath disconnecting links and SVL connections in these *Link Boxes*, the two earths shall be connected together using *Insulated Working*.

8.3 Where the terminal pillars of the *Link Box* are provided with special connecting points for the attachment of *Bridging Earths*, these earths shall be applied and removed by means of an Operating Pole or utilizing *Insulated Working*. The cable sheath disconnecting links and SVL connections may be adjusted as required once *Bridging Earths* are applied to all the terminal pillars.

8.4 Where the terminal pillars of the *Link Boxes* are not provided with special connecting points for attachment of *Bridging Earths*, *Insulated Working* shall be utilized for the application and removal of *Bridging Earths*, the adjustment of sheath disconnecting links, the adjustment of SVL connections or the fitting of an Adapter Plate (see Clause 12).

8.5 Where reasonably practicable, *Link Boxes* should be **Locked*** after each operation and a *Cautionary Notice* attached. The notice should not be removed until work has been completed, the links returned to the normal operating position and the box finally **Locked**.

* It is recommended that all *Link Boxes* on a circuit are fitted with a lock of the same series unique to the circuit. This facilitates identification of the *Link Box* with the circuit.

8.6 Where it is not possible to connect the earth-end fitting of the *Bridging Earth* to the earth pillar or to the external earth connections of the *Link Box*, the fitting should be connected to a supplementary earth rod driven as closely as possible to the *Link Box*.

8.7 Work or testing should now proceed in accordance with the relevant Scheme.

8.8 Before cancelling the final **Safety Document**, the **Senior Authorised Person** should satisfy himself that all links and earthing arrangements are returned to the correct operational mode.

9 GENERAL REQUIREMENTS FOR WORK OR TESTING ON AUXILIARY CABLES

9.1 The relevant precautions set down in SRI 5 - Clauses 3 - ‘Identification’ and 5 - ‘Excavation to Expose High Voltage Cables’ - shall be observed.

9.2 Where it has been determined that *Induced Voltage Working* does not apply, work or testing should be carried out in accordance with SRI 13 - ‘Low Voltage Apparatus’.

10 WORK OR TESTING ON AUXILIARY CABLES UNDER INDUCED VOLTAGE CONDITIONS

10.1 The relevant precautions set down in SRI 5 - Clauses 3 - 'Identification' and 5 - 'Excavation to Expose High Voltage Cables' - shall be observed.

10.2 Work or testing should be carried out in accordance with SRI 13 - 'Low Voltage Apparatus' and a **Senior Authorised Person** shall issue a **Safety Document** or give appropriate instructions on the manner of work or testing.

10.3 For auxiliary cables it is considered impracticable to develop effective means for earthing the conductors which can be guaranteed to sustain the passage of the resulting high value of induced current. Therefore *Insulated Working* should generally be applied for work or testing on the conductors except at non-insulated, metalclad terminal boxes where a combination of *Insulated Working* and *Earthed Working* may have to be employed.

10.4 Prior to any work or testing on the conductors, *Insulated Working* should be used to ensure the following:

10.4.1 At terminations at each end of the section to be worked on, the conductors in that section shall be **Isolated** from the terminal equipment and bonded together, if required. Unless the termination is the point of work, a *Cautionary Notice* shall be displayed and, where reasonably practicable, the terminal box **Locked**.

10.4.2 At terminations within the section to be worked on, for example oil points, the conductor terminations may be left in situ provided a *Cautionary Notice* is displayed at these positions and, where reasonably practicable, the terminal boxes **Locked**.

10.5 Depending on the work or testing to be done as detailed in the appropriate Schemes, the relevant precautions set down in Clauses 6.3, 6.4 and 6.5 shall be observed.

10.6 Work or testing should now proceed in accordance with the relevant Scheme.

11 USE OF BRIDLING BAR

This Clause sets down the procedures for using the Bridling Bar for earthing and through-bonding of conductors or cable sheaths. The Bar can be used attached to, or detached from, the Insulated Platform, as required.

11.1 USE OF BRIDLING BAR FOR EARTHING

11.1.1 When using *Insulated Working*, immediately prior to the application of a *Bridging Earth*, there could be **Danger** to the **Person** holding the *Bridging Earth* in one hand and touching, with another part of the body, a conductor or sheath subject to induction. To avoid this, a Bridling Bar attached to, but insulated from, the Insulated Platform provides an intermediate bonding point with the local earth system.

11.1.2 The *Bridging Earth* shall first be attached to the conductor or sheath to be **Earthed**, care being taken to ensure that no part of the *Bridging Earth* is allowed to come into contact with earth or any other conducting material. The free end of the *Bridging Earth* is then attached to the Bridling Bar using an **Approved** Operating Pole.

11.1.3 If at this stage the Bridling Bar is not connected to a common earth bar a connection shall be made, the connection first being applied to the common earth bar and then to the Bridling Bar using the Operating Pole.

This operation shall NOT be carried out by a **Person** on the Insulated Platform.

11.2 USE OF BRIDLING BAR FOR 'THROUGH BONDING'

11.2.1 Using *Insulated Working*, *Bridging Earths* shall first be attached to the conductors or sheaths to be bonded, care being taken to ensure that no parts of the *Bridging Earths* are allowed to come into contact with earth or any other conducting material. The free ends of the *Bridging Earths* are then attached to the Bridling Bar using the Operating Pole.

Note: The removal of connections from the Bridling Bar shall be carried out in the reverse order to that in which they were applied.

12 USE OF ADAPTOR PLATE

The Adaptor Plate is designed to facilitate the earthing of cable sheaths and the testing of cable sheaths and barrier joints at *Link Boxes* which do not meet the requirements of CEGB TDC 539. The use of the Adaptor Plate also obviates the need for Triflex Earths.

All operations involved in the fitting, use and removal of the Adaptor Plate shall be carried out under *Insulated Working* conditions using **Approved** insulated tools and Operating Poles, as appropriate.

12.1 USE OF ADAPTOR PLATE FOR EARTHING CABLE SHEATHS

12.1.1 Before application the Adaptor Plate should be carefully examined to ensure that it is clean and free of moisture, that all slide bars are secured in the 'Sheath to Earth' position and the lifting attachment is securely fitted.

12.1.2 After attaching one end of a Uniflex Earth to the Adaptor Plate earthing bar, the free end of the Uniflex Earth should be connected to the *Link Box* earthing system.

12.1.3 Disconnect the SVLs from the *Link Box* pillars.

12.1.4 Remove all links from the *Link Box*, place the Adaptor Plate over the *Link Box* pillars and secure the Plate to the pillar studs.

All cable sheaths connected to the *Link Box* are now **Earthed**.

12.2 USE OF ADAPTOR PLATE FOR TESTING CABLE SHEATHS AND BARRIER JOINTS

12.2.1 After completing the above procedure, the slide bar connections on the Adaptor Plate may be adjusted as necessary and test voltages applied to the cable sheaths through the Adaptor Plate test bar.

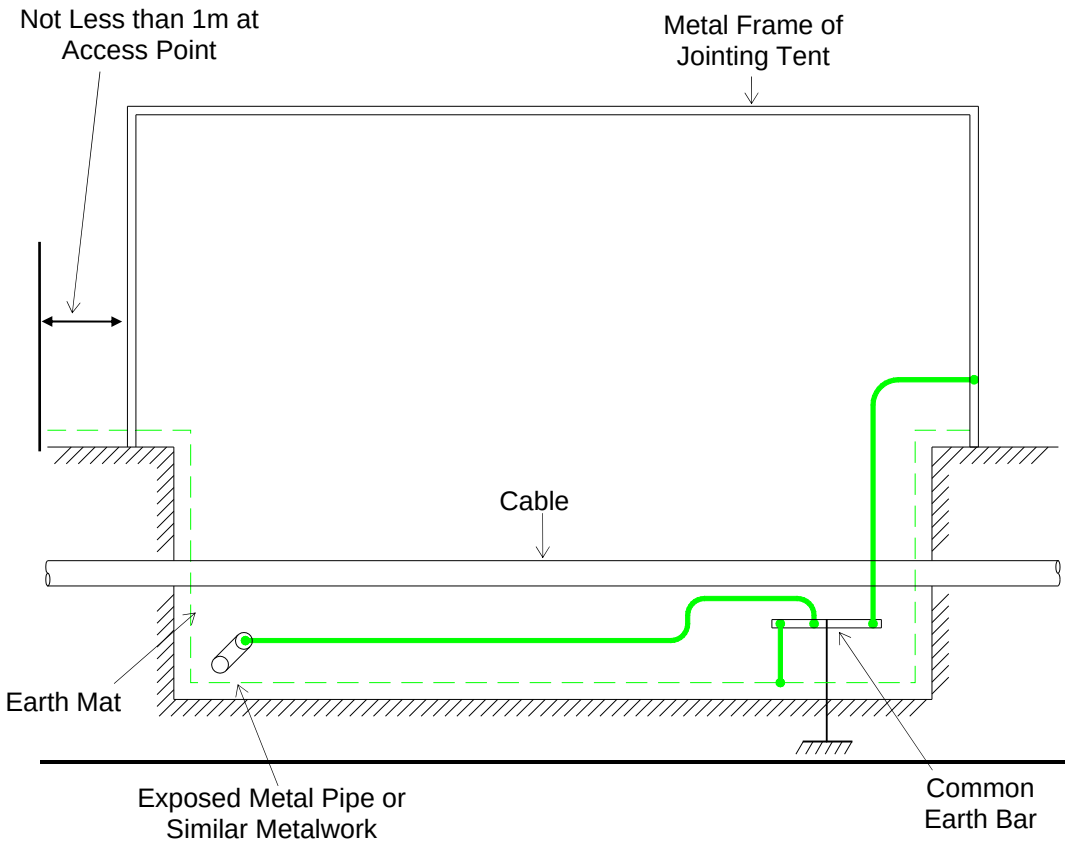

Not Less than 1m at
Access Point
Metal Frame of
Jointing Tent
Cable
Earth Mat
Exposed Metal Pipe or
Similar Metalwork
Common
Earth Bar

Fig. 1

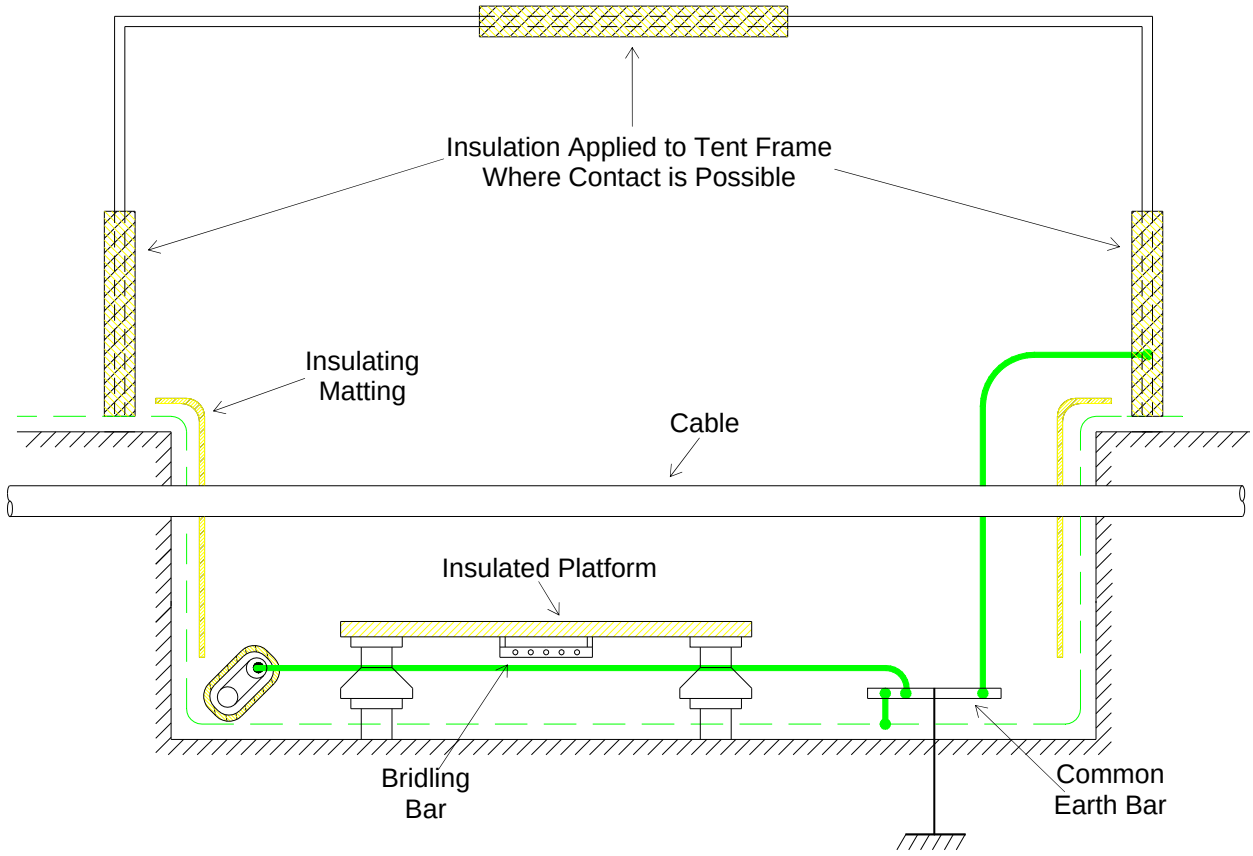

Insulation Applied to Tent Frame
Where Contact is Possible
Insulating
Matting
Cable
Insulated Platform
Bridling
Bar
Common
Earth Bar

Fig. 2

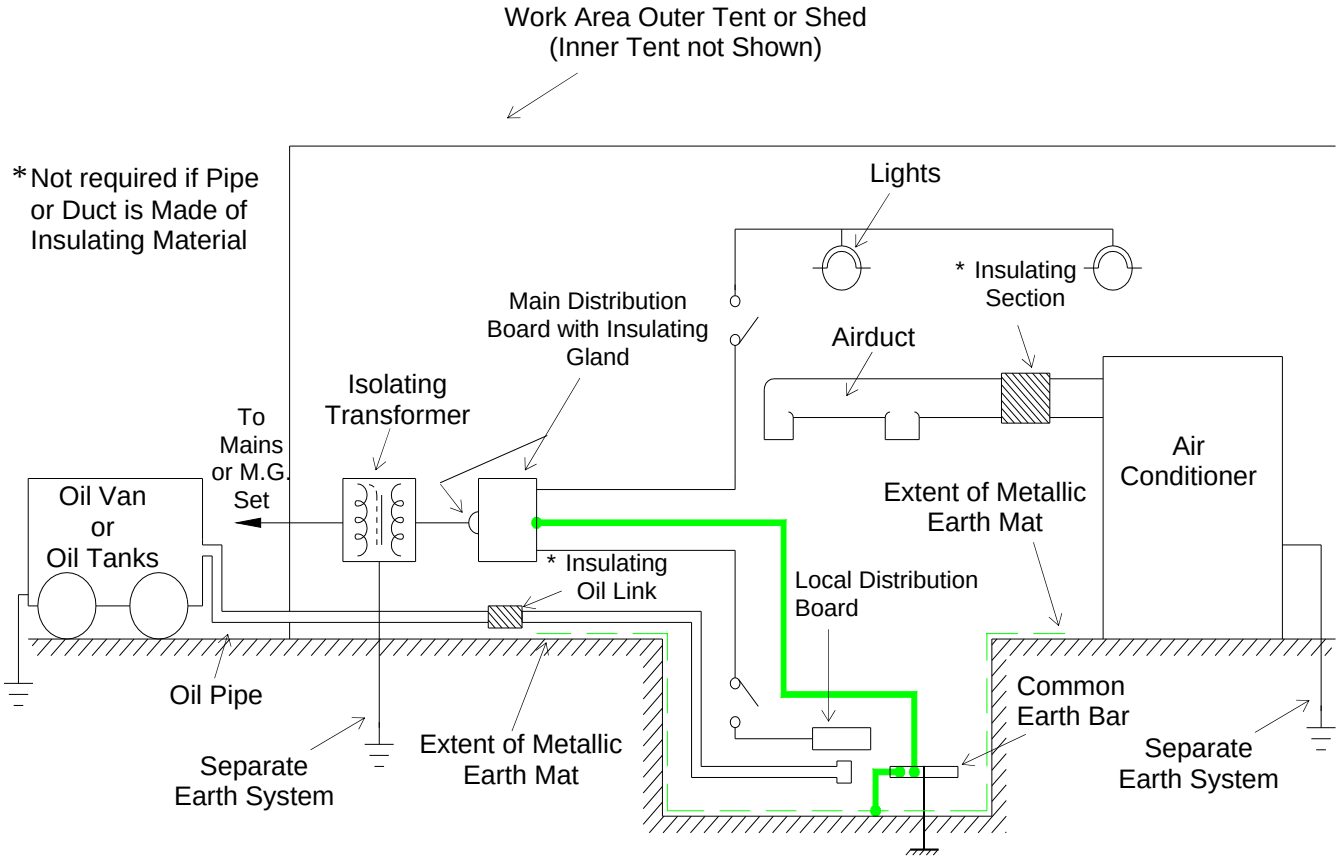
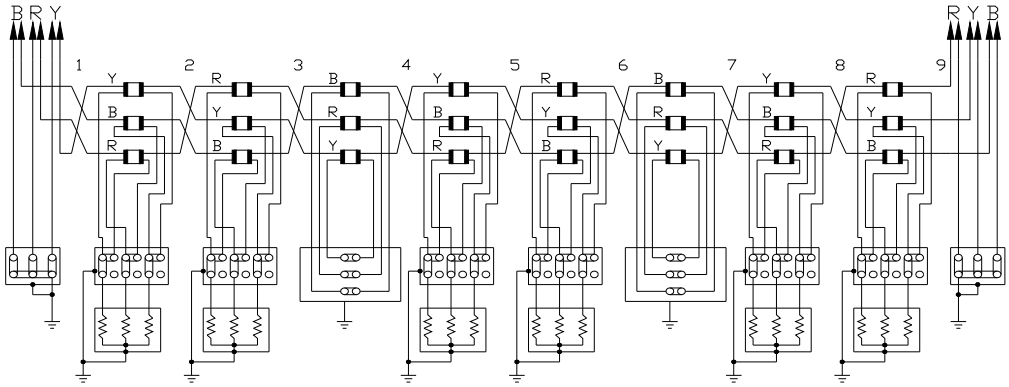
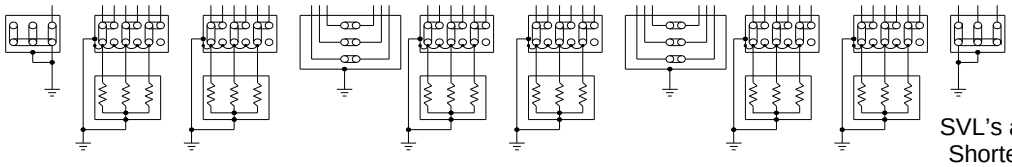

Work Area Outer Tent or Shed
(Inner Tent not Shown)
*Not required if Pipe or Duct is Made of Insulating Material
Lights
* Insulating Section
Main Distribution Board with Insulating Gland
Airduct
Isolating Transformer
To Mains or M.G. Set
Air Conditioner
Oil Van or Oil Tanks
Extent of Metallic Earth Mat
* Insulating Oil Link
Local Distribution Board
Common Earth Bar
Oil Pipe
Separate Earth System
Extent of Metallic Earth Mat
Separate Earth System

Fig. 3



NORMAL OPERATING ARRANGEMENT



SVL's and Sheaths Shorted Together and Earthed

ARRANGEMENT FOR VOLTAGE TESTING

Fig. 4

INDEX OF SCHEMES

SCHEME 1

OVERSHEATH AND JOINT BARRIER TESTS ON POWER CABLES

This Scheme supplements the relevant requirements of SRI 5 to enable testing of oversheaths and joint barriers on power cables.

1 Utilizing the appropriate procedures detailed in Section 7 of this Attachment the following operations should be carried out:

1.1 Where cross-bonded or single point bonded **Systems** are equipped with Sheath Voltage Limiters (SVLs) they shall be disconnected from the terminal pillars of the minor *Link Boxes* of the major section to be tested.

1.2 The metallic sheaths of the section under test should then be disconnected from earth at the major section *Link Box* remote from the point of test by removing the links. The terminal pillars associated with the adjacent major section shall be **Earthed** by *Bridging Earths* in this remote *Link Box*. Alternatively, it may be possible to earth these terminal pillars by replacing links in the appropriate position.

1.3 The links in the *Link Box* at the point of test should then be removed and *Bridging Earths* applied between earth and all the terminals.

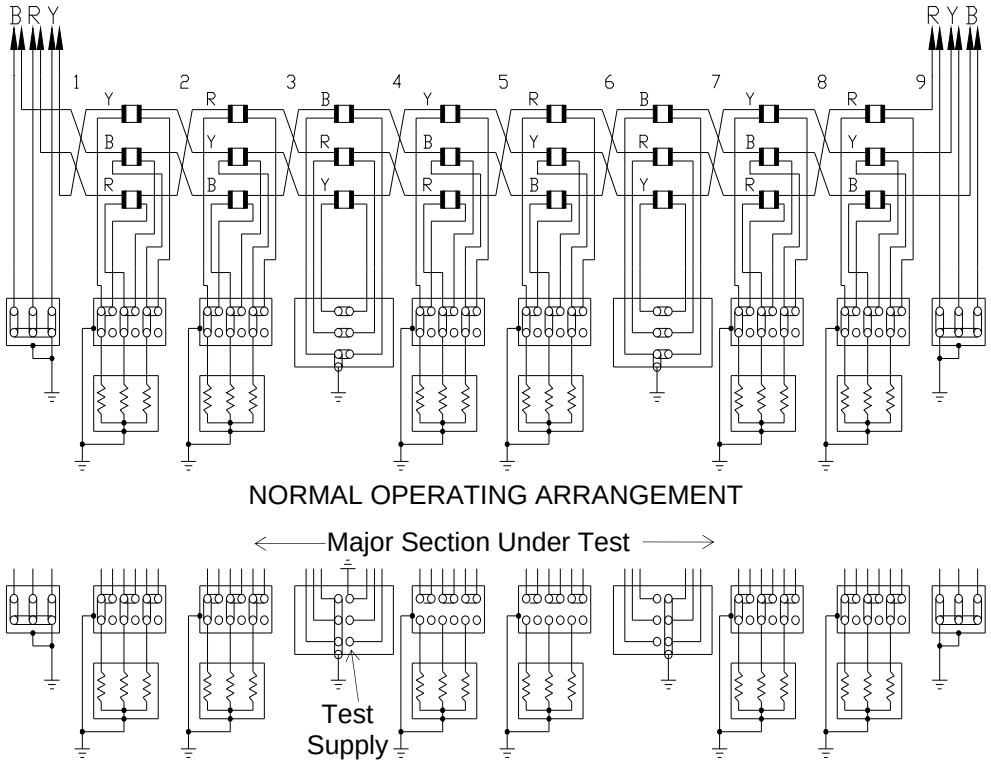
1.4 Where so desired, the above connections may be made via an Adaptor Plate (see Section 11 of this Attachment) or an **Approved** test and earth connection box. Care shall be taken during the initial connecting-up stage to ensure that the moveable contacts of the Plate or connection box are in the 'Earthed' position and that its earth lead is connected to the earth of the *Link Box* or to the supplementary earth rod, as applicable.

2 The metallic sheaths of the section to be tested are now **Earthed** only at the point of test. These earths may be removed, as necessary, only for the duration of the tests. Where an Adaptor Plate or **Approved** connection box is being used, the change of connection from 'test' to 'earth' and vice versa shall be carried out in accordance with an agreed procedure. Where such a connection box is not being used, the sheaths shall be **Earthed** before applying or removing test connections or alternatively the test connection shall be applied using *Insulated Working*.

3 Similar procedures shall be adopted if it is required to test individual minor sections.

Note: If a voltage is applied to the oversheath of one section, the associated joint barriers will be subjected to the same test voltage provided that the sheaths of the adjacent section(s) are **Earthed**.

4 When testing to identify sheaths, *Insulated Working* conditions shall be adopted.



ARRANGEMENT FOR OVERSHEATH TESTING ON
SINGLE SHEATH CIRCUITS OF MAJOR SECTIONS

Fig. 1.1

SCHEME 2

OVERSHEATH REPAIRS TO POWER AND AUXILIARY CABLES

This Scheme supplements the relevant requirements of SRI 5 to enable oversheath repairs to be carried out on power and auxiliary cables.

1 Using *Insulated Working*, a section of the oversheath should be removed.

2 A *Bridging Earth* shall then be applied to the metallic sheath and connected to the common earth bar via the Bridling Bar, using the procedure set down in Section 10 of this Attachment.

3 Repairs may then proceed under *Earthed Working* conditions.

4 When it is necessary to remove the *Bridging Earth* from the metallic sheath, *Insulated Working* shall be resumed and the work completed under these conditions.

5 If it is impracticable or undesirable to apply the *Bridging Earth* to the metallic sheath at, or close to, the point of work, *Insulated Working* shall be adopted throughout the work.

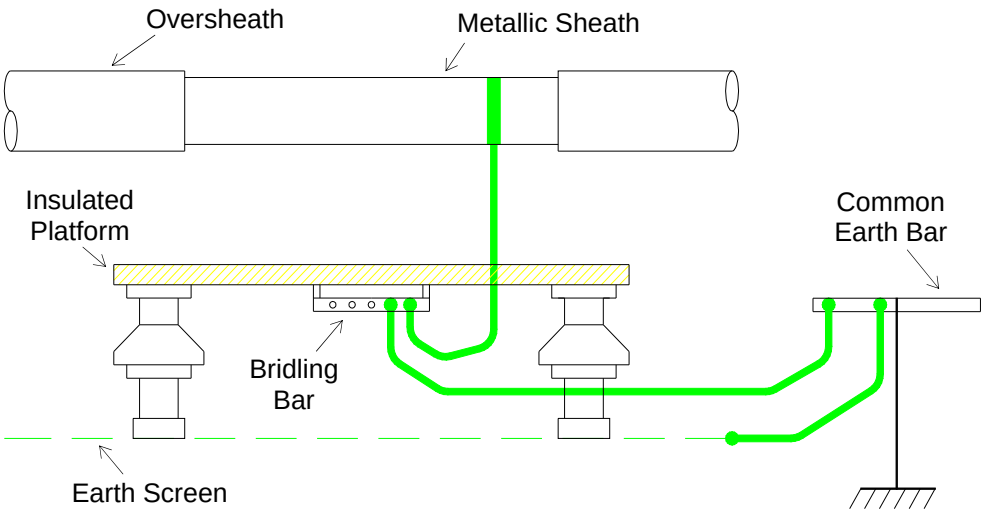


Fig. 2.1

6 When carrying out repairs to auxiliary cables any *Bridging Earth(s)* shall be applied to the auxiliary cable sheath and/or armour, as appropriate.

SCHEME 3

METALLIC SHEATH REPAIRS TO POWER AND AUXILIARY CABLES

This Scheme supplements the relevant requirements of SRI 5 to enable metallic sheath repairs to be carried out on power and auxiliary cables.

1 Using *Insulated Working*, a section of the oversheath should be removed to expose the metallic sheath.

2 A *Bridging Earth* shall then be applied to the metallic sheath and connected to the common earth bar via the Bridling Bar, using the procedure set down in Section 10 of this Attachment.

3 If the continuity of the metallic sheath is to be broken, a second *Bridging Earth* shall be applied to the metallic sheath such that an earth is positioned each side of the proposed break.

4 Repairs to the metallic sheath may then proceed under *Earthed Working* conditions, both *Bridging Earths* being maintained until the metallic sheath repair is completed.

5 Repairs to the oversheath shall then be effected as follows:

(i) One *Bridging Earth* may be removed and the oversheath repaired at that point using *Earthed Working*.

(ii) Using *Insulated Working*, the second earth may then be removed and the repair completed.

6 If it is impracticable or undesirable to earth the metallic sheath using *Bridging Earth(s)*, applied at or close to the point of work, and the continuity of the sheath is not to be broken, *Insulated Working* shall be adopted throughout the work. If necessary, a *Bridging Earth* shall be used to bond across any proposed break to maintain the continuity of the metallic sheath (see Fig. 3.1 on following page).

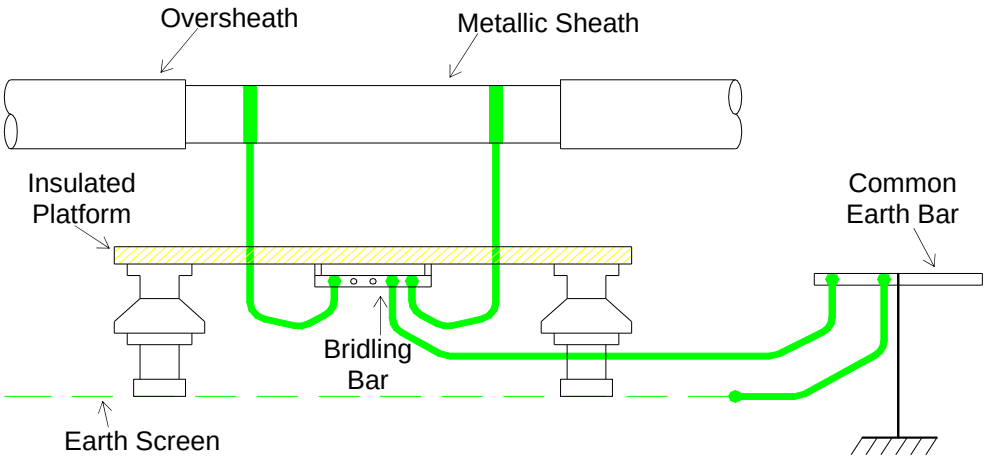


Fig. 3.1

7 When carrying out repairs to auxiliary cables any *Bridging Earth(s)* shall be applied to the auxiliary cable sheath and/or armour, as appropriate.

SCHEME 4

CUTTING AND CAPPING POWER CABLES

This Scheme supplements the relevant requirements of SRI 5 for cutting and capping of power cables.

1 Using *Insulated Working*, a section of oversheath should be removed to expose the metallic sheath.

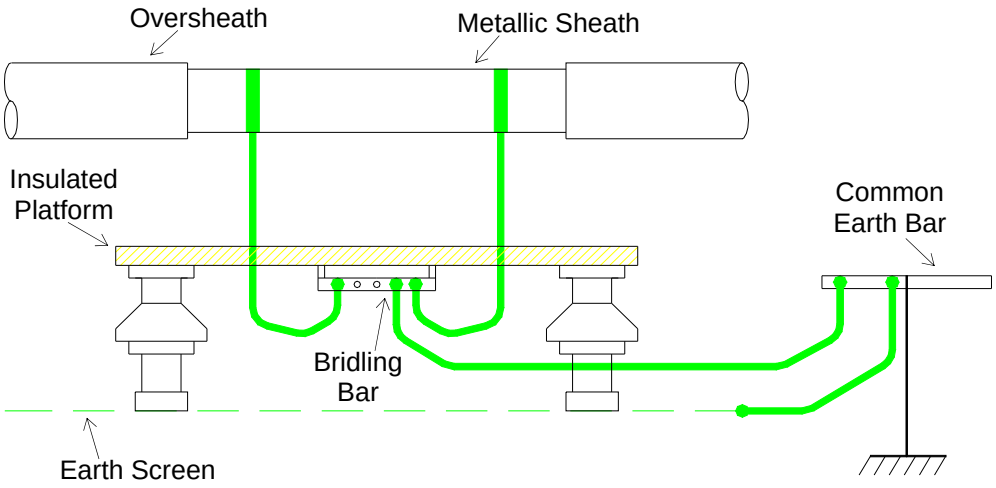


Fig. 4.1

2 *Bridging Earths* shall then be applied to the metallic sheath on both sides of the proposed cut and connected to the common earth bar via the Bridling Bar, using the procedure set down in Section 10 of this Attachment.

3 The cable shall now be spiked under *Earthed Working* conditions at the position of the proposed cut using an **Earthed** spiking gun (see Fig. 4.2 on following page).

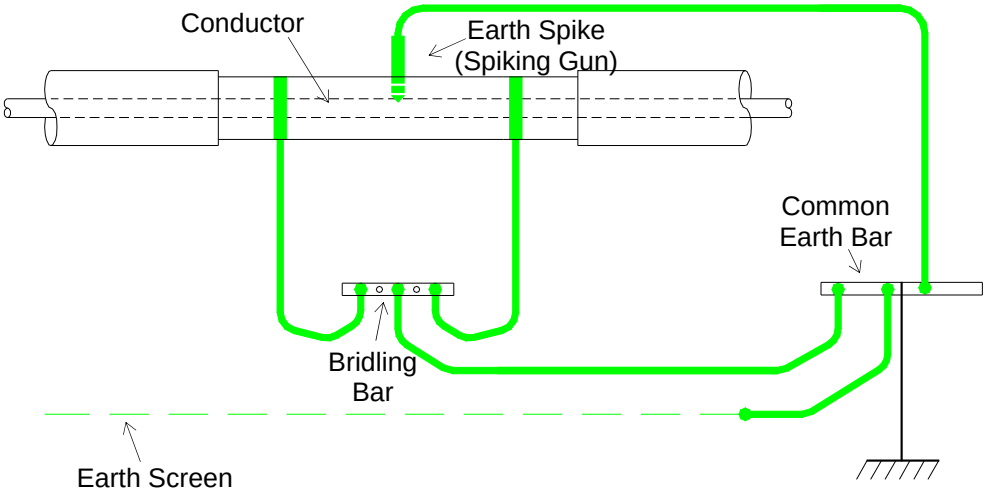


Fig. 4.2

4 Two rings of metallic sheath should be removed from the section between the spiking gun and the *Bridging Earths* and the cable insulation then reduced at these two points to leave 3mm radial thickness.

5 Using *Insulated Working*, all conductors on each side of the spiking gun shall be **Earthed** using **Approved** 'G' type *Bridging Earths* and the procedure set down in Section 10 of this Attachment.

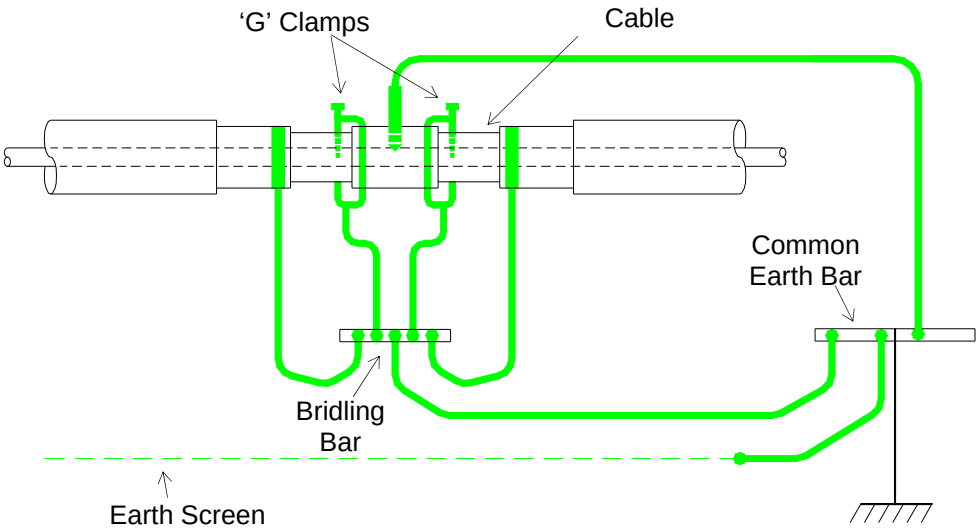


Fig. 4.3

6 Using *Earthed Working*, the spiking gun can now be removed and the cable cut at the prepared position.

7 A short section of insulation should be removed from each core and all conductors **Earthed** via the Bridling Bar to the common earth bar.

8 The **Approved** 'G' type *Bridging Earth* can now be removed.

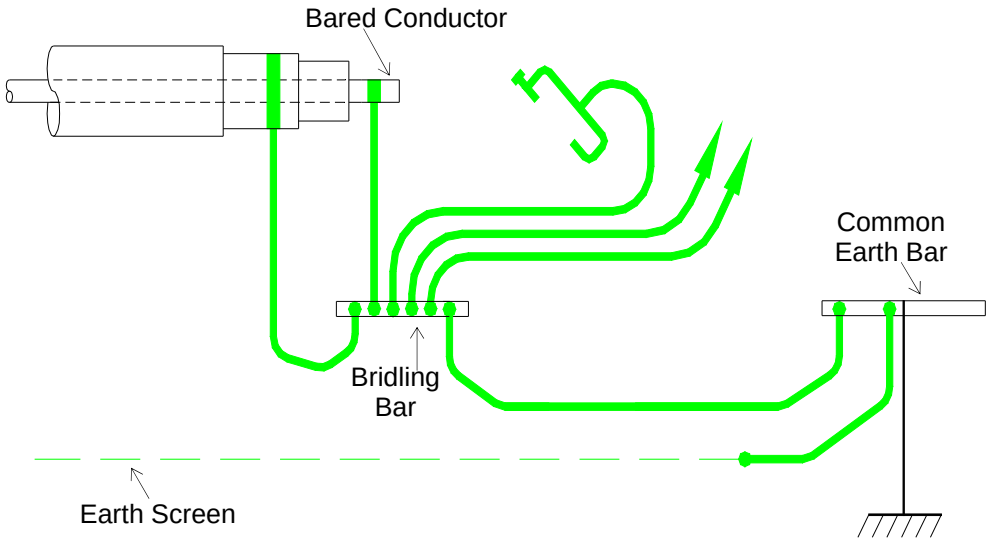


Fig. 4.4

9 On the cable end to be capped, the conductor and metallic sheath should be shorted together using flexible copper braid.

10 The *Bridging Earths* applied to the conductor should now be removed and the cable capped. Care should be taken to ensure that the cap completely covers the shorting braid (see Fig. 4.5 on following page).

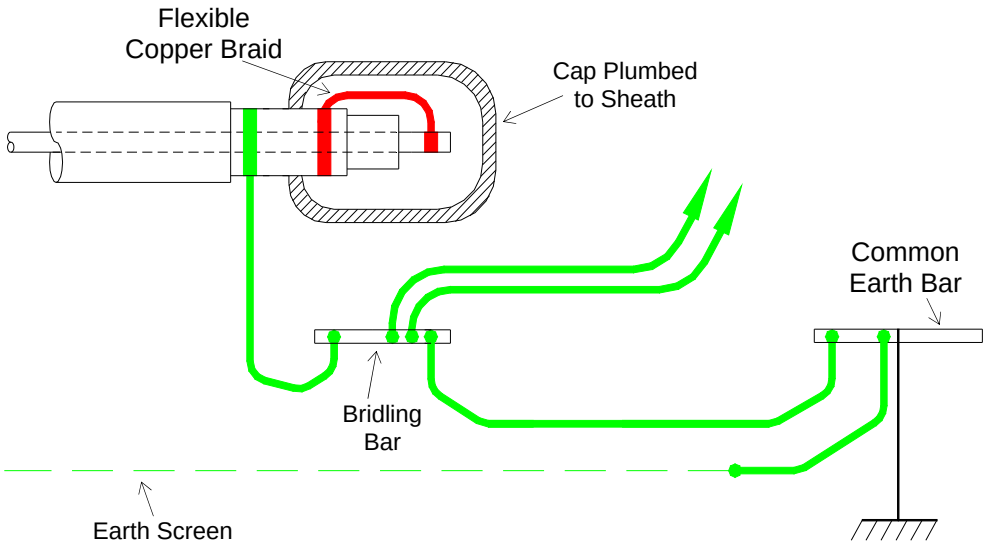


Fig. 4.5

11 If other work is to be carried out immediately, the *Bridging Earths* connected to the metallic sheath shall remain in position.

12 If the cable is to be left pot-ended, the *Bridging Earth* connected to the metallic sheath should be removed using the procedure set down in Section 10 of this Attachment. The end cap should then be fully insulated using *Insulated Working*.

SCHEME 5

MAKING OR BREAKING-DOWN STRAIGHT OR TRIFURCATING JOINTS OR 3-CORE STOP JOINTS INCORPORATING LEAD-THROUGH BUSHINGS ON POWER CABLES

This Scheme supplements the relevant requirements of SRI 5 for the making or breaking-down of straight or trifurcating joints or 3-core stop joints incorporating lead-through bushings on power cables.

1 Prior to commencing jointing operations it shall be ensured that the conductors and metallic sheaths of the cables to be jointed are individually **Earthed** to the common earth bar via the Bridling Bar using the procedures detailed below. The *Bridging Earths* used for this purpose should be threaded through the joint sleeve and end bells as necessary to allow these items to be located over the cable at the appropriate time.

1.1 Where the metallic sheath of the cable is electrically continuous within the work area, the cable shall be prepared and cut in accordance with Scheme 4, Clauses 1-8.

1.2 Where the metallic sheath of the cable is not electrically continuous within the work area, *Insulated Working* shall be used to expose a section of metallic sheath on one side of the discontinuity which shall be **Earthed** by a *Bridging Earth* applied to the common earth bar via the Bridling Bar, using the procedure set down in Section 10 of this Attachment. This operation shall then be repeated on the metallic sheath on the other side to the discontinuity.

1.3 If, on a capped cable, the conductors and metallic sheath are not shorted together, the cable shall be prepared in accordance with the principles of Scheme 4, Clauses 1-8, omitting the spiking.

1.4 If, on a capped cable, the conductor and metallic sheath are shorted together, the cap should be removed provided the metallic sheath is **Earthed**. If the metallic sheath is not **Earthed**, *Insulated Working* shall be used to expose a section of the sheath and a *Bridging Earth* applied using the procedure set out in Section 10 of this Attachment. A *Bridging Earth* shall then be applied between the conductor and the Bridling Bar so that the shorting braid between the conductor and metallic sheath can be removed.

2 Providing the conductors are kept **Earthed** at all times, *Earthed Working* can now be used up to the application of the insulation.

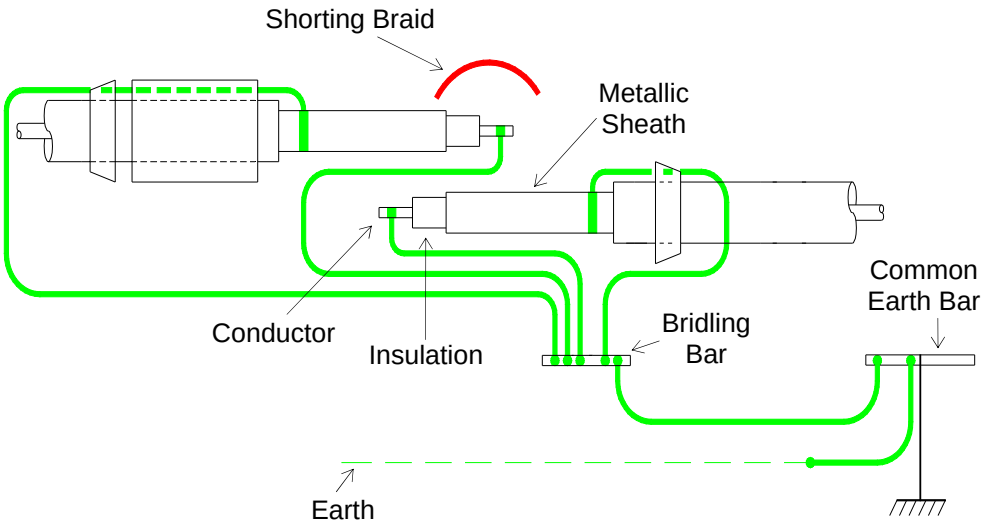


Fig. 5.1

3 The cable insulation may now be removed as required to enable the ferruling operation to be carried out. An earth may then be applied to the conductor as close as possible to the insulation, using an **Approved** calliper clamp type *Bridging Earth*. Other conductor earths may now be removed and the operation can proceed as follows:

(i) For Milliken type conductors a *Bridging Earth*, connected to earth, should be applied round the ferrule via the compression equipment and the conductors placed as far as possible into the ferrule. The calliper clamp type *Bridging Earth* may then be removed and the conductor pushed fully home. The ferrule should then be jointed on to both conductors. If space permits a *Bridging Earth*, connected to earth, should be applied to the ferrule and the compression equipment removed. Alternatively, if it is not possible to apply a *Bridging Earth* to the ferrule with the compression equipment still attached, *Insulated Working* shall be used to remove the compression equipment and to earth the ferrule with a *Bridging Earth*, using the procedures set down in Section 10 of this Attachment.

(ii) For other types of conductor, the ferrule should be jointed on to both conductors with the calliper clamp type *Bridging Earth* in position (see Fig. 5.2 on following page). A *Bridging Earth* should then be applied to the ferrule and the calliper clamp type *Bridging Earths* removed.

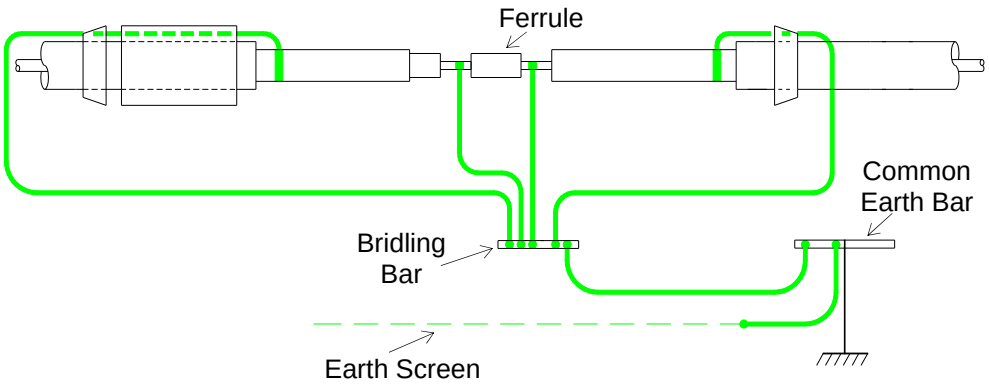


Fig. 5.2

4 The insulation and metallic sheaths should be finally prepared up to the re-insulation process.

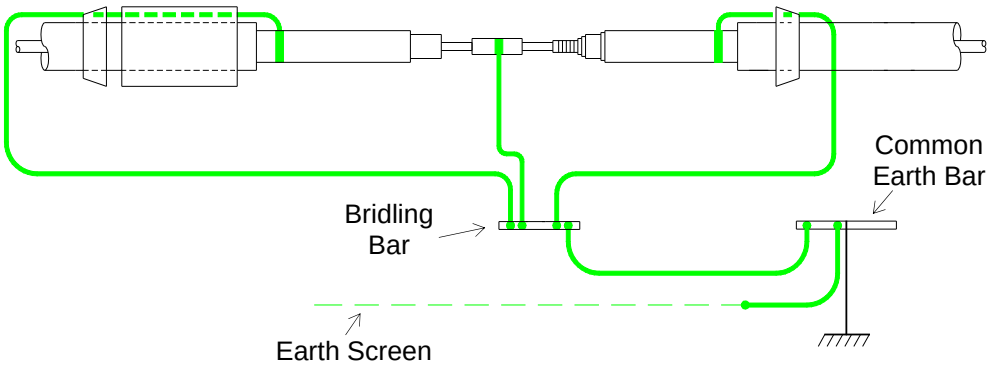


Fig. 5.3

5 Temporary insulation shall be applied over the exposed metallic sheaths and clamps. Using *Insulated Working*, the *Bridging Earth* on the ferrule shall be removed adopting the procedure set down in Section 10 of this Attachment. Insulation should then be applied to the conductor up to 3mm radial thickness (see Fig. 5.4 on following page).

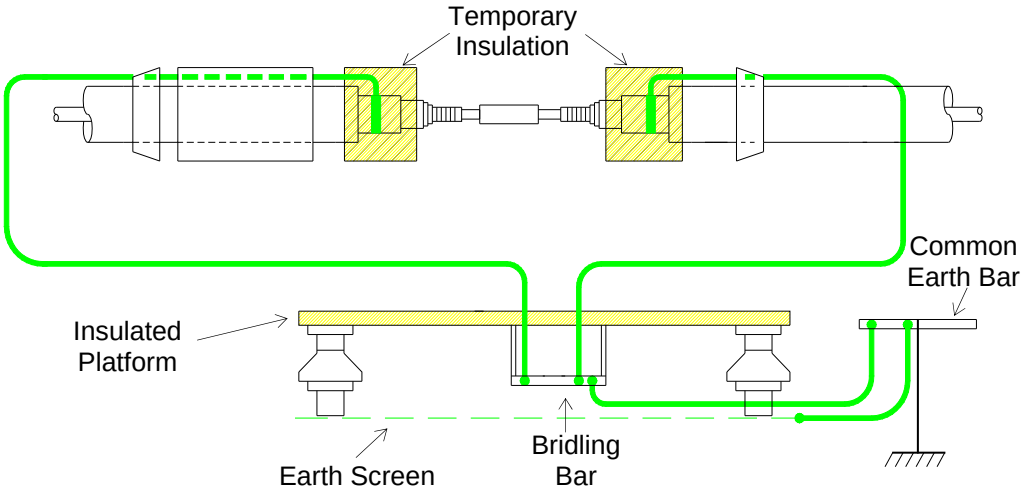


Fig. 5.4

6 Using *Earthed Working*, the temporary insulation may be removed and the joint completed up to, and including, plumbing and impregnation.

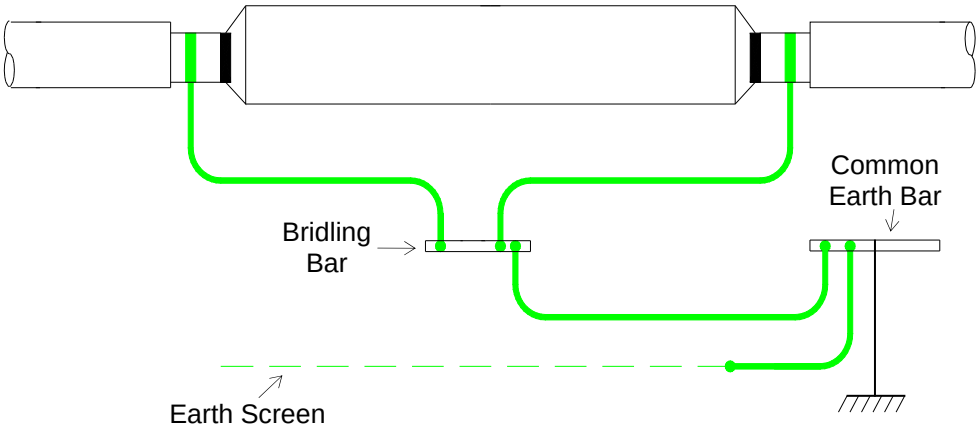


Fig. 5.5

7 The joint outer protection box, permanent oil feed lines and bonding leads should then be fitted in accordance with Scheme 10.

8 When breaking-down a joint, the reverse of the procedures detailed above shall be used, as applicable.

9 When making or breaking-down a 3-core stop joint incorporating lead-through bushings, this can be done using the procedures detailed above by treating the central barrier and the lead-through bushings as part of the ferrules.

SCHEME 6

REPAIRING POWER CABLES USING EXTENDED FERRULE REPAIR STRAIGHT JOINTS

This Scheme supplements the relevant requirements of SRI 5 for the repair of power cables using extended ferrule repair straight joints.

1 Where it has been established that spiking is not necessary (see SRI 5, Clause 7) the following procedures should be adopted:

1.1 Using *Insulated Working*, a section of the oversheath should be removed to expose the metallic sheath.

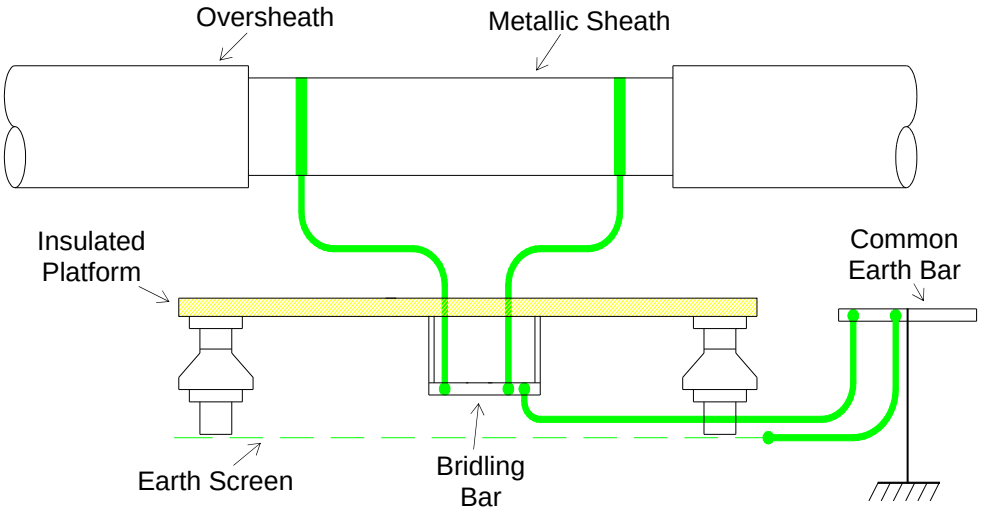


Fig. 6.1

1.2 *Bridging Earth*s shall then be applied to the metallic sheath on both sides of the proposed cut and connected to the common earth bar via the Bridling Bar, using the procedure set down in Section 10 of this Attachment.

1.3 A ring of metallic sheath should be carefully removed in the vicinity of the extended ferrule position.

1.4 Continuing with *Insulated Working*, the cable insulation should be removed to expose the core and the conductor **Earthed** each side of the proposed cut using *Bridging Earths* adopting the procedure set down in Section 10 of this Attachment.

1.5 Using *Earthed Working*, the cable can now be cut at the prepared position.

1.6 Jointing can now continue in accordance with the relevant paragraphs of Scheme 5.

2 Where positive identification cannot be established, the following procedure should be adopted:

2.1 The cable shall be spiked at the point of cut only (i.e. the centre line of the extended ferrule) under *Earthed Working* conditions using an **Earthed** spiking gun, after the cable has been prepared in accordance with Clauses 1.1 and 1.2.

2.2 The spiking gun should then be removed.

2.3 A ring of metallic sheath should be carefully removed in the vicinity of the extended ferrule position and the cable insulation reduced to leave 3mm radial thickness.

2.4 Continuing with *Insulated Working* all conductors on each side of the proposed cut shall be **Earthed** using **Approved** 'G' type *Bridging Earths* applied as close as possible to the cut position, adopting the procedure set down in Section 10 of this Attachment.

2.5 Using *Earthed Working*, the cable can now be cut at the prepared position.

2.6 A short section of insulation should be removed from each core and all conductors **Earthed** via the Bridling Bar to the common earth bar.

2.7 The **Approved** 'G' type *Bridging Earths* can now be removed.

2.8 Jointing can now continue in accordance with the relevant Clauses of Scheme 5.

SCHEME 7

MAKING OR BREAKING-DOWN SINGLE-CORE STOP JOINTS INCORPORATING TWO PLUG-IN CONDUCTOR FITTINGS

This Scheme supplements the relevant requirements of SRI 5 for the making or breaking-down of single-core stop joints incorporating two plug-in conductor fittings.

1 Prior to commencing jointing operations on the first cable to be worked on, it shall be ensured that the conductors and metallic sheaths of the cable are individually **Earthed** to the common earth bar via the Bridling Bar using the procedures detailed below. The *Bridging Earths* for this purpose should be threaded through the end bell as necessary to allow this item to be located over the cable at the appropriate time.

1.1 Where the metallic sheath of the cable is electrically continuous within the work area, the cable shall be prepared and cut in accordance with Scheme 4, Clauses 1-8.

1.2 Where the metallic sheath of the cable is not electrically continuous within the work area, *Insulated Working* shall be used to expose a section of metallic sheath on one side of the discontinuity which shall be **Earthed** by a *Bridging Earth* applied to the common earth bar via the Bridling Bar using the procedure set down in Section 10 of this Attachment. This operation shall then be repeated on the metallic sheath on the other side of the discontinuity.

1.3 If, on a capped cable, the conductors and metallic sheath are not shorted together, the cable shall be prepared in accordance with the principles of Scheme 4, Clauses 1-8, omitting the spiking.

1.4 If, on a capped cable, the conductor and metallic sheath are shorted together, the cap should be removed provided the metallic sheath is **Earthed**. If the metallic sheath is not **Earthed**, *Insulated Working* shall be used to expose a section of the sheath and a *Bridging Earth* applied using the procedure set out in Section 10 of this Attachment. A *Bridging Earth* shall then be applied between the conductor and the Bridling Bar so that the shorting braid between the conductor and metallic sheath can be removed.

2 Providing the conductor is kept **Earthed** at all times, *Earthed Working* can now be used up to and including the application of the insulation and the screen over the profile of the stress cone.

3 The cable insulation may now be removed as required to enable the ferruling operation to be carried out. An earth may then be applied to the conductor as close as possible to the insulation, using an **Approved** calliper clamp type *Bridging Earth*. Other conductor earths may now be removed and the operation can proceed as follows:

(i) For Milliken type conductors a *Bridging Earth*, connected to earth, should be applied to the ferrule and the conductors placed as far as possible into the ferrule. The calliper clamp type *Bridging Earth* should then be removed and the conductor pushed fully home.

(ii) For other types of conductor, the ferrule should be jointed on to the conductor with the calliper clamp type *Bridging Earth* in position. A *Bridging Earth*, connected to earth, should then be applied to the ferrule and the calliper clamp type *Bridging Earth* removed.

4 Work should now proceed with the application of the insulation and stress cone. During the fitting of the stress cone, either *Insulated Working* or *Earthed Working* can be adopted to suit the jointing operations.

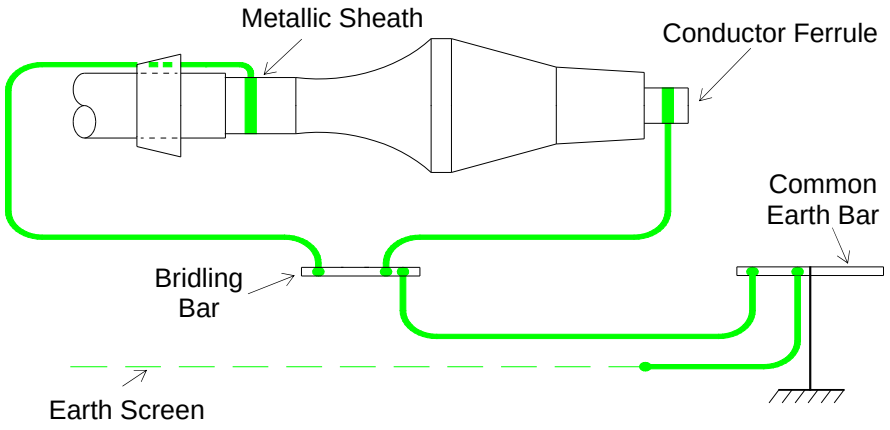


Fig. 7.1

5 The centre section of the joint, the casing of which shall be **Earthed** to the Bridling Bar, should be brought up to the end of the cable until the ferrule is on the point of entering the centre section. Using *Insulated Working*, the *Bridging Earth* on the ferrule should be removed adopting the procedure set out in Section 10 of this Attachment. The centre section should immediately be passed over the cable end until the ferrule plugs into the central conductor fitting.

6 The side of the joint being worked on can then be completed, up to and including plumbing and impregnation, using *Earthed Working*.

7 The other side of the joint should be completed using similar procedures to those detailed above.

8 The joint outer protection box, permanent oil feed lines and bonding leads should then be fitted in accordance with Scheme 10.

9 When breaking-down a stop joint of this type, the reverse of the procedures detailed above shall be used, as applicable.

SCHEME 8

MAKING OR BREAKING-DOWN SINGLE-CORE STOP JOINTS INCORPORATING A LOCKED AND PLUG-IN CONDUCTOR FITTING

This Scheme supplements the relevant requirements of SRI 5 for the making or breaking-down of single-core stop joints incorporating a locked and plug-in conductor fitting.

1 Prior to commencing jointing operations on the first cable to be worked on which is on the locking side of the joint, it shall be ensured that the conductor and metallic sheath of the cable are individually **Earthed** to the common earth bar via the Bridling Bar using the procedures detailed below. The *Bridging Earths* for this purpose should be threaded through the end bell as necessary to allow this item to be located over the cable at the appropriate time.

1.1 Where the metallic sheath of the cable is electrically continuous within the work area, the cable shall be prepared and cut in accordance with Scheme 4, Clauses 1-8.

1.2 Where the metallic sheath of the cable is not electrically continuous within the work area, *Insulated Working* shall be used to expose a section of metallic sheath on one side of the discontinuity which shall be **Earthed** by a *Bridging Earth* applied to the common earth bar via the Bridling Bar using the procedure set down in Section 10 of this Attachment. This operation shall then be repeated on the metallic sheath on the other side of the discontinuity.

1.3 If, on a capped cable, the conductor and metallic sheath are not shorted together, the cable shall be prepared in accordance with the principles of Scheme 4, Clauses 1-8, omitting the spiking.

1.4 If, on a capped cable, the conductor and metallic sheath are shorted together, the cap should be removed provided the metallic sheath is **Earthed**. If the metallic sheath is not **Earthed**, *Insulated Working* shall be used to expose a section of the sheath and a *Bridging Earth* applied using the procedure set out in Section 10 of this Attachment. A *Bridging Earth* shall then be applied between the conductor and the Bridling Bar so that the shorting braid between the conductor and metallic sheath can be removed.

2 Provided the conductors are kept **Earthed** at all times, *Earthed Working* can now be used up to and including the application of the insulation and the screen over the profile of the stress cone.

3 The cable insulation may now be removed as required to enable the ferruling operation to be carried out. An earth may then be applied to the conductor as close as possible to the insulation, using an **Approved** calliper clamp type *Bridging Earth*. Other conductor earths may now be removed and the operation can proceed as follows:

(i) For Milliken type conductors a *Bridging Earth*, connected to earth, should be applied to the ferrule and the conductors placed as far as possible into the ferrule. The calliper clamp type *Bridging Earth* should then be removed and the conductor pushed fully home.

(ii) For other types of conductor, the ferrule should be jointed on to the conductor with the calliper clamp type *Bridging Earth* in position. A *Bridging Earth*, connected to earth, should then be applied to the ferrule and the calliper clamp type *Bridging Earth* removed.

4 Work should now proceed with the application of the insulation and stress cone. During the fitting of the stress cone, either *Insulated Working* or *Earthed Working* can be adopted to suit the jointing operations.

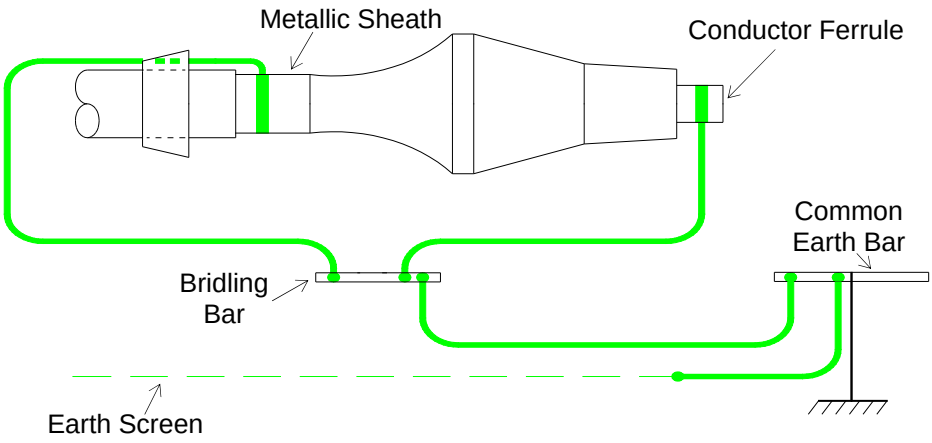


Fig. 8.1

5 The centre section of the joint, the casing of which shall be **Earthed** to the Bridling Bar, should be brought up to the end of the cable until the ferrule is on the point of entering the centre section. Using *Insulated Working*, the *Bridging Earth* on the ferrule should be removed adopting the procedure set out in Section 10 of this Attachment. The centre section should immediately be passed over the cable end until the ferrule plugs into the central conductor fitting.

6 The locking ring or nut shall be screwed on to the ferrule using an **Approved** insulated tool (see Fig. 8.2 on following page).

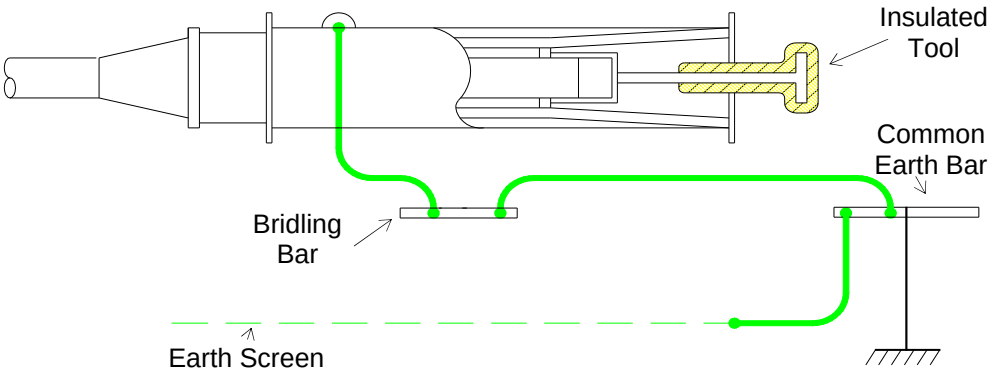


Fig. 8.2

7 The side of the joint being worked on can then be completed, up to and including plumbing and impregnation, using *Earthed Working*.

8 The other side of the joint should be completed using similar procedures to those detailed above.

9 The joint outer protection box, permanent oil feed lines and bonding leads should then be fitted in accordance with Scheme 10.

10 When breaking-down a joint, the reverse of the procedures detailed above shall be used, as applicable.

SCHEME 9

MAKING OR BREAKING-DOWN SINGLE-CORE STOP JOINTS INCORPORATING A SOLIDLY-FERRULED CONDUCTOR AND A 'SLIDE-OVER' CENTRE SECTION

This Scheme supplements the relevant requirements of SRI 5 for the making and breaking-down of single-core stop joints incorporating a solidly-ferruled conductor and a 'slide-over' centre section.

1 Prior to commencing jointing operations it shall be ensured that the conductors and metallic sheaths of the cables to be jointed are individually **Earthed** to the common earth bar via the Bridling Bar using the procedures detailed below. The *Bridging Earths* used for this purpose should be threaded through the joint sleeve and end bells as necessary to allow these items to be located over the cable at the appropriate time.

1.1 Where the metallic sheath of the cable is electrically continuous within the work area, the cable shall be prepared and cut in accordance with Scheme 4, Clauses 1-8.

1.2 Where the metallic sheath of the cable is not electrically continuous within the work area, *Insulated Working* shall be used to expose a section of metallic sheath on one side of the discontinuity which shall be **Earthed** by a *Bridging Earth* applied to the common earth bar via the Bridling Bar using the procedure set down in Section 10 of this Attachment. This operation shall then be repeated on the metallic sheath on the other side of the discontinuity.

1.3 If, on a capped cable, the conductor and metallic sheath are not shorted together, the cable shall be prepared in accordance with the principles of Scheme 4, Clauses 1-8, omitting the spiking.

1.4 If, on a capped cable, the conductor and metallic sheath are shorted together, the cap should be removed provided the metallic sheath is **Earthed**. If the metallic sheath is not **Earthed**, *Insulated Working* shall be used to expose a section of the sheath and a *Bridging Earth* applied using the procedure set out in Section 10 of this Attachment. A *Bridging Earth* shall then be applied between the conductor and the Bridling Bar so that the shorting braid between the conductor and metallic sheath can be removed.

2 Providing the conductors are kept **Earthed** at all times, *Earthed Working* can now be used up to the application of the insulation.

3 The cable insulation may now be removed as required to enable the ferruling operation to be carried out. An earth may then be applied to the conductor as close as possible to the insulation, using an **Approved** calliper clamp type *Bridging Earth*. Other conductor earths may now be removed and the operation can proceed as follows:

(i) For Milliken type conductors a *Bridging Earth*, connected to earth, should be applied round the ferrule via the compression equipment and the conductors placed as far as possible into the ferrule. The calliper clamp type *Bridging Earth* should then be removed and the conductor pushed fully home. The ferrule should then be jointed on to both conductors. If space permits, a *Bridging Earth*, connected to earth, should then be applied to the ferrule and the compression equipment removed. Alternatively, if it is not possible to apply a *Bridging Earth* to the ferrule with the compression equipment still attached, *Insulated Working* shall be used to remove the compression equipment and to earth the ferrule with a *Bridging Earth*, using the procedures set down in Section 10 of this Attachment.

(ii) For other types of conductor, the ferrule should be jointed on to both conductors with the calliper clamp type *Bridging Earths* in position. A *Bridging Earth* should then be applied to the ferrule and the calliper clamp type earths removed.

4 The metallic sheaths should then be finally prepared and the complete build-up of the cable insulation applied on both sides of the joint.

5 The centre section of the joints, the casing of which shall be **Earthed** to the Bridling Bar, should be moved along the cable until the ferrule is on the point of being covered by the centre section (see Fig. 9.1 on following page). Using *Insulated Working*, the *Bridging Earth* on the ferrule should be removed adopting the procedure set out in Section 10 of this Attachment. The centre section should immediately be moved further along the cable until the ferrule registers correctly into the central conductor fitting.

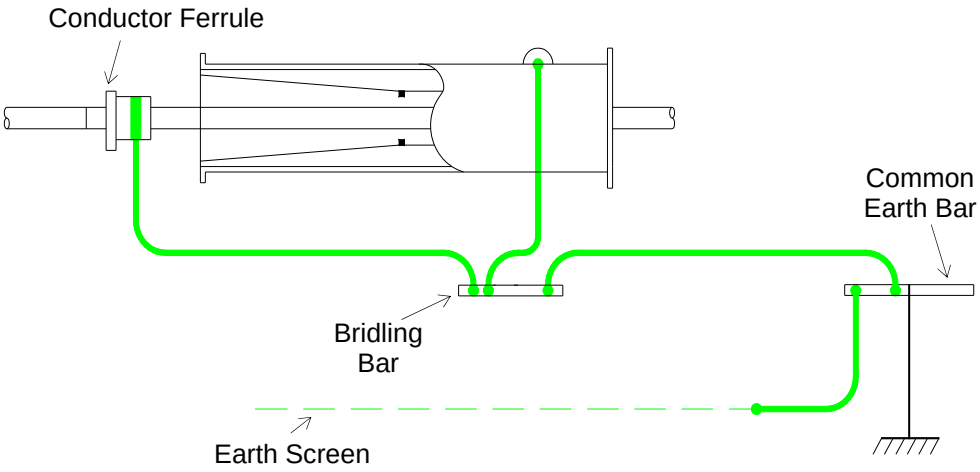


Fig. 9.1

6 The locking ring(s) or nut(s) should be screwed on to the ferrule using an **Approved** insulated tool.

7 The joint may be completed, up to and including plumbing and impregnation, using *Earthed Working*.

8 The joint outer protection box, permanent oil feed lines and bonding leads should then be fitted in accordance with Scheme 10.

9 When breaking-down a stop joint of this type, the reverse of the procedures detailed above shall be used, as applicable.

SCHEME 10

FITTING JOINT OUTER PROTECTIVE BOXES ON POWER CABLES

This Scheme supplements the relevant requirements of SRI 5 for the fitting of joint outer protective boxes on power cables.

1 Generally, for joints without bonding leads, *Insulated Working* should be adopted for the removal of any *Bridging Earths* connected to the metallic sheath, and the fitting of the outer protective box. With some joints however it is possible to pass an earth connection to the joint sleeve through the filling turret whilst the box is being fitted and then remove the *Bridging Earths* connected to the metallic sheath. In such cases the outer protective box can be fitted using *Earthed Working*, but *Insulated Working* shall be used to remove the *Bridging Earths* connected to the joint sleeve adopting the procedure set down in Section 10 of this Attachment immediately before filling the box.

2 For joints with bonding leads, *Earthed Working* may be used to fit the outer protective box provided the sequence of operations given below is adopted and the metallic sheaths are first **Earthed** by *Bridging Earths* connected to the joint bay common earth bar.

2.1 Where the *Link Box* is installed and the bonding leads are continuous between the *Link Box* and the joint sleeve:

(i) *Insulated Working* shall be adopted to connect a *Bridging Earth* between the *Link Box* permanent earth and the joint bay common earth bar, unless a permanent connection is already installed.

(ii) The bonding leads, and any permanent earth connections, should then be permanently installed and connected at both ends to the joint sleeve, *Link Box* or local earth, as appropriate, using *Earthed Working*.

(iii) *Bridging Earths*, connected to earth, should be applied to all terminal pillars in the *Link Box* and the earths connected to the metallic sheath removed (see Fig. 10.1 on following page).

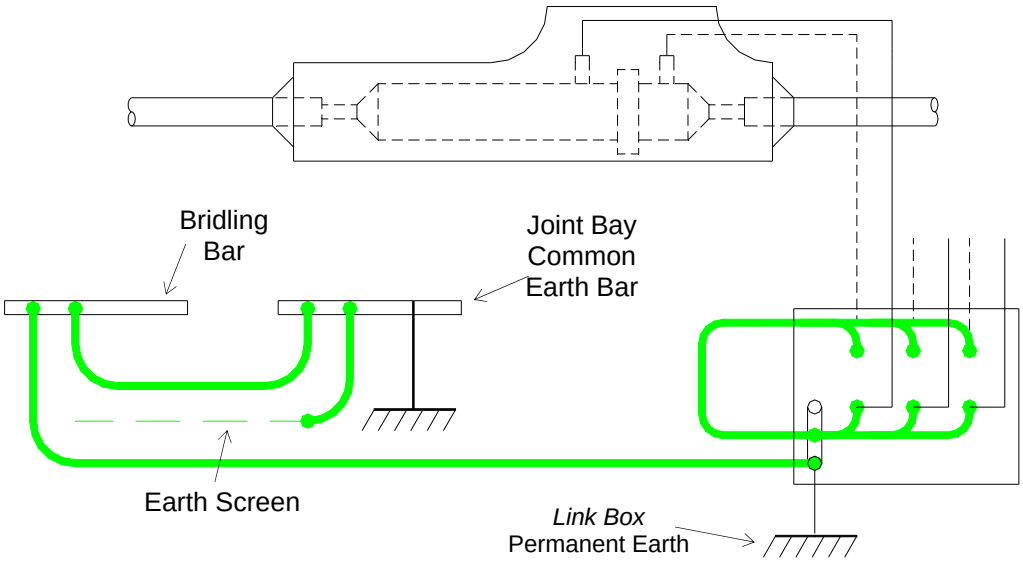


Fig. 10.1

(iv) The installation of the outer protective box may now be completed including permanent oil feed lines, provided an insulated link has first been fitted in these lines.

(v) *Insulated Working* shall then be used to remove any *Bridging Earths* applied between the joint bay and *Link Box* permanent earths, unless a permanent connection has since been installed in which case *Earthed Working* may be used.

2.2 Where the *Link Box* is installed after the joint, or the bonding leads from the joint have not yet been jointed on to existing leads from the *Link Box*:

(i) A temporary local earth point shall be established at the free end of the bonding leads, remote from the joint sleeve.

(ii) *Insulated Working* shall be adopted to connect a *Bridging Earth* between the local earth at the free end of the bonding leads and the joint bay common earth bar.

(iii) Using *Earthed Working*, all conductors at the free end of the bonding leads shall be temporarily **Earthed** and the conductors at the other end bolted to the connecting lugs of the joint sleeve. The *Bridging Earth* connected to the metallic sheath may then be removed and the installation of the outer protective box completed, including permanent oil feed lines, provided an insulated link has first been fitted in these lines.

(iv) *Insulated Working* shall then be used to remove the temporary connection between the local earth at the free end of the bonding leads and the joint bay common earth bar.

(v) Reference should be made to Schemes 14 and 15 for the procedure when the *Link Box* is to be installed or the bonding leads jointed.

3 When removing joint outer protective boxes, the reverse of the procedures detailed above shall be used, as applicable.

SCHEME 11

MAKING OR BREAKING-DOWN SEALING ENDS ON POWER CABLES

This Scheme supplements the relevant requirements of SRI 5 for the making and breaking-down of sealing ends on power cables.

1 Prior to commencing jointing operations it shall be ensured that the metallic sheath of the cable is **Earthed**. Similarly, it shall be ensured that the conductor is **Earthed** prior to work on the core.

1.1 *Insulated Working* shall be used to expose a section of the metallic sheath and then to earth this by a *Bridging Earth* applied to the common earth bar.

1.2 If, on a capped cable, the conductor and metallic sheath are not shorted together the cable should be prepared in accordance with the principles of Scheme 4, Clauses 1-8, omitting the spiking.

2 Providing the conductors are kept **Earthed** at the point of work at all times, *Earthed Working* can now be used in accordance with the appropriate jointing instructions.

3 Remove the cable insulation as required in preparation for attaching the conductor fitting. Apply an **Approved** conductor calliper clamp type *Bridging Earth* as close as possible to the insulation. Other conductor earths may now be removed and the conductor cut at the appropriate position. The operation may now proceed as follows:

(i) For Milliken type conductors a *Bridging Earth*, connected to earth, should be applied to the conductor fitting and the conductors placed as far as possible into the conductor fitting. The calliper clamp type *Bridging Earth* should then be removed and the conductor pushed fully home.

(ii) For other types of conductor, the conductor fitting should be jointed on to the conductor, with the calliper clamp type *Bridging Earth* in position. A *Bridging Earth*, connected to earth, should then be applied to the conductor fitting and the calliper clamp type *Bridging Earth* removed.

4 Work should now proceed in accordance with the appropriate jointing instructions (see Fig. 11.1 on following page).

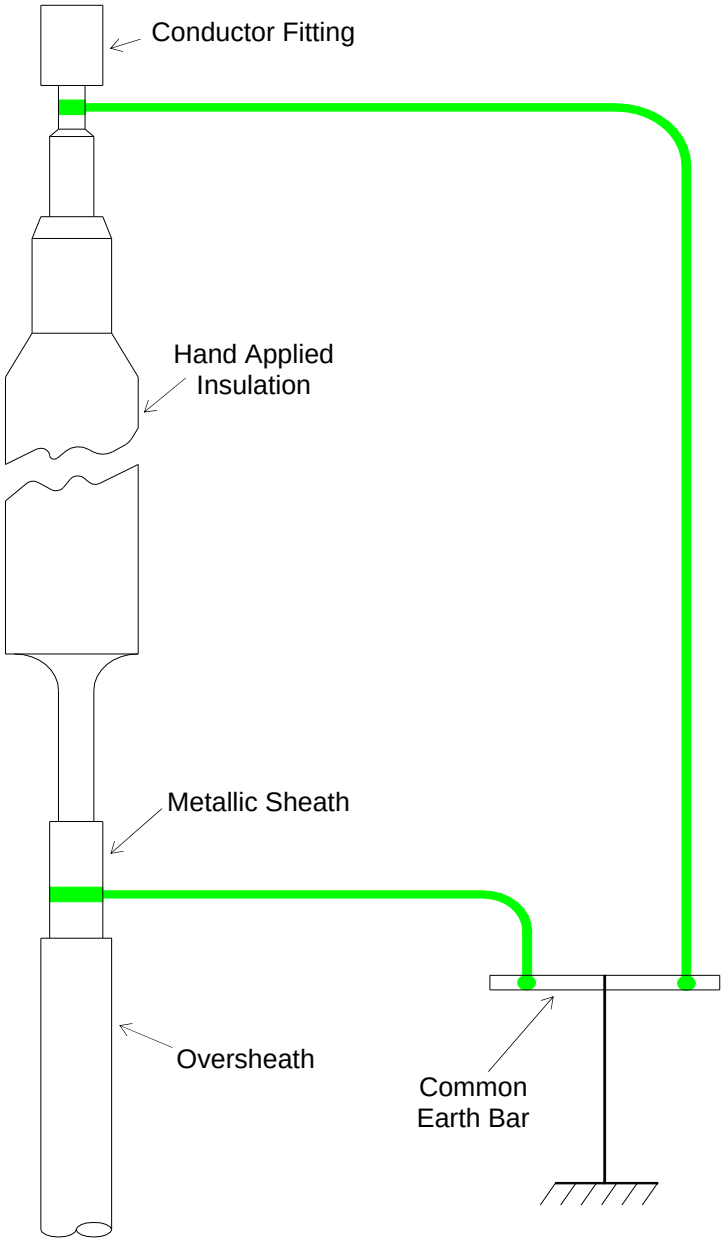


Fig. 11.1

5 Where possible, during the lowering of the porcelain, a temporary *Bridging Earth*, connected to earth, should be passed through it and attached to the conductor (see Fig. 11.2 on following page).

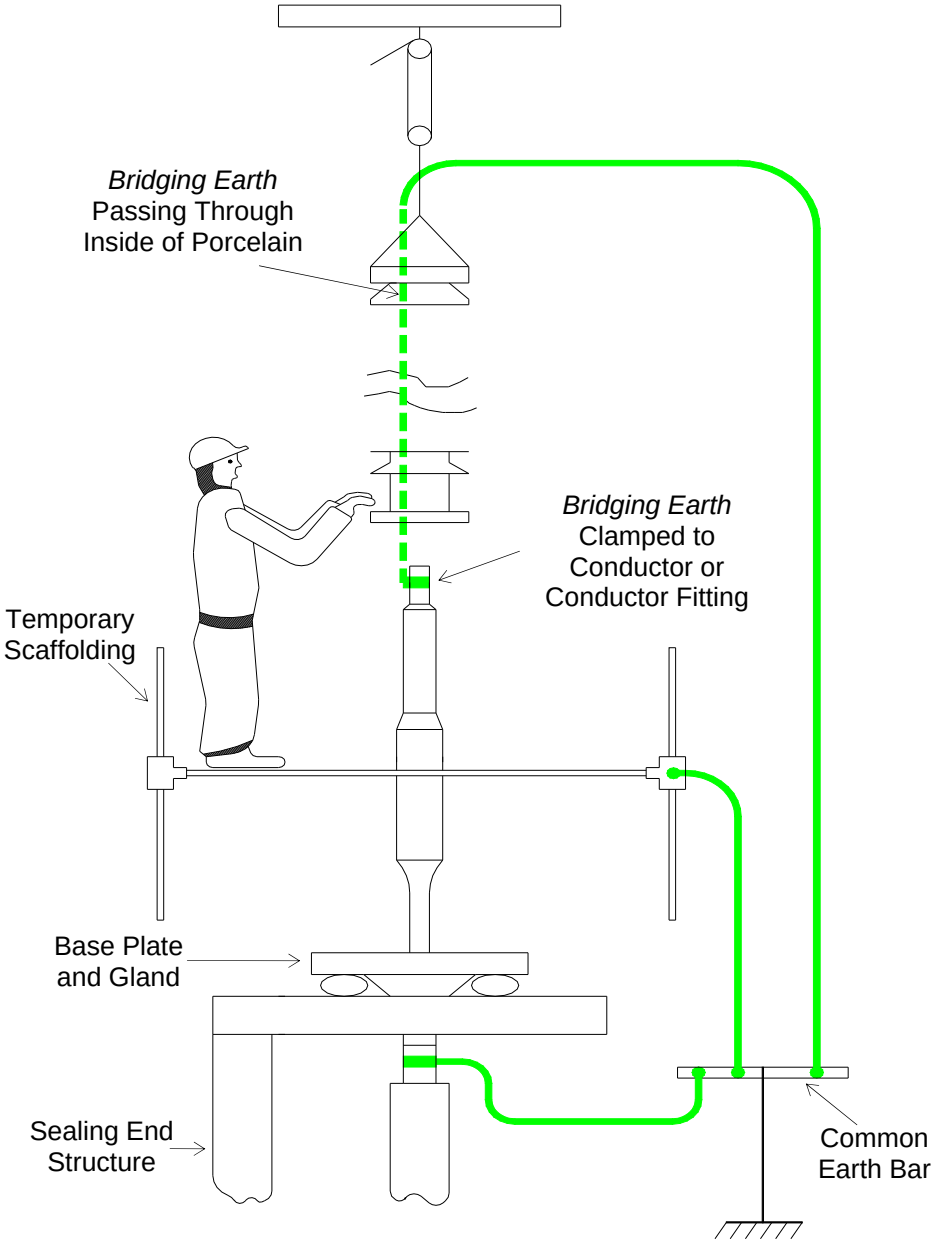


Fig. 11.2

6 When the design of sealing end is such that the clearance between the conductor stalk and the top cap does not permit the passage of an earth clamp, then using *Insulated Working* the earth can be temporarily removed during the operation of lowering the porcelain into position. The earth shall be replaced as soon as possible, but until this is done the **Person** doing the work shall comply with *Insulated Working* (see Fig. 11.3 on following page).

