

NORTHERN POWERGRID

Distribution Safety Rules 2015 Edition

These rules shall be read in conjunction with the Operational Practice Manual and/or indicated Operational Guidance.

Refer to the index for supplementary information where 'Approved' appears within the text or where there is a '*' symbol.

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REVISIONS

Any further revisions to the NORTHERN POWERGRID Distribution Safety Rules will be numbered and the appropriate page(s) will be identified by the number of the revision and the year. A new “Revisions” page will be produced to cover further revisions as indicated below:

Rev No.	Rule No.	Page No.	Date Issued	Page Indent
1				
2				

FOREWORD

The NORTHERN POWERGRID Distribution Safety Rules is a copyright document and is based upon the National Model Distribution Safety Rules produced and approved by the Safety, Health and Environment Committee of the Energy Networks Association, reference SHEC 010, dated November 2010.

BACKGROUND NOTES TO THE MODEL DISTRIBUTION SAFETY RULES (From SHEC 010)

The Model Distribution Safety Rules have been prepared following extensive consultation with Member Companies who are users of the Model Distribution Safety Rules. It is recognised that such Companies base their own Company Safety Rules on the Model Distribution Safety Rules and do not necessarily issue the Model Distribution Safety Rules to staff.

RISK ASSESSMENT (qualitative – utilising ALARP)

The Model Distribution Safety Rules have been designed and developed over many years utilising the competence and experience of Operational Electrical Engineers, Managers and other such professionals.

Governance and management of the Model Distribution Safety Rules is provided by the Energy Networks Association on behalf of member Electricity Companies. This structured management approach is essential for the continuous improvement and proper control of the Model Distribution Safety Rules.

Whilst it is a fact that operator competence, discipline and compliance with the Model Distribution Safety Rules (and any associated procedures) as a minimum is required to facilitate safe working; it is also true that the Model Distribution Safety Rules are, so far as reasonably practicable, considered to be a safe system of work for people to use when working or operating on or near the Electrical Transmission and Distribution systems. The risk assessment shown below supports this conclusion:

Assumptions (existing Control Measures)

- Operators stop and ask for help if they are unsure;
- Operator compliance, discipline and competence;
- Operational roles, responsibilities and authorisations in place;

- Effective communication of rules and associated procedures (of any kind);
- Transmission and Distribution system assets are fit for purpose;
- The Model Distribution Safety Rules form only part of Member Companies SHE Management Systems and as such additional complementary and supporting arrangements are in place to cover the remaining requirements of the SHE Management Systems chosen by Member Companies.

Event

The risk of a person or persons being injured whilst operating within the Model Distribution Safety Rules.

Likelihood

Whilst considering the number of people working within the Electricity Supply Industry within the UK and their every-day potential exposure to the system and the assumptions listed above the likelihood is considered to be 'Extremely Remote'.

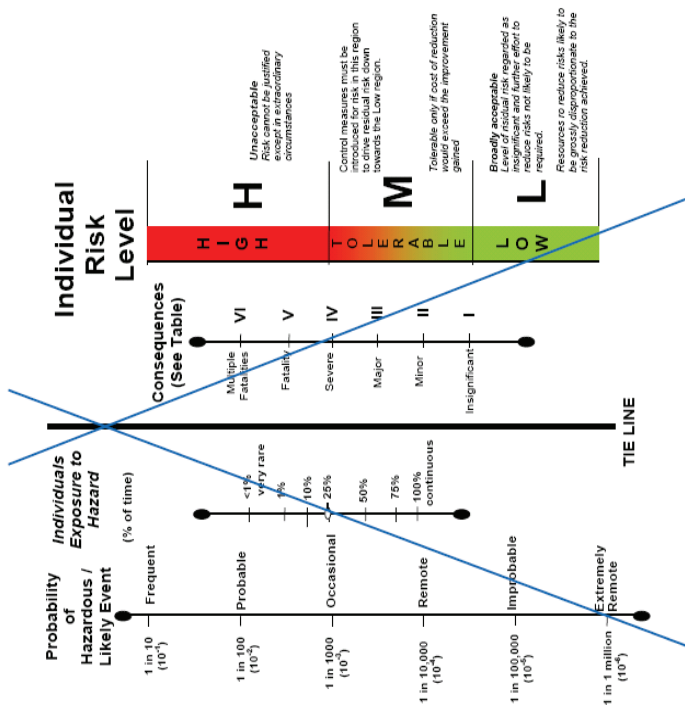
Exposure

Conservative view – considering a busy operator facing exposure to the Transmission or Distribution system for approx. 8 hours of their working day - 25% on the ALARP calculator.

