



Low Voltage (LV) SAFETY RULES 2017

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- Appendices

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LV.A. Foreword

Every Employer has a duty under the Health and Safety at Work etc. Act 1974, to prepare and issue a general policy statement on health and safety at work including the organisation and arrangements for carrying out that policy; such policy statements have been issued by **The Company**. For particular work or activities special rules, related documents and procedures are necessary in support of these policy statements and these Safety Rules or equivalent safety rules are used to cover work and activities associated with **LV** distribution systems and associated **Plant** and **Apparatus**.

These Safety Rules are also intended as a guide to safe working when employees are required to work on or near **LV** electrical systems, **Plant** and **Apparatus** not owned or controlled by **The Company**.

Every Electricity Company also has a duty, under the Management of Health and Safety at Work Regulations 1999 to make a suitable assessment of:-

- a) The risks to health and safety of his employees to which they are exposed whilst they are at work; and
- b) The risks to health and safety of persons not in his employment arising out of or in connection with the conduct by him or his undertaking.

For the purposes of identifying the measures he needs to take to comply with the requirements and prohibitions imposed upon him by or under the relevant statutory provisions.

These **LV** Safety Rules identify the measures to be taken to comply with the duties on the Electricity Company under the relevant statutory provisions in regard to the inherent dangers from **LV** distribution systems, **Plant** and **Apparatus**.

Numbering Protocol

Where rules are derived from **The Company's** DSR/OPM then the appropriate reference is given. The text may be altered as appropriate to suit **LV** operations.

LV.B. Policy

P1 The design of the **LV** Distribution system and associated **Plant** and **Apparatus** is such that it may be operated safely when **Approved** operational procedures are followed correctly. However, when switching for operational purposes, or when work such as maintenance, testing and repair has to be carried out or when, particularly, systems and associated **Plant** and **Apparatus** have to be taken temporarily out of normal operational use, it is necessary for the Distribution Safety Rules and associated documents and procedures to be applied so as to ensure of all who are liable to be affected by any danger that may arise. The Distribution Safety Rules, as read with related documents and procedures, are based on the principle that they should state what should be done to ensure that specified work or activity may be carried out without danger so far as is reasonably practicable. The dangers that can arise are twofold:

- i. Inherent dangers from the **LV** distribution systems, **Plant** and **Apparatus** which are covered by the **LV** Safety Rules;
- ii. General dangers associated with the work as it proceeds including, in addition to the work process, dangers from access and egress, the place of work and the working environment. (These dangers may be of a different kind, and under different control, from the inherent dangers in (i) above and may not be specifically covered by the **LV** Safety Rules.)

3.0 General Safety

In addition to all other requirements specified in these **LV** Safety Rules the safety of persons at work **Shall** also be achieved by maintaining at all times **General Safety** at and in the vicinity of the place of work. Before work or testing commences the Person in charge of the **Working Party** must ensure that safety precautions are taken to establish **General Safety** at and in the vicinity of the workplace. This Person must ensure that at all times during the work or testing that **General Safety** arrangements are maintained and that other work areas are not adversely affected by the activities for which they are responsible. The discharging of

responsibilities for **General Safety** will be achieved as part of the normal pattern of management delegation and control by ensuring that all activities are carried out in accordance with appropriate instructions and guidance.

P2 In the implementation of the **LV Safety Rules**, related documents and procedures, specified methods of work and other forms of local instruction, management shall allocate responsibility for the achievement of health and safety from inherent dangers mentioned in (i) above during the various stages of work or activity.

Management shall also carry out a suitable and sufficient risk assessment, issue instructions and allocate responsibility for dealing with the general dangers mentioned in detailed in (ii) above where such dangers are not specifically covered in the **LV Safety Rules** or associated Approved Procedures or Codes of Practice.

P3 It is Northern Powergrid policy that the persons in charge with the various stages of work or activity shall have the appropriate competence and authority and shall understand the **LV Safety Rules**, related documents and procedures, the methods and any local instructions. Such persons shall understand the dangers that might arise and the precautions to be taken over the whole period of work or activity.

The policy requires that all persons at work are adequately instructed and supervised and are competent to avoid **Danger**, according to the circumstances of the work they are doing. It is an essential condition of the policy that the relevant legal requirements, the **LV Safety Rules** and other required health and safety precautions are observed at all times.

SHALL

Where “**Shall**” is used in these Rules with no qualification, this indicates a mandatory requirement with no discretion permitted and no judgement to be made.

SHALL, WHERE PRACTICABLE

Where “**Shall**” is qualified only by the word “practicable”, a slightly less strict standard 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 work to be undertaken, then the requirement must be met. One is not allowed to avoid the requirement on the grounds of difficulty, inconvenience or cost.

SHALL, WHERE REASONABLY PRACTICABLE

When “**Shall, where reasonably practicable**” is used to qualify a requirement then 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.

LV.C. Relevant Definitions

D.1 APPARATUS

Any item of electrical machinery or equipment in which **Conductors** are used, or supported, or of which they form part.

D.2 APPROVED

Sanctioned by the **Designated Engineer** in order to satisfy in a specified manner the requirements of any or all of these Safety Rules.

D.3 DESIGNATED ENGINEER

The Person appointed by the **The Company** to be responsible for the application of these Safety Rules.

D.4 CONDUCTOR

An electrical **Conductor** arranged to be electrically connected to a **System**.

CONTROL

D.5 CONTROL ENGINEER

A **Distribution Control Engineer** or an appropriate "Control Person" recognised by **The Company**.

D.7 DANGER

A risk to health and bodily injury.

D.8 DEAD

At or about zero voltage and disconnected from any **Live System**.

EARTHING

D.9 EARTH

The conductive mass of the Earth, whose electric potential at any point is conventionally taken as zero.

D.10 EARTHED

Connected to **Earth** through switchgear with an adequately rated earthing capacity or by **Approved** earthing leads.

D.11 CIRCUIT MAIN EARTH

Earthing equipment of **Approved** type applied before the issue of, and at a position recorded in, a **Safety Document**.

D.12 ADDITIONAL EARTH

Earthing equipment of **Approved** type which is applied after the issue of a **Safety Document** (for example an Earth applied at a point of work).

D.13 THE COMPANY

Northern Powergrid (North East) Limited, Northern Powergrid (Yorkshire) plc or their successor companies.

D.14 HIGH VOLTAGE LIVE LINE WORK

Work in an **Approved** manner on the **Conductors** or **Apparatus** of a **High Voltage** overhead line with the **Conductors Live**.

D.15 ISOLATED

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

D.16 ISOLATING DEVICE

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

D.17 KEY SAFE

A device of an **Approved** type for the secure retention of keys.

D.18 LIVE

Electrically charged.

NOTICES

PF Notices are posted to give information on the operational state of the **System**. When applying notices the appropriate size, (large, medium or small) **Shall** be used so that essential information is not concealed and moving parts etc. are not obstructed.

D.19 CAUTION NOTICE

A notice in **Approved** form prohibiting unauthorised interference, with such additional **Approved** words as **The Company** may determine.

PF1

Caution Notices Drawing No. 1.10.110.0003. **Shall** be applied to convey a warning at points of **Isolation** (reversible

Caution/Danger bands to Drawing No. 1.10.110.0004 may be used on poles) and where there is a specific requirement in the DSR's this includes:

- a. **Low Voltage** or protection fuse/link positions where they **Isolate** the secondary side of a transformer, auxiliary supplies or battery supplies etc. (a tape format is available for this application).
- b. Points where automatic fire fighting equipment has been rendered inoperative.

Caution Notices Shall be applied or removed only by a **Person** who understands their purpose and has received training in their use.

D.20 DANGER NOTICE

A notice in **Approved** form reading "**Danger**" with such additional **Approved** words as **The Company** may determine.

PF2

Danger Notices, Drawing No. 1.10.110.0001. **Shall** be attached on or adjacent to **Live Apparatus** to define the limits of the work or test zone, examples are:

- a. To indicate exposed **Live Conductors** in open compounds
- b. Exposed **Apparatus** or **Conductors** subject to test voltage.

- c. **Live Low Voltage** panels.
- d. For pole mounted application a reversible **Danger/Caution** band to Drawing No. 1.10.110.0004 may be used on poles supporting **Live Conductors** adjacent to the work zone or as limit markers on poles and towers.

D.21 PERSONS, being one of the following:

(i) **COMPETENT PERSON**

A Person recognised by **The Company** as having sufficient technical knowledge and/or experience to enable them to avoid **Danger** and who may be nominated to receive and clear specified **Safety Documents**.

(ii) **AUTHORISED PERSON**

A **Competent Person** over 18 years of age who has been appointed in writing by **The Company** to carry out specified duties which may include authority to issue and cancel **Limitations-of-Access** and/or to receive **Sanctions-for-Test**.

(iii) **SENIOR AUTHORISED PERSON**

An **Authorised Person** who has been appointed in writing by **The Company** to carry out specified duties, including the issue and cancellation of **Safety Documents**.

D.22 PLANT

Mechanical plant including all machinery and equipment not elsewhere defined as **Apparatus**.

D.25 SAFETY DOCUMENTS being one of the following:

(i) **LIMITATION-OF-ACCESS**

A **Safety Document** of a format indicated in these Safety Rules which defines the limits and nature of work which may be carried out when verbal instructions are not considered sufficient for that purpose, and where a **Permit-to-Work** or **Sanction-for-Test** is not applicable. (See Appendix C)

(ii) **PERMIT-TO-WORK**

A **Safety Document** of a format indicated in these Safety Rules specifying the **High Voltage Apparatus** which has been made safe for proximity work adjacent to HV **Apparatus**.

D.26 SAFETY LOCK

A lock used exclusively for **Approved** purposes (such as locking off the points at which the circuit can be energised) that lock being different from all other standard locks used on the **System**

AA3 Ancillary **Safety Locks Shall**, where practicable, be used to secure points of isolation from the **Low Voltage System** and on ancillary equipment.

D.27 SUPERVISION, being one of the following:

(i) **IMMEDIATE SUPERVISION**

Supervision by a **Person** (having adequate technical knowledge, experience and competence) 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 or testing.

(ii) **PERSONAL SUPERVISION**

Supervision by a **Person** (having adequate technical knowledge, experience and competence) such that they are at all times during the course of the work or testing, continuously observing and in the presence of the **Person(s)** being supervised, with the ability and competence to directly intervene.