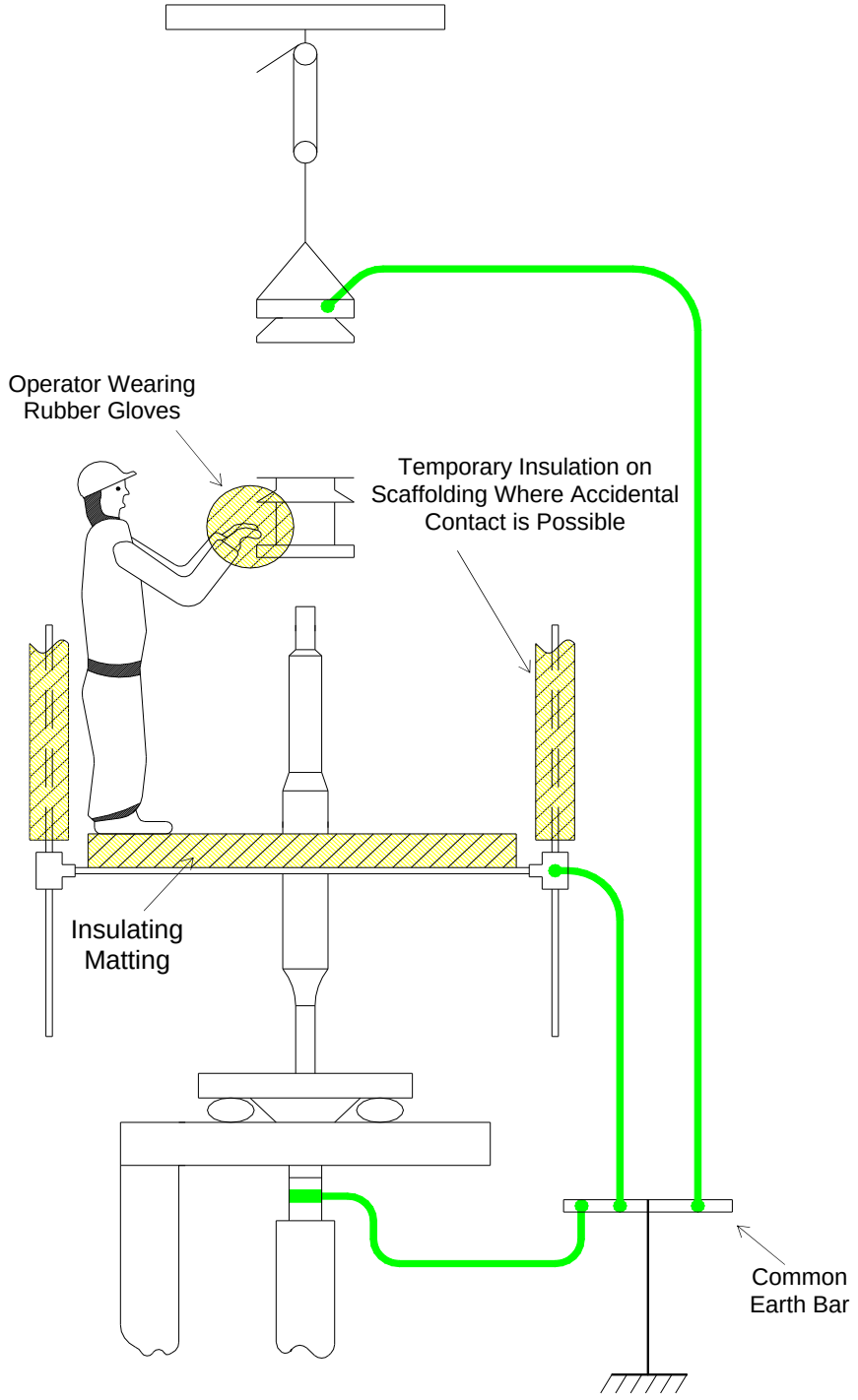


Fig. 11.3

7 When breaking-down a sealing end, the reverse of the procedures detailed above should be used, if applicable.

SCHEME 12

REPAIRING OIL LEAKS

This Scheme supplements the relevant requirements of SRI 5 for the repair of oil leaks.

1 Where leaks develop in metallic sheaths, cable accessories or metallic feed lines between the insulated oil links and the associated joint or sealing end, the work should be treated as a metallic sheath repair (see Scheme 3).

2 Where leaks occur in metallic feed lines between the insulated oil links and the oil reservoir, *Induced Voltage Working* will not be required and this Scheme therefore will not apply.

SCHEME 13

WORK IN CABLE SHEATH LINK BOXES NOT INVOLVING THE CUTTING OR DISCONNECTION OF BONDING LEADS

This Scheme supplements the relevant requirements of SRI 5 for work in cable sheath link boxes not involving the cutting or disconnection of bonding leads.

1 The work may be undertaken using one of the methods given below:

1.1 If it is practicable to maintain an earth connection via *Bridging Earths* or links to all terminals in the *Link Box* being worked on, then *Earthed Working* may be used.

1.2 If it is necessary to remove the earth connection from terminal pillars within the *Link Box* being worked on, then *Insulated Working* may be used provided the defined work environment can be maintained.

1.3 If it is not practicable to use either *Earthed Working* or *Insulated Working* techniques, then the method of working bare hand detailed below, which embodies the principle of ensuring that at all times there is a connection between earth and the metallic sheath of at least one cable on each side of the point of work, may be used provided the following requirements are first complied with:

(i) The oversheath and joint barriers on the minor section each side of the *Link Box* to be worked on shall be proved (see Scheme 1). Any oversheath or barrier faults shall be located and repaired before proceeding.

(ii) Using the procedures detailed in Clauses 7.3 and 7.4 of this Attachment:

(a) The metallic cable sheaths shall be bonded together at the adjacent section bonding boxes or cable termination on each side of the *Link Box* to be worked on. This bond shall be clear of earth and can in some cases be achieved by links for example in three-phase boxes. In the case of single-phase boxes, it will be necessary to achieve the bonding together by **Approved** insulated leads. *Cautionary Notices* shall be applied at the bonding locations.

(b) *Bridging Earths*, connected to earth, shall be applied to the terminal pillars of at least one bonding lead from each side of the point of work.

1.3.1 Work can now proceed on the terminal pillars other than those **Earthed** as in 1.3 (ii) (b) above.

1.3.2 During the course of the work the *Bridging Earths* applied under 1.3 (ii) (b) may be removed to allow work on those pillars provided *Bridging Earths*, connected to earth, are applied to the terminal pillars of at least one other bonding lead each side of the point of work.

SCHEME 14

REPLACING CABLE SHEATH LINK BOXES BY CUTTING AND JOINTING EXISTING BONDING LEADS

This Scheme supplements the relevant requirements of SRI 5 for replacing cable sheath link boxes by cutting and jointing existing bonding leads.

1 The work may be undertaken using one of the methods given below:

1.1 If it is practicable to maintain an earth connection via *Bridging Earths* or links to all terminals and bonding leads at the point of work at all times, then *Earthed Working* may be used.

1.2 If it is necessary to remove the *Bridging Earth* from terminal pillars or bonding leads at the point of work, then *Insulated Working* may be used provided the defined work environment can be maintained.

1.3 If it is not practicable to use either *Earthed Working* or *Insulated Working* techniques, then the method of working bare hand detailed below, which embodies the principle of ensuring that at all times there is a connection between earth and the metallic sheath of at least one cable on each side of the point of work, may be used provided the following requirements are first complied with:

(i) The oversheath and joint barriers on the minor section each side of the *Link Box* to be replaced shall be proved (see Scheme 1). Any oversheath or barrier faults shall be located and repaired before proceeding.

(ii) Using the procedures detailed in Clauses 7.3 and 7.4 of this Attachment:

(a) The metallic cable sheaths shall be bonded together at the adjacent section bonding boxes or cable termination on each side of the *Link Box* to be replaced. This bond shall be clear of earth and can in some cases be achieved by links, for example, in three-phase boxes. In the case of single-phase boxes, it will be necessary to achieve the bonding together by **Approved** insulated leads. *Cautionary Notices* shall be applied at the bonding locations.

(b) If *Bridging Earths* are not already applied between earth and all the terminal pillars or links of the *Link Box* to be replaced, then these shall be applied (see Fig. 14.1 on following page).

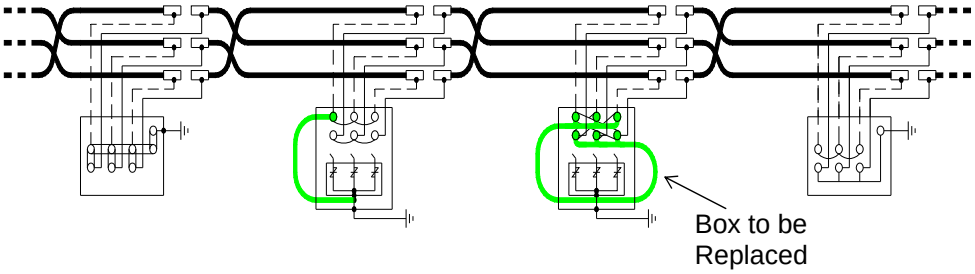


Fig. 14.1

1.3.1 One of the existing bonding leads between the cable joint and the *Link Box* should be cut at the appropriate place for jointing, and both the inner and outer conductors (on the cable joint side of the cut) shall be connected to the local earth by suitable *Bridging Earths* (see Fig. 14.2).

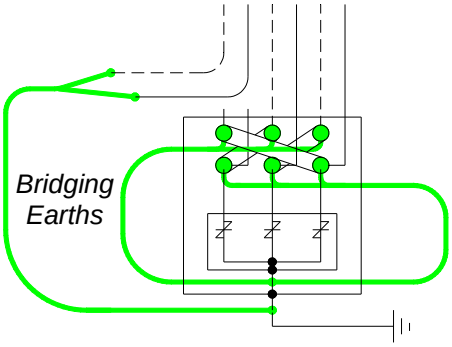


Fig. 14.2

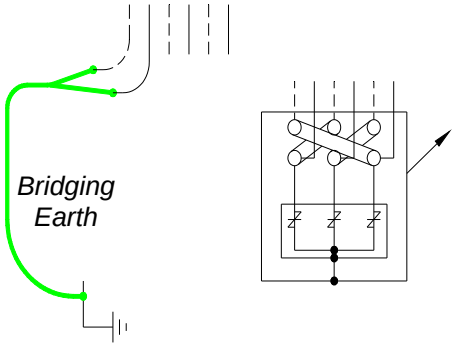


Fig. 14.3

1.3.2 The other two existing bonding leads should be cut and the *Link Box* removed (Fig. 14.3).

1.3.3 The new *Link Box*, complete with appropriate lengths of bonding lead, should be placed in situ. Where the terminal pillars of the *Link Box* are not provided with special connecting points for *Bridging Earths*, the links shall be bolted into their normal operating positions.

1.3.4 Straight joints should be made between the two bonding leads referred to in 1.3.2 and the corresponding leads of the new *Link Box* (Fig. 14.4).

1.3.5 Where practicable, *Bridging Earths* should be applied to the terminal pillars corresponding to the bonding leads just jointed (Fig. 14.5). Where the terminal pillars are not provided with suitable connecting points, *Bridging Earths* shall be connected to all three links.

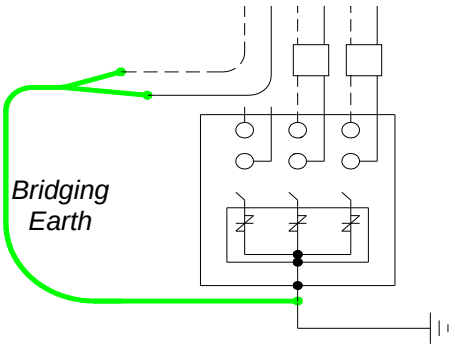


Fig. 14.4

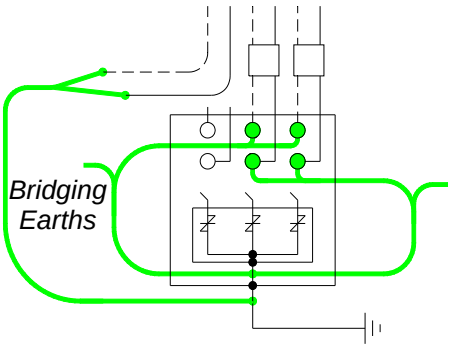


Fig. 14.5

1.3.6 The remaining bonding lead should be jointed (Fig. 14.6). Where appropriate, *Bridging Earths* should be applied to its terminals (Fig. 14.7).

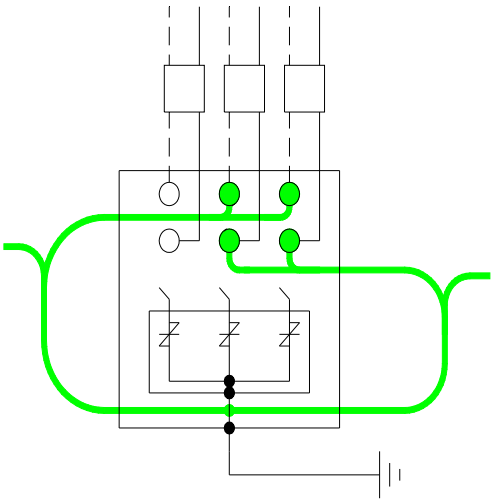


Fig. 14.6

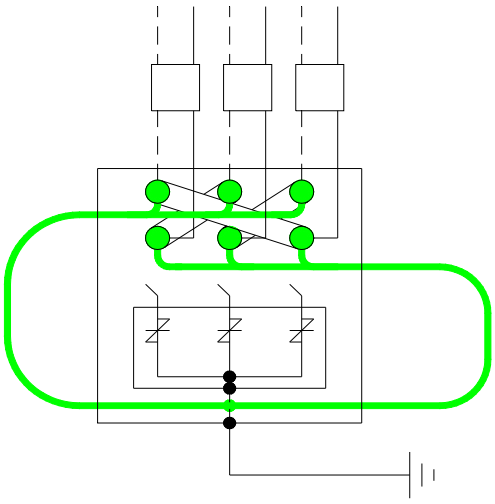


Fig. 14.7

1.3.7 Using the procedures detailed in Clauses 7.3 and 7.4 of this Attachment:

(i) The *Bridging Earths* at the point of work should be removed and the *Link Box* returned to service.

(ii) Any connections applied under 1.3 (ii) (a) should be removed and the bonding arrangement at the bonding position on each side of the point of work returned to the correct operational mode.

1.3.8 All the *Link Boxes* should be **Locked** and any *Cautionary Notices* removed.

1.3.9 In the case of single-phase *Link Boxes* or single-core bonding leads, similar procedures to those given above shall be adopted, care being taken to ensure that at all times there is a connection between earth and the metallic sheaths of at least one cable on each side of the point of work.

SCHEME 15

REPLACING CABLE SHEATH LINK BOXES BY BREAKING-DOWN EXISTING LINK BOXES

This Scheme supplements the relevant requirements of SRI 5 for the replacing of cable sheath link boxes by breaking-down existing link boxes.

1 The work may be undertaken using one of the methods given below:

1.1 If it is practicable to maintain an earth connection via *Bridging Earths* or links to all terminals and bonding leads at the point of work at all times, then *Earthed Working* may be used.

1.2 If it is necessary to remove the *Bridging Earths* from terminal pillars or bonding leads at the point of work, then *Insulated Working* may be used provided the defined work environment can be maintained.

1.3 If it is not practicable to use either *Earthed Working* or *Insulated Working* techniques, then the method of working bare hand detailed below, which embodies the principle of ensuring that at all times there is a connection between earth and the metallic sheath of at least one cable on each side of the point of work, may be used provided the following requirements are first complied with:

(i) The oversheath and joint barriers on the minor section each side of the *Link Box* to be replaced shall be proved (see Scheme 1). Any oversheath or barrier faults shall be located and repaired before proceeding.

(ii) Using the procedures detailed in Clauses 7.3 and 7.4 of this Attachment:

(a) The metallic cable sheaths shall be bonded together at the adjacent section bonding boxes or cable termination on each side of the *Link Box* to be replaced. This bond shall be clear of earth and can in some cases be achieved by links, for example, in three-phase boxes. In the case of single-phase boxes, it will be necessary to achieve the bonding together by **Approved** insulated leads. *Cautionary Notices* shall be applied at the bonding locations.

(b) If the phase links are not already removed and *Bridging Earths* applied to all the terminal pillars of the *Link Box* to be replaced, then these shall be carried out along with the disconnection of the SVLs.

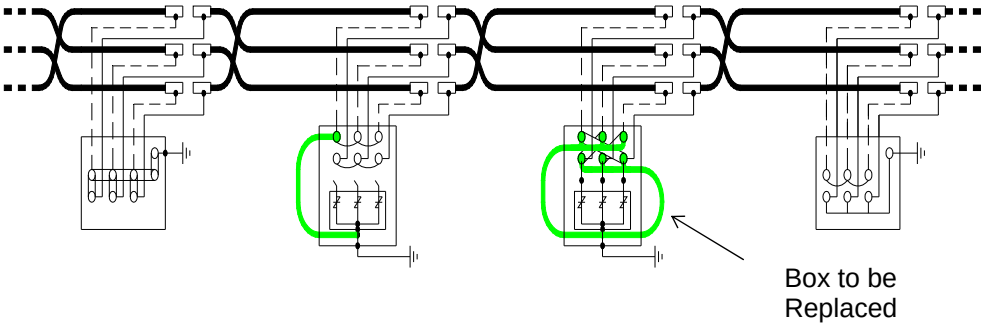


Fig. 15.1

1.3.1 In the case of underground *Link Boxes*, the compound should be removed by suitable means (Fig. 15.2).

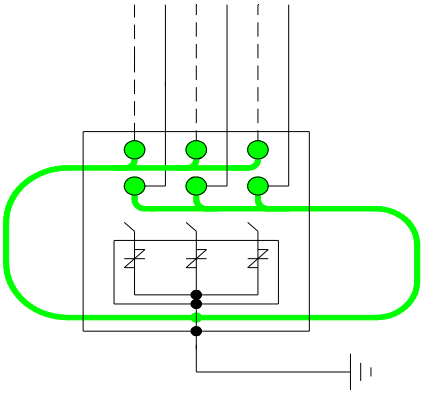


Fig. 15.2

Bridging Earths

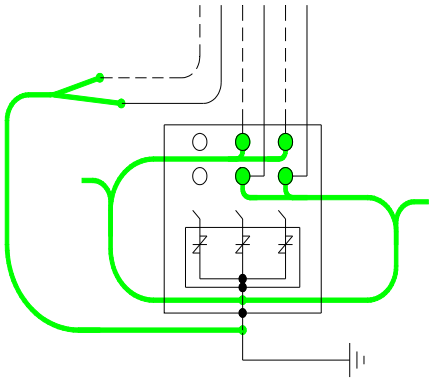


Fig. 15.3

1.3.2 The *Bridging Earths* should be disconnected from one pair of terminal pillars (on the same bonding lead). The existing bonding lead between the joint and the *Link Box* should be detached from the pillars and removed from the *Link Box*.

1.3.3 The *Bridging Earth* shall be connected to the inner and outer conductors of the bonding lead, the earth end fitting having first been connected to a local earth bar or rod external to the *Link Box* (Fig. 15.3).

1.3.4 The other two existing bonding leads between the joints and the *Link Box* should be dealt with as in 1.3.2 (Fig. 15.4).

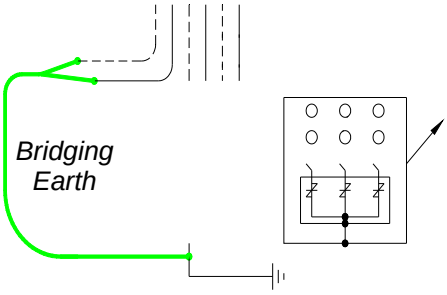


Fig. 15.4

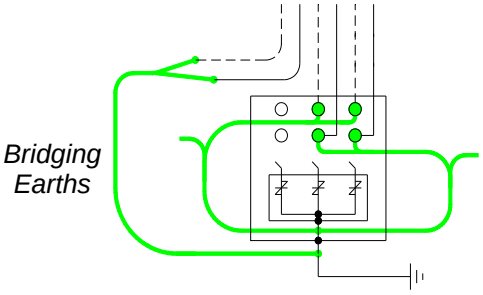


Fig. 15.5

1.3.5 The *Link Box* should be removed and the new box installed.

1.3.6 The two bonding leads referred to in 1.3.4 should be connected into the new *Link Box* and *Bridging Earths* attached between earth and their terminal pillars (Fig. 15.5). Where the terminal pillars of the *Link Box* are not provided with special attachment points for *Bridging Earths*, the link that is common to these two bonding leads shall be fitted and **Earthed** by means of a *Bridging Earth*.

1.3.7 The earths should be removed from the bonding lead referred to in 1.3.3 and the lead connected into the new *Link Box* (Fig. 15.6). *Bridging Earths* shall be attached between earth and the corresponding terminal pillars (Fig. 15.7). Where the terminal pillars of the *Link Box* are not provided with special attachment points for *Bridging Earths*, the remaining two links shall be fitted and **Earthed** by means of *Bridging Earths*.

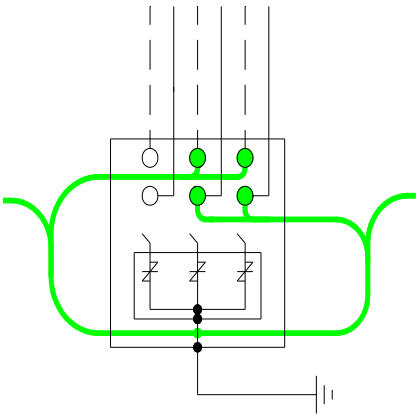


Fig. 15.6

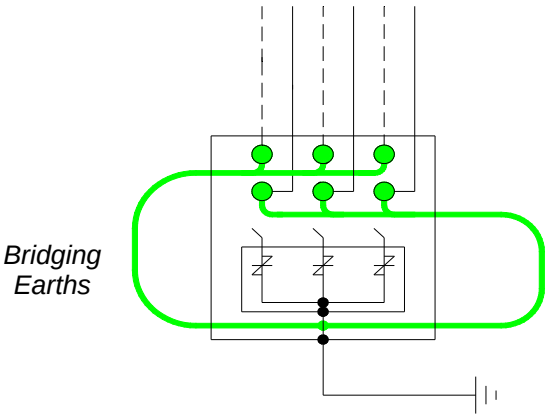


Fig. 15.7

1.3.8 The *Link Box* should then be completed as required.

1.3.9 Utilizing the procedures detailed in Clauses 7.3 and 7.4 of this Attachment:

(i) The *Bridging Earths* at the point of work should be removed and the *Link Box* returned to service.

(ii) Any connections applied under 1.3 (ii) (a) should be removed and the bonding arrangement at the bonding position on each side of the point of work returned to the correct operational mode.

1.3.10 All the *Link Boxes* should be **Locked** and any *Cautionary Notices* removed.

1.3.11 In the case of single-phase *Link Boxes* or single-core bonding leads, similar procedures to those given above shall be adopted, care being taken to ensure that at all times there is a connection between earth and the metallic sheaths of at least one cable on each side of the point of work.

SCHEME 16

CUTTING AND CAPPING AUXILIARY CABLES

This Scheme supplements the relevant requirements of SRI 5 for the cutting and capping of auxiliary cables.

1 *Insulated Working* shall be used throughout this Scheme.

2 At terminations at each end of the section to be worked on, all conductors shall be **Isolated** from their terminal equipment.

3 A section of oversheath should be removed to expose the metallic sheath and/or armour.

4 *Bridging Earths* shall then be applied to the metallic sheath and/or armour on both sides of the proposed cut and connected to the common earth bar via the Bridling Bar, using the procedure set down in Section 10 of this Attachment.

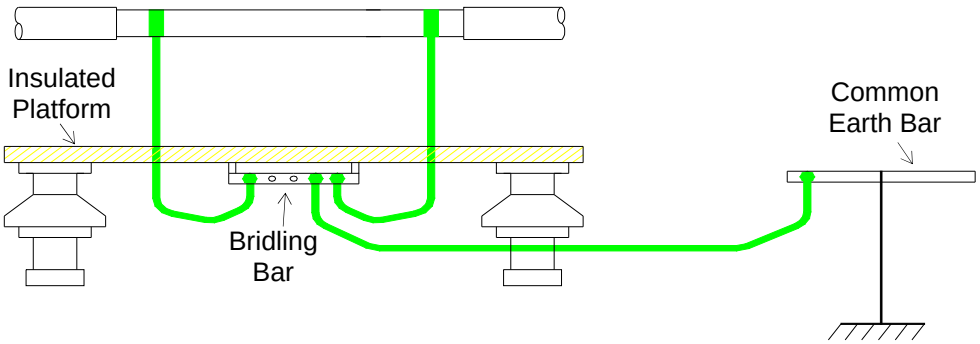


Fig. 16.1

5 A section of metallic sheath and/or armour shall be removed without disturbing the conductor insulation. The exposed ends of the metallic sheath and/or armour, together with the bonding clamps, shall be temporarily insulated.

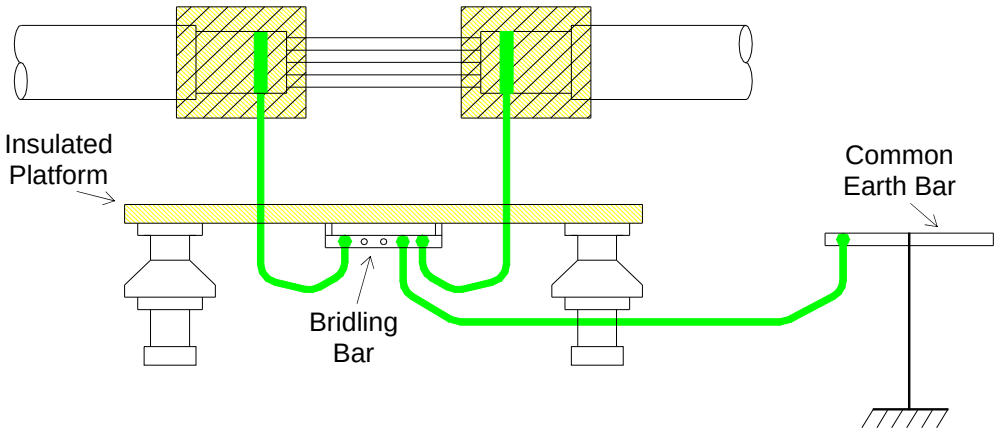


Fig. 16.2

6 The cores shall be cut one at a time. After each cut the core ends should be moved well apart to avoid accidental contact or alternatively the core ends may be insulated by a cap or other suitable means. This procedure should be followed until all the cores have been cut.

During this process personal contact shall not be made with more than one conductor at any one time; this includes avoiding the simultaneous touching of the two ends of a conductor after it has been cut (Fig. 16.3).

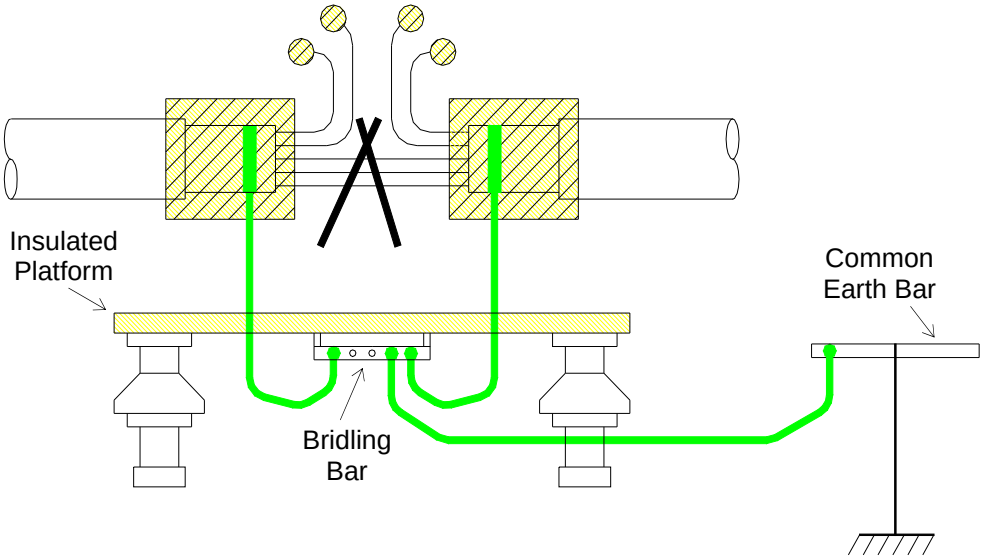


Fig. 16.3

7 The temporary insulation shall be removed from the metallic sheath and/or armour and associated clamp(s) on one of the cable ends only (Fig. 16.4).

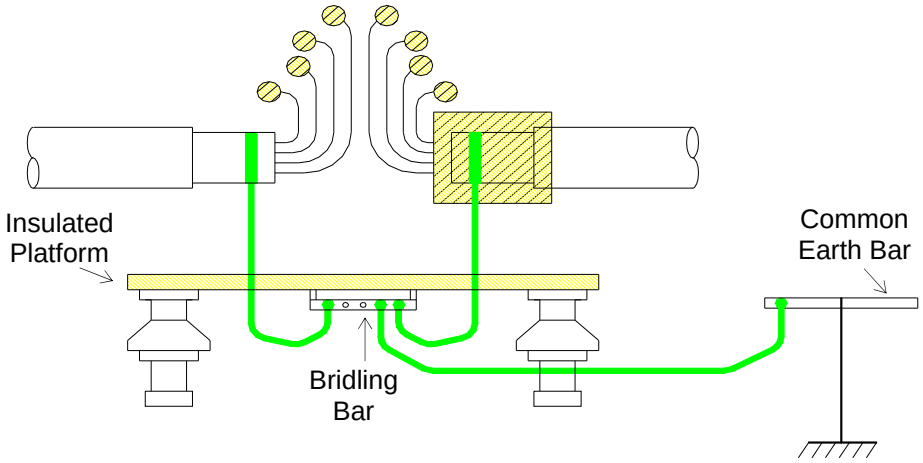


Fig. 16.4

8 The *Bridging Earth* on the cable end shall be disconnected from the Bridling Bar using the procedure set down in Section 10 of this Attachment and then removed from the metallic sheath and/or armour (Fig. 16.5).

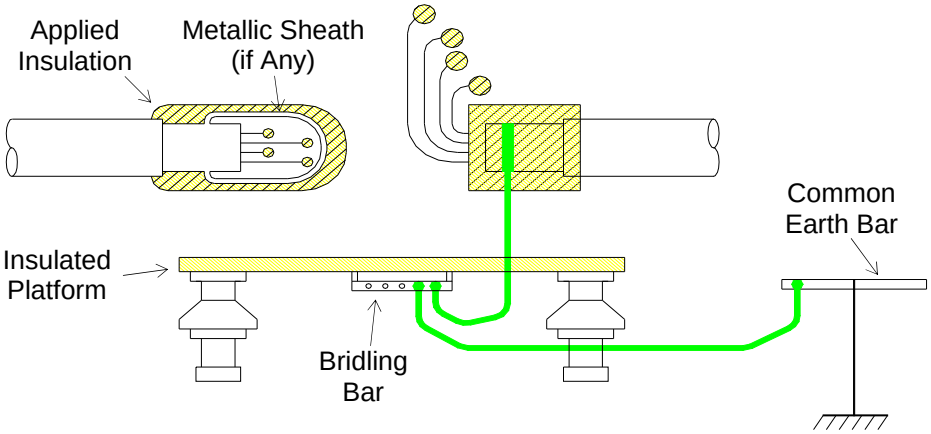


Fig. 16.5

9 The cable sheath should be capped and all the exposed metallic sheath and/or armouring, including any metal cap, shall be fully insulated.

10 The procedures detailed in Clauses 7-9 should be repeated for the other cable end, if applicable.

SCHEME 17

JOINTING AUXILIARY CABLES

This Scheme supplements the relevant requirements of SRI 5 for jointing of auxiliary cables.

1 *Insulated Working* shall be used throughout this Scheme.

2 At terminations at each end of the section to be worked on, all conductors shall be **Isolated** from their terminal equipment.

3 Any *Bridging Earth* used to earth the metallic sheath and/or armour of the cables to be jointed should be threaded through the joint sleeves as necessary to allow these items to be located over the cable at the appropriate time.

4 Where the metallic sheath and/or armour is electrically continuous within the work area, the cable shall be cut and prepared in accordance with Scheme 16, Clauses 4-6.

5 Where the metallic sheath and/or armour is not electrically continuous within the work area:

(i) A section of oversheath should be removed on one side of the discontinuity to expose the metallic sheath and/or armour which shall then be **Earthed** by a *Bridging Earth* applied to the common earth bar via the Bridling Bar using the procedure set down in Section 10 of this Attachment. This operation should then be repeated, if necessary, on the metallic sheath on the other side of the discontinuity.

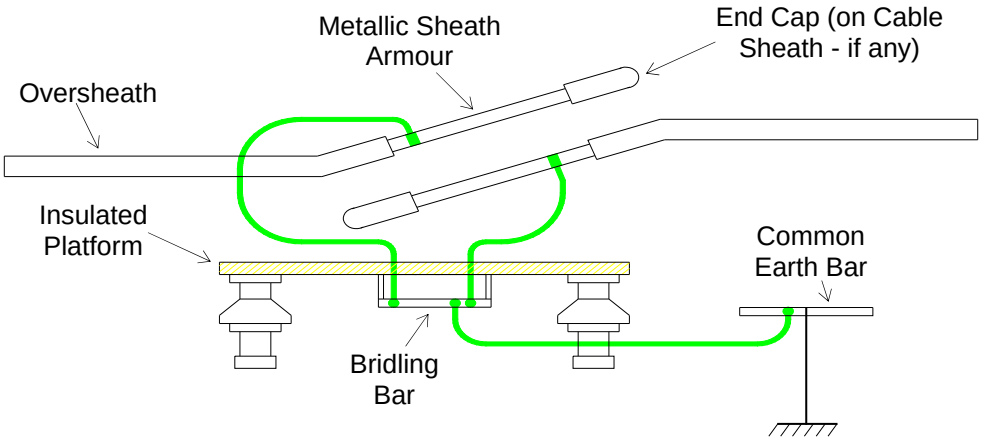


Fig. 17.1

(ii) A section of metallic sheath and/or armour shall be removed from each cable without disturbing the conductor insulation. The exposed ends of the metallic sheath and/or armour, together with the bonding clamps, shall be temporarily insulated (Fig. 17.2).

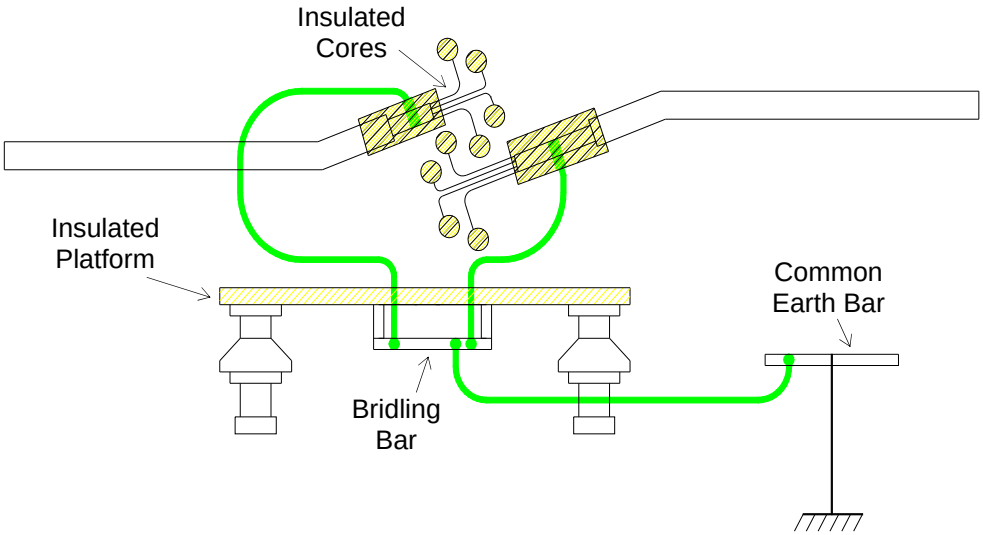


Fig. 17.2

6 Jointing can now proceed ensuring that only one core from one cable is handled at any one time. During each ferruling operation one of the two cores being jointed shall be held with **Approved** insulated pliers. Each completed ferrule shall be insulated before proceeding with the next ferruling operation (Fig. 17.3).

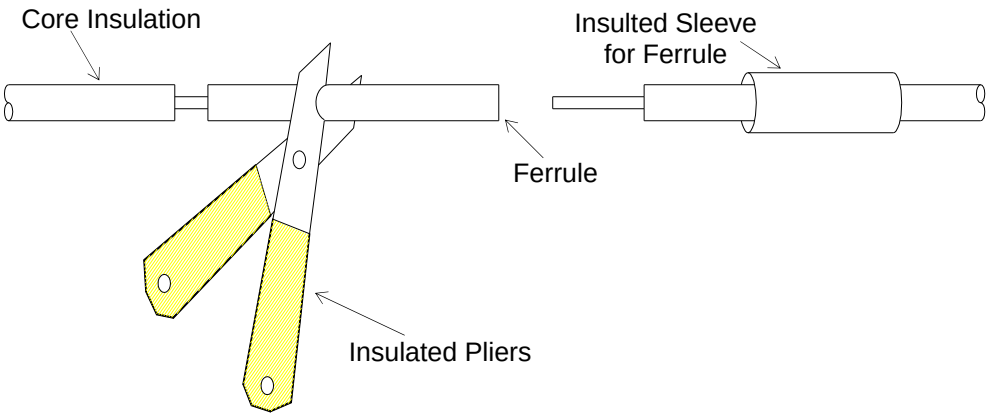


Fig. 17.3

7 After connecting all the cores, the joints should be completed by connecting through the metallic sheath(s) and/or armour(s), after which the *Bridging Earths* should be removed and the outer protective box applied or oversheath repair made as necessary (Fig. 17.4).

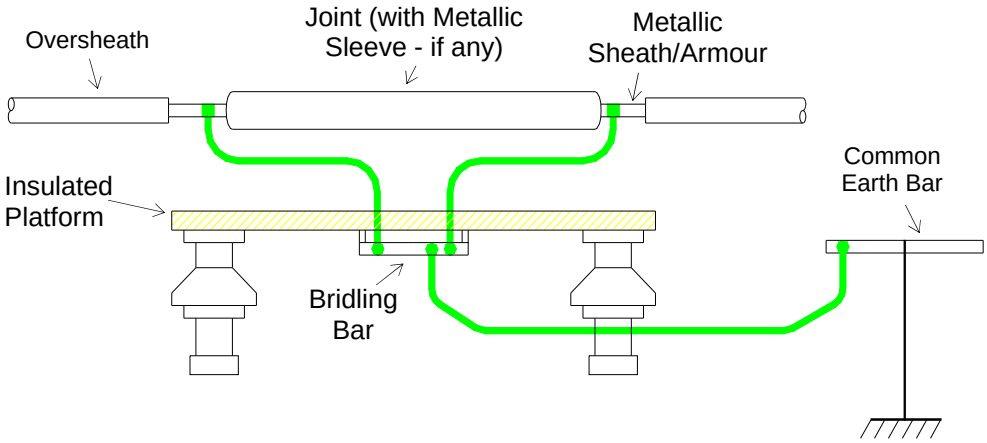


Fig. 17.4

SCHEME 18

GLANDING-OFF AUXILIARY CABLES AT TERMINAL BOXES

This Scheme supplements the relevant requirements of SRI 5 for the glanding-off of auxiliary cables at terminal boxes.

1 *Insulated Working* shall be used throughout this Scheme.

2 A section of oversheath should be removed to expose the metallic sheath and/or armour.

3 A *Bridging Earth* shall then be applied to the metallic sheath and/or armour and connected to the common earth bar via the Bridling Bar, using the procedures set down in Section 10 of this Attachment (Fig. 18.1).

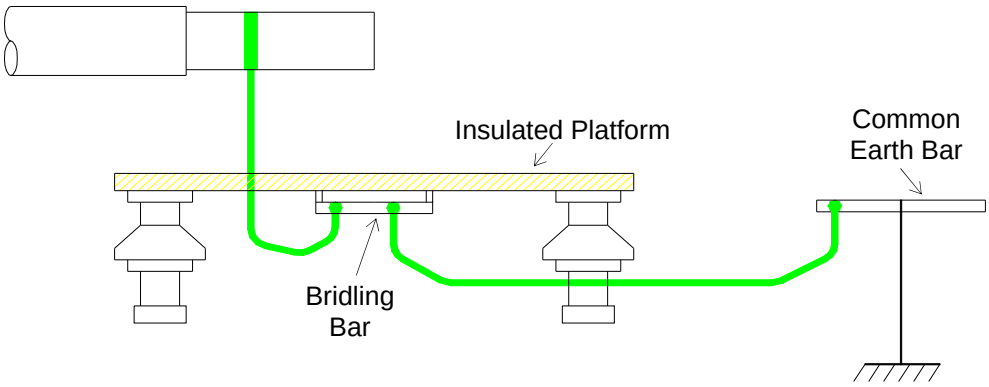


Fig. 18.1

4 A section of metallic sheath and/or armour shall be removed from the cable without disturbing the conductor insulation. The individual conductor ends shall be insulated to prevent accidental contact (Fig. 18.2).

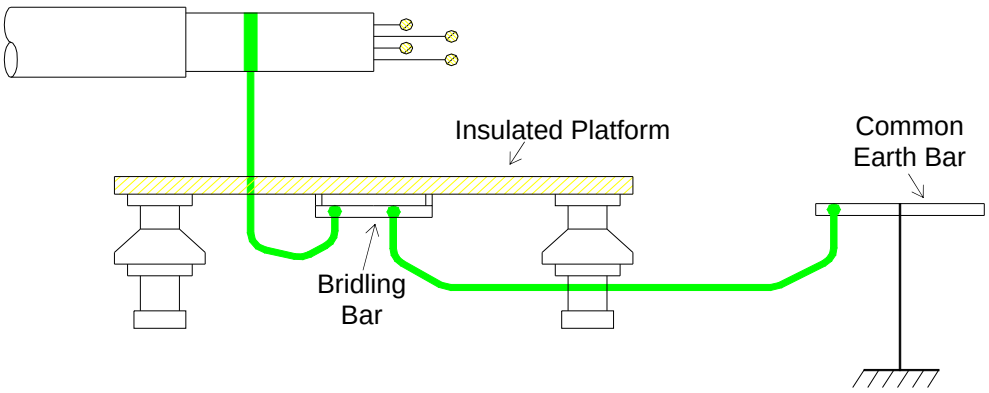


Fig. 18.2

5 The cable should be glanded-off and the permanent sheath and/or armour earth connection made (Fig. 18.3).

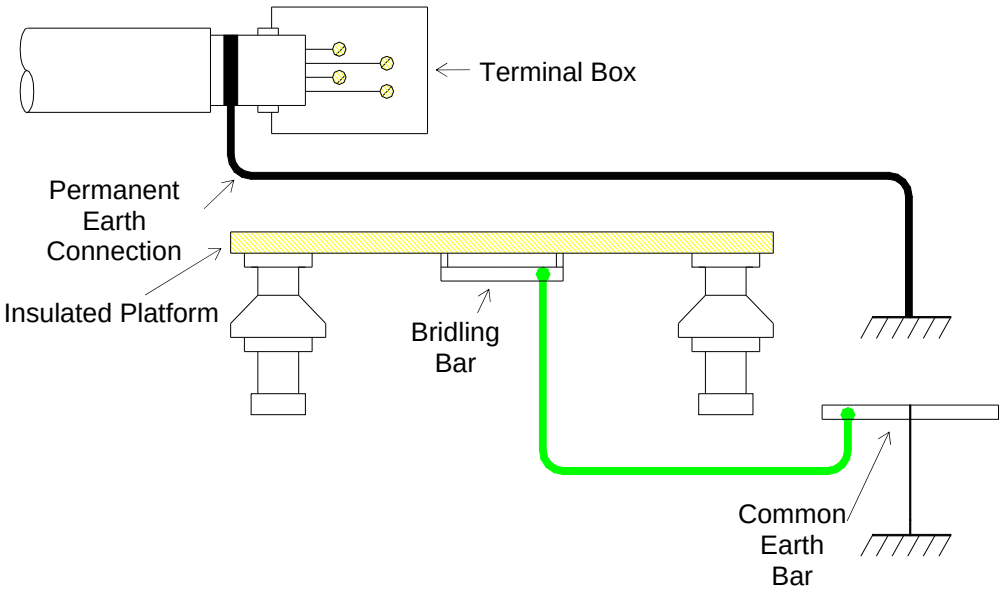


Fig. 18.3

6 The *Bridging Earth* connected to the metallic sheath and/or armour can now be removed and the oversheath repaired.

SCHEME 19

TERMINATIONS IN FULLY INSULATED BOXES

This Scheme supplements the relevant requirements of SRI 5 for terminating of auxiliary cables in fully insulated boxes.

1 *Insulated Working* shall be used throughout this Scheme.

2 Prior to terminating any core it shall be ensured that any existing connections to off-going equipment are **Isolated** on their terminals.

3 Each core can now be terminated individually on to its own terminal. Care shall be taken to ensure that no contact is made between any two cores and/or terminals; in fully insulated metalclad boxes, special care shall be taken to prevent the conductor touching the metal case.

SCHEME 20

TERMINATIONS IN NON-INSULATED METALCLAD BOXES

This Scheme supplements the relevant requirements of SRI 5 for the terminating of auxiliary cables in non-insulated, metalclad boxes.

1 Prior to commencement of work on the conductors, the core-to-earth insulation resistance of all cores shall be checked (see Scheme 23). The insulation resistance per core should be not less than the equivalent of 1 megohm for each 1000 metres. If the insulation resistance per core is less than this value, then:

(i) The fault shall be located and repaired prior to continuing the operation.

(ii) The operation can proceed providing all work is carried out using *Insulated Working.*

2 At the remote end of the cable from the point of work, all conductors shall be bonded together and insulated from the metallic sheath and from earth using *Insulated Working* and a *Cautionary Notice* displayed.

3 Using *Insulated Working*, one core shall be connected to earth at the point of work.

4 *Insulated Working* may now be dispensed with providing at all times while work is being carried out at least one core is connected to earth at the point of work.

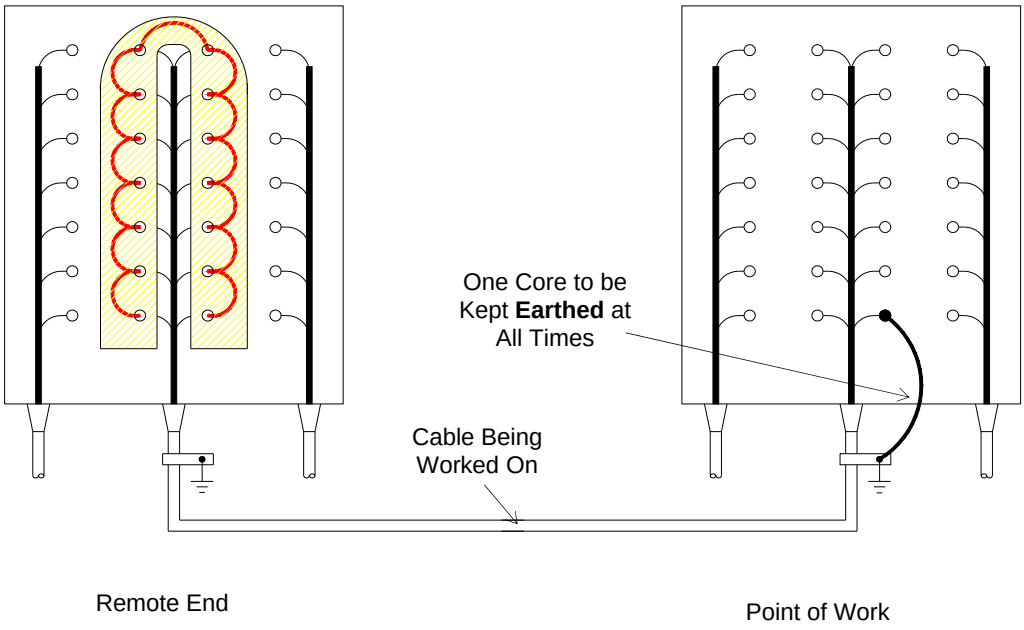


Fig. 20.1

5 Using *Insulated Working* the final earth should be removed from the point of work and the connections restored to normal at the remote end.

SCHEME 21

GENERAL COMMISSIONING TESTS ON AUXILIARY CABLES

This Scheme supplements the relevant requirements of SRI 5 for general commissioning tests on auxiliary cables.

1 *Insulated Working* shall be adopted for all general commissioning tests on auxiliary cables.

2 Test equipment and instruments which are to be connected to auxiliary cable cores shall be insulated from earth by placing them on an Insulated Platform or Insulating Mat. An isolating transformer shall be interposed between the test equipment and any mains or other power supply.

3 Auxiliary cable cores should not be used for temporary telephones unless special arrangements have been made to provide the necessary insulation level, i.e. isolating transformers.

SCHEME 22

OVERSHEATH TESTING ON AUXILIARY CABLES

This Scheme supplements the relevant requirements of SRI 5 for oversheath testing on insulated sheaths of auxiliary cables.

1 *Insulated Working* shall be adopted on disconnecting links and links in *Link Boxes* until such time as an *Adequate Earth* has been applied.

2 *Insulated Working* shall be used to ensure that the section under test is **Earthed** only at the point of test and that any adjacent section(s) are **Earthed** at each end adjacent to the section under test.

3 *Insulated Working* shall be used to remove the earth from the metallic sheath under test for the duration of such tests, but the section shall be **Earthed** before applying or removing test connections.

4 When testing to identify sheaths or to locate faults, *Insulated Working* shall be adopted.

SCHEME 23

DIELECTRIC TESTS ON AUXILIARY CABLES

This Scheme supplements the relevant requirements of SRI 5 for dielectric tests on auxiliary cables.

1 *Insulated Working* shall be adopted on disconnecting links and links in *Link Boxes* until such time as an *Adequate Earth* has been applied.

2 The metallic cable sheath of the section under test shall be **Earthed** at the terminations at each end of the section.

3 *Insulated Working* shall be used to isolate the conductors under test from their terminal equipment and to earth them at the point of test only.

4 The earth(s) can be removed for the duration of the test, but the conductors shall be **Earthed** before applying or removing test connections.

5 When testing to identify sheaths or to locate faults, *Insulated Working* shall be adopted.

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SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 6

[Issue 1]

HIGH VOLTAGE TRANSFORMERS

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HIGH VOLTAGE TRANSFORMERS

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and Safety Instructions to establish **Safety from the System** for personnel working on or testing **High Voltage (HV)** transformers.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 IDENTIFICATION

Apparatus on which work or testing is to be carried out shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the work or testing. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel working on or testing **HV** transformers are:

- Electric shock
- Burns
- Asphyxiation
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) Mistaking **HV** transformers on which it is not safe to work for those on which it is safe to work under the conditions laid down.

(ii) The possibility of the transformer becoming **Live** whilst work is proceeding due to incomplete isolation of all possible sources of supply.

(iii) Infringing **Safety Distances**.

(iv) Lack of oxygen when working inside large transformer tanks.

(v) Falling.

5 WORK ON OR TESTING TRANSFORMERS

5.1 When work or testing is to be carried out on the windings or connections of an **HV** transformer, the transformer shall be **Isolated** from all points of supply, including voltage and auxiliary transformers and generator backfeeds, from which it can be made **Live**. **SR A3** **SR A4**

5.2 The transformer shall be **Isolated** from all common neutral earthing equipment from which it may become **Live**. This does not require disconnection of solidly-earthed neutrals or neutral equipment connected solely to the transformer on which work is to be done.

5.3 Where reasonably practicable, a withdrawable voltage transformer shall not be **Isolated** or re-connected while the associated **HV** connections are **Live**. A withdrawable voltage transformer which is suspected faulty shall not be **Isolated** or re-connected while the associated **HV** connections are **Live**.

5.4 Where practicable, isolation arrangements shall be **Locked** with a Safety Lock. Where the **Isolating Device** or other means of isolation cannot be **Locked**, means shall be used to ensure that the point of isolation remains secure whilst work is in progress. Where the **Isolating Device** is removable links or fuses, these shall be kept in safe custody whilst work is being carried out. **SR A3** **SR A4**

5.5 **Caution Notices** shall be affixed at all points of isolation, including those from **Low Voltage** and from common neutral earthing equipment. **SR A3** **SR A4**

5.6 **Primary Earths** shall be applied between the transformer and all points of **HV** isolation including, where applicable, the point of isolation from common neutral earthing equipment and static capacitors. **SR A4** **SI 1**

5.7 Before a **Permit for Work** or **Sanction for Test** is issued, the **Senior Authorised Person** shall ensure that the transformer on which work or testing is to be carried out is readily identifiable or has fixed to it a means of identification which will remain effective throughout the course of the work or testing. **SR A8**

5.8 Before gaining access into, and while carrying out subsequent work or testing within, transformer tanks the requirements of SRI 401 - ‘General Confined Spaces’, where applicable, shall be met.

5.9 When testing **HV** transformers the requirements of SRI 11 - ‘Testing High Voltage Apparatus’, where applicable, shall be met.

5.10 When working on or testing **HV** transformers having remote or automatic control features the requirement of SRI 14 - 'Automatically or Remotely Controlled Plant and Apparatus', where applicable, shall be met.

5.11 When work is to be carried out on equipment associated with a **Live HV** transformer and there is a need to specify restrictions on the work or work area, a **Limited Work Certificate** shall be issued.

5.12 Where it is deemed necessary by the **Senior Authorised Person** to facilitate work, it may be necessary for some **LV** supplies to remain available and be **Isolated** during the course of the work by the **Authorised Person.** Such restrictions shall be stated on the relevant **Safety Document**.

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[Issue 1]

AC FILTERS AND CAPACITOR BANKS

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AC FILTERS AND CAPACITOR BANKS

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and the Safety Instructions to establish **Safety from the System** for personnel working on or testing **High Voltage** Static Capacitors and Reactors.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 IDENTIFICATION

Apparatus on which work or testing is to be carried out shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the work or testing. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel from AC filters and capacitor banks are:

- Electric shock
- Burns

4.2 These **Dangers** arise from the discharge of electrical energy retained by the AC filters and capacitor banks after they have been **Isolated**.

5 PREPARATION FOR WORK OR TESTING

5.1 The **Apparatus** shall be **Isolated** and **Primary Earths** applied. **SR A3** **SR A4**

5.2 Additional portable Earths shall be applied to appropriate points including the following:

(i) The common connection point of each group of AC filters and/or capacitor banks.

(ii) At any other point where additional portable **Primary Earths** or additional portable Earths have been specified by a **Senior Authorised Person**.

5.3 A **Permit for Work** or **Sanction for Test** shall be issued for the group or groups of **Apparatus** upon which work or testing is to be carried out. **SR A3** **SR A4**

6 WORK OR TESTING

6.1 When considered necessary by the **Senior Authorised Person** preparing the **Safety Document**, Earths shall be applied to the Apparatus so as to earth each unit at the point of work, at the same time short-circuiting and bonding the units to the racks or frames. These Earths shall only be applied or removed by, or under the **Personal Supervision** of, an **Authorised Person**. Attachment 1 shows examples of positions of fitting portable **Drain Earths** to various capacitor configurations and reactors.

6.2 When a disconnection is necessary, Earths shall be applied on both sides of, and in close proximity to, the point of disconnection of the **Apparatus** such that an Earth remains attached to the **Apparatus** being disconnected. These Earths shall only be applied or removed by, or under the **Personal Supervision** of, an **Authorised Person**. **SI 1**

6.3 Capacitor units shall be short-circuited and remain short-circuited on removal of the units from the capacitor group.

6.4 Following issue of a **Sanction for Test**, if Earths require to be removed from **Apparatus** during testing because of special access arrangements, the removal should be carried out by, or under the **Personal Supervision** of, an **Authorised Person** under the **Sanction for Test**. **SR A4**

ATTACHMENT 1

[Issue 1]

TO

SAFETY RULES INSTRUCTION SRI 7

POSITIONING OF PORTABLE EARTHS ON AC FILTERS AND CAPACITOR BANKS

Portable Earths shall be applied to appropriate points on capacitors and reactors according to their configuration (examples of type C1, C2 or C3 as follows):

Stacked Capacitors (Type "C1")

Prior to working on or testing capacitors type C1 Earths shall be applied; these are specific to this purpose and are applied in the following order:

1. 3-pole earthing and short circuiting cables.
2. 2-pole earthing and short circuiting cables.

An example showing the configuration of Earths on capacitor type C1 is shown in Figure 1.

Series and Parallel Capacitors (Type "C2" and "C3")

Prior to working on or testing parallel or series capacitor units of capacitor type C2 and C3 Earths shall be applied;
these are specific to this purpose and are applied in the following order:

1. 1-pole earthing and short circuiting cables.
2. 2-pole earthing and short circuiting cables.

An example showing the configuration of Earths on capacitor types C2 and C3 is shown in Figures 2.

Reactors

Prior to working on or testing reactors, Earths shall be applied.

An example showing the configuration of Earths on reactors is shown in Figure 3.

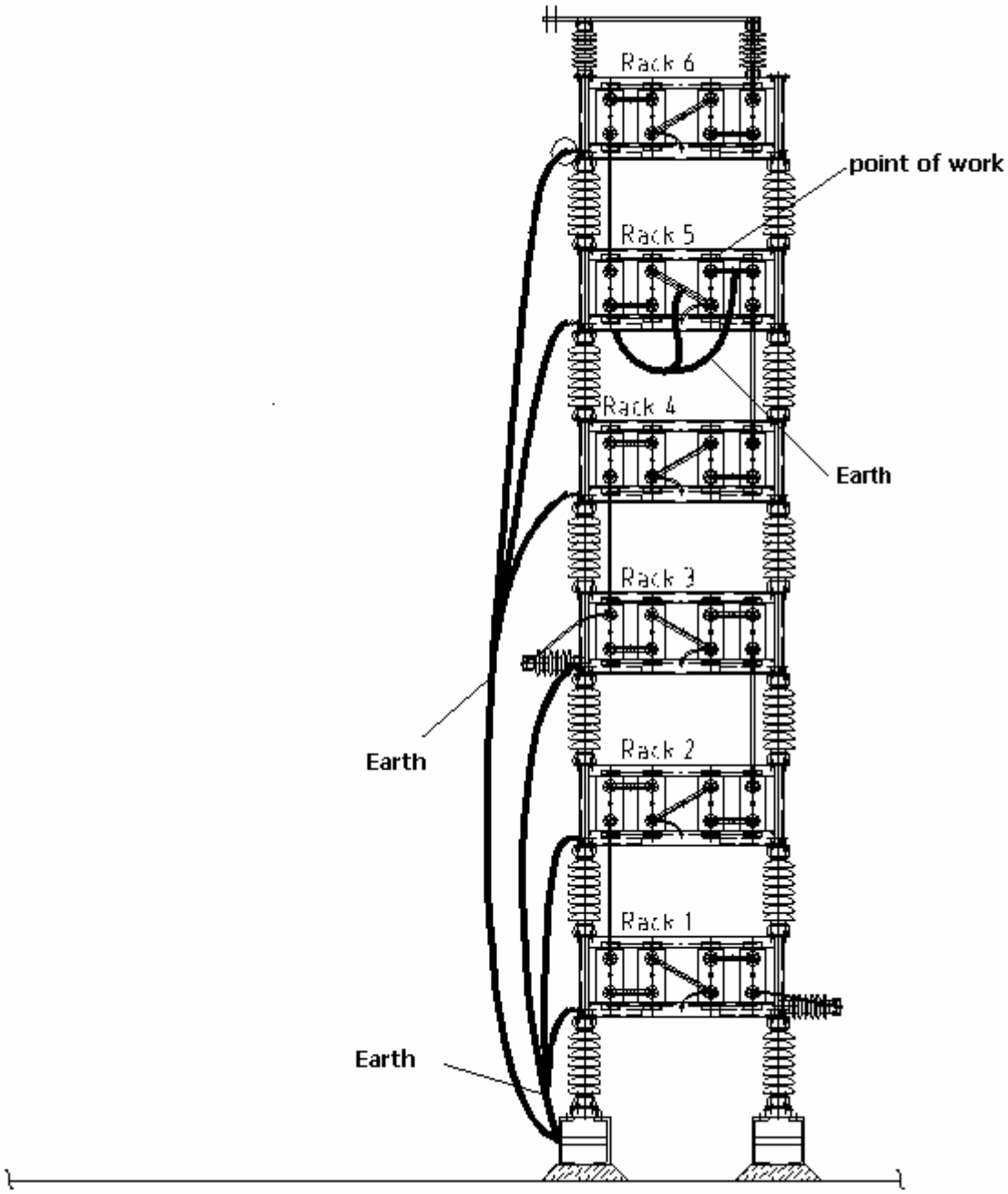
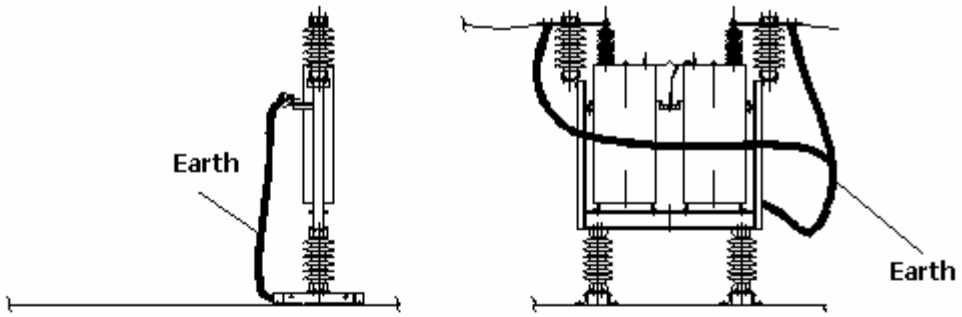
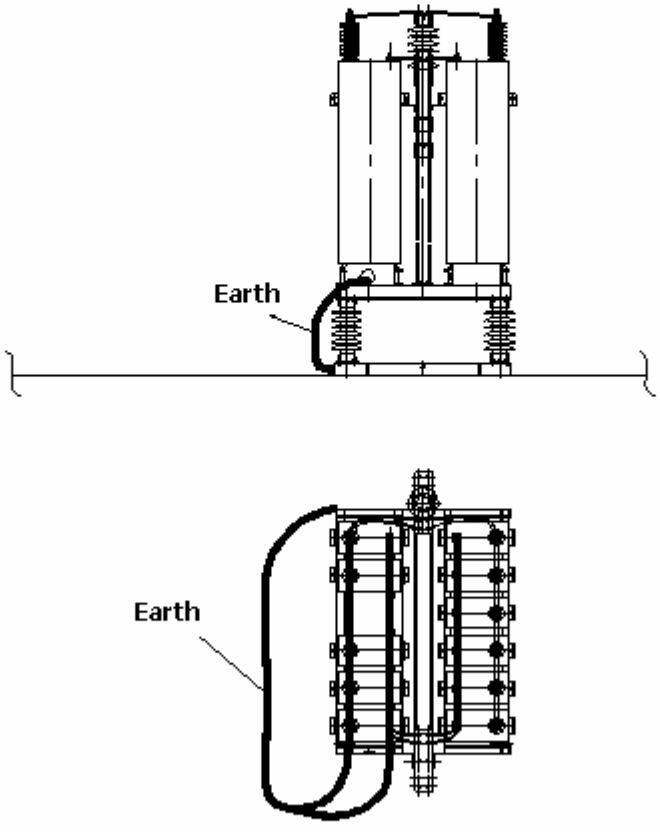


Figure 1: Portable Earths for Capacitor Type C1



(a) Capacitor Type C2



(b) Capacitor Type C3

Figure 2: Portable Earths for Capacitors Type C2, C3

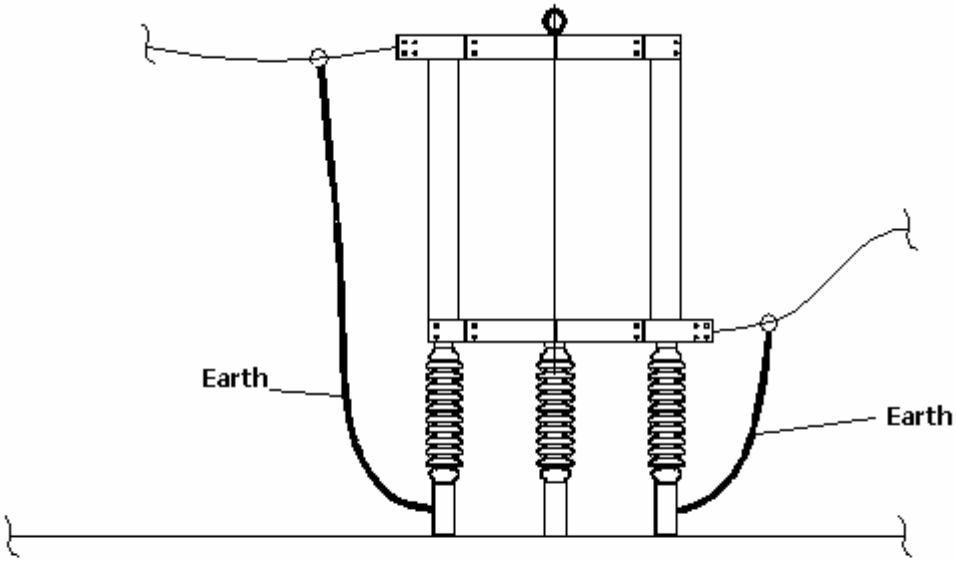


Figure 3: Portable Earths for Reactors

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[Issue – 2]

DEMARCATION OF WORK AREAS IN SUBSTATIONS

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DEMARCATION OF WORK AREAS IN SUBSTATIONS

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) setting down the requirements to achieve **Safety from the System** for personnel carrying out work in substations or **HV** enclosures;

(i) with exposed **High Voltage** conductors,

or

(ii) containing **Apparatus** nominally operating at a voltage level in excess of 11kV,

from **Dangers** which may be outside the work area.

Demarcation of test areas is outside the scope of this document and is covered by SRI 11 - 'Testing High Voltage Apparatus'.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purpose of this Instruction the following additional definitions will apply:

(i) *Access Point Notice* – A notice in **Approved** form defining access to and egress from a demarcated area (Figure 3)

(ii) *Danger Overhead Live Equipment Notice* – A notice in **Approved** form conveying a warning about **Danger** from overhead **Live Apparatus** (Figure 4)

3 IDENTIFICATION

Plant and **Apparatus** on which work is to be carried out shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the work. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel arising out of inadequate demarcation in substations or **HV** enclosures are:

- Electric shock
- Burns
- Other bodily injury.

4.2 These **Dangers** arise from;

(i) mistaking **Apparatus** which is **Live**, or must be considered to be **Live**, for that on which it is safe to work.

(ii) inadvertently infringing **Safety Distance**.

(iii) inadequate planning leading to a failure in the co-ordination of all work activities.

(iv) failure to adequately control vehicle movement.

5 BOUNDARIES AND SAFE WORK AREAS

5.1 Demarcation of a work area is one of the main control measures in achieving **Safety from the System** by ensuring clear boundaries between safe and unsafe workplaces.

5.2 The **Senior Authorised Person** shall decide whether demarcation is appropriate when work is to be carried out on or adjacent to **Plant** and/or **Apparatus** and the means of achieving **Safety from the System** is by limiting the work or the work area. **SR A2** **SR A3** **SR A7**

5.3 Boundary marks shall only be fixed by or under the **Personal Supervision** of the **Senior Authorised Person** issuing the **Safety Document**.

5.4 **Primary Earths** shall, where reasonably practicable, be positioned that both the line end clamps and earth end clamps are outside the safe work area. These earths shall be applied adjacent to the safe work area.

5.5 All freestanding demarcation shall be carried out in accordance with the standards shown in Figures 1 and 2. Boundary marking shall:

(i) Be fixed in position immediately prior to the issue of the **Safety Document**.

(ii) Be independently supported.

(iii) Not be attached to any structure supporting **Plant** or **Apparatus**.

(iv) Not carry any demarcation notice apart from specified sleeves as required.

(v) Have the minimum required number of clearly indicated suitable access and egress point(s) to the enclosed safe work area.

(vi) Be of an **Approved** type.

(vii) Be removed after the clearance of the **Safety Document**.

5.6 When structures supporting **Live Apparatus** are within the boundary marking, special precautions shall be taken before work commences to delineate unsafe access by affixing red pennants at working levels or by use of other appropriate devices to prevent access. The presence of this **Live Apparatus** within the work area shall be noted on all relevant **Safety Documents** and indicated on site at the demarcation entrance(s), and where practical, at the supporting structures by the use of **Approved** *Danger Overhead Live Equipment Notice(s)* clearly visible from all possible directions of approach. **SR A2**

When structures supporting **Live Apparatus** are adjacent to the work area, **Approved** 'Danger Live' signs shall be affixed at working levels as a special precaution prior to work commencing.

5.7 The enclosed safe work area shall be additionally distinguished by clearly visible green cones, placed 600mm to 1m (2ft to 3ft) inside the work area at intervals not exceeding 6m (20ft) - see Figure 1. These green cones shall be placed by the **Senior Authorised Person** immediately prior to the issue of the **Safety Document** and removed by the **Senior Authorised Person** immediately following the clearance of the **Safety Document**.

5.8 Where the safe work area is separated from adjoining areas by permanent walls, fixed divisions or screens, it is adequate to distinguish the safe work area by green cones placed within the safe work area and clearly visible from the outside at each point of access. These green cones shall be placed by the **Senior Authorised Person** immediately prior to the issue of the **Safety Document** and removed by the **Senior Authorised Person** immediately following the clearance of the **Safety Document**. Such fixed divisions or screens shall remain in position during the course of the work.

5.9 **Safety Distance** shall be maintained at all times to **Apparatus** on which it is unsafe to work. This includes any overhead conductors which pass over the safe work area and on which work is not to take place. In order to ensure that the **Safety Distance** is maintained, the risks associated with the work being carried out shall be assessed by the **Senior Authorised Person** issuing the **Safety Document**. The boundary of the safe working area and the access to the safe working area shall be positioned accordingly. The presence of overhead conductors above the safe working area shall be noted on all relevant **Safety Documents** and indicated on site at the demarcation entrance(s), and where practical, directly below the overhead conductors by the use of *Danger Overhead Live Equipment Notice*(s) clearly visible from all possible directions of approach. **SR A2**

5.10 Where a demarcated area has been set up it shall have a readily identifiable designated access point(s). Each access point shall be identified by plastic sleeves indicating access/egress placed over the yellow cones on each side of the access point. An *Access Point Notice* shall be positioned adjacent to these cones. If the **Safety Document** recipient is not on site, the access/egress point(s) shall be closed prohibiting access.

5.11 No person shall enter or exit a demarcated work area by crossing over or under the boundary marking. The access/egress point(s) to the demarcated work area must be used.

5.12 Work shall not commence on any day unless there has been a pre-work inspection of the demarcation equipment to confirm its continuing suitability. The recipient of the **Safety Document** who is in charge of the work within the demarcated area shall undertake this inspection. He will on satisfactory inspection completion enter his name and the valid date on the *Access Point Notice*.

5.13 If there is more than one **Safety Document** for one specific demarcated area, it will only be necessary for one of the **Safety Document** recipients to complete the requirements of clause 5.12 above. There must be mutual agreement between the **Safety Document** recipients as to the responsibility holder.

6 DANGER NOTICES

6.1 **Danger Notices** shall be placed to inform personnel working in or approaching a work area that adjacent **Plant** or **Apparatus** is not included in the specified work area. The notices shall be attached to, or fixed adjacent to, adjoining **Plant** and **Apparatus** in sufficient numbers to be clearly visible from the work area at all times. **SR A7**

6.2 **Danger Notices** shall only be fixed or moved by a **Senior Authorised Person** or by a **Person** under the **Personal Supervision** of a **Senior Authorised Person**.

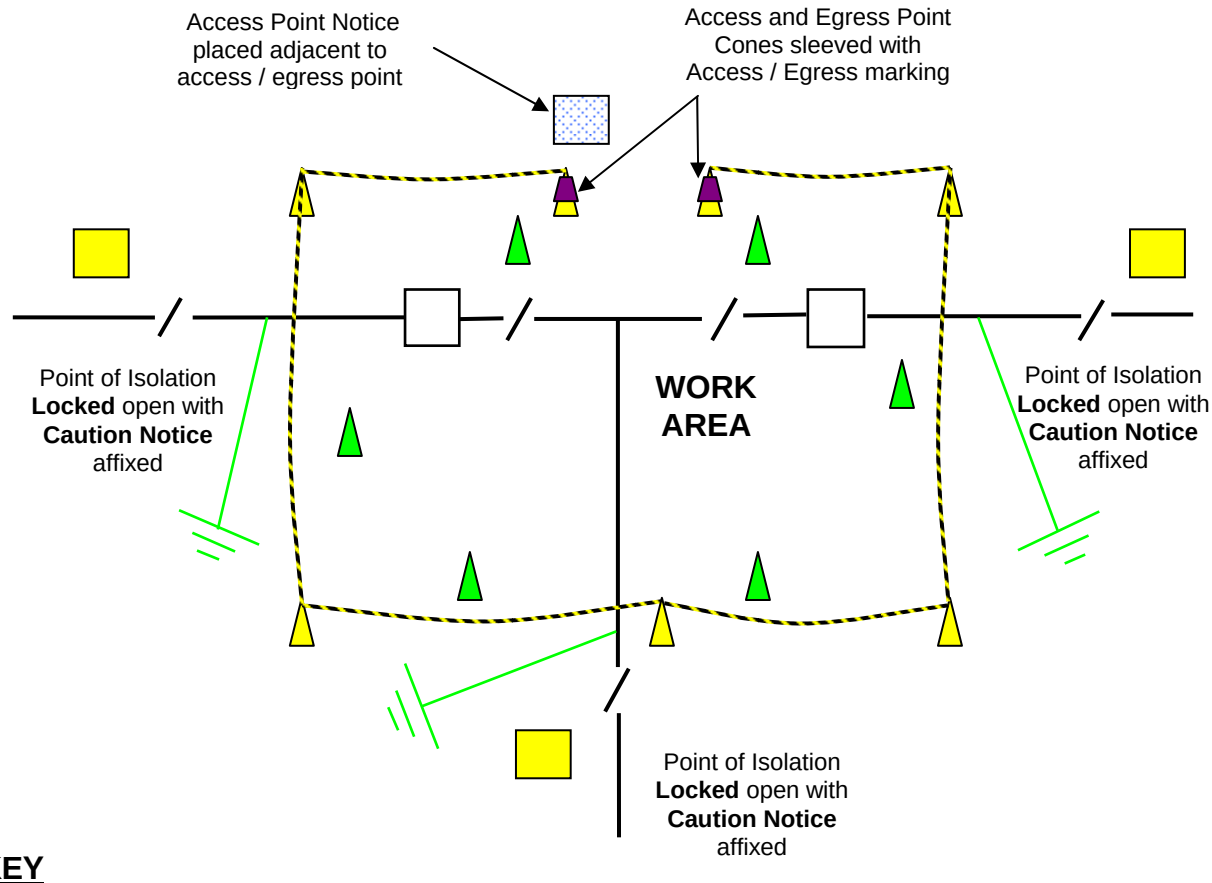
7 OTHER REQUIREMENTS

7.1 On completion of work the boundary marking shall be removed by the **Senior Authorised Person** or by a **Person** under the **Personal Supervision** of a **Senior Authorised Person** immediately following the clearance of the **Safety Document**.

7.2 Demarcation equipment shall not be used to indicate an area requiring de-limiting due only to the presence of general hazards such as tripping or falling. This type of de-limited area shall be indicated either by red cones/posts fitted where reasonably practical, with high visibility sleeves or marking and supporting a blue nylon rope perimeter or by red coloured road type barrier systems. It is permissible to attach warning/information notices to this perimeter.

FIGURE 1

FREE STANDING DEMARCATION OF WORK AREAS IN SUBSTATIONS



KEY

Danger Notice attached to, or fixed adjacent to, adjoining **Plant** and/or **Apparatus** which is **Live**, or must be regarded as **Live**.

Independent green cone placed 600mm to 1m (2 ft to 3ft) inside the work area and at intervals not exceeding 6m (20ft).
Green cones removed during testing – SRI 11 'Testing High Voltage Apparatus'.

Boundary marking support – yellow cone. Sufficient supports shall be used to ensure that the boundary marking remains a minimum of 500mm above ground level and is secure.

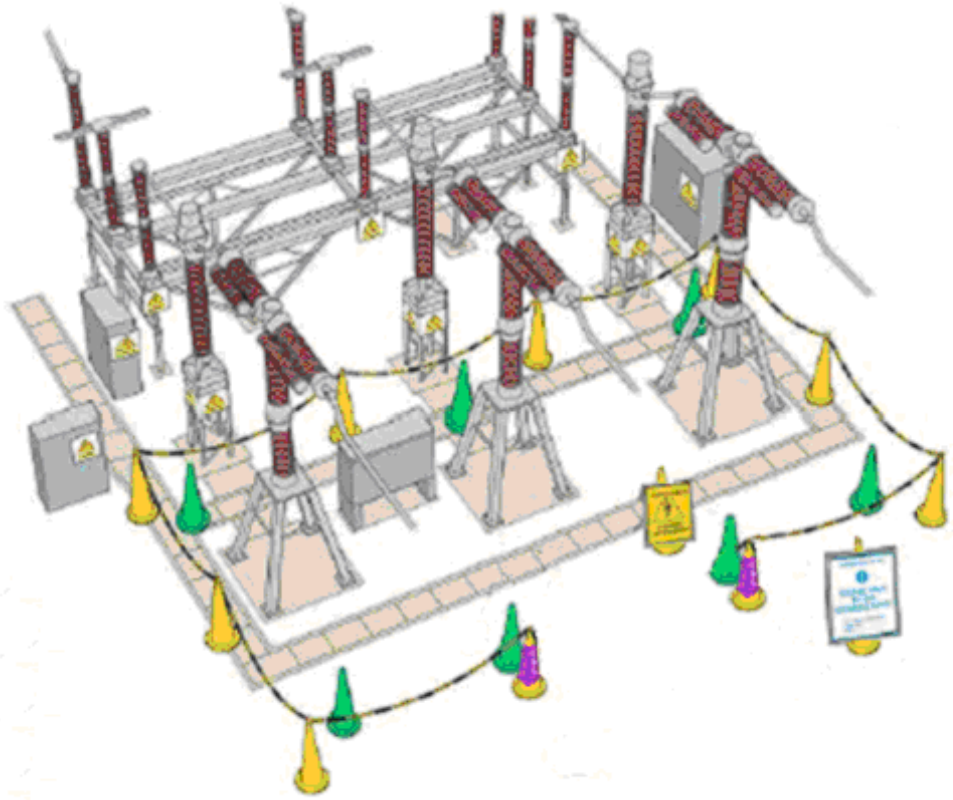
Boundary marking – yellow/black plastic chain.

Access Point Notice placed adjacent to access/egress point.

Primary Earth fitted where reasonably practicable outside the demarcated work area.

FIGURE 2

FREE STANDING DEMARCATION OF WORK AREAS IN SUBSTATIONS



Note:

(1) Access/Egress point maximum width 1 metre for pedestrian use.

(2) Demarcation chain must be kept more than 500mm above ground level.

(3) Green cones placed maximum 1 metre inside demarcated zone and at intervals not exceeding 6m (20ft).

(4) Danger Overhead Live Equipment Notice placed on yellow cone at access/egress point(s) if required.

(5) Access Point Notice placed on yellow cone adjacent to access/egress point(s).

FIGURE 3

ACCESS POINT NOTICE

FIGURE 4

DANGER OVERHEAD LIVE EQUIPMENT NOTICE

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 9

[Issue 1]

ACCESS TO HIGH VOLTAGE COMPARTMENTS AND STRUCTURES

Contents **Page**

ACCESS TO HIGH VOLTAGE COMPARTMENTS AND STRUCTURES

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) setting down the requirements and procedures which shall be applied in order to control the access of personnel to enclosures, chambers, cubicles or cells containing exposed **High Voltage (HV)** conductors and to towers, poles, gantries or other means of supporting or giving access to such conductors**.**

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purpose of this Safety Rules Instruction the following additional definitions apply:

(i) *Compartment* - an enclosure, chamber, cubicle or cell (but not a substation or a transformer within blast walls) containing **Apparatus** having exposed **HV** conductors. This term does not apply to metalclad switchgear spouts when such spouts are accessible.

(ii) *Structure* - a tower, pole, gantry or other means of supporting or giving access to exposed **HV** conductors.

3 IDENTIFICATION

Each *Compartment* or *Structure* to which access is required, shall be readily identifiable or have fixed to it means of identification which will remain effective throughout the period access is required. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel gaining access to *Compartments* and *Structures* are:

- Electric shock
- Burns
- Asphyxiation
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) Gaining access to **Live** conductors.

(ii) Operation of fixed fire-protection equipment.

(iii) Falling.

5 ACCESS TO COMPARTMENTS CONTAINING HV APPARATUS

5.1 Barriers, including plates on access ladders, designed to prevent access to *Compartments* shall normally be kept **Locked** with an operational lock.

5.2 Only an **Authorised Person** or a **Competent Person** acting under the **Personal Supervision** of an **Authorised Person** shall have access to a *Compartment* in which the exposed **HV** conductors are **Live**.

5.3 When work or testing is to be done on **HV Apparatus** in a *Compartment* all the exposed **HV** conductors shall be **Isolated**, **Earthed** and a **Permit for Work** or a **Sanction for Test** issued for the work or testing. The lock controlling access to the *Compartment* shall have been unlocked by an **Authorised Person** or a **Competent Person** under the **Personal Supervision** of an **Authorised Person**.

6 ACCESS TO STRUCTURES

Gates and devices designed to prevent the climbing of *Structures* shall be kept secured except when opened under a relevant **Safety Document** or by an **Authorised Person**, or by a **Competent Person** under the **Personal Supervision** of an **Authorised Person**.

NIE SAFETY RULES

SAFETY RULES INSTRUCTION

SRI.10

MOBILE ELEVATED WORK PLATFORMS (MEWPs), VEHICLES, CRANES AND LONG OBJECTS IN SUBSTATIONS

Issue 2

SECTION	MOBILE ELEVATED WORK PLATFORMS (MEWPs), VEHICLES, CRANES AND LONG OBJECTS IN SUBSTATIONS	PAGE

1 SCOPE

This Safety Rules Instruction:

1.1 Applies the principles established by the NIE Safety Rules and supporting documentation to achieve **Safety from the System** when Mobile Elevated Work Platforms (*MEWPs*), *Vehicles*, *Cranes and Long Objects* are being moved or used within substations.

1.2 Shall be applied when:

- Precautions to achieve **Safety from the System** are taking place
- Preparations for work and/ or testing are taking place
- Work and/ or testing is taking place

1.3 Refers to substations that contain exposed **Live High Voltage (HV) Plant** and **Apparatus.**

1.4 Requires that risks are assessed and mitigation identified for the specific type(s) of Mobile Elevated Work Platforms (*MEWPs), Vehicles, Cranes* and *Long Objects* to be used. This shall be defined at the planning stage of the work and/ or testing.