Most Likely Consequence

Conservative view taken – dependent on activity and therefore the most likely outcome is considered to be one person incurring a 'severe injury'.

Consequences		
VI	Multiple Fatalities	
V	Fatality	
IV	Severe	Permanent disability / loss of sight
III	Major	Serious injury (effects reversible)
II	Minor	Injury requiring medical treatment
I	Insignificant	Bruising / First Aid injury
(Based on working week of 5 X		
Exposure to Hazard	per day	
	per week	per day
0.5%	¼ hr	10 mins
1%	1.5 hrs	20 mins
2.5%	3 ¾ hrs	45 mins
5%	8 hrs	1 ½ hrs
7.5%	12 hrs	2 ½ hrs
10%	16 hrs	3 hrs
15%	24 hrs	5 hrs
20%	32 hrs	6.5 hrs
25%	40 hrs	8 hrs
50%	80 hrs	16 hrs
75%	120 hrs	24
100%	160 hrs	24 hrs



These Distribution Safety Rules are written to fulfil a number of extremely important roles:

- By documenting generic safe systems of work, these rules, in conjunction with approved procedures produced following risk assessments by the Company, fulfil a variety of legal obligations placed on the Company by legislation such as the Health and Safety at Work (etc) Act 1974 and the Management of Health and Safety at Work Regulations 1999;
- They provide a common framework that allows co-operation and safe movement of staff and contractors throughout the country;
- They allow best practicable safety standards to be known and shared throughout the industry; and
- Most importantly, they provide guidance to staff and contractors working in the industry to ensure that they are able to work safely and reduce the risk of serious injury to themselves and their colleagues.

These rules supercede the Fourth Edition reprinted January 2005.

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DISTRIBUTION SAFETY RULES

2015 EDITION

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POLICY

P1 The design of **The Companys'** systems and associated plant and apparatus for the distribution of electrical energy, at voltages up to and including 132 kV, is such that they 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 related documents and procedures to be applied so as to ensure the health and safety of all who are liable to be affected by any danger that might 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 two-fold:

- (i) inherent dangers from distribution systems, plant and apparatus, which are covered by the Distribution Safety Rules; and
- (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 Distribution Safety Rules.)

P2 In the implementation of the Distribution 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 the 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 (ii) above where such dangers are not already specifically covered in these Distribution Safety Rules or associated Approved Procedures or Codes of Practice.

P3 It is Company policy that the persons in charge of the various stages of the work or activity **Shall** have the appropriate competence and written authority and **Shall** understand the Distribution Safety Rules, related documents and procedures, the methods of work and any local instructions. Such persons **Shall** understand the dangers that might arise and the precautions to be taken over the whole period of the work or activity. Company 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 also Company policy that the relevant legal requirements, the Distribution Safety Rules and other required health and safety precautions are observed at all times.

DISTRIBUTION SAFETY RULES

SECTION 1

GENERAL PROVISIONS

1.1 SCOPE AND APPLICATION OF THE DISTRIBUTION SAFETY RULES

These Distribution Safety Rules apply to distribution and transmission **Systems** up to and including 132 kV and to 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.

*1.2 OTHER SAFETY RULES, RELATED DOCUMENTS AND PROCEDURES

In addition, or as an alternative, to the application of these Distribution 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 Distribution Safety Rules are not, in themselves, individual Distribution 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 Distribution 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 Transmission and/ or Distribution **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 Distribution Safety Rules and related documents and procedures **Shall** be used as a guide to safe working.

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 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.

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 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 REPORTING OF ACCIDENTS AND DANGEROUS OCCURRENCES**

Persons **Shall** comply with any **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 High Voltage 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 **Low Voltage Systems** or associated **Plant** or **Apparatus**, these **Shall** be reported immediately in accordance with **Approved** procedures.

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.

***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.

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.

SECTION 2

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.6 DISTRIBUTION CONTROL ENGINEER

In the case of a centrally controlled **System** the **Control Engineer** at **The Company's** Control Centre; in the case of a locally controlled **System** the engineer specifically deputed to exercise the function of control of such a **System**.

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

*D.19 CAUTION NOTICE

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

*D.20 DANGER NOTICE

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

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**.