Supervision at ground level provided for **Person(s)** positioned at height is considered to be **Personal Supervision** when the supervisor at ground level maintains verbal and visual communication with the **Person(s)** being supervised.

D.29 SYSTEM

An electrical system in which **Conductors** and **Apparatus** are electrically connected to a common source of supply.

VOLTAGE CATEGORIES

(Based on the Electricity Safety, Quality and Continuity Regulations 2002)

D.30 LOW VOLTAGE (LV)

A voltage not exceeding 1000 volts AC or 1500 volts DC.

D.31 HIGH VOLTAGE (HV)

A voltage exceeding 1000 volts AC or 1500 volts DC.

D.32 WORKING PARTY

Either the persons under the **Supervision** of a **Competent or Authorised Person** (who **Shall** themselves be a member of the working party) or a **Competent or Authorised Person** when working alone.

LV.D. General Provisions

1.1 Scope And Application Of The LV Safety Rules

These Distribution Safety Rules apply to **LV Distribution Systems** and associated **Plant** and **Apparatus** under the ownership or control of **The Company** under whose authority they have been issued. They, or equivalent Safety Rules, **Shall** normally be the only Rules applicable to such Systems, **Plant** and **Apparatus** and **Shall** be applied, in accordance with management instructions, together with related documents and procedures, for the whole course of the work for which they are intended.

PA1 Access for, operations or work on **The Company's Low Voltage Distribution System** **Shall** only be by **Persons** who have demonstrated their competence and have been authorised in writing following an assessment of their ability, or are under the **Personal Supervision** of a suitably **Authorised Person**

1.2 Other Safety Rules, Related Documents And Procedures

In addition, or as an alternative, to the application of these Distribution **LV Safety Rules** and related documents and procedures, other rules, documents and procedures issued by **The Company** or by other authorities, **Shall** be complied with in accordance with management instructions. Whereas the Appendices to these **LV Safety Rules** are not, in themselves, individual Distribution **LV Safety Rules**, they **Shall** be read in conjunction with the Rules to which they relate. As such, the Appendices form important supporting information for the implementation of the **LV Safety Rules**.

Where an appropriate written agreement exists between **The Company** and a third party, the employees of that third party may carry out work and operate on the **LV System** under the control and ownership of **The Company**. The employees of the third party may carry out work and operate in accordance with other rules and procedures, provided that

this approach complies fully with the detail of the written agreement between **The Company** and the third party.

Safety precautions required across control/ownership boundaries **Shall** be carried out and documented in accordance with **Approved** procedures. Such procedures **Shall** be agreed between the controller/owner of the other **System** and **The Company** and **Shall** be made known to the staff concerned. In all cases these **LV Safety Rules** and related documents and procedures **Shall** be used as a guide to safe working.

PA1.1 Agreements between **The Company** and a third party **Shall** normally require that employees of the third party work and operate in accordance with **The Company's LV Safety Rules** and procedures. **The Company Shall** require all such employees to demonstrate their competence by individual assessment. On satisfactory completion of the assessment they **Shall** be issued with a copy of **The Company's LV Safety Rules**. In exceptional circumstances the third party may, subject to written agreement with **The Company**, work and operate in accordance with the third party's Safety Rules and Procedures.

PA3 Operations on **Systems** controlled by other network operators are subject to the individual operators safety rules and procedures.

1.3 Information, Instruction and Training

Arrangements **Shall** be made by **The Company** to ensure:

- (i) that all employees concerned are adequately informed as to:-
 - the risks to their health and safety as identified by risk assessment;
 - the preventative and protective measures to be taken;
 - the procedures to be followed in the event of serious and imminent danger;

- the risks arising from the activities of any other employer and/ or employee; and
 - that adequate levels of supervision of its employees and those under its control are provided.
- (ii) that all employees concerned are adequately informed and instructed as to the **Systems, Plant and Apparatus** which are affected by a particular operation or work (whether or not they are owned or operated by **The Company** and which legal requirements, Safety Rules, related documents and procedures **Shall** apply;
- (iii) that other persons who are not employees, but who are carrying out work or operations on behalf of **The Company** and may be exposed to **Danger** during their operations or work, also receive adequate information and instruction;
- (iv) that the capabilities of employees are taken into account in allocating tasks; and
- (v) that employees are provided with adequate health and safety training and re-training.

1.4 Issue Of Safety Rules

A copy of these **LV Safety Rules**, and, as appropriate, related documents and procedures **Shall** be issued to such employees of **The Company** and such other persons as the **Designated Engineer** may determine. Such employees and other persons **Shall** sign a receipt for a copy of these Safety Rules, related documents and procedures (and any amendments there to) and **Shall** keep them in good condition and have them available for reference as necessary when work is being carried out under these Safety Rules.

PA2 These **LV Safety Rules** **Shall** be issued to **COMPETENT / AUTHORISED PERSONS** who are not in receipt of the Distribution Safety Rules. Such persons must have a thorough understanding of their responsibilities.

Issue of Safety Rules, related Operational Documentation and keys for operational locks to individual **Competent** or **Authorised Persons**, are recorded. These items, together with Authority Certificates, **Shall** be returned to **The Company's** issuing officer on cancellation of Authorisation.

1.5 Variation Of Safety Rules

The Company may vary these rules as required to suit its individual circumstances. Such variations **Shall** be approved by **The Company's Designated Engineer**.

1.6 Special Procedures

Work on or testing of **Apparatus, Conductors** or **Plant** to which these **LV** Safety Rules cannot be applied, or for special reasons should not be applied, **Shall** be carried out in accordance with an **Approved** procedure. Such a procedure **Shall** ensure that the safety requirements of these Safety Rules are satisfied in some other way.

1.7 Objections

When any person receives instructions regarding the operation of, or work upon **The Company's Systems**, and associated **Plant** and **Apparatus**, they **Shall** report any objections on safety grounds to the carrying out of such instructions to the persons issuing them, who **Shall** then have the matter investigated and, if necessary, referred to a higher authority for a decision before proceeding.

1.8/PC Reporting Of Accidents And Dangerous Occurrences

The Company is required to report specified events, including interruption of supply and accidents; see HAS/011

Persons **Shall** comply with **The Company's** procedures for the statutory reporting of accidents and dangerous occurrences. In addition, all electrical accidents, electrical dangerous occurrences and such other accidents and dangerous occurrences involving **The Company's HV** Systems or associated **Plant** and **Apparatus**, **Shall** be reported immediately to the appropriate **Control Engineer** in

accordance with **Approved** procedures. In the case of accidents and dangerous occurrences involving **LV Systems** or associated **Plant** or **Apparatus**, these **Shall** be reported immediately in accordance with **Approved** procedures.

PC2.1 Report Centres

PC2.1.2 Management Unit. Reports of accidents and events/failure of supply on the **Low Voltage System Shall** be made to the Designated Supervisor, Dispatch Unit, or Line Manager as required. Control Centre staff are available for other urgent reports when the Designated Supervisor is not available.

PC2.2 Reports

PC2.2.1 All incidents **Shall** be reported verbally to the report centre or Management Unit.

PC2.2.2 If a serious injury or fatality occurs on the **Low Voltage System**, reports **Shall** be made to the Designated Supervisor and the Control Centre.

PC2.2.3 All accidents, incidents and dangerous occurrences **Shall** be immediately reported to the responsible Line Manager and Safety Section using the Initial Report Form. The submission of forms should not be delayed due to incomplete information. Any details not immediately to hand **Shall** be submitted when they become available.

PC1.1 Failure of Supply

PC1.1.1 **Low Voltage System**: Reports **Shall** be made to the Designated Supervisor or Dispatcher.

PC1.3 Operational Event.

This is an unplanned or uninstructed operation on the **System** attributable to the action of an operator. Following an initial investigation, the event will be categorised as either an 'Operational Incident' where the event gave rise to:

- Recordable customer interruption(s).

- **Danger** or significant risk of **Danger** to the public or personnel.
- Damage or significant risk of damage to **Apparatus**, equipment etc.
- A significant risk to **System** security or an 'Operational Near Miss' in all other circumstances a fact finding inquiry will be held to determine the cause of the event and any appropriate remedial action will be taken subsequently.

PC1.4 Accidents Reports are required for the following:

- All accidents, incidents and near misses **Shall** be reported by the Line Manager.
- Statutory Reports to HSE/LA under Regulation 3 of the Reporting of Injuries, Diseases and Dangerous Occurrence Regulations 1995, **Shall** be reported by the Line Manager via the Safety Section.

PC3 Investigation

PC3.1 Action Following an Incident. Following an accident it is essential that prompt action is taken to render appropriate first aid to all casualties. (Appendix 3)

PC3.1.1 In order to understand how and why an incident or accident occurred it is essential that an investigation is initiated as soon as practicable. Where a statutory accident report is required, other than for emergency actions, the scene **Shall** not be disturbed until clearance is given by the HSE. All incidents **Shall** be investigated; see *HAS/011*.

PC3.1.2 Photographic evidence should be obtained, if possible, before anything is disturbed. This is essential in the case of a serious accident.

PC3.2 As a general guide, the following information will be required:

- a. The conditions as found on site including:
 - condition of **Apparatus**,

- any exposed **Conductors (Live or Dead)** and signs of flashover etc.,
 - position of tools and equipment,
 - any obstructions and
 - other relevant factors such as access, lighting and weather.
- b. Details of all persons directly or indirectly involved.
- c. Statements from anyone who witnessed the incident.
- d. Authority - what were the instructions:
- verbal or written,
 - approved procedure or work specification.
- e. Evidence of Risk Assessment
- f. Details of the activity or work in progress.
- g. Was any personal protective equipment being used and if so what was its condition.

1.9 Duties

The Company as an employer, has a duty to comply with the provisions of the Health and Safety at Work etc. Act 1974, the Electricity at Work Regulations 1989, and other relevant statutory provisions. Additionally, authoritative guidance is available from the Health and Safety Executive and other sources.

The Company's employees also have a duty to comply with the provisions of the Health and Safety at Work etc. Act 1974, the Electricity at Work Regulations 1989 and with other relevant statutory provisions.

In addition to these statutory duties and any other duties separately allocated to them, all persons who may be concerned with the operation of, or work upon, distribution and transmission **Systems** and associated **Plant** and

Apparatus Shall be conversant with, and comply with, those Safety Rules relevant to their duties and related documents and procedures. Ignorance of legal requirements, or of Safety Rules and related documents and procedures, **Shall** not be accepted as an excuse for neglect of such duties.