2 HAZARDS AND RISKS

2.1 The primary hazards to **Persons** identified during the movement and use of Mobile Elevated Work Platforms (*MEWPs), Vehicles, Cranes* and *Long Objects* in substations are:

- Contact with **Live Apparatus**
- Induced voltages

When it is not reasonably practicable to eliminate hazards, the associated risks shall be assessed and control measures identified to ensure the risks are controlled and maintained at an acceptable level.

Absolute application of the requirements detailed in this SRI are an essential part of risk mitigation.

3 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the NIE Safety Rules.

The following additional definitions apply within SRI.10:

3.1 *MEWP* – Mobile Elevated Work Platform.

3.2 *Vehicle* – includes Vans, Cars, Lorries, Vehicle Mounted Loaders (Tico, HIAB and Telehandlers) and Special Purpose Vehicles – (a Special Purpose Vehicle is taken to include all types of mechanical excavators.)

3.3 *Crane* – including any load which is moved on or carried by the crane.

3.4 *Field Equipment Earth* – an **Approved** connection for bonding *MEWPs, Vehicles, Cranes* and scaffolding to earth.

3.5 *Long Objects* – ladders, scaffold poles, ropes, tools, objects or items of equipment that when used, extended or erected could approach **High Voltage** conductors or insulators supporting them within **Safety Distances**.

3.6 *Dedicated Observer* – a **Person** selected by a **Senior Authorised Person** and/ or the recipient of a Safety Document and provided with instructions to assist in ensuring the safe movement or use of *MEWPs, Vehicles, Cranes or Long Objects* within a defined area of usage.

3.7 *Appointed Person* – A person (typically the *Crane* Owner or Operators Technical Representative) trained to establish and implement a safe system of work for the lifting operation in accordance with current industry regulations and standards.

3.8 *Operator* – A person who has been trained and assessed to use specific types of *MEWPs, Vehicles or Cranes*.

4 IDENTIFICATION

Plant and **Apparatus** on which work and/ or testing is to be carried out or adjacent to a route where *MEWPs*, *Vehicles*, *Cranes* or *Long Objects* are being used or moved shall be readily identifiable or have fixed to it, a means of identification which will remain effective throughout the course of the movement, work and/ or testing. **SR A8**

5 APPLYING AND REMOVING A PORTABLE PRIMARY EARTH USING A MEWP.

5.1 The **Senior Authorised Person** providing **Personal Supervision** to a **Competent Person** for the application and removal of a portable **Primary Earth** shall not be in or on the *MEWP w*hen providing **Personal Supervision.**

5.2 A *Dedicated Observer* shall be utilised when using a *MEWP* to assist in the application and/ or removal of a portable **Primary Earth**. The **Senior Authorised Person** will fulfil the role of *Dedicated Observer* and shall consider whether any additional *Dedicated Observers* are required.

5.3 Clear communication between the **Senior Authorised Person** providing **Personal Supervision** and the **Competent Person** applying and/ or removing the portable **Primary Earth** shall be established and maintained.

6 DEDICATED OBSERVER

6.1 When considering the use of a *Dedicated Observer,* the **Senior Authorised Person** shall assess the risks in relation to:

- applying precautions to achieve **Safety from the System**,
- work and/ or testing,
- the *MEWPs*, *Vehicles, Cranes* and/ or the *Long Objects* being used,
- the extent of vision of the *Operator*,
- the proximity of exposed **Live HV Plant** and **Apparatus.**

6.2 Clear communication shall be established and maintained between a *Dedicated Observer* and other persons. Where reasonably practicable, the *Dedicated Observer* shall be provided with means of communication and a means for halting the movement of the *MEWP, Vehicle* or *Crane* to avoid **Danger**.

6.3 A *Dedicated Observer* shall be appointed to maintain **Safety Distance** from exposed **Live HV Plant** and **Apparatus** during application and removal of a portable **Primary Earth**, when using a *MEWP.* **SRI.2**

6.4 The requirement for a *Dedicated Observer* to maintain **Safety Distance** from exposed **Live HV Plant** and **Apparatus** will be discussed and agreed by the **Senior Authorised Person** and the **Person** receiving the **Safety Document** when work and/ or testing is taking place.

7 ACCESS TO SUBSTATIONS

An **Authorised Person** shall give **Personal Supervision** to the movement on site of *MEWPs, Vehicles* or *Cranes* whose height or part, including any load or fully extended radio or other aerials, is higher than 2.3m (7ft 6ins) above ground level. Where *MEWPs, Vehicles* or *Cranes* of this height, or any lower, may infringe **Safety Distance**, appropriate additional restrictions shall be applied.

8 MOVEMENT OF MOBILE ELEVATED WORK PLATFORMS (MEWPS), VEHICLES, CRANES AND LONG OBJECTS TO AND FROM THE EARTHING POSITION OR WORK AND/ OR TEST AREA

8.1 When *MEWPs, Vehicles, Cranes* and *Long Objects* are to be moved, the route shall be specified on site by a **Senior Authorised Person** who shall provide **Personal Supervision** during the whole period of the movement to ensure adherence to the specified route.

8.2 Alternatively, the **Senior Authorised Person** referred to in 8.1 shall specify on site to an **Authorised Person** the route for the *MEWPs, Vehicles, Cranes* and *Long Objects*. The **Authorised Person** shall provide **Personal Supervision** during the whole period of the movement to ensure adherence to the specified route. This **Authorised Person** shall be in charge of the working party and where applicable, be the recipient of any **Safety Documents**.

8.3 At no time shall **Safety Distance** be infringed to any live equipment or to **Plant** or **Apparatus** that has been isolated but not earthed. In addition, an **Authorised Person** shall ensure the *MEWPs*, *Vehicles, Cranes* or *Long* Objects are electrically bonded to earth using a *Field Equipment Earth* before any part of it infringes the following distances to exposed **Live HV** conductors:

Rated Voltage	**Distance**		
kV	**m**	**(ft**	**ins)**
Up to 33	2.8	(9	0)
110	3.4	(11	0)
275	4.6	(15	0)
400	5.5	(18	0)

SR A2

To avoid **Danger** from induced voltages, persons on the ground shall not be in contact with the *MEWP*, *Vehicles, Cranes* or *Long Objects* when it is moving under or adjacent to **Live HV** conductors.

8.4 When a *MEWP*, *Vehicle, Crane* or *Long Object* is being moved in close proximity to, but outside the **Safety Distance** from exposed **Live HV** conductors the **Senior Authorised Person** shall ensure, so far as is reasonably practicable, that the busbar zone protection and/ or adjacent circuit protection is in service.

8.5 The *MEWPs*, *Vehicles* or *Cranes* shall be moved only by an *Operator* who shall be made aware by the **Senior Authorised Person**, or the **Authorised Person** in Clause 8.2, of the hazards of moving near **Live High Voltage Apparatus**. Only those **Persons** essential to the movement shall be allowed in or on the *MEWPs*, *Vehicles* or *Cranes*.

9 OPERATION OF MOBILE ELEVATED WORK PLATFORMS (MEWPs), CRANES AND LONG OBJECTS EQUIPMENT WITHIN THE DEMARCATED WORK AND/ OR TEST AREA

9.1 GENERAL

9.1.1 Safe boundary markings and work and/ or test areas shall be in accordance with SRI 8 – 'Demarcation of Work Areas in Substations' and SRI 11 – 'Testing High Voltage Apparatus'. **SR A8**

9.1.2 The recipient of the **Safety Document** shall ensure that, as soon as practicable after reaching the demarcated work and/ or test area, a *Field Equipment Earth* is applied to the *MEWP*, *Vehicle* or *Crane*

9.1.3 *MEWPs*, *Vehicles or Cranes* provided for personnel access shall where practicable be electrically bonded to the earth system to which the **HV Apparatus** is **Earthed**, so as to provide an equipotential zone. This can be achieved by connecting a *Field Equipment Earth* to the *MEWP*, *Vehicle* or *Crane* to the same earth point at which the **Primary Earth** or **Drain Earth** is attached to the **HV Apparatus**. If adjacent **Earthed HV** connections associated with the **Plant** and **Apparatus** being worked on are not electrically bonded to the *MEWP*, *Vehicle* or *Crane* by the *Field Equipment Earth*, and are accessible from the *MEWP* or *Vehicle,* those connections shall also be bonded to the equipment.

9.1.4 Where a **Permit for Work** has been issued, and after **Drain Earths**, if required, have been applied to the exposed **HV** conductors to be worked on, the *MEWP*, *Vehicle* or *Crane* may be allowed to approach or come within **Safety Distance** of the **Earthed** exposed **HV** conductors at the point of work and/ or testing. **SR A3** **SI 1**

Ref

9.1.5 The **Senior Authorised Person** issuing the **Safety Document** or in the case of *Cranes*, in consultation with the *Appointed Person*, shall consider whether it is necessary to consult an appropriately qualified specialist to ensure that safe ground bearing pressures will not be exceeded. This is particularly important where wheels, stabilising devices or outriggers may need to be positioned over ducts or soft ground. Where necessary, load spreading devices shall be provided and used.

9.1.6 *MEWPs, Vehicles* or *Cranes* shall be operated only by an *Operator* who shall be made aware by a **Senior Authorised Person**, or the nominated **Authorised Person**, of the hazards of working near **Live High Voltage Apparatus** and shall be fully conversant with the operation of the particular equipment involved. All *MEWPs, Vehicles* or *Cranes* shall be suitable for the work and/ or testing to be completed and safe working loads shall be observed at all times. The *Operator* shall ensure that effective use is made of any stabilising devices or outriggers.

9.1.7 Normally, only *Operators* who are **Competent Persons** shall be used. If the **Senior Authorised Person** decides, in exceptional circumstances, to allow a *MEWP, Vehicle* or *Crane* to be used by an *Operator* who is not a **Competent Person**, an **Authorised Person** shall provide **Personal Supervision**. This **Authorised Person** shall be in charge of the working party and be the recipient of any **Safety Documents**.

9.1.8 At no time shall any part of the *MEWP*, *Vehicle* or *Crane* operate or be positioned over exposed **Live HV Apparatus**.

9.1.9 The **Senior Authorised Person** shall ensure that the limits of operation are defined and clearly understood by the **Person** in charge of the working party and also by any *Dedicated Observer* provided who shall ensure that such limits are observed.

SR A3

9.1.10 Where the *MEWP*, *Vehicle* or *Crane* is provided with limit stops and these are to be used to limit the range of operation, the **Senior Authorised Person** shall confirm with the *Operator* that they are capable of correct operation and are correctly set. In addition, he shall satisfy himself that the *Operator* of the *MEWP*, *Vehicle* or *Crane* is conversant with the work and/ or testing to be completed and is obtaining correct response from all the controls.

9.1.11 When *MEWPs*, *Vehicles* or *Cranes* are to be left unattended, they shall be immobilised and stored in a secure state to prevent unauthorised interference or access to **Live Plant** or **Apparatus**.

9.2 CRANES

9.2.1 When *Cranes* are to be used within substations a **Senior Authorised Person** on site, shall assess the risks from **System** derived hazards, and shall consult with the *Appointed Person* who shall establish a safe system of work for the lifting operation including written Risk Assessments and Method Statements.

9.2.2 A Risk Assessment shall be completed considering the possibility of infringing **Safety Distance** in the event of a *Crane* malfunction. Where it is identified as necessary and reasonably practicable to do so by the Risk Assessment, limit stops will be fitted to the *Crane* to limit its range of operation. The **Senior Authorised Person** shall confirm with the *Operator* that they are capable of correct operation and are correctly set. The Risk Assessment shall also identify the potential for *Crane* instability caused by ground conditions or sudden stopping of the *Crane* in certain operating modes.

9.3 MOBILE ELEVATED WORK PLATFORMS (MEWPS) AND VEHICLES

9.3.1 When *MEWPs* or *Vehicles* are to be used within substations, a **Senior Authorised Person** on site shall assess the risks and ensure that a written Risk Assessment is produced by the *Operator*.

9.3.2 A Risk Assessment shall be completed and include the possibility of infringing **Safety Distance,** if the *MEWP* or *Vehicle* was to malfunction. Where it is identified as necessary by the Risk Assessment, and where reasonably practicable to do so, devices will be fitted to limit its movement. In the case of *MEWPs*, Vehicle Mounted Loaders or Excavators selecting the correct size of vehicle and/ or correct positioning, will control and mitigate this risk.

10 MOVEMENT AND USE OF LONG OBJECTS

10.1 *Long Objects* used within substations must be stored, moved and used in a controlled manner under the **Personal Supervision** of the **Person** in charge of the working party to ensure that they do not infringe **Safety Distance**.

10.2 LADDERS

10.2.1 Only **Approved** ladders shall be used which are of no greater length than is required for the work and/ or testing to be completed. Ladders shall be suitably secured or tethered to prevent them falling at the point of work. Where it is not reasonably practicable to tether, secure or use a suitable ladder stability aid, the ladder shall alternatively or in addition, be footed by another person.

10.2.2 When not in use all portable ladders shall be securely padlocked with an operational lock to a suitable anchorage point.

10.2.3 The movement and erection of ladders shall be carried out under the **Personal Supervision** of the **Person** in charge of the work and/ or testing. When moved at ground/ floor level, ladders shall where reasonably practicable be carried in a horizontal position and as near to the ground/ floor as is practicable.

10.2.4 If ladders have to be moved within a defined work and/ or test area after the initial placement, the movement shall be carried out in accordance with the specific instructions of the **Person** in charge of the work and/ or testing.

10.2.5 Before use, portable ladders, provided to give access to fixed ladders which terminate above ground/ floor level, shall be **Locked** in position with an operational lock by a **Senior Authorised Person**. These shall remain **Locked** in position during the period that the ladders are in use.

10.3 SCAFFOLDING

10.3.1 The **Senior Authorised Person** issuing the **Safety Document** shall define on site to an **Authorised Person** the movement route and location of the scaffolding to be erected. This **Authorised Person** shall be in charge of the working party and be the recipient of any **Safety Documents** issued. The **Senior Authorised Person** shall consider whether an additional *Dedicated Observer* is required.

10.3.2 When moved at ground level, long scaffolding components shall, where reasonably practicable, be carried in a horizontal position and as near to the ground/ floor as is practicable.

10.3.3 When scaffolding is to be erected or dismantled within a work and/ or test area, a **Senior Authorised Person** shall assess the risks from **System** derived hazards. The **Senior Authorised Person** shall issue an appropriate **Safety Document** and specify if the work and/ or testing is to be carried out under the **Personal Supervision** of an **Authorised Person**.

10.3.4 Scaffolding erected adjacent to exposed **Live HV** conductors shall be electrically bonded to earth, using *Field Equipment Earths*, preferably by connection to the substation earthing system, immediately that it is practicable to do so. As erection proceeds, the scaffolding shall, where practically, be electrically bonded to earth at approximately 5m (16 ft) intervals, vertically and horizontally, or as determined by the **Senior Authorised Person**. **SI 1**

11 CONTRACTORS USE OF EQUIPMENT

Before any *Operator* employed by a Contractor is permitted to operate *Cranes*, *Vehicles* or access equipment in a Northern Ireland Electricity substation, the **Senior Authorised Person** shall establish with the Contractor the conditions under which such *Cranes*, *Vehicles* or access equipment are operated to ensure compliance with this SRI.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 11

[Issue – 2]

TESTING HIGH VOLTAGE APPARATUS

Contents **Page**

TESTING HIGH VOLTAGE APPARATUS

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) to achieve **Safety from the System** for personnel testing **High Voltage (HV) Apparatus** under a **Sanction for Test**.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purpose of this Safety Rules Instruction the following additional definitions apply:

(i) *Compartment* - an enclosure, chamber, cubicle or cell (but not a substation or a transformer within blast walls) containing **Apparatus** having exposed **HV** conductors. This term does not apply to metalclad switchgear spouts when such spouts are accessible.

(ii) *Structure* - a tower, pole, gantry or other means of supporting or giving access to exposed **HV** conductors.

(iii) *Testing Notice* - A notice in **Approved** form reading "Danger – Testing Area".

(iv) *Access Point Notice* – A notice in **Approved** form defining access to and egress from a test area (Figure 2).

(v) *Danger Overhead Live Equipment Notice* – A notice in **Approved** form conveying a warning about **Danger** from overhead **Live Apparatus (**Figure 3).

3 IDENTIFICATION

Apparatus on which testing is to be carried out shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the testing. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel during the course of testing are:

- Electric shock
- Burns
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) inadvertent or erroneous contact with the **System** to which **Apparatus** is normally connected.

(ii) electrical energy and mechanical pressures and forces imposed by testing sources.

(iii) failure to adequately control vehicle movement.

5 PREPARATION FOR TESTING

5.1 The **Senior Authorised Person** shall ensure that there is no other **Safety Document** in force for the **Apparatus** on which he is to issue a **Sanction for Test**. **SR B5.7**

5.2 The **Apparatus** on which testing is to be done shall be **Isolated** and prepared for test. This preparation shall include: **SR A4**

(i) The placing of **Danger Notices** on any **Apparatus** which may give rise to **Danger** and which will be in the vicinity of **Persons** carrying out the testing.

(ii) Where reasonably practicable, the visible identification of the test area and its boundaries and limits shall be in accordance with the principles laid down in SRI 8 ‘Demarcation of Work Areas in Substations’. The **Authorised Person** in charge of testing shall ensure that *Testing Notice*(s) are attached in accordance with Clause 6.3 of this Safety Rules Instruction and that yellow cones with red ‘Test Area’ sleeves are placed 600mm to 1m (2 ft to 3ft) inside the test area and at intervals not exceeding 6m (20ft) – see Figure 1.

(iii) Where reasonably practicable access to the test area shall be restricted to one location.

5.3 The test area shall be **Isolated** from all supplies other than those test supplies necessary to allow the testing to take place. The **Safety Keys** for those isolations which shall be maintained for the period of the test shall be **Locked** in a **Key Safe** secured by the **Key Safe Key** and the **Control Key**. **SR A4** **SR B3.1**

5.4 Before issuing a **Sanction for Test** the **Senior Authorised Person** shall ensure that **Primary Earth(s)** are applied to the **Apparatus** on which testing is to be done.

5.5 A **Sanction for Test**, the **Key Safe Key(s)** where appropriate, and such **Safety Keys** as are necessary to enable the testing to be done, shall be issued to and received by the **Authorised Person** together with any **Earthing Schedule** and associated portable **Drain Earths**. **SR A4** **SR B3.2**

6 TESTING

6.1 Under the terms of the **Sanction for Test** the recipient is responsible for all matters of safety concerned with the test and for the control function within the test area. To enable testing to be done he may, if specified on the **Sanction for Test**, remove, replace, or instruct to be removed or replaced, **Primary Earths**. He may also operate, or instruct to be operated, **Apparatus** within the test area. All **Switching** shall be logged in accordance with SRI 1 – 'High Voltage Switching'. Essential minor work associated with the testing may also be done under the **Sanction for Test** provided that **Safety from the System** is maintained. **SR A4**

6.2 If the testing requires access to overhead lines, where applicable, **Circuit Identification** wristlets and flags shall be issued, and procedures carried out in accordance with SRI 4 - 'High Voltage Overhead Lines'.

6.3 Before testing commences, the **Authorised Person** in charge of the testing shall ensure, where practicable, that *Testing Notice*(s) are placed in conspicuous positions inside the test area facing outwards, such that they will be seen by persons approaching the test area. He shall inspect the test boundary marking and signage and on satisfactory inspection completion enter his name, the valid date and **Sanction for Test** details on the *Access Point Notice*.

6.4 Before test probes are inserted in Metalclad Switchgear spouts an **Approved** voltage indicator shall, where practicable, be used to verify that the spouts are at or about zero potential. The voltage indicator shall be tested immediately before and immediately after use. Where, under the conditions of issue of the **Sanction for Test**, an **Earthing Device** has been applied to the spouts where test probes are to be inserted, an **Approved** voltage indicator need not be used.

6.5 The **Authorised Person** in charge of the testing shall check the test probes immediately before and after use to ensure that there are no loose parts or signs of deterioration or damage.

6.6 Connections used for test purposes shall be of adequate size for the purpose and easily visible when in the test position.

6.7 Test connections may be applied in a *Compartment* only when all exposed conductors are **Isolated** from the **System**.

NOTE: **Approved** measuring devices or **Approved** devices for phasing out circuits may be applied, outside the scope of this Safety Rules Instruction, in a *Compartment* in which there is exposed metal which may be **Live** at **High Voltage**. **SR A2**

6.8 The application of the test supplies shall where practicable be done under the **Immediate Supervision** of the **Authorised Person** who has received the **Sanction for Test**. Where it is not possible for the **Authorised Person** to provide **Immediate Supervision** of the complete test, e.g. tests of line traps on Transmission circuits, then the **Person** applying test supplies at a remote **Location** shall possess the same authorisation level as the recipient of the **Sanction for Test** and shall apply the tests under the instruction of the recipient of the **Sanction for Test**.

6.9 **Apparatus** which is associated with a test and likely to have retained an electrical charge shall be discharged to earth before and after the application of the test supply.

6.10 Where **Apparatus** is to have a test voltage applied to it and that **Apparatus** has a remote end that may be made **Live** by the test voltage, then the remote end of that **Apparatus** shall be safeguarded so as to prevent **Danger**.

6.11 If the remote end of the **Apparatus** which may become **Live** by the test voltage is readily accessible from ground level, i.e. it is not within a **Locked** *Compartment* or on a *Structure*, then it is the responsibility of the **Authorised Person** who receives the **Sanction for Test** to obtain confirmation from an **Authorised Person** that it is roped or barriered off and under the control of a **Competent Person** before a test voltage is applied. It is the responsibility of that **Competent Person** to ensure that any person, including himself, does not approach the **Apparatus** unless instructed to do so by the **Authorised Person** in charge of the testing.

SR A2

7 COMPLETION OF TESTING

The **Authorised Person** clearing a **Sanction for Test** shall:

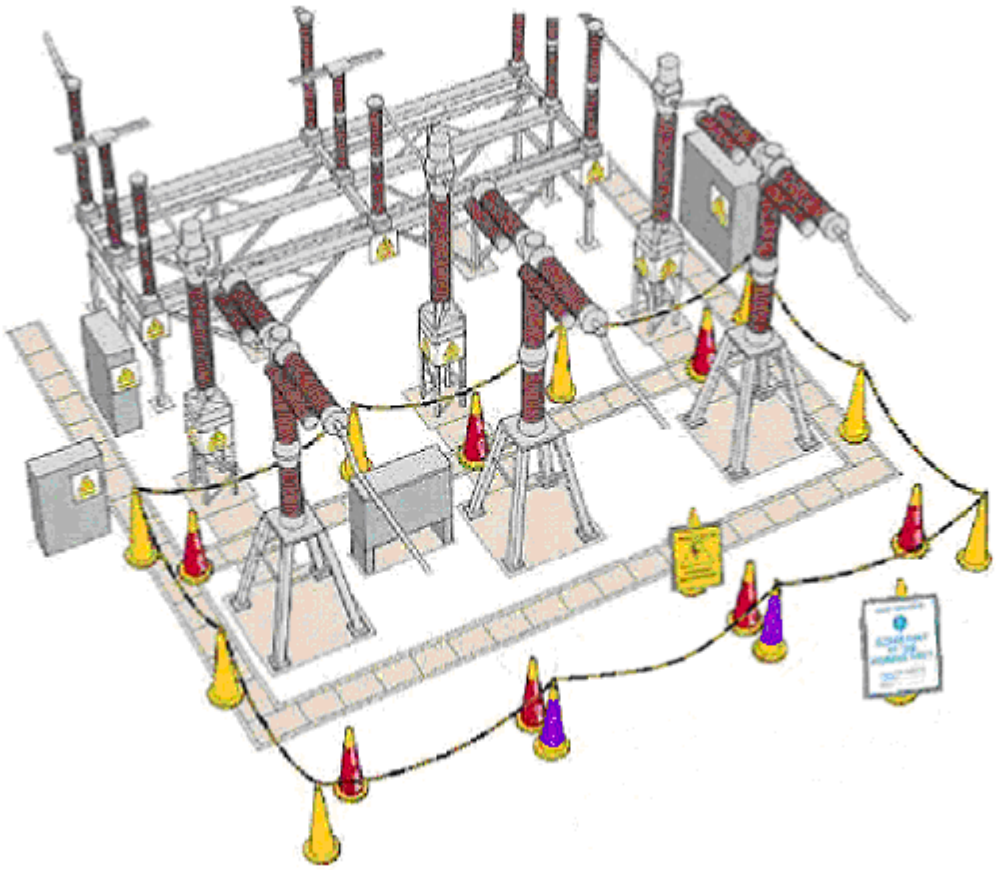
(i) specify on the **Sanction for Test** all changes of the conditions of isolation and earthing within the section of the **System Isolated** for testing from that at the time of issue of the **Sanction for Test**.

(ii) confirm on the **Sanction for Test** that all test connections and test probes have been removed.

The **Senior Authorised Person** cancelling the **Sanction for Test** shall advise the **Control Person** of any changes to the conditions within the **Isolated** zone.

FIGURE 1

DEMARCATION OF TEST AREAS IN SUBSTATIONS



Note:

(1) Access / Egress point maximum width 1 metre for pedestrian use. Closed using demarcation chain when testing in progress.

(2) Demarcation chain must be kept more than 500mm above ground level.

(3) Yellow cones with red ‘Test Area’ sleeves placed maximum 1 metre inside demarcated test zone and at intervals not exceeding 6m (20ft).

(4) Danger Overhead Live Equipment Notice placed on yellow cone at access/egress point if required.

(5) Access Point Notice placed on yellow cone adjacent to access/egress point.

FIGURE 2

ACCESS POINT NOTICE

FIGURE 3

DANGER OVERHEAD LIVE EQUIPMENT NOTICE

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 12

[Issue 1]

PLANT AND APPARATUS CONTAINING SULPHUR HEXAFLUORIDE (SF_6)

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PLANT AND APPARATUS CONTAINING SULPHUR HEXAFLUORIDE (SF_6)

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and Safety Instructions to achieve **Safety from the System** for personnel working on **Plant** and **Apparatus** which contains or has contained sulphur hexafluoride (SF_6) gas.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 IDENTIFICATION

3.1 **Plant** and **Apparatus** on which work is to be carried out shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the work. **SR A8**

3.2 All **Plant** and **Apparatus** containing SF_6 shall bear an **Approved** notice to this effect and similar notices shall also be displayed at access points to such **Plant** and **Apparatus**.

4 DANGERS

4.1 The main **Dangers** to personnel working on **Plant** and **Apparatus** containing SF_6 gas are:

- Poisoning
- Electric shock
- Burns
- Asphyxiation
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) Bodily contact with, inhalation or ingestion of, toxic breakdown products.

(ii) Contact with **Live Apparatus**.

(iii) Lack of oxygen due to inadequate ventilation.

(iv) The release of stored mechanical energy or pressure.

5 PROPERTIES OF SF_6 GAS AND ITS BY-PRODUCTS

5.1 SF_6 Gas

Sulphur hexafluoride is stable, non-toxic, colourless, tasteless, odourless and inert and is a gas at atmospheric and operating pressures. It will not easily disperse, being five times heavier than air, and consequently will collect in trenches, ducts, sumps, etc., which can create **Danger**.

5.2 SF_6 Gas Arc Breakdown By-Products

When SF_6 gas is subjected to electric arc, toxic substances can be produced which may be in gaseous or particulate form. An indication of the presence of these substances is a pungent odour similar to rotting eggs which, even at very low concentrations, can constitute a warning.

6 PREPARATION FOR WORK

6.1 When Depressurisation is not Required

If depressurisation is not required to allow work or testing to be done, precautions shall be taken to achieve **Safety from the System** by either:

(i) limiting the work or work area, or **SR A3**

(ii) rendering the **Plant** and/or **Apparatus Isolated**, **Earthed**, and stored energy contained or dissipated, followed by the issue of a **Safety Document**. **SR A3** **SI 1**

6.2 When Depressurisation is Required

6.2.1 The **Plant** and/or **Apparatus** shall be drained of SF_6 in addition to rendering it **Isolated**, **Earthed** and stored energy contained or dissipated. **SR A3**

6.2.2 Drainage of SF_6 should be through agents (filters) using **Approved** methods and equipment into storage as instructed by an **Authorised Person**. A **Senior Authorised Person** shall ascertain that the pressure inside the **Plant** and/or **Apparatus** to be worked upon is at or about that of atmosphere. **SR A3**

6.2.3 Following any drainage of the **Plant** and **Apparatus**, and dependent upon whether personal entry is required, consideration shall be given to requesting a **Selected Person**'s report on any precautions necessary to avoid **Danger**. If recommended by the report, the **Plant** and **Apparatus** shall be **Purged**. **SR A3** **SI 4**

6.2.4 If any **Selected Person**'s report called for indicates that the **Plant** and **Apparatus** is safe to enter, a **Permit for Work** shall be issued for the required work. **SR A3**

6.2.5 If the **Selected Person** has reported the presence of particulate toxic substances which could cause **Danger**, the procedure outlined in Section 8 - 'Removal of Particulate Toxic Substances' shall be followed before the required work commences.

7 SF_6 GAS LEAKS

When work is to be carried out on **Plant** and **Apparatus**, from which SF_6 is leaking or has leaked and **Danger** could arise, then before any **Person** is allowed to enter the affected area, the condition of the atmosphere in that area shall be declared free from **Danger** by a **Selected Person**. Alternatively, the **Person(s)** entering shall wear **Approved** breathing apparatus and be supported by two **Persons** outside the area, one of whom shall have **Approved** breathing apparatus immediately available. If the affected area is a confined space, the requirements set out in the appropriate clauses of Section 6 of SRI 401 - 'General Confined Spaces' shall be applied.

8 REMOVAL OF PARTICULATE TOXIC SUBSTANCES

8.1 When a **Selected Person** has reported that the SF_6 enclosure contains particulate toxic substances, the precautions given below shall be taken before any work can be permitted on **Plant** and **Apparatus** which could expose persons to these substances.

8.1.1 A **Permit for Work** for the removal of particulate toxic substances shall be issued. **SR A3**

8.1.2 Whilst carrying out the removal of the substances, all **Persons** involved in the removal shall:

(i) Wear **Approved** protective clothing.

(ii) Wear an **Approved** respirator if heavy contamination is present or a **Person** has to enter the enclosure to remove the substances.

(iii) Observe a high standard of personal hygiene.

(iv) Not eat, drink or smoke.

(iv) Avoid wiping the nose, eyes or face other than with clean paper tissues.

(v) Dispose of all filters, filter materials and cleaning material as directed in the **Selected Person**'s Report.

8.1.3 The particulate toxic substances shall be removed using **Approved** vacuum cleaning equipment followed by the use of **Approved** cloths.

8.1.4 Following removal of the substances, the **Person(s)** involved shall:

(i) Use only disposable materials to clean themselves and protective clothing and equipment.

(ii) Carry out such cleaning of protective clothing and equipment only in the work area.

(iii) Make proper use of the special changing and washing facilities available.

8.1.5 After a **Selected Person** has verified that particulate toxic substances are not present, the **Permit for Work** issued under Clause 8.1.1 shall then be cancelled.

8.1.6 A **Permit for Work** covering the subsequent work may then be issued. **SR A3**

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 13

[Issue 1]

LOW VOLTAGE APPARATUS

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LOW VOLTAGE APPARATUS

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and Safety Instructions to achieve **Safety from the System** for personnel working on or testing **Low Voltage (LV) Apparatus**. Any reference to work on or testing of **LV Apparatus** in this Safety Rules Instruction, shall include any work activity so near **LV Apparatus** that **Danger** may arise

This Safety Rules Instruction is to be used in association with the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and not as, or part of, any specific work method to be used.

The specific requirements of Specialised Procedures
SP1 – 'Requirements for Working on Live Low Voltage Apparatus' and SP2 – 'Testing and Adjustments on Live Low Voltage Apparatus' and the general requirements of
SRI 200 – 'Function of Control Person on LV Apparatus', shall where applicable, be complied with when applying this Safety Rules Instruction to work or testing of **Live Low Voltage (LV) Apparatus**.

Any further reference to "work" in this Instruction also applies to testing.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purposes of this Instruction the following additional definitions apply:

(i) *Apparatus* – Where the word *Apparatus* is used in this Instruction without qualification it refers to **Low Voltage Apparatus**. It includes all **LV Apparatus** between the **Low Voltage** terminals of **HV** distribution transformers and all customer's installations for which Northern Ireland Electricity has a maintenance responsibility.

(ii) *Radial Circuit* – A part of the **System**, upon which it is intended to do work, that is or may be connected to **Live** *Apparatus* at or through only one point, with no possible backfeed from any other part of the **System**.

(iii) *Supervisor* – A **Person** responsible for controlling the work and movements of a *Working Party*.

(iv) *Working Party* – The **Persons** under the **Supervision** of a **Competent Person** or an **Authorised Person**, which includes a **Competent Person** or **Authorised Person** when working by himself. A *Working Party* may include a person working under the **Personal Supervision** of a **Competent Person**.

3 IDENTIFICATION

Apparatus on which work is to be carried out shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the work. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel working on or testing *Apparatus* are:

– Electric shock

– Burns

– Other bodily injury.

4.2 These **Dangers** arise from:

(i) Inadequate precautions being taken under **Live** conditions.

(ii) Mistaking that part of *Apparatus* on which it is not safe to work without special precautions, for that which is **Isolated** and on which it is safe to work.

(iii) Mistaking **High Voltage (HV) Apparatus** on which it is unsafe to work for *Apparatus* on which it is safe to work under the conditions laid down.

(iv) The *Apparatus* being worked on being accidentally or inadvertently made **Live**.

(v) When working **Live**, excessive current transfer at the point of work during the attempted paralleling of two **LV** distributors, when one distributor accidentally or inadvertently becomes dead.

(vi) Falling.

4.3 The above **Dangers** to **Persons** are accentuated by the associated difficulty of being unable to summon immediate help and assistance when working unaccompanied.

5 GENERAL REQUIREMENTS

5.1 For work on *Apparatus* the following requirements shall be satisfied:-

(i) The work shall be identified into discrete packages.

(ii) Work teams shall be defined with their roles and responsibilities clearly understood.

(iii) A clearly identified **Person** shall be in charge of each work team. This **Person** shall have responsibility for all safety aspects on the work site including polarity checks, P.P.E. and general safety management.

(iv) The work packages for planned non-routine work shall be clearly identified on the 'Request for LV Outage and/or Live Work' (see SRI 600 clause 8.2.5 and Appendix 13).

(v) Clear work instructions shall be issued for non-routine work. These instructions may be accompanied by appropriate sketches, maps or **LV** diagrams which will enhance the achievement of **Safety from the System** and job organisation.

5.2 A **Senior Authorised Person** shall determine under what conditions the work is to take place and if a **Safety Document** is to be issued. However if the work is of a routine nature and is specified in Attachment 1 of this Instruction, it may proceed without reference to a **Senior Authorised Person**. **SR A5**

5.3 No work shall be carried out on **Live** *Apparatus* or in proximity to exposed **Live LV** conductors, other than by a **Competent Person** who has completed the appropriate course of training. **SP 1**

5.4 Before work is commenced, the *Apparatus* shall be inspected and confirmed sound. *Apparatus* which is damaged or faulty to the extent where it is considered dangerous shall not be worked on **Live**. **SP 1**

5.5 Where work is to be carried out on *Apparatus* which is part of **HV Apparatus**, adequate precautions shall be taken to avoid **Danger** from such **HV Apparatus** and an appropriate **Safety Document** issued by a **Senior Authorised Person**. **SR A3** **SR A4** **SR A7**

5.6 When work is to be carried out on auxiliary cables which may be subjected to induced voltages from adjacent **HV** circuits, precautions to prevent **Danger** from these voltages shall be taken in accordance with SRI 5 - 'High Voltage Cables'.

5.7 When work is to be carried out on *Apparatus* which is in proximity to exposed **HV Apparatus** which may be **Live**, or become **Live**, the relevant requirements of SRI 8 - 'Demarcation of Work Areas in Substations' shall be met and an appropriate **Safety Document** issued by a **Senior Authorised Person**. **SR A3** **SR A4** **SR A7**

5.8 Before commencing work in ducting, trenches or underground distribution boxes, where there is a possibility of the presence of gas which might be inadvertently ignited then special precautions shall be taken as are necessary to prevent such **Danger**.

5.9 When work is to be carried out on *Apparatus* which is part of an overhead line circuit, precautions to prevent **Danger** whilst climbing shall be taken in accordance with SRI 21 – 'Climbing of Poles and Structures'.

In addition to the above requirements, any **Person** working on a tower, pole or high structure shall be in visual range of at least one other **Person**. All **Persons** concerned shall be conversant with rescue procedures.

5.10 A *Working Party* may be called upon to undertake work in situations where the normal work method could give rise to **Danger**. In such cases the *Supervisor* shall be notified and a suitable work method shall be agreed beforehand by a **Senior Authorised Person**, who may decide to provide **Personal Supervision**, and/or issue a **Limited Work Certificate**.

5.11 If, during the course of the work, a hazard arises which could give rise to **Danger**, the **Competent Person** in charge shall stop the work immediately, and report this hazard to his *Supervisor*. The hazard shall be eliminated as a source of **Danger** before work may proceed any further, by isolation or additional precautions as agreed by the **Competent Person** and his *Supervisor*, or a **Senior Authorised Person** if it is a **System** derived hazard.

5.12 A **Person** undertaking unaccompanied **Live** work as specified in Attachment 2 to this Instruction shall maintain **General Safety** of the work **Location** and environment throughout the duration of the work and ensure that his **Location** and expected time of return are made known to another person.

5.13 The **Authorised Person** making **Live** any *Apparatus* shall ensure that any **Isolation** point (e.g. Transformer **LV** distribution board, mini-pillar, feeder frame, distribution or feeder pillar) is and will remain effectively identified on site and any existing records are updated as necessary.

6 WORK ON OR TESTING ISOLATED APPARATUS

6.1 To achieve **Safety from the System** before any work is done, *Apparatus* shall, where reasonably practicable, be **Isolated**, or the work shall be carried out in accordance with an **Approved** procedure. A **Control Person** shall control and co-ordinate the actions necessary to achieve **Safety from the System**, when isolation is required. The role of **Control Person**s on **LV Apparatus** is further defined in SRI 200 - 'Function of Control Persons on LV Apparatus'.

6.2 **LV** isolation shall be by the operation of an **Isolating Device(s)** or by adequate physical separation. Where isolation is by the operation of **HV Apparatus**, the isolation shall be done in accordance with the appropriate Safety Rules and SRI 1 - 'High Voltage Switching'.
Time switches, float switches, thermostats, sequence switching devices or similar automatic switching devices are not **Isolating Devices** and shall not be used as such. **SR A3** **SR A5**

6.3 Where reasonably practicable, all **Isolating Devices** shall be **Locked** with a Safety Lock. If this is not reasonably practical, the fuses, links or other **Isolating Device(s)** removed shall be kept in safe custody. Where reasonably practicable, **Caution Notices** shall be affixed at all points where the *Apparatus* has been **Isolated**. **SR A5**

6.4 **Caution Notices** affixed at points of isolation shall provide information identifying the **Authorised Person** carrying out the isolation and the date of the isolation

6.5 Where a **Limited Work Certificate** is to be issued and it is reasonably practicable for the *Apparatus* to remain **Isolated** throughout the course of the work, the **Senior Authorised Person** preparing the **Limited Work Certificate** shall take any removed **Isolating Device(s)** and/or **Safety Keys** into safe custody. **SR A5**

6.6 Where a **Limited Work Certificate** is to be issued and it is not reasonably practicable for the *Apparatus* to remain **Isolated** throughout the course of the work or testing, the **Senior Authorised Person** may issue the removed **Isolating Devices** and/or **Safety Keys** to the **Competent Person** who is to do the work. The **Competent Person** shall keep these in safe custody, preferably by retaining them in his personal possession, except when the *Apparatus* is made **Live**.

6.7 Where the isolation is done by the **Person** who is also to carry out the work, whether or not a **Limited Work Certificate** is issued, he shall take any removed **Isolating Device(s)** and/or **Safety Keys** into safe custody, preferably by retaining them in his personal possession.

6.8 In order to facilitate the handing over of **Isolating Devices** and **Safety Keys**, they shall be readily identifiable with the **Limited Work Certificate** or with the *Apparatus* with which they are associated.

6.9 Where work is to be continued by another **Competent Person**, the **Competent Person** who was doing the work shall surrender any removed **Isolating Device(s)** and **Safety Keys** either to a *Supervisor* or that other **Competent Person**. If they are surrendered to the *Supervisor* he shall retain them in safe custody until he re-issues them to the **Competent Person** who is to continue the work. Where a **Limited Work Certificate** is involved, the transfer of any removed **Isolating Device(s)** and **Safety Keys** shall be done in accordance with the appropriate parts of Rule B4.3 – Transfer of **Limited Work Certificates**.

SR B4

6.10 Before work commences, the **Competent Person** who is to do the work shall:

(i) So far as is practicable screen off any adjacent exposed or unprotected *Apparatus* which may be **Live** or shall be considered **Live** and/or make use of **Approved** rubber gloves and insulated tools, in order to avoid **Danger**.

(ii) So far as is practicable check, by means of an **Approved** voltage testing device, that the *Apparatus* on which he is to work or test is not **Live**. The device used shall be tested regularly and where reasonably practicable immediately before and after use.

(iii) Where reasonably practicable short circuit all conductors at the point of work if **Danger** could arise from inadvertent backfeeds on exposed **LV** conductors. Where the above is not reasonably practicable then the work shall be done in accordance with the requirements for **Live** working.

(iv) Where reasonably practicable short circuit and earth all conductors at the point of work if **Danger** could arise from induced voltages on exposed **LV** conductors. Where the above is not reasonably practicable then the work shall be done in accordance with the requirements for **Live** working. Where it can be established that no **Danger** can arise from induced voltages then the requirements to short circuit and earth all conductors can be dispensed with.

6.11 If work is interrupted, the **Competent Person** who is to continue the work shall first carry out the procedure in Clause 6.10 (ii).

6.12 Where work involves the initial connection, or the re-arrangement of conductors to a customer, supply shall not be made available to that customer until checks have been made at an appropriate point on the **System** in accordance with the relevant NIE Policy Document[1] to ensure correct polarity at the customer's supply terminals. Where necessary, in the case of three-phase supplies, the phase rotation shall also be checked.

7 METHOD FOR JUSTIFICATION AND IMPLEMENTATION OF LIVE WORKING/TESTING

7.1 *Apparatus* on which work is to be carried out shall, where reasonably practicable, be taken out of service by **Switching**.

7.2 The preferred method is to work on *Apparatus* which has been **Isolated**. Work on or near **Live** *Apparatus* where **Danger** may arise shall only be undertaken if:-

(i) it is unreasonable in the circumstances for the *Apparatus* to be **Isolated** to remove hazards which could give rise to **Danger**; and

(ii) it is reasonable in all the circumstances for that **Person** to be at work on or near the *Apparatus* while it is **Live**; and

(iii) suitable precautions (including, where necessary, the provision of suitable protective equipment) are taken to prevent injury.

7.3 If it is not reasonably practicable to isolate the *Apparatus* to be worked on, Specialised Procedures SP1 and SP2 shall be applied. A **Senior Authorised Person** shall determine under what conditions the work is to take place and if a **Safety Document** is to be issued. **SR A5**

If the work:

(i) is of a routine nature and is specified in Attachment 1 of this Instruction, it may proceed without reference to a **Senior Authorised Person**.

[1] **Policy Document 2_004 – Polarity Tests and Procedures on LV Distribution Systems**

(ii) does not fall into any of the routine categories listed, then it shall be given full consideration by a **Senior Authorised Person** and the work planned accordingly, including any requirement for **Personal Supervision**, and/or the issue of a **Limited Work Certificate**, before the work is executed. For all such planned work an 'Request for LV Outage and/or Live Work' form (see SRI 600 clause 8.2.5 and Appendix 13) shall be completed and signed by a **Senior Authorised Person**. **SP 1** **SP 2**

7.4 A risk assessment shall be carried out at the planning stage to include:

(i) The need to work **Live** as detailed in paragraph 7.2 above;
(ii) The level of risk;
(iii) The requirements of other statutory instruments;
(iv) Additional risks imposed by the specific working environment; and
(v) The effects of interruptions to supply.

Planned work not specified in Attachment 1 of this Instruction shall be subject to a process which will involve the completion of an 'Request for LV Outage and/or Live Work '(see SRI 600 Appendix 13). Justification for **Live** working will be recorded on this form along with the signature of the **Senior Authorised Person** involved. **SP 1** **SP 2**

7.5 In addition to the risk assessment carried out at the planning stage, the person in charge of each work team shall carry out an on-site risk assessment. This on-site risk assessment shall take into account any changes that have occurred since the work planning stage and also all prevailing site conditions. **SR A5**

8 PRECAUTIONS TO BE TAKEN TO PREVENT DANGER FROM CONTACT WITH OR BETWEEN LIVE CONDUCTORS, OR BETWEEN LIVE CONDUCTORS AND ADJACENT METALWORK

Precautions shall be taken by appropriate **Competent Persons** to prevent **Danger** by using **Approved** insulated tools and safety equipment when approaching **Live** conductors. The work shall be of such a nature that the control of body, tools, equipment and materials can be maintained to prevent **Danger** arising. If this control is lost then work shall cease. Before work re-commences, arrangements shall be made to have the *Apparatus* checked by a **Senior Authorised Person**, and if necessary **Isolated**.

The degree of control a **Person** has in working with **Live** *Apparatus* may be influenced by many factors, including atmospheric changes, positioning, state of the **Apparatus**, noise and vibration. The work shall proceed in accordance with Section 6 of this Safety Rules Instruction, after *Apparatus* has been **Isolated** for the above reason.

9 ADDITIONAL PRECAUTIONS WHEN WORKING ON LIVE CONDUCTORS

9.1 The action of making or breaking current-carrying **Live** conductors can give rise to **Danger**, additional to the **Danger** involved in approaching **Live** conductors. This **Danger** arises from either making/breaking load or possible fault current on *Radial Circuits* or, in the event of work on non-*Radial Circuits*, making/breaking possible circulating or fault current, in addition to any load current.

9.2 When conductors are to be made or broken, they shall be considered **Live**, unless proved otherwise by an **Approved** device. After the operation of making/breaking a connection and before leaving the **Location**, the **System** shall be checked to ensure there has been no loss of supply. If, during the course of work, there is reason to believe loss of supply has occurred, the **Competent Person** shall stop that work and report to a **Senior Authorised Person**.

9.3 ***Radial Circuits***

9.3.1 The operation of making or breaking a *Radial Circuit* normally involves connecting or interrupting load current. The circuit shall, where reasonably practicable, be off-loaded before the operation. Provided the **Competent Person** is appropriately authorised, he may make / break conductors and continue with the work.

9.4 **Non-*Radial Circuits***

9.4.1 The operation of making or breaking a non-*Radial Circuit* may give rise to additional **Danger**, and shall be agreed beforehand with a **Senior Authorised Person**. On completion of the work, where conductors have either been broken, or a new circuit is to be commissioned, and before completing any parallel by re-making or joining conductors, a **Senior Authorised Person** shall again agree to the operation proceeding, after satisfying himself that completing the circuit will not give rise to abnormal currents or present any additional hazards.

10 UNACCOMPANIED LIVE WORK

Unaccompanied work shall not be undertaken on *Apparatus* which is damaged or faulty to the extent where it could give rise to **Danger**.

A schedule of unaccompanied work is contained in Attachment 2 to this Instruction.

ATTACHMENT 1

[Issue 2]

TO

SAFETY RULES INSTRUCTION SRI 13

LOW VOLTAGE APPARATUS

ROUTINE LIVE LV WORK ON OVERHEAD LINES

No.	Job Description
1	Make off new **LV** service or mains from existing **LV** overhead **System** (open / conc / ABC).
2	Make / break Jumpers (*Radial Circuits*).
3	U/E – renew, alter, remove or erect additional conductors
4	Connect / remove street lighting services.
5	Inspect *Apparatus* for faults.
6	Maintenance to **LV** fittings.
7	Apply PME to O/H or U/E circuit.
8	Use of **Approved** voltage indicators.
9	Use of **Approved** current measuring devices.
10	Fit / remove / alter stay
11	Apply **LV** shrouding
12	Fit **LV** conductor spacers
13	Tree Work (as per SRI 23 Att2)

ROUTINE LIVE LV WORK ON UNDERGROUND CABLES

No.	Job Description
1	Multi-service joints.
2	Straight–through joints (*Radial Circuits*).
3	Breeches joint with only one cable **Live**.
4	Change cut-outs.
5	Connect or disconnect services from mini-pillars.
6	Break down / remake “Iron Boxes”, copper shell “T” joints and Wettern joints.
7	Core-cutting of **Live** cables (*Radial Circuits*).
8	Repair to PVC sheath of cables.
9	Use of **Approved** voltage indicators.
10	Use of **Approved** current measuring devices.
11	Making of earth bonds in substations or pillars etc.
12	Making of earth bonds in customers’ premises.

ROUTINE LIVE LV WORK ON CUSTOMERS' PREMISES

No.	Job Description
1	Use of **Approved** voltage indicators.
2	Use of **Approved** current measuring devices.
3	Use of **Approved** loop impedance testers.
4	Change cut-out.
5	Connect loop service from cut-out.
6	Remove illegal equipment from meter board and undereave wiring.
7	Fault location on meter board.
8	Maintenance to customer point *Apparatus*.
9	Making of earth bonds in customers' premises.

ROUTINE LIVE LV WORK IN SUBSTATIONS INCLUDING KIOSKS, FEEDER FRAMES, PILLARS AND UDB'S

No.	Job Description
1	Repair and replacement of insulators / contacts.
2	Making of earth bonds and applying PME to ground-mounted substations.
3	Change metering CT and / or metering.
4	General maintenance of Substations, Feeder Frames, Pillars and UDB's.
5	Heating / lighting in cubicles, etc. (including. Fault location).
6	Making a temporary connection to busbars and cable terminations.
7	Making a permanent connection to busbars.
8	Use of **Approved** voltage indicators.
9	Use of **Approved** current measuring devices.
10	Cable fault location and testing.

ATTACHMENT 2

[Issue 1]

TO

SAFETY RULES INSTRUCTION SRI 13

LOW VOLTAGE APPARATUS

ROUTINE LIVE LV WORK WHICH MAY BE UNDERTAKEN UNACCOMPANIED

No.	Job Description
1	Connect / disconnect service cable from mini-pillar.
2	Connect / disconnect loop service.
3	Fit / replace / remove cut –outs (except metalclad).
4	Fit /remove fuse links.
5	Fit / alter / remove ancillaries (e.g. heating and lighting, batteries) in cubicles, kiosks, etc.
6	Inspect and / or rectify / remove meter board wiring (e.g. illegal connections).
7	Fit / change / remove test metering *Apparatus* including test terminal blocks where applicable.
8	Cable fault location and testing.
9	Use of test instruments.
10	Fit / alter / remove VT's and DC secondary protection wiring.
11	PVC single phase service cable core-cut.
12	PVC single phase service cable straight through joint.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 14

[Issue 1]

AUTOMATICALLY OR REMOTELY CONTROLLED PLANT AND APPARATUS

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AUTOMATICALLY OR REMOTELY CONTROLLED PLANT AND APPARATUS

FOREWORD

Control of the operation of **Plant** and **Apparatus** can be by direct or remote mechanical means or by hydraulic, pneumatic or electrical actuators which can be controlled locally to or remotely from the **Plant** or **Apparatus** being controlled. The 'local' position may be physically remote from the **Plant** and **Apparatus**. Where **Danger** could occur to personnel working on or testing such **Plant** and **Apparatus** due to its operation, such operation shall be prevented whilst the work or testing is actually being done.

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), setting down the requirements in those situations where it is necessary to protect personnel from **Danger** arising due to the operation of **Plant** and **Apparatus** which is actuated by electrical, pneumatic, hydraulic or remote mechanical means. Where it is not reasonably practicable to apply this Safety Rules Instruction to **Apparatus** connected to Department of the Environment street lighting systems, work shall be carried out in accordance with the requirements of SRI 13 - 'Low Voltage Apparatus' and Specialised Procedure SP1 - 'Requirements for Working on Live Low Voltage Apparatus'.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 IDENTIFICATION

Plant and **Apparatus** on which work or testing is to be carried out shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the work or testing. **SR A8**

4 DANGERS

4.1 When personnel are working on or testing **Plant** or **Apparatus** which has automatic or remote control features, the main **Dangers** from these features are:

- Electric shock
- Burns
- Other bodily injury.

4.2 These **Dangers** arise from the operation of the automatic or remotely controlled features when they have not been **Isolated**.

5 WORK ON AND TESTING OF PLANT AND APPARATUS

5.1 Where work or testing is to be carried out on automatically or remotely controlled **Plant** or **Apparatus**, the precautions taken to achieve **Safety from the System** shall include making the automatic or remote control features, and also any local control features, **Isolated** from that **Plant** or **Apparatus**. Such isolations shall where practicable be **Locked** with a Safety Lock and shall have **Caution Notices** affixed to them.

5.2 These control features shall, except where the additional requirements of Clause 5.3 are met, remain **Isolated** and, if **Locked**, remain **Locked** for the duration of the work or testing. **SR A5**

5.3 If a **Sanction for Test** is issued the test procedure shall include the means of maintaining **Safety from the System** whilst any automatic, remote or local control features are operable.

6 WORK ON AND TESTING OF PLANT AND APPARATUS WITHOUT A SAFETY DOCUMENT

In those few instances where the Safety Rules cannot, or for very good reasons should not, be applied so far as the issue of a **Safety Document** is concerned, work or testing shall be carried out in an **Approved** manner which shall be confirmed in writing. The procedure shall so far as is reasonably practicable take account of the safety precautions detailed in Clauses 5.1 and 5.2 and specify the means of maintaining **Safety from the System**.

7 WORK ON AND TESTING OF OR MAKING ADJUSTMENTS TO AUTOMATIC OR REMOTE CONTROL EQUIPMENT

7.1 Unless otherwise specifically exempted by a Safety Rules Instruction work on, or the making of adjustments to, the controlling features, with the **Plant** or **Apparatus** which they control in the operating mode, shall only be done by an **Authorised Person** or by a **Competent Person** acting under the **Personal Supervision** of an **Authorised Person**. Before such work commences, consultation shall take place between the **Authorised Person** and the **Control Person**.

7.2 Work on, testing of, or the making of adjustments to, the controlling features with those features operational, but with the **Plant** or **Apparatus** which they control not in the operating mode, may be done without a **Safety Document** at the discretion of the **Authorised Person** provided that no work or testing is being carried out on the **Plant** or **Apparatus** being controlled. Before such work commences, consultation shall take place between the **Authorised Person** and the **Control Person**. If testing is to be carried out on the controlled **Plant** and **Apparatus** then the requirements of Clause 5.3 shall be met.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 20

[Issue 1]

ADDING AND REMOVING PLANT AND/OR APPARATUS TO AND FROM THE SYSTEM

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ADDING AND REMOVING PLANT AND/OR APPARATUS TO AND FROM THE SYSTEM

1 INTRODUCTION

The purpose of this Safety Rules Instruction is to specify how **Plant** and/or **Apparatus** will be added to or removed from the Northern Ireland Electricity **System** and also to determine when the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) shall be applied.

SR A1.2

2 SCOPE

The requirements of this Safety Rules Instruction apply to all **Persons** who work for Northern Ireland Electricity on the Northern Ireland Electricity **System**.

3 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

4 IDENTIFICATION

Plant and **Apparatus** which is to be added to or removed from the **System** shall be readily identifiable, or have a means of identification fixed to it, before the **Plant** or **Apparatus** is commissioned or decommissioned. The means of identification shall remain effective throughout the course of such commissioning or decommissioning.

SR A8

5 DANGERS

5.1 The main **Dangers** to personnel adding or removing Plant and/or Apparatus to and from the System, and to personnel who could be affected by such addition and removal, are:

- Electric shock
- Burns
- Poisoning
- Asphyxiation
- Other bodily injury.

5.2 These **Dangers** arise from:

(i) Mistaking **Apparatus** which is **Live** for **Apparatus** which has not yet been added to the **System**.

(ii) Mistaking **Apparatus** which is **Live** for **Apparatus** which has been removed from the **System**.

(iii) Mistaking **Plant** and/or **Apparatus** which contains stored energy or toxic residuals for **Plant** and/or **Apparatus** which has not yet been added to the **System**.

(iv) Mistaking **Plant** and/or **Apparatus** which contains stored energy or toxic residuals for **Plant** and/or **Apparatus** which has been removed from the **System**.

(v) Falling.

6 TEMPORARY REMOVAL OF HIGH VOLTAGE APPARATUS

Apparatus temporarily removed from the **System**, e.g. for workshop repair, return to manufacturers etc., shall be considered to be excluded from the requirements of the Safety Rules from the time of removal until the time of return or replacement to its normal position. **Apparatus** so removed shall be transported in a safe manner.

7 PERMANENT ADDITION OR REMOVAL OF HIGH VOLTAGE APPARATUS

7.1 General

The staff in the Managed Unit responsible for planning work that involves **Apparatus** being added to or removed from the **System** will, in advance of the work, inform the appropriate Control Centre by forwarding sufficient information in the form of **System** diagrams, control sketches, map cuttings or schedules to clearly identify the proposed change to the **System**.

The **Senior Authorised Person**, when requesting an outage for work that involves the adding to or removal from the **System**, will identify the work by reference to the relevant **System** diagrams, control sketches, map cuttings or schedules.

When work involving **Apparatus** being added to or removed from the **System** has been completed, the **Senior Authorised Person** shall ensure that the work has been carried out satisfactorily and shall confirm this to the appropriate Control Centre referring to the relevant **System** diagrams, control sketches, map cuttings or schedules.

Details of **Apparatus** added to or removed from the **System** shall be recorded using the data collection process specified by management.

7.2 Addition of High Voltage Apparatus

Before any **High Voltage Apparatus** is energised, or it is to be tested, a **Senior Authorised Person** shall ensure that:

(i) the **Apparatus** is in a state of readiness consistent with operational requirements and statutory regulations, and

(ii) all persons concerned are aware that it is no longer safe to work on the **Apparatus** without a **Safety Document**.

7.3 Permanent Removal of High Voltage Apparatus

The requirements of Section 7.1 shall be applied when **Apparatus** is to be permanently:

(i) disconnected from the **System** and retained in its normal operating position, or

(ii) removed from its normal operating position, or

(iii) demolished or dismantled,

such that there is no continuing hazard from the **System** which would require the continued application of the Safety Rules. Permanent disconnection shall therefore be achieved by the physical removal of sections of cable, conductors or electrical drives, as appropriate.

Where **Apparatus** subject to this Instruction is to be retained or dismantled in position, it shall be properly identified and, where necessary, clearly defined by a conspicuous and identifiable marked boundary.

8 CONSTRUCTION OF NEW HIGH VOLTAGE APPARATUS

8.1 General

High Voltage Apparatus under construction does not require the issue of a **Safety Document** up to the time of connection or possible connection with **Live High Voltage Apparatus**. Where such construction is close to existing **Live Apparatus**, a **Senior Authorised Person** shall decide what safety precautions and **Safety Documents** are required.

8.2 Major Substations

Before any **High Voltage Apparatus** may be connected to the **System**, a Person designated by the appropriate Manager shall confirm to the **Senior Authorised Person** issuing the **Safety Document** that the **Apparatus** is in a state of readiness for connection to the **System**, and complete the appropriate data collection form. When such a connection has been made, a notice stating "Work and/or Testing in this Substation now Requires the Issue of an Appropriate Safety Document" shall be affixed to the access(es).
It is the responsibility of the **Senior Authorised Person**, who is to issue the **Safety Document** enabling the connection to be made, to ensure that this notice has been posted. The notice shall remain on the access(es) to the substation until all construction work and subsequent testing have been completed. If the construction of the substation is to be carried out in two or more stages, then it is sufficient for the notice to remain until the initial stage is completed.

All **Persons**, other than appropriately authorised **Persons**, entering the substation to carry out work and/or testing shall be covered by a **Safety Document**.

Where some of the **Apparatus** in a substation is **Live** or could be made **Live** then **Danger Notices**, in the form of notices or tape, shall be affixed to such **Apparatus**.

Where a **Low Voltage** supply (either from the network or from a portable generator) is provided to a substation site for construction purposes, it may be possible for **HV Apparatus** to be inadvertently back-energised from this source. The display of a notice to this effect and, where applicable, the restrictions on access mentioned above shall also be necessary.

9 ADDITION AND REMOVAL OF LOW VOLTAGE APPARATUS

The addition and removal of LV Apparatus shall be carried out in a manner specified by the Unit Manager responsible for that part of the **System**.

10 ADDITION AND REMOVAL OF PLANT

The addition and removal of **Plant** shall also be carried out in a manner specified by the Unit Manager responsible for that part of the **System**.

11 RESIDUAL HAZARDS

Plant and/or **Apparatus** removed from the **System** may contain additional hazards such as stored energy or toxic residuals which shall require safe methods of work to overcome these hazards.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 21

[Issue 1]

CLIMBING OF POLES AND STRUCTURES

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CLIMBING OF POLES AND STRUCTURES

1 SCOPE

Climbing and working aloft on poles or structures can be hazardous and this Safety Rules Instruction is intended to minimise any potential **Dangers** by laying down a safe system of work.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 DANGERS

3.1 The main **Danger** to personnel climbing a pole or structure is bodily injury.

3.2 This **Danger** arises from falling.

4 PROCEDURE

4.1 Climbing of Poles

Person(s) shall at all times comply with the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

The only **Person(s)** permitted to climb poles and structures are those:

(i) Assessed competent in climbing techniques, or

(ii) Trained at the NIE Overhead Line Training School.

Person(s) under training will be permitted to climb poles and structures provided they are under the **Personal Supervision** of a **Competent Person**.

Whenever **Person(s)** climb or work aloft they shall wear and make proper use of **Approved** safety harnesses, fall arrest systems, protective clothing and tools and equipment provided and shall comply with all current related instructions.

4.2 Inspection of Poles

Prior to and during climbing of a wood pole it shall be prodded and sounded for decay and a visual inspection of the overall condition of the pole and equipment made, as there are a number of factors which have to be considered –

(i) If decay is detected, and it is considered that it could cause **Danger** during climbing of the pole, the **Person(s)** detecting the decay shall satisfy themselves that it is safe to climb the pole. If they are unhappy with the condition of the wood pole they shall inform the **Competent Person** in charge who will assess the situation and take whatever measures are necessary to avoid **Danger** – see Sections 4.3 and 4.4.

(ii) When an angle, tee-off or terminal pole is to be climbed, the stays shall be inspected in so far as is practicable to check that they are adequate.

(iii) Climbing of a free-standing pole deserves special attention, as it depends for its stability entirely on proper foundations. It is imperative that the pole has been buried to its correct depth (indicated by the gouge mark) and the soil around it properly conditioned and rammed. Sometimes the soil levels around an existing pole have been disturbed or altered by third parties or erosion, thus affecting the stability of the pole. **Person(s)** climbing the pole shall satisfy themselves that the foundations are adequate.

(iv) Where there is evidence of structural damage to the pole e.g. sawcuts, vehicle impact damage etc., then the **Person(s)** climbing the pole shall satisfy themselves that it is safe. If in doubt they shall consult with the **Competent Person** in charge.

4.3 Supporting of Poles

When a new pole has been erected it shall be supported, until backfilling and ramming of the foundation is completed by using one of the following methods:

(i) Mechanical pole erector

(ii) Crane

(iii) Shear-legs

(iv) Guy ropes.

Where an existing decayed, pinned or defective pole is to be changed or worked on, then the following additional measures shall be taken before commencement of the work:

(a) If the pole is a terminal, angle or section pole, then temporary stays shall be fitted to the adjacent pole(s).

(b) If the pole is decayed, but considered safe to climb and work on, then it shall be supported by the mechanical pole erector, crane or guy ropes until after the conductors are unbound or slackened and the work on the pole has been completed.

4.4 Access by Means Independent of the Pole

If the pole is considered by the **Competent Person** in charge to be unsafe and means of support is not feasible, then access to the pole top shall be provided by means independent of the pole. These are:

(i) Aerial platform

(ii) Crane

(iii) Independently guyed ladder or scaffolding

(iv) Independently guyed pole

(v) Wood pole lashed to existing pole.

In all these methods the positioning of the independent means shall be chosen to avoid **Danger** from the pole to be changed or worked on.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 22

[Issue 3]

BACKFEEDS FROM OTHER SOURCES

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BACKFEEDS FROM OTHER SOURCES

1 SCOPE

This Safety Rules Instruction sets down the procedures to be adopted to avoid **Dangers** associated with other sources from which **Plant** and **Apparatus** may become **Live**. It is recognised that all sources of generation are not known and no assumptions on the existence of such sources can be taken. These sources could include generation connected at HV or LV.

The earthing of HV conductors and/or shorting together of LV conductors at or close to the point of work removes this **Danger** on the overhead system. Such precautions are not practicable for work on **Plant** and **Apparatus** that is solely connected to an underground system. **SRI 4** **SRI 13**

This Safety Rules Instruction shall apply to all **Plant** and **Apparatus**, which is or is not yet part of the Transmission and Distribution **System** but for which Northern Ireland Electricity has a maintenance responsibility. **SRI 501**

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purpose of this Instruction the following additional definition will apply:

(i) *Live Line Equivalent Earth* – An Earthing Device equivalent to a **Primary Earth**.

3 IDENTIFICATION

Apparatus on which work is to be carried out shall be readily identifiable or have fixed to it a means of identification, which will remain effective throughout the course of the work. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel are:

- Electric shock
- Burns
- Other bodily injury.

4.2 These **Dangers** arise from the possibility of the **Apparatus** becoming **Live** whilst work is proceeding due to incomplete isolation of all possible sources of supply.

5 GENERAL REQUIREMENTS

5.1 It is the duty of all **Persons** who may be concerned with work or testing on **Plant** or **Apparatus** within Northern Ireland Electricity, to which the Safety Rules apply, to implement the Rules and have regard to the supporting mandatory and guidance documents. **SRI 600**

5.2 In the event of planned **HV** work the precautions to be taken to remove the potential **Danger** from other backfeeds shall be stated on the 'Request for Outage and/or Programmed Work' (E600) form. **SRI 600**

5.3 The isolation details shall be added to the isolation section of any associated **Safety Document**.

5.4 Points of **HV** isolation shall have **Caution Notices** fitted. **SR A3.2**

5.5 Points of **LV** isolation shall, where reasonably practicable, have **Caution Notices** fitted. **SRI 200**

5.6 Potential **Dangers** arising from customer's **LV** neutral earth arrangements associated with other backfeeds shall be considered.

6 PROCEDURES

6.1 When work is to take place on **Plant** and/or **Apparatus**, which is connected to any **HV** or **LV** network, the possibility of a backfeed from other sources of supply shall be considered. Precautions shall be taken to remove the potential **Danger** from these generation sources.

6.1.1 The **Danger** from a backfeed during work on the **HV** distribution overhead **System** is removed by the fitting of portable **Drain Earths** in accordance with SRI 4 Attachment 1 Section 3. **SI 1.2** **SRI 4**

6.1.2 The **Danger** from a backfeed during work on the **HV** overhead **System** in conjunction with **Live** Line work is removed by either fitting portable *Live Line Equivalent Earths* or by isolation of all points of supply and possible backfeeds from the work section in accordance with procedures contained in the 'HV Live Line Manual'. **SRI 300**

6.1.3 The **Danger** from a backfeed during work on **Plant** and/or **Apparatus** solely connected to the **HV** underground system is removed by either **LV** isolation or **HV** isolation.

6.1.4 The **Danger** from a backfeed during work on **Plant** and/or **Apparatus** on a mixed **HV** overhead and underground system is removed by either **LV** isolation, **HV** isolation and/or by fitting of portable **Drain Earth(s)**. **SI 1.2** **SRI 4**

6.1.5 The **Danger** from a backfeed during work on the **LV System** is removed by working in accordance with SRI 13 – 'Low Voltage Apparatus', clause 6.10 (iii): -. **SRI 13**

'Where reasonably practicable short circuit all conductors at the point of work if **Danger** could arise from inadvertent backfeeds on exposed **LV** conductors. Where the above is not reasonably practicable then the work shall be done in accordance with the requirements for **Live** working.'

6.1.6 The **Danger** from a backfeed during work associated with the installation or disconnection of meters, meter wiring and associated equipment is removed by opening the customer's main switch(es) before commencing work.

6.1.7 The creation of **LV** isolation points may involve withdrawing of fuses/links, unbolting of connections, breaking of conductors, operation of customer's switchgear or any other suitable method. The requirements of SP1 – 'Specialised Procedure 1', SRI 13 – 'Low Voltage Apparatus', SRI 200 – 'Function of Control Persons on LV Apparatus' and/or SRG 4 – 'Instructions for Operations or Work on the Premises of Customers Receiving High Voltage Supply' shall also be applied.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 23

[Issue 1]

TREE WORK ADJACENT TO OVERHEAD LINES

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Attachments

TREE WORK ADJACENT TO OVERHEAD LINES

1 SCOPE

This Safety Rules Instruction applies the principles established by the Electricity at Work Regulations (N.I.) 1991, the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and Policy Document (PD) 6/027 'Procedure and Guidelines for Tree Work Adjacent to NIE Overhead Lines' to achieve **Safety from the System** for **Persons** working adjacent to **HV** and **LV** Overhead Lines.

Attachments 1 and 2 of this Safety Rules Instruction detail the requirements for Tree Work on or adjacent to isolated **HV** circuits and **Live LV** circuits.

Issue 1 of SRI 23 will relate only to work adjacent to wood pole type distribution and transmission lines.

2 DEFINITIONS

2.1 Terms printed in bold type (other than in headings) in this Safety Rules Instruction are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

2.2 General terms associated with Tree Work and **Persons** responsibilities are also defined within Northern Ireland Electricity's PD 6/027

2.3 For the purposes of this Safety Rules Instruction, the following additional definitions apply:

Proximity Zone - Close enough to Live Apparatus to present Danger. Depending on the type of Tree Work, Proximity is defined as Proximity Zone 1 and Proximity Zone 2 (see PD-6/027 for details).

Live Zone - The Zone around an exposed Live Circuit Conductor or supporting insulators where there is Danger if any part of a Persons body or non-insulated tool breaches the Zone. The distances, which depend on Voltage, are shown in PD-6/027 Table 1.

Vicinity Zone - The Zone around an exposed Live Circuit Conductor, which, if maintained, will ensure that Danger is prevented because the Live Zone is not breached. The Live Zone is included within the measurement of the Vicinity Zone. The distances, which depend on Voltage, are shown in PD-6/027 Table 1.

Tree Cutting Control Measures – as defined in section 4 of the Tree Cutting Manual.

3 IDENTIFICATION

NIE **Apparatus** adjacent to the work zone that details the location of Tree Work to be carried out shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the work. **SR A8**

4 DANGERS

4.1 The main **Dangers** to **Persons** working adjacent to **Live High and Low** Voltage overhead lines are:

- Electric shock.
- Burns.
- Falling
- Other bodily injury associated with Tree Work.

4.2 These **Dangers** arise from:

(i) Inadequate precautions being taken when the **System** is **Live**.

(ii) Inadequate assessments of the risks and precautions taken to control the tree work

(iii) Inappropriate use or loss of control of mechanical devices and tools

(iv) Falling objects

5 GENERAL REQUIREMENTS FOR TREE WORK ADJACENT TO OVERHEAD LINES

5.1 All **Persons** working at height on poles or in or around trees shall wear and make proper use of **Approved** safety harnesses, fall arrest systems and other safety equipment and clothing which is provided for their safety and protection. This equipment shall be examined by users before use.

5.2 Any Tree Work within the *Proximity Zone* when the circuit is **Live** shall be completed by **Persons** in accordance with PD 6/027. This work shall only be carried out when appropriate control measures are applied to ensure that:

(1) No part of a tree which is within the *Vicinity Zone* can breach the *Live Zone*.

(2) No part of a tree which is outside the *Vicinity Zone* can breach the *Vicinity Zone*.

(3) No part of the person's body, tools or equipment breaches the *Vicinity Zone*

5.3 All **Live** Tree Work adjacent to 6.6kV and 11kV **Apparatus** and which is within the *Live Zone,* shall be undertaken in accordance with Northern Ireland Electricity's 'HV Live Line Manual'. **SRI 300**

6 AUTHORISATION LEVELS

6.1 B3X (SRI.4 & SRI.23 Att 1): An **Authorised Person** who can fit/ remove **Drain Earths** (SRI.4 Att 1) and make a decision to fit/ remove **Drain Earths** as per the requirements of SRI.23 Att 1.

6.2 D7B (SRI.13 & SRI.23 Att 2): A **Competent Person** who can carry out **Live Work** on **LV Apparatus** and Tree Work adjacent to **Live LV Apparatus** under the **Personal Supervision** of an **Authorised Person**.

D7B (SRI.23 Att 2): A **Competent Person** who can carry out **Live LV** Tree Work under the **Personal Supervision** of an **Authorised Person.**

B3X (SRI.23 Att 2): An **Authorised Person** who shall ensure all **Live LV** Tree Work is carried out as per the requirements of SRI.23.

7 TABLE FROM 6/027

Table 1 Live and Vicinity Zone Distances from Policy Document 06/027

System Voltage	Live Zone	Vicinity Zone
Up to and including 1 kV	0.3m	1m
Up to and including 11 kV	0.8m	2m
Up to and including 33 kV	0.8m	2.5m
Up to and including 110 kV	1.2m	3.5m

8 ATTACHMENTS

ATTACHMENT 1
TO
SAFETY RULES INSTRUCTION SRI 23

Requirements for fitting Drain Earths associated with Tree Work on wood pole overhead lines

Att1 When Tree Work is to be carried out on any tree within, or which is capable of coming within the Live Zone and a **Permit(s) For Work** has been issued, a **Drain Earth** shall be fitted and removed in accordance with SRI.4 Attachment 1 **SRI 4**

When a **Permit(s) For Work** has been issued and the Tree Work is to be carried out on any tree which is not within the *Live Zone* and when *Tree Cutting Control Measures* are applied, is not capable of breaching the *Live Zone*, a **Drain Earth** is not required. This Tree Work can be carried out where no part of the tree can breach the *Live Zone* and no part of the tree cutter's body, tools or equipment can breach the *Vicinity Zone*.

The decision as to whether a **Drain Earth** is required shall be made on site by an **Authorised Person**

ATTACHMENT 2
TO
SAFETY RULES INSTRUCTION SRI 23

Live LV Tree Work

Att2 All Tree Work adjacent to **Live LV Apparatus** and within the *Live Zone* shall be undertaken in accordance with Northern Ireland Electricity's Tree Cutting Manual.

Work shall be undertaken by a **Competent Person** under the **Personal Supervision** of an **Authorised Person**

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 24

[Issue 1]

WORK ON PLANT OR APPARATUS CONTAINING COMPRESSED AIR

Contents **Page**

WORK ON PLANT OR APPARATUS CONTAINING COMPRESSED AIR

1 SCOPE

The Safety Rule Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) to achieve **Safety from the System** for personnel working on **Plant** and **Apparatus** operated by or containing compressed air.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 IDENTIFICATION

Plant and **Apparatus** on which work is to be carried out shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the work.

4 DANGERS

4.1 The main **Dangers** to personnel working on **Plant** and **Apparatus** operated by or containing compressed air are:

- Asphyxiation
- Electric shock
- Burns
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) Loss of oxygen due to inadequate ventilation in pressure vessels.

(ii) Contact with **Live** conductors.

(iii) The release of air at a pressure greater than atmospheric.

(iv) The release of stored mechanical energy.

5 GENERAL REQUIREMENTS

5.1 Before work is carried out on **Plant** or **Apparatus** operated by or containing compressed air, the **Plant** or **Apparatus** shall be **Isolated**, and **Vented** where appropriate.

5.2 Before work commences a **Permit for Work** shall be issued.

6 PRECAUTIONS TO BE TAKEN BEFORE WORK IS COMMENCED ON PLANT CONTAINING COMPRESSED AIR

6.1 When work is to be carried out on **Plant** that is electrically or mechanically driven, the drives shall be **Isolated** and where practicable immobilised and **Locked** with a Safety Lock.

6.2 To achieve isolation from compressed air **Systems**, manually or remotely operated valves shall be adjusted to the required closed position and where practicable **Locked** with a Safety Lock. Electrically operated valves shall have their electrical supplies **Isolated** and, where practicable, **Locked** or have their mechanical drives disconnected. **Caution Notices** shall be affixed at all points of **Isolation**.

6.3 **Plant** containing compressed air shall have its contents **Vented** before any work commences, and where vents could give rise to **Danger** they shall, where practicable, be **Locked** with a Safety Lock in the appropriate position. Where **Danger** could arise from the release of stored energy, action shall be taken to contain or dissipate this energy safely.

6.4 Receivers and pressure vessels shall be regarded as confined spaces and where access is necessary the requirements of SRI 401 –'General Confined Spaces' shall be applied. This may require a request for a **Selected Person**'s report.

7 PRECAUTIONS TO BE TAKEN BEFORE WORK IS COMMENCED ON HV APPARATUS WHICH CONTAINS OR IS OPERATED BY COMPRESSED AIR

In addition to the requirements for the **HV Apparatus** to be **Isolated** from the electrical **System** and **Earthed**, the **HV Apparatus** shall also be **Isolated** from any source of compressed air as outlined in Clauses 6.2, 6.3 and 6.4.

8 OPERATING ADJUSTMENTS

Unless otherwise specifically exempted by another Safety Rules Instruction, the making of adjustments to **Plant** or **Apparatus** operated by or containing compressed air, which requires the normal air supply, shall be carried out by, or under the **Personal Supervision** of, an **Authorised Person**.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 25

[Issue 1]

FITTING AND REMOVAL OF PORTABLE DRAIN EARTHS IN HIGH VOLTAGE TRANSMISSION SUBSTATIONS

Contents **Page**

FITTING AND REMOVAL OF PORTABLE DRAIN EARTHS IN HIGH VOLTAGE TRANSMISSION SUBSTATIONS

1 SCOPE

The Safety Rule Instruction details the requirements for the placing of portable **Drain Earths** in preparation for work/testing on **HV Apparatus** in transmission substations in accordance with SRI 2 – 'Earthing High Voltage Apparatus' – Clauses 5.5, 5.17 and 5.20.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 IDENTIFICATION

Apparatus on which a portable **Drain Earth** is to be fitted shall be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the fitting and removal of the **Drain Earth**.

4 DANGERS

4.1 The main **Dangers** to personnel fitting and removing portable **Drain Earths** in **High Voltage** Transmission substations are:

- Electric shock
- Burns
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) The application of earths to **Live HV Apparatus**.

(ii) Poorly connected and/or insecure **Earthing Devices**.

(iii) The incorrect sequence or method of application or removal of portable **Earthing Devices**.

(iv) The inadvertent earthing of **Live HV Apparatus** due to loss of control or difficulty in the handling of portable earthing equipment.

(v) Falling.

5 GENERAL PRINCIPLES

5.1 Before a **Drain Earth** is applied the following shall be established:

(i) The **HV Apparatus** shall be isolated from the **System**.

(ii) **Primary Earths** shall be fitted between the point of work and any points of isolation.

(iii) A **Permit for Work** or a **Sanction for Test** shall be issued.

6 GENERAL REQUIREMENTS

6.1 Portable **Drain Earths** shall have a cross section of not less than 25mm^2 (0.04 in^2) copper equivalent.

6.2 Portable **Drain Earths** shall be applied to and removed from **HV Apparatus** using an **Approved** device.

6.3 When available, a fixed **Earthing Device** shall be used as a **Drain Earth**.

6.4 When possible, an isolator shall be used within the **Isolated** zone to establish a **Drain Earth** at the point of work.

6.5 When a fixed **Earthing Device** is being maintained, the associated portable **Drain Earth** shall only be applied or removed while the fixed **Earthing Device** is in the closed position.

6.6 When a portable **Drain Earth** is required on a long length of continuous busbar then, where applicable, a portable **Drain Earth** may be fitted to a short **Isolated** section of busbar and an isolator used to establish the **Drain Earth**.

6.7 **Drain Earths** in connection with a **Permit for Work** (which may include the use of an **Earthing Schedule**) shall be applied and removed by a **Competent Person**.

6.8 During the application and removal of portable **Drain Earths**, in connection with a **Permit for Work** in Substations containing open type **HV Apparatus**, two **Competent Persons** shall be present, one of whom shall be the recipient of the **Permit for Work**.

6.9 **Drain Earths** in connection with a **Sanction for Test** (which may include the use of an **Earthing Schedule**) shall be applied and removed by an **Authorised Person** or by a **Competent Person** acting under the **Personal Supervision** of an **Authorised Person**.

6.10 During the application and removal of portable **Drain Earths** in connection with a **Sanction for Test** in Substations containing open type **HV Apparatus**, two persons shall be present, one of whom shall be an **Authorised Person** and the other a **Competent Person**.

6.11 On completion of the work, the recipient of the **Permit for Work** or **Sanction for Test** shall ensure that all **Drain Earths** fitted in connection with the **Permit for Work** or **Sanction for Test** have been removed before he clears the **Safety Document**.

7 APPLICATION AND REMOVAL

7.1 When a Portable **Drain Earth** is to be applied, the earth-end of each **Drain Earth** connection shall be attached to metal which is electrically bonded to earth, before the conductor-end clamp is applied.

7.2 When a portable **Drain Earth** is to be removed, the conductor-end clamp connection shall be removed before the earth-end clamp.

7.3 At no time shall the conductor-end clamp of a portable **Drain Earth** be allowed to remain connected when its earth-end clamp has become detached. If such a disconnected portable **Drain Earth** is the only earth on that conductor, at that point, an additional portable **Drain Earth** shall be connected between earth and the conductor before the detached portable **Drain Earth** conductor-end clamp is removed. In all cases, before the earth-end clamp is re-connected, the conductor-end clamp shall first be removed.

7.4 While applying/removing a portable **Drain Earth** the **Competent Person** shall place himself and his earthing equipment such that **Safety Distances** are not infringed.

8 POSITIONING OF DRAIN EARTHS

8.1 A portable **Drain Earth** shall be fitted at a point of work unless a **Primary Earth** is fitted at that point.

8.2 If reasonably practicable, a portable **Drain Earth** shall also be fitted on a continuous conductor between the point of work and a **Primary Earth**, if the distance between them is greater than 9m (30 ft).

8.3 A portable **Drain Earth** shall also be fitted to any **Isolated HV Apparatus** not **Earthed** within the **Isolated** zone.

8.4 The **HV Apparatus** to be earthed shall not be more than 6.1m (20 ft) above ground or the access way used by the **Competent Person** fitting or removing the portable **Drain Earth**.

8.5 If it is necessary to apply the portable **Drain Earth** in circumstances where Clause 8.4 cannot be complied with, then an appropriate access device may be used to aid the fitting or removing of the portable **Drain Earth**.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 27

[Issue 1]

MOYLE INTERCONNECTOR

Contents **Page**

MOYLE INTERCONNECTOR

1 SCOPE

This Safety Rules Instruction details the extent of, and sets down the procedures to be adopted for, the **Plant** and **Apparatus** to which the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) are applied throughout that part of the **System** identified as the Moyle Interconnector.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 IDENTIFICATION

Apparatus on which work, testing and/or **Switching** is to be carried out shall be readily identifiable or have fixed to it a means of identification, which will remain effective throughout the course of work, testing and/or **Switching**.

4 DANGERS

4.1 The main **Dangers** to personnel **Switching** on the **High Voltage System** are:

- Electric shock
- Burns
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) Personnel mistaking that part of **High Voltage Apparatus** on which it is not safe to apply an **Earthing Device** or work, for that on which it is safe to do so, thus infringing **Safety Distance**.

(ii) Inadequate precautions to suppress or safely discharge any induced, stored or other impresses voltages in the conductors and associated fittings..

(iii) Injuries resulting from **Dangers** inherent in parts of **Apparatus** specific to the Moyle Interconnector.

(iv) Falling.