SAFETY DISTANCE AND WORKING AND ACCESS CLEARANCE

D.23 SAFETY DISTANCE

The distance from the nearest **High Voltage** exposed **Conductor** not **Earthed** or from an insulator

supporting a **High Voltage Conductor**, which must be maintained to avoid **Danger**. (See Diagram 1 in Rule 4.4.1.).

D.24 WORKING AND ACCESS CLEARANCE

The distance to be maintained from the nearest **Live** exposed **High Voltage Conductor** as specified in these Safety Rules to ensure observance of the **Safety Distance** in work on **Systems**.

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.

(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 to work on and the work which is to be carried out.

(iii) **SANCTION-FOR-TEST**

A **Safety Document** of a format indicated in these Safety Rules specifying the **High Voltage Apparatus** which has been made safe for the testing described in the **Safety Document** to proceed and the conditions under which the testing is carried out.

NB Model **Safety Documents** are reproduced in Appendices A, B and C.

D.26 SAFETY LOCK

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

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.28 SWITCHING

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

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.

D.33 SHALL

Where '**Shall**' is used in these Distribution Safety Rules with no qualification, this indicates a mandatory requirement with no discretion permitted and no judgement to be made. This can be qualified by:

'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 the 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.

'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 one hand and the cost, time and trouble, or effort necessary for averting the risk on the other hand.

D.34 GENERAL SAFETY

The control and management of risks posed by hazards in the working environment which are not covered by the Distribution Safety Rules.

SECTION 3

GENERAL PRECAUTIONS

3 GENERAL SAFETY

In addition to all other requirements specified in these Distribution 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.

***3.1 ACCESS TO AND WORK IN OPERATIONAL PREMISES, UNDERGROUND CHAMBERS, CONFINED SPACES AND VESSELS CONTAINING OIL OR OTHER FLAMMABLE OR TOXIC SUBSTANCES**

3.1.1 No person **Shall**, without proper authority, enter or have access to any operational premises such as any control room, substation, switching station or underground chamber belonging to, or wholly under the control of **The Company**.

*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.

*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**.

3.2 ACCESS TO AND WORK IN FIRE PROTECTED AREAS

***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;
- *(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 the appropriate **Safety Distances** specified in Rule 4.4 **Shall** be maintained. 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.

***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.

***3.3 CLIMBING OF POLES, TOWERS AND HIGH STRUCTURES**

- *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.

*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. 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.

*3.3.3 Gates and devices to prevent climbing of towers and gantries supporting **High Voltage Conductors** **Shall** always be kept secured in an **Approved** manner and access **Shall** be controlled by an **Authorised Person** or **Competent Person** in receipt of an appropriate **Safety Document**.

***3.4 ACCESS TO HIGH VOLTAGE APPARATUS AND CONDUCTORS**

***3.4.1 HIGH VOLTAGE STRUCTURES AND OUTDOOR COMPOUNDS**

Guards on access ladders, and barriers, or doors or gates on or in outdoor compounds preventing access to **Live High Voltage Conductors** **Shall** be kept secured in an **Approved** manner and access **Shall** be in accordance with **Approved** procedures.

***3.4.2 HIGH VOLTAGE CHAMBERS, CUBICLES AND CELLS**

Barriers, doors or gates preventing access to totally enclosed chambers, cubicles and cells containing **Live High Voltage Conductors** **Shall** where the facility exists be kept locked or otherwise secured and the keys **Shall** be accessible only to an **Authorised Person**.

***3.4.3 SPOUT SHUTTERS ON HIGH VOLTAGE SWITCHGEAR**

All spout shutters not required for immediate work or operation **Shall**, if the spouts are not otherwise made inaccessible, be locked shut and the keys **Shall** only be accessible to an **Authorised Person**.

***3.5 HIGH VOLTAGE SWITCHING**

***3.5.1** No **High Voltage Switching** Shall be carried out other than by an **Authorised Person** or by a **Competent Person** acting under the **Personal Supervision** of the **Authorised Person**. No such **Switching** Shall be carried out without the authority of the appropriate **Control Engineer**, except in cases of emergency, or other **Approved** cases, which may include **Switching** by remote control by a **Control Engineer**.

***3.5.2** When a **Control Engineer** gives authority for **High Voltage Switching** to be carried out they **Shall** communicate directly with the **Person** who is to carry out the **Switching**. Where, for special reasons, direct communication is not possible, an **Approved** procedure **Shall** be followed. Unless the person who is to carry out the **High Voltage Switching** is using a prepared and checked **Switching** schedule, then they **Shall** write down the instruction and read it back to the **Control Engineer** before undertaking the **Switching** operation.