If any person has any doubt as to any of these duties they **Shall** report the matter to a higher authority for advice before proceeding with work, i.e. if you are not sure, stop and ask for help.

9.1 General

9.1.1 It is the duty of all persons who may be concerned with the control, operation, work or testing, on or in the near vicinity of **Apparatus** and **Plant** to which these Safety Rules apply, to implement the Safety Rules and to comply with them and with related Codes and Procedures.

9.1.2 The responsibilities placed upon persons may include all or part of those detailed in this section, depending on the role of the persons.

9.1.3 Any written authorisation given to persons to perform their designated role in implementing the Safety Rules **Shall** indicate the class of operation and/or work permitted and the section of **System** to which the authorisation applies.

9.1.4 Persons involved in achieving safety from the inherent **Dangers** of the **LV System** to allow work or testing to commence on **Apparatus** and **Plant** and its subsequent restoration to service, will be concerned in separate broadly identifiable areas of responsibility, as follows:

- (i) control - including (before work commences) instructing actions to implement precautions and instructing actions to restore **Apparatus** and **Plant** to service;
- (ii) making safe or restoration of **Apparatus** and **Plant** - including (before work commences) taking action to make **Apparatus** and **Plant** safe for work

and after satisfactory completion of work, taking action to restore **Apparatus** and **Plant** to service;

9.2 Competent Persons

PA1.2 The standard of Competence is based on the requirements of Regulation 16 of the Electricity at Work Regulations 1989. The competence of an individual to carry out work or to supervise a **Working Party** depends upon the individual's level of knowledge, understanding following training, experience and satisfactory assessment.

PA1.3 **Persons** are **Authorised** according to their need to access the **System** to carry out their duties. It is the responsibility of the individual to ensure that any actions performed are within the bounds of his/her Competence and Authority level. Ignorance of requirements is not an excuse for neglect of duty.

PA1.4 All authorisations are subject to review according to the duties and circumstances of the individual and are subject to attendance on refresher courses at suitable intervals.

9.2.1 The responsibilities of **Competent Persons** include those specified below. **Competent Persons** must ensure that their responsibilities are implemented. **Competent Persons** who may be nominated to be responsible for the **Supervision** of a **Working Party**, which will include responsibility for establishing and maintaining **General Safety**, **Shall** be appointed in writing.

9.2.2 **Competent Persons Shall** comply with these Safety Rules when carrying out work whether instructions are issued orally or in writing.

9.2.3 **Competent Persons Shall** use safe methods of work, safe means of access and the personal protective equipment and clothing provided for their safety.

9.2.4 **Competent Persons** when responsible for the **Supervision** of a **Working Party** Shall:

- (i) be fully conversant with the nature and the extent of the work to be done;
- (ii) read the contents and confirm to the person issuing any work instruction document that they are fully understood;
- (iii) during the course of the work, adhere to, and instruct others under their charge to adhere to, any conditions, instructions or limits specified on any work instruction document;
- (iv) retain any work instruction document in safe custody and correctly implement any **Company** procedure to achieve this;
- (v) provide **Immediate** or **Personal Supervision** as required; and
- (vi) warn all persons as quickly as possible to withdraw from and not work on the **Apparatus** and **Plant** concerned until further notice, if during the course of work a hazard which could result in **Danger** arises or is suspected. The situation **Shall** be reported immediately by the **Competent Person** to a designated supervisor, despatch unit, or Line Manager as required.

9.3 **Authorised Persons**

9.3.1 In addition to responsibilities as **Competent Persons**, **Authorised Persons** **Shall** have some, or all of the following responsibilities within the limits imposed by their Authority Certificates

D1.1 Authorised Persons may on **LV Systems** :-

- Communicate with the **Control** Coordinator and take **Control** of part of the **LV System**
- Carry out **Switching** and fuse operations

- Communicate with the **HV System Control Engineer** where **LV Switching** affects operation of the **HV System**
- Make a record of **Switching** operations etc.
- Ensure alterations to the **LV System** are recorded
- Carry out live testing

1.10 Use And Wearing Of Safety Equipment And Protective Clothing

Where any work under these Safety Rules and related documents and procedures takes place, appropriate safety equipment and protective clothing of an **Approved** type **Shall** be issued and used in accordance with management instructions. At all times employees are expected to wear sensible clothing and footwear having regard to the work being carried out.

PE Personal Protection.

Personal Protective Equipment (PPE) is provided for use by employees to provide additional safeguards in potentially hazardous situations and in order to comply with Personal Protective Equipment at Work Regulations 1992. Note PPE does not replace safe working procedures designed to avoid **Danger**.

PE1 Approved PPE For full requirements on provision and use *see HAS/029.*

PE2.1 Insulating Gloves Shall comply with the appropriate IEC and BSEN Standards; *HAS/029*

PE2.1.1 Gloves **Shall** be inspected before use to ensure they are within date and undamaged. Any out of date or damaged gloves **Shall** be replaced before operations are carried out.

PE2.1.2 When carrying out routine or fault switching, insulating gloves (both) **Shall** be worn before touching any **Apparatus** and **Shall** not be removed until operations are complete and the operator has moved away from the operating position.

PE2.1.3 Class 0 (**Low Voltage**) gloves **Shall** be used by persons for **Low Voltage** switching or work. For **Low Voltage** switching, if Class 0 gloves are not available Class 1 gloves may be used.

PE2.2 Insulation

Insulating mats approved for operational purposes **Shall** be used where additional insulation from **earth** is considered necessary e.g. operating on **Low Voltage** boards and if necessary **Low Voltage** pillars and link boxes.

PE2.3 Eye/Face Protection

Eye protection **Shall** be used whenever there is **Danger** of impact, splashes or dust affecting the eyes. A full face visor **Shall** be worn to protect the eyes and face whenever there is a **Danger** of arc energy; see *HAS/029*

PE2.4 Clothing and footwear

Shall be suitable for the task in hand in accordance with company policy (see *HAS/029*) (e.g. coveralls, flame retardant, high visibility etc.).

PE3 Other Equipment

Any other protective clothing or equipment required for specific circumstances **Shall** be **Approved** by the **Designated Engineer**.

1.11 TREATMENT FOR ELECTRIC SHOCK

All persons who may be concerned with the operation of, or work upon, **The Company's Systems**, and associated **Plant** and **Apparatus**, **Shall** be trained in and be conversant with the treatment of electric shock. Information regarding such treatment is given in Appendix E.

LV.E. Operational Access and Locking

3.1.1 / AB No person **Shall**, without proper authority, enter or have access to any **Live Conductors** or operational premises such as a control room, substation, switching station or underground chamber belonging to, or wholly under the control of **The Company**. To prevent unauthorised access to operational premises, all doors and gates etc. **Shall** be secured with suitable locks. **Persons** who have been issued keys and given the necessary authority for access are responsible for maintaining security of the premises during the course of their visit, ensuring that doors and gates are secure and all locks are replaced on leaving. In particular they **Shall** ensure that non-competent **Persons** are only permitted to enter such areas when under the **Personal Supervision** of a **Person** holding the appropriate authority code.

E1; AA LOCKING

Locks are used to restrict access to operational sites or premises and to control operation of **System Plant** and **Apparatus**. **The Company's** operational locking policy recognises the responsibility conferred upon **Persons** by their training and experience. A **Person's** authorisation level is determined by their duties and successful assessment which may result in the issue of an appropriate key.

E2; AB2 Confined Spaces

A "confined space" means any place, (e.g. a chamber, tank, vat, silo, pit, trench, pipe, sewer, flue, well or other similar space) in which, by virtue of its enclosed nature, there arises an actual or reasonably foreseeable risk of:-

- serious injury to any **Person** at work arising from a fire or explosion;
- the loss of consciousness of any **Person** at work arising from an increase in body temperature;

- the loss of consciousness or asphyxiation of any **Person** at work arising from gas, fume, vapour or the lack of oxygen;
- the drowning of any **Person** at work arising from an increase in the level of a liquid; or
- the asphyxiation of any **Person** at work arising from a free flowing solid or the inability to reach a respirable environment due to entrapment by a free flowing solid.

There is a possibility in all of these cases of a build-up of gases which could pose **Danger** to personnel. In some situations where there is perceived to be a more significant risk, specific **Approved** instructions **Shall** apply which may include the use of non - standard locks to restrict access; see *HAS/013/001*.

AB2.1 Identification and Control

Confined spaces **Shall** be identified by the use of **notices**, where reasonably practicable at the entrance, to alert staff. Where locks are required they **Shall** be suitable to cover the level of perceived risk to personnel or the System. Non - standard locks may be used if considered appropriate, keys **Shall** only be available to suitably **Authorised Persons**.

3.1.2 Access to confined spaces such as underground chambers, cable tunnels and indoor substations with restricted access or egress **Shall** be gained in accordance with an **Approved** procedure.

AB2.2 Precautions before Entry

Before entry to a confined space a risk assessment **Shall** be carried out, all sources of ignition in close proximity **Shall** be extinguished and the atmosphere within the confined space **Shall** be tested.

AB2.2.1 The use of de-icing fluid may be necessary to free pit covers in cold weather. Under no circumstances **Shall** a naked flame be used.

AB2.2.2 Where shallow spaces are accessed, e.g. link boxes, care **Shall** be taken to ensure that any heavier than air gases, Revised 01/11/2017

which may have accumulated, are dispersed by agitating the air within the space, e.g. lift and replace the bell several times. Care should be taken not to introduce additional hazards e.g. LPG.

AB2.2.3 In cases where entry of a **Person** is required, the atmosphere **Shall** be tested using an **Approved** gas detector/oxygen meter; see *HAS/013/001*

The instruments **Shall** be checked prior to testing the air sample(s) from within the confined space. Air samples **Shall** be representative.

AB2.3 Access and Work

AB2.3.1 When a **Person** enters a confined space, a second **Person Shall** at all times remain outside and be in constant contact with the **Person** inside. The second **Person Shall** be suitably trained, equipped and readily available to render assistance.

AB2.3.2 The air within the confined space **Shall** be monitored at all times with **Approved** instruments. The space **Shall** be vacated if an alarm operates indicating a lack of oxygen or build up of flammable gas. Re-entry must not be attempted until suitable precautions have been taken and the air is safe to breath, (AB2.2.3).