5 PLANT AND APPARATUS TO WHICH THE SAFETY RULES APPLY

5.1 The extent of the identified Moyle **System** known as the Moyle Interconnector includes all **Plant** and **Apparatus** from the common point of connection on the 275kV busbar connections (Attachment 2) at Ballycronan More converter station (Northern Ireland), through the **Plant** and **Apparatus** which make up the circuits between the two converter stations, as far as the common point of connection on the 275kV busbars (Attachment 1) between isolators GM6 and GM9, adjacent to Scottish Power earth switch L141B (on the Coylton 275kV line circuit) at Auchencrosh converter station, as defined in Interconnector Operating Code IOC4. Scottish Power Safety Rules apply beyond this point

5.2 The identified Moyle **System** known as the Moyle Interconnector does not include the following equipment at Ballycronan More and Auchencrosh converter stations;

- **Plant** and **Apparatus** physically disconnected from the **System**.
- **Plant** and **Apparatus** forming part of the Northern Ireland Electricity **System** at Ballycronan More
- Equipment owned and operated by Scottish Power at Auchencrosh (Coylton Line Bay).
- Buildings, building services, including office heating / air conditioning and interior lighting.
- Standby generators.
- Exterior lighting, site security / detection equipment.
- Portable test equipment.
- Telecommunications systems, computers and office equipment.

6 PROCEDURES FOR WORK AND/OR TESTING ON THE IDENTIFIED SYSTEM

6.1 All work and/or testing on the Moyle Interconnector shall be carried out whilst achieving **Safety from the System** in accordance with the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and procedures found in The Moyle Interconnector Safety Manuals issued by the Director, Moyle Interconnector plc.

These Instruction Manuals include, but are not limited to;

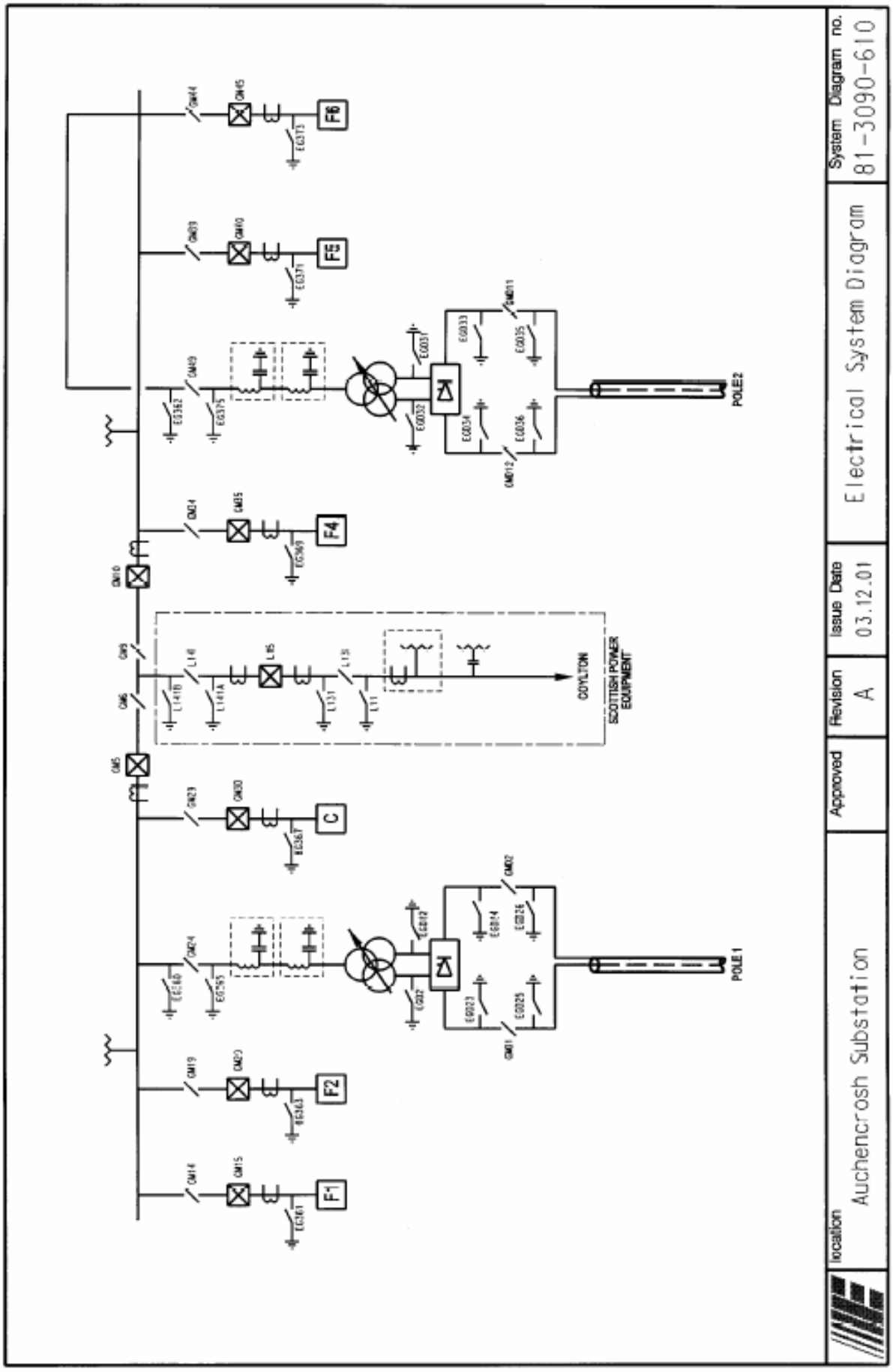
- System Information.
- Operating Instructions, including General Safety Instructions (Safety Notes).
- Maintenance procedures.
- Health and Safety procedures.

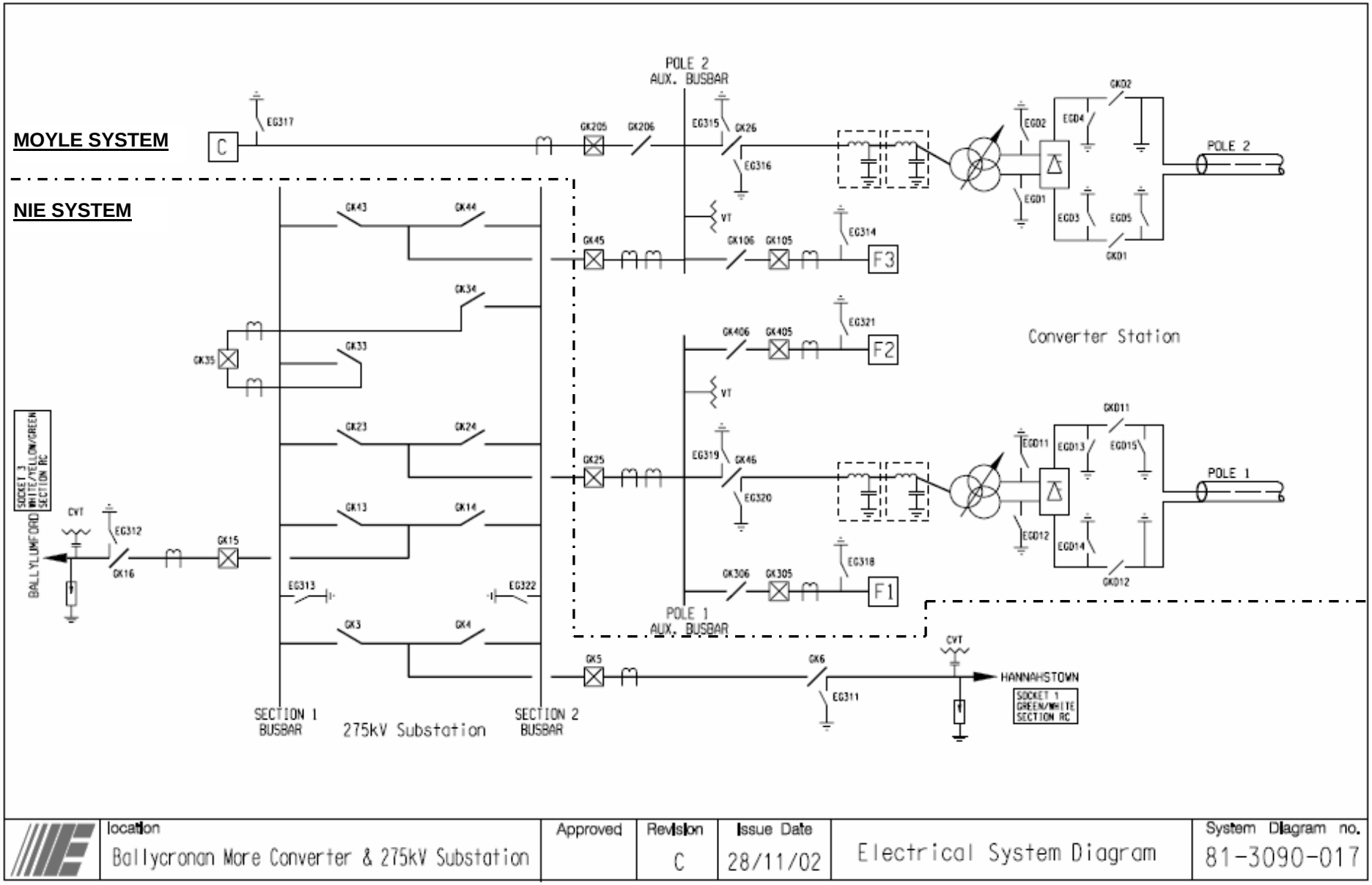
6.2 Where portable **Primary Earths** are to be used, SI 1, SRI 1 – 'High Voltage Switching' and SRI 2 – 'Earthing High Voltage Apparatus' shall be complied with in addition to any specific requirements in the relevant Instruction Manual(s).

6.3 Where portable **Drain Earths** are to be used under a **Safety Document**, SRI 25 – 'Fitting and Removal of Portable drain Earths in High Voltage Transmission Substations' shall be complied with, in addition to any specific requirements in the relevant Instruction Manual(s).

6.4 Any work and/or testing on **Plant** and **Apparatus** which involves stored electrical energy shall be made safe by complying with SRI 7 – ' AC Filters and Capacitor Banks', which are used at both Moyle Interconnector converter stations. Manuals issued by the Director, Moyle Interconnector plc. may contain further specific requirements for making safe these filters and other items of **Plant** and **Apparatus** where stored energy can arise.

6.5 Instruction Manuals issued by the Director, Moyle Interconnector plc. include procedures for work and/or testing on items of equipment other than identified **Plant** or **Apparatus**. These items are governed by the requirements set down in these Manuals but it shall be ensured that **Safety from the System** is maintained at all times regardless of whether they are associated with **Plant** or **Apparatus**.


Location
Auchencrosh Substation
Approved
Revision
A
Issue Date
03.12.01
System Diagram no.
81-3090-610
Electrical System Diagram
F1
F2
C
F4
F5
F6
POLE 1
POLE 2
COYLTON
SCOTTISH POWER EQUIPMENT



	location	Approved	Revision	Issue Date		System Diagram no.
	Ballycronan More Converter & 275kV Substation		C	28/11/02	Electrical System Diagram	81-3090-017

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 102

[Issue 1]

MOBILE LV GENERATION

Contents **Page**

MOBILE LV GENERATION

1 SCOPE

This Safety Rules Instruction covers the use of mobile **LV** generation **Plant**, operated by Northern Ireland Electricity and designed for the purpose of generating electricity, of acceptable quality, for connection to the Northern Ireland Electricity **LV System** and/or customers' premises. This mobile **LV** generation **Plant** is utilised for the temporary supply of electricity to customers during planned or emergency work on the **HV** or **LV System**.

It does not apply to:

(i) Portable generators supplied to teams/squads for the operation of power tools, portable lighting equipment, etc.

(ii) Fixed stand-by generators.

(iii) Any **Plant** owned by a generating company.

This Instruction shall be read in conjunction with the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and other Safety Rules Instruction, with special reference to the following, the requirements of which shall be met:

(a) Safety Rule A5 – 'Safety Precautions for Work on or Testing of Low Voltage Apparatus'.

(b) Specialised Procedure SP 1 – 'Requirements for Working on Live Low Voltage Apparatus'.

(c) SRI 13 – 'Low Voltage Apparatus'.

(d) SRI 200 – 'Function of Control Persons on LV Apparatus'.

The considerations and procedures for all matters concerning the use of mobile generation are covered in Northern Ireland Electricity's 'Mobile LV Generation Operation Manual'.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purpose of this Safety Rules Instruction the following additional definitions apply:

(i) *Connection* – physical connection of the *Generator* leads to the **System** prior to generation commencing.

(ii) *Disconnection* - physical disconnection of the *Generator* leads from the **System** after generation ceases.

(iii) *Generator* – mobile or portable **LV** generation plant, operated by Northern Ireland Electricity and designed for the purpose of generating electricity, of acceptable quality, for connection to the Northern Ireland Electricity **LV System** and/or customers' installations.

3 IDENTIFICATION

Apparatus to or from which the *Connection* or *Disconnection* of a Generator is to be carried out shall be readily identifiable or have fixed to it a means of identification, which will remain effective throughout the period the *Connection* or *Disconnection* is being carried out. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel working on or testing **Live** *Apparatus* are:

- Electric shock
- Burns
- Respiratory problems
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) Mistaking that part of **Apparatus** on which it is not safe to work without special precautions, for that which is **Isolated** and on which it is safe to work.

(ii) Mistaking **High Voltage Apparatus** on which it is unsafe to work for **LV Apparatus** on which it is safe to work under the conditions laid down.

(iii) The **Apparatus** being worked on being accidentally or inadvertently made **Live**.

(iv) Excessive noise.

(v) Exposure to noxious gases from engine exhausts, especially in confined areas.

5 GENERAL SAFETY ISSUES

Generators, by their nature, are a source of electrical energy and their *Connection* to the **System** can have major effects on many of the safety issues involved in the day-to-day work of Northern Ireland Electricity. As the *Connection* of the *Generators* could, in effect, create a full possible interconnection with an existing substation, the Distribution Control Centre shall be informed immediately the *Connection* of any *Generator* to, or *Disconnection* of any *Generator* from, the **System** has taken place. See also Section 8 of this Instruction.

Any **LV** fuses or links which are used as a point of isolation for an outage shall not be used for the *Connection* of a *Generator*.

6 COMMUNICATIONS

It is important that a reliable system of communication is maintained to ensure that all relevant staff are kept informed as to the location of *Generators* and the **System** configuration at the time of their *Connection* and subsequent use.

7 GENERAL RESPONSIBILITIES OF PERSONS

When mobile or portable generation is planned, a **Senior Authorised Person** within the Managed Unit involved is responsible for informing, where appropriate (see Clauses 8.1 and 8.2), the Distribution Control Centre of his plans by completing a ‘Mobile Generator Request and Log’ form (see Appendix).

The **Senior Authorised Person** shall establish that the *Connection* and *Disconnection* of the *Generator* to and from the **System** can be carried out safely. In particular, if the *Connection* and *Disconnection* of the *Generator* to and from the **System** is to be carried out **Live**, then the requirements of the Safety Rules relating to **Live** work and an **Approved** procedure shall be followed.

It will be the responsibility of the **Senior Authorised Person** to consider the impact that the use of a *Generator* might have on any other work on or adjacent to the part of the **System** which is to be energised, and to inform all relevant **Persons**, so that **Safety from the System** can be maintained at all times.

For example, restringing type work can involve running a conductor over a part of the **LV** overhead **System** which may be made **Live** from a mobile or portable *Generator*.

The *Connection* and *Disconnection* of the *Generator* to and from the **System** shall only be carried out by an **Authorised Person** familiar with the **System** configuration at the point of connection or under his **Personal Supervision**. The **Authorised Person** will be responsible for confirming the *Connection* and *Disconnection* of a *Generator* to the Distribution Control Centre.

8 ROLE OF DISTRIBUTION CONTROL CENTRE

8.1 Mobile Generation

The Distribution Control Centre shall be informed about the proposed use of mobile generation. For planned work this notification will consist of a completed 'Mobile Generator Request and Log' form (see Appendix) and, if appropriate, be cross-referenced to the relevant 'Request for Outage and/or Programmed Work' (E600) form (see Appendix).

8.2 Portable Generation

If the *Connection* of a portable *Generator* is to be made to an individual customer's installation, and it could not backfeed onto the **System**, the Distribution Control Centre does not need to be notified of the proposed use of the *Generator*, nor to be informed when the *Connection* or *Disconnection* of the *Generator* is carried out.

If, however, the portable *Generator* is to be *Connected* to the Northern Ireland Electricity **LV System**, and would therefore be a possible backfeed, the Distribution Control Centre shall be informed. This notification shall be as for mobile generation, as described in Clause 8.1, and as required by Clause 5.

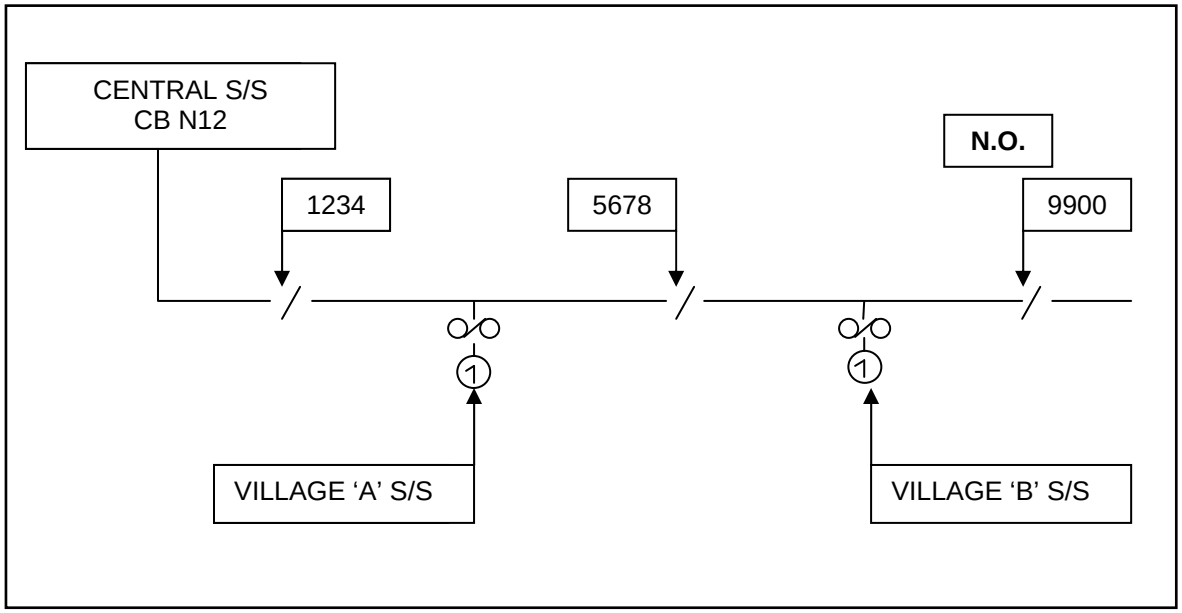
8.3 The Distribution Control Centre will record the use of *Generators* on the **System** in accordance with Control Centre procedures.

APPENDIX

EXAMPLES OF FORMS TO BE USED

This Appendix includes examples of a 'Request for Outage and/or Programmed Work' (E600) form and a 'Mobile Generator Request and Log' form for a typical situation, described below, where mobile generation is planned.

Consider the *System* shown below (for clarity only relevant details are shown). The work involved is in the section between isolators 1234 and 5678, which includes Village 'A' substation. It is assumed that the **LV** interconnection between Village 'A' and Village 'B' substations would not be capable of backfeeding the load at Village 'A' substation, and it is therefore proposed to connect a *Generator* at this substation to maintain supplies. The *Generator* would remain synchronised with the *System* throughout the outage due to the aforementioned backfeed.



Examples of typical 'Request for Outage and/or Programmed Work' (E600) and 'Mobile Generator Request and Log' forms (front only) for the outage are shown on the following pages.

Northern Ireland Electricity

REQUEST FOR OUTAGE AND/OR PROGRAMMED WORK
(This is not a safety document)

REQUEST NO: BLG/HV/9000/08

DEPOT: BALLYGEN | DEL CONTROL: YES | SRG2 COMPLEX WK: NO

EVENT NO: | JOB NO: | OP NO:

ORDER NO: 8100115 | CNS NO:

ASSOCIATED DOCUMENTS: BLG

LOCATION: CENTRAL S/S – VILLAGE 11KV CIRCUIT | CB NO: N12 | DIAG REF: TG11

VOLTAGE kV): 11 | COLOUR CODE: N/A | SOCKET: N/A

PLANT/APPARATUS IDENTIFICATION:
POLES EX–10 TO EX-25

WORK/TESTING TO BE DONE:
11KV LINE REFURBISHMENT

POINTS OF HV ISOLATION AND LV ISOLATION TO THE SYSTEM:
SWITCH 1234
SWITCH 5678
TX LV LINKS WITHDRAWN AT VILLAGE 'A' SUBSTATION

PRIMARY EARTHS REQUIRED:
ON THE O/H LINE AT POLE EX–10 TOWARDS EX-9
ON THE O/H LINE AT POLE EX–25 TOWARDS EX-26

DURATION OF OUTAGE / WORK

	START TIME	DAY (start)	DATE (start)		FINISH TIME:	DAY (finish)	DATE (finish)
FROM	**09:00**	**MONDAY**	**02/06/08**	TO	**16:30**	**MONDAY**	**02/06/08**

REQUESTED BY: | DATE: | BUSINESS:

SIGNED (S.A.P.) | DATE: | NAT/WK:

APPROVED BY: | DATE: | RESTORATION TO SERVICE IN EMERGENCY: 3H

AGREED BY: | DATE: | REASON FOR OUTAGE: 1

NOTES

LOAD ANALYSIS: (DCC USE ONLY)

CIRCUIT | RE-SUPPLY1 | RE-SUPPLY2

PEAK	LOAD TO TRANSFER	O/C SETTING	PEAK	PEAK + TRANSFER	O/C SETTING	PEAK	PEAK + TRANSFER

AOR'S/SWITCHING PLAN / ADDITIONAL COMMENTS

DELEGATED CONTROL RECORD

NAME	DELEGATED	RETURNED

Engineer / SAP: | Supervisor:

Contractor: | Other:

Northern Ireland Electricity	**MOBILE GENERATOR REQUEST AND LOG** (This is not a safety document)	**REQUEST NO: BLG/HV/9000/08**

DEPOT:

EVENT NO: JOB NO: OP NO:

ORDER NO. 4800111 CNS NO:

ASSOCIATED DOCUMENTS

BLG/HV/9000/08

SUBSTATION: **VILLAGE 'A'** GRID REFERENCE:

LOCATION: VILLAGE CONTROL DIAGRAM No: TG11

REASON FOR FITTING GENERATOR: CML mitigation POLE NUMBER: EX-16

NATURE OF WORK: overhead line system work

NUMBER OF CUSTOMERS TO BE HELD ON GENERATOR: 151

REQUESTED GENERATION DETAILS:

SIZE of GENERATOR: 300 KVA GENERATOR NUMBER:

LENGTH OF LEADS REQUIRED: 20

STANDBY PERSON REQUIRED: YES

RESYNCHRONISATION REQUIRED: YES

SYNCHRONISATION DETAILS: Synchronised with system for duration of outage

LV ISOLATION REQUIRED: TX LV LINKS WITHDRAWN AT VILLAGE 'A' S/S

PROPOSED DATE and TIME of CONNECTION: 02/06/2008 at 08:00 hrs

PROPOSED DATE and TIME of DISCONNECTION: 02/06/2008 at 17:00 hrs

NOTES

REQUESTED BY: DATE:

SIGNED SAP:

ENGINEER/SAP: OTHER:

KILOWATT-HOUR READINGS:

	INITIAL	FINAL	DIFFERENCE	
L1				HOURS RUN – INITIAL READING:
L2				HOURS RUN – FINAL READING:
L3				TOTAL HOURS RUN:
		TOTAL UNITS – L1+L2+L3:		

ACTUAL GENERATION DETAILS: - to be completed by SAP / AP

DATE FITTED: FITTED BY:

DELIVERED TO SITE BY: (Team manager responsible)

GENERATOR NO: GENERATOR SIZE:

TIME GENERATION COMMENCED: TIME OF ISOLATION:

TIME GENERATION ENDED: TIME OF RESTORATION:

TOTAL GENERATION TIME (hrs): TOTAL OUTAGE TIME:

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 200

[Issue 1]

FUNCTION OF CONTROL PERSONS ON LV APPARATUS

Contents **Page**

FUNCTION OF CONTROL PERSONS ON LV APPARATUS

1 SCOPE

This Safety Rules Instruction is to be used in association with the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), to allow isolation of **LV Apparatus** on the Northern Ireland Electricity **System**. It excludes isolation of **LV** supplies in Primary and Secondary substations, which is included in SRI 201 – 'Function of Control Persons in a Transmission Substation'.
Any reference to "work" in this Instruction also applies to testing.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purposes of this Instruction the following additional definition will apply:

Apparatus – Where the word *Apparatus* is used in this Instruction without qualification it refers to **Low Voltage Apparatus**. It includes all **LV Apparatus** between the **Low Voltage** terminals of **HV** distribution transformers and all customers' installations for which Northern Ireland Electricity has a maintenance responsibility.

3 IDENTIFICATION

Apparatus, in respect of which a **Person** is acting as a **Control Person**, shall be readily identifiable or have fixed to them means of identification, which will remain effective throughout the period the **Person** is acting as a **Control Person**. **SR A8**

4 GENERAL REQUIREMENTS

4.1 General

4.1.1 To achieve **Safety from the System** before any work is done, *Apparatus* shall, where reasonably practicable, be **Isolated**, or the work shall be carried out in accordance with an **Approved** procedure. A **Control Person** shall control and co-ordinate the actions necessary to achieve **Safety from the System**, when isolation is required.

4.1.2 When *Apparatus* is to be **Isolated** for work, the staff performing the duties of **Control Persons** shall ensure that the boundaries of the **Isolated** zone are not breached at any time during the course of the work. Points of isolation shall, where reasonably practicable, have **Caution Notices** affixed.

4.1.3 **Caution Notices** affixed at points of isolation shall provide information identifying the **Authorised Person** carrying out the isolation and the date of the isolation.

4.1.4 **LV Apparatus** shall at all times be under the control of a **Senior Authorised Person**(s) appointed by an appropriate Manager, except where work to be done is of a routine nature when Clause 4.3 applies.

4.1.5 Any **Persons** intending to do work shall establish who is the appropriate **Control Person**.

4.2 Work of a Non – Routine Nature (i.e. not included in the Attachment 1 to SRI 13 – 'Work or Testing on Live LV Apparatus')

4.2.1 When work of a non routine nature is to be done, the **Control Person** shall be a **Senior Authorised Person.**

4.2.2 A **Control Person** may consult with, where necessary, all other **Control Persons** in adjoining parts of the **System**, to confirm that **Safety from the System** will be achieved.

4.2.3 One or more **Control Persons** may sanction work simultaneously on adjacent *Apparatus*, provided each **Control Person**'s sphere of operation does not interfere with any other. This allows individual items of work to be carried out independently, even where one work area is contained totally within another.

4.3 Work of a Routine Nature

The **Competent Person** in charge of the work, performs the duties of a **Control Person** and an **Authorised Person** when isolating *Apparatus*. The requirement that a **Senior Authorised Person** checks the safety precautions as being adequate, as called for in Safety Rule C4.1.1, is satisfied by SRI 13 – 'Low Voltage Apparatus' – Section 7.3 (i), and no further confirmation is required. **SR C4.1.1**

4.4 Responsibilities

The duties of the **Control Person** are as follows:

(i) To agree with the **Senior Authorised Person** as to the safety precautions to be taken.

(ii) To issue instructions to the **Authorised Person** for isolation of the *Apparatus*.

(iii) To confirm with the **Senior Authorised Person** or, where the **Control Person** is a **Competent Person** carrying out routine categories of work, with himself, that the safety precautions have been taken and are adequate for the work to be done.

(iv) To consent to work proceeding.

(v) On completion of work, to issue instructions to the **Authorised Person** to restore *Apparatus* to service.

These events may be considered to have been fulfilled when the work is of a routine nature as included in the Attachment 1 to SRI 13 – 'Low Voltage Apparatus', provided the **Competent Person** is nominated as a **Control Person** for the specified *Apparatus*, and has understood and accepted instructions for the work to be done in this manner.

All instructions for isolation and restoration to service of *Apparatus* shall be recorded in accordance with SRI 600 –'Application of the Safety Rules' Appendix 8.

5 ISOLATION AND RESTORATION OF APPARATUS

5.1 LV Isolation (including transformer LV Isolating Devices on interconnected LV networks)

The sanctioning of isolation, and the consent for work to proceed, shall be by a **Senior Authorised Person**, an **Authorised Person** or, for work of a routine nature as included in the Attachment 1 to SRI 13 – 'Low Voltage Apparatus', an **Authorised Person**, who has the appropriate category of nomination as a **Control Person** for the specified *Apparatus*.

5.2 HV Isolation (including transformer LV Isolating Devices on interconnected LV networks)

The sanctioning of isolation shall be by a **Control Person** at Distribution Control Centre. The responsibility for the control function may be delegated to the **Senior Authorised Person**, consenting to work being done after all the safety precautions have been applied, and where necessary issuing a **Safety Document**.

5.3 Restoration to Service

5.3.1 The **Control Person** shall issue instructions to restore *Apparatus* to service, on receipt of confirmation that the work is complete and the *Apparatus* to be connected is in serviceable condition. This includes instructions given by a **Person** when acting on his own, applying particularly to routine categories of work on **Live** *Apparatus*.

5.3.2 Where **HV** isolation has been carried out, the control function shall be returned to the Distribution Control Centre as soon as supplies have been restored.

6 FAULT CONDITIONS

6.1 Work of a Non – Routine Nature

All work shall be under the control of a **Senior Authorised Person.**

6.2 Work of a Routine Nature

6.2.1 A **Competent Person** may isolate *Apparatus* and carry out repairs when appropriately nominated as the **Control Person** and **Authorised Person**, where this can be done without **HV** isolation.

6.2.2 For routine categories of work,

(i) *Apparatus* may be **Isolated**, repaired and restored to service by the **Competent Person**, or

(ii) the role of **Control Person** may be handed over to a **Senior Authorised Person** prior to restoration of *Apparatus* to service.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 201

[Issue 1]

FUNCTION OF CONTROL PERSONS IN A TRANSMISSION SUBSTATION

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FUNCTION OF CONTROL PERSONS IN A TRANSMISSION SUBSTATION

1 SCOPE

This Safety Rules Instruction is to be used as a procedure associated with the Northern Ireland Safety Rules (Electrical and Mechanical) to allow isolation of compressed air systems, **LV** (including DC) supplies in a Transmission Substation for work on **Plant** and **HV Apparatus** as specified in SRI 501 – 'The Northern Ireland Electricity System'. Control of other **LV Apparatus** not involved in the work on **Plant** and **HV Apparatus** may be carried out under SRI 200 – 'Function of Control Persons on LV Apparatus'.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 GENERAL REQUIREMENTS

To achieve **Safety from the System** before any work is done, **Plant** and **Apparatus** shall, where reasonably practicable, be **Isolated** or an **Approved** procedure adopted.

When **Plant** or **Apparatus** is to be **Isolated** for work or testing, Management will nominate members of staff to be **Control Persons** for particular divisions of **Plant** or **Apparatus** at particular substations. **Plant** or **Apparatus** shall be **Isolated** by an **Authorised Person** who may be enacting other roles. This isolation shall not be breached and any point of isolation shall have **Caution Notices** affixed.

To achieve this there is a requirement for a **Control Person** to be nominated to discharge the control functions on **Plant** and **Apparatus** owned and/or maintained by Northern Ireland Electricity where the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) apply:-

(i) Air, Gas, Oil and **LV Systems** including those directly associated with **HV Apparatus** but excluding VT **LV** fuses and **LV** isolating switches on auxiliary transformers.

(ii) Protective equipment, A.V.C. schemes, auto-reclose, intertripping and control schemes.

(iii) All other auxiliary **Plant** and **Apparatus** within the Substation.

The events relating specifically to the duties of a **Control Person** at a Transmission Substation are as follows:-

(i) At any one time only one **Control Person** implements the **Control Person's** responsibilities in any Transmission Substation.

(ii) The **Control Person** on taking up his duties in any Transmission Substation will familiarise himself with the Substation Log and the operational state of the **Plant** or **Apparatus** for which he has responsibility.

(iii) The **Control Person** will record all actions / messages in the Substation Log.

(iv) The Safety Rules do not preclude one or more **Persons** from performing the duties of a **Control Person**, **Authorised Person** and/or **Senior Authorised Person** at the same time.

(v) Prior to completing his role as a **Control Person**, the **Control Person** shall record in the Substation Log the state of all the systems under his control e.g.
LV system normal
DC system normal
Compressed Air system open at SV41 and SV43

4 ISOLATION FROM THE SYSTEM

To achieve isolation from the system more than one **Control Person** may be involved i.e. at Grid Control, at Distribution Control Centre, at a Transmission Substation.

The following relate specifically to isolation from the **System**:-

(i) The **Control Person** decides what safety precautions are needed to isolate the **Plant** and **Apparatus** to be worked on, from the rest of the **System** for which he has responsibility.

(ii) The **Senior Authorised Person** will decide whether venting, purging, draining or adjustments in levels is required.

(iii) The **Control Person** instructs the **Authorised Person(s)** to carry out the safety precautions decided in 4(i) and 4(ii) above.

(iv) On receiving confirmation from the **Authorised Person(s)** that the safety precautions have been taken, the **Control Person** and the **Senior Authorised Person** will check with each other that the safety precautions taken are adequate for the work to be done.

(v) On request from the **Senior Authorised Person** the **Control Person** will then **Consent** to the issue of the **Safety Document**. He shall retain a copy of the relevant details.

5 RESTORATION

(i) The **Safety Document** is cancelled by the **Senior Authorised Person** informing the appropriate **Control Person**.

(ii) The **Control Person** then takes any necessary actions to restore the **Plant** or **Apparatus** to its operational state.

EXAMPLE

The following example has been included to clarify the roles of individual **Control Persons** at specific locations

For Work on an 110kV CB and Line Isolator on a Radial Feeder

In this case the items of **HV Apparatus** are partly within the sphere of operation of the **Control Person** at Grid Control and partly within the sphere of operation of the Site **Control Person**, but to achieve complete isolation of this **HV Apparatus**, some **Isolating devices** under the control of a **Control Person** at the Distribution Control Centre must also be operated.

(i) The management system decides that safety precautions are necessary i.e. that Safety Rule A3.2 applies.

(ii) The **Control Person** at Grid Control in conjunction with the site **Control Person** decide what safety precautions are needed to isolate the **Plant** and **Apparatus** to be worked on from the rest of the **System** within their own sphere of operation.

(iii) The **Control Person** at Grid Control or the site **Control Person**, as appropriate, then consults with the **Control Person** at the Distribution Control Centre to agree the actions necessary to establish the safety precautions required in his sphere of operation.

(iv) The **Senior Authorised Person** will decide whether venting, purging, draining or adjustments of levels is required.

(v) The **Control Person** at Grid Control instructs the **Authorised Person(s)** to carry out the safety precautions decided in (ii) and (iv) which lie within his sphere of operation.

(vi) The **Control Person** at the Distribution Control Centre instructs the **Authorised Person(s)** to carry out the safety precautions decided in (ii) and (iv) which lie within his sphere of operation.

(vii) The Site **Control Person** instructs the **Authorised Person(s)** to carry out the safety precautions decided in (ii) and (iv) which lie within his sphere of operation.

(viii) The **Control Person(s)** at Grid Control, Distribution Control Centre and on site receive confirmation of the completion of safety precautions from the **Authorised Person(s)**

(ix) The **Control Person** at the Distribution Control Centre consults with the **Control Person** at Grid Control or the **Control Person** on site, as appropriate, to record the actions necessary to maintain the safety precautions.

(x) The **Control Person** at Grid Control and the **Control Person** on site each check with the **Senior Authorised Person** that the precautions taken are adequate for the work to be done.

(xi) On request from the **Senior Authorised Person** the **Control Person** at Grid Control and the **Control Person** on site will consent to the issue of the **Safety Document**. They shall each retain a copy of the relevant details.

(xii) On cancellation of the **Safety Document** the **Senior Authorised Person** will inform the **Control Person** at Grid Control and the **Control Person** on site.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 202

[Issue 1]

DELEGATED CONTROL ON NORTHERN IRELAND ELECTRICITY HIGH VOLTAGE SYSTEM

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DELEGATED CONTROL ON NORTHERN IRELAND ELECTRICITY HIGH VOLTAGE SYSTEM

1 INTRODUCTION

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and describes the procedures to be followed when certain responsibilities for **Safety from the System** are to be transferred to the **Senior Authorised Person** in charge of the work.

The *Control Engineer* at the Distribution Control Centre is responsible, in the role of **Control Person**, for controlling and co-ordinating safety activities necessary to achieve **Safety from the System** within the boundaries, which define his operational responsibilities.

Under this Instruction the responsibilities of the *Control Engineer* for a clearly defined part of the System will be transferred to a **Senior Authorised Person**. The defined part of the System can include the 33kV, 11kV and 6.6kV overhead network and the 11kV and 6.6kV underground network*.

* For example, this could include the addition, or replacement of, a Ring Main Unit.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purposes of this Instruction the following additional definitions will apply:

(i) *Control Engineer* – A **Control Person** appointed and on duty at the Northern Ireland Electricity Distribution Control Centre.

(ii) *Defined System* – A part of the **HV System** that is transferred to a *Field Control Person* by a *Control Engineer* in accordance with the details given in Section 6. This is further defined as the **Plant** and **Apparatus** between the points of isolation defined in the 'Request for Outage and/or Programmed Work' (E600) form and includes the **Apparatus** that provides the isolation to achieve **Safety from the System**.

(iii) *Field Control Person* – A **Senior Authorised Person** to whom has been transferred the control responsibilities detailed in Section 6 for a *Defined System* by the *Control Engineer*.

(iv) *Delegated Control* – The exercising by a *Field Control Person* of those responsibilities of a *Control Engineer* detailed in Section 6.

(v) *Unit Manager* - A *Unit Manager* is a person having line responsibility for persons within a Department.

3 IDENTIFICATION

Apparatus, in respect of which a **Person** is acting as a *Field Control Person*, shall be readily identifiable or have fixed to them means of identification, which will remain effective throughout the period the **Person** is acting as a *Field Control Person*. **SR A8**

4 APPLICATION

Delegated Control will be the normal method of operation for work / testing on **HV** overhead lines and underground cables and shall be enacted as follows:

When the *Defined System* can be fed from one, or more, **HV** points of supply it may be transferred **Live** provided that only one operation / instruction is required to achieve final isolation. In these cases any interconnections, which could back-energise the *Defined System* shall be removed whilst the *Defined System* is under the control of the *Control Engineer*. Any **LV** isolation required in order that generators are fitted to maintain supplies shall be co-ordinated by the *Control Engineer* prior to *Delegated Control* being granted to the *Field Control Person*.

Delegated Control will not apply when:

(i) the *Field Control Person* would not have full control of the **Danger** to be avoided, or

(ii) there are operational restrictions on the switchgear at the point(s) of isolation which impedes the safe operation of that switchgear to achieve **Safety from the System.** The *Control Engineer* may retain control to ensure a strict sequence is observed up to a point where he is satisfied that Delegated Control may be granted, or

(iii) **Safety Documents** are to be issued by more than one **Senior Authorised Person**.

5 PROCEDURES

A 'Request for Outage and/or Programmed Work' (E600) form shall be completed giving the following information:

(i) the **Apparatus** on which work / testing is to be carried out;

(ii) details of the work / testing to be undertaken;

(iii) the identification and location of all points of isolation;

(iv) the identification and location of all **Primary Earths.**

The 'Request for Outage and/or Programmed Work' (E600) form is then forwarded to the Distribution Control Centre for approval. The *Field Control Person* should normally be named on this form. Any changes to the *Field Control Person* named on the form shall be advised to the Distribution Control Centre by the **Senior Authorised Person** who has signed the 'Request for Outage and/or Programmed Work' (E600) form as soon as practicable.

For short notice work, emergency work, or fault repairs not previously arranged, this information shall be given verbally to the *Control Engineer* who will record and approve it.

Where the *Defined System* can be fed from one, or more, **HV** points of supply it may be transferred **Live** provided that only one operation / instruction is required to achieve final isolation. In these cases any interconnections, which could back-energise the *Defined System* shall be removed whilst the *Defined System* is under the control of the *Control Engineer*.

If the application and/or removal of a **Primary Earth** requires the assistance of another **Senior Authorised Person**, control and co-ordination of this activity may be undertaken by the *Field Control Person* who will issue a formal switching instruction.

The *Field Control Person* will, where applicable, be responsible for isolation, earthing, work / testing and removal of earths as detailed on the 'Request for Outage and/or Programmed Work' (E600) form.

The **Senior Authorised Person** accepting responsibility as the *Field Control Person* will identify himself to the *Control Engineer* and they will agree the *Defined System*. The *Control Engineer* will confirm any points where isolation has been carried out or is to be carried out, and any **Primary Earths** which have been applied or are to be applied before giving his consent to the transfer of control to the *Field Control Person*. He will record the name of the *Field Control Person* and the time and date in an agreed manner.

The *Field Control Person* will inform the Distribution Control Centre before, and after, any **HV** cable is spiked as required in SRI 5 – 'High Voltage Cables'.

When *Delegated Control* is to be relinquished the *Field Control Person* shall record and confirm to the *Control Engineer* the following information:

(i) details of the *Defined System* as it now exists, to enable the *Control Engineer* to update the System Control Diagram and records where applicable;

(ii) the state of all **Apparatus** on the *Defined System*, e.g. On, Off, or **Earthed**. Generally the *Defined System* should be returned to the *Control Engineer* in the same operational state as it was received subject to any changes due to construction work;

(iii) confirmation that all **Safety Documents** have been cancelled and/or details of any outstanding **Safety Documents**;

(iv) details of any restrictions in respect of the operating capabilities of the **Apparatus**.

If, following an outage, phasing out is required on part of the *Defined System* or between the *Defined System* and the rest of the **HV System** then *Delegated Control* will be relinquished and the *Control Engineer* will co-ordinate the phasing out procedure.

When the *Control Engineer* is satisfied that he has been given all the relevant information, he will accept responsibility for the **Apparatus** from the *Field Control Person*.

6 RESPONSIBILITIES OF FIELD CONTROL PERSON

In addition to his responsibilities as a **Senior Authorised Person** the *Field Control Person* shall;

(i) before work commences within the *Defined System* for which he is responsible,

(a) control, co-ordinate and instruct actions to achieve **Safety from the System**;

(b) consent to, and issue the necessary **Safety Documents**;

(c) ensure safety precautions established to achieve **Safety from the System**, including those carried out before delegation of control, are maintained while the **Safety Documents** are in force;

(d) record actions and precautions required to establish and maintain Safety precautions and the issue of **Safety Documents**;

(ii) on completion of work or testing and cancellation of all **Safety Documents**, relinquish *Delegated Control*.

(iii) If the *Defined System* has only one overhead **HV** source of supply, **Primary Earths** may be removed, and supply restored, before *Delegated Control* is relinquished. In all cases the *Control Engineer* shall, where reasonably practicable, be advised immediately before re-energising.

7 CHANGE OF FIELD CONTROL PERSON

The same *Field Control Person* should remain responsible for the *Defined System* until all work or testing has been completed.

Where it becomes necessary for the *Field Control Person* to relinquish *Delegated Control* before the work is completed, he shall notify the *Control Engineer*. The *Field Control Person* relinquishing *Delegated Control* shall hand over to the *Field Control Person* appointed to succeed him a written record of the position of the **Apparatus** and details of all **Safety Documents** that have been issued. Both parties shall log this. The person who is to accept *Delegated Control* shall declare his identity to the *Control Engineer* who will give his consent to proceed and will record the name of the new *Field Control Person* on the ‘Request for Outage and/or Programmed Work’ (E600) form.

If the *Field Control Person* having responsibility for the *Defined System* is not available to relinquish *Delegated Control* then an appropriate Unit Manager shall make appropriate arrangements and ensure that all the original **Safety Documents** are cancelled.

NORTHERN IRELAND ELECTRICITY NETWORKS
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 400

[Issue 2]

ACCESS TO AREAS WITH FIXED FIRE PROTECTION EQUIPMENT

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ACCESS TO AREAS WITH FIXED FIRE PROTECTION EQUIPMENT

FOREWORD

Whilst the equipment referred to in this Safety Rules Instruction does not fall strictly within the defined term 'System' in the Northern Ireland Electricity Networks Safety Rules (Electrical and Mechanical), the duties imposed by statutory legislation necessitated the inclusion in previous Safety Rules of certain requirements when entering areas protected by such equipment. This instruction has been produced because it is considered that these requirements shall be included in the series of Safety Rules Instructions.

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Networks Safety Rules (Electrical and Mechanical) to achieve **Safety from the System** for personnel working in, or entering, areas protected by fixed fire protection equipment.

Fire fighting procedures and work on fixed fire protection equipment are outside the scope of this document.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Networks Safety Rules (Electrical and Mechanical).

3 IDENTIFICATION

Areas protected by fixed fire protection equipment shall be readily identifiable at all access points, or have fixed to them means of identification which will remain effective throughout the period for which access is required. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel from the operation of fixed fire protection equipment are:

- Asphyxiation.
- Poisoning.
- Electric shock.
- Bodily injury.
- Hypothermia.

4.2 These **Dangers** arise from:

(i) Lack of oxygen due to extinguishants used.

(ii) Toxicity of extinguishants.

(iii) Falling or striking against objects due to poor visibility or panic.

(iv) Low temperature.

5 EQUIPMENT INCORPORATING GAS OR CHEMICAL EXTINGUISHANTS

5.1 The following precautions shall be taken if persons are to enter or work in areas in which the operation of automatic fire protection equipment, using gas or chemical extinguishants, could cause **Danger**:

(i) The automatic control of the fire protection equipment shall be rendered inoperative. Where applicable the control shall be left on 'manual'. These precautions shall be recorded in a personal log or the substation log.

(ii) A notice requiring the above action shall be displayed at the point(s) of access to the area.

(iii) **Caution** notice(s) indicating that the automatic control(s) has been rendered inoperative shall be fixed to the automatic selector(s).

(iv) Precautions taken to render the automatic control inoperative, and the requirements under which it may be restored, shall be noted on any **Safety Document** issued for work in the protected area.

5.2 The automatic control of the fire protection equipment shall not be restored until all the person(s) who have entered or who are engaged in work have been withdrawn from the protected area and the doors closed.

5.3 The Appendices to this Instruction details the procedures for de-activating CO_2 fixed fire protection systems in substations.

6 ACCESS TO AREAS FOLLOWING OPERATION OF FIRE PROTECTION EQUIPMENT

6.1 Before permitting **Persons** who are not wearing breathing apparatus to enter areas in which gas or chemical extinguishants have been discharged, the areas shall be thoroughly ventilated and the atmosphere verified as safe by a **Selected Person**. If the atmosphere cannot be verified as safe, **Approved** breathing apparatus shall be worn.

6.2 Where the equipment has been operated other than by a fire and a **Person** using **Approved** breathing apparatus enters the area, he shall be able to communicate with another **Person** stationed immediately outside the area. An additional **Person** shall be stationed outside the area who shall have immediately available, and be able to use, another set of **Approved** breathing apparatus.

6.3 Where the equipment has been operated in a fire fighting situation and **Persons** using **Approved** breathing apparatus enter the area, the Northern Ireland Fire & Rescue Services requirements apply.

APPENDIX 1

NORTHERN IRELAND ELECTRICITY NETWORKS
SAFETY RULES (ELECTRICAL & MECHANICAL)

ENTRY TO AREAS PROTECTED BY CO_2 FIXED FIRE PROTECTION SYSTEMS IN SUBSTATIONS

(RULES APPLICABLE TO 'CO_2' KEY OPERATED FIXED CO_2 GAS SUPPRESSION SYSTEMS)

1 Entry to Protected Areas

1.1 Warning signs are displayed at points of access to all CO_2 protected areas in substations, and entry to such areas is only permitted after the associated fire protection system has been rendered inoperative.

1.2 The CO_2 gas used in this system is odourised with a strong minty smell.

Do not enter the protected area or the bottle store if this smell is detected.

2 Principle of Operation

2.1 The main components of the CO_2 Fixed Fire Protection System are:

a) Status Indicator – The device, located at the main entrance to the protected area, which facilitates safe access to that area by allowing the operator to change the status of the system.

b) Fire Control Panel – The device which displays information regarding events or faults, and through which all of the other components interact.

c) Smoke Detectors – Two types: ionisation and optical.

d) Sounders & Beacons

e) CO_2 Bottles – Contain the CO_2 gas in pressurised containers.

f) Manual Isolating Valve – Used to isolate the pipework when performing work on the CO_2 system itself.

2.2 Setting: *Auto / Manual* – In this mode, if fire is detected or the Extinguishant Release lever is deliberately pulled, the system will activate a 60 second countdown, along with sounders and beacons, at the end of which it will discharge CO_2 into the protected area.

2.3 Setting: *Manual Only* – In this mode, if the Extinguishant Release lever is deliberately pulled, the system will activate a 60 second countdown, along with sounders and beacons, at the end of which it will discharge CO_2 into the protected area.

Should fire be detected in this setting, the alarm will sound but no automatic CO_2 discharge will occur.

3 Control Mechanism

3.1 The fire protection system is activated/ de-activated by turning a key switch which is operated by a 'CO_2' key and is located in the Status Indicator. The Status Indicator is housed in a red box, located outside the protected area, and locked with an operational lock.

3.2 Six LED's on the Status Indicator display the current state of the fixed fire protection system, including any restriction on entry to the protected area, indication as follows:

STATUS SELECTED	MEANING	RESULT
Manual Only	Automatic system inoperative	SAFE TO ENTER
Auto / Manual	Automatic system operating	DO NOT ENTER
Hold Activated	Discharge on hold	DO NOT ENTER
Disabled	System inoperative due to system fault	DO NOT ENTER
Imminent	Discharge imminent	DO NOT ENTER
Released	System has discharged	DO NOT ENTER

Note: A single protected area will have a single row of LED status indicators. Multiple protected areas will have individual rows of LED indicators to indicate the condition of each protected area.

3.3 Procedures for De-activating and Activating the Protection System

3.3.1 De-activating the Protection System (before entering Protected Area)

(a) Remove the Status Indicator operational lock and place in the box.

(b) Insert a 'CO_2' key in the Status Indicator key switch and turn clockwise to select "Manual Only".

(c) Check that "Manual Only" LED is illuminated.

(d) Remove Status Indicator 'CO_2' key, lock box with a **Safety Lock** and affix a **Caution Notice**.

3.3.2 Activating the Protection System (after leaving Protected Area)

(a) Check that the protected area is clear of all personnel.

(b) Check that the protected area is clear of smoke and dust clouds and that no alarms are active on the Fire Control Panel.

(c) If the protected area is not clear of smoke or dust clouds, or an alarm is sounding, open all doors to ventilate the area and check / reset the Fire Control Panel so that no alarms are indicated.

(d) Remove Status Indicator **Caution Notice** and **Safety Lock.**

(e) If no other **Caution Notice(s)** and **Safety Lock(s)** are fitted, insert the 'CO_2' Status Indicator key and turn anticlockwise to select "Auto / Manual" and then remove key.

(f) Check that the "Auto / Manual" LED is illuminated, and that no other LED's are illuminated.

(g) Secure box with an operational lock.

4 System Fault

If any of the following scenarios or defects occur, report them without delay to the department responsible for maintaining the fire protection system.

(a) Any LED's fail to illuminate as expected on either Status Indicator or the Fire Control Panel.

(b) The Hold Activated, Disabled, Imminent or Release LED's are illuminated on either Status Indicator or Fire Control Panel.

(c) A persistent fault LED is illuminated on the Fire Control Panel.

(d) A strong minty odour is present in the protected area or bottle store.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 401

[Issue 1]

GENERAL CONFINED SPACES

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GENERAL CONFINED SPACES

FOREWORD

The term “Confined Spaces” conventionally embraces enclosed spaces such as drums, vessels, tanks, culverts, tunnels and underground chambers that frequently have restricted access and poor ventilation, sometimes with limited facility for movement within the space. This may include certain types of enclosed substations. In general the term “Confined Space” also applies to open-topped tanks or pits where heavier-than-air gases may be present, or other spaces where dangerous accumulation of gases can build up because of poor ventilation. This can include spaces where, due to lack of natural ventilation, a dangerous accumulation of undesirable gases can be present.

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) to achieve **Safety from the System** for personnel requiring access to general confined spaces. This Instruction is concerned only with general confined spaces and excludes culverts and cable tunnels which are the subject of another Safety Rules Instruction.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purpose of this Safety Rules Instruction the following additional definitions apply:

(i) *Occupational Exposure Limit (OEL)* – A long-term or short-term limit of exposure to airborne substances hazardous to health as stated in the Health and Safety Executive Guidance Note EH40.

(ii) *Lower Flammable Limit (LFL)* – The concentration in air at or below which a flammable substance will not burn when exposed to a source of ignition.

It should be noted that *Occupational Exposure Limits* referred to in Clause 2(i) are subject to change. Care should be taken that the most recently published values are used.

3 IDENTIFICATION

Confined spaces in which work or testing is to take place shall be readily identifiable at all access points, or have fixed to them means of identification which will remain effective throughout the period for which access is required. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel in confined spaces are:

- Asphyxiation.
- Poisoning.
- Burns.
- Hypothermia or hyperthermia.
- Hearing impairment.
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) Lack of oxygen.

(ii) Bodily contact with, or inhalation of, toxic substances.

(iii) Fire or explosion caused by the presence of flammable gases or excess oxygen.

(iv) Abnormal temperatures.

(v) Excessive noise.

(vi) Falling or other inadvertent bodily contact.

4.3 **Danger** can be present due to Clauses 4.2 (i), (ii) and (iii) in the case of an open-topped space containing the gases of chemicals such as liquefied petroleum gases, chlorine and certain solvent cleaners which are heavier than air, or those such as nitrogen and carbon monoxide which are of a similar weight to air.

4.4 **Danger** can also be present in an inverted (open-bottomed) space containing a gas such as hydrogen, which is lighter than air, or those such as nitrogen and carbon monoxide, which are of a similar weight to air.

4.5 The **Dangers** due to Clauses 4.2 (i), (ii) and (iii) cannot occur if a sufficient volume of forced ventilation is provided such that:

(i) Exposure to toxic substances does not exceed the *OEL* and the concentration of flammable gases in the confined space atmosphere is not above the *LFL*.

(ii) There cannot be a significant decrease or increase in the amount of oxygen in the atmosphere.

4.6 At normal temperature and pressure the percentage of oxygen in air by volume is approximately 21 per cent. A lowering of this value by a small amount may result in the loss of consciousness by persons in such oxygen deficient atmospheres.

4.7 Special notice shall be taken of the possibility of **Danger** due to work on the external surfaces of confined spaces, particularly if this includes the application of heat which may cause ignition of, or a chemical reaction in, the contents or residue of the contents of a confined space.

5 PRECAUTIONS BEFORE ENTERING OR COMMENCING WORK OR TESTING IN CONFINED SPACES

Before access to and commencement of work or testing in confined spaces, to which this Instruction applies, is permitted, the precautions detailed below shall be observed.

5.1 The confined space shall be **Isolated**, drained and **Vented** as appropriate. **SR A3**

5.2 **Persons** who enter and remain in a confined space to carry out work or testing may only do so after a **Senior Authorised Person** has decided whether the requirements for safe access require the issue of a **Safety Document**. **SR A3** **SR A4**

5.3 If a **Senior Authorised Person** decides that a **Safety Document** is required before work or testing may proceed, he may if considered necessary call upon a **Selected Person** to provide a report on the conditions in the space. In providing the report, the requirements of Section 6 – 'Testing For and Clearing Noxious Substances in Confined Spaces' shall be met.

5.4 Before allowing work or testing to proceed, consideration shall be given to the provision of forced ventilation. Even if a completed enclosed steel tank has not contained any substance but air and has been left completely closed for some time, oxygen in the air can be depleted by the formation of oxidation products on the inside surfaces of the vessel.

5.5 Where substances liable to give off gases, vapours or fumes (e.g. Group 2 solvents, some paints and resinous compounds) are to be taken into the confined space, a **Selected Person** shall be informed of the substances and their application in order that he may advise on any precautions which should be taken to avoid **Danger**.

5.6 Where work is to take place in a confined space containing fixed fire fighting equipment, the requirements of SRI 400 – 'Access to Areas with Fixed Fire Protection Equipment' shall also be applied.

5.7 Before allowing work or testing to proceed in a confined space which has or may have contained noxious substances, a **Selected Person**'s report recommending such special precautions as may be required to safeguard persons shall be obtained before a **Safety Document** can be issued to enable work to take place, except that in the case of **HV** oil circuit breaker tanks the **Senior Authorised Person** preparing the **Safety Document** shall satisfy himself that **Danger** from gases, vapours and substances will be excluded before work commences. **SR B2 (B2.1.4)**

6 TESTING FOR AND CLEARING NOXIOUS SUBSTANCES IN CONFINED SPACES

The precautions given below shall be observed if it is necessary to enter a confined space to test for and/or clear noxious substances.

6.1 Before a **Selected Person** enters a confined space in order to make tests or take samples, he shall be in possession of a **Safety Document** issued for that purpose. **SR A3 SR A4**

6.2 The **Selected Person** shall, if he or the **Senior Authorised Person** preparing the **Safety Document** requires it, be accompanied by a **Competent Person**.

6.3 Where there is the possibility of the presence of flammable vapours or gases in the confined space, no sources or materials which could inadvertently cause ignition shall be introduced into, or be present in the vicinity of the opening of, the confined space. Particular attention shall be paid to the suitability of the lighting arrangements.

6.4 The **Person(s)** entering the confined space shall wear **Approved** breathing apparatus. Canister-type respirators shall not be used for this purpose.

6.5 If practical, the **Person(s)** entering the confined space shall wear an **Approved** safety harness to which a rope is securely attached, with another **Person** capable of pulling him out holding the free end of the rope and keeping watch outside the confined space. A further **Person** shall be stationed outside the space with breathing apparatus ready for immediate use.

6.6 When the **Senior Authorised Person** considers it necessary, communications shall be maintained between **Persons** inside the confined space and a **Person** stationed outside and in proximity to the entrance. When in use, communications systems shall be checked at regular intervals throughout the period **Persons** are within the space. At the same time the position of the **Persons** should be verified.

6.7 When taking samples, care shall be taken to stir any sludge or deposit that may give off harmful vapours or gases if disturbed by persons during any subsequent work.

6.8 If, after consultation with the **Selected Person**, the **Senior Authorised Person** decides that it is necessary to remove substances or to clear deposits from the confined space, this work shall be done under a **Safety Document**. Consideration shall be given to the use of forced ventilation or the use of breathing apparatus before and during the removal of substances.

6.9 Following the above work, confirmation shall be obtained by a **Senior Authorised Person** from the **Selected Person** that adequate clearance of substances or deposits has been achieved before allowing further work to proceed.

6.10 The **Selected Person**, in preparing any report that may be required, shall give consideration to possibility that, although the atmosphere initially found in the confined space may be free from contamination, processes of varying kinds used in the course of work may produce noxious substances.

6.11 If, after receiving the **Selected Person**'s report, the **Senior Authorised Person** considers that work can proceed, the existing **Safety Document(s)** shall be cancelled, and if the **Senior Authorised Person** considers that a **Safety Document** is now required, this shall be issued specifically for the work to be done. The work should now proceed in accordance with the appropriate clauses of Section 7 – 'Precautions During the Course of Work or Testing where a Safety Document is Required'.

7 PRECAUTIONS DURING THE COURSE OF WORK OR TESTING WHERE A SAFETY DOCUMENT IS REQUIRED

7.1 When work or testing is to be carried out in a confined space and the issue of a **Safety Document** is necessary, the **Senior Authorised Person** preparing the **Safety Document** shall ensure that prior to the work commencing:

7.1.1 Ventilation will be adequate throughout the whole of the confined space, taking into account the effect of gas from geological or biological sources or leakage from an external gas system.

7.1.2 Where emergency evacuation procedures are necessary, such procedures will be clearly understood by all **Persons** concerned.

7.1.3 Where considered necessary, a communication system will be established between **Persons** inside the confined space and a point outside the confined space, which will be manned.

7.2 The **Competent Person** in charge of the work or testing shall ensure that:

7.2.1 Where substances are to be taken into the confined space which are liable to give off gases, vapours or fumes in such quantity as to cause **Danger** (e.g. some paints and resinous compounds), a **Selected Person**'s report shall be available regarding any precautions which shall be taken to avoid **Danger**.

7.2.2 When in use, communication is maintained between the **Persons** inside the confined space and a **Person** stationed outside and in proximity to the entrance being used, in order that the positions of the **Persons** inside can be monitored. The communication system shall be regularly checked during the period of work.

7.2.3 Because of the **Danger** of the products of combustion, no internal combustion engine is used in the confined space unless precautions are taken to remove such products. Wherever practicable, engines shall be placed outside the space and in such a position that exhaust gases are not drawn into the ventilation system.

7.2.4 Where forced ventilation has been provided to avoid **Danger**, **Caution Notices** are attached as appropriate, the ventilation monitored and if this ventilation fails personnel working in the space are evacuated as quickly as possible.

7.2.5 An atmospheric test, when specified, is carried out before lighting or re-lighting any appliance using a naked flame and that the provisions of any **Selected Person**'s report are carried out.

7.2.6 Tests, when specified, are carried out when there are reasonable grounds to suspect that there is a risk of fire or explosion.

7.2.7 When work or testing is carried out under a **Safety Document** specifying the use of breathing apparatus, **Person(s)** entering the confined space are wearing **Approved** breathing apparatus.

7.2.8 During the course of work all reasonably practicable steps are taken to keep access ways clear. In those situations where access is unavoidably obstructed, the **Competent Person** in charge of work shall advise **Persons** affected on how to get past any obstruction in an emergency.

7.2.9 Precautions are taken to avoid the possibility of **Persons** being trapped between a fire and an obstruction.

7.2.10 The simultaneous use of naked flames at more than one point is avoided wherever possible but, where this is unavoidable, that precautions are taken to preclude the possibility of **Persons** being trapped between two fires.

7.2.11 Flammable waste is deposited in a suitable container and removed daily from the confined space.

7.2.12 During the course of work on **HV** oil circuit-breaker tanks he satisfies himself that **Danger** from gases, vapours and substances continue to be excluded. If a hazard is suspected the **Competent Person** shall withdraw all personnel and report the matter to a **Senior Authorised Person**. **SR C2 (C2.1.4)**

7.2.13 Under no circumstances is oxygen released into the atmosphere to ‘sweeten’ it, as oxygen-enriched atmospheres can cause normally quiescent materials to become highly combustible, e.g. grease can become liable to spontaneous combustion when oxygen-enriched.

8 ADDITIONAL PRECAUTIONS TO BE TAKEN WHEN GAS APPLIANCES ARE USED

8.1 The quantity of gas taken into a confined space shall be limited to a one day or shift supply, or the amount necessary to do the job in hand, whichever is less.

8.2 All gas cylinders and gas hoses and equipment shall be inspected immediately before being taken into the confined space, to ensure that the condition of such items is satisfactory.

8.3 While gas cylinders are in the confined space they shall be stored in a safe place, which, if practicable, should be at least 3m (10ft) from any naked flame or the point of work.

8.4 Gas equipment shall be positioned and connected correctly and then tested for leaks. Whenever practicable, the cylinders shall be located such that they are not between the point of work and any escape route.

8.5 Care shall be taken when using gas burning or welding equipment inside a confined space to prevent the accidental escape of oxygen from the equipment.

8.6 If the use of gases is to be discontinued for a period in excess of one hour, the gas supply shall be shut off at source.

8.7 If the use of gases is to be discontinued for a shift or similar period of time, movable pipes or hoses used for conveying oxygen or flammable gas or vapour and any oxygen or gas bottles shall be removed from the confined space. Where the movable pipes or hoses are supplying oxygen or flammable gas or vapour from an external source, and owing to the nature of the work it is impracticable to comply with the foregoing requirements of this paragraph, the movable pipes or hoses shall be physically disconnected at that external source.

8.8 The appropriate fire extinguishers, fire-screens or smothering blankets shall be readily available at the point of work.

8.9 Smoking shall be prohibited and notices placed to this effect.

8.10 Consideration shall be given to monitoring of explosive mixtures in the working area.

9 NOISE

If hammering or other work external or internal to a confined space is likely to cause impairment to the hearing of **Person(s)** working in that confined space, consideration shall be given to the use of ear defenders or otherwise.

10 PRECAUTIONS ON COMPLETION OF WORK IN A CONFINED SPACE

In order to avoid entombing **Persons** within a confined space on the completion of work the following safeguards shall be taken:

(i) The **Person** in charge of the work shall ensure that, when **Persons** under his charge are withdrawn, they are personally warned by him not to re-enter the confined space.

(ii) The **Person** in charge of closing access doors and/or manholes of the confined space shall ensure, so far as he personally can, that no one is entombed in the process. If, owing to the nature of the confined space, the **Person** considers it necessary to make a final check, all access points except one shall be closed and secured and that one point of access then guarded, so as to ensure that no **Person** re-enters the space while the check is being made. Care shall be taken such that any partial closing up of access doors and manholes does not adversely affect the atmosphere whilst the final check is in progress.

(iii) If it is necessary for the **Person** in charge of closing the confined space to enter it in order to make a final check, and the work has been done by **Persons** in accordance with a **Selected Person**'s report and/or wearing breathing apparatus, then that **Person** so entering shall also comply with the requirements of the **Selected Person**'s report and/or wear breathing apparatus.

(iv) The **Senior Authorised Person** cancelling any **Safety Document** that may have been issued should, if he considers it necessary, give **Personal Supervision** to the closing of the final access point.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 402

[Issue 1]

CABLE TUNNELS AND CULVERTS

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CABLE TUNNELS AND CULVERTS

FOREWORD

The term “Cable Tunnel” conventionally embraces cableways and spaces beneath turbine house and interconnections between switch houses including those beneath roadways. The term includes cableways beneath waterways, railways, roads and undulating terrain.

Many of the cableways and spaces are of such a design and location that they are normally devoid of **Dangers** associated with confined spaces and indeed some contain operational equipment that requires free and frequent access. It is necessary, therefore, because some cableways may not be subject to the **Dangers** detailed below, that the Unit Manager shall define those places to which this Safety Rules Instruction would not normally apply.

In addition to water culverts, similar underground spaces are sometimes used for sewage disposal purposes. The requirements of this Safety Rules Instruction are also intended to be applied to such spaces.

1 SCOPE

This Safety Rules Instruction applies the principles established by the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) to achieve **Safety from the System** for personnel working or testing in cable tunnels, culverts and similar underground spaces.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 IDENTIFICATION

Cable tunnels and culverts in which work or testing is to take place shall be readily identifiable at all access points, or have fixed to them means of identification, which will remain effective throughout the period for which access is required. **SR A8**

4 DANGERS

4.1 The main **Dangers** to personnel in confined spaces are:

- Asphyxiation.
- Poisoning.
- Burns.
- Electric shock.
- Hypothermia or hyperthermia.
- Other bodily injury.

4.2 These **Dangers** arise from:

(i) Drowning or lack of oxygen.

(ii) Fire or explosion.

(iii) Falling.

(iv) Abnormal temperatures.

(v) Induced voltages in other conducting materials in parallel with cables or damaged cable insulation.

(vi) Bodily contact with, inhalation or ingestion of, toxic substances.

5 PRECAUTIONS BEFORE ENTERING OR COMMENCING WORK OR TESTING IN CABLE TUNNELS

Before access to and commencement of work or testing in cable tunnels, to which this Instruction applies, is permitted, the precautions detailed below shall be observed.

5.1 **Persons** who enter and remain in cable tunnels to carry out work or testing may only do so after a **Senior Authorised Person** has decided whether the requirements for safe access require the issue of a **Safety Document**. **SR A3**

5.2 If a **Senior Authorised Person** decides that a **Safety Document** is required before work or testing may proceed, he shall call upon a **Selected Person** to provide a report on the conditions in the tunnel. In providing the report, the requirements of Section 7 – ‘Testing for and Clearing Noxious Substances in Tunnels and Culverts’ shall be met.

5.3 If a **Senior Authorised Person** decides that a **Safety Document** is not required, the conditions of entry shall be determined by the **Senior Authorised Person**, who should ensure that Supervisors take into account appropriate requirements as set out in this Instruction before setting **Persons** to work.

5.4 Where work is to take place in tunnels whose means of emergency escape include the use of manholes or doors into the open air, before such work is allowed to commence, the **Competent Person** in charge of the work shall ensure that such manholes and doors which might be used as a means of emergency escape from the place of work are capable of being opened if required. This requirement particularly applies during the winter period when conditions of ice and snow, which might seal the manholes and doors and prevent escape, are likely to be encountered.

5.5 Care should be taken to ensure that any hinged access covers are prevented from inadvertent closing while **Persons** are inside the tunnel(s).

5.6 Where work is to take place in tunnels containing fixed fire fighting equipment, the requirements of SRI 400 – ' Access to Areas with Fixed Fire Protection Equipment' shall also be applied.

5.7 Where **HV** cables are present and work is to take place on cables, the requirements of SRI 5 – 'High Voltage Cables' shall also be applied.

6 PRECAUTIONS BEFORE ENTERING OR COMMENCING WORK OR TESTING IN CULVERTS AND SIMILAR SPACES

Before access to and commencement of work or testing in culverts and similar spaces is permitted, the precautions detailed below shall be observed.

6.1 Culverts shall be **Isolated**, including any chemical injection points into the system. If diving operations are necessary either to ensure that a culvert is **Isolated** or to complete the isolation of a culvert, the following requirements shall be met: **SR A3**

(i) **Plant** associated with the culvert which is likely to cause excessive water flow shall be **Isolated**. **SR A3**

(ii) Diving operations shall be in accordance with the relevant Statutory Regulations and any Safety Rules Instructions and carried out under a **Safety Document**.

6.2 Culverts shall be drained and **Vented** as far as practicable. When draining, vents shall where practicable be opened to take advantage of the suction effect to draw clean air into the culvert. Arrangements shall be made to prevent access during draining and venting. **SI 3**

6.3 **Persons** shall only enter and remain in culverts when either they are, or the **Person** in charge of the work or testing is, in possession of a **Safety Document**.

6.4 Before issuing the **Safety Document** the **Senior Authorised Person** shall call upon a **Selected Person** to provide a report on the conditions in the culvert. In providing a report, the requirements of section 7 – 'Testing for and Clearing Noxious Substances in Tunnels and Culverts' shall be met.

6.5 Care shall be taken to ensure that any hinged access covers are prevented from inadvertent closing while **Persons** are inside the culvert(s).

7 TESTING FOR AND CLEARING NOXIOUS SUBSTANCES IN TUNNELS AND CULVERTS

The precautions given below shall be observed if it is necessary to enter a tunnel or culvert to test for and/or clear noxious substances.

7.1 Before a **Selected Person** enters a tunnel or culvert in order to make tests or take samples, he shall be in possession of a **Safety Document** issued for that purpose. **SR A3** **SR A4**

7.2 The **Selected Person** shall, if he or the **Senior Authorised Person** preparing the **Safety Document** requires it, be accompanied by a **Competent Person**.

7.3 Where there is the possibility of the presence of flammable vapours or gases in the tunnel or culvert, no sources or materials which could inadvertently cause ignition shall be introduced into, or be present in the vicinity of the opening of, the tunnel or culvert. Particular attention shall be paid to the suitability of the lighting arrangements.

7.4 The **Person(s)** entering the tunnel or culvert shall wear **Approved** breathing apparatus. Canister-type respirators shall not be used for this purpose.

7.5 If practical, the **Person(s)** entering the tunnel or culvert shall wear an **Approved** safety harness to which a rope is securely attached, with another **Person** capable of pulling him out holding the free end of the rope and keeping watch outside the tunnel or culvert. A further **Person** shall be stationed outside the space with breathing apparatus ready for immediate use.

7.6 Communications shall be maintained between **Persons** inside the tunnel or culvert and a **Person** stationed outside and in proximity to the entrance. When in use, communications systems should be checked at regular intervals throughout the period **Persons** are within the tunnel or space. At the same time the position of the **Persons** should be verified.

7.7 When taking samples, care shall be taken to stir any sludge or deposit which may give off harmful vapours or gases if disturbed by persons during any subsequent work.

7.8 If, after consultation with the **Selected Person**, the **Senior Authorised Person** decides that it is necessary to remove substances or to clear deposits from the tunnel or culvert, this work shall be done under a **Safety Document**. Consideration shall be given to the use of forced ventilation or the use of breathing apparatus before and during the removal of substances.

7.9 Following the above work, confirmation shall be obtained by a **Senior Authorised Person** from the **Selected Person** that adequate clearance of substances or deposits has been achieved before allowing further work to proceed.

7.10 The **Selected Person**, in preparing any report that may be required, shall give consideration to possibility that, although the atmosphere initially found in the tunnel or culvert may be free from contamination, processes of varying kinds used in the course of work may produce noxious substances.

7.11 If, after receiving the **Selected Person**'s report, the **Senior Authorised Person** considers that work can proceed, the existing **Safety Document(s)** shall be cancelled, and if the **Senior Authorised Person** considers that a **Safety Document** is now required, this shall be issued specifically for the work to be done. The work shall now proceed in accordance with the appropriate clauses of Section 8 – 'Precautions During the Course of Work or Testing where a Safety Document is Required'.

8 PRECAUTIONS DURING THE COURSE OF WORK OR TESTING WHERE A SAFETY DOCUMENT IS REQUIRED

8.1 When work or testing is to be carried out in tunnels or culverts and the issue of a **Safety Document** is necessary, the **Senior Authorised Person** preparing the **Safety Document** shall:

8.1.1 Ensure that prior to the work commencing:

8.1.1.1 Ventilation will be adequate throughout the whole of the tunnel or culvert, taking into account the effect of gas from geological or biological sources or leakage from an external gas system.

8.1.1.2 Where emergency evacuation procedures are necessary, such procedures will be clearly understood by all **Persons** concerned.

8.1.1.3 A communication system will be established between **Persons** inside the tunnel or culvert and a point outside the tunnel or culvert which will be manned.

8.1.2 Specify that whilst the work is in progress:

8.1.2.1 A register will be maintained of all **Persons** entering and leaving the tunnel or culvert together with the times of these movements. Such **Persons** should be at least 18 years of age. The register should be maintained by a **Person(s)** external to the tunnel or culvert but in proximity to the entrance(s) being used.

8.2 The **Competent Person** in charge of the work or testing shall ensure that:

8.2.1 Where substances are to be taken into the tunnel or culvert which are liable to give off gases, vapours or fumes in such quantity as to cause **Danger** (e.g. some paints and resinous compounds), a **Selected Person**'s report shall be available regarding any precautions which shall be taken to avoid **Danger.**

8.2.2 All **Persons** who have to enter the tunnel or culvert are in possession of a headlamp or torch together with suitable safety equipment. Attention should be given to the wearing of protective clothing where necessary.

8.2.3 Communication is maintained between the **Persons** inside the tunnel or culvert and a **Person** stationed outside and in proximity to the entrance being used, in order that the positions of the **Persons** inside can be monitored. The communication system shall be regularly checked during the period of work.

8.2.4 Because of the **Danger** of the products of combustion, no internal combustion engine is used in the tunnel or culvert unless precautions are taken to remove such products. Wherever practicable, engines shall be placed outside tunnels or culverts and in such a position that exhaust gases are not drawn into the ventilation system.

8.2.5 Where forced ventilation has been provided to avoid **Danger**, **Caution Notices** are attached as appropriate, the ventilation monitored and if this ventilation fails personnel working in the space are evacuated as quickly as possible.

8.2.6 An atmospheric test, when specified, is carried out before lighting or re-lighting any appliance using a naked flame and that the provisions of any **Selected Person**'s report are carried out.

8.2.7 Tests, when specified, are carried out when there are reasonable grounds to suspect that there is a risk of fire or explosion.

8.2.8 When work or testing is carried out under a **Safety Document** specifying the use of breathing apparatus, **Person(s)** entering the tunnel or culvert are wearing **Approved** breathing apparatus.

8.2.9 During the course of work all reasonably practicable steps are taken to keep access ways clear. In those situations where access is unavoidably obstructed, the **Competent Person** in charge of work shall advise **Persons** affected on how to get past any obstruction in an emergency.

8.2.10 Precautions are taken to avoid the possibility of **Persons** being trapped between a fire and an obstruction.

8.2.11 The simultaneous use of naked flames at more than one point is avoided wherever possible but where this is unavoidable, that precautions are taken to preclude the possibility of **Persons** being trapped between two fires.

8.2.12 Flammable waste is deposited in a suitable container and removed daily from the tunnel or culvert.

9 PRECAUTIONS TO BE TAKEN WHEN GAS APPLIANCES ARE USED

9.1 The quantity of gas taken into a tunnel or culvert shall be limited to a one day or shift supply, or the amount necessary to do the job in hand, whichever is less.

9.2 All gas cylinders and gas hoses and equipment shall be inspected immediately before being taken into the tunnel or culvert, to ensure that the condition of such items is satisfactory.

9.3 While gas cylinders are in the tunnel or culvert they shall be stored in a safe place, which if practicable, shall be at least 3m (10ft) from any naked flame or the point of work.

9.4 Gas equipment shall be positioned and connected correctly and then tested for leaks. If work is temporarily stopped the gas shall be turned off at the cylinder, thus isolating the local controls. Whenever practicable, the cylinders shall be located such that they are not between the point of work and any escape route.

9.5 Care shall be taken to prevent the accidental escape of oxygen and under no circumstances shall oxygen be released into the atmosphere to 'sweeten' it. An oxygen-enriched atmosphere can cause normally quiescent materials to become highly combustible and substances such as grease can become liable to spontaneous combustion.

9.6 The appropriate fire extinguishers, fire screens or smothering blankets shall be readily available at the point of work.

9.7 If the use of gases is to be discontinued for a shift or similar period of time, the gas cylinders shall be removed from a tunnel or culvert.

9.8 Smoking shall be prohibited and notices placed to this effect.

9.9 Consideration shall be given to monitoring of explosive mixtures in the working area.

10 PRECAUTIONS ON COMPLETION OF WORK

In order to avoid entombing **Persons** within the tunnel or culvert on completion of the work the following safeguards shall be taken:

(i) The **Person** in charge of the work shall ensure that, when **Persons** under his charge are withdrawn, they are personally warned by him not to re-enter the tunnel or culvert.

(ii) The **Person** in charge of closing access doors and/or manholes of a tunnel or culvert shall ensure, so far as he personally can, that no one is entombed in the process. If, owing to the design of the tunnel or culvert, the **Person** considers it necessary to make a final check, all access points except one shall be closed and secured and that one point of access then guarded, so as to ensure that no **Person** re-enters the tunnel or culvert while the check is being made. Care shall be taken such that any partial closing up of access doors and manholes does not adversely affect the atmosphere whilst the final check is in progress.

(iii) The **Senior Authorised Person** cancelling any **Safety Document** that may have been issued shall, if he considers it necessary, give **Personal Supervision** to the closing of the final access point.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 501

[Issue 1]

THE NORTHERN IRELAND ELECTRICITY SYSTEM

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THE NORTHERN IRELAND ELECTRICITY SYSTEM

1 SCOPE

This Safety Rules Instruction details the extent of **Plant and Apparatus** to which the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) are applied to the Transmission and Distribution system.

2 DEFINITIONS

Terms printed in bold type are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

3 PLANT AND APPARATUS TO WHICH THE SAFETY RULES APPLY

3.1 The Northern Ireland Electricity Safety Rules (Electrical and Mechanical) shall apply to all **Plant** and **Apparatus** that form part of the Northern Ireland Electricity Transmission and Distribution **System(s)**.

3.2 The Transmission **System** includes all **HV Plant** and **Apparatus** including associated **LV** and Compressed Air Systems. The Transmission system extends from the higher voltage side of the Generator Transformers to the transformer bushing on the lower voltage side of the 110kV Transformers, including Earthing Transformers.

The Distribution **System** includes the **HV** and **LV System(s)**, including **LV** auxiliary supplies to **HV Apparatus** and extends from the transformer bushing on the lower voltage side of a 110kV Transformer down to and including the meters and metering equipment on Customer's premises, but excluding 33kV Earthing Transformers.

3.3 The Northern Ireland Electricity Safety Rules (Electrical and Mechanical) shall also apply when work and testing is being carried out on **Plant** and **Apparatus** which is not part of the Transmission and Distribution **System** but for which Northern Ireland Electricity have a maintenance responsibility.

4 PLANT AND APPARATUS TO WHICH THE SAFETY RULES DO NOT APPLY

4.1 Since electrical and mechanical equipment whose ultimate purpose is not to transmit or distribute electricity may have a similar level of inherent **Dangers**, care must be taken to ensure that alternative safe systems of work are provided and implemented if the Safety Rules are not to be applied.

4.2 The Northern Ireland Electricity Safety Rules (Electrical and Mechanical) do not apply, for example to the following **Plant** and **Apparatus:**

(i) **LV** lighting and heating internal to buildings owned and maintained by Northern Ireland Electricity.

(ii) Plant, Apparatus and Test Equipment in workshops.

(iii) Portable Test Equipment.

(iv) Mobile Plant and Vehicles.

(v) Office equipment, including IT equipment.

(vi) Site security and alarm equipment.

(vii) Telecommunications systems and SCADA systems.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 503

[Issue 1]

APPROVAL OF PROCEDURES

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APPROVAL OF PROCEDURES

1 FOREWORD

There are instances within the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and their supporting documentation where the word '**Approved**' is used in relation to a procedure, to work or to the manner of carrying out work or testing. **Approved** is defined as 'Sanctioned by the Chairman of the Electrical and Mechanical Safety Advisory Committee (EMSAC) for use' – Safety Rules definition D2.

In practice, the Chairman of EMSAC, or a person specifically appointed in writing by him to act on his behalf in this regard, will sanction a *Procedure* for use by signing a related approval form.

2 SCOPE

This Safety Rules Instruction establishes the procedures to be followed when a *Procedure* is to be **Approved**. The Instruction also includes, in Appendix 2, an index of all *Procedures* **Approved** under this Instruction.

3 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purpose of this Procedure the following additional definitions will apply:

Procedure – any procedure, work, test or manner of carrying out work or a test, which is referred to within the Safety Rules as having to be **Approved**. A *Procedure* may be contained within a Special Instruction or other document.

Nominated Manager – the Manager who has functional responsibility for the activity covered by the *Procedure*.

4 APPLICATION FOR APPROVAL

4.1 The appropriate person seeking approval for a *Procedure* will complete Part 1 of an 'Approval of a Procedure' form – No. SRI 503/1 (Appendix 1), and submit it and the document containing the *Procedure* to the *Nominated Manager*.

4.2 The *Nominated Manager*, in consultation with the person referred to in Clause 4.1, will examine the documentation submitted. If it is considered to be satisfactory, the *Nominated Manager* will recommend that the *Procedure* be **Approved**, by completing Part 2 of the form, and submit it and the document containing the *Procedure* to the Chairman of EMSAC.

4.3 The Chairman of EMSAC, or his delegate, will approve the *Procedure*, by signing part 3 of the form, and will forward the form and the document containing the **Approved** *Procedure* to the Manager responsible for company safety, for processing in accordance with Section 5 of this Instruction.

5 PROCESSING OF COMPLETED FORM AND APPROVED PROCEDURE

5.1 On receipt of the completed 'Approval of a Procedure' form and the document containing the **Approved** *Procedure*, the Manager responsible for company safety will take the following action:

(i) Initial and date the form.

(ii) Allocate a unique reference number to the *Procedure* and insert it on the form, and on the document containing the **Approved** *Procedure*.

(iii) Revise the Appendix for the indexing of **Approved** *Procedures* (Appendix 2) to include the new **Approved** *Procedure*.

(iv) Ensure that any Intranet available copy of the **Approved** *Procedures* index (Appendix 2) is updated.

(v) Issue a copy of the document containing the **Approved** *Procedure* to all recipients of Safety Rules Instructions who might be required to implement the *Procedure*.

(vi) Issue a copy of the document containing the **Approved** *Procedure*, and a copy of the completed 'Approval of a Procedure' form (for information only), to the initiating person and the *Nominated Manager*, with an accompanying memorandum, to advise them that the *Procedure* has been **Approved** and issued for implementation.

(vii) Attach the form to the document containing the **Approved** *Procedure* and retain them in a dedicated file.

6 RENEWAL OF APPROVED PROCEDURE

6.1 An **Approved** *Procedure* will be valid for a maximum period of five years, at the end of which the person who initiated the original approval will, if necessary, arrange for the approval to be renewed, in line with Sections 4 and 5 of this Instruction.

7 CANCELLATION OF APPROVED PROCEDURE

7.1 When an **Approved** *Procedure* is no longer required, the initiating person shall request the Manager responsible for company safety to arrange for the approval to be cancelled.

7.2 On receipt of the above request the Manager responsible for company safety shall take the following action:

(i) Arrange with the Chairman of EMSAC for his approval of the *Procedure* to be cancelled.

(ii) Arrange for all recipients of the *Procedure* to be advised, without delay, that the *Procedure* is no longer **Approved**.

(iii) Revise the Appendix for the indexing of **Approved** *Procedures* (Appendix 2) by deleting the relevant **Approved** *Procedure*.

(iv) Ensure that any Intranet available copy of the indexing of **Approved** *Procedures* (Appendix 2) is updated

.

NORTHERN IRELAND ELECTRICITY SAFETY RULES
(ELECTRICAL AND MECHANICAL)

APPROVAL OF A PROCEDURE

1 Application

To: …… (Nominated Manager)
…… (Designation)

Application is herby made for Approval of the Procedure within the following document, for the purposes of the Northern Ireland Electricity Safety Rules (Electrical and Mechanical):.

Document Type: ……

Document Title: ……

……

……

Document Reference: ……..

(The Procedure and any supporting technical information to be attached to this Application)

Signed: …… Date: ……..

Designation ……

2 Examination

I have completed an examination of the above Procedure, consider it to be satisfactory and RECOMMEND that it be Approved.

Remarks (if any): ……

……

Signed: …… (Nominated Manager) Date: ……..

3 Approval

I hereby APPROVE the procedure detailed above for application under the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

Signed: …… (Chairman EMSAC) Date: ……..

For Office Use:

Received by : …… Dept : …… Date: ……..

APPROVAL No: …… Form No. SRI 503/1

NORTHERN IRELAND ELECTRICITY SAFETY RULES
(ELECTRICAL AND MECHANICAL)

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APPROVED PROCEDURES

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 504

[Issue 1]

APPROVAL OF EQUIPMENT

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APPROVAL OF PROCEDURES

1 FOREWORD

There are instances within the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and their supporting documentation where the word '**Approved**' is used in relation to equipment, tools or materials. **Approved** is defined as 'Sanctioned by the Chairman of the Electrical and Mechanical Safety Advisory Committee (EMSAC) for use' – Safety Rules definition D2.

In practice, the Chairman of EMSAC, or a person specifically appointed in writing by him to act on his behalf in this regard, will sanction a type of *Equipment* for use by signing a related approval form.

2 SCOPE

This Safety Rules Instruction establishes the procedures to be followed when a Manager requires a type of *Equipment* to be **Approved**.

3 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purpose of this Procedure the following additional definitions will apply:

Equipment – any equipment, tool or material which is referred to within the Safety Rules as having to be **Approved**.

Nominated Manager – the Manager who has functional responsibility for the use of the type of *Equipment*.

Approving Officer – the Chairman of EMSAC, or a person specifically appointed in writing by him to act on his behalf in approving types of *Equipment*.

4 APPLICATION FOR APPROVAL

4.1 The appropriate person seeking approval for a type of *Equipment* will carry out all necessary research and evaluation and, so far as reasonably practicable, will ensure by consultation that the approval will relate to the maximum number of Managed Units / Departments or systems. He will then complete Part 1 of an 'Equipment Approval Form' – Form No. SRI 504/1 (see Appendix 1), and submit it and its supporting documentation to the *Nominated Manager*.

4.2 The *Nominated Manager*, in consultation with the person referred to in Clause 4.1, will examine the documentation submitted. If it is considered to be satisfactory, the *Nominated Manager* will recommend that the type of *Equipment* be **Approved**, by completing Part 2 of the form, and submit it to the *Approving Officer*.

4.3 The *Approving Officer* will approve the *Equipment* by signing part 3 of the form, and will forward the form to the Manager responsible for company safety, for processing in accordance with Section 5 of this Instruction.

5 PROCESSING OF COMPLETED FORM AND APPROVED PROCEDURE

5.1 On receipt of the completed 'Equipment Approval Form' the Manager responsible for company safety will take the following action:

(i) Initial and date the form.

(ii) Allocate a unique Equipment Approval reference number for the type of *Equipment* and insert it at the top of the form.

(iii) Revise any Approved Equipment Index to include the new **Approved** type of *Equipment*.

(iv) Ensure that any Intranet available copy of the above index is updated.

(v) Issue a copy of the Equipment Approval Form to all Managed Units / Departments where staff might be required to supply, make available for use, or authorise the use of, the type of *Equipment*.

(vi) Issue a copy of the Equipment Approval Form (for information only), to the initiating person and the *Nominated Manager*, with an accompanying memorandum, to advise them that the type of *Equipment* has been **Approved** and an Equipment Approval Form issued for application.

(vii) Retain the completed Equipment Approval Form in a dedicated file.

6 RENEWAL OF APPROVAL OF EQUIPMENT

6.1 An **Approved** type of *Equipment* will be valid for a maximum period of five years, at the end of which the Manager who initiated the original approval will, if necessary, arrange for the approval to be renewed, in line with Section 5 of this Instruction.

7 WITHDRAWAL OF APPROVAL OF TYPE OF EQUIPMENT

7.1 When it is considered necessary, for safety or other reasons, to withdraw approval from a type of *Equipment*, the person initiating the withdrawal must inform the *Nominated Manager* who recommended its approval, giving the reason(s) in writing as to why approval should be withdrawn.

7.2 The *Nominated Manager* will request the Manager responsible for company safety to arrange for the approval to be cancelled.

7.3 On receipt of the above request the Manager responsible for company safety will take the following action:

(i) Arrange with the *Approving Officer* for approval of the type of *Equipment* to be cancelled.

(ii) Arrange for all Managed Units / Departments referred to in Clause 5.1(v) above to be advised without delay that the type of *Equipment* is no longer **Approved**.

(iii) Revise any Approved Equipment Index by deleting the relevant **Approved** type of *Equipment*.

(viii) Ensure that any Intranet available copy of the above index is updated.

NORTHERN IRELAND ELECTRICITY SAFETY RULES
(ELECTRICAL AND MECHANICAL)

EQUIPMENT APPROVAL FORM No.

1	**TYPE OF EQUIPMENT:**
	For Use In: Managed Unit(s)
	On:
	Safety Rules / Supporting Documentation Reference(s):
	Relevant Specification, Documents and Drawings:
	Make, Model, etc.:
	Conditions of Use:
	Approval Sought by: ..... Designation ..... Date:
2	Recommended for Approval: ..... (Nominated Manager) Date:
3	Approved: ..... (Approving Officer) Date:

THIS FORM IS VALID FOR FIVE YEARS FROM DATE OF APPROVAL

For Office Use: Received by ..... Date .....

Form No. SRI 504/1

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 505

[Issue 2]

AUTHORISATION OF PERSONS

CONTENTS

1. SCOPE

This Safety Rules Instruction supplements Part C of the NIE Safety Rules (Electrical and Mechanical) and defines procedures for the appointment of Persons to work on or near to the **System**, to operate on the **System** or to control the **System**. Operations on the **System** shall include **Switching**, achieving and maintaining **Safety from the System** and restoring the **System** after completion of work. The appointments will be for the **Authorisation** of the following Persons, as appropriate:

(i) **Senior Authorised Person**
(ii) **Authorised Person**
(iii) **Control Person**
(iv) **Selected Person**
(v) Nominated Supervisor
(vi) Engineer's Representative
(vii) Nominated **Competent Person**
(viii) **Competent Person**

2. INTRODUCTION

In compliance with the requirements of the Electricity at Work Regulations (Northern Ireland) 1991, Regulation 16, no person shall be engaged in any work activity where technical knowledge and experience is necessary to prevent danger or where appropriate, injury, unless he possesses such knowledge and experience, or is under such degree of supervision as may be appropriate having regard to the nature of the work.

The question of technical knowledge or experience necessitates:-

(i) adequate knowledge of electricity;

(ii) adequate experience of electrical work;

(iii) adequate understanding of the **System** to be worked on and practical experience of that class of **System**;

(iv) understanding of the hazards which may arise during the work and the precautions which need to be taken, and

(v) ability to recognise at all times whether it is safe for work to continue.

There are no defined voltage limitations on the application of the Electricity at Work Regulations (Northern Ireland) 1991. As defined in the Regulations, “Electrical Equipment” includes every type of electrical equipment from, for example, 400kV overhead lines to a battery powered hand lamp and includes electrical equipment on vehicles. Work on electrical equipment in offices, customers premises, workshops, construction sites or any other place of work as well as work on or in connection with transmission, distribution, generation and supply of electrical energy will therefore come within the scope of the Regulations.

The Electricity at Work Regulations do not require a person to be accompanied at work, nor do they recognise age as a factor for determining whether a person can work on electrical equipment. However, because of the additional hazards associated with working on or adjacent to **HV/LV Apparatus**, NIE Networks has imposed, through the training governance, a minimum age requirement of 18 years on a person before that person may be authorised to enter or work alone in a substation or to hold any **Live** working Authorisation. Persons below the age of 18 years may enter an **HV/LV** substation under the **Personal Supervision** of a suitable **Person** or, in the case of **Live** working, to work to the limits of the **Person** providing the **Personal Supervision**.

3. DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the NIE Safety Rules (Electrical and Mechanical).

For the purpose of this Safety Rules Instruction the following additional definitions will apply:

(i) *Unit Manager* – A person having overall responsibility for persons within a Department.

(ii) *Authorisation Officer* – A NIE Networks officer responsible for the issue of Safety Rules and associated supporting documentation to, and for arranging the preparation of, candidates for Authorisation and for ensuring the maintenance of records of all Safety Rules appointments.

(iii) *Line Manage*r – A person having day to day responsibility for persons within a Department.

(iv) *Engineer's Representative* - Any person(s) appointed in writing by the Engineer (the NIE Networks engineer identified within a Contract document) to carry out certain delegated duties in connection with the on-site management of Contracts. Such delegation should include the duty to liaise with the Contractor on the safety aspects of the Contract so that the actions of any party which may affect any other party with regard to health or safety can be made known and suitably controlled.

(v) *Safety Rules Instruction (SRI)* – An Instruction which is derived from the NIE Safety Rules (Electrical and Mechanical) and from Safety Rules Codes of Practice.

(vi) *Safety Rules Guidance (SRG)* – Guidance on processes derived from the NIE Safety Rules (Electrical and Mechanical) and from Safety Rules Codes of Practice.

4. AUTHORISATION OFFICER

The *Unit Manager* responsible for safety shall nominate a person responsible for the management of the appointment procedure under the NIE Safety Rules (Electrical and Mechanical). This person will be known as the *Authorisation Officer* and will have the following duties:

4.1 Ensuring that all relevant Safety Rules, Safety Instructions, *Safety Rules Instructions* and *Safety Rules Guidance* have been made available to and, where appropriate, issued to each candidate for appointment.

4.2 Ensuring that candidates have received appropriate instruction, training, experience and practical testing to enable them to satisfactorily discharge their responsibilities as Persons appointed under the NIE Safety Rules (Electrical and Mechanical).

4.3 Preparing the Authorisation Form (Appendix 1) by completing Part A.

4.4 Arranging for the printing, issue and receipting of the Certificate of Authorisation.

4.5 Ensuring that up-to-date records of all appointments are maintained.

5. TRAINING

Persons who are to be nominated for authorisation must be given appropriate training in the application of the NIE Safety Rules (Electrical and Mechanical) and relevant *Safety Rules Instructions*.

6. AUTHORISATION OF PERSONS

6.1 Each candidate for authorisation will be required to satisfy an interview/ Authorisation Panel that they have the necessary technical knowledge and experience to carry out the duties for which they are to be authorised in accordance with the NIE Safety Rules (Electrical and Mechanical).

6.2 Before a candidate is invited to attend an interview/ Authorisation Panel, their *Line Manager* or the appropriate *Engineer's Representative* must confirm in writing that they are satisfied that the Person has been given training in the particular Group(s) for which they are to be authorised and has demonstrated their competence. Authorisation will be in accordance with the Group(s) listed in Appendix 5 of this Safety Rules Instruction. Confirmation by the *Line Manager* or *Engineer's Representative* will be given by the completion of Part A of the Authorisation Form (Appendix 1). Confirmation by the *Unit Manager* will be given by the completion of Part B of the Authorisation Form (Appendix 1).

6.3 Where the duties will entail **Switching** to the instruction of a **Control Person** at a **System** Control Centre, the candidate must complete the following in this order.

(i) First visit the Control Centre to familiarise themselves with the Control Centre's relevant system operations procedures. The candidate will be required to demonstrate that he has the necessary operational knowledge to fulfil the duties for which he is to be authorised.

(ii) After the Control Centre visit the candidate must complete a **Switching** test to the instruction of a **Control Person** at an appropriate **System** Control Centre, under the **Personal Supervision** of an **Authorised Person**.

Confirmation of this will be given by the completion of Part C of the Authorisation Form (Appendix 1).

Note: If at the stage of completing Part C of the Authorisation Form the candidate is found to be unsatisfactory, the Authorisation Form will be suitably endorsed, returned to the *Authorisation Officer* who will inform the candidate's *Line Manager* or *Engineer's Representative* and the Authorisation Form will be retained on file for five years.

6.4 When a Person is to be authorised as a **Selected Person**, *Engineer's Representative* and/ or to apply safety precautions on **LV Apparatus** to the instructions of a **Control Person** and/or to carry out, as an **Authorised Person**, certain duties as identified by the *Unit Manager* and specified in certain *Safety Rules Instructions*, the Authorisation Panel which will conduct the examination will consist of two persons as follows:

(i) The *Line Manager* with responsibility for the Person or a suitably experienced engineer or if the candidate is a contractor's employee, the appropriate *Engineer's Representative*. This person will normally be Chairman of the Authorisation Panel and be responsible for organising the examination.

(ii) The *Authorisation Officer*.

6.5 When a Person is to be authorised as a **Competent Person,** the *Line Manager* or if appropriate, the *Engineer's Representative* must satisfy themselves that the nominated **Person** has sufficient knowledge and experience. This will normally be by means of an interview/ Authorisation Panel consisting of the *Line Manager* or if appropriate, the *Engineer's Representative* and if deemed necessary a second person with sufficient knowledge and experience.

Once the *Line Manager* or if appropriate, the *Engineer's Representative* have satisfied themselves that the nominated **Person** has sufficient knowledge and experience they will sign Part D of the Form.

6.6 An Authorisation Panel which is to conduct the examination of a candidate who is not a Person as identified in 6.4 will, depending on the Group(s) of Authorisation, be normally composed from the following:

(i) The *Unit Manager* or a suitably experienced engineer or if the candidate is a contractor's employee, the appropriate *Engineer's Representative.* This person will normally be the Chairman and be responsible for organising the Authorisation Panel.

(ii) The *Authorisation Officer*.

(iii) One or more of the following persons, so that the Panel will normally consist of at least three members:

(a) The most appropriate **Person** holding a current appointment in the Group(s) of authorisation being sought by the candidate.

(b) A person to give special assistance to the Panel when deemed to be necessary.

The Manager responsible for Safety will decide the appropriate constitution of the Panel.

6.7 The Panel Chairman will enter the names of all Panel members in Part D of the Authorisation Form. Once all Panel members unanimously agree that the candidate has satisfactorily completed the authorisation interview will they sign Part D.

The **Person** will then sign Part E of the Form, signifying his acceptance of the terms of his authorisation. The *Authorisation Officer* will then process the Authorisation Form - see Section 9.

Note: If at the stage of completing Part D of the Authorisation Form the candidate is found to be unsatisfactory, the Authorisation Form will be suitably endorsed, returned to the *Authorisation Officer* who will inform the candidate's *Line Manager* or if appropriate the *Engineer's Representative* and the Authorisation Form will be retained on file for five years.

6.8 A Temporary Certificate of Authorisation (Appendix 3) can be issued to the candidate. The *Authorisation Officer* will complete both the candidate's details and the relevant authorisation categories sections. The Temporary Certificate of Authorisation will then be signed by the *Unit Manager* or the Panel Chairman.

6.9 The Certificate of Authorisation (Appendix 2) and/or the Temporary Certificate of Authorisation (Appendix 3) which the **Person** receives must be signed & kept by themselves, during their respective periods of validity, as proof of their authorisation. The certificate shall where reasonably practical be immediately available to the holder when involved in any activities on or adjacent to the **System**.

6.10 When a **Person** is required to undertake responsibilities not covered by his existing Authorisation, they will be required to satisfy an Authorisation Panel as to his capability of carrying out his new duties.

6.11 On each occasion that a **Person** is examined by an Authorisation Panel, they will normally at the same time be examined as to his continuing suitability to hold those of his current Group(s) of Authorisation. The Certificate of Authorisation resulting from an Authorisation Panel will normally be valid for five years.

7. ASSESSMENT OF PERSONS

7.1 For all **Persons** authorised in accordance with NIE Safety Rules, the *Unit Manager/ Engineer's Representative* must ensure that an annual assessment of the continuing suitability is carried out and the result formally recorded (Appendix 6a & 6b).

7.2 Each **Authorised Person** will normally be re-authorised at intervals not exceeding five years. The re-authorisation process will include examination by an Authorisation Panel and may at the discretion of the *Authorisation Officer* include a visit to a Control Centre.

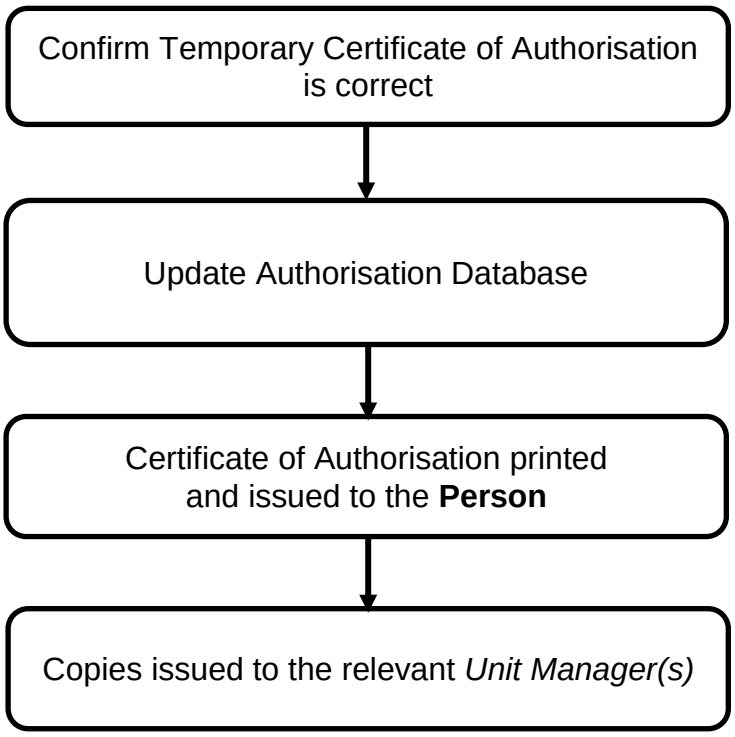
8. FORMAL RECORDING OF INTERVIEWS

8.1 The interview shall be recorded by each member of the Authorisation Panel conducting the examination using the template in Appendix 7. Upon completion, the notes taken by each panel member must be passed to the *Authorisation Officer*, who will ensure they are retained for minimum of 5 years.

If an *Authorisation Officer* is not present the notes must be passed to Health Safety & Environment.

9. PROCESSING OF AUTHORISATION FORMS AND ISSUE OF CERTIFICATES OF AUTHORISATION

9.1 When the *Authorisation Officer* or Health Safety & Environment receives a copy Temporary Certificate of Authorisation and/or an Authorisation Form for processing, or a request for a Certificate for a **Competent Person**, they should:



10. VALIDITY OF AUTHORISATION

All categories of authorisation will be valid for a period of 5 years with the exception of Temporary Authorisation which will be valid for a period of 2 months.

Re-Authorisation of all categories must follow the process detailed in section 6 of this Safety Rules Instruction.

11. SAFETY RULES REFRESHER TRAINING

Each *Unit Manager* must ensure that all **Persons** within his Managed Unit will normally receive Safety Rules refresher training within the twelve month period prior to re-authorisation, and at any other time if considered necessary.

12. EMERGENCY CONDITIONS

12.1 During emergency conditions e.g. storm repairs it may be necessary to import NEWSAC Donor Company authorised staff to carry out work on the **System**. These persons will require to be recognised as **Persons**, but the time constraints involved determine that it will not be possible to fully comply with the procedures detailed above.

12.2 The following procedure must only be adopted under emergency conditions.

12.3 Persons who may be considered for Temporary Authorisation under emergency conditions are those persons who are already authorised by another Distribution/ Transmission Network Operator.

12.4 The evidence required in support of Temporary Authorisation in emergency conditions will consist of the following:

(i) individual's existing Certificate of Authorisation

(ii) or if not readily available, verbal assurance from their manager/ supervisor that the individual is authorised by their employer to carry out similar work and is capable of performing the tasks required.

(iii) identification, e.g. Driver's Licence, Employee's work pass.

12.5 An *Authorisation Officer* will conduct an assessment of imported staff to verify they possess knowledge and understanding in line with the level of authorisation held.

12.6 Subject to the interview being satisfactory, the *Authorisation Officer* will issue a 'Temporary Certificate of Authorisation' (Appendix 3). The level of authorisation granted will be the minimum compatible with the work required and will not exceed the Authorisation that the person already holds with their existing employer.

12.7 Additional information can also be found in the NIE Networks Emergency Plan & NEWSAC Agreement.

13. SUSPENSION/ WITHDRAWAL OF AUTHORISATION

13.1 There may be occasions such as a Switching or safety incident when a **Person's** authorisation will be suspended or withdrawn by his *Unit Manager*. This can be defined as:

(i) Suspend – When a **Persons** Authorisation is temporarily removed until an initial investigation is completed.

(ii) Withdrawn – When a **Persons** Authorisation is permanently removed as a recommendation of an investigation.

HSG-21 Suspension / Withdrawal of Safety Rules Authorisation provides guidance for such occasions.

13.2 If a **Person's** authorisation is withdrawn, the **Person** must be informed and they must relinquish his Certificate of Authorisation. If the **Person** is a contractor then the relevant *Engineer's Representative* will inform the **Person's** employer of the suspension/ withdrawal of authorisation.

If the **Person's** authorisation is withdrawn and he is to be subsequently re-authorised, he will be required to undertake further training and to satisfy an Authorisation Panel in accordance with Section 6. If the **Person's** authorisation is suspended, at the end of the suspension period it will either be re-instated, in which case further training and examination by an Authorisation Panel will not be required, or it will be withdrawn.

13.3 When a **Person** leaves a Managed Unit or contractor's employment permanently or when his authorisation is no longer required, they must relinquish his Certificate of Authorisation. The *Unit Manager or Engineer's Representative,* as appropriate*,* will withdraw the authorisation.

13.4 When a **Person** changes employer or returns to employment within a short time period, the requirement for any re-authorisation panel will be determined by the *Authorisation Officer*.

Appendix 1
AUTHORISATION FORM

PART A **NOMINATION FOR AUTHORISATION**

NAME: _____ (Full Name in block capitals)

PAYROLL / NI No.: _____

DEPARTMENT/ CONTRACTOR: _____

I confirm that the above named person has been given instruction on the relevant NIE Safety Rules (Electrical and Mechanical), Safety Instructions, Safety Rules Instructions, Safety Rules Guidance, and has received appropriate practical training. I am satisfied that they have the necessary technical knowledge and experience and, in my opinion, they understand the responsibilities of the Authorisation(s) detailed below:

SENIOR AUTHORISED PERSON:	AUTHORISED PERSON:	COMPETENT PERSON:
_____	_____	_____
_____	_____	_____
_____	_____	_____
CONTROL PERSON:	**SELECTED PERSON:**	**PERSON IN TRAINING:**
_____	_____	_____

Print _____ Signed _____ Date _____
(Line Manager/Engineer's Rep.)

PART B

The above person is hereby nominated in accordance with the terms of this Authorisation Form.

Print_____ Signed _____ Date _____
(Unit Manager)

PART C **CONTROL CENTRE VISIT**

I certify that the above named person has:

(i) visited the Distribution Control Centre on _____(date) and/or the Transmission Control Centre _____(date) and has satisfactorily demonstrated their understanding of the operational procedures followed by the Control Room Staff.

(ii) satisfactorily undertaken a Switching Test to the instructions of Control Room staff under the Personal Supervision of _____ (Distribution) _____ (Transmission)

Signed _____Date_____ Signed _____Date _____
(DCC Shift Manager) **(TCC Shift Manager)**

PART D **AUTHORISATION PANEL**

An Authorisation Panel consisting of: _____(Chairperson) _____ (Auth. Officer) _____ (Technical Person(s)) has examined the above-named person and is unanimously satisfied that they have the necessary technical knowledge and experience to be appointed as a **Person** as defined in Part A above and is hereby so appointed.

Signed _____Signed _____Signed _____
(Chairperson/ Line Manager) **(Auth. Officer)** **(Technical Expert(s))**

NB. The Panel may wish to limit the Authorisation by refusing some of the categories sought, in which case the Panel Chairperson will make and initial amendments to the list in Part A.

PART E **DECLARATION**

I declare that I have read and understand the relevant NIE Safety Rules (Electrical and Mechanical), Safety Instructions, Safety Rules Instructions and Safety Rules Guidance. I accept the terms of the Authorisation, and agree to act in the capacity which is defined in Part A above.

Signed _____ **(Authorised Person)** **Date** _____

AUTHORISATIONS

GROUP A A SENIOR AUTHORISED PERSON, AUTHORISED AT SPECIFIED LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS AS:

A1? Prepare, issue, transfer, suspend and cancel PfW. Decide what category of Person shall provide Personal Supervision when it is required

A2? Prepare, issue, transfer and cancel SFT.

A3? Prepare, issue, transfer, suspend and cancel LWC when:

1. work or testing is done outside Safety Distances but in close proximity to the limits of Safety Distances to HV Apparatus, and to decide whether to issue a LWC in such circumstances. Decide what category of Person should provide Personal Supervision when it is required.
2. Safety Distances to HV Apparatus do not have to be considered. To achieve Safety from the System by limiting the work or testing or the work area and to decide whether a LWC is required to confirm oral instructions in such circumstances.

Decide what category of Person shall provide Personal Supervision when it is required.

A5? Prepare, issue, transfer, suspend and cancel LWC for work or testing on LV Apparatus. Decide whether work or testing on LV Apparatus is to be carried out with the Apparatus Isolated, or with the Apparatus Live and in accordance with the relevant Specialised Procedure, and to decide whether such work or testing is to be carried out under normal routine instructions, oral instructions, a LWC or Personal Supervision. Decide what category of Person shall provide Personal Supervision when it is required.

A6? Carry out duties allocated to Senior Authorised Person in specified Safety Rules Instructions.

GROUP B AN AUTHORISED PERSON TO:

B1? Apply and remove safety precautions to the instructions of Control Persons.

B2? Receive and clear SFT

B3X Carry out duties allocated to Authorised Persons in specified Safety Rules Instructions.

CONTROL PERSONS
GROUP C AUTHORISED FOR SPECIFIC CONTROL SPHERES OF OPERATION TO:

C1X Carry out duties of a Control Person at a System Control Centre on specified apparatus.

C2X Carry out duties of a Control Person on that part of the HV System transferred to him under the relevant Delegated Control Procedure.

C3? Carry out duties of a Control Person on Plant and/or LV Apparatus and Site Control Duties in Substations.

COMPETENT PERSONS
GROUP D AUTHORISED AT SPECIFIED LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:

D1? Gain access to Substations containing Plant and Apparatus to perform duties in a manner such that Safety Distances will not be infringed and that System derived hazards will not cause Danger.

D2? Work as a member of a Working Party on the Northern Ireland Electricity System in accordance with the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and the relevant Safety Rules Instructions.

D3? Fit and remove portable Primary Earths under the Personal Supervision of a Senior Authorised Person.

D4X Work on Live HV Overhead Lines under the Personal Supervision of an Authorised Person in accordance with a specified Safety Rules Instruction.

D5? Receive and clear LWC.

D6? Receive and clear PFW.

D7? Work on Live LV Apparatus, in accordance with the relevant Safety Rules Instruction.

D8? Carry out duties of a nominated Supervisor.

D9? Carry out the duties of an Engineering Representative (Safety Rules).

SELECTED PERSONS

GROUP E AUTHORISED AT SPECIFIED LOACTIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:

E1X As a Selected Person, make reports and recommendations to overcome hazards which may prevent work or testing being performed safely on Plant and Apparatus which has otherwise been made safe.

PERSONS IN TRAINING

GROUP F NOMINATED AT SPECIFIED LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:

F1? As a person in Training carry out duties as directed by, and under the Personal Supervision of a Person authorised to carry out such duties.

3RD CHARACTER SUBSCRIPTS

SCOPE AS APPLIED TO SPECIFY PLANT/APPARATUS FOR AUTHORISATION

The 3rd characters in the Authorisation/Nomination/Assessment Group categories shown as "?" in this Key, are taken from the following list of subscripts "A" to "T". Categories with the subscripts "A" to "J" are structured in ascending and inclusive order. Categories "S" and "T" stand alone. Where the 3rd character is "X", this indicates that the more specific duties are detailed in the Safety Rules Instruction (S) listed on the Certificate of Authorisation/Nomination/ Assessment

SUBSCRIPT LETTER (APPLIED TO GROUP NO.) SPECIFIED PLANT/APPARATUS

A Customer point LV

B LV Busbars, overhead conductors, underground cables and pole-mounted fuses.

C LV Isolating Devices and Connections

D Apparatus nominally operating at up to 33kV, excluding substations containing circuit breakers.

E Apparatus nominally operating at up to 33kV, related Plant and Apparatus.

F Apparatus nominally operating at 110kV, 275kV and 400kV, excluding substations.

G Apparatus nominally operating at up to 110kV related Plant and Apparatus.

H Apparatus nominally operating at up to 275kV related Plant and Apparatus.

J Apparatus nominally operating at up to 400kV and related Plant and Apparatus

S Apparatus nominally operating at 110kV, 275kV and 400kV, excluding substations.

T Apparatus nominally operating at 110kV, 275kV and 400kV and all other Plant and Apparatus in Bulk supply points and Power stations for which NIE has a maintenance responsibility.

X Specified in text.

Appendix 2 - CERTIFICATE OF AUTHORISATION

NIE SAFETY RULES
(Electrical and Mechanical)

CERTIFICATE OF AUTHORISATION

I certify that: (Full name in block capitals)

Payroll No/ NI No: Managed Unit:
Contractor:

is Authorised in the following categories for duties under the above Safety Rules:
(for details of categories refer to the reverse of this certificate)

at those locations where I require him to carry out his normal duties.

The holder of this certificate may carry out those duties for which they have been trained and Authorised for and as detailed in the NIE Safety Rules, Safety Rules Instructions and Safety Rules Guidance.

A & B CATEGORIES ARE VALID UNTIL

Issued by: Designation[1]:

Date of Authorisation[2]:

Authorised Person:
(Signature)

[1] Unit Manager / Chairman of Authorisation Panel / Line Manager, as appropriate.
[2] Date as shown in Part E of Authorisation Form.

AUTHORISATIONS

GROUP A A SENIOR AUTHORISED PERSON, AUTHORISED AT SPECIFIED LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS AS:

A1? Prepare, issue, transfer, suspend and cancel PfW. Decide what category of Person shall provide Personal Supervision when it is required

A2? Prepare, issue, transfer and cancel SFT.

A3? Prepare, issue, transfer, suspend and cancel LWC when:

1. work or testing is done outside Safety Distances but in close proximity to the limits of Safety Distances to HV Apparatus, and to decide whether to issue a LWC in such circumstances. Decide what category of Person should provide Personal Supervision when it is required.
2. Safety Distances to HV Apparatus do not have to be considered. To achieve Safety from the System by limiting the work or testing or the work area and to decide whether a LWC is required to confirm oral instructions in such circumstances.

Decide what category of Person shall provide Personal Supervision when it is required.

A5? Prepare, issue, transfer, suspend and cancel LWC for work or testing on LV Apparatus. Decide whether work or testing on LV Apparatus is to be carried out with the Apparatus Isolated, or with the Apparatus Live and in accordance with the relevant Specialised Procedure, and to decide whether such work or testing is to be carried out under normal routine instructions, oral instructions, a LWC or Personal Supervision. Decide what category of Person shall provide Personal Supervision when it is required.

A6? Carry out duties allocated to Senior Authorised Person in specified Safety Rules Instructions.

GROUP B AN AUTHORISED PERSON TO:

B1? Apply and remove safety precautions to the instructions of Control Persons.

B2? Receive and clear SFT

B3X Carry out duties allocated to Authorised Persons in specified Safety Rules Instructions.

CONTROL PERSONS
GROUP C AUTHORISED FOR SPECIFIC CONTROL SPHERES OF OPERATION TO:

C1X Carry out duties of a Control Person at a System Control Centre on specified apparatus.

C2X Carry out duties of a Control Person on that part of the HV System transferred to him under the relevant Delegated Control Procedure.

C3? Carry out duties of a Control Person on Plant and/or LV Apparatus and Site Control Duties in Substations.

COMPETENT PERSONS
GROUP D AUTHORISED AT SPECIFIED LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:

D1? Gain access to Substations containing Plant and Apparatus to perform duties in a manner such that Safety Distances will not be infringed and that System derived hazards will not cause Danger.

D2? Work as a member of a Working Party on the Northern Ireland Electricity System in accordance with the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and the relevant Safety Rules Instructions.

D3? Fit and remove portable Primary Earths under the Personal Supervision of a Senior Authorised Person.

D4X Work on Live HV Overhead Lines under the Personal Supervision of an Authorised Person in accordance with a specified Safety Rules Instruction.

D5? Receive and clear LWC.

D6? Receive and clear PFW.

D7? Work on Live LV Apparatus, in accordance with the relevant Safety Rules Instruction.

D8? Carry out duties of a nominated Supervisor.

D9? Carry out the duties of an Engineering Representative (Safety Rules).

SELECTED PERSONS

GROUP E AUTHORISED AT SPECIFIED LOACTIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:

E1X As a Selected Person, make reports and recommendations to overcome hazards which may prevent work or testing being performed safely on Plant and Apparatus which has otherwise been made safe.

PERSONS IN TRAINING

GROUP F NOMINATED AT SPECIFIED LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:

F1? As a person in Training carry out duties as directed by, and under the Personal Supervision of a Person authorised to carry out such duties.

3RD CHARACTER SUBSCRIPTS

SCOPE AS APPLIED TO SPECIFY PLANT/APPARATUS FOR AUTHORISATION
The 3rd characters in the Authorisation/Nomination/Assessment Group categories shown as "?" in this Key, are taken from the following list of subscripts "A" to "T". Categories with the subscripts "A" to "J" are structured in ascending and inclusive order. Categories "S" and "T" stand alone. Where the 3rd character is "X", this indicates that the more specific duties are detailed in the Safety Rules Instruction (S) listed on the Certificate of Authorisation/Nomination/ Assessment

SUBSCRIPT LETTER (APPLIED TO GROUP NO.) SPECIFIED PLANT/APPARATUS

A Customer point LV

B LV Busbars, overhead conductors, underground cables and pole-mounted fuses.

C LV Isolating Devices and Connections

D Apparatus nominally operating at up to 33kV, excluding substations containing circuit breakers.

E Apparatus nominally operating at up to 33kV, related Plant and Apparatus.

F Apparatus nominally operating at 110kV, 275kV and 400kV, excluding substations.

G Apparatus nominally operating at up to 110kV related Plant and Apparatus.

H Apparatus nominally operating at up to 275kV related Plant and Apparatus.

J Apparatus nominally operating at up to 400kV and related Plant and Apparatus

S Apparatus nominally operating at 110kV, 275kV and 400kV, excluding substations.

T Apparatus nominally operating at 110kV, 275kV and 400kV and all other Plant and Apparatus in Bulk supply points and Power stations for which NIE has a maintenance responsibility.

X Specified in text.

Appendix 3 – TEMPORARY CERTIFICATE OF AUTHORISATION

Northern Ireland Electricity Networks

NIE SAFETY RULES
(Electrical and Mechanical)

TEMPORARY CERTIFICATE OF AUTHORISATION

I certify that: _____ **Expiry Date:** _____

Payroll No/ NI No: _____ **Managed Unit:** _____

Contractor: _____
_____
_____
_____

is Authorised in the following categories for duties under the above Safety Rules:
(for details of categories refer to the reverse of this certificate)

_____
_____
_____
_____
_____
_____

at those locations where I require him to carry out his normal duties.

The holder of this certificate may carry out those duties for which they have been trained and Authorised for and as detailed in the NIE Safety Rules, Safety Rules Instructions and Safety Rules Guidance.

This Temporary Certificate ceases to be valid two months from Date of Authorisation or on receipt of corresponding Certificate

Issued by: _____ (Printed) _____ (Signature) **Designation[1]:** _____

Authorised Person
(Signature) _____ **Date of Authorisation[2]:** _____

TEMPORARY AUTHORISATION
VALID FOR 2 MONTHS

[1] Unit Manager / Chairman of Authorisation Panel / Line Manager, as appropriate.
[2] Date as shown in Part E of Authorisation Form.

AUTHORISATIONS

GROUP A A SENIOR AUTHORISED PERSON, AUTHORISED AT SPECIFIED LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS AS:

A1? Prepare, issue, transfer, suspend and cancel PfW. Decide what category of Person shall provide Personal Supervision when it is required

A2? Prepare, issue, transfer and cancel SFT.

A3? Prepare, issue, transfer, suspend and cancel LWC when:

1. work or testing is done outside Safety Distances but in close proximity to the limits of Safety Distances to HV Apparatus, and to decide whether to issue a LWC in such circumstances. Decide what category of Person should provide Personal Supervision when it is required.
2. Safety Distances to HV Apparatus do not have to be considered. To achieve Safety from the System by limiting the work or testing or the work area and to decide whether a LWC is required to confirm oral instructions in such circumstances.

Decide what category of Person shall provide Personal Supervision when it is required.

A5? Prepare, issue, transfer, suspend and cancel LWC for work or testing on LV Apparatus. Decide whether work or testing on LV Apparatus is to be carried out with the Apparatus Isolated, or with the Apparatus Live and in accordance with the relevant Specialised Procedure, and to decide whether such work or testing is to be carried out under normal routine instructions, oral instructions, a LWC or Personal Supervision. Decide what category of Person shall provide Personal Supervision when it is required.

A6? Carry out duties allocated to Senior Authorised Person in specified Safety Rules Instructions.

GROUP B AN AUTHORISED PERSON TO:

B1? Apply and remove safety precautions to the instructions of Control Persons.

B2? Receive and clear SFT

B3X Carry out duties allocated to Authorised Persons in specified Safety Rules Instructions.

CONTROL PERSONS
GROUP C AUTHORISED FOR SPECIFIC CONTROL SPHERES OF OPERATION TO:

C1X Carry out duties of a Control Person at a System Control Centre on specified apparatus.

C2X Carry out duties of a Control Person on that part of the HV System transferred to him under the relevant Delegated Control Procedure.

C3? Carry out duties of a Control Person on Plant and/or LV Apparatus and Site Control Duties in Substations.

COMPETENT PERSONS
GROUP D AUTHORISED AT SPECIFIED LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:

D1? Gain access to Substations containing Plant and Apparatus to perform duties in a manner such that Safety Distances will not be infringed and that System derived hazards will not cause Danger.

D2? Work as a member of a Working Party on the Northern Ireland Electricity System in accordance with the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and the relevant Safety Rules Instructions.

D3? Fit and remove portable Primary Earths under the Personal Supervision of a Senior Authorised Person.

D4X Work on Live HV Overhead Lines under the Personal Supervision of an Authorised Person in accordance with a specified Safety Rules Instruction.

D5? Receive and clear LWC.

D6? Receive and clear PFW.

D7? Work on Live LV Apparatus, in accordance with the relevant Safety Rules Instruction.

D8? Carry out duties of a nominated Supervisor.

D9? Carry out the duties of an Engineering Representative (Safety Rules).

SELECTED PERSONS

GROUP E AUTHORISED AT SPECIFIED LOACTIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:

E1X As a Selected Person, make reports and recommendations to overcome hazards which may prevent work or testing being performed safely on Plant and Apparatus which has otherwise been made safe.

PERSONS IN TRAINING

GROUP F NOMINATED AT SPECIFIED LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:

F1? As a person in Training carry out duties as directed by, and under the Personal Supervision of a Person authorised to carry out such duties.

3RD CHARACTER SUBSCRIPTS

SCOPE AS APPLIED TO SPECIFY PLANT/APPARATUS FOR AUTHORISATION

The 3rd characters in the Authorisation/Nomination/Assessment Group categories shown as "?" in this Key, are taken from the following list of subscripts "A" to "T". Categories with the subscripts "A" to "J" are structured in ascending and inclusive order. Categories "S" and "T" stand alone. Where the 3rd character is "X", this indicates that the more specific duties are detailed in the Safety Rules Instruction (S) listed on the Certificate of Authorisation/Nomination/ Assessment

SUBSCRIPT LETTER (APPLIED TO GROUP NO.) SPECIFIED PLANT/APPARATUS

A Customer point LV

B LV Busbars, overhead conductors, underground cables and pole-mounted fuses.

C LV Isolating Devices and Connections

D Apparatus nominally operating at up to 33kV, excluding substations containing circuit breakers.

E Apparatus nominally operating at up to 33kV, related Plant and Apparatus.

F Apparatus nominally operating at 110kV, 275kV and 400kV, excluding substations.

G Apparatus nominally operating at up to 110kV related Plant and Apparatus.

H Apparatus nominally operating at up to 275kV related Plant and Apparatus.

J Apparatus nominally operating at up to 400kV and related Plant and Apparatus

S Apparatus nominally operating at 110kV, 275kV and 400kV, excluding substations.

T Apparatus nominally operating at 110kV, 275kV and 400kV and all other Plant and Apparatus in Bulk supply points and Power stations for which NIE has a maintenance responsibility.

X Specified in text.

[1] Unit Manager / Chairman of Authorisation Panel / Line Manager, as appropriate.
[2] Date as shown in Part E of Authorisation Form.

Appendix 4 - AUTHORISATION CHART

FOR FULL DESCRIPTION OF THESE CATEGORIES SEE APPENDIX 6		FOR FULL DESCRIPTION OF THESE CATEGORIES SEE APPENDIX 6											
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**S**	**T**	**X**
Prepare, Issue and Cancel PERMITS FOR WORK	A1	■	■	■									■
Prepare, Issue and Cancel SANCTIONS FOR TEST	A2	■	■	■									■
Prepare, Issue and Cancel LIMITED WORK CERTIFICATES on HV Apparatus	A3	■	■	■									■
Prepare, Issue and Cancel LIMITED WORK CERTIFICATES on LV Apparatus	A5				■	■	■	■	■	■	■		■
Carry out duties allocated to a Senior Authorised Person in specified Safety Rules Instructions	A6	■	■	■	■	■	■	■	■	■	■	■	
Apply / Remove Safety Precautions to Instruction of Control Persons	B1						■				■		■
Receive and Clear SANCTION FOR TEST	B2	■	■	■			■	■	■	■	■		■
Authorised Persons duties in Specified Safety Rules Instructions	B3	■	■	■	■	■	■	■	■	■	■	■	
Control Person at High Voltage System Control Centre	C1	■	■	■	■	■	■	■	■	■	■	■	
Control Person Delegated Control	C2	■	■	■	■	■	■	■	■	■	■	■	
Control Person Plant and/or LV Apparatus and Site Control Duties at Substations	C3				■		■				■		■
Access to Substations containing Plant and/or Apparatus (Safety Distance not infringed)	D1	■	■	■	■		■				■		■
Work as a member of a Working Party in accordance with relevant Safety Rules Instructions	D2												■
Fit / Remove Portable Primary Earths	D3	■	■	■			■						■
HV Live Line Working in accordance with Safety Rules Instructions	D4	■	■	■	■	■	■	■	■	■	■	■	
Receive and Clear LIMITED WORK CERTIFICATES	D5												■
Receive and Clear PERMITS FOR WORK	D6	■	■	■									■
Work on Live LV Apparatus in accordance with Safety Rules Instructions	D7				■	■	■	■	■	■			■
Carry out duties as a Nominated Supervisor	D8												■
Carry out the duties of an Engineering Representative	D9												■
Selected Person	E1	■	■	■	■	■	■	■	■	■	■	■	
Person in Training	F1												■

CERTIFICATE CATEGORIES EXPLANATORY NOTES

AUTHORISATIONS

Persons authorised in Group A are designated **Senior Authorised Persons** and those authorised in Group B are designated **Authorised Persons**, for the purpose of the NIE Safety Rules (Electrical and Mechanical). Where '?' occurs the relevant suffix must be drawn from Table A of this appendix. Where 'X' occurs detailed specification of the category is required.

SENIOR AUTHORISED PERSON

GROUP		**AUTHORISED AT SPECIFIC LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:**
A	A1?	Prepare, issue, transfer, suspend and cancel **Permits for Work**. Decide what category of **Person** shall provide **Personal Supervision** when it is required.
	A2?	Prepare, issue, transfer and cancel **Sanctions for Test**.
	A3?	Prepare, issue, transfer, suspend and cancel **Limited Work Certificates** when: 1. work or testing is done outside **Safety Distance** but in close proximity to the limits of **Safety Distance** to **HV Apparatus**, and to decide whether to issue a **Limited Work Certificate** in such circumstances. 2. **Safety Distance** to **HV Apparatus** do not have to be considered. To achieve **Safety from the System** by limiting the work or testing or the work area and to decide whether a **Limited Work Certificate** is required to confirm oral instructions in such circumstances. Decide what category of **Person** shall provide **Personal Supervision** when it is required.

	A5?	Prepare, issue, transfer, suspend and cancel **Limited Work Certificates** for work or testing on **LV Apparatus**. Decide whether work or testing on **LV Apparatus** is to be carried out with the **Apparatus Isolated**, or with the **Apparatus Live** and in accordance with the relevant **Specialised Procedure**, and to decide whether such work or testing is to be carried out under normal routine instructions, oral instructions, a **Limited Work Certificate** or **Personal Supervision**. Decide what category of **Person** shall provide **Personal Supervision** when it is required.
	A6X	Carry out duties allocated to a **Senior Authorised Person** in specified Safety Rules Instructions

AUTHORISED PERSON

GROUP		**AUTHORISED AT SPECIFIC LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:**
B	B1?	Apply and remove safety precautions to the instructions of **Control Persons**.
	B2?	Receive and clear **Sanctions for Test**.
	B3X	Carry out duties allocated to **Authorised Persons** in specified Safety Rules Instructions.

DESIGNATION OF CONTROL PERSONS, COMPETENT PERSONS, SELECTED PERSONS AND PERSONS IN TRAINING.

Persons authorised in Group C are designated **Control Persons**, those in Group D are designated **Competent Persons**, those in Group E are designated **Selected Persons** and those in Group F are designated Persons in Training for the purpose of the NIE Safety Rules (Electrical and Mechanical). Where '?' occurs the relevant suffix must be drawn from Table A of this appendix. Where 'X' occurs detailed specification of the category is required.

CONTROL PERSON

GROUP		**AUTHORISED FOR SPECIFIC CONTROL SPHERES OF OPERATION TO:**
C	C1X	Carry out duties of a **Control Person** at a **System** Control Centre on specified **Apparatus**.
	C2X	Carry out duties of a **Control Person** on that part of the **HV System** transferred to him under the relevant Delegated Control Procedure.
	C3?	Carry out duties of a **Control Person** on **Plant** and/or **LV Apparatus** and Site Control Duties in Substations.

COMPETENT PERSON

GROUP		**AUTHORISED AT SPECIFIC LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:**
D	D1?	Gain access to Substations containing **Plant** and/or **Apparatus** to perform duties in a manner such that **Safety Distance** will not be infringed and that **System** derived hazards will not cause **Danger**.
	D2?	Work as a member of a Working Party on the Northern Ireland Electricity **System** in accordance with the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and the relevant Safety Rules Instructions.
	D3?	Fit and remove portable **Primary Earths** under the **Personal Supervision** of a **Senior Authorised Person**.
	D4X	Work on **Live HV** Overhead Lines under the **Personal Supervision** of an **Authorised Person** in accordance with a specified Safety Rules Instruction.
	D5?	Receive and clear **Limited Work Certificates**.

	D6?	Receive and clear **Permits for Work**.
	D7?	Work on **Live LV Apparatus** in accordance with the relevant Safety Rules Instruction.
	D8?	Carry out duties of a Nominated Supervisor.
	D9?	Carry out the duties of an Engineering Representative (Safety Rules).

SELECTED PERSON

GROUP		**AUTHORISED AT SPECIFIED LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:**
E	E1X	As a **Selected Person**, make reports and recommendations to overcome hazards which may prevent work or testing being performed safely on **Plant** and **Apparatus** which has otherwise been made safe.

PERSON IN TRAINING

GROUP		**NOMINATED AT SPECIFIED LOCATIONS ON SPECIFIED PLANT AND/OR APPARATUS TO:**
F	F1?	As a person in Training carry out duties as directed by, and under the Personal Supervision of a Person Authorised to carry out such duties.

TABLE A

SCOPE AS APPLIED TO SPECIFY PLANT/APPARATUS FOR AUTHORISATION AND/ OR DESIGNATIONS.

The 3rd characters in the Authorisation Group categories shown as '?' in this Appendix, are taken from the following list of subscripts 'A' to 'T'. Categories with the subscripts 'A' to 'J' are structured in ascending and inclusive order. Categories 'S' and 'T' stand alone. Where the 3rd character is 'X', this indicates that the more specific duties are detailed in the Safety Rules Instruction(s) listed on the Certificate of Authorisation.

SUBSCRIPT LETTER (Applied to Group No.)	**SPECIFIED PLANT / APPARATUS**
A	Customer point **LV**.
B	**LV** busbars, overhead conductors, underground cables and pole-mounted fuses.
C	**LV Isolating Devices** and Connections.
D	**Apparatus** nominally operating at up to 33kV, excluding substations containing circuit breakers.
E	**Apparatus** nominally operating at up to 33kV and related **Plant** and **Apparatus**.
F	**Apparatus** nominally operating at 110kV, 275kV and 400kV excluding substations.
G	**Apparatus** nominally operating at up to 110kV and related **Plant** and **Apparatus**.
H	**Apparatus** nominally operating at up to 275kV and related **Plant** and **Apparatus**.
J	**Apparatus** nominally operating at up to 400kV and related **Plant** and **Apparatus**.
S	**Apparatus** nominally operating at 110kV, 275kV and 400kV excluding substations.
T	**Apparatus** nominally operating at 110kV, 275kV and 400kV and all other **Plant** and **Apparatus** in Bulk supply points and Power Stations for which NIE has a maintenance responsibility.
X	Specified in text.

Appendix 6a – STAFF ANNUAL REVIEW OF AUTHORISATION

NIE Safety Rules (E&M)

2018 Annual Review of Authorisation

THIS FORM MUST BE COMPLETED DURING PPR MEETINGS

Name: _____ Payroll Number: _____

Managers Name _____

Business Unit/ Department: _____

Section 1: Employee

1. Select your level of Authorisation?

SAP/ SAIS ☐ AP ☐ CP ☐ Control Person ☐ Selected Person ☐ None ☐

2. Does your current role require this level of Authorisation? Yes ☐ No ☐

3. List your Sub-Station keys:

_____

4. Do you understand the requirements of HSG-021? Yes ☐ No ☐
'Suspension/ Withdrawal of Authorisation'
If you answer 'No', ask your Manager to explain HSG-021 to you during the PPR Meeting.

5. Do you understand the requirements of HSG-026? Yes ☐ No ☐
'AP/ SAP Training'
If you answer 'No', ask your Manager to explain HSG-026 to you during the PPR Meeting.

6. Have you any concern or reason for not continuing with your Authorisation?

_____

I agree to operate within the terms of my Certificate of Authorisation.

Signature: _____ Date: _____

Section 2: Manager

1. Do the Authorisation Categories cover current and anticipated duties?

   Yes ☐ No ☐

2. If a 'F1?' Training Category is included, is it required?

   Yes ☐ No ☐ N/A ☐

3. Do you have any concerns/ reasons for not continuing with the Authorisation?

   Yes ☐ No ☐

   If 'Yes', list your concerns/ reasons:

   _____
   _____

4. Have you checked the NMS Switching Report to verify the Authorisation is being used?

   Yes ☐ No ☐ N/A ☐

5. If Q.4 in Section 1 was answered 'No', have you explained HSG-021 and verified it is understood?

   Yes ☐ No ☐ N/A ☐

6. If Q.5 in Section 1 was answered 'No', have you explained HSG-026 and verified it is understood?

   Yes ☐ No ☐ N/A ☐

7. Switching Log checked:

   Yes ☐ No ☐ N/A ☐

   Add your comments on quality and compliance with SRI.1 'High Voltage Switching':

   _____

8. Authorisation Certificate Expiry Date: _____

I agree to ensure the employee operates within the terms of his Certificate of Authorisation.

Signature: _____ Date:_____

Send completed forms to Health, Safety and Environment within 1month of PPR Meeting.

NIE Safety Rules (E&M)

2018 Annual Review of Authorisation

CONTRACTORS

Name: _____ N.I. Number: _____

Engineers Rep Name _____

Contractor: _____

Section 1: Contractor

1. Select your level of Authorisation?

SAP/ SAIS ☐ AP ☐ CP ☐ Control Person ☐ Selected Person ☐ None ☐

2. Does your current role require this level of Authorisation? Yes ☐ No ☐

3. List your Sub-Station keys:

_____

4. Do you understand the requirements of HSG-021? Yes ☐ No ☐
'Suspension/ Withdrawal of Authorisation'
If you answer 'No', ask your Engineers Rep to explain HSG-021 to you.

5. Do you understand the requirements of HSG-026? Yes ☐ No ☐ N/A ☐
'AP/ SAP Training'
If you answer 'No', ask your Engineers Rep to explain HSG-026 to you.

6. Have you any concern or reason for not continuing with your Authorisation?

_____

I agree to operate within the terms of my Certificate of Authorisation.

Signature: _____ Date: _____

Section 2: Engineers Rep

1. Do the Authorisation Categories cover current and anticipated duties?

   Yes ☐ No ☐

2. If a 'F1?' Training Category is included, is it required?

   Yes ☐ No ☐ N/A ☐

3. Do you have any concerns/ reasons for not continuing with the Authorisation?

   Yes ☐ No ☐

   If 'Yes', list your concerns/ reasons:

   _____
   _____

4. Have you checked the NMS Switching Report to verify the Authorisation is being used?

   Yes ☐ No ☐ N/A ☐

5. If Q.4 in Section 1 was answered 'No', have you explained HSG-021 and verified it is understood?

   Yes ☐ No ☐

6. If Q.5 in Section 1 was answered 'No', have you explained HSG-026 and verified it is understood?

   Yes ☐ No ☐

7. Switching Log checked:

   Yes ☐ No ☐ N/A ☐

   Add your comments on quality and compliance with SRI.1 'High Voltage Switching':

   _____

8. Authorisation Certificate Expiry Date: _____

I agree to ensure the Contractor operates within the terms of his Certificate of Authorisation.

Signature: _____ Date:_____

Send completed forms to Health, Safety and Environment within 1 month of completing.

AUTHORISATION RECORD SHEET

Authorisation Panel Members & Interviewee Details		Page: of
Name of Interviewee:	Nat. Ins./ Payroll No:	
Name of Interviewer:	Role*:	
Panel Member:	Role*:	
Panel Member:	Role*:	
Panel Member:	Role*:	
Interview Date:	Time – Start:	End:

Interview Details

Delete unused lines & sign each page	
Interviewer Signature:	Date:

Role* - Chairman, Authorisation Officer or Technical Expert

AUTHORISATION RECORD SHEET (Continued)

Interview Details	Page: of
Name of Interviewee:	
Name of Interviewer:	
Interview Date:	

Interview Details

Delete unused lines & sign each page	
Interviewer Signature:	Date:

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES INSTRUCTION

SRI 600

[Issue 1]

APPLICATION OF THE SAFETY RULES

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1A - Guidance for Selection of Safety Documents.

1B - Flow Chart Guide for the Selection of Safety Documents.

2 - Procedure for Amendment of Safety Rules Instructions.

3 - Procedure for Gaining Approval of Special Instructions Approved Under General Provision GP3 of the Safety Rules.

4 - Special Instructions to be followed when Normal Safety Document Clearance / Cancellation Cannot be Enacted.

5 - Procedure for Dealing with Objections on Safety Grounds.

6 - Responsibilities of Nominated Supervisors.

7 - Responsibilities of Control Persons.

8 - Guidance for Completion of Logs.

9 - Common (Operational) Locks.

10 - Standard Abbreviations.

11 - Requirements for Selected Person's Reports.

12 - 'Request for Outage and/or Programmed Work' Form.

13 - 'Request for LV Outage and/or Live Work' Form.

14 - Emergency Authorisation procedure for NIE staff.

15 - Sign on / off procedure for NIE staff.

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APPLICATION OF THE SAFETY RULES

1 INTRODUCTION

The purpose of this Safety Rules Instruction is to specify how the requirements of Part B of the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) are to be applied within the Distribution and Transmission functions of Northern Ireland Electricity. In the Safety Rules, Part B deals with the 'Procedures for Safety Documents and Keys'. The roles of the Persons involved in this part of the Safety Rules are also clearly defined in this Instruction.

2 SCOPE

The requirements of this Instruction apply to all **Persons** who work for Northern Ireland Electricity on **Plant** and/or **Apparatus** known as the Distribution and Transmission System including those undertaking Contract work.

System is defined in the Safety Rules as 'Items of **Plant** and **Apparatus** which are used separately or in combination in any process associated with the generation, transmission or distribution of electricity'. The Northern Ireland Electricity System is further defined in SRI 501 – 'The Northern Ireland Electricity System'.

The Safety Rules and Safety Rules Instructions apply only to items of **Plant** and **Apparatus** which form the **System**, when work or testing is to be done and it is necessary to change the normal operating mode or depart from routine operating procedures. The Safety Rules and Safety Rules Instructions are concerned solely with the safety of persons from the inherent **Dangers** of the **System** when work or testing is to be done. Aspects of 'plant safety', whilst very important, are not specifically covered and are best met by the requirements and procedures contained in existing manufacturers' manuals, operating instructions and other operational directives issued by Management. Where precautions that provide 'safety of the plant' are necessary and have to be maintained simultaneously with safety precautions that achieve **Safety from the System** during a period of work or testing, then it is the responsibility of local Management to specify how such arrangements are worked within each department.

Where, for a very good reason, the Rules cannot or should not be applied to such **Plant** and **Apparatus**, then **Approved** procedures are provided. These procedures are in the form of the Northern Ireland Electricity series of 'General Provision 3 (GP3) – Special Instructions'. *Unit Managers* will identify and provide for these requirements.

The Safety Rules do not apply to plant and apparatus which is outside the **System**. Where work or testing of such plant and apparatus is required, *Unit Managers* will identify those areas where alternative safe methods of work will be applied in place of the Safety Rules and establish the principles on which these alternative safe methods are based.

3 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical).

For the purpose of this Safety Rules Instruction the following additional definition applies:

(i) *Working Party* - The **Persons** under the **Supervision** of a **Competent Person** or an **Authorised Person** and includes a **Competent Person** or **Authorised Person** when working by himself. A *Working Party* may also include a person working under the **Personal Supervision** of a **Competent Person** – see Section 4.8 for further clarification.

(ii) *Unit Manager* - A *Unit Manager* is a person having line responsibility for persons within a Department.

(iii) *Safe Custody* – *Safe Custody* is that which allows access to and control of **Safety Documents**, **Keys** and associated items only by the appropriate **Persons**. The **Senior Authorised Person** issuing the **Safety Document** will be responsible for defining any related *Safe Custody* requirements.

(iv) *Remote Location* – A *Remote Location* is defined by the **Senior Authorised Person** issuing the **Safety Documents**, having regard to the time and effort required to return **Safety Keys** to the **Location** where the **Safety Documents** are to be issued. It is recommended that the requirement for more than fifteen minutes driving time would suffice for consideration of a **Location** as remote.

4 PERSONS AND THEIR RESPONSIBILITIES

4.1 General

It is the duty of all **Persons** who may be concerned with work or testing on **Plant** or **Apparatus** within Northern Ireland Electricity, to which the Safety Rules apply, to implement the Rules and have regard to the supporting mandatory and guidance documents.

The range of **Persons** recognised in the Safety Rules is as follows:

Competent Person
Authorised Person
Senior Authorised Person
Control Person
Selected Person

Although not defined in the Safety Rules nominated **Competent Person(s)**, nominated Supervisor(s) and *Working Party* are recognised as well.

Relevant Northern Ireland Electricity personnel and Contractors' employees will be assigned to one or more of these categories of **Persons**. Details of persons so assigned will be maintained in two separate Registers of Persons – see Section 4.9.

The roles of **Control**, **Authorised** and **Senior Authorised Persons** are central to the taking of precautions and preparation, issue and cancellation of **Safety Documents** under the Safety Rules. It is within the flexibility of the Safety Rules that one **Person** can, in the appropriate circumstances, enact the role of all three **Persons**. Further, that same **Person** could also enact the role of a **Competent Person** to receive the **Safety Document**, carry out the work and clear the **Safety Document**.

4.2 Competent Persons

Competent Persons have sufficient technical knowledge and/or experience to enable them to avoid **Danger**. They may also receive, surrender and clear specified **Safety Documents** and also receive Supplementary Forms, when nominated by a *Unit Manager*.

Within the definition, two categories of **Competent Person** are recognised:

(i) **Persons** who have sufficient technical knowledge and/or experience to enable them to avoid **Danger**.

(ii) **Persons** who have sufficient technical knowledge and/or experience to enable them to avoid **Danger** and have been nominated by their *Unit Manager* to receive, surrender and clear specified **Safety Documents**.

In the case of Contractors, the responsibility for assessment of persons as **Competent Persons** and the maintenance of a register of such **Persons** rests with the relevant Engineer's representative.

Competent Persons will fulfil the responsibilities laid down in Part C2 of the Northern Ireland Electricity Safety Rules.

Only nominated **Competent Persons** as defined in category (ii) above are explained in the remainder of this Section.

The nomination of Northern Ireland Electricity Staff in a Department and Contractors' Staff is the responsibility of the appropriate *Unit Manager*. For Contractors, the contract document includes a Notification to Contractors of Northern Ireland Electricity Regulations – in this notification is a requirement for Contractors to provide a list of their nominated **Competent Persons**. The *Unit Manager*'s responsibility for Contractor's nominated **Competent Persons** is met by consulting this supplied list.

The person responsible for the use of Contractor's Staff and Northern Ireland Electricity Staff from other Departments ensures that the *Unit Manager* has the required information to meet that responsibility.

In the event that emergency work is undertaken by Contractors and time is not available to process the required list in the normal way, then the most Senior person or his Deputy concerned with the requirement to use such Contractors issues an emergency list. This emergency list requires formal recognition by the Duty Incident Manager at the earliest possible time and is then processed in the normal manner.

Nomination of **Competent Persons** by the *Unit Manager* is specific and falls into two categories:

(i) As a nominated **Competent Person** to receive and/or clear specified **Safety Documents**.

(ii) As a nominated Supervisor – see 4.3 below

In each of these cases, the nomination states the **Plant**, **Apparatus** and **Safety Documents** which apply to the **Person**.

4.3 Nominated Supervisors

Supervisors nominated by the *Unit Manager* for specific functions referred to in the Safety Rules may include Team Managers or Technical Staff employed by Northern Ireland Electricity or Supervisory Staff employed by Contractors working on Northern Ireland Electricity **Plant** or **Apparatus**.

Nominated Supervisors shall fulfil the responsibilities laid down and explained in detail in Appendix 6.
The following are functions relating to **Safety Documents** for which nominated Supervisors are required:

(i) Setting further **Competent Persons** to work under **Safety Documents** – see Safety Rules B2.2.6 and B4.2.4.

(ii) During the transfer of a **Permit for Work** or **Limited Work Certificate**, receiving the **Safety Document** and associated items into safe custody – See Safety Rules B2.3.2 and B4.3.2.

(iii) During the transfer of a **Permit for Work** or **Limited Work Certificate**, handing the **Safety Document** and associated items to the **Competent Person** who is to become the recipient – See Safety Rules B2.3.2 and B4.3.2.

In addition they are required to decide the level of **Supervision** necessary for persons in a *Working Party* as set out in Section 4.8.

4.4 Authorised Persons

Authorised Persons are **Competent Persons** who have been nominated by a *Unit Manager* in writing to carry out specified duties.

Authorised Persons will fulfil the responsibilities laid down in Part C3 of the Safety Rules.

Persons nominated as **Authorised Persons** fall into categories determined by SRI 505 – 'Examination and Authorisation / Nomination / Assessment of Northern Ireland Electricity Personnel' and SRI 506 – 'Nomination / Assessment of Contractors' Employees (Categories A & B)', which cover every aspect of the duties of **Authorised Persons** in the Safety Rules.

The Certificate of Authorisation specifies the **Plant** and **Apparatus** to which the authorisation applies.

4.5 Senior Authorised Persons

Senior Authorised Persons are **Authorised Persons** who have been nominated by a *Unit Manager* in writing to carry out duties in connection with the preparation, issue, transfer, suspension and cancellation of **Safety Documents** in accordance with the appropriate group categories detailed in SRI 505 – 'Examination and Authorisation / Nomination / Assessment of Northern Ireland Electricity Personnel' and SRI 506 – 'Nomination / Assessment of Contractors' Employees (Categories A & B)' and are thereby designated as **Senior Authorised Persons**.

Senior Authorised Persons will fulfil the responsibilities laid down in Part C4 of the Safety Rules.

The Certificate of Authorisation states the **Safety Documents** which are applicable as well as the **Plant** and **Apparatus** to which it applies.

Emergency re-authorisation of **Senior Authorised Persons** whose **Authorisation** has lapsed due to their position in Northern Ireland Electricity not requiring the associated duties is set out in Appendix 14 of this Instruction.

4.6 Control Persons

Control Persons are **Persons** who have been nominated by an appropriate *Unit Manager* to be responsible for controlling and co-ordinating safety activities necessary to achieve **Safety from the System**.

Control Persons will fulfil the responsibilities laid down in Part C5 of the Safety Rules. Appendix 7 of this Instruction gives guidance on the role of *Control Persons* where one or more *Control Person* is involved in achieving **Safety from the System**.

Control Centre staff, with responsibility for co-ordination and control of **System** operations, are nominated to be **Control Persons** for **High Voltage Apparatus**.

Some **Senior Authorised Persons** will also be nominated as **Control Persons** for **Plant** and/or **LV Apparatus**. In some cases the **Control Person** for the **HV** electrical **System** and the **Senior Authorised Person** as **Control Person** for other **Systems** associated with the **HV Apparatus** and associated **Plant** will both have their names stated on the relevant parts of the **Safety Document**.

4.7 Selected Persons

Selected Persons are **Persons** qualified by technical knowledge and experience, and nominated by the appropriate *Unit Manager* to carry out measurements and examinations and specify the precautions to be taken to overcome specified hazards.

Selected Persons will fulfil the responsibilities laid down in Part C6 of the Safety Rules.

Recommendations may be called for (as detailed in Section 8.2.1) by a **Senior Authorised Person** preparing a **Safety Document**. These recommendations are made in writing on a **Selected Person**'s report. The areas requiring **Selected Person**'s comments have been recognised to include those specified in this Instruction – Section 8.2.1, but that list is not accepted as a complete statement. Where occasions arise that indicate other areas of expertise being required, then the range of **Selected Persons** is extended and registered accordingly.

The **Selected Person** will make recommendations to the **Senior Authorised Person** who shall decide the action necessary to implement such recommendations. In the event that there is a significant difference of opinion between the **Selected Person** and the **Senior Authorised Person**, as to the adequacy of procedures recommended, this shall be reviewed by the appropriate *Unit Manager* before the **Safety Document** is issued.

4.8 Working Party

Although a *Working Party* is not defined in the Safety Rules it is defined in Section 3 of this Instruction and it receives mention in connection with issue and receipt of **Safety Documents** – Safety Rules B2.2.6 and B4.2.4.

Working Party in Northern Ireland Electricity documentation means those **Persons** working with the recipient of any **Safety Document** on the work for which the **Safety Document** was issued and includes the recipient, even in the case where he works on his own.

Where a *Working Party* is working under a **Safety Document** the **Person** in charge of the *Working Party* shall be a nominated **Competent Person** and be the recipient of a personally retained **Safety Document**. All members of the *Working Party* shall read and understand the **Safety Document** and confirm that the work that they are to undertake is included in that specified on the **Safety Document**.

The Supervisor who arranges for persons, who are not **Competent Persons**, to work in a *Working Party* under the **Personal Supervision** of a **Competent Person** shall ensure that the ratio of persons to **Competent Persons** in the *Working Party* is such that adequate **Personal Supervision** can be exercised. He will also record details of the persons receiving **Personal Supervision** and of the **Competent Persons** exercising that **Personal Supervision**.

To be in charge of a *Working Party* as a recipient of a **Safety Document**, the **Person** takes on the responsibilities for **General Safety** and **Safety from the System** established in Part C of the **Safety Rules**.

4.9 Register of Persons

4.9.1 Register of Persons – Northern Ireland Electricity Staff

It is the responsibility of each relevant *Unit Manager*, or another acting on his behalf, to assign staff under his control to one or more of the categories of **Persons** detailed in Sections 4.2 to 4.7, as appropriate, and to maintain a register of **Persons** for those personnel so assigned. Each such register of **Persons** is in the form of a database.

The database information relating to staff in each Department will be audited annually by the relevant *Unit Manager* to ensure that it is complete and up-to-date, with particular reference to the removal of **Persons** from the register who are no longer appropriate to it. The relevant *Unit Manager* is responsible for this audit.

4.9.2 Register of Persons – Contractors' Employees

A Register of Persons, in respect of Contractors' employees assigned to the various categories of **Persons** detailed in Sections 4.2 to 4.7, is maintained in the form of a separate database.

The database is serviced centrally by the Northern Ireland Electricity Group Safety & Risk department and will be audited annually by Engineer's Representatives to ensure that it is complete and up-to-date, with particular reference to the removal of **Persons** from the register who are no longer appropriate to it.

5 SAFES

5.1 Key Safes

A **Key Safe** is an **Approved** safe used to secure **Safety Keys**, the use of which is described in Section 9. The safes are a numbered series, each having fitted locks which are unique (either 2 or 4 in number). The locks are identified along with their **Keys** by the **Key Safe** number and a letter. Additionally, there is a common control lock on each safe operated by a **Control Key** issued to **Senior Authorised Persons** only.

Key Safes may be portable or fixed in Substations and / or Vehicles as required.

6 LOCKS

A number of categories of locks are in use throughout Northern Ireland Electricity. This section details those locks which have a direct application in achieving **Safety from the System**. The distribution and control of the associated **Keys** is also described.

A number of other Locks are in use for operational purposes at Northern Ireland Electricity locations. Their use is detailed in Appendix 9 of this Instruction.

6.1 Safety Locks and Keys

Safety Locks are used for securing **Plant** and/or **Apparatus** in an **Isolated** and/or **Earthed** state. The locks for this purpose are of a series, which ensures that each is unique. In addition, each lock is issued with only one **Safety Key**. The Northern Ireland Electricity Safety Rules (Electrical and Mechanical) require a **Caution Notice** to be affixed to the lock when securing **Plant** and/or **Apparatus** in an **Isolated** state. On certain types of **Apparatus** it is necessary for a Safety Lock to be temporarily removed from a circuit isolator to allow the associated circuit **Earthing Device** to be operated.

In order to facilitate the handing over of **Safety Keys**, they shall be readily identifiable with the **Apparatus** with which they are associated.

6.2 Key Safe Locks

6.2.1 Control Locks

A Control Lock is the lock on each **Key Safe** which can be operated by a **Key** issued only to **Senior Authorised Persons**. This lock is a common lock, being identical on each **Key Safe**.

Whenever **Key Safes** are used to secure **Safety Keys**, the **Senior Authorised Person** involved in that activity shall operate the **Control Lock** with his **Control Key** as the first means of achieving that security. Where the **Key Safe** is in a *Remote Location* only a Secondary Lock will be used.

6.2.2 Secondary Locks

Secondary Locks are unique and used to secure **Safety Keys** within the **Key Safe**. The **Key Safe** number and a letter uniquely identify the Secondary Locks on each **Key Safe**. Two types of **Key Safe** are in use, with two or with four Secondary Locks.

Keys to Secondary Locks are either issued with **Safety Documents** or used to cascade isolations from one **Key Safe** to another as appropriate.

7 SAFETY DOCUMENTS AND SUPPLEMENTARY FORMS

7.1 Safety Documents

The following **Safety Documents** are issued for work and/or testing on the **System**:

Limited Work Certificate
Permit for Work
Sanction for Test

Safety Documents shall be completed to the standards prescribed in SRI 502 – 'Completion of Safety Documents and Associated Documents (including Specimen Safety Documents)'.

7.2 Supplementary Forms

Safety Documents may be supplemented, as appropriate, by some of the following Forms:

Selected Person's Report
Earthing Schedule
Safety Key List
Request for Outage and/or Programmed Work (E600)
Request for LV Outage and/or Live Work Form
Normal / Routine Instructions
Field and/or Substation Logs
Sign on / Sign off sheet
Continuation Sheet

8 APPLICATION OF SAFETY DOCUMENTS AND SUPPLEMENTARY FORMS

8.1 Safety Documents

This Section details the application of the **Safety Documents** identified in Section 7.1 to the variety of work and/or testing which the Safety Rules recognise. The detail is given in tabular form (Appendix 1A), correlating the work and/or testing description with the **Safety Document** required.

The basic philosophy of the application of a particular **Safety Document** to any type of work or testing is set out in the tables in Appendix 1A.

Only personally held **Safety Documents** will be issued for work / testing on the Northern Ireland Electricity **System**.

8.1.1 Personally Held Safety Documents

The Required Document column of Appendix 1A lists the requirement for personally held **Safety Documents** which include **Safety Documents** that require **Personal Supervision** of their transfer by a **Senior Authorised Person**.

A personally held **Safety Document** shall be cleared only by the recipient or the **Person** to whom it has been transferred. If transfer of a personally held **Safety Document** is required, it shall be done under the **Personal Supervision** of a **Senior Authorised Person**.

8.1.2 Safety Document Preparation / Issue / Transfer / Cancellation

Preparation, issue and cancellation of all **Safety Documents** shall be by a **Senior Authorised Person**. Transfer of personally held **Safety Documents** or suspension of any **Safety Document** (except the **Sanction for Test** which cannot be suspended) shall be under the **Personal Supervision** of a **Senior Authorised Person**.

The issue of all **Safety Documents**, with the exception of **Limited Work Certificates** for certain categories of work detailed in Appendix 1A, requires the **Consent** of the **Control Person** who shall record relevant details of the **Safety Document** being issued.

The **Control Person** is informed of the cancellation of all **Safety Documents** with the exception of those **Limited Work certificates** which do not include recording of safety precautions – i.e. where confirmation of oral instructions to limit work, area or testing is the case.

The preparation of all **Safety Documents** with the exception of the **Sanction for Test** may be done by a different **Senior Authorised Person** to the one who carries out the issue.

A **Sanction for Test** may be issued only by the **Senior Authorised Person** who prepared it and may only be received by an **Authorised Person**.

All other **Safety Documents** may be received by a **Competent Person**.

The format of a **Safety Document** has preparation, issue and receipt sections on the front of the original and the copy.

A continuation sheet as detailed in Appendix 16 of this Safety Rules Instruction may be used if the available space in sections 2(i) or 3(i) of the original **Safety Document** is insufficient to detail the precautions taken.

The clearance and cancellation sections are on the reverse side, together with a transfer and suspension section.

The numbering method of **Safety Documents** issued within Northern Ireland Electricity is specified in SRI 502 – 'Completion of Safety Documents and Associated Documents (including Specimen Safety Documents)'.

Each **Safety Document** has a copy. Only the coloured copy is recognised as the **Safety Document** through which the work process is enacted, and only this copy requires the signatures for clearance and cancellation. The book remains with the **Senior Authorised Person** for reference or, in the case of a Substation, the book shall remain in the Substation control room or switch house.

8.2 Supplementary Forms

8.2.1 Selected Person's Report

A **Selected Person**'s report gives specialist advice to the **Senior Authorised Person** preparing a **Safety Document** where special hazards exist. The report is called for by a **Senior Authorised Person** and prepared by a **Selected Person**.

The **Selected Person** providing a report in such circumstances will be chosen from a register of nominated **Selected Persons**.

The register, as detailed in Section 4.9, specifies the particular specialist area of each **Selected Person** so that the **Senior Authorised Person** can identify which **Selected Person** to choose to make the report.

Occasions where a **Selected Person**'s report may be called for within Northern Ireland Electricity are detailed in Appendix 11. A **Senior Authorised Person** may call for reports on other occasions. They will require the nomination of an appropriate **Selected Person** where a new hazard is identified.

Where it is known in advance that a **Selected Person**'s report is necessary, then the **Senior Authorised Person** involved in the planning process will initiate the request for the **Selected Person**'s report.

That request together with details of the work to be done, is included in the **Selected Person's** report shown in Appendix 11. A copy of the Report Form, when completed, will be retained by the **Selected Person**.

8.2.2 Earthing Schedule

An **Earthing Schedule** is issued with any **Safety Document** where **Drain Earths** are required and where called for in the **Approved** Procedure for the fitting of **Drain Earths**.

The purpose of the **Earthing Schedule** is to specify where and when **Drain Earths** are to be applied by a **Competent Person** during the course of the work for which the **Safety Document** was issued. The **Earthing Schedule** identifies the corresponding **Safety Document**, the serial number of which is recorded on the **Earthing Schedule**.

Earthing Schedules will have no application in Distribution work but will be applied in Transmission work.

Earthing Schedules in book form are made available, as appropriate, for issue with **Safety Documents**.

8.2.3 Safety Document Transfer Record

There is a **Transfer Record** on the reverse side of the coloured copy of a **Safety Document**. If the number of transfers exceeds the space available on the **Safety Document** itself, then a new **Safety Document** shall be issued.

8.2.4 'Request for Outage and/or Programmed Work' (E600) Form

This is a standard form, requesting the release of **Plant** and/or **HV Apparatus** on the **System** for work and/or testing, which is completed and signed by a **Senior Authorised Person** and sent to the appropriate Control Centre requesting an outage and/or programmed work. This form is shown in Appendix 12.

The 'Request for Outage and/or Programmed Work' (E600) form will specify the **Location**, the **Plant/Apparatus** uniquely identified, the work/testing to be done and the duration of the outage or work/testing.

In addition, it will give guidance to the **Senior Authorised Person** preparing the **Safety Document** and the **Control Person(s)** giving **Consent** to the issue of the **Safety Document** on the precautions to be taken and the **Safety Document** type.

The adequacy or otherwise of the precautions on the 'Request for Outage and/or Programmed Work' (E600) form, to ensure **Safety from the System** for **Persons** carrying out the work/testing, shall be determined by the **Senior Authorised Person** preparing the **Safety Document** and the **Control Person(s)** consenting to its issue within their spheres of operation.

The release of **Plant** and/or **HV Apparatus** which the **Senior Authorised Person** can foresee may cause operational difficulties on the **System** shall be arranged with the appropriate Control Centre (by telephone or other means) in advance of the 'Request for Outage and/or Programmed Work' (E600) form being sent to the Control Centre.

8.2.5 'Request for LV Outage and/or Live Work' Form

This is a standard form, recording and authorising non-routine work and/or requesting the release of **Plant** and/or **LV Apparatus** on the **System** for work and/or testing. This form is shown in Appendix 13.

The 'Request for LV Outage and/or Live Work' form will specify the **Location**, the **Plant/Apparatus** identification, the work/testing to be done, the duration of the outage or work/testing and if necessary the justification for **Live LV** work.

8.2.6 Normal / Routine Instructions

These are issued as per current practice i.e. Work instructions.

8.2.7 Field and Substation Logs

Guidance for the use and completion of these logs is contained in Appendix 8.

8.2.8 Sign on Sign off sheet

This is a standard form for recording those persons working under a Permit for Work. This form is shown in Appendix 15.

9 OPERATION OF THE SAFETY DOCUMENT PROCEDURE

9.1 General

Setting people to work safely involves clearly identifiable stages as set out in the philosophy of the Northern Ireland Safety Rules (Electrical & Mechanical):

(i) making available **Plant** and/or **Apparatus** concerned for the work required;

(ii) establishment of conditions to safeguard persons from the inherent dangers of the system;

(iii) execution of the work required;

(iv) clearance of the **Plant** and/or **Apparatus** on completion or termination of the work;

(v) restoration of the **Plant** and/or **Apparatus** to its normal conditions within the **System**.

The following sections establish the Northern Ireland Electricity Procedures in following that process with particular emphasis on the **Safety Document** requirement.

In the event that an objection is raised on safety grounds, concerning any instruction in the application of the Safety Rules, then the GP 4 Procedures will be implemented as laid down in Appendix 5.

Where the term “work” is used in this Section, it includes testing unless specified otherwise.

9.2 Work Planning

This falls into two main categories – planned and emergency and involves the use of Northern Ireland Electricity Staff, Contractor's Staff and Customer's Staff.

Guidance set out in SRG 2, "Complex Planned Work – Setting Persons to Work" shall also be considered at this stage.

9.2.1 Planned Work

The planning process involves Staff from various disciplines who prepare schedules of work activity. Amongst other things the process identifies as appropriate for the particular work:

The **Safety Document** requirement.
The need for a **Selected Person's** Report.
The **Drain Earth** and **Earthing Schedule** requirement.
The **General Safety** requirement for the work.

Planned work requires a 'Request for Outage and/or Programmed Work' (E600) form as indicated in Section 8.2.4. This form and any attachments aid the **Senior Authorised Person** in preparing the **Safety Document(s)**.

9.2.2 Emergency Work

Where emergency work is required, a **Senior Authorised Person** shall discuss with an appropriate **Control Person** the extent of the work, and shall agree the precautions to be taken to achieve **Safety from the System**, the **Safety Document(s)** required and the agreement to be logged. The need for a 'Request for Outage and/or Programmed Work' (E600) form will be determined by the **Control Person** at the appropriate Control Centre.

9.3 Safety Document Preparation

Safety Documents are prepared by a **Senior Authorised Person** to meet the requirements of the 'Request for Outage and/or Programmed Work' (E600) form produced through the planning process and shall include the requirements of any emergency work raised as in Section 9.2.2. In most cases where **Selected Persons**' reports are required, the need will have been identified by the planning process but, in the event that they have not been foreseen, the **Senior Authorised Person** initiates action to obtain them.

Where **Safety Keys**, **Key Safes**, **Key Safe Keys** and **Control Keys** are involved in the preparation of any **Safety Document**, then their use is in accordance with the strict requirements of the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) – Part B and Sections 5 & 6 of this Safety Rules Instruction.

Safety Documents shall be completed in the manner prescribed in SRI 502 – 'Completion of Safety Documents and Associated Documents (including Specimen Safety Documents)'.