3.1.3 Access to vessels recently emptied of flammable or toxic substances, **Shall** only be allowed in accordance with an **Approved** procedure which includes provision to expel all dangerous vapours and substances.

3.1.4 Work involving the application of heat or the use of exposed flames, in the vicinity of open vessels containing or having recently contained flammable substances, **Shall** be prohibited until all practicable steps have been taken, in accordance with an **Approved** procedure, to prevent **Danger**.

AB2.3.3 When work is to be carried out involving additional hazards e.g. LPG equipment, welding gear, anything giving off fumes etc. or where **Danger** may exist from whatsoever source, a **Limitation of Access**, detailing the safety precautions required,

e.g. the use of forced ventilation, **Shall** be issued by the **Authorised Person** in charge of the work.

AB2.3.4 **Approved** contractors or other third parties may be engaged to carry out work in confined spaces, approval **Shall** include verification that their training and procedures meet the **Company's** standards as a minimum. Otherwise they **Shall** receive **Company** training and Authorisation and work to **Company** procedures.

AB2.3.5 If any situation requires the use of breathing equipment then specialist contractors or, in an emergency, the fire and rescue service **Shall** be used.

E3; 3.2/AC Access To And Work In Fire Protected Areas

Fire Control. For full details of policy on fire prevention see *HAS/017; DSS/031*. Substations may be equipped with automatic fire control equipment, there may be portable fire extinguishing equipment installed or reliance may be placed on fire fighting equipment being available with personnel. All fire protected areas and fire fighting equipment must be **Approved**, accessed and used as follows:

3.2.1 Automatic Control

Unless alternative **Approved** procedures apply because of special circumstances then before access to, or work or other activities are carried out in, any enclosure protected by automatic fire extinguishing equipment:

- (a) The automatic control **Shall** be rendered inoperative and the equipment left on hand control. A **Caution Notice Shall** be attached;

AC1.1 Where controls for automatic fire fighting equipment are within the protected chamber, before any work, including switching or inspection, is carried out, it is permitted to enter the chamber for a distance of up to 2 metres in order to render the equipment inoperative.

There **Shall** be:

- No obstruction to access and
- No adjacent electrical hazards.

AC1.2 Where this is not possible, as long as the fire fighting equipment is operative, treat the zone as a confined space, (AB2.2.3).

- (b) precautions taken to render the automatic control inoperative and the conditions under which it may be restored **Shall** be noted on any **Safety Document** or written instruction issued for access, work or other activity in the protected enclosure; and
- (c) the automatic control **Shall** be restored immediately after the persons engaged on the work or other activity have withdrawn from the protected enclosure.

3.2.2 Portable Fire Extinguishers

Only **Approved** portable fire extinguishers **Shall** be available and used in the vicinity of **Live Apparatus** and **Conductors**. In the handling of fire extinguishers contact with **Live LV Apparatus** **Shall** be avoided. After the discharge of portable fire extinguishers in an enclosed space, personnel **Shall** leave the space until the precautions set out in Rule 3.2.3 have been taken.

AC2.1 Portable fire extinguishers **Approved** for use in the vicinity of **Live Apparatus** and **Conductors** **Shall** be in accordance with current standards.

AC2.2 When using **Approved** portable fire extinguishing equipment to the manufacturer's or **The Company's** instructions, personnel must ensure their own safety.

3.2.3 General

After any explosion or fire, or after the discharge of fire extinguishers in an enclosed space, either the space **Shall** be adequately ventilated before entry of personnel or **Approved** breathing apparatus and, where necessary, **Approved** safety harnesses **Shall** be worn by persons specially trained in their use. Such breathing apparatus and safety harnesses **Shall** be worn in any case of doubt.

AC3 Precautions after Discharge

AC3.1 Where there is continuing **Danger** of fire or **Danger** to life, the emergency services **Shall** be called. Where for other reasons it is necessary to enter a chamber or enclosed space which has not been adequately ventilated, suitably trained personnel with **Approved** equipment shall be made available.

AC3.2 **Ventilation Procedure**, if considered necessary, treat the enclosure as a confined space (AB2).

E4; 3.9/WC1 Excavation Near Live Cables

All cables including those damaged or with exposed **Conductors** **Shall** be treated as **Live** until identified and proved **Dead** by an **Approved** procedure.

When excavation work is carried out in proximity to **Live** cables by **The Company** or its contractors, the work **Shall** be done in accordance with an **Approved Procedure**. At all times personnel must be aware that if they encounter any problems or any signs of a cable fault, excavation must cease immediately. They **Shall** then seek advice from a supervisor.

To minimise the possibility of striking (**Live**) cables and other services during excavation work, wherever possible appropriate authorities should be consulted and their plans made available to those on site. All work **Shall** be carried out in accordance with the New Roads and Street Works Act. The following safe working practice **Shall** be observed:

WC1.1 **Cable Records**: Records, showing all cable routes, position and type etc. **Shall** where practicable, be made available on site to those doing the work. If there is any difficulty in relating the records to the site situation a supervisor **Shall** be consulted.

WC1.2 **Cable Location Devices**: **Approved** types, suitable for the purpose, **Shall** be used to locate or confirm the position of cables and or other services.

WC1.3.1 Hand Tools.

- a. Spades and shovels are the preferred hand tools, which **Shall** be used cautiously in the vicinity of cables and other services.
- b. Picks and pins may be used with care to break hard layers or free lumps of stone but not in soft ground or near cables and other services.
- c. **Approved PPE Shall** be worn including overalls, buttoned up to neck with sleeves rolled down and gloves.
- d. Where there is any potential **Danger**, e.g. excavating in the vicinity of a **Low Voltage** cable fault, a full face visor and other appropriate PPE **Shall** be worn until the fault has been positively identified and made safe.

WC1.3.2 Hand Held Power Tools.

- a. Where practicable hand held power tools must not be used within 0.5m of the indicated line of a cable or other utility service equipment buried in or below a hard surface.
- b. Further excavation, using hand tools, **Shall** be carried out by undermining the hard surface to fully identify all services or confirm their absence.
- c. Use of power tools may recommence once all utility services are located (or proved to be absent from the proposed excavation) and there is no risk of damage to the services.

WC1.3.3 Mechanical Excavators: where reasonably practicable the following procedure **Shall** be used:

- a. Preliminary planning. Follow NRSWA routine to identify other services WC1, Consult cable records as WC1.1 and use cable locating Devices WC1.2.
- b. Confirm location of services by consulting directly with appropriate authorities and where appropriate by excavating trial holes.

- c. All personnel must keep clear of moving parts while an excavator is in use.
- d. May be used up to 0.5m of the indicated line of a cable with a 'banksman' in attendance to look out for obstacles.
- e. Further excavation may be carried out using hand tools as WC1.3.2b
- f. When safe, mechanical excavation may recommence as WC1.3.2c
- g. If a cable is damaged it **Shall** be treated as **Live** until proved **Dead** (see WC6), the driver must remain in the cab or jump clear to avoid possible touch potentials. WC1.3.4 On completion of excavation, any cable to be worked upon **Shall** be identified in accordance with **Approved** procedures.

WC1.4 Exposed cables and joints **Shall** be blinded or otherwise suitably protected as soon as reasonably practicable to prevent **Danger** or interference.

E5; 3.3 Climbing of Poles, Towers and High Structures

3.3.2 All persons gaining access to and during work on towers, poles and high structures **Shall** make proper use of **Approved** safety equipment and **Shall** be in visual range of another person. All persons concerned **Shall** be fully conversant with **Approved** rescue procedures, see Appendix WD1. Unaccompanied access is allowed up to a height of two metres above ground for switching or testing when it is of limited duration and is covered by an **Approved** procedure

3.3.1 Before any pole is climbed it **Shall** be tested in an **Approved** manner. No pole badly impaired by decay or damage or whose stability is in doubt **Shall** be climbed until it has been supported by **Approved** means. The pole **Shall** then either be climbed by only one person at a time or access to the top of such pole **Shall** be by **Approved** means independent of the pole.

WD1.1 Before climbing poles, towers or structures above 2m personnel **Shall** be trained and be proficient in the use of **Approved** harnesses, access methods, including permanently attached climbing and rescue procedures. (Appendix WD.1).

WD1.2 Climbing and Work, above 2m.

- a. An additional **Person**, suitably trained and equipped, **Shall** be in a position to safeguard the site and obtain or render assistance in the event of an emergency.
- b. Where **Live** working is involved the second **Person Shall** be at ground level.

WD1.3 **Stability**

Before any pole, tower or structure is climbed it **Shall** be subjected to a visual inspection, looking for:

- a. Signs of damage or decay
- b. Damage to steelwork or insulators
- c. Signs that the structure may not be stable. e.g. excavation around or nearby.

Wood poles **Shall** be further checked for stability, check gouge mark, and tested for decay.

A structure whose stability is in doubt **Shall** not be used for personal support. Access **Shall** be by independent means e.g. hydraulic platform or scaffolding or by other approved means.

WD2.2 For details of all **Approved** access ladders and equipment, including scaffolding and climbing irons, see *SCOP MISC 2 and SAF/001/101*. All access equipment **Shall** be kept secure and inspected before use.

WD2.2.2 Fixed ladders provided for access to towers or high structures etc **Shall** be deemed **Approved** for the intended purpose.

AD2.1.1 A **Working and Access** Clearance of 1.0m for **Low Voltage** **Shall** not be infringed under any circumstances unless work is carried out to **Approved Low Voltage Live** work procedures.

When **The Company** or its Contractors are working within 2m of a **Live Low Voltage** line with mobile machines, **plant** and equipment which is capable of reaching within 1m of a **Live LV Conductor** the work **Shall** be subject to the **Personal Supervision** of a suitably **Authorised** or **Competent Person** who **Shall** ensure that no part of the machine etc. will approach within 1m of the **Live Low Voltage** line. The operator must be suitably trained and made aware of the hazards.

LV.F. LV Systems

8.1.1 The term **Low Voltage System** and this section of the Safety Rules applies to **The Company's LV** distributing mains and services.

F1; OA RESTRICTIONS

It is occasionally necessary to impose restrictions on operation of **System Apparatus**. It is imperative that such restrictions are initiated and complied with as soon as possible in order to ensure safety of personnel and maintain the integrity of the **System**.

F1.1 Notice : Access restricted - contact **Control Engineer**

This notice is used where it is required to restrict access for operational reasons e.g. **Apparatus** defects etc.