When safety precautions are applied, the strict requirement of the Safety Rules and Safety Rules Instructions shall be met with regard to the interpretation of the words "Shall", "Shall where Practicable" and "Shall where Reasonably Practicable" – see Safety Rules Handbook, page (ii) for definitions.

Any problem in the application of these interpretations shall be resolved by consulting with the relevant line manager who will then decide the correct course of action, referring the matter to the *Unit Manager* when necessary.

All **Safety Documents** prepared shall be retained in safe custody by a **Senior Authorised Person** until they are issued. Once a **Safety Document** has been prepared, the safety precautions carried out shall be maintained until the **Safety Document** is cancelled, even though it may not have been issued.

It is the responsibility of the **Senior Authorised Persons** preparing the **Safety Documents**, in agreement with an appropriate **Control Person**, to ensure that the precautions detailed are adequate to provide **Safety from the System**.

9.4 Safety Document Issue

9.4.1 General

Issue of all **Safety Documents**, including re-issue of transferred **Safety Documents**, for planned or emergency work shall be carried out by a **Senior Authorised Person** at a place specified by him.

Recipients of **Safety Documents** may be any of the following **Persons**:

(i) Northern Ireland Electricity staff:

(a) A **Competent Person** nominated to receive specified **Safety Documents** acting on instruction from a Supervisor.

(b) An **Authorised Person** nominated to receive specified **Safety Documents**.

(ii) Similarly nominated Staff from a Contractor.

(iii) Similarly nominated Staff from a Customer.

Receipt of **Safety Documents** is by the **Person** in charge of a *Working Party* – Section 4.8. Confirmation that the recipient of each **Safety Document** is listed as a **Person** nominated to receive the particular **Safety Document** is the responsibility of the **Senior Authorised Person** who carries out the **Safety Document** issue. This is done through the personal knowledge of the **Senior Authorised Person** or by reference to the recipient's Certificate of Competence or to the data bases referred to in Section 4.9.

After issue of each **Safety Document** the **Senior Authorised Person** retains a copy as a reference.

Recipients of **Safety Documents** shall retain the **Safety Documents** in *Safe Custody*. To assist in achieving clean and tidy custody of the **Safety Documents** the use of plastic covers is advised.

The **Safety Document** shall be securely held at all times and only available to members of the *Working Party*, who may read the **Safety Document** only under the Personal Supervision of the recipient.

9.4.2 Initial Receipt of Safety Documents

(i) Northern Ireland Electricity Staff

(a) By a **Competent Person**

The **Competent Person** who is to be in charge of a *Working Party* shall understand the nature of the work he is to do. This understanding shall include **General Safety** matters associated with the work and any other work which may be affected by it. The **Competent Person** who is to take the receipt of the specific **Safety Document** and any relevant Supplementary Forms shall be determined during the planning process.

The responsibilities of the nominated **Competent Person** in the process and the **Senior Authorised Person** are clearly established in Part C of the Safety Rules – Rules C2 and C4 respectively and Section 4 of this Safety Rules Instruction.

The **Competent Person** shall retain the **Safety Document** in *Safe Custody*.

(b) By a Supervisor

A Supervisor may receive **Safety Documents** as a **Competent Person** in charge of a *Working Party* in the same manner described for **Competent Persons**.

(c) By an **Authorised Person** as a recipient of a **Sanction for Test**.

(ii) Contractors

The arrangements for Contractors who are required to receive **Safety Documents** follow the same principles as for Northern Ireland Electricity **Competent Persons** and Supervisors.

Where reasonably practicable, **Key Safes** shall be fixed at a suitable place. Where this is not reasonably practicable, **Key Safes** are available from the Department in which the Contractors are working for issue by a **Senior Authorised Person** against the Contractor's signature. For any specific work, the person in charge of the contract will determine what the requirements are for **Key Safes**. The person in charge of the contract then arranges with the **Senior Authorised Person** issuing the **Safety Document** for the Contractor to receive and sign for them.

(iii) Customer's Nominated Person

The requirements of SRG 4 – 'Instruction for Operations or Work on the Premises of Customers Receiving High Voltage Supply' shall be met.

9.4.3 Further Competent Persons Set to Work Under an Existing Safety Document

Further **Competent Persons** may be set to work under an existing **Safety Document** by an nominated Supervisor who will ensure that the **Safety Document** which exists is appropriate to their work.

The Nominated Supervisor shall instruct them to report to the recipient of the **Safety Document** before joining the *Working Party*. The enhanced *Working Party* shall still comply with the conditions laid down in Section 4.8.

Before allowing further **Competent Persons** to join his *Working Party*, the recipient of the **Safety Document** shall ensure that they understand the limits of the work and the requirements imposed by the **Safety Document**.

9.5 Work Interruption

The following section applies equally to Northern Ireland Electricity Staff, Contractors and Customers.

9.5.1 Safety Document Transfer

If the recipient of the **Safety Document** is unable to complete the work then he is required to surrender the **Safety Document** by signing Part 1 of the **Transfer Record**. The nominated Supervisor receives the **Safety Document** into *Safe Custody*, and accounts for all items associated with it. Only when the work is to be resumed will the nominated Supervisor release the **Safety Document** and the associated items to a new recipient. The new recipient is instructed by the nominated Supervisor to report to a **Senior Authorised Person** in order that the **Safety Document** may be re-issued. The new recipient and the **Senior Authorised Person** sign Part 3 of the **Transfer Record** to complete the re-issue of the **Safety Document**.

9.5.2 Safety Document Suspension

A **Safety Document** (other than a **Sanction for Test**) may be suspended when the following apply:

(i) It is found necessary to temporarily discontinue work and it is inappropriate to clear the **Safety Document** because control over the outstanding work would be lost as a result of work ceasing, or

(ii) A change in the conditions, which applied at the time of the initial precautions being taken, which gives rise to a need for confirmation that the precautions remain adequate.

A **Senior Authorised Person** decides in accordance with the above principles when a **Safety Document** shall be suspended.

Should it be necessary to obtain access to the **Key Safe** associated with a suspended **Safety Document**, a Senior Authorised Person shall cancel the Safety Document.

9.5.2.1 Suspension

The recipient of a **Safety Document** signs Part 1 of the **Transfer Record** to surrender it.

After signing Part 1, the **Safety Document** is surrendered and any items which accompanied it (e.g. Supplementary Forms) are accounted for, by the recipient, to a **Senior Authorised Person** at a suitable place.

To receive the **Safety Document** into suspension, the **Senior Authorised Person** signs Part 2 of the **Transfer Record**, noting in Part 2 the reason for suspension.

The suspended **Safety Document**, together with all other **Safety Documents**, **Keys** and other appropriate items, are placed in *Safe Custody* by the **Senior Authorised Person**.

9.5.2.2 Re-Issue after Suspension

When work is re-scheduled which requires the re-issue of a suspended **Safety Document**, then the **Safety Document** is taken from *Safe Custody* and re-issued to the nominated **Competent Person** who is to carry on the work. The **Senior Authorised Person** re-issuing the **Safety Document** satisfies himself before the re-issue takes place that the precautions originally taken in the preparation of the **Safety Document** still exist. The nominated **Competent Person** who is chosen to receive the **Safety Document** does so in line with the principles in Section 9.4.2 for the initial receipt of **Safety Documents**. The **Competent Person** and the **Senior Authorised Person** sign Part 3 of the **Transfer Record** to complete the re-issue of the **Safety Document**.

The nominated **Competent Person** receiving the **Safety Document** takes it into *Safe Custody* in accordance with the requirements set down in Section 9.4.2 for the initial receipt of **Safety Documents**.

9.6 Work Completion

9.6.1 Safety Document Clearance

When work is complete, or when a **Senior Authorised Person** requires the cancellation, then the recipient of the **Safety Document** is required to complete and sign the clearance section.

The **Safety Document** cleared in this way, together with any Supplementary Forms and associated items, is returned to a **Senior Authorised Person** at a place specified by him.

9.6.2 Safety Document Cancellation

Where no **Control Person Consent** has been given to the issue of a **Limited Work Certificate**, the **Senior Authorised Person** cancels the **Limited Work Certificate** by signing and entering the time and date.

Where **Control Person(s) Consent** has been given to the issue of a **Safety Document**, the **Senior Authorised Person** cancels the **Safety Document** by signing and entering the time and date of acknowledgement of cancellation of all **Control Persons**.

Where **Control Person(s) Consent** has been given to the issue of a **Safety Document**, the **Senior Authorised Person(s)** shall inform the **Control Person(s)** of any restrictions on returning the **Plant**/**Apparatus** to service.

Before any **HV** switchgear on which work or testing has been carried out is returned to service, the **Senior Authorised Person** cancelling the **Safety Document** shall advise the **Control Person** of the operational state of the switchgear.

The requirement by a **Senior Authorised Person** to cancel a **Safety Document**, even though the work is not completed, could arise from a need to use **Plant** and/or **Apparatus** in emergency conditions or a need to modify the safety precautions appropriate to the stage that work has reached. Clearance and cancellation in this instance are as detailed for routine work.

A **Senior Authorised Person** cancels a **Safety Document** by saying, for example, to the **Control Person**, "I am cancelling Permit for Work number 123456 and there are no restrictions on returning this circuit to service". Any restrictions on returning the **Plant** and/or **Apparatus** to service shall be stated at this stage.

9.6.2.1 Cancellation of Safety Documents which have been Prepared but Not Issued

If, between the preparation and issue of a **Safety Document**, it is decided that the work for which the **Safety Document** was prepared is not to proceed, a **Senior Authorised Person** shall cancel the **Safety Document** by informing the **Control Person**. Before cancelling the **Safety Document** he shall draw two parallel lines through the Issue Section writing "Not Issued" between these lines.

9.6.2.2 Cancellation of Safety Documents which have been Transferred but Not Cleared

If, a **Safety Document** (other than a **Sanction for Test**) is received into *Safe Custody* by a nominated Supervisor and it is decided that the work for which the **Safety Document** was originally issued is not to proceed any further, the **Safety Document** shall be handed to a **Senior Authorised Person** who shall cancel the **Safety Document** by informing the **Control Person**. In the case of a **Sanction for Test** the **Senior Authorised Person** who receives the **Safety Document** into *Safe Custody* shall cancel the **Safety Document** by informing the **Control Person**.

9.6.2.3 Cancellation of Safety Documents which have been Suspended

If, a **Safety Document** (other than a **Sanction for Test**) has been suspended and it is decided that the work for which the **Safety Document** was originally issued is not to proceed any further, a **Senior Authorised Person** shall cancel the **Safety Document** by informing the **Control Person**.

9.7 Filing etc. of Safety Documents

The **Senior Authorised Person** cancelling the **Safety Document** ensures that the **Safety Document**, any **Selected Person**'s report and any **Earthing Schedule**, are matched up and securely retained for a minimum period of two years. The Group Safety and Risk Manager will establish a process for monitoring these **Safety Documents** with regard to verifying correct procedural use.

APPENDIX 1

COMPLETION OF SAFETY DOCUMENTS

1 General Considerations

1.1 Legibility

The details entered on any **Safety Document** must be clear and legible using block capitals if necessary.

A ballpoint pen should be used to ensure that the original and copy are produced clearly. The copy must be confirmed to be clear and aligned.

If carbon coated paper is used, it is essential to ensure that written copies are not inadvertently transferred through to the blank forms beneath. A thin sheet of hard material introduced immediately after the **Safety Document** set being completed will prevent this and also improve the quality of the copy.

1.2 Abbreviations

Any use of abbreviations must be restricted to those listed in SRI 600 Appendix 10

1.3 Plant and Apparatus Identification

Plant and **Apparatus** on which work or testing is to be carried out must be readily identifiable or have fixed to it a means of identification which will remain effective throughout the course of the work or testing. **SR A8**

The **Senior Authorised Person** preparing the **Safety Document** shall ensure, in every case, that there is no inconsistency between the identification on the **Safety Document** and any that appears on the **Plant** and/or **Apparatus** itself.

Consistency shall also be achieved in the nomenclature used on **Plant** and **Apparatus**, relevant **Safety Documents**, Supplementary Forms, Job Cards, Work Instructions and Work Specifications.

1.4 Correctness of Entries

Persons completing **Safety Documents** shall take care to meet the precise requirements of each section and indicate that all sections have been given due consideration by entering the full details required or ‘N/A’ (Not Applicable), or ‘YES’ as appropriate.

1.5 Additions or Alterations

Alterations to entries in a section of a **Safety Document** prior to signing of that section shall, whenever possible, be avoided. Alterations are not acceptable in Section 1 of any **Safety Document**.

Prior to any section being signed a line shall be drawn through any remaining blank spaces, to prevent additional items being subsequently entered.

Once a section has been completed and signed, additions or alterations to its contents are not acceptable.

Alterations of a minor nature in a section other than Section 1 of a **Safety Document** shall be carried out by the obliteration of the complete word or item to be changed and each new entry shall be countersigned by the **Person** who signs that particular section of the **Safety Document**.

If there are more alterations required than is permitted above, the preparation of that particular **Safety Document** shall be abandoned and a new **Safety Document** shall be prepared instead. The abandoned **Safety Document** shall have two diagonal parallel lines drawn across the Preparation Section with 'Not Prepared' written between the lines.

If **Consent** to the issue of a **Safety Document** has been given by a **Control Person**, the Procedure to be followed is detailed in SRI 600 Section 9.6.2.1.

1.6 Numbering and Recording

Each **Safety Document** and its copies shall carry a pre-printed serial number which is not duplicated on any other **Safety Document** of the same type.

1.7 Use of Continuation Sheets

If the space available on any **Safety Document** is insufficient to record either the **Plant**/**Apparatus** identification, the Work/Testing to be done or the precautions taken, a Continuation Sheet shall be used. This Continuation Sheet shall be referred to in the relevant section on the **Safety Document** with the wording 'Continuation Sheet No._____ attached.' Only one Continuation Sheet shall be used with each **Safety Document**.

The Continuation Sheet shall follow the form set out in SRI 600 Appendix 16. The type and number of the relevant **Safety Document** shall be entered. The Continuation Sheet shall be completed to the standards set out above. It shall stipulate the Section of the **Safety Document** to which it relates and shall be timed and dated by the **Senior Authorised Person**. It shall be attached to the **Safety Document** and a copy retained by the **Senior Authorised Person**.

1.8 Pre-printed Contents of Safety Documents

There shall be no locally produced pre-printed entries on **Safety Documents**.

1.9 Attachment of Keys to Safety Documents

Care shall be taken to ensure that the attachment of a **Key Safe Key** to a **Safety Document** does not obscure any part of the **Safety Document** which might require to be read and understood.

1.10 Completion by Persons under Training

Where **Safety Documents** are prepared as part of a training exercise they shall be marked 'FOR TRAINING USE ONLY' and the documents shall be coloured white and unnumbered.

The final stages of training may allow a candidate to prepare working **Safety Documents** under the **Personal Supervision** of a **Senior Authorised Person** responsible for training the candidate. The responsibility for the completion of the relevant section of any document remains with the **Senior Authorised Person** and only he shall sign it.

APPENDIX 1A

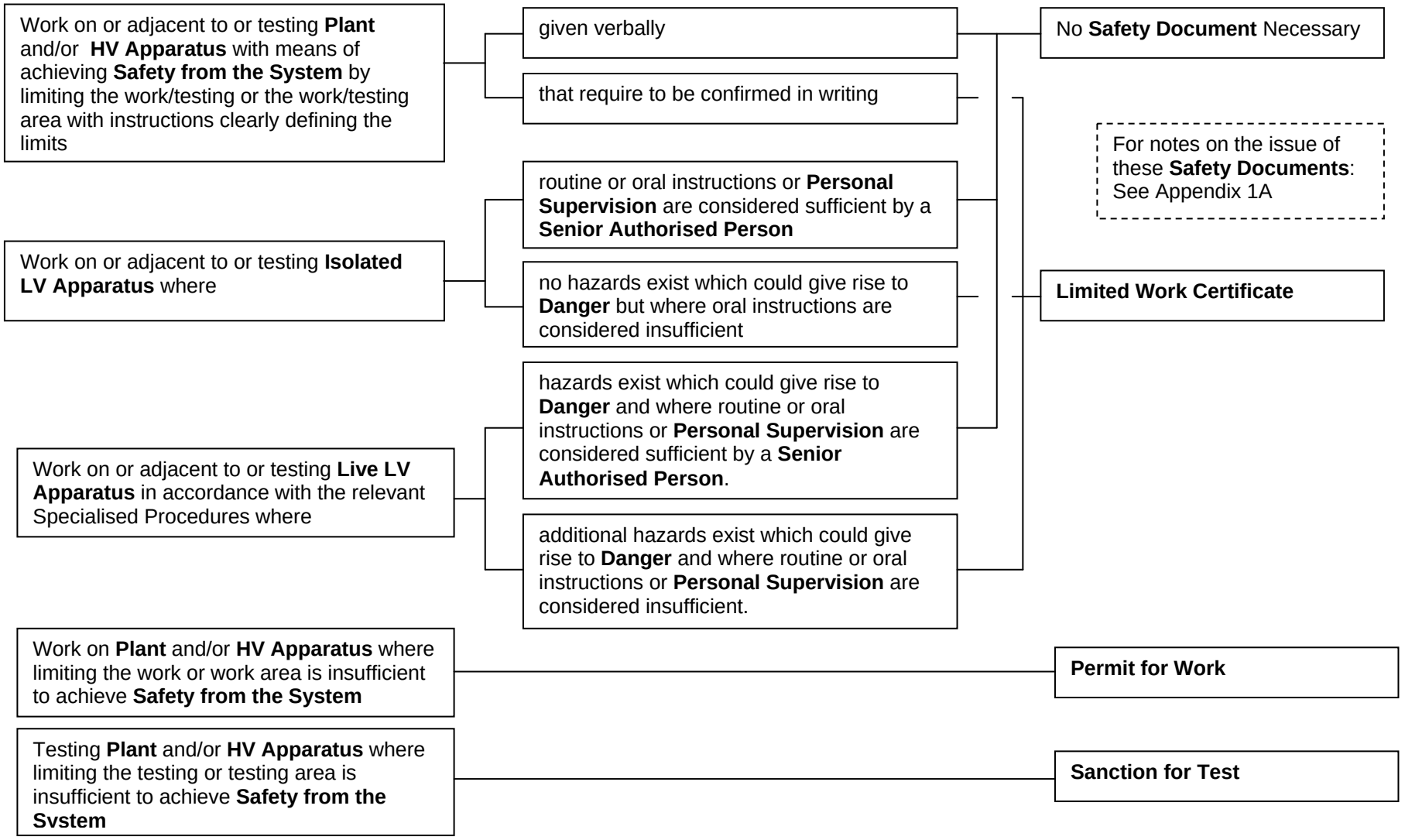
GUIDANCE FOR SELECTION OF SAFETY DOCUMENTS

	Description of Work and/or Testing	Required Document
1(a) 1(b)	Work on or adjacent to **Plant** and/or **HV Apparatus** with means of achieving **Safety from the System** by limiting the work or the work area with instructions clearly defining the limits given verbally. Testing **Plant** and/or **HV Apparatus** with means of achieving **Safety from the System** by limiting the testing or the testing area with instructions clearly defining the limits given verbally.	No **Safety Document** necessary
2	Work on or testing **Isolated LV Apparatus** where routine or oral instructions or **Personal Supervision** are considered sufficient by a **Senior Authorised Person**.	No **Safety Document** necessary
3	Work on or testing **Live LV Apparatus** in accordance with the relevant Specialised Procedures where hazards exist that could give rise to **Danger** and where routine or oral instructions or **Personal Supervision** are considered sufficient by a **Senior Authorised Person**.	No **Safety Document** necessary
4(a) 4(b) 4(c)	Work on or adjacent to **Plant** and/or **HV Apparatus** with means of achieving **Safety from the System** by limiting the work or the work area with instructions clearly defining the limits that require to be confirmed in writing. Testing **Plant** and/or **HV Apparatus** with means of achieving **Safety from the System** by limiting the testing or testing area with instructions clearly defining the limits that require to be confirmed in writing. Work on or testing **Isolated LV Apparatus** where no hazards exist which could give rise to **Danger** but where oral instructions are considered insufficient.	**Limited Work Certificate.**

	Description of Work and/or Testing	Required Document
4(d)	Work on or testing **Live LV Apparatus** in accordance with the relevant Specialised Procedures where additional hazards exist which could give rise to **Danger** and where routine or oral instructions are considered insufficient.	**Limited Work Certificate.** **Control Person** Agreement to Issue of LWC required for work or testing that could affect operating **Plant** and/or **HV Apparatus**. This 'Agreement to Issue' is supplementary to the **Consent** to issue.
5	Work on **Plant** and/or **HV Apparatus** where limiting the work or work area is insufficient to achieve **Safety from the System**.	**Permit for Work**.
6	Testing **Plant** and/or **HV Apparatus** where limiting the testing or testing area is insufficient to achieve **Safety from the System**.	**Sanction for Test**. Issued only to **Persons** authorised in writing to receive such **Safety Document**. The **Safety Document** cannot be suspended and if transferred the transfer shall be immediate. No other **Safety Document** may be in force on the item of **Plant** or **HV Apparatus** at the time of its issue.

APPENDIX 1B

FLOW CHART GUIDE FOR THE SELECTION OF SAFETY DOCUMENTS



APPENDIX 2

PROCEDURE FOR AMENDMENT OF SAFETY RULES INSTRUCTIONS

1 Foreword

The first issue of the Safety Rules Instructions was prepared from the Northern Ireland Electricity Safety Rules Codes of Practice, prior to the implementation of the 1988 Edition Safety Rules on 3 January 1989.

The preparation was subject to audit, which ensured that the provisions of the Safety Rules Codes of Practice were not weakened in the Safety Rules Instructions. Audit of the Safety Rules Instructions on a regular basis will be an established practice.

The principle of 'not weakening' any Safety Rules Code of Practice through the content of its equivalent Safety Rules Instruction is of paramount importance and is continued with any revisions and additions since 1989. This procedure ensures that the principle is upheld.

2 Scope

This procedure is concerned with:

(i) Permanent amendments, both on an interim basis and subsequent longer term revision of the affected Safety Rules Instructions to incorporate the amendments.

(ii) Temporary amendments where it is not the intention to change the content of an existing Safety Rules Instruction on a permanent basis.

Amendments in either case are expected to be very few in number and will only be made where it is established to the satisfaction of the relevant *Unit Manager* and the Chairman of EMSAC that they are necessary.

3 Recognition of an Amendment

Any person who believes an amendment to a Safety Rules Instruction is necessary shall present his case via line management. Line management will determine, in discussion with the relevant *Unit Manager* and any other relevant persons as necessary, the merit of the proposed amendment and whether the amendment is to be permanent or temporary.

4 Publishing an Amendment

The amendment, when agreed, will be published by the relevant *Unit Manager* on a standard 'Safety Rules Instruction – Notice of Amendment' form – see Section 7 of this Appendix.

A 'Notice of Amendment' form will be issued to each holder of the relevant Safety Rules Instruction and a copy will be attached to the master copy of the relevant Safety Rule Instruction.

The *Unit Manager* is responsible for ensuring that such amendments are managed and a signature of receipt is obtained for each form issued – see Section 8 of this Appendix.

The 'Notice of Amendment' form will be signed by the Chairman of the Safety Advisory Committee (EMSAC) and will include a statement to indicate the status of the amendment (permanent or temporary) and a declaration that the amendment does not weaken any of the provisions of any equivalent Safety Rules Codes of Practice.

5 Revision of Amended Safety Rules Instructions

The opportunity will be taken at the times of regular audit to issue revised versions of those Safety Rules Instructions which have permanent amendments to them.

The Manager responsible for Company Safety will exercise this revision. Each revised Safety Rules Instruction will carry an Issue number.

The index of Safety Rules Instructions will be kept up-to-date, and a revised Index will be issued with each revised Safety Rules Instruction. The recipient will acknowledge receipt of a revised Safety Rules Instruction and will return the Safety Rules Instruction and Index which have been superseded to his line manager for destruction.

6 Withdrawal of a Temporary Amendment

When the circumstances which gave rise to a temporary amendment of a Safety Rules Instruction no longer apply, the *Unit Manager* originally issuing the amendment will issue a withdrawal notice to each holder of the Safety Rules instruction – see Section 9 of this Appendix.

Acknowledgement of the withdrawal is obtained by return of the original 'Notice of Amendment' form, with Section 5 signed by the recipient.

7 SAFETY RULES INSTRUCTION AMENDMENT – STANDARD FORM

Northern Ireland Electricity Safety Rules (Electrical and Mechanical)

SAFETY RULES INSTRUCTION – NOTICE OF AMENDMENT

SAFETY RULES INSTRUCTION No. ……. **AMENDMENT No.** …….

1 APPROVAL OF AMENDMENT

I hereby approve the amendment, as detailed overleaf, to the above Safety Rules Instruction.
The amendment is for implementation within the following Departments:

……
……
……
The amendment is permanent*/ temporary*

** Delete where appropriate.*

2 REASON FOR AMENDMENT

……
……
……

3 DECLARATION

I declare that the amendment detailed overleaf does not weaken the principles established by any equivalent Northern Ireland Safety Rules Code of Practice.

4 ISSUE OF AMENDMENT

I hereby authorise the issue of the amendment detailed overleaf, for implementation within the Departments detailed above,
from……..hrs. on …….[date].

Signed: …… [EMSAC Chairman] Date: ……

5 WITHDRAWAL OF AMENDMENT – ACKNOWLEDGEMENT

Note: This section is only to be completed by the recipient of the Notice of Amendment when a temporary amendment is withdrawn, or when a permanent amendment is incorporated into a revised issue of the relevant Safety Rules Instruction. When this section is completed, this Notice of Amendment form, and any attached sheets are to be returned to line management.

I have been advised that the amendment detailed overleaf has been withdrawn and I therefore acknowledge that the amendment is no longer applicable.

Signed: …… being the recipient of the Notice of Amendment.

Name: …… [Block Capitals] Date: ……

8 SAFETY RULES INSTRUCTION AMENDMENT – RECEIPT

Northern Ireland Electricity Safety Rules (Electrical and Mechanical)

SAFETY RULES INSTRUCTION – RECEIPT OF AMENDMENT

To: Recipient of Safety Rules Instruction

From: …… Department

Date: ……

Please acknowledge receipt of the attached *Safety Rules Instruction – Notice of Amendment* by completing the Receipt section below and returning it to the undersigned.

Signed: …….. Date: ……..

Name: …… [Block Capitals] Line Management

Cut across dotted line

RECEIPT

Northern Ireland Electricity Safety Rules (Electrical and Mechanical)

To: …… [Block Capitals] Line Management

From: …… [Name in Block Capitals]

SAFETY RULES INSTRUCTION – NOTICE OF AMENDMENT

I hereby acknowledge receipt of the *Safety Rules Instruction – Notice of Amendment* relating to the Safety Rules Instruction No. …….
Amendment No. …….

Signed: ……. being the recipient of the above Notice of Amendment.

Date: ……..

9 SAFETY RULES INSTRUCTION AMENDMENT – WITHDRAWAL

Northern Ireland Electricity Safety Rules (Electrical and Mechanical)

SAFETY RULES INSTRUCTION – NOTICE OF WITHDRAWAL OF AMENDMENT

SAFETY RULES INSTRUCTION No. ……. **AMENDMENT No.** …….

1 WITHDRAWAL OF APPROVAL OF AMENDMENT

I hereby withdraw my approval of the amendment, detailed overleaf, to the above Safety Rules Instruction.

The withdrawal will take effect from ……. hrs. on ……. [date].

Signed: …….. Date: ……..

Name: ……. [Block Capitals] EMSAC Chairman

2 WITHDRAWAL OF AMENDMENT – ACKNOWLEDGEMENT

To: Each Recipient of Notice of Amendment relating to the above amendment

After the time and date of withdrawal, specified in Section 1 of this Notice of Withdrawal of Amendment, please complete Section 5 of the relevant Notice of Amendment and forward the complete Notice of Amendment, with any associated attached sheets, to the undersigned.

Signed: …….. Date: ……..

Name: ……. [Block Capitals] Line Management

APPENDIX 3

PROCEDURE FOR GAINING APPROVAL OF PROCEDURES WITHIN SPECIAL INSTRUCTIONS UNDER GENERAL PROVISION GP3 OF THE SAFETY RULES

1 Introduction

In those circumstances where it is impossible to apply the Safety Rules or there are strong reasons, commercial or technical, for not applying the Rules, General Provision GP3 of the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) allows work to proceed, provided **Safety from the System** can be maintained, and the work is in accordance with an **Approved** written procedure contained within a Special Instruction. This document sets out the procedure for gaining Approval of such procedures and also specifies how they shall be used. An up-to-date list of GP3 Special Instructions is maintained in Appendix 3 to SRI 503 –'Approval of Procedures'.

2 Approval of a GP3 Special Instruction

The Person seeing the need for a Special Instruction under General Provision GP3 of the Safety Rules shall consult his own Line Manager for guidance on suitability of a Special Instruction for the problem area identified. Following this discussion, the Person concerned shall produce a draft Special Instruction which shall include the following sections:

FOREWORD: This section shall identify the problem and explain the need for a Special Instruction.

SCOPE: This section shall identify the **Plant / Apparatus** or other problem areas to which the procedure applies.

DANGERS: This section shall identify the **Dangers** associated with the work or problem area.

PROCEDURE: This section shall detail the method and sequence of operations to be followed to overcome the **Dangers** identified in the 'Dangers' section.

The *Unit Manager*, having agreed that the procedure within the draft Special Instruction shall be **Approved**, will seek such approval in accordance with Section 3 of SRI 503 – 'Approval of Procedures'.

GP3 Special Instructions are to be subject to annual audit by the relevant *Unit Managers* to maintain their continuing validity.

3 Application of GP3 Special Instructions

When the procedure within a GP3 Special Instruction has been **Approved** and is to be applied, it is essential that sufficient control be imposed to ensure that the procedure is closely followed. To achieve this, the following points will apply:

3.1 Staff permitted to carry out this work shall have received specific training to ensure their competency for the particular work.

3.2 Their authority to carry out this work shall be recorded in writing on the associated Outage Request and/or Work Instruction.

3.3 A note informing staff that they are working under a GP3 Special Instruction shall be made on the appropriate Work Instruction.

APPENDIX 4

SPECIAL INSTRUCTION - PROCEDURES TO BE FOLLOWED WHEN NORMAL SAFETY DOCUMENT CLEARANCE / CANCELLATION CANNOT BE ENACTED

1 Introduction

The Northern Ireland Electricity Safety Rules (Electrical and Mechanical) Part B defines specific procedures which shall be followed when a **Safety Document** is required to be cleared and cancelled. However, it is recognised that there will be occasions when these procedures cannot be followed.

The **Approved** Procedures in this Special Instruction shall only be implemented when authorised by the appropriate *Unit Manager*, or his nominee, and after all reasonably practicable steps have been taken to clear and cancel the **Safety Document** in the normal manner.

2 Scope

The Special Instruction sets out the **Approved** Procedures to be followed when a **Safety** Document cannot be cleared and cancelled in the normal manner.

The occasions will be:

(i) When a **Safety Document** or **Key Safe Key** is lost.

(ii) When a recipient of a **Safety Document** is unavoidably absent.

(iii) When other items cannot be accounted for.

3 Dangers

The main **Danger** associated with not following the normal clearance/cancellation procedure is restoring **Plant**/**Apparatus** to normal operation whilst persons are still working on such **Plant**/**Apparatus**.

4 Procedure for Clearance and Cancellation of a Safety Document in the Absence of the Recipient

The **Senior Authorised Person** cancelling the **Safety Document** shall:

(i) Obtain the **Safety Document** and **Key(s)** from *Safe Custody*.

(ii) Ascertain whether all work covered by the **Safety Documents** is complete and whether all gear, tools, **Drain Earths** and loose materials have been removed and guards and access doors replaced.

(iii) Ensure that all persons that have worked under the **Safety Document** are withdrawn from the **Plant**/**Apparatus** and informed that the **Safety Document** is about to be cleared.

(iv) Ascertain whether the **Plant**/**Apparatus** is in a suitable state to be returned to service.

(v) Complete the clearance section of the **Safety Document** and endorse it: "In the absence of the recipient, I am responsible for clearing this Safety Document".

(vi) Carry out the normal cancellation procedure and record all relevant information.

(vii) After cancellation of the **Safety Document**, take whatever steps are necessary to contact the recipient either before or immediately upon his return to site, and shall inform him that his **Safety Document** is no longer in force. If the recipient does not return to site, the **Senior Authorised Person** shall personally inform every other member of the *Working party* that the **Safety Document** is cancelled and arrange for the details of the cancellation to be displayed on relevant Notice Boards within the Product / Department for a period of twelve months.

(viii) Issue a new **Safety Document** if there is work and/or testing to be completed

.

5 Procedure for Clearance and Cancellation of a Safety Document when Circuit Identification Staffs or Wristlets are Lost.

The **Senior Authorised Person** cancelling the **Safety Document** shall:

(i) Ensure that the recipient of the **Safety Document** signs a declaration stating that he has informed all **Persons** working under his **Safety Document** of his intention to clear the **Safety Document**, and stating the **Circuit Identification** colours/symbols and numbers of staffs and/or wristlets lost. The declaration shall be attached to the **Safety Document**.

(ii) Arrange for the clearance of the **Safety Document** in the normal manner.

(iii) Cancel the **Safety Document** using the normal procedure.

(iv) Arrange for the details of the lost **Circuit Identification** staffs and wristlets to be displayed on relevant Notice Boards within the Department for a period of twelve months.

6 Procedure for Clearance and Cancellation of a Safety Document when a Senior Authorised Person is Unable to Account for All Portable Drain Earths Issued with the Document.

The **Senior Authorised Person** cancelling the **Safety Document** shall:

(i) Ensure that the recipient of the **Safety Document** signs a declaration stating the number of **Drain Earths** for which he is unable to account and this shall be affixed to the **Safety Document**.

(ii) Ensure that all **Drain Earths** have been removed from the **Apparatus**. In the case of an overhead circuit, a visual check on the circuit shall be made.

(iii) Cancel the **Safety Document** using the normal procedure.

(iv) Ascertain the details of the **Drain Earths** unaccounted for and arrange for the display of this information on relevant Notice Boards within the Department for a period of twelve months.

7 Procedure for Clearance and Cancellation of a Safety Document on Completion of Work/Testing but in the Absence of the Recipient and the Safety Document and/or Keys, Circuit Identification Staffs/Wristlets.

The **Senior Authorised Person** cancelling the **Safety Document** shall:

(i) Ascertain whether all the work covered by the **Safety Document** is complete and whether all gear, tools, **Drain Earths** and loose materials have been removed and guards and access doors replaced.

(ii) Ensure that all **Persons** that have worked under the **Safety Document** are withdrawn from the **Plant**/**Apparatus** and, if possible, informed that the **Safety Document** is about to be cancelled.

(iii) Ascertain whether the **Plant**/**Apparatus** is in a suitable state to be returned to service.

(iv) Complete Sections 1 and 2 of the Safety Document Abnormal Clearance/Cancellation Certificate (see Section 9 of this Appendix).

(v) Cancel the **Safety Document** by informing the appropriate **Control Person(s)** of the cancellation and of any restrictions in returning the **Plant**/**Apparatus** to service and completing Section 3 of the Certificate.

(vi) Following the cancellation of the **Safety Document** the **Senior Authorised Person** shall take whatever steps are necessary to contact the recipient either before or immediately on his return to site, and shall inform him that his **Safety Document** is no longer in force. The **Senior Authorised Person** shall retrieve any **Circuit Identification** Staffs, Wristlets and/or **Drain Earths** issued with the **Safety Document** at this time. If the recipient does not return to site, the **Senior Authorised Person** shall personally inform every other member of the *Working Party* that the **Safety Document** is cancelled and arrange for details of the cancellation to be displayed on relevant Notice Boards within the Department for a period of twelve months.

(vii) If the **Key Safe** is available, then access to the **Safety Keys** by the **Senior Authorised Person** will be by breaking the transparent panel in the front of the **Key Safe**. Otherwise it will be necessary to remove the **Safety Locks** by cutting hasps with an appropriate tool. If this latter course of action is taken then the **Senior Authorised Person** shall ensure that when the **Safety Keys** are recovered they are destroyed.

8 Procedure when a Safety Document or Key has been Lost.

The **Senior Authorised Person** cancelling the **Safety Document** shall ensure that:

(i) In the case of a lost **Safety Document**, the recipient signs the 'Safety Document Abnormal Clearance/Cancellation Certificate' stating that he considers the **Safety Document** cleared and if he finds the **Safety Document** he will return it to the Line Manager named on the Certificate.

(ii) (a) In the event of a **Key Safe Key** being lost, the loss shall be reported without delay to a **Senior Authorised Person** who shall arrange for the immediate clearance and cancellation of the **Safety Document**, ensuring that the clearance section is endorsed "Key Safe Key No. …. lost".

If it is desirable to continue with the work, a further **Key Safe Key** shall be taken from the **Key Safe** in which the **Safety Keys** are secured and issued with a new **Safety Document**.

Before access is gained to **Safety Keys** in the **Key Safe**, a **Senior Authorised Person** shall arrange for the clearance and cancellation of all other **Safety Documents** and obtain the associated **Key Safe Keys**.

Access to the **Safety Keys** by an **Authorised Person** will be by breaking the transparent panel in the front of the **Key Safe**. The appropriate **Key Safe** lock and the transparent panel shall be replaced before the **Key Safe** can once again be used.

In the event that a **Key Safe Key** is discovered lost at a remote location before the associated **Safety Document(s)** has been cancelled, another **Key Safe Key** shall be taken from the **Key Safe** in which the **Safety Keys** are secured and put in *Safe Custody*. The details shall be recorded in the **Authorised Person**'s Log.

In the event that a **Key Safe Key** is discovered lost at a remote location after the associated **Safety Document(s)** has been cancelled, the loss will be recorded in the **Authorised Person**'s Log.

In the event that a **Safety Key** is lost before it has been placed in a **Key Safe**, then the **Authorised Person** shall have the corresponding lock removed and destroyed. The destroyed lock shall be replaced by another and its **Safety Key** placed in the **Key Safe**.

(b) If a **Safety Key** which was handed over with a **Safety Document** is lost during the course of work and/or testing, the loss shall be reported without delay to a **Senior Authorised Person** who shall arrange for the immediate clearance and cancellation procedures to be carried out in the normal way.

(c) In the case of a **Control Key** or common lock key being lost, the loss shall be reported as soon as reasonably practicable to the appropriate Line Manager who, after investigation, will arrange for the **Control Key** or common lock key to be replaced.

A **Senior Authorised Person** shall arrange for the details of the lost **Safety Document** and/or **Keys** to be displayed on relevant Notice Boards within the Department for a period of twelve months.

9 SAFETY DOCUMENT ABNORMAL CLEARANCE/CANCELLATION CERTIFICATE

Northern Ireland Electricity Safety Rules (Electrical and Mechanical)

SAFETY DOCUMENT ABNORMAL CLEARANCE/CANCELLATION CERTIFICATE

To: ……[Name of Line Manager]

Safety Document Type: …… No. ……

1 Reason for Abnormal Clearance/Cancellation of Safety Document

……
……
……
……
……

2 Clearance of Safety Document

I certify that all persons working* / testing* under the above **Safety Document** have been withdrawn from, and warned* / will be warned before their next period of duty*, not to work* / test* on the **Plant**/**Apparatus** in Section 1 of the **Safety Document**. All gear, tools, **Drain Earths** and loose material have been removed and guards and access doors have been replaced, except for:

……
……
……
……
……

Signed: ……[Recipient*/Senior Authorised Person*] Time: ……hrs
Date: ……

3 Cancellation of Safety Document

I hereby certify that all items issued under Section 3*/4* of the above **Safety Document** have been accounted for and the **Control Person(s)**…… informed of the cancellation and of any restrictions on returning the **Plant/Apparatus** in Section 1 to service.

Signed: …… Time: ……hrs. Date: …… being the **Senior Authorised Person** responsible for cancelling the above **Safety Document**.

* *Delete where applicable*

APPENDIX 5

PROCEDURE FOR DEALING WITH OBJECTIONS ON SAFETY GROUNDS

Introduction

General Provision GP4 of the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) states 'Any **Person** receiving instructions in the application of these Safety Rules shall report to the **Person** issuing those instructions any objections on safety grounds to carrying them out. Any such objections shall then be dealt with in an **Approved** manner'.

The **Approved** Procedure for dealing with such objections is as follows:

1 Any **Person** wishing to object on safety grounds to instructions issued in the application of the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) shall discuss the objection in the first place with the **Person** who issued the instruction(s) with a view to resolving the objection at that level if possible.

2 During the period the objection is being handled, every effort should be made to re-schedule the work or testing so that any part of the work or testing not affected by the objection can proceed.

3 In the event of failure to agree by the parties concerned, the matter shall be processed through increasingly senior levels of line management until agreement is reached or until the difficulty is brought to the attention of the *Unit Manager(s)* whose responsibility it is to achieve a solution to the problem. The *Unit Manager* will seek whatever knowledge is required and obtain a ruling on the objection. During these discussions the parties concerned may also consult with the Safety Representative.

4 If the matter cannot be resolved by the *Unit Manager(s)* it shall be brought to the attention of the most senior management representative responsible for operation of the Northern Ireland Electricity system who shall resolve the objection.

5 In certain circumstances the *Unit Manager* may decide that the Safety Rules cannot be applied to cover the work or testing and that the work or testing can safely proceed under a GP3 Special Instruction which shall be **Approved** in writing.

APPENDIX 6

RESPONSIBILITIES OF NOMINATED SUPERVISORS

1 Nomination of Supervisors

1.1 *Unit Managers* shall arrange to nominate appropriate persons to carry out one or more of the following functions of the Safety Rules for which nominated Supervisors are required.

(i) Setting further **Competent Persons** to work under personally retained **Safety Documents** – Safety Rules B2.2.6 and B4.2.4.

(ii) During the transfer of **Permit for Work** and **Limited Work Certificates**, receiving the **Safety Document** and associated items into *Safe Custody* – Safety Rules B2.3.2(i) and B4.3.2(i).

(iii) During the transfer of **Permit for Work** and **Limited Work Certificates**, handing the **Safety Document** and associated items to the **Competent Persons** who are to become the recipients – Safety Rules B2.3.2(ii) and B4.3.2(ii).

1.2 A list of nominated Supervisors shall be kept by each Department detailing the **Safety Documents**, the **Plant** and **Apparatus** and the Staff to which the nomination applies. The manner in which each function is to be carried out shall be specified in sufficient detail to ensure that those nominated understand the precise requirements.

1.3 The nominated Supervisor for specific functions referred to in the Safety Rules may include Team Managers or Technical Staff employed by Northern Ireland Electricity or supervisory staff employed by Contractors working on Northern Ireland Electricity **Plant** and **Apparatus**.

1.4 The nominated Supervisors need not be limited to the **Competent Person**'s normal Supervisors. They could include, for example, Technical Staff if work might be carried out when normal Supervisory staff are not working.

1.5 The nomination of Supervisors for these functions does not remove from them or any other **Persons** those responsibilities they may have as Supervisors with respect to **General Safety** (Safety Rules General Provision GP1) or general supervisory or managerial duties.

2 Nominated Supervisor's Role

The following examples demonstrate the role of the nominated Supervisor in the practical applications to **Permits for Work** of the various functions specified in the Safety Rules and outlined in Section 1.1 of this Appendix. The same Procedures apply to **Limited Work Certificates**.

2.1 Setting further Competent Persons to Work under a **Permit for Work** (example of 1.1.1(i))

2.1.1 Arrangements for initiating work shall include Procedures whereby the nominated Supervisor is told that a specific item of work is to be undertaken under a specific **Permit for Work**. The nominated Supervisor will instruct the further **Competent Persons** to work under the **Permit for Work**. The nominated Supervisor shall therefore know what work is to be done and he shall have sufficient knowledge of the **Permit for Work** to know what work is specified in Section 1 of the **Permit for Work**.

2.1.2 The nominated Supervisor shall instruct the further **Competent Persons** to report to the recipient of the **Permit for Work** and ensure that this instruction is understood.

2.2 Retaining in Safe Custody a **Permit for Work** undergoing a Transfer procedure (example of 1.1.1(ii))

2.2.1 The nominated Supervisor need not be the **Competent Person**'s normal Supervisor.

2.2.2 The nominated Supervisor shall accept the **Permit for Work**, **Keys**, associated documents and other items, after he has checked that the Transfer Record has been signed by the recipient and that the items listed in Section 3 of the **Permit for Work** are accounted for.

2.2.3 All items received shall be retained in *Safe Custody* in a manner specified by the *Unit Manager*. This shall include details of how *Safe Custody* will be transferred from one nominated Supervisor to another.

2.2.4 The *Unit Manager* shall ensure that the Procedure for *Safe Custody* of the **Permit for Work** is subjected to regular audit.

2.3 Handing to the New Recipient a **Permit for Work** undergoing a Transfer procedure (example of 1.1.1(iii))

2.3.1 The nominated Supervisor need not be the new recipient's normal Supervisor.

2.3.2 The nominated Supervisor shall ensure that the new recipient understands that he shall report to a **Senior Authorised Person** for the transfer to be completed.

2.3.3 The *Unit Manager* shall ensure that the handing-over Procedure is subjected to regular audit.

APPENDIX 7

RESPONSIBILITIES OF CONTROL PERSONS

1 Nomination of Control Persons

The Northern Ireland Electricity Safety Rules (Electrical and Mechanical) define a **Control Person** in Rule D21 (iv) as:

"A Person who has been nominated by an appropriate officer of Northern Ireland Electricity to be responsible for controlling and co-ordinating safety activities necessary to achieve **Safety from the System**."

The "appropriate officer of Northern Ireland Electricity" will be designated by the relevant *Unit Manager*, and the control room function will be enacted in accordance with **Approved** Procedures required under Rule C5.1.2(i).

The manner of implementation of the control function will therefore be completely specified by **Approved** Procedures. The following examples would be in accordance with the Safety Rules.

1.1 *Unit Managers* nominate members of their staff to be **Control Persons** for particular divisions of **Plant**/**Apparatus**.

2 Control Person Role

The examples in Section 3 of this Appendix include generalised descriptions of the sequences of events for establishing **Safety from the System**, and for the issue of **Safety Documents**. They are given to clarify the roles and duties of the various **Control Persons** involved in various **System** control configurations. Actions not involving **Control Persons** have been omitted from the sequences of events.

3 Examples

3.1 Work on 275kV Overhead Conductors (*Figure 1*)

This example relates to work on an item of **HV Apparatus** which lies wholly within the sphere of operation of one **Control Person**, and for which the isolations and other necessary safety precautions are also located within that same sphere of operations.

3.1.1 Sequence of Events

Planning

The planning process decides that safety precautions on the 275kV **System** are necessary, i.e. that Safety Rule A3.2 applies.

Decision

(i) The **Control Person** decides what safety precautions are needed to isolate from the rest of the **System**, and earth, the **Apparatus** to be worked on.

Instruction

(ii) The **Control Person** instructs an **Authorised Person**(s) to carry out the safety precautions decided in (i) above.

Confirmation, Recording and Checking

(iii) The **Control Person** receives and records confirmation of the completion of safety precautions from the **Authorised Person**s in (ii) above.

(iv) The **Control Person** checks with the **Senior Authorised Person** that the safety precautions taken in (iii) above are adequate for the work to be done.

Permit for Work

(v) On request from the **Senior Authorised Person**, the **Control Person** gives **Consent** to the issue of the **Permit for Work**.

Note: The **Control Person** retains a copy of the relevant details, and the name of the **Control Person** is entered in Section 2 of the **Permit for Work**.

(vi) On cancellation of the **Permit for Work** in (v), the **Senior Authorised Person** informs the **Control Person**.

Restoration-to-Service

(vii) The **Control Person** instructs the **Authorised Person**(s) to restore the **Apparatus** to service.

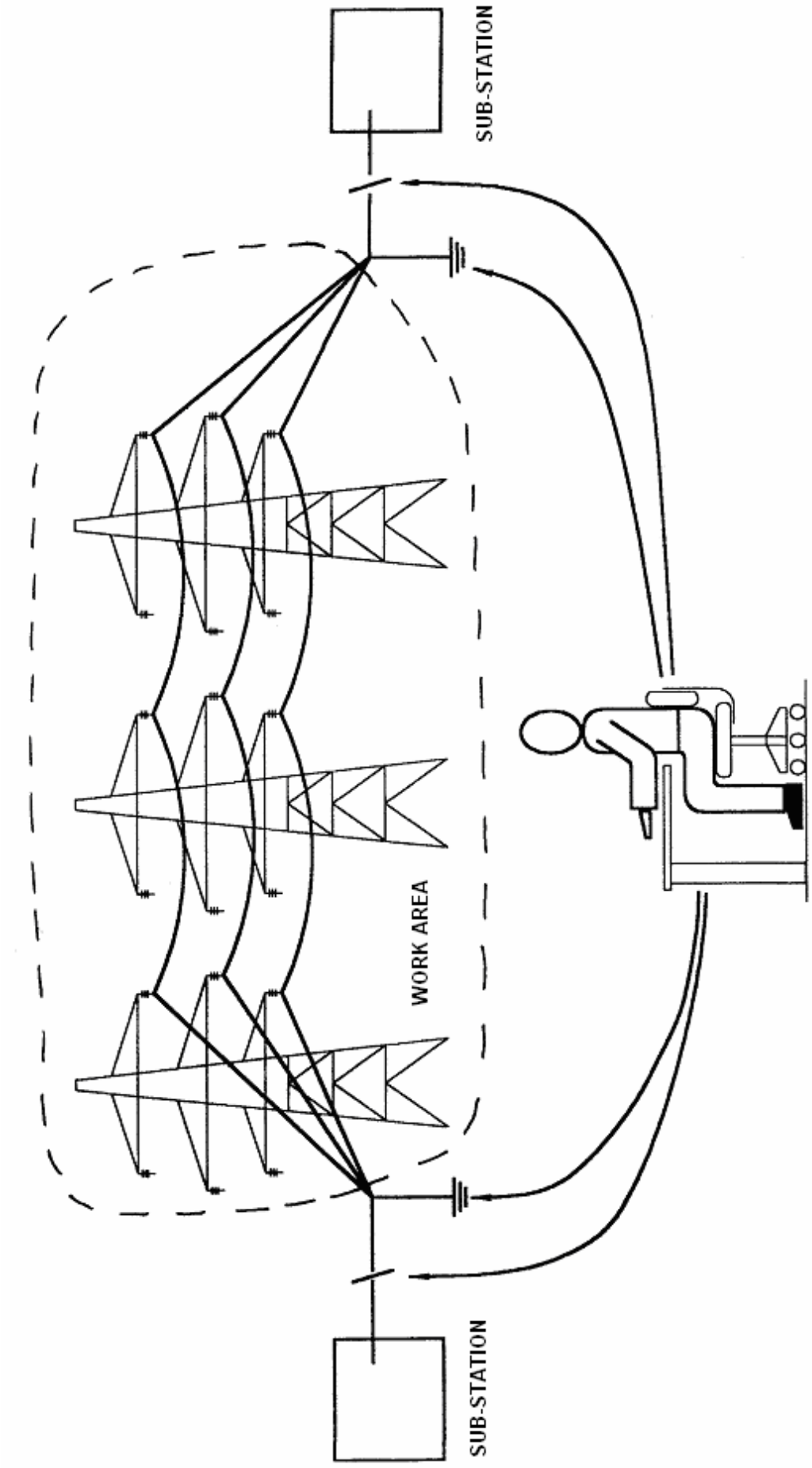


FIGURE 1 - WORK ON 275KV OVERHEAD CONDUCTORS

The following two examples relate to work on items of **HV Apparatus** which lie wholly within the sphere of operation of one **Control Person** but which, for complete isolation of that **Apparatus**, or for the maintenance of **Safety Distance** during such work, requires the operation of an **Isolating Device**(s) which lies within the adjacent sphere of operation of another **Control Person**.

3.2 Work on 110kV Isolators which requires Isolation on the 33kV System (*Figure 2A*)

In this example, complete isolation for work on items of **HV Apparatus** which lie wholly within the sphere of operation of **Control Person** A can only be achieved with the operation of an **Isolating Device** within the sphere of operation of **Control Person** B.

3.2.1 Sequence of Events

Planning

The planning process decides that safety precautions on the 110kV **System** and on the 33kV **System** are necessary, i.e. that Safety Rule A3.2 applies.

Decision

(i) **Control Person** A decides what safety precautions are needed, within his sphere of operation, to isolate from the rest of the **System**, and earth, the **Apparatus** to be worked on.

(ii) **Control Person** A consults with **Control Person** B and **Control Person** B decides what safety precautions are needed, within his sphere of operation, to isolate from the rest of the **System**, and earth if necessary, the **Apparatus** to be worked on.

(iii) **Control Person** A and **Control Person** B agree the actions necessary to establish the safety precautions required within the sphere of operation of **Control Person** B.

Instruction

(iv) **Control Person** A requests **Control Person** B to instruct an **Authorised Person**(s) to carry out the safety precautions, decided in (ii) above, which lie within the sphere of operation of **Control Person** B.

(v) **Control Person** A instructs an **Authorised Person**(s) to carry out the safety precautions, decided in (i) above, which lie within the sphere of operation of **Control Person** A.

Confirmation, Recording and Checking

(vi) **Control Person**s A and B receive confirmation of the completion of safety precautions from the **Authorised Person**(s) in (iv) and (v) above, respectively.

(vii) **Control Person** A consults with **Control Person** B, to record the actions necessary to maintain the safety precautions in (iv) and (v) above.

(viii) **Control Person** A checks with the **Senior Authorised Person** that the precautions taken in (iv) and (v) above are adequate for the work to be done.

Permit for Work

(ix) On request from the **Senior Authorised Person**, **Control Person** A gives **Consent** to the issue of the **Permit for Work**.

Note: **Control person** A retains a copy of the relevant details, and the name of **Control Person** A is entered in Section 2 of the **Permit for Work**.

(x) On cancellation of the **Permit for Work** in (ix), the **Senior Authorised Person** informs **Control person** A.

(xi) **Control Person** A informs **Control Person** B that the safety precautions in (iv) above are no longer required.

Restoration-to-Service

(xii) **Control Person**s A and B instruct the **Authorised Person**(s) to restore the **Apparatus** within their respective spheres of operation to service.

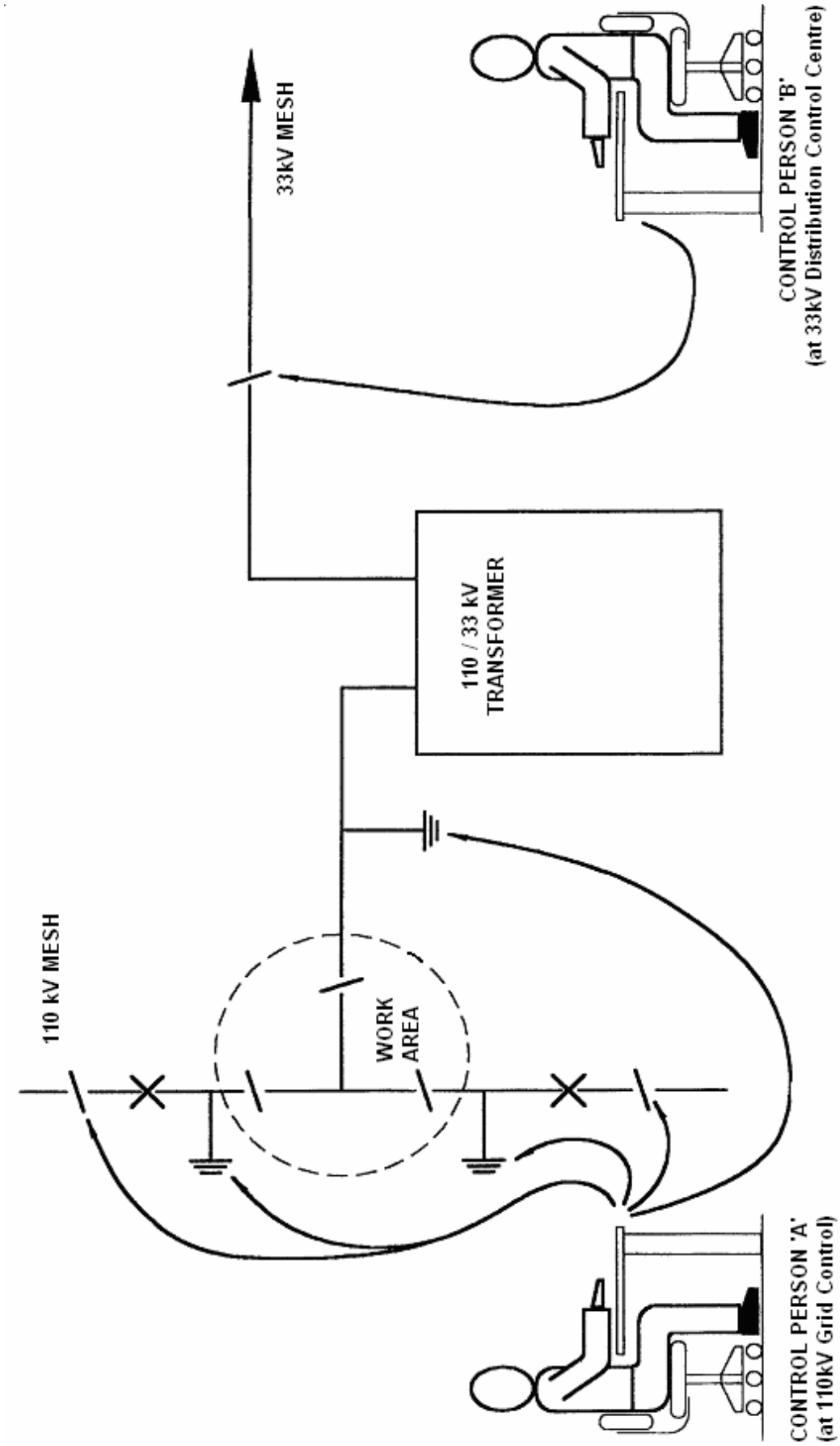


FIGURE 2A - WORK ON 110KV ISOLATORS WHICH REQUIRES ISOLATION ON 33KV SYSTEM

3.3 Work on 110kV Overhead Conductors with 11kV Conductors in Span Crossing Below (*Figure 2B*)

In this example, work on the items of **HV Apparatus** (110 kV overhead conductors) which lie wholly within the sphere of operation of **Control Person** A requires isolation and earthing of **HV Apparatus** (11Kv overhead conductors) which lie wholly within the sphere of operation of **Control Person** B.

This requires the operation of **Isolating Devices**, and the application of other safety precautions, within the sphere of operation of **Control Person** B.

3.3.1 Sequence of Events

Planning

The planning process decides that safety precautions on the 110kV **System** and on the 11kV **System** are necessary, i.e. that Safety Rule A3.2 applies. Relevant maps and diagrams showing the work location and the associated **Apparatus** are provided to each **Control Person**.

Control Person A and **Control Person** B confirm with each other that both are ready to proceed with the outage process.

11kV System

Decision

(i) **Control Person** B decides what safety precautions are needed, within his sphere of operation, to isolate from the rest of the **System**, and earth, the **Apparatus** (the 11kV conductors.

Instruction

(ii) **Control Person** B instructs an **Authorised Person**(s) to carry out the safety precautions, decided in (i) above, which lie within the sphere of operation of **Control Person** B.

Confirmation, Recording and Checking

(iii) **Control Person** B receives and records confirmation of the completion of safety precautions from the **Authorised Person**(s) in (ii) above.

110kV System

Decision

(iv) **Control Person** A decides what safety precautions are needed, within his sphere of operation, to isolate from the rest of the **System**, and earth, the **Apparatus** (the 110kV conductors) to be worked on.

Instruction

(v) **Control Person** A instructs an **Authorised Person**(s) to carry out the safety precautions, decided in (iv) above, which lie within the sphere of operation of **Control Person** A.

Confirmation, Recording and Checking

(vi) **Control Person** A receives and records confirmation of the completion of safety precautions from the **Authorised Person**(s) in (v) above.

(vii) **Control Person** A checks with the **Senior Authorised Person** that the precautions taken in (vi) above, together with the safety precautions established in (iii) above (the 11kV isolation), are adequate for the work to be done on the **Apparatus** (the 110kV conductors) which lies within the sphere of operation of **Control Person** A.

Note 1: The **Control Person** responsible for checking the adequacy of the safety precautions with the **Senior Authorised Person** is determined by the sphere of operation encompassing the work to be done.

(viii) **Control Person** A (as the **Control Person** identified in Note 1 above) consults with **Control Person** B to verify that the outage process has reached the stage of **Permit for Work** issue.

Permit for Work

(ix) On request from the **Senior Authorised Person**, **Control Person** B gives **Consent** to the issue of the **Permit for Work** for work on the **Apparatus** (the 11kV conductors) which lies within the sphere of operation of **Control Person** B.

Note 2: **Control Person** B retains a copy of the relevant details, and the name of **Control Person** B is entered in Section 2 of the **Permit for Work**.

(x) On request from the **Senior Authorised Person**, **Control Person** A gives **Consent** to the issue of the **Permit for Work** for work on the **Apparatus** (the 110kV conductors) which lies within the sphere of operation of **Control Person** A.

Note 3: **Control Person** A retains a copy of the relevant details, and the name of **Control Person** A is entered in Section 2 of the **Permit for Work**.

(xi) On cancellation of the **Permit for Work** above, the **Senior Authorised Person** informs **Control Person** A and **Control Person** B

Restoration-to-Service

(ii) **Control Person** A (as the **Control Person** identified in Note 1 above) consults with **Control Person** B to verify that both **Control Persons** have been made aware that the safety precautions established in (iii) and (vi) above are no longer required.

(iii) **Control Persons** A and B instruct the **Authorised Person**(s) to restore the **Apparatus** within their respective spheres of operation to service.

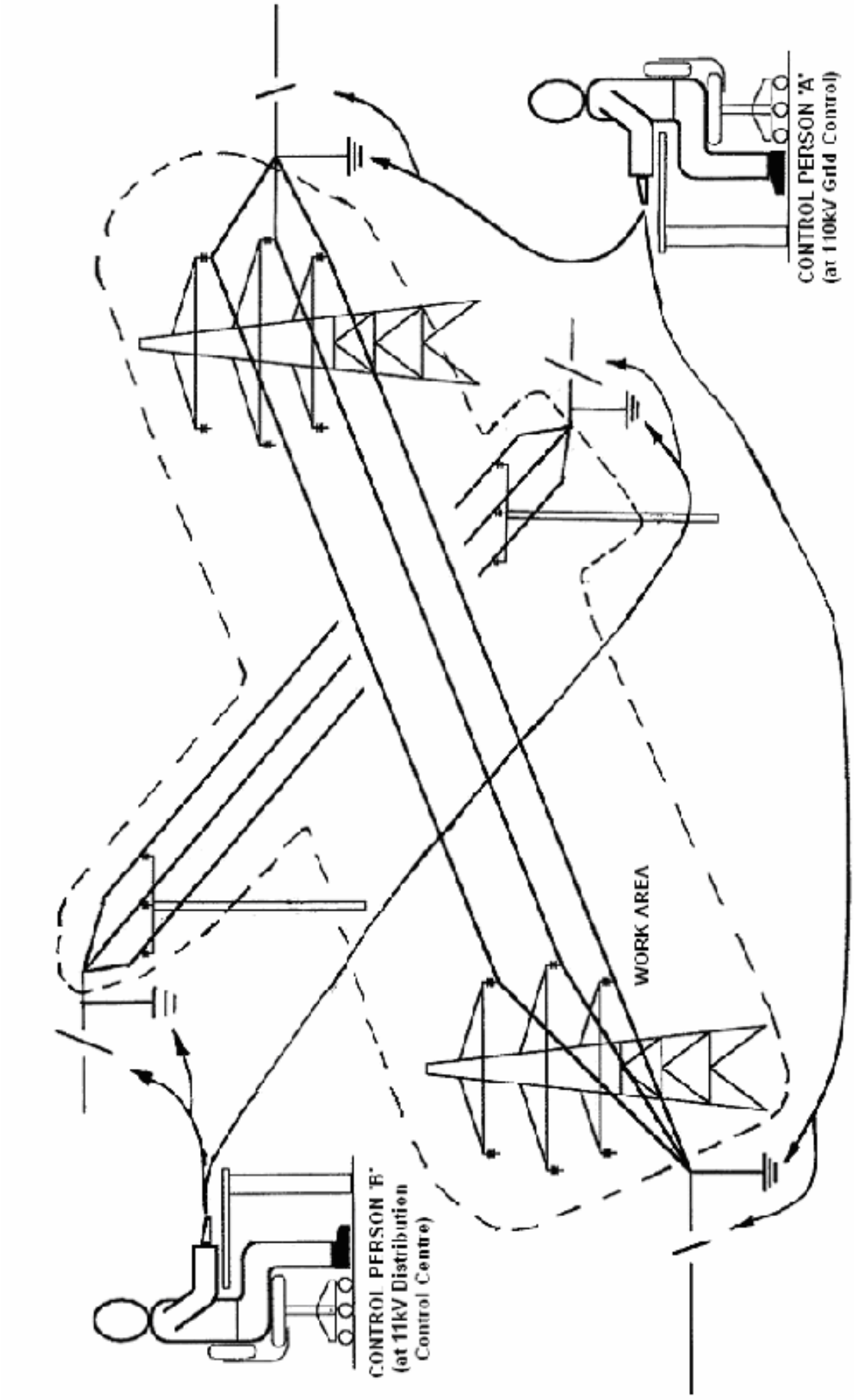


FIGURE 2B - WORK ON 11OKV OVERHEAD CONDUCTORS WHICH DOES NOT REQUIRE REMOVAL OF THE 11KV CONDUCTORS IN THE SPAN CROSSING BELOW

3.4 Work on a 110kV Circuit Breaker and 110kV Isolator (*Figure 3*)

This example relates to work on items of **HV Apparatus** which lie wholly within the sphere of operation of one **Control Person** – **Control Person** A. Isolation of the **Apparatus**, however, can only be achieved by the operation of an **Isolating Device**(s) located within the adjacent spheres of operation of **Control Person**s B and C.

3.4.1 Sequence of Events

Planning

The planning process decides that safety precautions on the 110kV **System** and on the 33kV **System** are necessary, i.e. that Safety Rule A3.2 applies.

Decision

(i) **Control Person** A decides what safety precautions are needed, within his sphere of operation, to isolate from the rest of the **System**, and earth, the **Apparatus** to be worked on.

(ii) **Control Person** A consults with **Control Person** B, and **Control Person** B decides what safety precautions are needed, within his sphere of operation, to isolate from the rest of the **System**, and earth if necessary, the **Apparatus** to be worked on.

(iii) **Control Person** A and **Control Person** B agree the actions necessary to establish the safety precautions required within the sphere of operation of **Control Person** B.

(iv) **Control Person** C (as the on-site **Senior Authorised Person**) will decide whether venting, purging, draining, adjustment of levels or other local isolation is required.

Instruction

(v) **Control Person** A requests **Control Person** B to instruct an **Authorised Person**(s) to carry out the safety precautions, decided in (ii) above, which lie within the sphere of operation of **Control Person** B.

(vi) **Control Person** A instructs an **Authorised Person**(s) to carry out the safety precautions, decided in (i) above, which lie within the sphere of operation of **Control Person** A.

(vii) **Control Person** C instructs an **Authorised Person**(s) to carry out the safety precautions, decided in (iv) above, which lie within the sphere of operation of **Control Person** C.

Confirmation, Recording and Checking

(viii) **Control Person**s A, B and C receive confirmation of the completion of safety precautions from **Authorised Person**s, in (v), (vi) and (vii) above, respectively.

(ix) **Control Person** A consults with **Control Person** B to record the actions necessary to maintain safety precautions in (vi) above.

(x) **Control Person** A checks with the **Senior Authorised Person** that the precautions taken in (v) and (vi) above are adequate for the work to be done.

Permit for Work

(xi) On request from the **Senior Authorised Person**, **Control Person** A gives **Consent** to the issue of the **Permit for Work**.

Note: **Control Person** A retains a copy of the relevant details, and the names of **Control Person** A and C are entered in Section 2 of the **Permit for Work**.

(xii) On cancellation of the **Permit for Work** in (xi) above, the **Senior Authorised Person** informs **Control Person** A.

(xiii) **Control Person** A informs **Control Person** B that the safety precautions in (v) above are no longer required.

(xiv) **Control Person** C informs an **Authorised Person**(s) that the safety precautions in (vii) are no longer required.

Restoration-to-Service

(xv) **Control Person**s A, B and C instruct the **Authorised Person**(s) to restore the **Apparatus** within their respective spheres of operation to service.

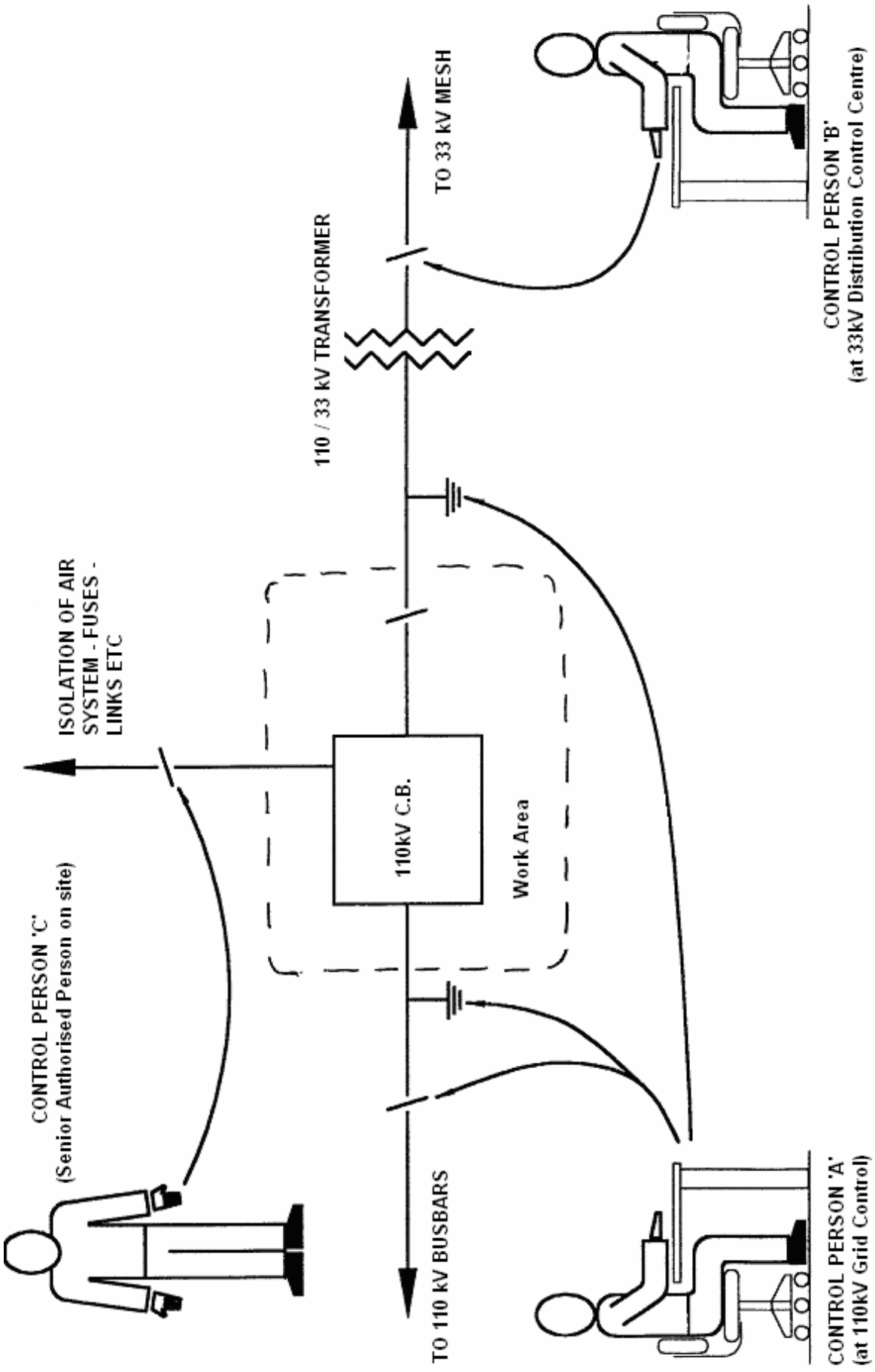


FIGURE 3 - WORK ON 110KV CIRCUIT BREAKER AND 110KV ISOLATOR

APPENDIX 8

GUIDANCE FOR COMPLETION OF LOGS

This guide should be read in conjunction with SRI 1 – 'High Voltage Switching' and SRI 13 – 'Low Voltage Apparatus'.

1 There are two types of Logs used in connection with the construction, operation and maintenance of the Northern Ireland Electricity **System**:

(i) Logs used in Substations, and

(ii) Personal Logs used in **Locations** other than Substations.

These Logs have a common format, as shown on the following page. All **Switching** instructions for **HV** and/or **LV** operations shall be recorded in these Logs.

2 All entries shall be clear and legible and shall include the name of the **Control Person** issuing the instructions. All sections of the Log shall be completed.

3 A ballpoint pen shall be used for all entries. (Other types of pen may 'run' when the pages are in contact with water.)

4 Alterations should be avoided - if this is not possible then the alteration is carried out by drawing a line through the word or words to be deleted and inserting the new word or words. Entries shall not be erased.

5 Pages shall not be removed from the Log.

6 There shall be no spaces between entries in the Log

7 Only the abbreviations listed in Appendix 10 of SRI 600 –'Application of the Safety Rules' can be used in Logs.

8 Times shall be recorded in 24 hour format.

9 Entries in Logs other than **Switching** Instructions shall be confined to protection indications, loadings, voltages, tap indications and details of failures, etc.

10 The Log is not to be used for recording information which does not relate to **System** operations.

11 The Log shall be retained for inspection for a period of two years after it has been used.

SUBSTATION LOG

DATE	TIME	CONTROL PERSON/ENGINEER ISSUING INSTRUCTION	OPERATION/INSTRUCTION/MESSAGE	TIME	CONTROL PERSON/ENGINEER ACKNOWLEDGING	AUTHORISED PERSON'S SIGNATURE

A923-975/3314

FIELD LOG

DATE/ TIME	CONTROL PERSON/ ENGINEER	OPERATION/INSTRUCTION/MESSAGE	TIME COMPLETED	TIME CONFIRMED

APPENDIX 9

COMMON OPERATIONAL LOCKS

Lock	Description of Use
'A' & 'K' Series	Yale 'A' series locks are being replaced by the equivalent ASSA 'K' series
K1 A1	Fitted on customer's access gates. (Gates leading to Northern Ireland Electricity substation areas via customers' property).
K2 A2	Fitted on all **HV** switch and isolator locking points capable of taking this size of lock and on access gates in enclosures surrounding ground mounted distribution transformers with exposed **Live HV** terminals.
K3 A3	Fitted on all **LV** isolators, kiosks and access to areas and buildings where there is unprotected **Live LV Apparatus**.
K4 A4	Fitted on all distribution substation access gates and doors excluding enclosures as stated under 'K2 / A2' and 'K3 / A3' locks.
K5	Fitted on the security / perimeter access doors or gates of all Transmission (400kV, 275kV or 110kV), and Primary (33/11kV or 6.6kV) substations.
A5	Fitted on doors or gates of new substations under construction and not connected to the Northern Ireland Electricity **System**.
'N' Series	'N1' series locks are being replaced by the equivalent 'N2' series
N1 N2	Fitted to **HV** switch and isolator locking points where 'K2' or 'A2' locks cannot be fitted. Also fitted to shutters on **HV** metalclad switchboards and to **LV** switchboards (incomers and bus-section) in Transmission substations and supervisory control switches.
N1/1 N2/1	Fitted to protection cubicles, marshalling cubicles, tap change auxiliary supplies or where 'K3 / A3' or 'K4 / A4' locks cannot be fitted.

Lock	Description of Use
570R YN5045	Used in Belfast only. Lock fitted to access doors and gates of 6.6kV distribution substations.

Persons	Key Selection
Customer having right to a shared access way	K1 or A1
Competent Persons authorised at category group D1 to gain access to distribution substations where there is no hazard from unprotected **Live** metal.	K1 and K4 A1 and A4
Competent Persons authorised at category group D1 to gain access to all distribution substations or **LV** isolators, kiosks or cubicles.	K1, K3 and K4 A1, A3 and A4 N2/1 and N1/1
Competent Persons authorised at category group D1 to gain access to Primary, 110kv, 275kV and 400kV substations.	K5
Competent Persons authorised at category group B1.	K2 and A2
Competent Persons authorised at category group B1 and with access to all substations areas, kiosks and cubicles.	K Master A Submaster N2, N2/1 N1, N1/1

APPENDIX 10

STANDARD ABBREVIATIONS

Any use of abbreviations on **Safety Documents**, Supplementary Forms, Control, Field and Substation Logs must be restricted to the following list:

DEFINED SAFETY RULES TERMS/ SAFETY INSTRUCTIONS

High Voltage	-	HV
Limited Work Certificate	-	LWC
Low Voltage	-	LV
Permit for Work	-	PFW
Safety Instruction	-	SI
Sanction for Test	-	SFT

No other defined term shall be abbreviated

GENERAL

Auxiliary	-	AUX
Busbar	-	B/B
Kilo Volts	-	kV
Number	-	No.
Overhead	-	O/H
Station	-	STN
Substation	-	S/S
Underground	-	U/G

SWITCHGEAR / TRANSFORMERS

Circuit Breaker	-	CB
Current Transformer	-	CT
Earthing Transformer	-	ET
Fused Isolator	-	FI
Generator	-	GEN
Interbus	-	IB
Isolator	-	ISOL
Local Air Receiver	-	LAR
Pole Mounted Reclosure	-	PMR
Gas Vacuum Recloser	-	GVR
Pole Mounted Sectionliser	-	PMS
Ring Main Unit	-	RMU
Solid Link	-	SL
Switch	-	Sw
Switchgear	-	SwGR
Transformer (general term)	-	Tx
Unit Transformer	-	UT
Voltage Transformer	-	VT

The following abbreviations can be used **ONLY** in Control, Field and Substation Logs

GENERAL

Castlereagh House Control Centre	-	CHCC
Delayed Auto Reclose	-	DAR
Distribution Control Centre	-	DCC
Earth Fault	-	E/F
Earth Fault Indicator	-	EFI
Emergency Control Centre	-	ECC
Energy Management System	-	EMS
Fault Passage Indicator	-	FPI
National Control Centre	-	NCC
National Grid Company	-	NGC
Scottish Power Grid System Operator	-	SPGSO
Windfarm	-	WF

OPERATIONAL

Auto Reclose	-	A/R
Automatic Voltage Regulator	-	AVR
Capacitor Voltage Transformer	-	CVT
Confirm	-	CFM
Confirmed	-	CFMD
Earth Switch	-	E/Sw
High Speed Auto Reclose	-	HSAR
Instantaneous	-	Inst
Local Trip Link	-	LTL
Make Operative	-	MO
No Flags, No Operations	-	NFNO
Normally Open	-	N/O
Overcurrent	-	O/C
Restricted Earth Fault	-	REF
Safety Secure	-	S/SEC
Select for Local Control	-	SFLC
Select for Supervisory Control	-	SFSC
Sensitive Earth Fault	-	SEF
Supervisory	-	SUPY
Synchronise	-	SYNC
Withdrawn	-	WD

ELECTRICAL TERMS

Amps	-	A
Kilo-Voltamps	-	kVA
Kilowatts	-	kW
Megawatts	-	MW
Neutral	-	N
Phase	-	Ph.
Volts	-	V

APPENDIX 11

REQUIREMENT FOR SELECTED PERSON'S REPORT

Removal of asbestos from underground cable.
Atmospheric tests in underground chambers and substations.
Handling requirements for polychlorinated Biphenyl (PCB).
Removal of particulate toxic substances associated with SF_6 breakdown products.

The above list represents the type of work where reports may be called for and is not exhaustive. The **Senior Authorised Person** may call for reports on other types of work as he considers necessary. This will require the nomination of the appropriate **Selected Person** for the newly identified hazard.

A copy of the **Selected Person**'s report form is shown on the following page.

Northern Ireland Electricity

SAFETY RULES
(Electrical and Mechanical)

SELECTED PERSON'S REPORT

S.P. No.

* REQUEST FOR OUTAGE AND/OR PROGRAMMED WORK **No.**

LWC *	**SFT ***	**PFW ***	**No.**

LOCATION _____

PLANT / APPARATUS _____

WORK / TESTING TO BE CARRIED OUT AND NATURE OF HAZARD(S) SUSPECTED _____

REQUESTED BY _____ *** SENIOR AUTHORISED PERSON / PLANNING**

HAZARDS IDENTIFIED / MEASUREMENTS TAKEN _____

I hereby declare that, providing the conditions below are satisfied, the work / testing detailed above can, in my opinion, be safely carried out. Where the work / testing is to be in a confined space, tests have been made to confirm that it is free from flammable and toxic substances and has been adequately vented to allow the work / testing to commence.
It is recommended that the following special precautions are taken during the course of the work / testing:

This report is only valid for _____ Hours* / days* after issue.

Further testing* / examination* will be required at intervals of _____ Hours* / days*.

Signed _____ being a Selected Person

* Delete as applicable Time _____ Date _____

SR-SD9/1

APPENDIX 12

REQUEST FOR OUTAGE AND/OR PROGRAMMED WORK – FORM (FRONT)

Northern Ireland Electricity

REQUEST FOR HV OUTAGE AND OR PROGRAMMED WORK
(This is not a safety document)

REQUEST NO:

ASSOCIATED DOCUMENTS

DEPOT: | DEL. CONTROL: | SRG2 COMPLEX WK:

EVENT NO: | JOB NO: | OP NO:

ORDER NO: | CNS NO:

LOCATION: | CB NO: | DIAG REF:

VOLTAGE kV): | COLOUR CODE: | SOCKET:

PLANT/APPARATUS IDENTIFICATION:

WORK/TESTING TO BE DONE:

POINTS OF HV ISOLATION AND LV ISOLATION TO THE SYSTEM:

PRIMARY EARTHS REQUIRED:

DURATION OF OUTAGE / WORK

	START TIME	DAY (start):	DATE (start)		FINISH TIME:	DAY (finish):	DATE (finish)
FROM				TO			

REQUESTED BY: | DATE: | BUSINESS:

SIGNED (S.A.P.) | DATE: | NAT/WK:

APPROVED BY: | DATE: | RESTORATION TO SERVICE IN EMERGENCY:

AGREED BY: | DATE: | REASON FOR OUTAGE:

NOTES:

LOAD ANALYSIS (DCC USE ONLY)

CIRCUIT		RE-SUPPLY1			RE-SUPPLY2		
PEAK	LOAD TO TRANSFER	O/C SETTING	PEAK	PEAK + TRANSFER	O/C SETTING	PEAK	PEAK + TRANSFER

AOR'S/SWITCHING PLAN / ADDITIONAL COMMENTS

DELEGATED CONTROL RECORD NAME	DELEGATED	RETURNED

Engineer / SAP: | Supervisor:

Contractor: | Other:

FORM E600

REQUEST FOR OUTAGE AND/OR PROGRAMMED WORK – FORM (REAR)

SAFETY PRECAUTIONS TO BE INSTRUCTED BY SITE CONTROL PERSON – OTHER ISOLATIONS / PRECAUTIONS:

CONDITION OF PLANT / APPARATUS (LWC ISSUE ONLY):

LIMITS OF WORK / TESTING OR WORK AREA (LWC ISSUE ONLY):

FURTHER PRECAUTIONS TO BE TAKEN DURING COURSE OF WORK / TESTING TO AVOID SYSTEM DERIVED HAZARD:

PCR UPDATE REQUIRED: (Yes / No)

ALTERATION TO - (Enter NEW,CHANGE,RECOVERY or N/A)

TRANSFORMER:
SWITCHGEAR:
A/B SWITCH / FUSEGEAR:

COMMISSIONING REQUIREMENTS

CONSTRUCTION CLEARANCE
CONSTRUCTION CLEARANCE NO:
COMMISSION REPORT
PHASE CHECK
PRESSURE TEST
LV NORMALISATION
PARALLEL/SUBSTATION SWITCHING

OPERATIONAL REQUIREMENTS:

OPS STAFF	TO REPORT FROM	TIME	DATE	PURPOSE

LOAD ANALYSIS CONTINUED…:

ISOLATION AND RESTORATION DETAILS (to be filled in on completion of outage)

DATE OF ISOLATION:
DATE OF RESTORATION:
TIME OF ISOLATION:
TIME OF RESTORATION:
NUMBER OF CUSTOMERS:

APPENDIX 13

LV REQUEST FOR OUTAGE AND/OR PROGRAMMED WORK – FORM (FRONT)

Northern Ireland Electricity	**REQUEST FOR LV OUTAGE AND/OR LIVE WORK (This is not a safety document)**	**REQUEST NO:**

DEPOT:
EVENT NO: JOB NO: OP NO:
ORDER NO: CNS NO:

ASSOCIATED DOCUMENTS

TOWN		CB NO	
LOCATION / ADDRESS		LV DIAGRAM	
SECONDARY SUBSTATION			

PLANT / APPARATUS IDENTIFICATION:

WORK / TESTING TO BE DONE:

CONDITION OF PLANT / APPARATUS (LWC ISSUE ONLY):

POINTS OF ISOLATION TO THE SYSTEM

DURATION OF OUTAGE / WORK:

	START TIME	DAY (start)	DATE (start)	FINISH TIME	DAY (finish)	DATE (finish)
FROM				TO		

REQUESTED BY: DATE: BUSINESS:

IS JUSTIFICATION FOR LIVE WORK REQUIRED:

REASON FOR JUSTIFYING LIVE WORKING:

SAP AGREEING TO WORK DATE

APPROVED BY: DATE

NOTES:

Authorised Person:		Supervisor:	
Work Team:		Other:	

REQUEST FOR OUTAGE AND/OR PROGRAMMED WORK – FORM (REAR)

LIMITS OF WORK / TESTING OR WORK AREAS (LWC ISSUE ONLY):

FURTHER PRECAUTIONS TO BE TAKEN DURING THE COURSE OF WORK / TESTING TO AVOID SYSTEM DERIVED HAZARD:

SAFETY PRECAUTIONS TO BE INSTRUCTED BY SITE CONTROL PERSON:

NATURE OF WORK REASON FOR OUTAGE

RECORDS:

LV DIAGRAM TO BE AMENDED? PCR TO BE AMENDED?