F2 LOW VOLTAGE COORDINATION & OPERATIONS

8.1.4 Coordination and operation of **Low Voltage Systems** **Shall** be in accordance with an **Approved** procedure. Only persons appointed in accordance with an **Approved** procedure **Shall** have authority to carry out activities such as **Switching** and the **Live** testing of **Low Voltage Systems**.

If an access restriction applies, a Level 1 or Safety lock **Shall** be applied to the affected chamber/compound together with a warning notice, Access Restricted contact the Control Engineer.

F2.1; OC1 Authorisation.

All **Persons** engaged in operations, work or testing on the **Low Voltage System** **Shall** be **Competent** and / or **Authorised** in accordance with section PA1.

OC2.1 **Coordination of Operations** on the **Low Voltage System** (Work on distributors excluding the connection of service cables with a maximum cross sectional area of 35mm sq. and inspection of feeder pillars and link boxes) **Shall** be either:

- a. Through the **Control Engineer** when in conjunction with **High Voltage** operations or,

- b. with the sanction of a **Low Voltage** coordinator and under **Control** of an **Authorised Person**.

OC2.2 LV Coordination. (Work on distributors excluding the connection of service cables with a maximum cross sectional area of 35mm sq. and inspection of feeder pillars and link boxes). The **Low Voltage** coordinator **Shall**;

- a. ensure that there is no conflict between requests for local **Low Voltage** control of the **Low Voltage** network(s),
- b. record all operations and certain work activities (see F3.3.6) on the **Low Voltage System**,
- c. record all abnormalities, both permanent and temporary, notified by **Competent** and **Authorised Persons** on the return of **Low Voltage** control.
- d. provide guidance on **Low Voltage** network configuration when requested and including points of **Low Voltage** system infeed (Generation, BEES apparatus or EAVC units). This must be verified on site by the **Authorised Person** as the responsibility for **Low Voltage** operations lies with the **Authorised Person** undertaking the operations.

F2.2; OC3 Operations

OC3.1 Switching.

On the **Low Voltage System**, **Switching Shall** be carried out by an **Authorised Person**.

OC3.1.1 An **Authorised Person Shall** have a request for **Low Voltage** control approved by the **Low Voltage** coordinator before commencing work and /or operations.

OC3.1.2 On completion/suspension of work and/or operations the **Authorised Person Shall** return **Low Voltage Control** to the **Low Voltage** coordinator and **Shall** report any changes to network running conditions.

OC3.1.3 In cases of emergency involving hazard to public, staff or the **System**, switching to eliminate **Danger**, i.e. to make the circuit **Dead**, may be carried out without reference to the appropriate **Low Voltage** coordinator.

However the circumstances necessitating emergency switching **Shall** be reported as soon as possible after the incident to the appropriate **Low Voltage** coordinator, (F2.1 / OC2).

OC3.1.4 Switching by signal or prearranged understanding is forbidden.

OC3.1.5 Where switching on the **Low Voltage System** affects the **High Voltage System**, e.g. **System** parallels, auxiliary supplies to substations etc., the **Authorised Person Shall** inform the **High Voltage System Control Engineer**.

OC3.1.6 When carrying out **Low Voltage Switching** operations, the operator **Shall** wear appropriate long sleeved, protective clothing and use **Approved** personal protective equipment, (PE2). The following is given as a guide:

Ground mounted

- a. **Low Voltage** substation switch boards incorporating exposed **Conductors** – full face protection, insulating gloves, and if required by risk assessment additional insulation from ground (Insulating mat or insulating boots).
- b. Link Boxes or Feeder Pillars and service termination **Apparatus** – full face protection, insulating gloves and, if required by risk assessment, additional insulation from ground (Insulating mat or insulating boots). All permanent phase barriers must be in place or suitable shrouding **Shall** be applied. Measures **Shall** be taken to ensure no loose items fall into link boxes. If necessary, where additional hazards exist, e.g. descending into a deep link box, a second person **Shall** be present.
- c. Pole mounted - Safety helmet, full face protection and insulating gloves.

Note Provided **Working and Access Clearances** are not infringed and **Approved** access equipment is used, fuse replacement can be carried out on pole mounted transformers, section fuses etc.

OC3.1.7 Where it is required to test **Low Voltage Conductors**, to prove **Dead** or check **System** conditions operators **Shall** use **Approved** personal protective equipment, as detailed in paragraph OC 3.1.6, and only **Approved** testing devices or instruments **Shall** be used.

OC3.2 Overload or Suspect Fault Conditions.

When investigating supply irregularities record all operations on a suitable form which **Shall** be left in a prominent place in the substation.

OC3.2.1 General Procedure. Restoring supplies where a fuse controlling a **Low Voltage** distributor has blown:

- a. Test for blown fuse(s) and evidence of backfeed.
- b. Remove affected carrier(s) checking hinged action in the process.
- c. If there is evidence of back feed, carry out further investigation.
- d. Check the feeder route where reasonably practicable for evidence of disturbance or third party activity.
- e. Connect a fault re-energising device, check discrimination and transformer rating and if satisfactory, close.
- f. If successful, check supplies, use clamp ammeter where reasonably practicable to note load picked up.
- g. If the CB remains closed for 5 minutes,
- h. Replace the fuse in the fuse carrier with the correctly rated element, comparing barrel dimensions to ensure adequate clearance.
- i. Open and remove the fault re-energising device and insert the fuse with a continuous positive action.
- j. Repeat for other phases if necessary.

OC3.2.2 Where a re-energising device is unavailable:

- a. Carry out relevant parts of the procedure in OC3.2.1
- b. Where the circuit has an operational restriction then for fuse replacement or closing a circuit breaker or fuse switch which is not suitably rated for closing on fault, the **Low Voltage** busbars **Shall** be made **Dead** from a suitably rated switching device. Where this device is part of the **High Voltage System**, switching **Shall** be carried out by a suitably **Authorised Person** to the instructions of the **High Voltage System Control Engineer**.

OC3.2.3 Intermittent Faults.

- a. If a fuse blows for a second time or an auto-reclose device operates within 1 month of its initial installation an auto reclose device **Shall** be installed on each phase in line with customer service policy. Where auto-reclose devices cannot be fitted or are not suitable consideration may be given to temporarily increase the fuse size (requires check on protection / discrimination and transformer rating).
- b. The number of reclose operations set for auto- reclose equipment (e.g. Faultmaster / Modular Rezap) may be set up to a maximum of 5 auto- reclose operations to lock out. Any higher reclose values to lock-out will need to be individually risk assessed.
- c. Following 'lock out' of a reclosing device, the full re-energising procedure **Shall** be followed. Following a check of the feeder route the device may, if required, be closed by remote operation.
- d. When an intermittent fault has been repaired or after a specified period of time in line with customer service/intermittent fault policy, the **System Shall** be returned to normal. (i.e. Remove auto reclose device and restore normal fuse size).

OC3.2.4 The fitting of an auto-reclosing device to **Low Voltage** circuits containing overhead conductors requires special consideration. The auto-reclose feature **Shall** only be enabled

with the consent of an **Authorised Person** who will risk assess the circuit route and consider the following in determining the fitting of reclose devices in automatic mode:

- a. The proportion of overhead line and underground cable
- b. Fault condition or other information that may indicate the likely position of the fault
- c. The likelihood of a bare multiphase overhead network passing fault current and clashing the conductors
- d. The perceived level of public safety risk posed by the physical location of the overhead conductors

In all situations the maximum number of auto-reclose shots **Shall** be in accordance with the customer service policy.

OE5.1.2 **Low Voltage**. When a fault on an Independent Distribution Network Operator's **Low Voltage System** results in the operation of a **Company** controlled fuse, **Switching**, in liaison with the third party, to restore supply may be carried out after the **Low Voltage** control coordinator has approved a request for local **Low Voltage** control by an **Authorised Person**. Where necessary links or fuses at the interface with the Independent Distribution Network Operator's network **Shall** be removed in order to restore supply to the **Company's** network and facilitate fault location and repair by the Independent Distribution Network Operator .see IDNO interface document.

F3; WA Work Methods.

The consequences of electric shock or serious burns from short circuit arising from inadvertent contact with exposed **Low Voltage Apparatus** may be serious and in some circumstances may be fatal.

Danger may arise in the following circumstances:

- (a) a person confuses **Apparatus** and **Conductors** which have been made **Dead** with those which remain **Live**;
- (b) **Dead Apparatus** and **Conductors** are accidentally or inadvertently made **Live**;

- (c) a person accidentally or inadvertently makes contact with adjacent **Live Conductors**; or
- (d) inadequate precautions are taken during **Live** work or testing.

Due to the nature of the **LV System**, under most conditions including maintaining supply and the **Danger** of backfeed, it will be necessary to work using **Live** working techniques.

These **LV Safety Rules** provide guidance and instruction to avoid the inherent **Danger** from the **System**. Any risk associated with **Live Conductors** in the work area **Shall** be eliminated, where reasonably practicable, by making them **Dead**.

F3.1 Proximity Working

The implications of carrying out work in proximity to exposed **(Live) Low Voltage Apparatus** must be considered seriously. Such work shall only be carried out under the **Personal Supervision** of an **Authorised Person** or following the establishment of **Approved** screens and the receipt of written instructions. Good lighting and tidy housekeeping are essential elements of working safely.

8.1.2 When work or testing is carried out on or near **Low Voltage Apparatus** and exposed **Conductors**, precautions **Shall** be taken to prevent **Danger** from burn injury due to electric arc and from electric shock

If the **Conductors** are covered with insulation or with insulation and screening, the adequacy of these materials to prevent **Danger** **Shall** be assessed by a **Competent Person** with regard to the nature of the work or testing. Where necessary the precautions appropriate to work on or near exposed **Conductors** **Shall** be applied.

AD1.2.2 Vegetation Management (Engineering Recommendation G55/1) is an exception; see IHSS/024

8.8 Where **LV** work is carried out in proximity to **HV Apparatus** or **Conductors** the **Authorised Person** in charge **Shall** ensure **Working & Access Clearances** are observed at all times or

suitable screening is used. If **Working & Access Clearances** cannot be maintained then the **LV** work **Shall** be carried out to **HV** procedures to ensure safety from the **High Voltage System**.

8.2.4/OC3.3.2 Suitable precautions **Shall** be taken by **Approved** screening or other **Approved** means to avoid **Danger** from inadvertent contact with adjacent **Live Conductors** including, where necessary, the fixing of **Danger Notices** to **Apparatus** containing **Live Conductors**, adjacent to other **Live Conductors** and at the limits of the work area.