OPERATIONAL REQUIREMENTS:

OPS STAFF	TO REPORT FROM	TIME	DATE	PURPOSE

LV SYSTEM TO BE RETURNED TO NORMAL OPERATION ON COMPLETION OF OUTAGE:

ISOLATION AND RESTORATION DETAILS (to be filled in on completion of outage):

DATE OF ISOLATION: DATE OF RESTORATION:

TIME OF ISOLATION: TIME OF RESTORATION: NUMBER OF CUSTOMERS:

APPENDIX 14

PROCEDURE FOR EMERGENCY AUTHORISATION OF NIE STAFF

1 Introduction

This procedure is intended to give a procedure for the emergency re-authorisation of **Senior Authorised Persons**, within the company who no longer have a requirement to fulfil the duties of a **Senior Authorised Person** and therefore have relinquished their **Senior Authorised Person** status.

The procedure below provides a method to release and utilise a resource in times of extreme need within the framework of the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and the spirit of the requirements of SRI 505 - 'Examination and Authorisation /Nomination /Assessment of Northern Ireland Electricity Personnel'

2 Authorisation level

Confirmation of a person's previous level of Authorisation will be used to determine the maximum level of Authorisation that can be applied to an individual under emergency situations. It is the responsibility of the individual to ensure that he only operates **Plant** and **Apparatus** within his competency.

An "archive" of Authorisation levels of **Persons** who's Authorisation has been withdrawn due to changes in the requirements of their job will be maintained by the Group Safety & Risk Department.

3 Emergency Authorisation Procedure

For emergency authorisations it is imperative that the authorisation can be completed quickly but still within the spirit of SRI 505 – 'Examination and Authorisation/Nomination/Assessment of Northern Ireland Electricity Personnel'.

3.1 Authorisation Level

The previous Authorisation level of **Person** shall be used as a basis in determining the person's maximum level of emergency Authorisation.

3.2 Management Responsibility

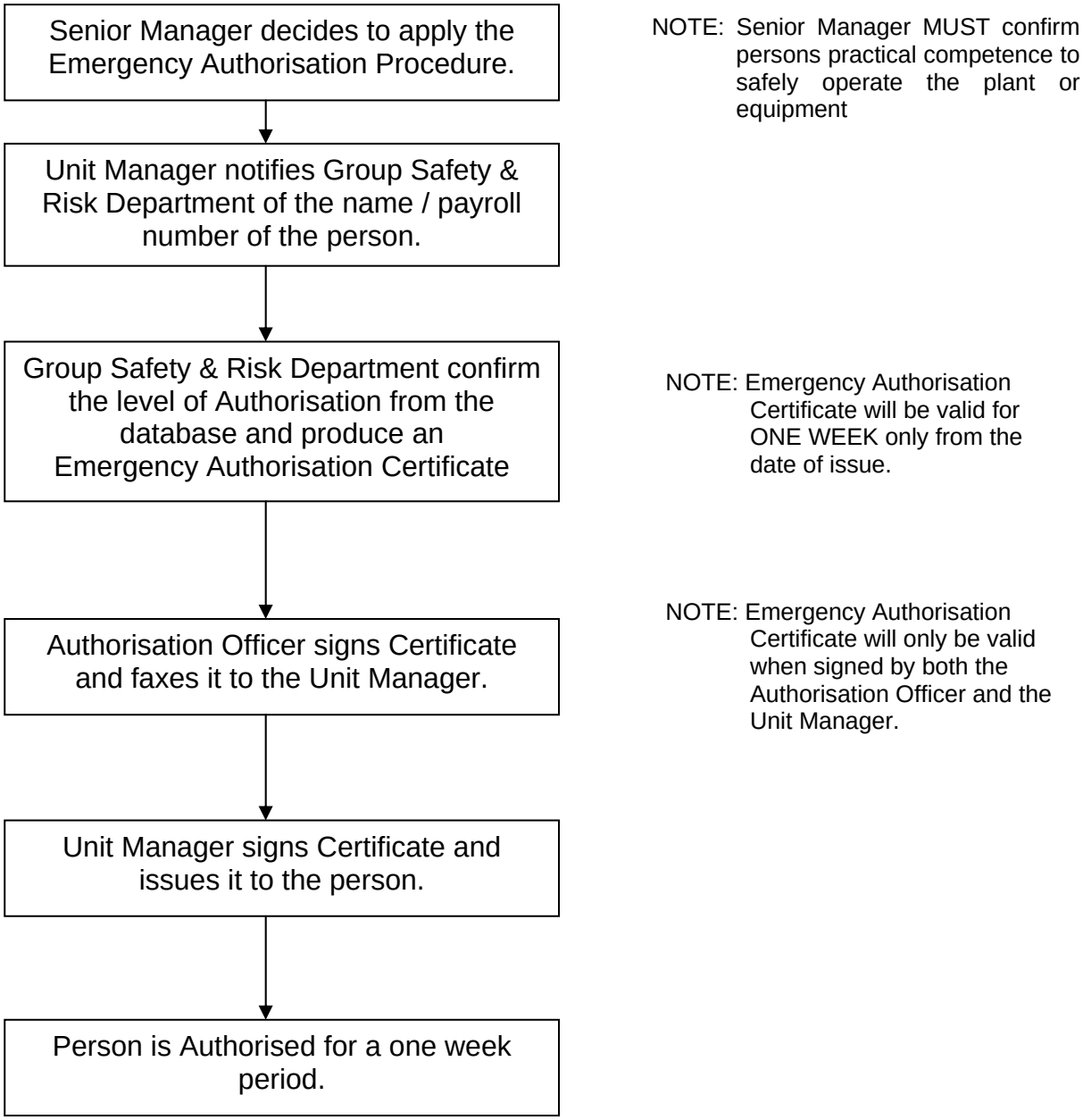
Both the *Unit Manager* involved and an Authorisation Officer shall sanction the emergency Authorisation.

3.3 Period of Authorisation

The emergency Authorisation will only be effective for a period of ONE WEEK from the date of issue.

This process (with guidance notes) is summarised in the following flowchart.

EMERGENCY AUTHORISATION PROCEDURE



APPENDIX 15

SIGN ON / SIGN OFF SHEET

NORTHERN IRELAND ELECTRICITY
ATTACHMENT SHEET FOR PERMIT FOR WORK

PERMIT FOR WORK No. _____

DATE _____ _____ _____ LOCATION _____

RECIPIENT OF PERMIT FOR WORK _____

By signing below I certify that I have read and understood the contents of the above numbered Permit for Work and accept my responsibilities under that Safety Document.

NAME (BLOCK CAPITALS)	SIGN ON	SIGN OFF	NAME (BLOCK CAPITALS)	SIGN ON	SIGN OFF

(1) THIS FORM MUST BE USED WHERE THERE IS MORE THAN ONE 2 MAN TEAM WORKING ON THE PFW.
(2) PERSONS WORKING ON THE SYSTEM DEFINED BY THE PFW MUST 'SIGN ON' BELOW PRIOR TO STARTING WORK AND 'SIGN OFF' AFTER COMPLETING WORK
(3) THIS ATTACHMENT SHEET MUST BE RETURNED TO THE SAP WHEN CLEARING THE PFW

APPENDIX 16

CONTINUATION SHEET

Northern Ireland Electricity

SAFETY RULES
(Electrical and Mechanical)

SAFETY DOCUMENT CONTINUATION SHEET

No.

SAFETY DOCUMENT CONTINUATION SHEET FOR USE WHEN INSUFFICIENT SPACE IS AVAILABLE ON NORTHERN IRELAND ELECTRICITY SAFETY DOCUMENTS

LOCATION	ASSOCIATED **SAFETY DOCUMENT** TYPE & NUMBER		
	LWC *	**SFT ***	**PFW ***
	No.		

ENTER TITLE OF RELEVANT SECTION OF ASSOCIATED **SAFETY DOCUMENT**
(i.e. 2. (i) PRECAUTIONS TAKEN TO ACHIEVE SAFETY FROM THE SYSTEM)

ENTER ADDITIONAL INFORMATION

NOTE
THIS CONTINUATION SHEET TO BE ATTACHED TO THE ASSOCIATED **SAFETY DOCUMENT**

SIGNED being the Senior Authorised Person preparing the associated **Safety Document**.

Time Date

* Delete as applicable

SRI 600/16

NORTHERN IRELAND ELECTRICITY SAFETY RULES GUIDANCE

CONTENTS

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES GUIDANCE DOCUMENT

SRG 1

[Issue 1]

LIVE WORKING ON THE NIE LV SYSTEM SAFETY JUSTIFICATION

Contents **Page**

LIVE WORKING ON THE NIE LV SYSTEM – SAFETY JUSTIFICATION

1 SCOPE

This document presents the case for the ongoing management of **Live LV** Working as a means of undertaking work **Live** on the NIE **LV System** safely and in conformity with Health & Safety legislation, Regulatory and other legal requirements, within the UK.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and are as follows:

Apparatus – All equipment forming part of the **System** in which electrical conductors are used, supported, or of which they may form a part, and for which Northern Ireland Electricity has a maintenance responsibility.

Approved - Sanctioned by the Chairman of the Electrical & Mechanical Safety Advisory Committee (EMSAC) for use.

Competent Person – A person who has sufficient technical knowledge and/or experience to enable him to avoid **Danger** who may receive, transfer and clear specified **Safety Documents** when nominated by an appropriate officer of Northern Ireland Electricity.

Danger – A risk, to health or of bodily injury.

High Voltage (HV) – A voltage exceeding 1000 volts.

Live – Electrically charged.

Low Voltage (LV) - A voltage not exceeding 1000 volts.

Plant – Fixed and movable items of equipment, other than **Apparatus** forming part of the **System**, for which Northern Ireland Electricity has a maintenance responsibility.

Safety Documents - Being one of the following:

(i) **Limited Work Certificate** – A **Safety Document** of a format indicated in these Rules which defines the limits within which work or testing may be carried out and specifies necessary precautions.

(ii) **Permit for Work** – A **Safety Document** of a format indicated in these Rules specifying the **Plant** and/or **Apparatus** to be worked on, the work to be carried out and the actions taken to achieve **Safety from the System**.

(iii) **Sanction for Test** – A **Safety Document** of a format indicated in these Rules specifying the **Plant** and/or **Apparatus** to be tested, making known the conditions under which the testing is to be carried out and confirming actions which have been taken to achieve **Safety from the System**.

System - Items of **Plant** and **Apparatus** which are used separately or in combination in any process associated with the generation, transmission or distribution of electricity.

For the purposes of this document the following additional definition will apply:

Apparatus – Where the word *Apparatus* is used in this document without qualification it refers to **Low Voltage Apparatus**. It includes all **LV Apparatus** between the **Low Voltage** terminals of **HV** distribution transformers and all customers' installations for which Northern Ireland Electricity has a maintenance responsibility.

3 OVERVIEW

The philosophy of **Live LV** Working is to:

1) establish a regime and subsequently apply systems of work (or processes) that will enable hands on **Live LV** work to be carried out safely on the NIE **LV System**.

2) ensure the number and duration of supply interruptions (affecting customers who expect, and in many cases rely on, continuity of supply) are kept to a minimum, whilst operating and maintaining the supply systems to required standards.

Live LV Working is an alternative work method to dead working, for maintenance, faultfinding, refurbishment and connection work on the NIE **LV System**.

The principles involved in **Live LV** Working are founded on:

1) Establishing competency of persons, by way of appropriate qualifications and training and assessment.

2) Applying specially developed safe working methods.

3) Isolating persons electrically from earth, by using **Approved** insulating gloves which provide the primary insulation between **Live** metal and the person's body, supplemented by **Approved** insulated tools.

Ongoing management of **Live LV** Working requires that NIE has in place resources to:

1) Develop Method Statements.

2) Manage training.

3) Ensure appropriate PPE, tools and equipment are obtained, and maintained.

4) Ensure adequate and thorough auditing and reviews are subsequently carried out.

Live LV Working is used extensively by most Distribution Network Operators. Experience has shown that:

1) The technique has been well developed; **Live** working procedures have been used worldwide for many years.

2) Methods have been well proven to be safe.

4 INTRODUCTION

Justification for **Live LV** Working is based on the principle that the work method and its associated controls enable competent persons to undertake the work safely. In all considerations of **Live LV** Working techniques, it shall be emphasised that the safety of those persons directly or indirectly involved, including the public, is of paramount importance.

Legislation requires that a safe working environment be established and maintained in all situations, and the argument is centered on satisfying this demand.

This document outlines the main requirements for a company utilising **Live LV** Working as a means of completing significant quantities of work, without interrupting supplies of electricity to customers, unless necessary due to safety requirements.

5 HEALTH, SAFETY AND OTHER LEGAL REQUIREMENTS

The key legal issues applicable to **Live LV** Working are to ensure compliance with the Management of Health and Safety at Work Regulations 1992 and the Electricity at Work Regulations (N.I.) 1991. In addition to these requirements, the following list of statutory provisions (which is not exhaustive) is also relevant to **LV Live** Working:

Health and Safety at Work (NI) Order 1978
Electricity Supply Order 1991
Provision and Use of Work Equipment Regulations 1992
Electricity Supply Regulations 1991
Personal Protective Equipment Regulations 1992.

The Electricity at Work Regulations (NI) 1991, Regulation 14 states that

> *"A person shall not be engaged in any work activity on or near any live part (other than one suitably covered with insulating material so as to prevent danger) where danger may arise unless:*

(i) *it is unreasonable in all the circumstances for it to be dead; and*

(ii) *it is reasonable in all the circumstances for him be at work on or near it while it is live; and*

(iii) *suitable precautions (including, where necessary, the provision of suitable protective equipment) are taken to prevent injury."*

Compliance with requirement (i) is achieved by reference to the need for the supply company to ensure the number and duration of supply interruptions (affecting customers who expect, and in many cases rely on, continuity of supply) are kept to a minimum, whilst operating and maintaining the supply systems to required standards.

Compliance with requirement (ii) and (iii) is achieved by:

(a) Permitting only **Competent Persons** to work
(b) Following **Approved** procedures
(c) Using **Approved** tools and equipment
(d) Working in accordance with company Safety Rules.

Compliance with requirement (iii) is reinforced by implementing and maintaining the specific PPE requirements necessary for **Live LV** Working.

It is important to note that no Electricity Supply Licensing or Regulatory legislation at present places any requirements on Suppliers to manage **Live** working -it only increases the need to minimise interruptions of supply and any other disruption to users of electricity.

This need to minimise supply disruption and the creation of other hazards is the main driver for companies to adopt **Live LV** Working procedures.

6 LIVE LV WORKING

The following "Streams" are established during ongoing management of **Live LV** Working:

6.1 Training

A comprehensive package, which includes training specifically, tailored to company requirements. Authorisation of persons to carry out **Live LV** Working shall be based on satisfactory completion of this training, and subsequent formal assessments.

Training for all **Competent Persons** required to perform **Live LV** work shall consist of, in sequence:

(i) Simulated **LV** Working (on systems that are not **Live**) during which an initial safety and skills assessment is completed;

(ii) On satisfactory assessment, continuation of training using a **Live** training system at a location suitably equipped, concluding with an interim assessment of skills gained;

(iii) Training would then be transferred to **Live LV** networks, with continuing direct supervision and assessment by the training organisation. Once the required standard is achieved, persons would be individually assessed on all aspects, and if satisfactory, authorised to undertake **Live LV** Working.

6.2 Risk Assessment

This is a formal site risk control process, recorded on a standard on-site risk assessment form in accordance with the Management of Health and Safety of Work Regulations. It includes a section specifying procedures for working on or near **Live** *Apparatus*. The form also details the specific **Live** work to be carried out. Any hazards are noted, along with the control measures required and steps taken to limit or eliminate them. The names of all team members present are recorded, with the procedures to be used for that particular job. If any additional hazards or risks are foreseen or observed during the course of work, the job shall stop immediately and these additions shall be added to the original form.

6.3 Personnel

Team members:

The persons employed to carry out **Live LV** work shall be **Competent Persons** suitably authorised, who have successfully completed the training and assessment process detailed in section 6.1.

Others:

Team Managers shall be fully conversant with the requirements of **Live LV** Working Procedures and be suitably authorised. This ensures work planning and management functions can be safely implemented. Team Managers shall ensure the team is properly equipped with tools, equipment, and procedures.

Any **Senior Authorised Person** required to perform duties in relation to the **LV** system shall be authorised for overall management of **Live LV** Working. Responsibilities include work planning/programming and advising on safety issues (which may relate to **Live** and to non-**Live** work on interconnected systems) when necessary.

6.4 Live LV Method Statements

Method Statements shall be included in the relevant construction manuals. The Method Statements shall specify:

(i) The preliminary work to be completed prior to starting work, including the on job Risk Assessment, removal of other hazards such as other sources of danger in proximity, inspection of all tools, protective equipment and devices to ensure that they are fit for use.

(ii) The specific safety precautions to be taken before and during the course of work.

(iii) The method for carrying out the work to completion.

6.5 Management of LV Working Tools and Equipment

All **LV** tools and equipment shall be:

(i) **Approved** by the company in which the work will be carried out.

(ii) Inspected before each job.

(iii) Cared for and stored in suitable conditions when not in use.

The intervals for inspection and testing should be clearly stated. It is suggested that the intervals are:

(i) Gloves and **LV** Tools: –
Inspected before and after use by the Competent Person.

(ii) Gloves and **LV** Tools: –
Inspected on a regular basis by line management or when deemed necessary.

(iii) Gloves: –
Formally replaced or tested as necessary.

6.6 Safety Auditing of LV work

It is recommended that site safety inspections, which are completed at predetermined intervals by management, are utilised to confirm that procedures are complied with.

This Safety Inspection shall verify that:

(i) Safety and work procedures are being adhered to and the supervisory back up and control mechanisms are being maintained.

(ii) The procedures, work planning and control processes are correct and relevant to the work being undertaken

(iii) Teams are completing the necessary documentation and continue to possess the skills required for the work.

(iv) No complacency exists due to familiarity with the work procedures.

(v) The condition of equipment and the **LV Live** gloves is satisfactory.

(vi) All insulating tools and equipment have valid Approvals and are in good condition.

(vii) Polarity checks are being carried out (where applicable).

The results of the audits are discussed with the individuals involved in the **Live LV** work and the Intranet reporting form completed.

7 CONCLUSIONS

7.1 This Safety Justification **Live LV** Working document is founded upon the following principles: -

(i) Being in conformity with the requirements of Health and Safety and other relevant legislation, company Safety Rules and other safety and work method documents and instructions; and

(ii) Having safe working methods, using appropriately managed and **Approved Live** working tools and equipment, and **Approved** procedures and/or instructions; and

(iii) Ensuring competency of team members, supervisors and all others involved.

7.2 Two further specific requirements, arising from the Electricity at Work Regulations, and the Management of Health and Safety at Work Regulations, are that:-

(i) To conform with Regulation 14 of the Electricity at Work Regulations, justification shall be confirmed in advance of each job by the person performing the work, justifying it for **Live LV** Work; and

(ii) The competent person performing the work, prior to starting work, shall carry out an on-site risk assessment.

7.3 Finally, as regards documentation: this justification document has set out the principles to be adopted for **Live LV** Working in NIE, based on the impact of current legislation; hence company Safety Rules and other relevant philosophy and policy statements at present support this process.

Procedures written specifically for **Live LV** Working, and other associated documents, shall reflect these principles.

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES GUIDANCE DOCUMENT

SRG 2

[Issue 1]

COMPLEX PLANNED WORK – SETTING PERSONS TO WORK

Contents **Page**

COMPLEX PLANNED WORK – SETTING PERSONS TO WORK

1 SCOPE

Work may involve several *Working Party(s)* working within one **Isolated** zone.
This Procedure may be used when such work is being carried out on **Apparatus** by more than one *Working Party* or by a single *Working Party* comprised of more **Persons** than the recommended maximum limit.

2 DANGERS

The main **Dangers** to personnel working on **Apparatus** are electric shock, burns or falling, arising from incorrect identification of the **Apparatus** or, from rise in potential due to badly connected or insecure **Earthing Devices**.

3 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and are as follows:

Apparatus – All equipment forming part of the **System** in which electrical conductors are used, supported, or of which they may form a part, and for which Northern Ireland Electricity has a maintenance responsibility.

Approved - Sanctioned by the Chairman of the Electrical & Mechanical Safety Advisory Committee (EMSAC) for use.

Earthing Device

An **Approved** means of providing a connection between a conductor and earth, being one of the following:

(i) **Primary Earth** – A fixed or portable **Earthing Device** applied at a position defined in a **Safety Document**.

(ii) **Drain Earth** - A fixed or portable **Earthing Device** applied for the purpose of protection against induced voltages or inadvertent backfeed.

Danger – A risk, to health or of bodily injury.

High Voltage (HV) – A voltage exceeding 1000 volts.

Isolated – Disconnected from associated **Plant** and/or **Apparatus** by an **Isolating Device(s)** in the isolating position, or by adequate phyical seperation or sufficient gap.

Isolating Device – A device for rendering **Plant** and **Apparatus Isolated**.

Low Voltage (LV) - A voltage not exceeding 1000 volts.

Persons

Being one of the following:

(i) **Competent Person** – A **Person** who has sufficient technical knowledge and/or experience to avoid **Danger** who may receive, transfer and clear specified **Safety Documents** when nominated by an appropriate officer of Northern Ireland Electricity.

(ii) **Authorised Person** – A **Competent Person** who has been nominated by an appropriate officer of Northern Ireland Electricity to carry out duties specified in writing.

(iii) **Senior Authorised Person –** An **Authorised Person** nominated by an appropriate officer of Northern Ireland Electricity to carry out duties specified in writing, including the preparation, issue and cancellation of specified **Safety Documents**.

Plant – Fixed and movable items of equipment, other than **Apparatus** forming part of the **System**, for which Northern Ireland Electricity has a maintenance responsibility.

Safety Document

Being one of the following:

(i) **Limited Work Certificate** – A **Safety Document** of a format indicated in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), which defines the limits within which work or testing may be carried out and specifies necessary precautions.

(ii) **Permit for Work** - A **Safety Document** of a format indicated in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), specifying the **Plant** and/or **Apparatus** to be worked on, the work to be carried out and the actions taken to achieve **Safety from the System**.

(iii) **Sanction for Test** - A **Safety Document** of a format indicated in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), specifying the **Plant** and/or **Apparatus** to be tested, making known the conditions under which the testing is to be carried out and confirming actions which have been taken to achieve **Safety from the System**.

Safety from the System – That condition that safeguards persons working on or testing **Plant** and/or **Apparatus** from the **Dangers** which are inherent in the **System**.

Supervision

Being one of the following:

(i) **Immediate Supervision** – **Supervision** by a **Person** who is continually available at the **Location** where work or testing is in progress and who attends the work area as is necessary for the safe performance of the work.

(i) **Personal Supervision** – **Supervision** by a **Person** such that the supervising **Person** is at all times during the course of the work or testing continuously observing and in the presence of the individual(s) being supervised with the ability to intervene.

When individual(s) are working at height, supervision can be given at ground level providing verbal and visual communication is maintained at all times.

This level of supervision shall ensure individual(s) are not exposed to **Danger**.

System - Items of **Plant** and **Apparatus** which are used separately or in combination in any process associated with the generation, transmission or distribution of electricity.

For the purposes of this document the following additional definition will apply:

Working Party – The **Persons** under the **Immediate Supervision** of a **Competent Person** and includes a **Competent Person** when working alone. The recommended maximum number of **Persons** comprising a *Working Party* is five.

Work Area – Any place where a defined package of work or testing under the Northern Ireland Electricity Safety Rules is carried out

Work Location – Any place at which work or testing under the Northern Ireland Electricity Safety Rules is carried out.

4 TRAINING

Persons working to this Procedure shall be given appropriate training and shall have sufficient technical knowledge and experience of the work to be undertaken and shall be conversant with this Procedure.
Before each occasion when this Procedure is to be used, the **Senior Authorised Person** shall confirm that the recipient of any **Safety Document** understands the procedures detailed in this document. If no **Safety Document** is to be issued then the person organising the work shall confirm that the person in overall charge of the work understands the procedures detailed in this document.

5 PROCEDURE

5.1 General

The Procedure is designed to give guidance when more than one *Working Party* has work to complete within one **Isolated** zone.

There may be a number of *Work Areas* within the *Work Location*.

Where there are a number of *Work Areas* within the *Work Location*, a **Person** within the *Work Location* shall be clearly identified to be in overall charge of the work. This **Person** shall ensure that individual 'Whole Job Risk Assessments' are completed by each *Working Party* and shall take into account interactions between *Working Party(s)* and the changing environment of the *Work Location*.

For work on **Apparatus** the following requirements shall be satisfied:-

1) The work shall be identified into clearly defined work packages.

2) Individual *Working Party(s)* shall be defined with their roles and responsibilities clearly understood.

3) A clearly identified person shall be in charge of each *Working Party*. This person shall have responsibility for safety aspects on the work site including P.P.E. and general safety management including completion of Whole SiteRisk Assessment for the *Work Area*.

4) The work packages for planned work shall be clearly identified on the relevant **HV** or **LV** E600 'Request for Outage and/or Programmed Work' form.

5) The E600 'Request for Outage and/or Programmed Work' form shall detail a plan of **Safety Document(s)** to be issued. It may be appropriate to issue a number of **Safety Document(s)**. A Safety document may be issued to the **Competent Person** in charge of each *Working Party* for the work to be carried out by that *Working Party*. Alternatively a single **Safety Document** may be issued to a **Person** in charge of a number of *Working Party(s)* within a *Work Location*. The number of **Safety Documents** will depend on the nature of the individual work packages and the requirement for **Immediate Supervision**.

6) Consideration of project management for complex planned work.

5.2 Pre-Outage Procedure

5.2.1 Plans

The relevant **HV** or **LV** E600 'Request for Programmed Work and/or Outage form' shall be used to produce the Master Work Plan. A suitably scaled Master Work Plan and a copy of the relevant section of the **System** Control diagram or other suitably marked diagram showing the boundaries of all Work Areas within the Work Location shall be produced. **Apparatus** to be worked on shall be indicated on the Master Work Plan.
Individual Work Plans identifying the relevant Work Areas for each *Working Party* shall be produced from the Master Work Plan.
A copy of the relevant section of the **System** Control diagram or other suitably marked diagram shall also be provided.
The Individual Work Plans shall be checked to be in agreement with the Master Plan by the proposed recipient of the planned **Safety Documents** or the person in overall charge of the work where a **Safety Document** is not to be issued**.**

5.3 Outage Procedure

5.3.1 Following Isolation

If **Safety Documents** are necessary they shall be issued by a **Senior Authorised Person** for work to be carried out within the Work Location. The relevant Master Work Plan shall also be checked by the **Senior Authorised Person** at this time to correspond with the **Safety Document** being issued. The relevant Master Work Plan shall be signed, timed and dated by both the **Senior Authorised Person** and the recipient of the **Safety Document** to certify that the **Apparatus** to be worked on, as indicated by the Master Work Plan, is specified on the **Safety Document**. A Sign On Sign Off sheet shall be initiated by the recipient of the **Safety Document** and completed by all members of the *Working Party(s)* working under the **Safety Document** where a *Working Party* consists of more than two persons.

If **Safety Documents** are not required then the relevant Master Work Plan shall be checked on site by the person in overall charge of the work to ensure agreement with the planned work to be undertaken and signed, timed and dated.

5.3.2 Work Plan

The person in overall charge of the work shall be responsible for ensuring that each **Competent Person** in charge of a *Working Party* shall be issued with:

(i) An Individual Work Plan clearly defining the *Work Area(s)* for his *Working Party* and identifying the **Apparatus** on which work is to take place. This Individual Work Plan shall be signed, timed and dated by the recipient of the **Safety Document** and the person in charge of the *Working Party* to certify that the **Apparatus** to be worked on, as indicated by the Individual Work Plan, is specified on the **Safety Document**.

(ii) The Individual Work Plan shall contain a copy of the relevant section of the **System** diagram or other suitably marked diagram, map, Grade 1 information etc.

(iii) Contact details for the person in overall charge of the work and a suitable emergency number.

5.4 Responsibilities of the Competent Person in Charge of Each Working Party

The **Competent Person** in charge of each *Working Party* shall:

(i) Read and understand the contents of any **Safety Document** issued for the work. Check that the **Apparatus** to be worked on, as indicated by the Individual Work Plan, is specified on the **Safety Document**.

(ii) Instruct each member of the *Working Party* on the work to be done.

(iii) Identify the point of work by:

(a) reference to an Individual Work Plan;
(b) checking **Apparatus** identification corresponds to that on the Plan;
(c) checking the identification of the substation, if applicable

(iv) Complete a Whole Job Risk Assessment for the Work Area

(v) Ensure that the person in overall charge of the work is aware of his contact details.

Pre – Outage Procedure

Does the work involve multi discipline teams?

Yes

Team Managers(TM) to discuss entire job.
The TM with the main work content is to act as the Lead TM and take ownership of job.

No

Does job involve >1 Working Party or is the Working Party >5 persons? Are there other factors, which make the job complex?

Yes

No

SRG 2 does not apply.
(OM to validate at E600 approval)

Does the Lead TM consider the job Complex?

SRG 2 does not apply.
(OM to validate at E600 approval)

No

Yes

SRG 2 does not apply.
(OM to validate at E600 approval)

TM's to continue to liase, discuss changes or additions with each other. Advise OM accordingly if changes relate to Network Access or alterations to E600

TM's to discuss full work content of entire job, with their individual team members, prior to teams arriving on site.

Initial discussion between lead TM and Outage Manager (OM), or his appointed Outage Engineer, to agree if the job is complex. (OM and TM to use their combined knowledge and experience in making this decision)

Job agreed as complex and SRG 2 to apply

No

Yes

Date for Complex Job Pre-Outage Planning meeting arranged by TM and OM. Prior to this meeting: -

- Lead TM creates initial draft of 'Complex Job Pre Planning Sheet'
- All TM's create their Individual Work Plans

Typical contents of Master and Individual Work Plans

- Work instruction sheet (e.g. Grade 1 sheet, Tree Cutting Wayleave Sheet, Maximo Work Instruction, Secondary wiring diagrams, Individual Method Statements, JMS Work Instruction, Final Pole schedule, other written work instructions, etc)
- Control Diagram (HV and/or LV) suitably marked up denoting points of isolation, earthing and identifying the apparatus to be worked on
- Suitably scaled maps
- E600 (HV and/or LV)
- The Complex Job Pre Planning sheet (in Master Work Plan only)
- Whole Job R.A. (Blank)
- Near Miss Report (Blank)

Pre -Outage Planning Meeting

Attended by all relevant TM's, OM, Person In Overall Charge of Work (where practicable), Third Party contractors (if considered necessary).

- Individual work plans reviewed
- Areas where problems may arise are identified and actions taken to resolve
- Consideration given to Project Management of entire job
- Person in Overall Charge of Work on day of outage identified and nominated
- Master Work Plan created (consists of sum of Individual Work Plans)
- Individual Work Plans checked against Master Work Plan
- Complex Job Pre Planning Sheet updated, finalised and when all actions resolved, signed off by Outage Manager and Lead Team Manager.

Has work content/circumstances changed since completion of Complex Job Pre Planning Sheet?

Yes

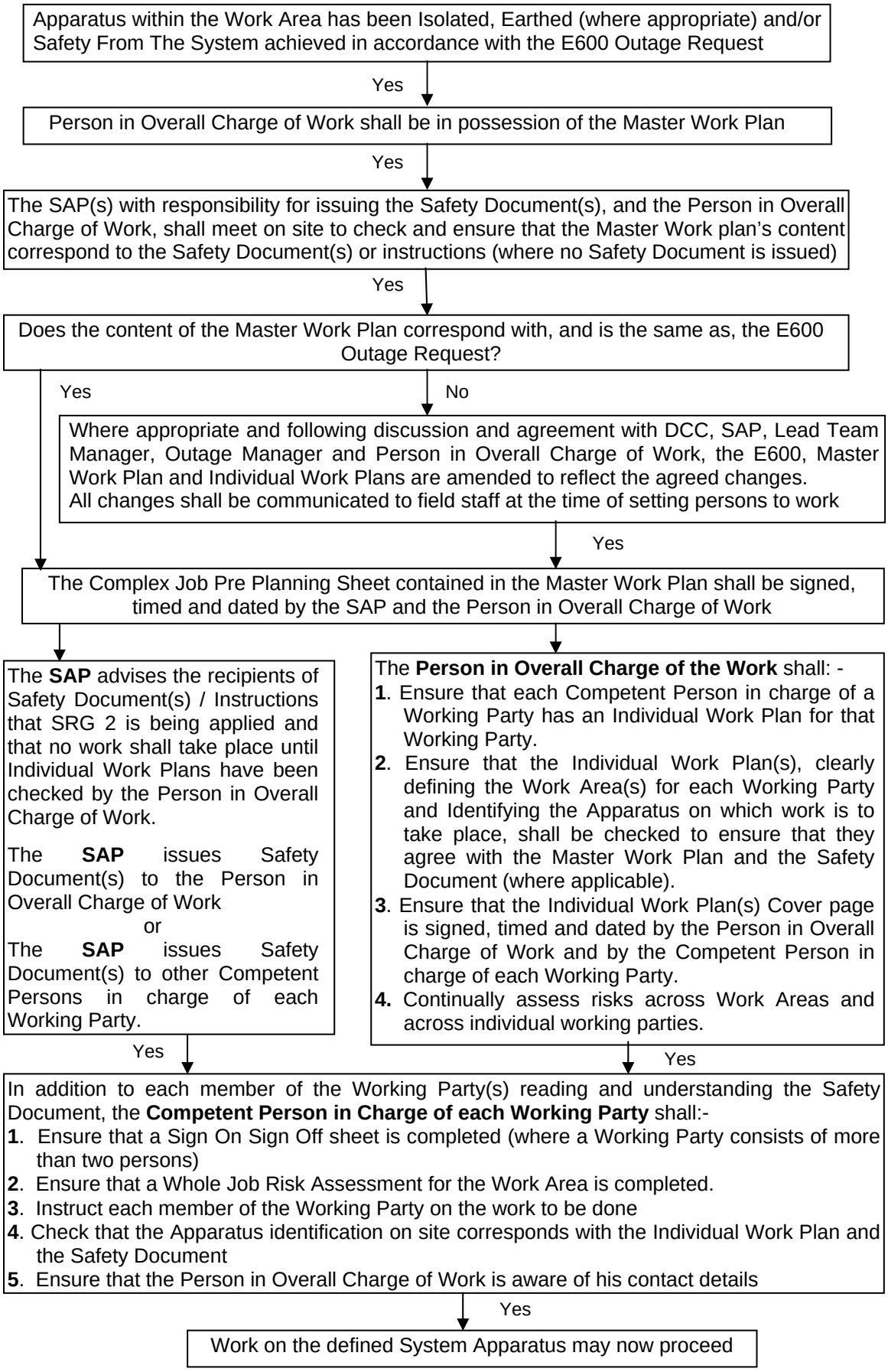
No

Master Work Plan, Individual Work Plans and Complex Job Pre Planning Sheet amended to reflect changes and all parties advised.

Yes

Copy of Master Work Plan given to Person in Overall Charge of Work a minimum of 2 days prior to Shutdown date

Outage Procedure on day of work



NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES GUIDANCE DOCUMENT

SRG 3

[Issue 1]

IDENTIFICATION OF LOW VOLTAGE PAPER INSULATED LEAD COVERED CABLES

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IDENTIFICATION OF LOW VOLTAGE PILC CABLES

1 INTRODUCTION

The vast majority of **Low Voltage (LV)** Paper Insulated Lead Covered (PILC) cables on the Northern Ireland Electricity (NIE) network are constructed with Steel Tape Armours (STA) wound on a bedding of hessian around the lead sheath.

High Voltage (HV) PILC (Hessian and PVC covered) cables typically have Steel Wire Armours (SWA). Some very old, **HV** PILC cables also exist where the armours, providing mechanical protection to the cable, are also constructed with Steel Tape Armours (STA). Due to their age and location many of these cables are not individually recorded or identified as STA on NIE mapping or cable record systems.

It is therefore difficult to visually identify, from appearance alone, whether a STA PILC cable is an **LV** or an **HV** cable.

The vast majority of routine **LV** jointing is justified, and carried out with the **Apparatus Live**. There is a risk that an **HV** PILC cable could be opened in error by a cable jointer after mistaking it for an **LV** cable. A similar situation also exists with jointing on **Isolated LV** cables, as the cable being worked on may in fact be a STA HV cable.

It should be stressed that PILC STA **HV** cable exists in a minority of locations however planning, engineering, Team Managers and jointing staff must always be vigilant to this risk.

2 SCOPE

2.1 This procedure applies to planned work where a cable sheath is to be removed and insulation exposed.

2.2 This instruction does not attempt to reduce the severity of any injuries that may occur if a **Live HV** cable is opened. Opening a **Live HV** cable carries the risk of severe injury and it is expected that any jointer will open all cables with care and follow **Approved** jointing procedures including use of Personal Protective Equipment (PPE).

3 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and are as follows:

Apparatus – All equipment forming part of the **System** in which electrical conductors are used, supported, or of which they may form a part, and for which Northern Ireland Electricity has a maintenance responsibility.

Approved - Sanctioned by the Chairman of the Electrical & Mechanical Safety Advisory Committee (EMSAC) for use.

Authorised Person – A **Competent Person** who has been nominated by an appropriate officer of Northern Ireland Electricity to carry out duties specified in writing.

Competent Person – A person who has sufficient technical knowledge and/or experience to enable him to avoid **Danger**.

Danger – A risk, to health or of bodily injury.

High Voltage (HV) – A voltage exceeding 1000 volts.

Isolated – Disconnected from the associated **Plant** and/or **Apparatus** by an **Isolating Device(s)** in the isolating position, or by adequate physical separation or sufficient gap.

Isolating Device – A device for rendering **Plant** and **Apparatus Isolated**.

Live – Electrically charged.

Low Voltage (LV) - A voltage not exceeding 1000 volts.

Plant – Fixed and movable items of equipment, other than **Apparatus** forming part of the **System**, for which Northern Ireland Electricity has a maintenance responsibility.

Senior Authorised Person – An **Authorised Person** nominated by an appropriate officer of Northern Ireland Electricity to carry out duties specified in writing, including the preparation, issue and cancellation of specified **Safety Documents**.

For the purposes of this document the following additional definition will apply:

Positive Cable Identification – The identification of a cable by its physical attributes or by means of testing. (In all instances the **Approved** VODCA device shall be used prior to working on any previously identified cable).

4 OBJECTIVE

To reduce the probability of opening a **Live** STA, PILC **HV** cable.

5 GENERAL REQUIREMENTS FOR WORKING ON LV PILC CABLES

The following criteria apply to work on all **LV** PILC cables.

5.1 All cable records, GNIS maps, **LV** diagrams and other available information shall be checked at the work planning stage to determine which cables exist at the point of work.

5.2 Team Managers or **Senior Authorised Persons** setting excavation or jointing teams to work shall make reference to these records prior to setting persons to work.

5.3 The work instruction sheet, associated maps or cable records shall, where reasonably practicable be given to the cable jointer to indicate if **HV** cables whether PILC Steel Tape Armoured (STA), PILC Steel Wire Armoured (SWA) or PVC covered are known to be present in the immediate vicinity.

5.4 Where maps or cable records may not be readily available to the jointer, as in the case of faults, etc, the jointer shall be given an oral instruction advising the details of known cables in the immediate vicinity from his Team Manager or an **Senior Authorised Person** who has previously checked cable records and maps.

5.5 Where cable records denote that **HV** cables exist at the point of work sufficient excavation shall take place to expose all known cables in the immediate vicinity.

5.6 Where an **HV** cable is suspected, or known to be in the immediate vicinity, **LV** jointing work will only commence after positive identification has been carried out proving that the cable to be worked on is an **LV** cable.

6 POSITIVE CABLE IDENTIFICATION OF LV CABLES

6.1 *Positive Cable Identification* may be carried out using one or more of the following methods:

6.1.1 Some **HV** and **LV** Cables may be identified from embossing on the PVC cable oversheath. **HV** cables PVC oversheath may be marked with 11,000V or 33,000V. **LV** cables PVC oversheath may be marked 600/1000 volts.

6.1.2 Steel Wire Armoured PILC cables must be treated as **HV** cables unless proven otherwise.

6.1.3 Where reasonably practicable, excavate and expose the PILC cable to a point where a service joint (with a service cable exiting this joint) or PILC to PVC covered **LV** cable transition joint is found.

6.1.4 The cable must be traced visually or, with a rope noose around the cable and it must be identified throughout its entire length from the point of work to an **LV** circuit termination point.

6.1.5 A single cable shown on cable record plans (including utilising maps, record drawings, book records and **LV** diagrams where appropriate) which is clearly designated as being an **LV** cable on the plans and where only one cable is found at the work location.
This will necessitate sweeping the joint hole area for a distance of at least 2m where possible either side of the centre line of the joint hole with a Cable Avoidance Tool (CAT) to confirm that only one cable exists.

6.2 There will be many situations where the cable to be worked on can be positively identified by using one, or a combination of these physical means of identification only.

6.2.1 When positive identification by physical means cannot be carried out, the **LV** cable shall where reasonably practicable be identified using an **Approved** cable identifier. The signal transmitter shall be connected between two phases to reduce the magnitude of signals on the Neutral and Earth that could transfer to the sheath or armour of an adjacent **HV** cable. An **Approved** signal receiver device should then be applied to all of the cables exposed in the excavation at the work location.

6.2.2 Where positive cable identification has been carried out by means of testing, the **LV** cable to be worked on shall be clearly identified, or marked, to the person carrying out the work by the person who completed the test.

6.2.3 When it has been not possible to carry out positive cable identification on an **LV** cable then the risk of working on an energised **HV** cable shall where reasonably practicable be removed. This could be by positive **HV** cable identification under a **Sanction For Test** in accordance with SRI 5, de-energising the cables or a combination of both methods depending on the circumstances and what is considered reasonably practicable.

7 VODCA - VOLTAGE DISCRIMINATOR FOR PILC CABLES

7.1 The **Approved** device known as VODCA must be used by the jointer, before removing belt insulation papers, to make a final check to confirm that the PILC cable being worked on is not **Live** at **High Voltage**. The nature of the VODCA's operation is such that it measures the electro static field surrounding a **Live** cable. It can only be applied to the cable belt insulation papers after the cable serving armours and lead sheath have been removed.

7.2 The VODCA instrument is NOT a cable identifier. It will indicate that a cable is energised at **HV**, **LV** or not **Live**.

7.3 There have been incidents where STA PILC **HV** cables have been opened in error. The VODCA has proven to be extremely effective at identifying these cables prior to further insulation papers being removed and works proceeding on the cable cores.

7.4 Irrespective of which means of positive cable identification as defined in this procedure is used, the VODCA shall be used in all instances immediately prior to proceeding to work on any PILC cable.

8 EXAMPLES OF LV CABLE IDENTIFICATION PROCESS

In addition to the requirements specified in
Section 5 'General Requirements for Working on LV PILC cables',
Section 6 'Positive Cable Identification of LV cables' and
Section 7 'VODCA - Voltage Discriminator for PILC cables' of this document, the following actions are required prior to working on an **LV** PILC cable as described in Clauses 8.1 and 8.2 below.

8.1 Example 1: Work on **LV** PILC Cables with only **LV** cables present in the immediate vicinity

8.1.1 If it is considered from utilising all cable records (including maps, record drawings, book records, **LV** diagrams and local knowledge where appropriate, that there are only **LV** cables present in the area of intended jointing work, and use of a cable avoidance tool (CAT), excavation and inspection of the cables agrees with the records used to identify the **LV** cable, then the work may proceed in the sequence as set out in 8.1.2 to 8.1.4

8.1.2 Apply the VODCA in accordance with section 7.5 of the NIE MV/LV jointing Manual.

8.1.3 If the VODCA indicates that the cable is energised at **HV**, or is not **Live** as expected then work must stop immediately and a Line Manager or **Senior Authorised Person** advised.

8.1.4 Confirmation that the cable is **Live** at **LV** will allow jointing work to proceed in accordance with approved procedures.

8.2 Example 2: Work on **LV** PILC Cables with **HV** cables suspected, or known to be, present in the immediate vicinity (see Figure No.1).

8.2.1 Where an **HV** cable is suspected, or known to be in the immediate vicinity, **LV** jointing work will only commence after positive identification has been carried out proving that the cable to be worked on is an **LV** cable.

8.2.2 Positive identification of the **LV** cable can be determined by visual, physical cable attributes, additional excavation and inspection or alternatively, and where reasonably practicable, by **LV** cable testing. Alternatively it may be acceptable to eliminate the **HV** cable by its positive physical identification.

8.2.3 Where positive cable identification of the PILC **LV** cable cannot be achieved then further steps to identify the cable may necessitate isolation and testing of **HV** cables. This will be the case when the **HV** cables are potentially STA PILC cable. This work of determining positive cable identification of **HV** cables is to be carried out in accordance with NIE Safety Rules Instruction SRI 5 – 'High Voltage Cables'.

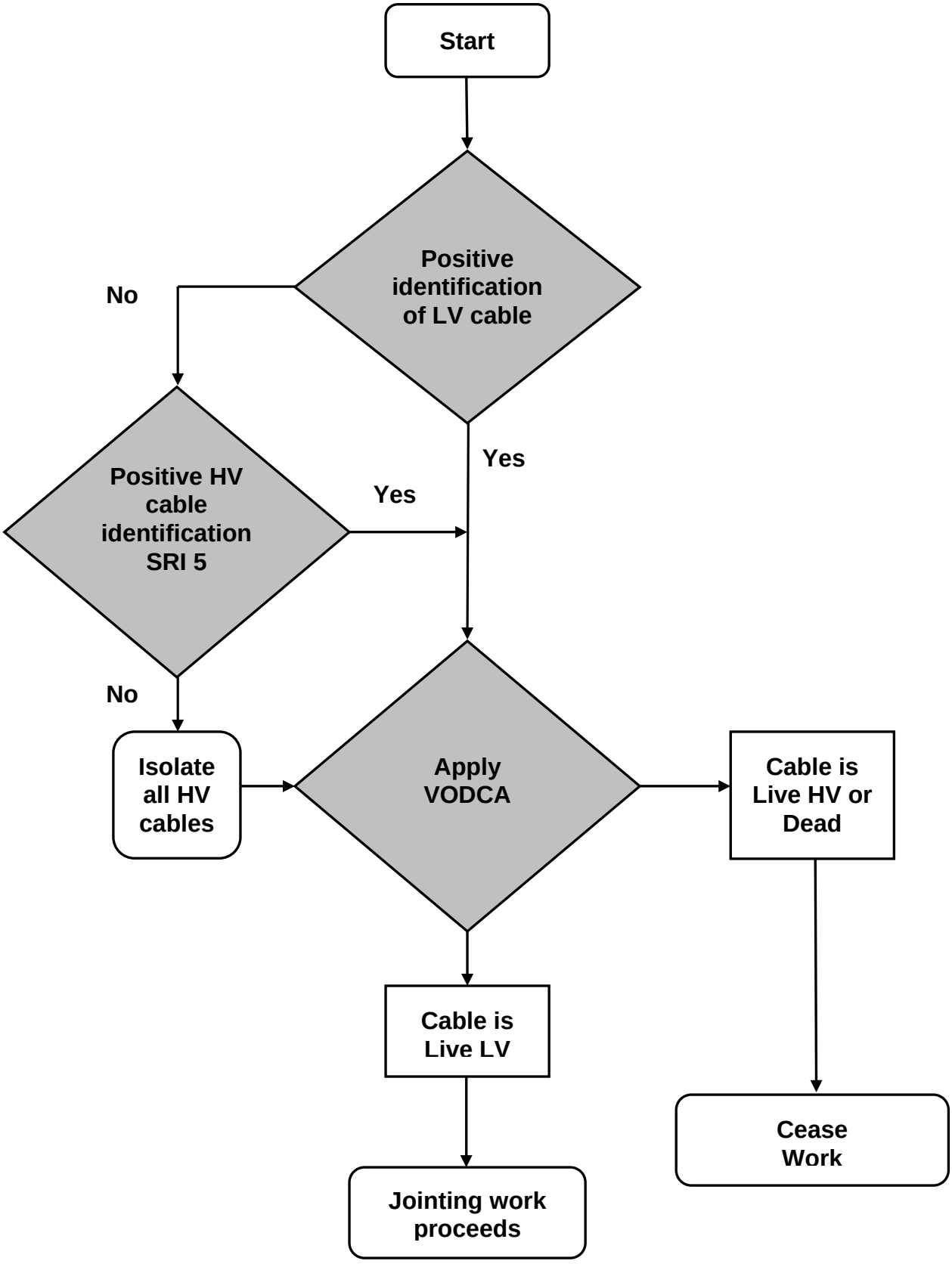
8.2.4 On completion of positive cable identification apply the VODCA to the anticipated cable to be worked on in accordance with Section 7.5 of the NIE MV/LV Jointing Manual.

8.2.5 If the VODCA indicates that the cable is energised at **HV**, or is de-energised then work must stop immediately and a Line Manager or **Senior Authorised Person** advised.

8.2.6 Confirmation that the cable is energised at **LV** will allow jointing work to proceed in accordance with approved procedures.

Figure No. 1

Work on LV PILC cables with HV cables suspected, or known to be, present in the immediate vicinity.



NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES GUIDANCE DOCUMENT

SRG 4

[Issue 1]

INSTRUCTION FOR OPERATIONS OR WORK ON THE PREMISES OF CUSTOMERS RECEIVING HIGH VOLTAGE SUPPLY

Contents **Page**

Appendices :-

(A) Ownership, Control and Operation Diagram of a typical 11kV intake Substation.

(B) Authorisation of Northern Ireland Electricity Personnel to operate customer controlled HV Switchgear.

(C) Authorisation of Customers to operate Northern Ireland Electricity controlled HV Switchgear – Standard Form of Indemnity.

(D) Work Instruction.

(E) Operation, Isolation and Earthing Log.

(F) Procedure for use of Operation, Isolation and Earthing Log.

(G) Request for the Commissioning of High Voltage supplies.

(H) Customers Guarantee and Declaration Form.

INSTRUCTION FOR OPERATIONS OR WORK ON THE PREMISES OF CUSTOMERS RECEIVING HIGH VOLTAGE SUPPLY

1 INTRODUCTION

1.1 The Electricity at Work Regulations (Northern Ireland) 1991 requires that 'No person shall engage in work that requires technical knowledge or experience to prevent danger or injury, unless he has that knowledge or experience, or is under appropriate supervision'.

In certain cases the **Danger** to be avoided may not be under the sole control of either the occupier or the contractor and it may therefore be necessary for the occupier and the contractor each to appoint an Authorised Person. On other occasions, Northern Ireland Electricity employees may be acting as employees of a contractor to carry out specialised work such as maintenance, fault repairs etc. on **HV** Apparatus which is the property of the customer. On such occasions the Northern Ireland Electricity employees may have to be appointed as Authorised Persons by the occupier to operate or work on customers **HV** Apparatus.

Alternatively where Northern Ireland Electricity undertakes work on customers **HV** Apparatus as a contractor with the **Danger** to be avoided under its control it shall appoint the **Authorised Person**.

1.2 The written agreement of the customer to the procedures contained in this document shall be obtained before any work is undertaken on **HV** Apparatus in customer's premises.

1.3 Where Northern Ireland Electricity is satisfied that the customer operates effective **Switching** control and Safety Rules, Safety Documents issued by the customer shall be accepted as sufficient evidence that the necessary isolation, earthing and safety precautions have been properly carried out. In these circumstances the detailed requirements of this document need not be implemented.

Safety Documentation issued by the customer shall be countersigned by the Northern Ireland Electricity **Senior Authorised Person**.

Alternatively, the Northern Ireland Electricity Engineer may accept the customer's Safety Documentation and then issue a Northern Ireland Electricity **Safety Document** to the staff under his control.

2 SCOPE

This Safety Rules Guidance Document and accompanying Appendices give guidance on the procedures to be followed in relation to the operations associated with the provision of supplies to customers at **HV**. The procedures include those to be adopted when Northern Ireland Electricity employees or contractors carry out work on Northern Ireland Electricity or customers **HV** Apparatus situated on customer's premises when such Apparatus can be energised either by Northern Ireland Electricity controlled switchgear or customer controlled switchgear or both Northern Ireland Electricity controlled and customer controlled switchgear. The procedures also include those to be adapted when customers carry out work on **HV** Apparatus on their premises when such Apparatus can be energised by either Northern Ireland Electricity controlled switchgear or both Northern Ireland Electricity controlled and customer controlled switchgear. This also includes cases where **HV** Apparatus can be energised from **LV** sources. Northern Ireland Electricity Policy on planning the methods of supply at **HV** is explained in Northern Ireland Electricity Network Policies and Procedures documents.

3 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and are as follows:

Apparatus – All equipment forming part of the **System** in which electrical conductors are used, supported, or of which they may form a part, and for which Northern Ireland Electricity has a maintenance responsibility.

Approved - Sanctioned by the Chairman of the Electrical & Mechanical Safety Advisory Committee (EMSAC) for use.

Caution Notice - A notice in **Approved** form conveying a warning against interference.

Earthing Device

An **Approved** means of providing a connection between a conductor and earth, being one of the following:

(i) **Primary Earth** – A fixed or portable **Earthing Device** applied at a position defined in a **Safety Document**.

(ii) **Drain Earth** - A fixed or portable **Earthing Device** applied for the purpose of protection against induced voltages or inadvertent backfeed.

Danger – A risk, to health or of bodily injury.

High Voltage (HV) – A voltage exceeding 1000 volts.

Isolated - Disconnected from associated **Plant** and/or **Apparatus** by an **Isolating Device(s)** in the isolating position, or by adequate physical separation or sufficient gap.

Isolating Device - A device for rendering **Plant** and **Apparatus Isolated**.

Keys
Being one of the following:

(i) **Safety Key** – A key unique at the **Location** capable of operating a lock which will cause an **Isolating Device**, **Earthing Device**, vent or drain to be **Locked**.

(ii) **Key Safe Key** - A key unique at the **Location** capable of operating a lock, other than the control lock, on a **Key Safe**.

Key Safe – A device of an **Approved** type for the secure retention of **Keys**.

Location – Any place at which work or testing under the Northern Ireland Electricity Safety Rules is carried out.

Low Voltage (LV) - A voltage not exceeding 1000 volts.

Persons
Being one of the following:

(i) **Competent Person** – A **Person** who has sufficient technical knowledge and/or experience to avoid **Danger** who may receive, transfer and clear specified **Safety Documents** when nominated by an appropriate officer of Northern Ireland Electricity.

(ii) **Authorised Person** – A **Competent Person** who has been nominated by an appropriate officer of Northern Ireland Electricity to carry out duties specified in writing.

(iii) **Senior Authorised Person** – An **Authorised Person** nominated by an appropriate officer of Northern Ireland Electricity to carry out duties specified in writing, including the preparation, issue and cancellation of specified **Safety Documents**.

(iv) **Control Person** – A **Person** who has been nominated by an appropriate officer of Northern Ireland Electricity to be responsible for controlling and co-ordinating safety activities necessary to achieve **Safety from the System**.

Plant - Fixed and movable items of equipment, other than **Apparatus**, forming part of the **System**, for which Northern Ireland Electricity has a maintenance responsibility.

Safety Document
Being one of the following:

(i) **Limited Work Certificate** – A **Safety Document** of a format indicated in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), which defines the limits within which work or testing may be carried out and specifies necessary precautions.

(ii) **Permit for Work** - A **Safety Document** of a format indicated in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), specifying the **Plant** and/or **Apparatus** to be worked on, the work to be carried out and the actions taken to achieve **Safety from the System**.

(iii) **Sanction for Test** - A **Safety Document** of a format indicated in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), specifying the **Plant** and/or **Apparatus** to be tested, making known the conditions under which the testing is to be carried out and confirming actions which have been taken to achieve **Safety from the System**.

Safety from the System – That condition that safeguards persons working on or testing **Plant** and/or **Apparatus** from the **Dangers** which are inherent in the **System**.

Switching – The operation of circuit breakers, disconnectors/isolators, fuses or other methods of making or breaking an electrical circuit, and/or the application and removal of **Primary Earths**.

System - Items of **Plant** and **Apparatus** which are used separately or in combination in any process associated with the generation, transmission or distribution of electricity.

4 GENERAL REQUIREMENTS

Full details are given in the Appendices to this Guidance Document of procedures relating to operations on Apparatus which can be energised by Northern Ireland Electricity controlled or customer controlled switchgear. In addition steps shall normally be taken as far as possible to prevent the customer inadvertently applying an **Earthing Device** to Northern Ireland Electricity **HV** systems viz., by operation of an integral earthing arrangement. Where there is joint operation of Apparatus between Northern Ireland Electricity and the customer it shall be normal to apply both Northern Ireland Electricity and customer Safety Locks to the **Apparatus**.

This shall be accomplished by the use of an 'Itex Lokgard' or similar device. In order to comply with statutory requirements it shall be necessary whatever the arrangements of supply, for the customer in an emergency to disconnect supply from his Apparatus.

5 CONTROL OF APPARATUS ON CUSTOMER'S PREMISES

5.1 Control of the switchgear used to isolate and or earth the circuit to be worked on determines the responsibility for the procedure to be followed. In general, the customer's Authorised Person shall operate the customer-controlled switchgear and Northern Ireland Electricity's **Authorised Person** shall operate the Northern Ireland Electricity controlled switchgear.

5.2 An ownership, control and operation diagram shall be prepared where a customer has **HV** Apparatus. The diagram shall show the relationship between the Apparatus to be worked on and the associated local network and shall indicate all points of isolation irrespective of voltage.

Where work to be preformed involves Northern Ireland Electricity supply intake positions, the diagram shall indicate the respective ownership and control and operation of the Apparatus involved.

This diagram shall be checked at the time any work or operations are to be carried out on the relevant Apparatus. A typical diagram is shown in Appendix A.

6 AUTHORISATION OF NORTHERN IRELAND ELECTRICITY PERSONS TO OPERATE CUSTOMER CONTROLLED SWITCHGEAR

6.1 When at the request of the customer it is necessary for a Northern Ireland Electricity **Authorised Person** to operate the customer's **HV** switchgear, the customer's authority in writing shall first be obtained. The customer shall be responsible for any damage to Apparatus resulting from such operation, except in the cases where damage is caused by negligence on the part of Northern Ireland Electricity. The customer shall indemnify Northern Ireland Electricity against any claim arising from damage to property or injury to Northern Ireland Electricity's employees, customer's employees or third party except where negligence on the part of Northern Ireland Electricity can be proven. A typical form of Authorisation / Indemnity is shown in Appendix B.

The Operation, Isolation and Earthing Log is not regarded as an authorisation for this purpose. Where a Northern Ireland Electricity **Senior Authorised Person** is appointed as the customer's Authorised Person or where Northern Ireland Electricity, as Contractor, takes control of the **Danger** to be avoided, the Operation, Isolation and Earthing Log shall not be required, but where work is to be carried out by customer's personnel an Operation, Isolation and Earthing Log shall be used (a model form of which is shown in Appendix E).

6.2 When a Northern Ireland Electricity **Authorised Person** requires to operate customers **HV** switchgear, all practical steps shall be taken to ensure that he has adequate knowledge of the Apparatus concerned.

6.3 The Northern Ireland Electricity **Authorised Person** is at all times acting as an agent of Northern Ireland Electricity when he is carrying out operational duties and this is the case even when he is operating on the premises of a customer, provided he is there on Northern Ireland Electricity business.

6.4 If the Northern Ireland Electricity **Authorised Person** has any doubt about work on, or operation of, customer's switchgear, he can refer any objection to the person issuing the instructions who would have the matter investigated and, if necessary, refer to a higher authority.

7 AUTHORISATION OF CUSTOMERS PERSONS TO OPERATE NORTHERN IRELAND ELECTRICITY CONTROLLED SWITCHGEAR

7.1 Where the necessity arises in compliance with Electricity Regulations for the customer to be provided with the facility to disconnect supplies to his Apparatus, the customer may be given permission by Northern Ireland Electricity to carry out such operations as are necessary to disconnect the incoming supplies to his Apparatus.

7.2 Unless there is a formal agreement to the contrary, customers shall not be able to parallel at **HV** Northern Ireland Electricity incoming supplies. To ensure that this is so, suitable interlocking features shall where practicable be fitted.

Where a customer is given the facility of changing over supplies for his operational convenience he shall advise Northern Ireland Electricity's **Control Person** before carrying out such operations. Where the customer is afforded special facilities for operating Northern Ireland Electricity's switchgear he shall nominate specific persons for this purpose. The person so nominated shall be notified to Northern Ireland Electricity in writing and approved by Northern Ireland Electricity in writing.

7.3 The customer shall be responsible for any damage to Northern Ireland Electricity's **Apparatus** resulting from such operation, except in the cases where damage is caused by negligence on the part of Northern Ireland Electricity. The customer shall indemnify Northern Ireland Electricity against any claim arising from damage to property or injury to Northern Ireland Electricity's employees, customer's employees or third party except where negligence on the part of Northern Ireland Electricity can be proven. A standard form of Indemnity is shown in Appendix C.

8 WORK ON HV APPARATUS WHICH CAN BE ENERGISED BY SWITCHGEAR CONTROLLED BY NORTHERN IRELAND ELECTRICITY

8.1 When Work is to be carried out by Northern Ireland Electricity Personnel

8.1.1 The de-energising, isolation, earthing and issue of **Permit For Work**, **Limited Work Certificate** or **Sanction For Test** shall be carried out by an **Authorised Person** or **Senior Authorised Person** in accordance with Northern Ireland Electricity Safety Rules, other associated Safety Rules Instructions issued by Northern Ireland Electricity and the requirements of supporting mandatory documents. **Safety Keys** shall be secured by Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person**.

8.1.2 Where the Apparatus on which work is to be carried out is owned by the customer, the customer's Authorised Person shall issue Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** with a written instruction to proceed with the work (see Appendix D).

8.2 **When Work is to be carried out by Customer's Personnel**

8.2.1 The customer's Authorised Person shall request in writing, isolation and earthing from Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** using an Operation, Isolation and Earthing Log (see Appendix E). The de-energising, isolation and earthing shall be carried out by Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** in accordance with Northern Ireland Electricity Safety Rules. Where the customer requests double locking this shall be carried out and if necessary a device such as the 'Itex Lokgard' used.

The customer's Authorised Person shall be asked to accompany Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** during isolation and earthing of the switchgear controlled by Northern Ireland Electricity.

Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** shall confirm completion of the customer's request on the Operation, Isolation and Earthing Log and return it to the customer's Authorised Person.

8.2.2 The customer's personnel shall then carry out their work on the Apparatus concerned under the customer's safety documentation.

8.2.3 On completion of the work the customer's Authorised Person shall request in writing, removal of earthing and re-energisation of the Apparatus by using the Operation, Isolation and Earthing Log.

9 WORK ON HV APPARATUS WHICH CAN BE ENERGISED BY SWITCHGEAR CONTROLLED BY THE CUSTOMER

9.1 **When Work is to be carried out by Northern Ireland Electricity Personnel**

9.1.1 The Northern Ireland Electricity **Authorised Person** or **Senior Authorised Person** shall request in writing on an Operation, Isolation and Earthing Log, the customer's Authorised Person to carry out de-energising, isolation and earthing of the Apparatus.

If, however a Northern Ireland Electricity **Authorised Person** or **Senior Authorised Person** is appointed, by the customer, to act as the customer's Authorised Person, the Operation, Isolation and Earthing Log shall not be required, and work can proceed as under Clause 8.1.

9.1.2 All de-energising, isolation and earthing shall be carried out by the customer's Authorised Person who shall be accompanied by Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person**. Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** shall satisfy himself that the isolation and earthing of the equipment has been carried out to meet the requirements of Northern Ireland Electricity Safety Rules and supporting mandatory documents.

9.1.3 The customer's Authorised Person shall apply his Safety Locks at each point of isolation from supply, the customer's Authorised Person securing the keys to those locks. The Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** shall apply his own Safety Locks at each point of Isolation from Supply, the Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** securing the **Keys** to his locks.

If two locks cannot be applied at a point of Isolation, a device such as the 'Itex Lokgard' may be used to facilitate multiple locking or a single Safety Lock and **Key Safe** may be used. Where a **Key Safe** is used, on unique **Key Safe Key** shall be held by the customer's Authorised Person and another by the Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person**. The customer's Authorised Person shall confirm completion of the request using the Operation, Isolation and Earthing Log and return it to the Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person**.

9.1.4 Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** shall affix suitable **Caution Notices** and **Danger Notices**.

9.1.5 When the Apparatus on which work is to be carried out is owned by the customer, the customer's Authorised Person, after completion of the isolation and earthing of the Apparatus shall issue Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** with a written instruction to proceed with the work (see Appendix D).

The instruction shall contain confirmation of all details of the work to be undertaken on the Apparatus.

9.1.6 Northern Ireland Electricity's **Senior Authorised Person** shall then issue a **Permit For Work**, **Limited Work Certificate** or **Sanction For Test** in accordance with Northern Ireland Electricity Safety Rules and supporting mandatory documents.

9.1.7 On completion of the work, the **Permit For Work**, **Limited Work Certificate** or **Sanction For Test** shall be cleared and cancelled in accordance with Northern Ireland electricity Safety Rules and supporting mandatory documents.

9.1.8 Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** shall then remove Northern Ireland Electricity Safety Locks and inform the customer's Authorised Person accordingly by the Operation, Isolation and Earthing Log.

9.2 When Work is to be carried out by Customer's Personnel

No action is required to be taken by Northern Ireland Electricity. It is the responsibility of the customer to comply with the Electricity at Work Regulations (Northern Ireland) 1991. The customer's personnel shall then carry out their work on the Apparatus concerned under the customer's safety documentation. When any of the Apparatus on which work is to be carried out is owned by Northern Ireland Electricity (e.g. a transformer on hire) the customer shall give Northern Ireland Electricity reasonable notice prior to the commencement of the work.

10 WORK ON APPARATUS WHICH CAN BE ENERGISED BY SWITCHGEAR CONTROLLED BY NORTHERN IRELAND ELECTRICITY AND BY SWITCHGEAR CONTROLLED BY THE CUSTOMER

10.1 General Requirements

10.1.1 Where the equipment to be worked on can be disconnected from supply only by the operation of both Northern Ireland Electricity controlled and customer controlled switchgear, Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** and the customer's Authorised Person working in close liaison shall isolate and earth their respective equipment.

10.1.2 All Operation Isolation and Earthing Logs used during a unique work activity shall be cross-referenced using the associated Northern Ireland Electricity's Request for Outage and/or Planned Work (E600) reference number.

10.2 When Work is to be carried out by Northern Ireland Electricity Personnel

10.2.1 Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** shall request in writing on an Operation, Isolation and Earthing Log, the customer's Authorised Person to carry out de-energising, isolation and earthing of the Apparatus.

If, however an Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** is appointed by the customer, to act as the customer's Authorised Person, the Operation, Isolation and Earthing Log is not required.

10.2.2 The customer's Authorised Person shall isolate the Apparatus at each point of supply under his control and apply his Safety Locks at each point, the customer's Authorised Person securing the Keys to his locks. The Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** shall also apply his own Safety Locks at these points, the Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** securing the keys to his locks. If two locks cannot be applied at a point of isolation, a device such as the 'Itex Lokgard' may be used to facilitate multiple locking, or a single Safety Lock and a **Key Safe** may be used. Where a **Key Safe** is used one unique **Key Safe Key** shall be held by the customer's Authorised Person and another by Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person.**

The customer's Authorised Person shall confirm completion of the request using the Operation, Isolation and Earthing Log and return it to the Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person**.. The customer's Authorised Person shall be accompanied by the Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** in the above operations. The Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** may operate the customer controlled switchgear if he has the written agreement of the customer for this purpose.

10.2.3 Northern Ireland Electricity's **Senior Authorised Person** shall isolate at each point of supply under his control and apply his Safety Locks to those points. Northern Ireland Electricity Safety Keys shall be secured by the Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person**.

10.2.4 The Northern Ireland Electricity **Authorised Person** or **Senior Authorised Person** shall in accordance with Northern Ireland Electricity Safety Rules and supporting mandatory documents, earth the Apparatus at each point of disconnection from the supply under his control, the Northern Ireland Electricity **Authorised Person** or **Senior Authorised Person** securing the **Safety Keys** where Safety Locks can be applied to lock a switch or circuit breaker in the **Earthed** position. The customer's Authorised Person shall then be requested by Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** to earth at each of the points of supply under his control. Where Safety Locks can be applied to lock a switch or circuit breaker in the **Earthed** position, the customer's Authorised Person shall apply his own Safety Locks, retaining the Keys to his locks. The Northern Ireland Electricity **Authorised Person** or **Senior Authorised Person** shall also apply his own Safety Locks at these points, the Northern Ireland Electricity **Authorised Person** or **Senior Authorised Person** securing the **Keys** to his locks. Alternatively the locking arrangements described in Clause 10.2.2 may be applied. It is essential that any Key to a lock which is used to secure a switch or circuit breaker in the **Earthed** position shall be inaccessible to unauthorised persons.

10.2.5 Northern Ireland Electricity's **Senior Authorised Person** shall apply Northern Ireland Electricity **Caution Notices** and **Danger Notices** as required and shall satisfy himself that isolation and earthing of the Apparatus has been carried out to the standard required by Northern Ireland Electricity Safety Rules and supporting mandatory documents.

10.2.6 When the Apparatus on which work is to be carried out is owned by the customer, the customer's Authorised Person shall then issue Northern Ireland Electricity's **Senior Authorised Person** with a written instruction to proceed with the work. This instruction shall contain confirmation of all details of the work to be carried out on the Apparatus.

10.2.7 Northern Ireland Electricity's **Senior Authorised Person** shall then issue a **Permit For Work**, **Limited Work Certificate** or **Sanction For Test** in accordance with Northern Ireland Electricity Safety Rules and supporting mandatory documents.

10.2.8 Work under a **Permit For Work**, **Limited Work Certificate** or **Sanction For Test** shall then proceed in accordance with Northern Ireland Electricity Safety Rules and supporting mandatory documents.

10.2.9 On completion of the work the **Permit For Work**, **Limited Work Certificate** or **Sanction For Test** shall be cleared by the Person in charge of the work and shall then be cancelled in accordance with Northern Ireland Electricity Safety Rules and supporting mandatory documents. Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** shall then remove Northern Ireland Electricity Safety Locks and inform the customer's Authorised Person by the Operation, Isolation and Earthing Log that the work by Northern Ireland Electricity's personnel is finished.

10.3 When Work is to be carried out by Customer's Personnel

10.3.1 The customer's Authorised Person shall request by an Operation, Isolation and Earthing Log for Northern Ireland Electricity's **Senior Authorised Person** to isolate at each point of supply under Northern Ireland Electricity control. Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** shall fit Northern Ireland Electricity Safety Locks on Northern Ireland Electricity **Apparatus** and shall retain Northern Ireland Electricity **Safety Keys** in his possession. The customer's Authorised Person shall apply his Safety Locks at these points of isolation including associated **LV** sources. If two locks cannot be applied at a point of Isolation, a device such as the 'Itex Lokgard' may be used to facilitate multiple locking or a single Safety Lock and **Key Safe** may be used. Where a **Key Safe** is used, on unique **Key Safe Key** shall be held by the customer's Authorised Person and another by the Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person**.

The Northern Ireland Electricity **Authorised Person** or **Senior Authorised Person** shall confirm isolation on the Operation, Isolation and Earthing Log and return it to the customer's Authorised Person. The customer's Authorised Person shall be asked to accompany the Northern Ireland Electricity **Authorised Person** or **Senior Authorised Person** during isolation and subsequent earthing of the Northern Ireland Electricity switchgear.

10.3.2 The customer's Authorised Person shall isolate at each point of supply under his control and apply his Safety Locks to these points, the customer's Authorised Person securing his Safety Lock Keys.

10.3.3 The customer's Authorised Person shall then earth the Apparatus at each point of disconnection of supply under his control. Northern Ireland Electricity's **Authorised Person** or **Senior Authorised Person** shall then in accordance with Northern Ireland Electricity Safety Rules, earth the Apparatus at each point of disconnection from the supply under his control and retain in his **Key Safe** the **Keys** to Northern Ireland Electricity Safety Locks fitted at points of isolation and earthing. The customer's Authorised Person shall apply his Safety Locks at each of these points. To facilitate multiple locking, a device such as the 'Itex Lokgard' may be used.

10.3.4 The customer's personnel shall then carry out their work on the Apparatus concerned under the customer's safety documentation.

10.4 **When Work is to be carried out by both Northern Ireland Electricity and Customer's Personnel**

Both the customer's Authorised Person and Northern Ireland Electricity's Authorised Person or Senior Authorised Person shall use an Operation, Isolation and Earthing Log for all isolation and earthing requests and confirmations.

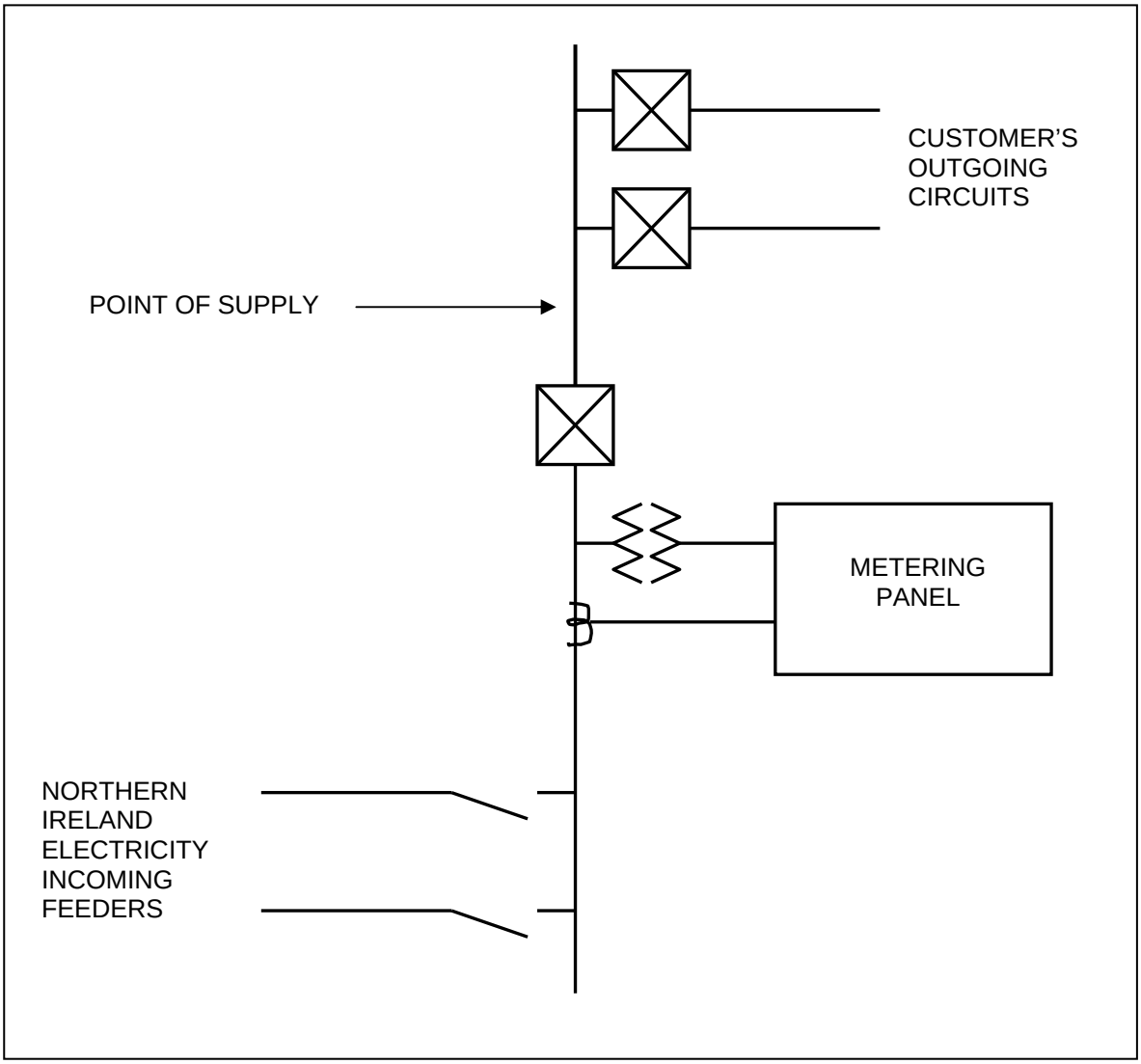
11 COMMISSIONING PROCEDURE

11.1 Before any supplies at high voltage are made available to the customer, the customer shall make such a request in writing. He shall state that he accepts full responsibility for the control of such supplies and shall nominate a duly authorised person to be in attendance at the time of commissioning to accept supplies on his behalf. A 'Request for the Commissioning of High Voltage Supplies' Form, (Appendix G), shall be used to make such a request. In addition to this the customer shall give to Northern Ireland Electricity a guarantee and declaration in writing regarding the electrical installation (see Appendix H).

11.2 Northern Ireland Electricity's **Senior Authorised Person** shall before commissioning supplies check that the details shown on the Ownership Diagram (Appendix A) are correct.

APPENDIX A

OWNERSHIP, CONTROL AND OPERATION DIAGRAM OF A TYPICAL 11kV SUBSTATION



Northern Ireland Electricity

OWNERSHIP DIAGRAM
FACTORY INTAKE SUBSTATION

APPENDIX B

AUTHORISATION OF NORTHERN IRELAND ELECTRICITY PERSONNEL TO OPERATE CUSTOMER CONTROLLED HV SWITCHGEAR

AUTHORITY TO OPERATE CUSTOMER'S HIGH VOLTAGE SWITCHGEAR	

…….. is a

Senior Authorised / Authorised Person employed by Northern Ireland Electricity

and has authority to operate high voltage switchgear belonging to

……

……

……

at the following premises ……

……

……

……

……

in accordance with an appropriate work instruction.

SIGNED …….. DESIGNATION ……..

N.B. See note below DATE ……..

The granting of authority does not place any obligation on the recipient to operate the customer's switchgear if the recipient has any objections concerning its capability.

AUTHORITY TO OPERATE CUSTOMER'S HIGH VOLTAGE SWITCHGEAR

It is part of the terms of the arrangement referred to in clause 6.1 of the Northern Ireland Electricity Safety Rules Guidance document SRG 4 that you shall indemnify Northern Ireland Electricity against any claims which may be made against Northern Ireland Electricity in respect of damage to property whether belonging to you, Northern Ireland Electricity, or third parties and also you shall indemnify Northern Ireland Electricity in respect of any claims arising out of injury to any persons whether they are your employees, or employees of Northern Ireland Electricity or injuries to persons who do not fall into either of the preceding classes, except where negligence on the part of Northern Ireland Electricity is admitted by Northern Ireland Electricity or can be proved against Northern Ireland Electricity.

If the arrangement referred to above comes into operation then it is a term and condition of that arrangement that the indemnity referred to in the preceding paragraph shall come immediately into effective force and operation.

SIGNED …… DESIGNATION ……..

DATE ……..

COMPANY ……

APPENDIX C

AUTHORISATION OF CUSTOMERS TO OPERATE NORTHERN IRELAND ELECTRICITY CONTROLLED HV SWITCHGEAR

STANDARD FORM OF INDEMNITY

AUTHORISATION OF CUSTOMER'S TO OPERATE NORTHERN IRELAND ELECTRICITY CONTROLLED HV SWITCHGEAR	

It is part of the terms of the arrangement referred to in clause 7.3 of the Northern Ireland Electricity Safety Rules Guidance document SRG 4 that you shall indemnify Northern Ireland Electricity against any claims which may be made against Northern Ireland Electricity in respect of damage to property whether belonging to you, Northern Ireland Electricity, or third parties and also you shall indemnify Northern Ireland Electricity in respect of any claims arising out of injury to any persons whether they are your employees, or employees of Northern Ireland Electricity or injuries to persons who do not fall into either of the preceding classes, except where negligence on the part of Northern Ireland Electricity is admitted by Northern Ireland Electricity or can be proved against Northern Ireland Electricity.

If the arrangement referred to above comes into operation then it is a term and condition of that arrangement that the indemnity referred to in the preceding paragraph shall come immediately into effective force and operation.

SIGNED …… DESIGNATION ……

DATE ……

COMPANY ……

APPENDIX D

WORK INSTRUCTION

WORK INSTRUCTION
FROM ……. TO …….
Details of Work to be Carried out
Signed …….. Designation …….. Date …….. Time ……..

APPENDIX E

OPERATION, ISOLATION AND EARTHING LOG

HV CUSTOMER OPERATION, ISOLATION AND EARTHING LOG

Location ……
NIE E600 Request No. ……

HV Customer ……
Customer's Person ……
Designation ……

NIE Person ……
Log No. OIEL/ ……

DATE	TIME REQUEST ISSUED	PERSON ISSUING REQUEST (BLOCK CAPITALS)	OPERATION / ISOLATION / EARTHING REQUEST CONFIRMATION OF PRECAUTIONS TAKEN / REMOVED	TIME REQUEST COMPLETED	SIGNATURE OF PERSON CONFIRMING COMPLETION	SIGNATURE OF PERSON ACKNOWLEDGING COMPLETION

When a Permit for Work is issued the precautions stated above will be maintained
When a Sanction for Test is issued those earths stated above that can be temporarily removed, shall be removed only under the supervision of a NIE Senior Authorised Person

Page ….. of ……

This form to be retained by NIE

APPENDIX F

PROCEDURE FOR USE OF HV CUSTOMER OPERATION, ISOLATION AND EARTHING LOG

The HV Customer Operation, Isolation and Earthing Log has been designed for use in situations where Northern Ireland Electricity carries out operations and/or work on Apparatus controlled by a customer or when customers carry out operations and/or work on Northern Ireland Electricity controlled Apparatus.

The HV Customer Operation, Isolation and Earthing Log has been designed for use in situations where Northern Ireland Electricity carries out operations and/or work on Apparatus controlled by a customer or when customers carry out operations and/or work on Northern Ireland Electricity controlled Apparatus.

The log has also been designed to cover the situation where work is to be undertaken by customer's or Northern Ireland Electricity's employees, or in fact both groups of personnel, on Apparatus which is capable of being energised by equipment which is under the customer's control and also by Apparatus which is under Northern Ireland Electricity's control. The general requirements for use of the log are as follows.

(a) All entries shall be clear and legible and shall include the name of the Person issuing the request. All sections of the log shall be completed.

(b) A ball point pen shall be used for all entries. (Other types of pen may 'run' when the pages are in contact with water).

(c) There shall be no spaces between entries in the log. Times shall be recorded in 24 hour format.

(d) Alterations should be avoided - if this is not possible then the alteration is carried out by drawing a line through the word or words to be deleted and inserting the new word or words. Entries shall not be erased.

(e) Operational requests shall be carried out only by the person to whom the request has been issued or by a person in training under their personal supervision.

(f) If the person receiving the request has any query regarding the request he shall raise this with the issuing person before carrying out any part of the request.

(g) If during any switching operation an abnormality occurs the switching sequence will be immediately stopped and the issuing person informed.

(h) Issue of keys or safety documents shall be recorded on the log.

(i) The associated E600 number or where this is not available the associated NAFIRS number shall be used to create a unique log number. The log number shall contain the prefix OIEL.

Where practicable the requirements of the Northern Ireland Safety Rules, Safety Rules Instructions and other mandatory documents shall be complied with.

The HV Customer Operation, Isolation and Earthing Log is designed to be used in the following situations:-

1 When Work is to be carried out by Customer's Personnel on Equipment which can be Energised from Switchgear Controlled by Northern Ireland Electricity

The customer's Authorised Person shall request isolation / earthing using the HV Customer Operation, Isolation and Earthing Log. The NIE **Authorised Person** shall following consultation with the NIE Distribution Control Centre record and carry out the required isolation / earthing in accordance with Northern Ireland Electricity Safety Rules, other associated Safety Rules Instructions issued by Northern Ireland Electricity and the requirements of supporting mandatory documents. Following this he shall then confirm completion of the request to the customer's Authorised Person using the HV Customer Operation, Isolation and Earthing Log. The points of isolation and/or earthing shall be specified on the HV Customer Operation, Isolation and Earthing Log The customer's Authorised Person shall acknowledge the completion of the request on the HV Customer Operation, Isolation and Earthing Log and can then proceed to carry out his work by issuing his own Safety Documents.

On completion of the work the customer's Authorised Person shall confirm his work complete and his earthing removed on the HV Customer Operation, Isolation and Earthing Log. He shall request the removal of earths and re-energisation of the HV Apparatus using the HV Customer Operation, Isolation and Earthing Log.

2 When Work is to be carried out by Northern Ireland Electricity's Personnel on Equipment which can be Energised by Switchgear Controlled by a Customer

The procedure to be followed will be as in **1** above with the roles of Northern Ireland Electricity's **Senior Authorised Person** and the customer's Authorised Person interchanged i.e. Northern Ireland Electricity's **Senior Authorised Person** will request the required isolation with the customer's Authorised Person confirming completion.

3 When Work is to be carried out by Northern Ireland Electricity Personnel on Equipment which can be Energised by either Northern Ireland Electricity or the Customer

The Northern Ireland Electricity's **Senior Authorised Person** shall request isolation of the customer's controlled switchgear using the HV Customer Operation, Isolation and Earthing Log. When the isolation has been completed the customer's Authorised Person will confirm and record the details of the isolation on the HV Customer Operation, Isolation and Earthing Log. Following his acknowledgement of the completion of this request the Northern Ireland Electricity's **Authorised Person** shall then proceed to isolate and earth the **Apparatus** that is under the control of Northern Ireland Electricity. On completion of this the customer's Authorised Person shall be requested to earth the Apparatus under his control using the HV Customer Operation, Isolation and Earthing Log.

When this earthing has been completed, it shall be confirmed and recorded as above and acknowledged by the Northern Ireland Electricity's **Senior Authorised Person.** The work can proceed following the issue of the necessary Safety Document.

On completion of work and cancellation of the necessary Safety Documents which shall be recorded on the HV Customer Operation, Isolation and Earthing Log, the removal of earthing and isolation on the customer's controlled Apparatus will be carried out in the same manner as described above.

4 When Work is to be carried out by Customer's Personnel on Equipment which can be Energised by either Northern Ireland Electricity or the Customer

The procedure to be followed will be as in **3** above with the roles of Northern Ireland Electricity's **Senior Authorised Person** / **Authorised Person** and the customer's Authorised Person interchanged i.e. Northern Ireland Electricity's **Senior Authorised Person** will request the required isolation with the customer's Authorised Person confirming completion.

5 When Work is to be carried out by both Northern Ireland Electricity's and Customer's Personnel on Equipment which can be Energised by either Northern Ireland Electricity or the Customer

In this case it will be necessary for the customer's Authorised Person to request isolation of the **Apparatus** controlled by Northern Ireland Electricity and for Northern Ireland Electricity's **Senior Authorised Person** to request isolation of the Apparatus controlled by the customer. The procedures for requesting, recording and confirmation will be as described above. The requests and confirmations shall be where practicable be recorded on the same HV Customer Operation, Isolation and Earthing Log. If the same log cannot be used then all logs used for the isolation and earthing requests shall be cross-referenced using the associated Northern Ireland Electricity's Request for Outage and/or Planned Work (E600) reference number.

It is important to ensure that in all instances of utilising this procedure that isolation is completed, recorded and acknowledged before any earthing request is accepted. Also that during the re-energisation process all earthing is removed, recorded and acknowledged before any request for removal of isolation is accepted.

APPENDIX G

REQUEST FOR THE COMMISSIONING OF HIGH VOLTAGE SUPPLIES

ISSUE:-

FROM: ……

TO: NORTHERN IRELAND ELECTRICITY

Please energise the under noted apparatus at the time and date indicated. All staff have been warned of the intention to energise this equipment, all work has been completed, all Earthing Devices have been removed and where necessary warning notices posted.

CIRCUIT / PLANT DESCRIPTION: -   EXPLANATORY SKETCH: -

COMMISSION AT ……Hrs on ……..

I declare that I am the above customers authorised person and accept full responsibility for the request to commission the above apparatus.

Signed …… (Customer's authorised person)

Date……

RECEIPT:-

I acknowledge receipt of the above request.

Signed …… (NIE SENIOR AUTHORISED PERSON)

Date……

CLEARANCE:-

I hereby confirm that the above noted equipment was energised at …….hrs on ……..

Signed …… (NIE SENIOR AUTHORISED PERSON)

Date……

APPENDIX H

CUSTOMERS GUARANTEE AND DECLARATION FORM

Guarantee and declaration to be given to Northern Ireland Electricity by an applicant before connection of a supply of electricity at high voltage

We, the undersigned officers of

_____

hereby Guarantee that ever portion of the electrical installation at our premises situated at

_____

which is in use at high voltage will be maintained in an efficient state and, if so required, to the satisfaction of Northern Ireland Electricity; that in cases where the said portion of the electrical installation is not enclosed in a building or other structure to which access can only be obtained by means of a key or special appliance, an authorised person will be available to cut off the supply in the event of emergency; and that instructions as to the treatment of persons suffering from electric shock will be displayed in our premises.

We also declare that the electrical installation is so designed and will be so maintained that:

(i) no metalwork designed to be electrically charged at high voltage will normally be exposed so that it can be touched.

(ii) all conductors for use at high voltage (other than overhead lines, overhead bus-bars and connections) are completely enclosed in metal which is electrically continuous and adequately protected against mechanical damage.

(iii) all metalwork enclosing, supporting or associated with the electrical installation, other than that designed to serve as a conductor, is where necessary to prevent danger connected with earth.

(iv) the supply of energy to each motor or separate piece of apparatus is controlled by an efficient cut-off switch placed in such a position as to be readily accessible to and easily operated by the person in charge of the said motor or apparatus and so connected in circuit that by its means all voltage can be cut off from the motor or apparatus itself and from any regulating switch, resistance or other device associated therewith.

(v) all windings at high voltage of motors or other apparatus within reach from any position in which a person may require to be are efficiently protected so as to prevent danger.

(vi) where transforming apparatus is used, suitable provision is made, either by connecting with earth a point of the circuit at the lower voltage or otherwise, to guard against danger by reason of the said circuit becoming accidentally charged above its normal voltage by leakage from or contact with the circuit at the higher voltage.

(vii) unless the conditions are such that the whole of the conductors and apparatus for use at high voltage may be made dead at the same time for the purpose of cleaning or other work thereon, the said conductors and apparatus are so arranged that they may be made dead in sections, and that such sections are so separated by divisions or screens from all adjacent metal which is live that work on any section made dead may be carried out by an authorised person without danger.

(viii) adequate working space is provided in front of any switchboard (other than panels for controlling circuits at low voltage) and at parts of the installation where live conductors can be exposed.

(ix) adequate means are provided for preventing access by the public or any unauthorised person to any part of the installation which is designed to be electrically charged at high voltage.

For and on behalf of

_____

Dated this _____ day of _____ Two Thousand and _____

NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

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[Issue 1]

LOCAL CONTROL PROCEDURES

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LOCAL CONTROL PROCEDURES

1 INTRODUCTION

1.1 Local Control is the transfer of control of a clearly defined and agreed part of the Northern Ireland Electricity 11kV overhead line **System*** to a **Senior Authorised Person**. This **Senior Authorised Person** then issues instructions to an **Authorised Person** or **Control Person** (using the SCADA System) to carry out Operational **Switching** Instructions for the purpose of fault location and sectionalising. The defined **System** includes the reclosing device and the **System** beyond it to defined open points. Before closing any open point, Local Control must either be relinquished or the status of the **System** re-defined to allow the **Control Person** to issue an instruction to close the open point. After the fault has been located, Local Control must be relinquished to allow the **Control Person** to sanction repairs using standard procedures.

All relevant Northern Ireland Electricity Safety Rules and Safety Rules Instructions must be complied with when Local Control has been granted, in particular SRI 1 '**High Voltage Switching**'. **Switching** Instructions issued and completed must be logged in the approved way as given in SRI 600, 'Application of the Safety Rules'.

(*The 11kV overhead line **System** may include a section of underground cable, but not Ring Main Units.)

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and are as follows:

Apparatus – All equipment forming part of the **System** in which electrical conductors are used, supported, or of which they may form a part, and for which Northern Ireland Electricity has a maintenance responsibility.

Approved - Sanctioned by the Chairman of the Electrical & Mechanical Safety Advisory Committee (EMSAC) for use.

Earthing Device

An **Approved** means of providing a connection between a conductor and earth, being one of the following:

(i) **Primary Earth** – A fixed or portable **Earthing Device** applied at a position defined in a **Safety Document**.

(ii) **Drain Earth** - A fixed or portable **Earthing Device** applied for the purpose of protection against induced voltages or inadvertent backfeed.

Danger – A risk, to health or of bodily injury.

Persons
Being one of the following:

(i) **Competent Person** – A **Person** who has sufficient technical knowledge and/or experience to avoid **Danger** who may receive, transfer and clear specified **Safety Documents** when nominated by an appropriate officer of Northern Ireland Electricity.

(ii) **Authorised Person** – A **Competent Person** who has been nominated by an appropriate officer of Northern Ireland Electricity to carry out duties specified in writing.

(iii) **Senior Authorised Person** – An **Authorised Person** nominated by an appropriate officer of Northern Ireland Electricity to carry out duties specified in writing, including the preparation, issue and cancellation of specified **Safety Documents**.

(iv) **Control Person** – A **Person** who has been nominated by an appropriate officer of Northern Ireland Electricity to be responsible for controlling and co-ordinating safety activities necessary to achieve **Safety from the System**.

Plant - Fixed and movable items of equipment, other than **Apparatus**, forming part of the **System**, for which Northern Ireland Electricity has a maintenance responsibility.

Safety Document
Being one of the following:

(i) **Limited Work Certificate** – A **Safety Document** of a format indicated in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), which defines the limits within which work or testing may be carried out and specifies necessary precautions.

(ii) **Permit for Work** - A **Safety Document** of a format indicated in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), specifying the **Plant** and/or **Apparatus** to be worked on, the work to be carried out and the actions taken to achieve **Safety from the System**.

(iii) **Sanction for Test** - A **Safety Document** of a format indicated in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), specifying the **Plant** and/or **Apparatus** to be tested, making known the conditions under which the testing is to be carried out and confirming actions which have been taken to achieve **Safety from the System**.

Safety from the System – That condition that safeguards persons working on or testing **Plant** and/or **Apparatus** from the **Dangers** which are inherent in the **System**.

Switching – The operation of circuit breakers, disconnectors/isolators, fuses or other methods of making or breaking an electrical circuit, and/or the application and removal of **Primary Earths**.

System - Items of **Plant** and **Apparatus** which are used separately or in combination in any process associated with the generation, transmission or distribution of electricity.

3 PRINCIPLES

3.1 Local Control is used as a method of permitting **Senior Authorised Person**(s) to complete independent fault location on the Northern Ireland Electricity 11kV overhead line **System**. The fault location can be completed without receiving instructions from the Distribution Control Centre for **Switching** operations associated with sectionalising.

3.2 Local Control:

(i) can be issued when a permanent fault has occurred on the 11kV Overhead Line **System**.

(ii) can only be issued to **Senior Authorised Person**(s) who in the opinion of the Local Incident Manager or the local outage manager processes sufficient operational experience of the **System** being considered for Local Control.

(iii) does not permit closing defined open points.

(iv) must not be used to achieve **Safety from the System** / setting **Persons** to work.

(v) cannot be transferred between **Senior Authorised Persons**.

3.3 Local Control will not be issued when:

(i) the reclosing devices are subject to an operational restrictions eg. AOR

(ii) the reclosing device has 3 or less fault operations available.

(iii) the Control Diagram available to the **Senior Authorised Person** does not show the reclosing device and all the open points on the defined **System**.

4 PROCEDURES FOR LOCAL CONTROL

4.1 The **Control Person** at the Distribution Control Centre will assign a failure of supply report number that will be issued to the **Senior Authorised Person**. The **Control Person** will transfer Control responsibilities for the defined part of the **System** and the **Senior Authorised Person** will become the Local Control Person. The **Control Person** at the Distribution Control Centre will record details of the defined System under Local Control and will update the control board/ diagram accordingly.

4.2 When parts of the **System** not affected by the fault are to be restored from an alternative source the **Senior Authorised Person** must return these to the Control of the **Control Person** at the Distribution Control Centre. This is achieved by redefining the **System** under Local Control. The **Control Person** at the Distribution Control Centre will then issue instructions to have the open point closed.

4.3 When the fault has been located the **Senior Authorised Person** must relinquish Local Control. The **Senior Authorised Person** must confirm the position of all isolating devices, switches etc. where their position has changed within the defined **System**. The **Control Person** at the Distribution Control Centre is responsible for achieving **Safety from the System** and carrying out repairs in line with established practices (e.g. SRI. 202 - 'Delegated Control on NIE HV System') where applicable.

4.4 Local Control will only be issued to a **Senior Authorised Person** possessing the following Authorisation categories:

(i) B1D - Apply & remove Safety Precautions to the Instruction of a **Control Person**

and

(ii) C2X (SRI 202) - **Control Person** for Delegated Control.

4.5 Local Control applies to 11kV overhead line circuits from the source circuit breaker, pole mounted reclosing device or fuse isolators to the open points or remote ends of the circuit.

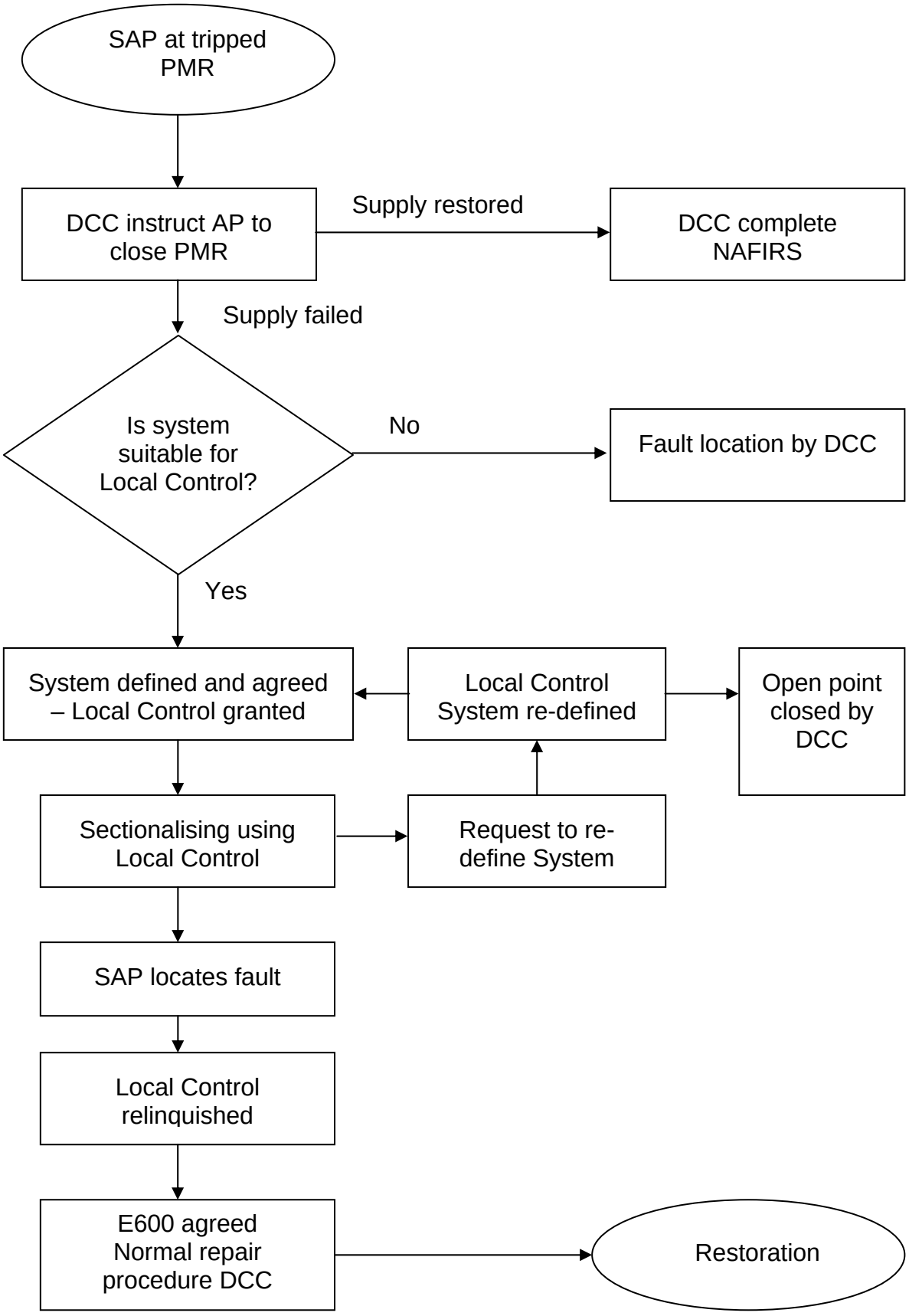
4.6 The defined open points will remain under control of the **Control Person** at the Distribution Control Centre at all times. The **Control Person** at the Distribution Control Centre and **Senior Authorised Person** must give consideration to fault level boundaries (G18) when enacting Local Control.

4.7 Normal communication should be by the Radio Telephone (Tetra) system during switching operations. When Local Control procedures are to be implemented a secondary means of communication must be established between the **Control Person** at the Distribution Control Centre and Local Control Person using either a mobile phone or substation phone.

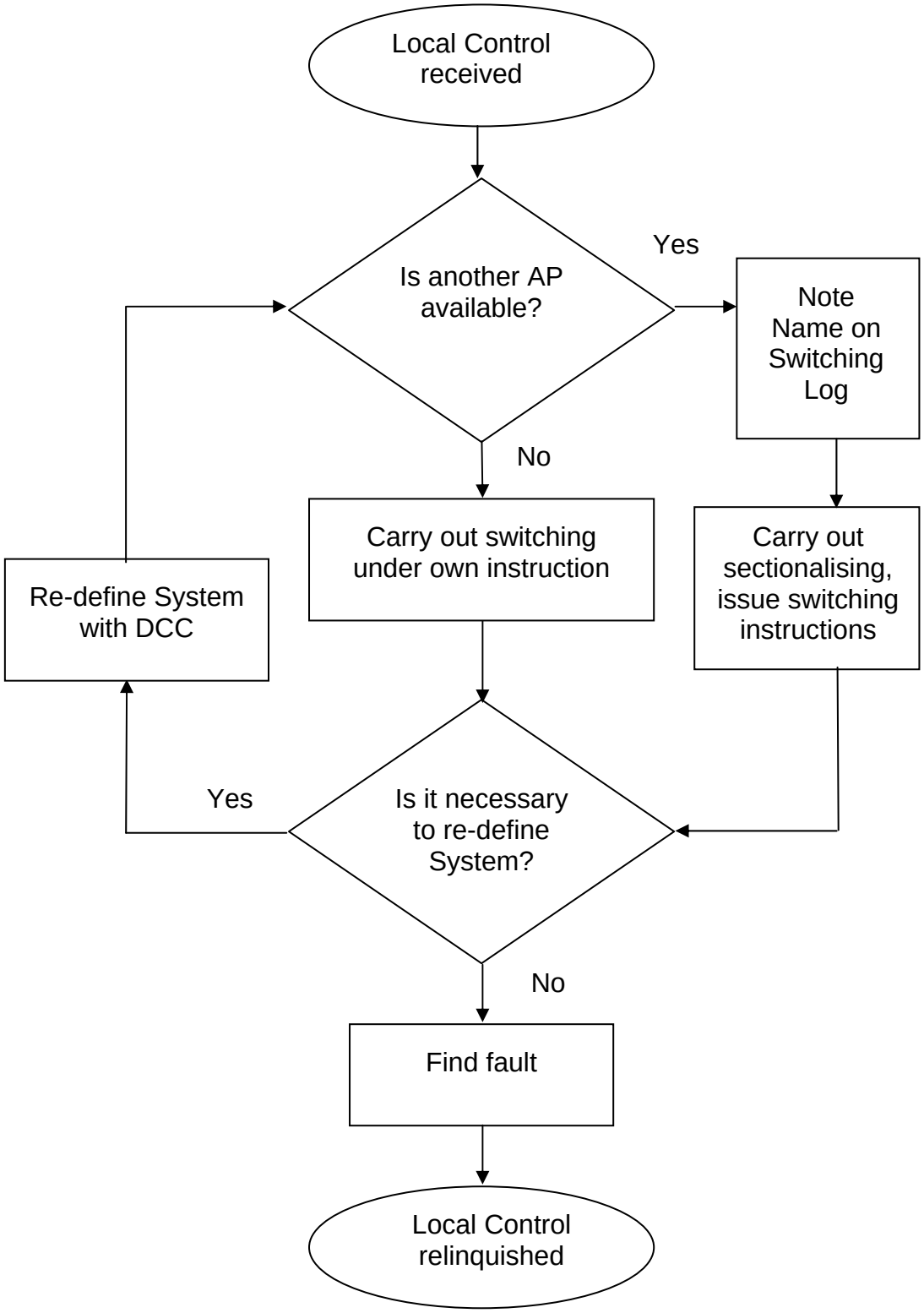
4.8 Suspension of Local Control - it may be necessary to suspend Local Control in some circumstances, for example when the supply fails on the source side of a pole mounted reclosing device. Local Control shall be suspended until supply is restored.

5 PROCEDURE FOR FAULT LOCATION AND REPAIR

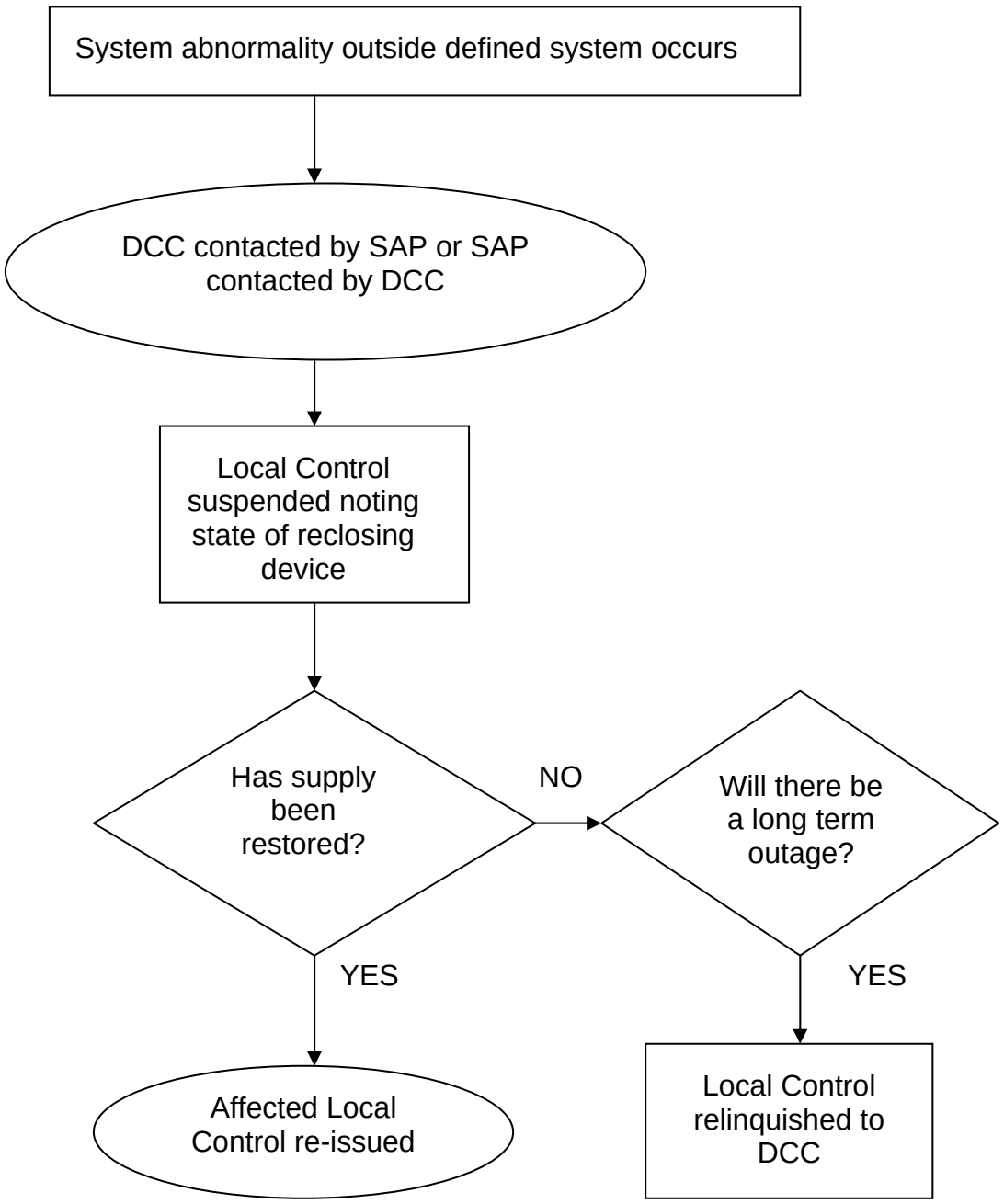
(the following example is for a fault beyond a PMR)



6 PROCEDURE TO BE FOLLOWED BY FIELD STAFF RECEIVING LOCAL CONTROL



7 SUSPENSION OF LOCAL CONTROL



8 FAULT FINDING TECHNIQUES AND GUIDELINES

Northern Ireland Electricity, in line with the Electricity Supply Industry has an established procedure of energising a faulted system in the process of locating a fault. The technique used to locate faults (sectionalise) when Local Control has been issued will not differ from those currently used by the Distribution Control Centre. The following guidelines are included as an aid to this procedure to locate a fault using the minimum number of reclosures.

8.1 After a permanent fault has been established (and Local Control issued) the next switch to be opened should be as close as possible to the middle of the circuit length. (the objective here is to 'half-split' the circuit.)

8.2 It can be taken that all automatic sectionalising devices have operated correctly, eg.
(If a sectionaliser has not tripped, the fault is not beyond it).

8.3 The operation of fault indicators is dependant on fault current. This can be verified for certain faults by placing indicators on the circuit at the first stage of sectionalising.

8.4 For safety reasons, during fault location it is often desirable for a second person to assist the **Senior Authorised Person**. During Local Control this will equally apply.

8.5 If the **Senior Authorised Person** feels that progress in locating the fault has not been made within a reasonable time or number of circuit reclosures, then he must relinquish Local Control**.**

8.6 After Local Control has been granted, all **Switching** instructions must be logged in the **Senior Authorised Person**'s personal **Switching** Log as follows: the 'Control Person / Engineer' section must show the name of the **Authorised Person** to whom which the instruction is given; this can take the form of 'Self' or the **Authorised Person**'s name. The remaining sections must be used in accordance with SRI 600, Appendices 8 and 10.

9 CONTROL CENTRE GUIDELINES

9.1 For Local Control, determining the number of fault operations allowed on oil circuit breaker's is decided by the number of pre-maintenance operations available minus one. e.g. after a permanent fault has been determined under instruction from Distribution Control Centre, a circuit breaker has already 3 fault operations. Distribution Control Centre will grant a further 4 fault operations under Local Control. This leaves one operation for Distribution Control Centre purposes where the total pre-maintenance operations allowed is eight.

9.2 Exceptions may include a switch that needs special consideration or any other abnormality in which the Distribution Control Centre **Control Person** deems important prior to issuing Local Control.

9.3 When the **System** is redefined the Distribution Control Centre will restore supplies up to the newly defined System if appropriate.

9.4 Local Control will always be relinquished before any repair work is carried out.

9.5 When relinquishing Local Control, the **Senior Authorised Person** shall confirm the position of all Switches/ Devices. This shall be recorded by Distribution Control Centre.

9.6 When relinquishing Local Control, the **Senior Authorised Person** will confirm the number of fault operations recorded on an circuit breaker during the period of Local Control. This will be recorded on the Local Control Document.

9.7 Distribution Control Centre will be responsible for recording restoration of supplies restored under Distribution Control Centre instruction in any associated NAFIRS. It is the responsibility of the **Senior Authorised Person** to insert any further restoration sections occurring within the defined **System** under their Control.

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[Issue 1]

PROXIMITY ISOLATION

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PROXIMITY ISOLATION

1 INTRODUCTION

The Northern Ireland Electricity Transmission and Distribution System is designed to operate with a degree of redundancy to mitigate against loss of **Plant** and/or **Apparatus** due to planned maintenance or during fault conditions. This level of redundancy usually provides for loss of one component of a dual supply arrangement e.g. one cable outage of twin 110kV feeders to a bulk supply substation.

Dual cable circuits may be laid in close proximity to each other and in the event of mechanical damage to one circuit it is prudent to visually examine the adjacent circuit for any collateral damage. While it is necessary to mitigate against any possible disruption of the second cable circuit whilst persons are in close proximity, the time taken to provide isolation and earthing may be considerable. This operation may create additional risk to customer supplies when the time involved in achieving isolation and applying **Earthing Devices** is considerable compared to the outage window available due to load restrictions.

This Guidance Document shall only to be implemented in the exceptional circumstances detailed above and with the authority of the Duty Incident Manager. The use of this procedure does not compromise the requirements of the Northern Ireland Electricity Safety Rules (Electrical and Mechanical)

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and are as follows:

Apparatus – All equipment forming part of the **System** in which electrical conductors are used, supported, or of which they may form a part, and for which Northern Ireland Electricity has a maintenance responsibility.

Approved - Sanctioned by the Chairman of the Electrical & Mechanical Safety Advisory Committee (EMSAC) for use.

Danger – A risk, to health or of bodily injury.

Earthed – Connected to earth by means of an **Earthing Device**.

Earthing Device

An **Approved** means of providing a connection between a conductor and earth, being one of the following:

(i) **Primary Earth** – A fixed or portable **Earthing Device** applied at a position defined in a **Safety Document**.

(ii) **Drain Earth** - A fixed or portable **Earthing Device** applied for the purpose of protection against induced voltages or inadvertent backfeed.

Isolated - Disconnected from associated **Plant** and/or **Apparatus** by an **Isolating Device**(s) in the isolating position, or by adequate physical separation or sufficient gap.

Locked - A condition of **Plant** and/or **Apparatus** that cannot be altered without the operation of a locking device which is of a standard acceptable to the Chairman of the Electrical & Mechanical Safety Advisory Committee (EMSAC)

Persons
Being one of the following:

(i) **Competent Person** – A **Person** who has sufficient technical knowledge and/or experience to avoid **Danger** who may receive, transfer and clear specified **Safety Documents** when nominated by an appropriate officer of Northern Ireland Electricity.

(ii) **Authorised Person** – A **Competent Person** who has been nominated by an appropriate officer of Northern Ireland Electricity to carry out duties specified in writing.

(iii) **Senior Authorised Person** – An **Authorised Person** nominated by an appropriate officer of Northern Ireland Electricity to carry out duties specified in writing, including the preparation, issue and cancellation of specified **Safety Documents**.

(iv) **Control Person** – A **Person** who has been nominated by an appropriate officer of Northern Ireland Electricity to be responsible for controlling and co-ordinating safety activities necessary to achieve **Safety from the System**.

Plant - Fixed and movable items of equipment, other than **Apparatus**, forming part of the **System**, for which Northern Ireland Electricity has a maintenance responsibility.

Safety Document
Being one of the following:

(i) **Limited Work Certificate** – A **Safety Document** of a format indicated in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), which defines the limits within which work or testing may be carried out and specifies necessary precautions.

(ii) **Permit for Work** - A **Safety Document** of a format indicated in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), specifying the **Plant** and/or **Apparatus** to be worked on, the work to be carried out and the actions taken to achieve **Safety from the System**.

(iii) **Sanction for Test** - A **Safety Document** of a format indicated in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical), specifying the **Plant** and/or **Apparatus** to be tested, making known the conditions under which the testing is to be carried out and confirming actions which have been taken to achieve **Safety from the System**.

Safety from the System – That condition that safeguards persons working on or testing **Plant** and/or **Apparatus** from the **Dangers** which are inherent in the **System**.

System - Items of **Plant** and **Apparatus** which are used separately or in combination in any process associated with the generation, transmission or distribution of electricity.

3 PRINCIPLES

3.1 The Duty Incident Manager after discussions with relevant parties may decide to invoke this procedure where it is considered that the time involved in achieving **Locked** isolation and fitting **Earthing Device**(s) would result in the creation of other hazards to customers. This procedure shall only be implemented on **Systems** energised at 33kV and above.

3.2 The known damaged circuit shall be **Isolated** and **Earthed**.

3.3 Work under this procedure shall be limited to visual inspection of a cable where there is no immediate indication of damage to the cable being inspected.

3.3 This procedure shall not be implemented if there is evidence of leakage of insulating fluid in the immediate vicinity of the cable to be inspected or any associated abnormal alarm indications.

3.4 Work under this procedure includes that work which is necessary to excavate the cable to establish its physical condition by visual examination.

4 PROCEDURE

The Duty Incident Manager may decide to invoke this procedure after discussion with the relevant Control Centres regarding the risk to customer supplies from the length of time involved in isolation, fitting **Earthing Device**(s) and the issue of **Safety Documents**.

1. The circuit to be inspected shall be de-energised.
2. Automatic reclosure devices shall be rendered inoperative.
3. A **Limited Work Certificate** shall be issued to the **Person** carrying out the visual inspection of the cable.

NIE SAFETY RULES

SAFETY RULES GUIDANCE

SRG 8

THIRD PARTIES WORKING ADJACENT TO LOW VOLTAGE OVERHEAD APPARATUS

Issue 1

THIRD PARTIES WORKING ADJACENT TO LOW VOLTAGE OVERHEAD APPARATUS

THIRD PARTIES WORKING ADJACENT TO LOW VOLTAGE OVERHEAD APPARATUS

1 Scope

This Safety Rules Guidance document and accompanying appendices provide information to be followed in relation to *Third Party Works* adjacent to NIE Networks **Isolated** overhead **LV Apparatus***.*

2 Definitions

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules.

For the purpose of this Safety Rules Guidance the following additional definitions apply:

Third Party Works – apply to any type of work so long as the activities of the *Third Party Person* will not alter the structural or electrical integrity of NIE Networks **Apparatus**, and are agreed in the presence of a representative of NIE Networks.

Safety Declaration Form – is a form intended to be used to give '*Third Party Persons'* confirmation that the **LV Apparatus** is and will remain **Isolated** for an agreed period of time during *Third Party Works.*

Third Party Person – person or persons, being a representative of a party requesting the *Third Party Works,* who shall have knowledge and understanding of all of the *Third Party Works* taking place.

Close Proximity – less than 1m or close enough to **Apparatus** to present a **Danger**.

3 General Requirements

3.1 This Safety Rules Guidance will allow the agreed *Third Party Works* adjacent to the **Isolated LV Apparatus** to proceed after a review of the planning stage risk assessment, network inspection and control measures identified such that the person(s), tools, equipment or other materials remain outside an agreed distance. By exception and in agreement with the **Senior Authorised Person** (and noted on the *Safety Declaration Form*) contact with the **Isolated LV Apparatus** may be acceptable.

3.2 This Safety Rules Guidance shall not include any *Third Party Works* taking place in *Close Proximity* to NIE Networks **Isolated HV Apparatus.**

Note - *Third Party Persons* and/or NIE Networks staff working in *Close Proximity* to **Isolated HV Apparatus** shall be subject to the conditions of NIE Safety Rules.

3.3 This Safety Rules Guidance document shall not include any *Third Party Works* taking place adjacent to NIE Networks **Live LV** or **Live HV Apparatus**

Note - *Third Party Persons* working adjacent to **Live LV** or **Live HV Apparatus** shall be subject to a risk assessment as detailed in HSE Guidance note GS6 – 'Avoiding Danger from Overhead Power Lines'.

3.4 Under this Safety Rules Guidance *Third Party Works* in *Close Proximity* to **LV Apparatus** shall require this **Apparatus** to be **Isolated**.

4 Planning

4.1 An initial meeting on site shall be held between a **Competent Person** and the *Third Party Person*.

Note – At this site meeting a record shall be kept of what has been agreed.

4.2 As part of this meeting a planning stage risk assessment shall be completed, this shall include a network inspection of the **LV Apparatus**.

4.3 A warning letter will be generated and shall be sent or hand delivered to the *Third Party Person* in advance of the works taking place.

4.4 If further consideration is required the work pack shall be forwarded to the local Network Access Manager or their equivalent and then assigned to a **Senior Authorised Person**.

4.5 An assessment shall be conducted by a **Senior Authorised Person** to ensure that controls and instructions will be adequate, so that the *Third Party Works* will not affect the integrity of the **LV Apparatus.**

4.6 Consideration shall be given by the **Senior Authorised Person** to adjacent conductors and voltages.

4.7 There shall, where reasonably practicable, be one span of conductor between the position of **Live LV Apparatus** and where the *Third Party Works* are taking place.

Note – if at this stage the **Senior Authorised Person** is not content to proceed with this guidance, the Network Access Manager or their equivalent must be informed.

4.8 A 'Request for LV Outage' form (E600) shall be considered and if applicable completed, agreed and approved.

4.9 The **Senior Authorised Person** shall have the **LV Apparatus Isolated** and where reasonably practicable short circuited prior to the issue of the *Safety Declaration Form.*

Short circuiting of the **Isolated LV Apparatus** shall, where reasonably practicable, be at the point of work.

5 Completion of the Safety Declaration Form

5.1 The **Senior Authorised Person** shall complete the issue section of the *Safety Declaration Form*.

5.2 The points at which **Plant** and **Apparatus** have been **Isolated** and the position at which the conductors have been short circuited, as applicable, shall be written onto the *Safety Declaration Form.* **SR A8**

Note: all **Plant** and **Apparatus** shall be readily identifiable or fixed to it a means of identification which will remain effective throughout the course of the *Third Party Works*.

5.3 The agreed *Third Party Works* and control measures or instructions where applicable, shall be written on the *Safety Declaration Form.*

5.4 The location shall be written on the *Safety Declaration Form*.

5.5 A set time period for the work shall be agreed and written on the *Safety Declaration Form*.

5.6 The **Senior Authorised Person** shall then print and sign their name, write their contact details on the form, and add the time and date. At this stage the **Senior Authorised Person** is confirming that precautions are adequate to allow *Third Party Works* to continue.

6 Issue and Receipt

6.1 The **Senior Authorised Person** shall fully explain the contents of the *Safety Declaration Form*, including the statement below, to the *Third Party Person.* They shall satisfy themselves that the *Third Party Person* understands the contents.

'I accept and understand the terms of this Safety Declaration Form which I will sign and return to a NIE Networks' Person immediately upon completion of the work. I also understand that no part of body, equipment or material will approach the isolated apparatus, unless agreed with the NIE Networks' Person issuing this Safety Declaration Form and the control measures, where applicable, shall be applied during the course of the agreed work.

WARNING! Failure to return this form at the agreed time to the NIE Networks' Person shall make the form void and the circuit shall be treated as Live.'

6.2 The *Third Party Person* shall then print and sign their name, before adding their contact details, time and date on the receipt section of the *Safety Declaration Form.*

6.3 The *Safety Declaration Form* shall be issued to the *Third Party Person* with a diagram/map.

The diagram/map shall indicate the points at which **Plant** and **Apparatus** have been **Isolated**, the position at which the conductors have been short circuited (as applicable), and the work area.

Note - No **Safety Keys** are required to be issued to the *Third Party Person*.

7 Clearance and Restoration

7.1 When *Third Party Works* have been completed

(i) Inspection of the work area shall be completed by an NIE Networks **Authorised Person** and the *Third Party Person*.

(ii) The *Third Party Perso*n shall sign the clearance part of the *Safety Declaration Form* certifying that all persons working under the Form have been withdrawn and warned not to work in *Close Proximity* to the **Apparatus**.

(iii) The NIE Networks **Authorised Person** onsite shall confirm to the **Senior Authorised Person** who issued the document that clearance has been received from the *Third Party Person* and that the LV **Apparatus** is in a suitable condition to return to service.

Note – if the **Senior Authorised Person** issuing the document is not available then the **Authorised Person** shall contact the Network Access Manager or their equivalent.

(iv) If fitted, the device for short circuiting the conductors shall be removed and the **LV Apparatus** can be re-energised.

(v) **LV Apparatus** shall be re-energised on the instruction of a **Senior Authorised Person.**

8 Problems at *Third Party Person's* Site

8.1 *Third Party Person* Leaves Site

Should the *Third Party Person*, who has been issued with the *Safety Declaration Form* leaves the work site and is not available to complete the Clearance Section of the *Safety Declaration Form* then: -

(i) Efforts shall be made by the **Senior Authorised Person** to contact the *Third Party Person*.

(ii) If the **Senior Authorised Person** cannot contact the *Third Party Person* then the *Third Party Works* shall be examined and any remaining *Third Party Persons* instructed that no further work in *Close Proximity* of the NIE Networks **Apparatus** is to continue.

The device for short circuiting the conductors shall only be removed and the **LV Apparatus** shall be re-energised when the **Senior Authorised Person** is satisfied that all *Third Party Persons* are clear of **LV Apparatus**.

8.2 Incidents with Apparatus

Incidents, such as heavy contact, with NIE Networks **Isolated LV Apparatus** should be avoided.

Where it is deemed necessary, controls shall be agreed prior to and applied during *Third Party Works* to avoid contact. However, should these controls fail and contact is made with the **Isolated LV Apparatus** the incident shall be referred to the **Senior Authorised Person** who issued the *Safety Declaration Form*.

Appendix 1 - Safety Declaration Form

Northern Ireland Electricity Networks

SAFETY DECLARATION FORM

No. ...………………..

LV Outage No. (if applicable) ………………….....

TO ……….. (Contact Details)…………………………..………………………….....

COMPANY……...

WORK SITE ADDRESS/ LOCATION: ……………………………………………………………………………….......

Issue

On behalf of NIE Networks, I declare that the following apparatus: ……………………………………………….......

……………………………………………………………………………………………….……………………………..

has been isolated at the following points……...………………………..……………………………….......................................

……………………………………………………………………………………………….……………………………..

All conductors have been short circuited at ………………………………………………………………………….....

……

and it is electrically safe, for you, and persons under your control, to carry out the agreed work within the isolated Low Voltage network as indicated on the attached diagram.

Agreed Third Party work: …………………………………………………………...

…...…...…...…………………………………………………………………………………...………………………...…........

Agreed Third Party control measures: ...……………………………………………………..
(where applicable)

……………………………………………………………………………………...

Location of work: ……………………………………………………………………..………………….......................................
(See attached diagram/map)

Agreed completion date and time for the above work: Date……………………..Time…………………………

Print Name (SAP) ………………………………….............Signed (SAP).……………………………….......................

Contact Details ……………………..…………............ Date ……………………. Time ……..…………..........

Receipt:

'I accept and understand the terms of this Safety Declaration Form which I will sign and return to a NIE Networks' Person immediately upon completion of the work. I also understand that no part of body, equipment or material will approach the isolated apparatus, unless agreed with the NIE Networks' Person issuing this Safety Declaration Form and the control measures, where applicable, shall be applied during the course of the agreed work'. WARNING! Failure to return this form at the agreed time to the NIE Networks' Person shall make the form void and the circuit shall be treated as Live.

Print Name (Third party) ……………………..…..…….....Signed (Third party)……..

Contact Details ……………………..………………......Date …………………….. Time …….…………...

This form must be returned signed by the recipient, to NIE Networks on completion of the work

Clearance

I declare that all persons under my control have ceased the above work, have withdrawn to a safe distance from the above LV Apparatus and that there has been no contact with the apparatus.

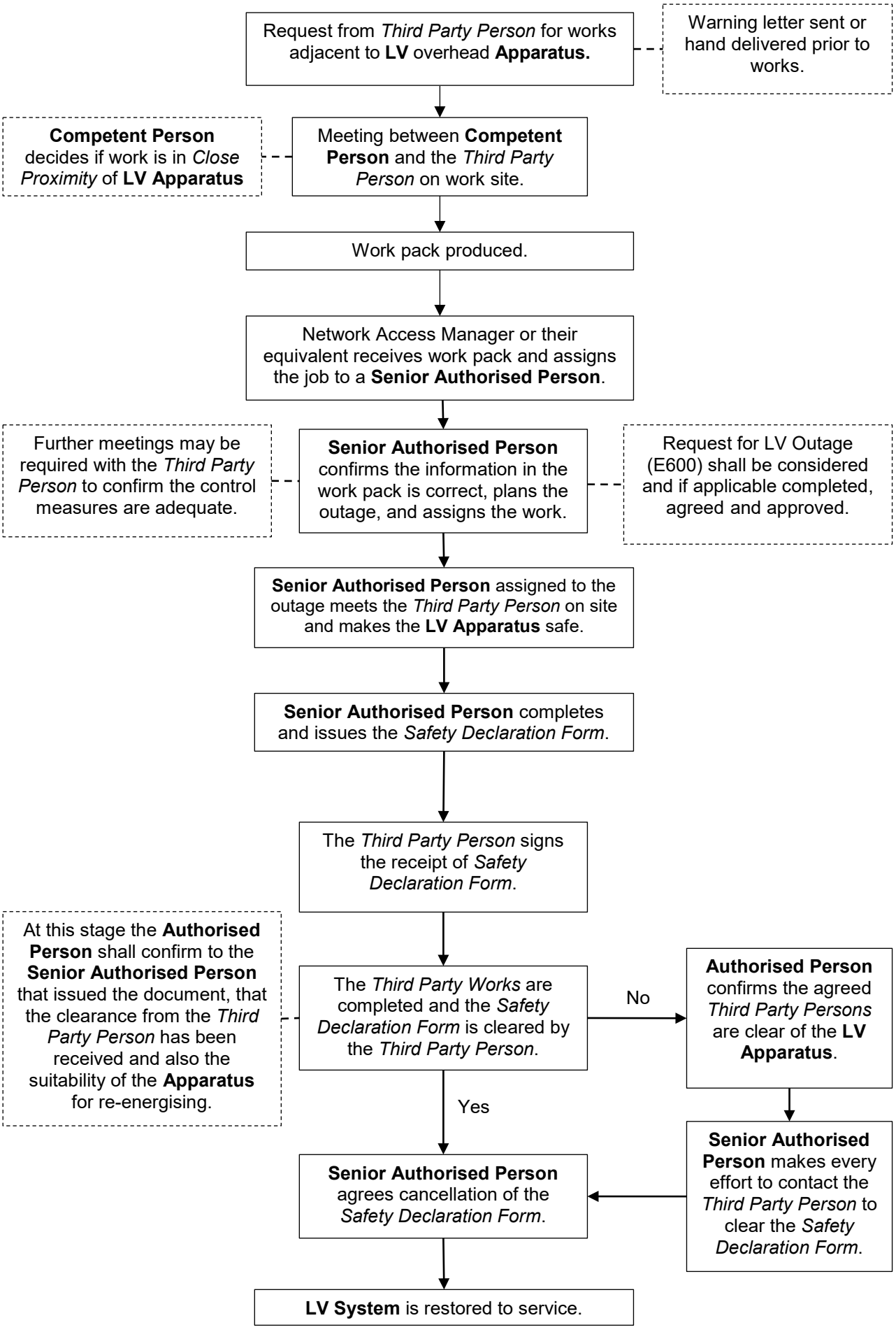
Signed …………………………………......... (Third Party) Date ……………………...Time …………………

Cancellation

This form is hereby cancelled by ………………………………… (SAP) and the above apparatus will be made Live and the system returned to normal

Signed …………………..…........(NIE Networks Authorised Person) Date …………………... Time ………………...

Appendix 2 - Flow Chart for Safety Declaration Form Working Practice



NORTHERN IRELAND ELECTRICITY
SAFETY RULES (ELECTRICAL AND MECHANICAL)

SAFETY RULES GUIDANCE DOCUMENT

SRG 9

[Issue 2]

LIVE WORKING ON THE NIE HIGH VOLTAGE (6.6/11kV) SYSTEM SAFETY JUSTIFICATION

CONTENTS

LIVE WORKING ON THE NIE HIGH VOLTAGE (6.6/11kV) SYSTEM SAFETY JUSTIFICATION

1 SCOPE

This document presents the case for the ongoing safe management of *Live Line Work* on or adjacent to NIE *System*. It documents the NIE application of the Energy Networks Association (ENA) SHE standard 08 (Principles Of High Voltage Overhead Line Live Working). It takes into consideration Health and Safety legislation, and NIE's ongoing safe working procedures.

Live Line Work is work on the NIE *System* where **Persons**, plant, equipment and/or materials will or have the intension to encroach within the **Safety Distance**. The *Live Line* Work can only be undertaken if the conditions of SP3 and SP5 can be applied.

2 DEFINITIONS

Terms printed in bold type (other than in headings) are as defined in the Northern Ireland Electricity Safety Rules (Electrical and Mechanical) and are as follows:

Apparatus – All equipment forming part of the **System** in which electrical conductors are used, supported, or of which they may form a part, and for which Northern Ireland Electricity has a maintenance responsibility.

Approved - Sanctioned by the Chairman of the Electrical & Mechanical Safety Advisory Committee (EMSAC) for use.

Personal Supervision – **Supervision** by a **Person** such that the supervising **Person** is at all times during the course of the work or testing continuously observing and in the presence of the individual(s) being supervised with the ability to intervene.

When individual(s) are working at height, supervision can be given at ground level providing verbal and visual communication is maintained at all times.

This level of supervision shall ensure individual(s) are not exposed to **Danger**.

Danger – A risk, to health or of bodily injury.

High Voltage (HV) – A voltage exceeding 1000 volts.

Live – Electrically charged.

Persons
Being one of the following:

(i) **Competent Person** – A **Person** who has sufficient technical knowledge and/or experience to enable him to avoid **Danger** who may receive, transfer and clear specified **Safety Documents** when nominated by an appropriate officer of Northern Ireland Electricity.

(ii) **Authorised Person** – A **Competent Person** who has been nominated by an appropriate officer of Northern Ireland Electricity to carry out duties specified in writing.

(iii) **Senior Authorised Person** – An **Authorised Person** nominated by an appropriate officer of Northern Ireland Electricity to carry out duties specified in writing, including the preparation, issue and cancellation of specified **Safety Documents.**

For the purposes of this document the following additional definitions will apply:

Live Line Work – work on or adjacent to the **Live** *System* and complies with the conditions in SP3 or SP5 and SRI 300.

Hotstick Working (Short stick) – Any work carried out on the **Live** NIE *System* overhead lines using **Approved** insulated tools and equipment and working from an elevated position outside of an defined safety distance.

Hotstick Working (Long stick) – Any work carried out on the **Live** NIE *System* overhead lines using **Approved** long insulated rods, from ground level or from an elevated pole mounted platform.

Hotglove Working (Rubber glove Working) – Any work carried out on **Live** NIE *System* overhead lines using a platform insulated from earth and using **Approved** insulating Personal Protective Equipment.

Work area – The area encompassed by the reach of the operator plus the length of any insulated hand tools or as defined in a specific procedure.

System - **HV** Items of **Plant** and **Apparatus** which are used for the distribution of electricity with a nominal voltage up to and including 11kV.

Dead - this is referred to in the Model Distribution Safety Rules as 'At or about zero voltage and disconnected from any Live System', and for the purpose of this document can be defined as an electrical system that has been disconnected from all known sources of supply, has been short-circuited or Earthed to mitigate against risk from becoming Live during the course of work.

3 OVERVIEW

The philosophy of *Live Line Work* is to:

1) establish a regime and subsequently apply procedures that will enable *Live Line Work* to be carried out safely on the NIE *System*,

2) ensure the number and duration of supply interruptions (affecting customers who expect, and in many cases rely on, continuity of supply) are kept to a minimum, whilst operating and maintaining the supply systems to required standards.

Live Line Work is alternative work to *Dead* working, for maintenance, refurbishment and connection work on or adjacent to the NIE *System*.

The principles involved in *Live Line Work* are founded on:

1) Establishing competency of Persons, by way of appropriate qualifications and training and assessment.

2) Applying specially developed safe working procedures.

3) *Live Line Work* shall only be permitted in circumstances when it is considered to be 'unreasonable' for the conductors to be *Dead* and released for work, by the issue of a Safety Document and

4) it is reasonable for a **Person(s)** to be carrying out that work and that suitable precautions e.g. insulating aerial devices, insulating tools, suitable PPE etc. are in place to prevent **Danger**.

Ongoing management of *Live Line Work* requires that NIE has in place resources to:

1) Develop and implement **Approved** procedures and methods.

2) Manage training.

3) Ensure appropriate PPE, tools and equipment are obtained, and maintained.

4) Ensure adequate and thorough auditing and that reviews are subsequently carried out.

Live Line Work is used extensively across the electrical industry including most of the UK Distribution Network Operators and Experience has shown that:

1) The techniques are well developed; *Live Line Working* procedures have been used worldwide for many years including within NIE.

2) Methods have been proven through time to be safe.

4 INTRODUCTION

Justification for *Live Line Work* is based on the principle that the work method and its associated controls enable **Competent** and/or **Authorised Persons** to undertake the work safely. During the considerations of *Live Line Working* techniques, it shall be emphasised that the safety of those persons directly or indirectly involved, including the public, is of paramount importance.

Legislation requires that a safe working environment be established and maintained in all situations.

This document outlines the main requirements for NIE, in utilising *Live Line Work* as a means of completing significant quantities of work, without interrupting supplies of electricity, so long as the requirements' of Northern Ireland Electricity Safety Rules (Electrical & Mechanical), SP 3 and SP5 can be met.

5 HEALTH, SAFETY AND OTHER LEGAL REQUIREMENTS

5.1 The key legal issues applicable to *Live Line Work* are to ensure compliance with the Management of Health and Safety at Work Regulations 1992 and the Electricity at Work Regulations (N.I.) 1991. In addition to these requirements, the following list of statutory provisions (which is not exhaustive) is also relevant to *Live Line Work*:

Health and Safety at Work (NI) Order 1978
Electricity Supply Order 1991
Provision and Use of Work Equipment Regulations 1992
Personal Protective Equipment Regulations 1992.
Provision and use of work Equipment Regulations 1998.
Electricity Safety, Quality and Continuity Regulations 2012
Working at Height Regulations 2005

The Electricity at Work Regulations (NI) 1991, Regulation 14 states that

"*A person shall not be engaged in any work activity on or near any **Live** part (other than one suitably covered with insulating material so as to prevent danger) where danger may arise unless:*

(i) *it is unreasonable in all the circumstances for it to be Dead; and*

(ii) *it is reasonable in all the circumstances for him to be at work on or near it while it is **Live**; and*

(iii) *suitable precautions (including, where necessary, the provision of suitable protective equipment) are taken to prevent injury."*

Compliance with requirement (i) is achieved by reference to the need for NIE to ensure the number and duration of supply interruptions (affecting customers who expect, and in many cases rely on, continuity of supply) are kept to a minimum, whilst operating and maintaining the supply systems to required standards.

Compliance with requirement (ii) and (iii) is achieved by:

(a) Permitting only **Competent Persons** and/or **Authorised Persons** to conduct *Live Line Work*
(b) following **Approved** procedures
(c) Using **Approved** tools and equipment
(d) Working in accordance with NIE Safety Rules (Electrical and Mechanical).

Compliance with requirement (iii) is reinforced by implementing and maintaining the specific PPE, tools & Equipment necessary for *Live Line Work* to be carried out in accordance with approved procedures.

It is important to note that no Electricity Supply Licensing or Regulatory legislation at present places any requirements on Suppliers to manage **Live** working - it only increases the need to minimise interruptions of supply and any other disruption to users of electricity.

This need to minimise supply disruption and the creation of other hazards to both employees and other persons is the main driver for NIE to adopt *Live Line Working* procedures.

5.2 Criteria for Justification of *Live Line Work*

When *Live Line Work* is proposed, an assessment of all the relevant factors involved shall be made. The criteria for justifying *Live Line Work* to proceed is listed below, but other factors can arise and influence the decision to Justify the *Live Line work* -

The proposed Live Line Work must comply, without exception, to the following criteria requirements of 5.2 (i)-(iii)

(i) There must be **Approved** procedure(s) for the proposed *Live Line Work*.

(ii) The *Live Line Working* party must be trained, competent and Authorised to carry out the proposed *Live Line work*.

(iii) The *Live Line Working* party must have suitable or **Approved** tools, equipment, devices to carry out the proposed *Live Line work*.

If requirements 5.2 (i)-(iii) can be met, the proposed *Live Line Work* can proceed, provided there are fifteen customers or more in the associated switchable section of the *system* where the *Live Line Work* is taking place.

When the proposed *Live Line Work* has less the fifteen customers in the associated switchable section of the *system*. It can only be Justified after careful consideration, for compliance, with one or more of the requirements 5.2 (iv)-(x) detailed below.

(iv) Is the circuit of strategic importance in terms of overall system security?

(v) Will domestic, commercial or industrial customers having special, strategic or sensitive needs be affected?

(vi) Would *Dead* working require a major outage based on the number/complexity of switching operations, the time to carry out that switching and the associated risks of driving, walking, lone working, working at height and operating the switchgear to undertake the work?

(vii) Would the programmed work require repeated interruptions of supply possibly extending over several days?

(viii) Seasonal considerations: e.g. where loss of supply in the winter months would mean customers without heating and/or lighting.

(ix) Time of day or day of week (e.g. circuits that have shared commercial industrial and/or domestic load where it is often difficult to establish a satisfactory compromise for interruption of supply to suit all parties).

(x) Planned remedial work on circuits that have historically been subject to a large number of faults (e.g. certain ‘rogue’ circuits that may have been prone to a number of supply interruptions caused by fault conditions).

6 *LIVE LINE WORK*

The following “Streams” are established during ongoing management of *Live Line Work*:

6.1 Selection and Training of Persons Involved in *Live Line Work*

Within the Energy Networks Association (ENA) SHE standard 08 (Principles Of High Voltage Overhead Line Live Working) it refers to ISSA ‘Guideline for assessing the competence of persons involved in *Live Line work*.
This guidance document has in place a package, which includes the selection and training specifically, tailored to NIE requirements. The Authorisation of persons to carry out *Live Line Work* shall be based on satisfactory completion of this training, and the subsequent formal assessments.

Selection of employees for *Live Line Work* will include the following factors

1) Knowledge, skills and experience factors

Core factors for knowledge, skills and experience that are considered the minimum that should be addressed for each person being considered for *Live Line Work,* these are set out below. They are in no particular order of priority.

- Level of responsibility
- Application of knowledge
- Breadth and depth of experience
- Quality and standards of work undertaken
- Self-awareness
- Coping with change
- Analytical thinking and communication

2) Core Behaviours

Behaviours are distinct from, but complementary to, technical and job specific skills, knowledge and experience. These core behaviours can be identified as follows. They are in no particular order of priority.

- Attention to detail
- Communication
- Methodical working
- Self confidence
- Self-control (including calm disposition and patience)
- Self-management
- Sense of responsibility

Training for all **Persons** required to perform **HV** *Live Line Work* shall consist of, in sequence:

(i) Simulated *Live Line Work* (on a *System* that is *Dead*) during which an initial safety and skills assessment is completed;

(ii) On satisfactory assessment, continuation of training using a **Live** training system at a location suitably equipped, concluding with an interim assessment of skills gained;

(iii) Training would then be transferred to a **Live** *System*, with continuing **Personal Supervision** and assessment by a **Person** suitably **Authorised**. Once the required standard is achieved, the **Person** would be individually assessed on all aspects, and if satisfactory, **Authorised** to undertake *Live Line Work*.

6.2 Whole Job Risk Assessment (WJRA) and Job Plan

This is a formal work planning process, recorded on a standard form specific to *Live Line Work*, in accordance with the Management of Health and Safety of Work Regulations, and in accordance with the control system for *Live Line Work.*

All hazards are noted, along with control measures required and steps taken to control or eliminate them.

Prior to any work commencing the work site and overhead line including the structures adjacent to the work site are assessed for defects which may affect the integrity of the work site.

A step by step Job Plan of the work must be established and recorded.

The names of all the team members present are recorded, with a named team member designated to act as the **Authorised Person**. The work procedures to be used for that particular job are also identified.

Should any additional hazards be observed during the course of *Live Line Work*, the *Live Line work* must stop immediately and these additional hazards must be added to the WJRA, the required control measures to control or eliminate the hazard must be put in place and recorded on the WJRA.

Should it be necessary to change the order of steps in which the *Live Line Work* is to be completed, then this must be agreed with the team members and recorded on the WJRA (Job Plan).

6.3 Personnel

Team members:

The **Persons** employed to carry out *Live Line Work* shall be **Competent/Authorised Persons** who have successfully completed the training and assessment process detailed in section 6.1.

One team member must perform the role of a **Authorised Person** for the duration of the *Live Line Work*. The **Authorised Person** must provide continual safety monitoring from ground level, for the duration of the *Live Line Work*. This includes making sure that the work proceeds as detailed in section 6.2 The work must stop if the **Authorised Person** in charge is unable for any reason to observe and/or control the *Live Line work*.

Hotstick Working requires one team member to be an **Authorised Person,** the other team members must have as a minimum a **Competent Persons** level of Authorisation.

Hotglove Working requires all team members to be **Authorised Persons.** The role of the **Authorised Person** for *Hotglove Work* must be rotated between team members to ensure that skill levels are maintained by all team members.

Others:

Line Managers shall be fully competent and conversant with the requirements of *Live Line Working* procedures and be suitably **Authorised**. This ensures work planning and management functions can be safely implemented. Line Managers shall ensure the team is properly equipped with tools, equipment, and comply with the *Live Line Working* procedures.

Any **Senior Authorised Person** required to perform their duties in relation to the *system* shall be authorised for overall management of *Live Line Working*. Responsibilities include work planning/programming and advising on safety issues (which may relate to **Live** and *Dead* work) when necessary.

Manager – All *Live Line Work* must be Justified by an appropriate manager. This manager may nominate a Person to Justify *Live Line Work* on their behalf. This nominated **Person** must adhere to the criteria detailed in 5.2 when Justifying *Live Line Work* and by signing section 1 of the *Live Line Working* record.

6.4 Safety Notes

Safety Notes are included in the 'HV Live Line manual' and must be applied in conjunction with the Northern Ireland Electricity Safety Rules (Electrical & Mechanical). These Safety Notes include:

(i) Definitions appropriate to *Live Line Working*, not included in the NIE Safety Rules or Safety Rules Instructions (SRI's). These definitions include "adverse weather", "dedicated observer" and "second point of contact".

(ii) Roles and responsibilities of team members, in particular the role of the dedicated observer, and the requirement to complete the Whole Job Risk Assessment and Job Plan prior to *Live Line Work* beginning.

(iii) limitations imposed by adverse weather

(iv) Safety clearances to be observed by **Persons** and equipment.

(v) Care, inspection, electrical testing and safe use of:
   a. personal protective equipment including insulating gloves and sleeves
   b. other protective insulating equipment
   c. *Live Line Working* tools
   d. the Insulating Aerial Device

6.5 *Live Line Working* Procedures and Methods

The *Live Line Working* procedures detailed in the 'HV Live Line manual' specify:

(i) the safety precautions to be taken before and during the course of work

(ii) the preliminary work to be completed prior to starting the *Live Line Working,* including the Whole Job Risk Assessment and Job Plan, the inspection of all tools, protective equipment and devices to ensure that they are fit for purpose

(iii) how to safely undertake the *Live Line Working* to which the appropriate procedures and methods refer.

6.6 Management of *Live Line Working* Tools and Equipment

All *Live Line Working* tools and equipment shall be:

(i) **Approved**

(ii) Inspected before each job and in accordance with details described in the *'*HV Live Line Manual'

(iii) Cared for and stored in suitable conditions in accordance with approved procedures

(iv) The intervals for scheduled inspection, testing and maintenance are detailed in the 'HV Live Line Manual'

(v) All insulating items are stamped with a "use until" date. Equipment must not be used after the "use until" date

6.7 Safety Auditing and Inspection of *Live Line Work*

Annual Safety Audit:

The Annual Safety Audit must be carried out by Auditor(s), independent of the managed unit in which the Team works. This audit is to verify that:

(i) safety and work procedures are being adhered to, and the supervisory back up and control mechanisms are being maintained,

(ii) the procedures, planning and control processes are correct and relevant to the work being undertaken,

(iii) teams and supervisors are completing the necessary documentation, and continue to possess the skills required for the work,

(iv) no complacency exists due to familiarity with the work procedures,

(v) the condition of tools, equipment and the Insulating Aerial Device are satisfactory, and have a valid "use until" date and

(vi) the maintenance regimes and records for all tools and equipment and the Insulating Aerial Device are operating correctly, and up to date.

The results of all audits will be discussed with the team and copies of the audit reports sent to the team involved, the Team Manager and the relevant Business manager.

Monthly safety inspection

The monthly safety inspection must be carried out by the Team Manager.

This inspection is to verify that:

(i) The General safety of the work area and *Live Line Working* procedures are correctly maintained and used.

(ii) The teams are completing the necessary documentation and continue to possess the skills required for the work.

(iii) That no complacency exists due to familiarity with the *Live Line Working* procedures.

(iv) The Insulating Aerial Device has a valid **Approval**, that it is in a satisfactory condition and that all inspections/tests (electrical and mechanical) have been completed and passed.

(v) All insulating tools and equipment have valid **Approvals**, that they are in a satisfactory condition and that all inspections/tests (electrical and mechanical) have been completed and passed

7 CONCLUSIONS

7.1 The Safety Justification for *Live Line Work* contained within this document is founded upon the following principles: -

(i) Being in conformity with the requirements of Health and Safety and other relevant legislation, NIE Safety Rules and other safety and work method documents and instructions.

(ii) Having safe **Approved** *Live Line Working* procedures.

(iii) Using appropriately managed and **Approved** *Live Line Working* tools and equipment.

(iv) Having an appropriate management and supervisory system in place to ensure that all electrically insulating equipment and tools are cared for, inspected, examined and tested in accordance with the **Approved** procedures.

(v) Training assessment and auditing procedures to ensure the competency of team members, supervisors and all others involved.

(vi) The establishment of a regular and thorough audit process.

(vii) This Justification document has addressed all these issues and confirms that the necessary controls are in place for NIE to proceed with *Live Line Work* as a safe means of work.

(viii) The requirements of the Electricity at Work Regulations (N.I.) 1991 have been specifically addressed. Conformity with Regulation 14 as regards Justification must be confirmed in advance for each job by the Manager authorising it for *Live Line Work*

(ix) This Justification document sets the principles to be adopted for *Live Line Work*, based on the philosophy stated.

NORTHERN IRELAND ELECTRICITY
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The philosophy of *Live Line Work* is to:

1) establish a regime and subsequently apply procedures that will enable *Live Line Work* to be carried out safely on the NIE *System*,

2) ensure the number and duration of supply interruptions (affecting customers who expect, and in many cases rely on, continuity of supply) are kept to a minimum, whilst operating and maintaining the supply systems to required standards.

Live Line Work is alternative work to *Dead* working, for maintenance, refurbishment and connection work on or adjacent to the NIE *System*.

The principles involved in *Live Line Work* are founded on:

1) Establishing competency of Persons, by way of appropriate qualifications and training and assessment.

2) Applying specially developed safe working procedures.

3) *Live Line Work* shall only be permitted in circumstances when it is considered to be 'unreasonable' for the conductors to be *Dead* and released for work, by the issue of a Safety Document and

4) it is reasonable for a **Person(s)** to be carrying out that work and that suitable precautions e.g. insulating aerial devices, insulating tools, suitable PPE etc. are in place to prevent **Danger**.

Ongoing management of *Live Line Work* requires that NIE has in place resources to:

1) Develop and implement **Approved** procedures and methods.

2) Manage training.

3) Ensure appropriate PPE, tools and equipment are obtained, and maintained.

4) Ensure adequate and thorough auditing and that reviews are subsequently carried out.

Live Line Work is used extensively across the electrical industry including most of the UK Distribution Network Operators and Experience has shown that:

1) The techniques are well developed; *Live Line Working* procedures have been used worldwide for many years including within NIE.

2) Methods have been proven through time to be safe.

4 INTRODUCTION

Justification for *Live Line Work* is based on the principle that the work method and its associated controls enable **Competent** and/or **Authorised Persons** to undertake the work safely. During the considerations of *Live Line Working* techniques, it shall be emphasised that the safety of those persons directly or indirectly involved, including the public, is of paramount importance.

Legislation requires that a safe working environment be established and maintained in all situations.

This document outlines the main requirements for NIE, in utilising *Live Line Work* as a means of completing significant quantities of work, without interrupting supplies of electricity, so long as the requirements' of Northern Ireland Electricity Safety Rules (Electrical & Mechanical), SP 3 and SP5 can be met.

5 HEALTH, SAFETY AND OTHER LEGAL REQUIREMENTS

5.1 The key legal issues applicable to *Live Line Work* are to ensure compliance with the Management of Health and Safety at Work Regulations 1992 and the Electricity at Work Regulations (N.I.) 1991. In addition to these requirements, the following list of statutory provisions (which is not exhaustive) is also relevant to *Live Line Work*:

Health and Safety at Work (NI) Order 1978
Electricity Supply Order 1991
Provision and Use of Work Equipment Regulations 1992
Personal Protective Equipment Regulations 1992.
Provision and use of work Equipment Regulations 1998.
Electricity Safety, Quality and Continuity Regulations 2012
Working at Height Regulations 2005

The Electricity at Work Regulations (NI) 1991, Regulation 14 states that

"*A person shall not be engaged in any work activity on or near any **Live** part (other than one suitably covered with insulating material so as to prevent danger) where danger may arise unless:*

(i) *it is unreasonable in all the circumstances for it to be Dead; and*

(ii) *it is reasonable in all the circumstances for him to be at work on or near it while it is **Live**; and*

(iii) *suitable precautions (including, where necessary, the provision of suitable protective equipment) are taken to prevent injury."*

Compliance with requirement (i) is achieved by reference to the need for NIE to ensure the number and duration of supply interruptions (affecting customers who expect, and in many cases rely on, continuity of supply) are kept to a minimum, whilst operating and maintaining the supply systems to required standards.

Compliance with requirement (ii) and (iii) is achieved by:

(a) Permitting only **Competent Persons** and/or **Authorised Persons** to conduct *Live Line Work*
(b) following **Approved** procedures
(c) Using **Approved** tools and equipment
(d) Working in accordance with NIE Safety Rules (Electrical and Mechanical).

Compliance with requirement (iii) is reinforced by implementing and maintaining the specific PPE, tools & Equipment necessary for *Live Line Work* to be carried out in accordance with approved procedures.

It is important to note that no Electricity Supply Licensing or Regulatory legislation at present places any requirements on Suppliers to manage **Live** working - it only increases the need to minimise interruptions of supply and any other disruption to users of electricity.

This need to minimise supply disruption and the creation of other hazards to both employees and other persons is the main driver for NIE to adopt *Live Line Working* procedures.

5.2 Criteria for Justification of *Live Line Work*

When *Live Line Work* is proposed, an assessment of all the relevant factors involved shall be made. The criteria for justifying *Live Line Work* to proceed is listed below, but other factors can arise and influence the decision to Justify the *Live Line work* -

The proposed Live Line Work must comply, without exception, to the following criteria requirements of 5.2 (i)-(iii)

(i) There must be **Approved** procedure(s) for the proposed *Live Line Work*.

(ii) The *Live Line Working* party must be trained, competent and Authorised to carry out the proposed *Live Line work*.

(iii) The *Live Line Working* party must have suitable or **Approved** tools, equipment, devices to carry out the proposed *Live Line work*.

If requirements 5.2 (i)-(iii) can be met, the proposed *Live Line Work* can proceed, provided there are fifteen customers or more in the associated switchable section of the *system* where the *Live Line Work* is taking place.

When the proposed *Live Line Work* has less the fifteen customers in the associated switchable section of the *system*. It can only be Justified after careful consideration, for compliance, with one or more of the requirements 5.2 (iv)-(x) detailed below.

(iv) Is the circuit of strategic importance in terms of overall system security?

(v) Will domestic, commercial or industrial customers having special, strategic or sensitive needs be affected?

(vi) Would *Dead* working require a major outage based on the number/complexity of switching operations, the time to carry out that switching and the associated risks of driving, walking, lone working, working at height and operating the switchgear to undertake the work?

(vii) Would the programmed work require repeated interruptions of supply possibly extending over several days?

(viii) Seasonal considerations: e.g. where loss of supply in the winter months would mean customers without heating and/or lighting.

(ix) Time of day or day of week (e.g. circuits that have shared commercial industrial and/or domestic load where it is often difficult to establish a satisfactory compromise for interruption of supply to suit all parties).

(x) Planned remedial work on circuits that have historically been subject to a large number of faults (e.g. certain ‘rogue’ circuits that may have been prone to a number of supply interruptions caused by fault conditions).

6 *LIVE LINE WORK*

The following “Streams” are established during ongoing management of *Live Line Work*:

6.1 Selection and Training of Persons Involved in *Live Line Work*

Within the Energy Networks Association (ENA) SHE standard 08 (Principles Of High Voltage Overhead Line Live Working) it refers to ISSA ‘Guideline for assessing the competence of persons involved in *Live Line work*.
This guidance document has in place a package, which includes the selection and training specifically, tailored to NIE requirements. The Authorisation of persons to carry out *Live Line Work* shall be based on satisfactory completion of this training, and the subsequent formal assessments.

Selection of employees for *Live Line Work* will include the following factors

1) Knowledge, skills and experience factors

Core factors for knowledge, skills and experience that are considered the minimum that should be addressed for each person being considered for *Live Line Work,* these are set out below. They are in no particular order of priority.

- Level of responsibility
- Application of knowledge
- Breadth and depth of experience
- Quality and standards of work undertaken
- Self-awareness
- Coping with change
- Analytical thinking and communication

2) Core Behaviours

Behaviours are distinct from, but complementary to, technical and job specific skills, knowledge and experience. These core behaviours can be identified as follows. They are in no particular order of priority.

- Attention to detail
- Communication
- Methodical working
- Self confidence
- Self-control (including calm disposition and patience)
- Self-management
- Sense of responsibility

Training for all **Persons** required to perform **HV** *Live Line Work* shall consist of, in sequence:

(i) Simulated *Live Line Work* (on a *System* that is *Dead*) during which an initial safety and skills assessment is completed;

(ii) On satisfactory assessment, continuation of training using a **Live** training system at a location suitably equipped, concluding with an interim assessment of skills gained;

(iii) Training would then be transferred to a **Live** *System*, with continuing **Personal Supervision** and assessment by a **Person** suitably **Authorised**. Once the required standard is achieved, the **Person** would be individually assessed on all aspects, and if satisfactory, **Authorised** to undertake *Live Line Work*.

6.2 Whole Job Risk Assessment (WJRA) and Job Plan

This is a formal work planning process, recorded on a standard form specific to *Live Line Work*, in accordance with the Management of Health and Safety of Work Regulations, and in accordance with the control system for *Live Line Work.*

All hazards are noted, along with control measures required and steps taken to control or eliminate them.

Prior to any work commencing the work site and overhead line including the structures adjacent to the work site are assessed for defects which may affect the integrity of the work site.

A step by step Job Plan of the work must be established and recorded.

The names of all the team members present are recorded, with a named team member designated to act as the **Authorised Person**. The work procedures to be used for that particular job are also identified.

Should any additional hazards be observed during the course of *Live Line Work*, the *Live Line work* must stop immediately and these additional hazards must be added to the WJRA, the required control measures to control or eliminate the hazard must be put in place and recorded on the WJRA.

Should it be necessary to change the order of steps in which the *Live Line Work* is to be completed, then this must be agreed with the team members and recorded on the WJRA (Job Plan).

6.3 Personnel

Team members:

The **Persons** employed to carry out *Live Line Work* shall be **Competent/Authorised Persons** who have successfully completed the training and assessment process detailed in section 6.1.

One team member must perform the role of a **Authorised Person** for the duration of the *Live Line Work*. The **Authorised Person** must provide continual safety monitoring from ground level, for the duration of the *Live Line Work*. This includes making sure that the work proceeds as detailed in section 6.2 The work must stop if the **Authorised Person** in charge is unable for any reason to observe and/or control the *Live Line work*.

Hotstick Working requires one team member to be an **Authorised Person,** the other team members must have as a minimum a **Competent Persons** level of Authorisation.

Hotglove Working requires all team members to be **Authorised Persons.** The role of the **Authorised Person** for *Hotglove Work* must be rotated between team members to ensure that skill levels are maintained by all team members.

Others:

Line Managers shall be fully competent and conversant with the requirements of *Live Line Working* procedures and be suitably **Authorised**. This ensures work planning and management functions can be safely implemented. Line Managers shall ensure the team is properly equipped with tools, equipment, and comply with the *Live Line Working* procedures.

Any **Senior Authorised Person** required to perform their duties in relation to the *system* shall be authorised for overall management of *Live Line Working*. Responsibilities include work planning/programming and advising on safety issues (which may relate to **Live** and *Dead* work) when necessary.

Manager – All *Live Line Work* must be Justified by an appropriate manager. This manager may nominate a Person to Justify *Live Line Work* on their behalf. This nominated **Person** must adhere to the criteria detailed in 5.2 when Justifying *Live Line Work* and by signing section 1 of the *Live Line Working* record.

6.4 Safety Notes

Safety Notes are included in the 'HV Live Line manual' and must be applied in conjunction with the Northern Ireland Electricity Safety Rules (Electrical & Mechanical). These Safety Notes include:

(i) Definitions appropriate to *Live Line Working*, not included in the NIE Safety Rules or Safety Rules Instructions (SRI's). These definitions include "adverse weather", "dedicated observer" and "second point of contact".

(ii) Roles and responsibilities of team members, in particular the role of the dedicated observer, and the requirement to complete the Whole Job Risk Assessment and Job Plan prior to *Live Line Work* beginning.

(iii) limitations imposed by adverse weather

(iv) Safety clearances to be observed by **Persons** and equipment.

(v) Care, inspection, electrical testing and safe use of:
   a. personal protective equipment including insulating gloves and sleeves
   b. other protective insulating equipment
   c. *Live Line Working* tools
   d. the Insulating Aerial Device

6.5 *Live Line Working* Procedures and Methods

The *Live Line Working* procedures detailed in the 'HV Live Line manual' specify:

(i) the safety precautions to be taken before and during the course of work

(ii) the preliminary work to be completed prior to starting the *Live Line Working,* including the Whole Job Risk Assessment and Job Plan, the inspection of all tools, protective equipment and devices to ensure that they are fit for purpose

(iii) how to safely undertake the *Live Line Working* to which the appropriate procedures and methods refer.

6.6 Management of *Live Line Working* Tools and Equipment

All *Live Line Working* tools and equipment shall be:

(i) **Approved**

(ii) Inspected before each job and in accordance with details described in the *'*HV Live Line Manual'

(iii) Cared for and stored in suitable conditions in accordance with approved procedures

(iv) The intervals for scheduled inspection, testing and maintenance are detailed in the 'HV Live Line Manual'

(v) All insulating items are stamped with a "use until" date. Equipment must not be used after the "use until" date

6.7 Safety Auditing and Inspection of *Live Line Work*

Annual Safety Audit:

The Annual Safety Audit must be carried out by Auditor(s), independent of the managed unit in which the Team works. This audit is to verify that:

(i) safety and work procedures are being adhered to, and the supervisory back up and control mechanisms are being maintained,

(ii) the procedures, planning and control processes are correct and relevant to the work being undertaken,

(iii) teams and supervisors are completing the necessary documentation, and continue to possess the skills required for the work,

(iv) no complacency exists due to familiarity with the work procedures,

(v) the condition of tools, equipment and the Insulating Aerial Device are satisfactory, and have a valid "use until" date and

(vi) the maintenance regimes and records for all tools and equipment and the Insulating Aerial Device are operating correctly, and up to date.

The results of all audits will be discussed with the team and copies of the audit reports sent to the team involved, the Team Manager and the relevant Business manager.

Monthly safety inspection

The monthly safety inspection must be carried out by the Team Manager.

This inspection is to verify that:

(i) The General safety of the work area and *Live Line Working* procedures are correctly maintained and used.

(ii) The teams are completing the necessary documentation and continue to possess the skills required for the work.

(iii) That no complacency exists due to familiarity with the *Live Line Working* procedures.

(iv) The Insulating Aerial Device has a valid **Approval**, that it is in a satisfactory condition and that all inspections/tests (electrical and mechanical) have been completed and passed.

(v) All insulating tools and equipment have valid **Approvals**, that they are in a satisfactory condition and that all inspections/tests (electrical and mechanical) have been completed and passed

7 CONCLUSIONS

7.1 The Safety Justification for *Live Line Work* contained within this document is founded upon the following principles: -

(i) Being in conformity with the requirements of Health and Safety and other relevant legislation, NIE Safety Rules and other safety and work method documents and instructions.

(ii) Having safe **Approved** *Live Line Working* procedures.

(iii) Using appropriately managed and **Approved** *Live Line Working* tools and equipment.

(iv) Having an appropriate management and supervisory system in place to ensure that all electrically insulating equipment and tools are cared for, inspected, examined and tested in accordance with the **Approved** procedures.

(v) Training assessment and auditing procedures to ensure the competency of team members, supervisors and all others involved.

(vi) The establishment of a regular and thorough audit process.

(vii) This Justification document has addressed all these issues and confirms that the necessary controls are in place for NIE to proceed with *Live Line Work* as a safe means of work.

(viii) The requirements of the Electricity at Work Regulations (N.I.) 1991 have been specifically addressed. Conformity with Regulation 14 as regards Justification must be confirmed in advance for each job by the Manager authorising it for *Live Line Work*

(ix) This Justification document sets the principles to be adopted for *Live Line Work*, based on the philosophy stated.