Approved screening for:

- a. Lines; Drawing Nos. 1.09.117.0261; 0271; 0281; 0291; 0301
- b. Link Boxes; Drawing No. 1.18.012.0002
- c. Open Low Voltage Distribution Boards; Portable screens to Drawing No. 1.02.0004.0028 or purpose built continuous enclosure constructed of suitable material;

The application of **Approved** screening, shrouding and **Danger Notices** **Shall** be carried out or moved only by or under the **Personal Supervision** of a suitably **Authorised Person**. Additional precautions to exclude **Danger** will include the use of insulated tools and suitable PPE **Approved** for the work.

F3.2 Prerequisites for Testing / Work

8.1.8 When work or testing on the **Low Voltage System** is planned, precautions **Shall** be taken to safeguard the integrity of the **Low Voltage System** and in the process prevent, so far as reasonably practicable, **Danger** to third parties

8.1.5/6/WA1.1.1 Work on, or testing of **Low Voltage Apparatus** and **Conductors** **Shall** only be carried out by a **Competent Person** using **Approved** tools and equipment to **Approved** procedures.

- a. **Immediate Supervision** may be required or a **Limitation of Access** issued where it is considered other hazards, including environmental, may exist.

- b. Where work involves the re-arrangement of **Conductors**, where practicable, checks for correct polarity etc. **Shall** be made prior to work commencing.
- c. Supply **Shall** not be commenced/recommenced to any consumer unless appropriate checks for polarity etc. have been made, see OC4.

F3.3 DEAD WORKING

F3.3.1 Make Dead Switching Shall be carried out by an **Authorised Person to Approved** procedures (**F2.2**)

F3.3.2 Isolate.

8.2.1/OC 3.3 When work is to be carried out on **Dead Low Voltage Apparatus** the **Conductors Shall** be isolated from all sources of supply from the **System**.

- a. Where the **Isolating Devices** are lockable, Ancillary **Safety Locks Shall** be applied by a suitable **Authorised Person**. Ancillary **Safety Locks Shall** be used to safeguard isolation of **LV** feeder ways, isolation of ancillary **LV** supplies and any other points of isolation which require locking.
- b. If components such as fuses and links are removable they **Shall** be removed and use **Shall** be made of proprietary shrouds/caution tape where reasonably practicable.
- c. **Caution Notices Shall** be securely fixed at all points of isolation. Keys and removed components **Shall** be kept in a secure place.
- d. For work on a **Low Voltage** distributor remote from a substation the distributor **Low Voltage** fuses **Shall** be removed, a **Caution Notice** posted and an Ancillary **Safety Lock** applied where practicable.

OB5.2.2 CB's switches and isolators controlling the **Low Voltage** windings of a Transformer, Auxiliary Transformer or VT **Shall**,

where practicable, be **Isolated** and an appropriate **Safety Lock** and **Caution Notice** applied.

Where this is not practicable the following alternative methods are

Approved:

- a. Use of locking bar or proprietary shroud.
- b. Where circuit breakers or fuse switches cannot be **Isolated** the mechanism **Shall** be immobilized and a **Safety Lock** and **Caution Notice** applied.
- c. Where none of the above are possible, the chamber containing the switch/**Isolating Device** **Shall** be locked closed with a **Safety Lock** and a **Caution Notice** applied.
- d. Alternative methods, subject to the Approval of the **Designated Engineer**, may be sought.

8.2.5 Where **Conductors** may become **Live** due to the infeed from distributed generation, one or more of the following precautions **Shall** be taken to prevent **Danger**:

- (a) the **Conductors** **Shall** be **Isolated** from the consumer's **System**;
- (b) the **Conductors** **Shall** be **Earthed** or an **Earth** provided between the point of work and the consumer's **System**;
- (c) the work **Shall** be carried out using **Live** working techniques.

F3.3.3 Earthing

8.2.2 The **Conductors** **Shall** be **Earthed** where an earthing device or earthing leads are **Approved** for use on the **Conductors** concerned.

8.1.3/OC3.4.1 The term '**Earthed**' when applied to **Low Voltage Systems** will mean the bonding of all the phase **Conductors**

(including any switch or earth wire) to the neutral **Conductor** by means of an **Approved** device/leads, see **Approved** earthing devices.

8.4.1/OC3.4.2 Where practicable, **Low Voltage Conductors** **Shall** be **Earthed** using **Approved** earthing leads. The shorting & earthing device **Shall** be inspected immediately before use paying attention to cleanliness and the condition and security of contacts, clamps and leads. Do not use if there is any sign of damage. The shorting and earthing devices **Shall** be fitted as near as practicable to the point-of-work or between the point- of-work and any potential source of supply.

OC3.4.3 The isolated circuit, **Shall** be proved **Dead** using an **Approved** voltage indicator before applying the **Earth** (F2.2 / OC3.1.6)

F3.3.4 Identification of Apparatus

8.2.6 Before work is commenced the **Apparatus** and **Conductors** **Shall** be identified and proved **Dead** at the point of work by means of an **Approved** voltage testing device or other **Approved** procedure.

WA2.1.7 Link Boxes and Feeder Pillars **Shall** be suitably labelled to identify the **Apparatus** and circuits, and for underground link boxes, the geographic orientation

WC2.1 Cables.

All damaged cables **Shall** be treated as **Live** in accordance with section F4.2.3 / WC6.

WC1.1 The **Person** in charge of the work **Shall** consult the appropriate records. Records showing all cable routes, position and type etc. **Shall** where practicable, be made available on site to those doing the work. If there is any difficulty in relating the records to the site situation a supervisor **Shall** be consulted.

WC2.1.1 Where all cables in the vicinity are known to be **Low Voltage**, identification by size, outer covering, including embossing, or protection method **Shall** be deemed adequate. Where there is any doubt, positive identification of the correct

Low Voltage cable **Shall** be achieved by further testing or the exposure of a service joint or connection to identifiable **Low Voltage Apparatus**.

WC2.1.2 Where any adjacent cable is known or suspected to be **High Voltage**, then in addition to the above in WC2.1.1, positive identification **Shall** be confirmed from records.

If there is any doubt about the identification of the **Low Voltage** cable to be worked upon and the identification of all adjacent **High Voltage** cables, then identification of the **Low Voltage** cable or all **High Voltage** cables, **Shall** be confirmed by the use of **Approved** cable identification equipment. Particular care is needed in areas where it is known non- standard cables exist e.g. plain lead or tape armoured **High Voltage** cables or wire armoured **Low Voltage** cables. Where there is any doubt a **Senior Authorised Person** **Shall** be consulted.

WD2.1 **Lines**. **LV** lines **Shall** be identified using records, **System** diagrams and where fitted, circuit identification/number plates.

F3.3.5 Screening of Apparatus

8.2.4 Suitable precautions **Shall** be taken by **Approved** screening or other **Approved** means to avoid **Danger** from inadvertent contact with adjacent **Live Conductors** including, where necessary, the fixing of **Danger Notices** to **Apparatus** containing **Live Conductors**, adjacent to other **Live Conductors** and at the limits of the work area.

OC3.3.2 Application of **Approved** screening, shrouding and **Danger Notices** **Shall** be carried out or moved only by or under the **Personal Supervision** of a suitably **Authorised Person**.

Approved screening for:

- a. Lines; Drawing Nos. 1.09.117.0261; 0271; 0281; 0291; 0301
- b. Link Boxes; Drawing No. 1.18.012.0002

- c. Open Low Voltage Distribution Boards; Portable screens to Drawing No. 1.02.0004.0028 or purpose built continuous enclosure constructed of suitable material-

F3.3.6 Setting to Work

WA2.1.1 The **Person** in charge **Shall** instruct work to commence when:

- a. **Control** procedures are complied with, (F2.1 / OC2).
- b. The **Low Voltage** coordinator has granted any required **Low Voltage** control to the **Person** in charge of the **Working Party**.
- c. In the case of fault repair work on **Low Voltage** mains circuits, any auto reclose device connected to the circuit has been set to one trip.
- d. The **Apparatus** to be worked upon has been identified by labels, records etc. and for cables, in accordance with section WC2 and WC3 of OPM for **High Voltage** cables.
- e. The **Competent Person** in charge of the **Working Party** fully understands the nature and extent of the work to be done.

WA2.1.2 Task instructions **Shall** be clear and unambiguous, instructions may be:

- a. To an appropriate **Approved** work procedure, otherwise
- b. written where reasonably practicable or
- c. verbal for simple tasks where the risk involved is low.

Where insulated but un-screened **Conductors** are present the requirements for **Live** working **Shall** be observed until the **Conductors** have been proved **Dead**.

Whilst work is in progress any **Live** working methods that can reasonably be applied to minimise the risk of **Danger** from the **Conductors** being inadvertently made **Live**, **Shall** be used. (8.2.6).

F3.4 WORKING LIVE

Working **Live** can only be justified under the Electricity at Work Regulations if the following criteria can be met:

- a. It is unreasonable to be made **Dead**, and
- b. it is reasonable to work **Live** and
- c. suitable precautions are taken to prevent injury.

e.g. It will be unreasonable for the **Apparatus** to be made **Dead** if consumers require supply and it is reasonable to work **Live** if safe working procedures can be applied.

8.5.1 No **Low Voltage Live** work **Shall** be carried out except in accordance with an **Approved** procedure which **Shall** adequately prevent **Danger** from electric shock and inadvertent short-circuiting of the **Conductors**.

8.5.2 Where **Live** work is to be carried out under an **Approved** procedure, the **Competent Person** in charge of the **Working Party Shall** make an assessment of the site conditions. **Live** work **Shall** only be commenced where site conditions enable the work to be done safely. If the site conditions become unfavourable **Live** working **Shall** be suspended. In particular the following requirements **Shall** be assessed:

- (a) the **Apparatus** to be worked upon **Shall** be visually inspected to see that it is in a satisfactory condition;
- (b) there **Shall** be adequate working space and safe means of egress;
- (c) the working space and the **Apparatus** to be worked on **Shall** be adequately illuminated; and
- (d) if the work is outdoors the weather conditions **Shall** not be unduly adverse.

WA1.1.1 Work or testing on **Live Low Voltage Systems Shall** only be carried out by **Competent Persons** using **Approved** tools and equipment to **Approved** procedures to which they have received appropriate training.. **Immediate Supervision** may be

required or a **Limitation of Access** issued where it is considered other hazards, including environmental, may exist

8.6.2 Unless alternative **Approved** procedures allow, during all work, including the change of cut-outs, only one conductor **Shall** be bared at a time and as a minimum **Approved** insulating gloves **Shall** be used and where there is a **Danger** of arc energy, a full face visor **Shall** be worn.

8.5.4/WA1.1.2 Where work which involves, or is equivalent to, the manipulation of bare **Live Conductors**, a second person, who is trained to recognise **Danger**, **Shall** be continuously available at the location to obtain or render immediate assistance in the event of an emergency.

F4 Work on Particular Items

F4.1 Apparatus

WA2.1.4 Metal enclosed switchgear: No work may be carried out on **Live Conductors**, other than testing, unless special dispensation is given by the **Designated Engineer**.

- a. Where covers are required to be left open or removed for testing then suitable precautions **Shall** be taken to avoid **Danger**.
- b. Where covers are not hinged and it is required to expose uninsulated **Conductors** for testing or inspection, where reasonably practicable the **Conductors Shall** be made **Dead** for removal and replacement of the covers or suitable precautions taken to avoid **Danger**

WA2.1.5 **Low Voltage** Boards. Apart from fitting labels etc. which may be carried out following a suitable risk assessment, **Live** work is permitted, subject to all **Live** parts being suitably screened & guarded and, because of the **Danger** of backfeed, the work carried out as if it were **Live**. All other work will require the incoming circuit to be made **Dead** and work carried out to the appropriate **Approved** procedure.

WA2.1.7 Link Boxes and Feeder Pillars. If cleaning and contact dressing is required, the work **Shall** be carried out in accordance

with an **Approved** procedure. For all other work all **Conductors Shall** be made **Dead**.

F4.2 Cables

F4.2.1 Excavation of cables **Shall** be carried out in accordance with **E4**. All damaged cables **Shall** be treated as **Live** in accordance with section F4.2.3 / WC6.

8.6.1 The cable to be worked on **Shall** be identified by **Approved** means. All metalwork adjacent to the point of work **Shall** be adequately shrouded with **Approved** insulating material to prevent inadvertent contact. The metallic sheaths of cables **Shall** be bonded to each other with an **Approved** insulated **Conductor** before jointing and before cutting to ensure continuity of the electrical circuit through the sheath.

8.3.1 Cable Dead ,unless the point of work can be physically traced from a point where the **Conductors** are accessible and have been proved **Dead** at that point, it will normally be necessary to open the cable as if it is **Live** and test each **Conductor** with an **Approved** voltage testing device; or

if the cable has been damaged or is faulty this test **Shall** be made at a safe distance from the suspected point of damage / fault.. The cable **Shall** then be physically traced from the point of test to the suspect point of damage /fault. Appropriate precautions **Shall** be taken to avoid **Danger** from electric shock and explosive arcing until the point of damage / fault is located and the cable made **Dead**.

F4.2.2, WC5 Disconnected Cables

Disconnected Cables which have been cut and declared removed from the **System Shall** have their conductors shorted and connected to the cable sheath at the cap end position.

WC5.4 Where it is necessary to confirm that a suspected abandoned **Low Voltage** cable is **Dead**, it **Shall** be treated as **Live** until the cable has been opened and the cores have been tested to prove **Dead**

WC5.1 Disconnected cables may be worked upon provided they are identified as far as reasonably practicable, in accordance with WC2.1 for **Low Voltage** cables

F4.2.3; WC6 Faulted/Damaged

WC6.1 All faulty or damaged cables **Shall** be treated as **Live**, movement is prohibited until identified and proved **Dead**.

8.3.1.c There is no **Approved** procedure to allow testing at the point of damage.

WC6.2.1 Identification. (WC2.1)

- a. An indication of the fault position may be given by:
 - Cable visible after damage.
 - Ground disturbance coincident with fuse operation (may include flash marks).
 - Sounds of discharge
 - Smell of burning etc. or by use of fault location equipment such as pulse echo or injected signal etc.
- b. Confirmation of the existence of the cable **Shall** be sought from records.
- c. Identification may be obtained from circuit labelling where:
 - There is only one cable installed in the vicinity and
 - fuses are blown consistent with damage or
 - loss of supply in the immediate vicinity of the fault / damage is confirmed following **Switching**.
- d. Where there are multiple cables in the vicinity and definite identification of the faulty cable cannot be

obtained then all other cables **Shall** be identified or all cables in the vicinity made **Dead**.

WC6.2.2 Excavation. Initial excavation for the testing of faulty or damaged **Low Voltage** cable **Shall** take place at a point sufficiently remote from the point of fault / damage to avoid **Danger**, (WC1.3.1).

This **Shall** normally be at least 2m away from the indicated point of fault ensuring that 1m of solid ground is maintained between the excavation and the point of fault. If the faulty or damaged cable has been definitely identified, in accordance with WC6.2.1c, or all supplies in the vicinity have been cut off, then the 1m of solid ground need not be maintained.

WC6.2.4 On confirming the cable is **Dead** between the test position the point of damage **Shall** be traced visually, or by using a running noose, to the point of fault.

F4.2.4; WC4 Auxiliary.

Auxiliary cables are normally associated with **High Voltage** cables. If, after consulting records, there is any doubt about the identification of the auxiliary cable it **Shall** be identified using approved cable identification equipment

8.3.2 When work is to be carried out on an auxiliary cable which may be subject to induced voltage from a **High Voltage** circuit, additional precautions to prevent **Danger** from these voltages **Shall** be taken in accordance with **Approved** procedures.

WC4.1 Induced voltage.

Experience has shown that problems arising from induced voltages are limited to auxiliary cables associated with overhead systems. However precautions **Shall** be taken in all cases, especially with circuits at 132kV and above to minimise the effects of any induced voltage.

WC4.1.2 Any **High Voltage Conductors** associated with catenary mounted auxiliary cables **Shall**, where reasonably practicable, be made **Dead**. If not then consideration **Shall** be given to lowering the catenary so that work may be carried out at

ground level. The restriction on work more than 3m from a support with the **Conductors Live** will not then apply.

WC4.1.3 Disconnect the cores at all points and where practicable short and **Earth**.

WC4.2.1 For catenary mounted cables the sheath/armours and catenary **Shall** be covered with **Approved** insulating material for a distance of 1 metre on each side of the point of work.

WC4.2.2 Exposed sheath / armours of underground auxiliary cables **Shall** be covered with **Approved** insulating material and an **Approved** insulating mat used when working on **Conductors**.

WC4.2.3 When working on one **Conductor**, the others **Shall** be insulated or so placed to avoid contact.

WC4.2.4 When working on fibre wrap installations with the **High Voltage conductors Live** then this **Shall** be carried out in accordance with an **Approved** procedure.

F4.3 Overhead Lines

8.4.2 / 8.7.1 Where work is carried out on **Live** overhead lines any unearthed steelwork such as an offset bracket or the upper portion of a stay above the insulator **Shall** be treated as **Live** until it has been proved **Dead** using an **Approved** voltage testing device.

WD4.3 Movement of Conductors:

8.1.7 / WD4.3.1 When any overhead line **Conductor** is to be moved, erected, dismantled, subject to a change in tension or otherwise held on temporary supports/connections, **Approved** procedures **Shall** be followed. Due regard must be taken of the effect on other **Apparatus** and equipment and other persons, including members of the public. In all cases a comprehensive risk assessment, taking account of the possibility of conductor breakage **Shall** be carried out.

Where **HV Apparatus** or **Conductors** are involved the **Person** in charge **Shall** ensure **Working** and **Access Clearances** are observed at all times or suitable screening is used. If **Working**

and **Access Clearances** cannot be maintained then the **LV** work **Shall** be carried out to **HV** procedures (**Permit to Work** issued) to ensure safety from the **High Voltage System**.

WD4.3.2 Crossings - Account **Shall** be taken of the risk involved and the type and importance of the crossing. Precautions taken **Shall** be in proportion to the risk to eliminate any hazard as far as reasonably practicable. e.g. Where tension is being altered, consideration **Shall** be given to the use of adequate secondary attachments. See **Approved** procedure for crossings.

Safety precautions **Shall** include the use of signs and guarding to ensure safety of passing persons/traffic. Where appropriate use **Shall** be made of scaffolding/towers, netting or vehicular mounted towers etc.

While **Conductor** erection or dismantling is in progress, the crossing **Shall** be supervised by an attendant who **Shall** be in communication with the **Person** in charge of the operation.

Particular regard should be paid to the crossing of or proximity to:

- a. Lines (including telecoms) - Guard to prevent damage and make dead if possible or take precautions to avoid **Danger**.
- b. Roads - The Local Highway Authority will require notification for work on or near roads in accordance with the requirements of current Street Works Regulations. Small private roads and tracks will require the owners consent. Signs and guarding **Shall** be used in all cases.
- c. Rail - The network operator will require notification and additional precautions **Shall** be required where the line is electrified.
- d. Rivers/Canals - The local river authority may have to be involved especially where navigable or used for recreational purposes.

Advice should be sought from the Safety Section where the Supervising Person envisages any difficulty.

8.7.2 When work is carried out on insulated but unscreened **Low Voltage Conductors Approved** insulated gloves **Shall** be worn and **Approved** insulated tools used to prevent **Danger** that may arise if the insulation has deteriorated or is damaged.

8.7.1 Where work is carried out on **Live** overhead lines any unearthed steelwork such as an offset bracket or the upper portion of a stay above the insulator **Shall** be proved **Dead** using an **Approved** voltage testing device.

WA2.1.6 Pole mounted transformer **Low Voltage** cabling and switchgear, provided **Working and Access Clearances** are maintained from **High Voltage Conductors**, the transformer **Low Voltage** fuse units can be changed in accordance with an **Approved** work procedure. In all other circumstances, for work on the transformer **Low Voltage** cables and or the **Low Voltage Isolating Device**, work **Shall** be carried out under **HV** procedures (**Permit to Work** issued)

F4.4 Service Apparatus

WA2.1.8 Service Cut-outs **Shall** only be changed **Live** in accordance with the appropriate **Approved** work procedure. Where practicable only one **Conductor** **Shall** be exposed at a time.

Note. The changing of metalclad cutouts while **Live** is prohibited.

F5; WA3 Work Handover.

WA3.1 Low Voltage

Where the **Working Party** is to be changed, a formal handover **Shall** take place to the designated lead **Person** of the second **Working Party**. This handover **Shall** be recorded. Preferably the handover is best undertaken on site and documented between the two parties. Where an on-site handover is not practicable then both parties must ensure the handover is comprehensive and fully understood. Consideration will be given to:

- Temporary rearrangement made to the **Low Voltage** system.
- Detail of any partially completed work e.g. for cable jointing works any incomplete or partially completed joints, for overhead line repairs the position of shorting and earthing devices and tools connected to conductors.
- Services disconnected.
- Location of any mobile generator.

F6 Testing & Commissioning

F6.1 WE Testing

The Company has a duty under legislation to ensure the **System** is operated and maintained to prevent **Danger** as far as reasonably practicable. Therefore, before connecting or reconnecting any **Apparatus** or circuit to the **System**, tests **Shall**, where reasonably practicable, be carried out to ensure integrity of insulation.

3.8 USE OF VOLTAGE TEST DEVICES

Where voltage testing devices are used they **Shall** be of **Approved** type and such use **Shall** be in accordance with **Approved** procedures. Such devices **Shall** be tested in an **Approved** manner immediately before and after use or, where this is not reasonably practicable; they **Shall** be tested in accordance with **Approved** procedures.

WE2.1 Insulation resistance and continuity testing of **Low Voltage Apparatus** and **Conductors** **Shall**, where reasonably practicable, be carried out using **Approved** instruments. Manufacturer's operating instructions must be observed. Tests for insulation resistance **Shall** be carried out at 500 volts and applied for 1 min. each test.

8.9.1 Testing and adjustment, including functional testing, may be made with **Low voltage Apparatus Live** provided that **Approved** insulated tools and instruments are used.

8.9.2 If the testing or adjustment requires covers to be removed so that terminals or connections that are **Live**, or can be made **Live**, are exposed or temporarily disconnected, then precautions **Shall** be taken to prevent unauthorised access to or interference with the **Apparatus**. Such precautions **Shall** include, where necessary, **Personal Supervision** and/or erection of suitable barriers or screening and the display of **Danger Notices**.

8.9.3 If the **Conductors** are to be made **Dead** in order to avoid **Danger**, appropriate requirements for **Dead** working in Section F3.3, **Shall** be applied.

F6.2 Commissioning

OC4 Procedure for energising Low Voltage Apparatus and Conductors:

- a. **Apparatus Shall** be fully assembled and connected with all gear and tools removed.
- b. All members of the **Working Party Shall** be warned that it is no longer safe to work on the **Apparatus** and, if issued, any **Safety Document** cancelled.
- c. Check that no hazard will be created by testing or energising the **Apparatus**.
- d. Carry out insulation and continuity tests etc. as appropriate, (F6.1). When energising from a service termination, ensure consumers circuits are disconnected.
- e. Remove **Notices** and make **Live**.
- f. Check for polarity, earth loop impedance, phase rotation (for 3 phase) and correct operation.

Appendices

Appendix A Permit to Work

Appendix B Not applicable to LV working

Appendix C Limitation of Access

Appendix D Not applicable to LV working

Appendix E Treatment for Electric Shock

Appendix WD1 Rescue procedure

Appendix A: Permit-to-Work form (front)

NORTHERN POWERGRID Permit to WorkNo. PW

1. IssueBy**To**

The following
HV APPARATUS
has been
made SAFE
in accordance
with the
Distribution
Safety Rules
for the work
detailed on this
Permit-to-Work
to proceed.

TREAT ALL OTHER APPARATUS AS LIVE

.....
Circuit Main
Earths are
applied at:
.....
.....
.....

Other Precautions
As required by
Distribution
Safety Rules
The following
Work is to be
carried out
Signed Time Date

2. RECEIPT

I accept responsibility for carrying out work on the Apparatus detailed on this Permit-to-Work in accordance with the Distribution Safety Rules. No attempt will be made by me, or persons under my charge, to work on any other Apparatus.

Signed Time Date

Permit-to-Work form (back)

3. CLEARANCE

All persons under my charge have been withdrawn and warned that it is no longer safe to work on the Apparatus detailed on this Permit-to-Work.

All gear and tools have* / have not* been removed.

All Additional Earths have been removed* / accounted for

The work is complete* / incomplete*

Signed Time Date

*Delete words not applicable

4. CANCELLATION

This Permit-to Work is cancelled by

Signed Time Date

Appendix C: Limitation-of-Access form (front)

NORTHERN POWERGRID Limitation-of-Access No. LA

1. IssueBy **To**

Permission is given to carry out the work described below:

Location
.....

Access to:
.....

Work to be done:
.....
.....

SAFETY PRECAUTIONS APPLICABLE

a) Plant and Apparatus:
.....
.....

b) Environment:
.....

c) Access/General:
.....

Signed Time Date

2. RECEIPT

I accept responsibility for carrying out work on the Apparatus detailed on this Limitation-of-Access and no other work will be done by me or the persons under my charge at the above location.

Signed Time Date

Limitation-of-Access form (back)

3. CLEARANCE

All persons under my charge have been withdrawn and warned that it is no longer permitted to carry out the work specified on this Limitation-of-Access.

Signed Time Date

*Delete words not applicable

4. CANCELLATION

This Limitation-of-Access is cancelled

Signed Time Date

TREATMENT FOR ELECTRIC SHOCK AND BASIC FIRST AID

ELECTRIC SHOCK

First make safe

- DO NOT touch the casualty with your unprotected hands.
- Make the electrical source dead immediately or send someone to do so.
- Do not attempt to remove a person from contact with high voltage unless a Senior Authorised Person confirms it is safe to do so.
- To free the casualty from contact with a live low voltage source wear insulating gloves to pull the casualty free OR
- Stand on a dry insulating material, such as a wooden pallet or plastic mat, then use a dry wooden or plastic implement to free the casualty from the electrical source; OR
- If dry rope is available, without touching the casualty, loop it around the feet or under the arms and pull the casualty free.



AFTER REMOVING ANY ELECTRICAL HAZARD

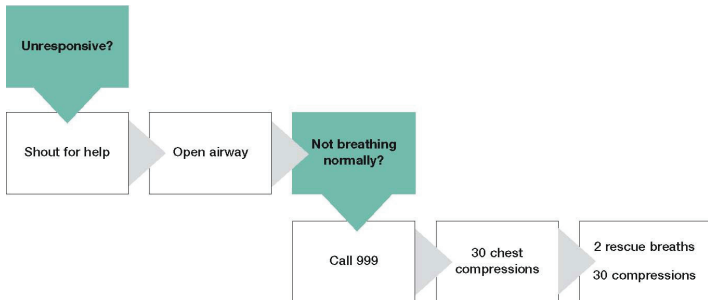
Don't delay - Your priorities are to:

- assess the situation – do not put yourself in danger;
- make the area safe;
- assess all casualties and attend first to any **unconscious** casualties;
- send for help – do not delay - call 999.

Check for a response

Gently shake the casualty's shoulders and ask loudly, 'Are you all right?' If there is no response, your priorities are to:

- shout for help;
- open the airway;
- check for normal breathing;
- take appropriate action.



A - Airway

To open the airway:

- place your hand on the casualty's forehead and gently tilt the head back;
- lift the chin with two fingertips.



B - Breathing

Look, listen and feel for normal breathing for no more than 10 seconds:

- look for chest movement;
- listen at the casualty's mouth for breath sounds;
- feel for air on your cheek.



If the casualty **is** breathing normally:

- place in the recovery position;
- get help;
- check for continued breathing.

If the casualty **is not** breathing normally:

- get help; call 999
- start chest compressions (see CPR).



C - CPR

To start chest compressions:

- lean over the casualty and with your arms straight, press down on the centre of the breastbone 4-5 cm, then release the pressure;
- repeat at a rate of about 100 times a minute;
- after 30 compressions open the airway again;



- pinch the casualty's nose closed and allow the mouth to open;
- take a normal breath and place your mouth around the casualty's mouth, making a good seal;
- blow steadily into the mouth while watching for the chest rising;
- remove your mouth from the casualty and watch for the chest falling;



- give a second breath and then start 30 compressions again without delay;
- continue with chest compressions and rescue breaths in a ratio of 30:2 until qualified help takes over or the casualty starts breathing normally.

Severe bleeding

If there is severe bleeding:

- apply direct pressure to the wound;
- raise and support the injured part (unless broken);
- apply a dressing and bandage firmly in place.

Broken bones and spinal injuries

If a broken bone or spinal injury is suspected, **obtain expert help. Do not move casualties** unless they are in immediate danger.

Burns

Burns can be serious so if in doubt, seek medical help. Cool the affected part of the body with cold water until pain is relieved. Thorough cooling may take 10 minutes or more, but this must not delay taking the casualty to hospital.

Certain chemicals may seriously irritate or damage the skin. Avoid contaminating yourself with the chemical. Treat in the same way as for other burns but flood the affected area with water for 20 minutes. Continue treatment even on the way to hospital, if necessary. Remove any contaminated clothing which is not stuck to the skin.

Eye injuries

All eye injuries are potentially serious. If there is something in the eye, wash out the eye with clean water or sterile fluid from a sealed container, to remove loose material. **Do not attempt to remove anything that is embedded in the eye.**

If chemicals are involved, flush the eye with water or sterile fluid for at least 10 minutes, while gently holding the eyelids open. Ask the casualty to hold a pad over the injured eye and send them to hospital.

Appendix WD.1 Rescue Procedure

Where rescue of a person is required from a pole, tower or other high structure summon help from the emergency service, carry out a risk assessment to ensure your own safety then:

Pole top rescue, Diagram WD.1 shows a method of attachment using a sling, carabiner and Figure of 8 Descender. Procedure as follows:

- a. Climb pole and assess casualty for vital signs. If required, start resuscitation and continue at suitable intervals during the rescue process.
- b. Attach sling to a suitable anchorage point.
- c. Pass suitable rope (12mm) through and round Figure of 8 Descender as Diagram WD.1.
- d. Connect Figure of 8 Descender to sling via a carabiner.
- e. Fasten one end of the rope to the casualties harness with a bowline and take the strain on the other side.
- f. While still taking strain, cut the casualty free of the fall arrester etc. and lower to the ground.
- g. Continue resuscitation and or first aid as necessary until qualified help arrives.

DIAGRAM WD.1

**Attachment using
Sling, Carabiner and Descender**