3.5.3 Before any **High Voltage Switching** is carried out on any **System** which may affect another **System**, the **Control Engineer** authorising the **Switching** **Shall** communicate with the **Control Engineer** of the other **System** and the **Switching** **Shall** be agreed between them and recorded by all **Control Engineers** concerned.

3.5.4 Where **High Voltage Switching** is to be carried out for the purpose of issuing a **Safety Document** and there are two or more control functions involved then, in the absence of a standing agreement for such matters, the **Control Engineers** concerned **Shall** agree on the person who **Shall** be in control of the part of the **System** in the **Isolated** state and who **Shall** be responsible for giving consent to the issuing of a **Safety Document**. Such agreement between the **Control Engineers** **Shall** be recorded by each **Control Engineer**.

***3.5.5** Where there are special requirements to be complied with before, during or after **High Voltage Switching** operations, **Approved** procedures **Shall** apply and special provision **Shall** be made to ensure that the **Control Engineers**, the operators and others affected are aware of their responsibilities.

3.5.6 **High Voltage Switching** with the **Control Engineer's** authority **Shall** be carried out without unnecessary delay. Completed switching operations **Shall** be confirmed to the **Control Engineer** as agreed and without unnecessary delay.

Emergency **Switching** (in accordance with Rule 3.5.1) **Shall** be reported to the **Control Engineer** without unnecessary delay. The circumstances necessitating such **Switching** **Shall** be explained at that time.

*3.5.7 All switchgear **Shall**, so far as reasonably practicable, be operated in accordance with the following hierarchy:

- (i) Remotely via remote control facilities;
- (ii) Remotely on site via control panels in a different room to the switchgear being operated;
- (iii) Remotely via a control panel in the same room as the switchgear being operated;
- (iv) Remotely via an **Approved** umbilical device or similar; or
- (v) Via the operating facilities on the switchgear.

Switchgear (including associated equipment) which is to be operated locally on site **Shall** be visually inspected immediately before any **Switching** operation to check its condition is satisfactory. The Switch to be operated **Shall** be visually checked to ensure that it is in the expected position prior to operating.

Following the intended operation, switchgear **Shall** be visually checked to ensure the anticipated position has been achieved and it has operated fully and correctly.

When switchgear shows any signs of distress, its condition **Shall** be reported immediately to the **Control Engineer** and it **Shall** be examined before a decision is made about further operation.

*3.5.8 When operating switchgear mounted on a pole or other structure from ground level, the operator **Shall** wear **Approved** insulating gloves and/or use such other equipment as may be **Approved**.

3.5.9 It is forbidden to undertake **Switching** by signal or pre-arranged understanding after an agreed interval of time.

3.6 RECORDS

3.6.1 MESSAGES

Messages by telephone or otherwise, relating to the operation of any **High Voltage System**, **Shall** be written down, unless a prepared and checked **Switching** schedule is being used. Every such message **Shall** be read back to the sender to ensure that it has been accurately received.

*3.6.2 RECORDING OF SWITCHING

The **Control Engineer** **Shall** ensure that a record is made of the time and particulars of all **High Voltage Switching** including any carried out by the **Control Engineer** by remote control.

*3.7 FAILURE OF SUPPLY

A failure of supply, from whatever cause, to or from any part of the **High Voltage System** **Shall** be immediately reported to the **Control Engineer**. During failures of supply all **Apparatus** and **Conductors** **Shall** be regarded as being **Live** unless **Isolated** and proved **Dead** by **Approved** means.

*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.

*3.9 EXCAVATION NEAR LIVE CABLES

All damaged cables or cables 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**.

***3.10 USE OF MOBILE PLANT AND EQUIPMENT NEAR OVERHEAD LINES**

When **The Company** or its Contractors are working adjacent to overhead lines with mobile **plant** and equipment which is capable of reaching within the **Safety Distance** of a **Live High Voltage Conductor**, or touching a **Live LV Conductor** the work **Shall** be done in accordance with an **Approved** procedure.

SECTION 4

SAFETY PRECAUTIONS FOR WORK ON OR NEAR HIGH VOLTAGE SYSTEMS

4.1 GENERAL REQUIREMENTS

All **High Voltage Apparatus** and **Conductors**, including those that are damaged or have faulted, **Shall** be treated as **Live** unless they have been made safe in accordance with Rule 4.1.1.

*4.1.1 Subject to the exceptions stated below and those expressly permitted by individual Rules, no person **Shall** undertake any repair, maintenance, cleaning, alteration or such work, on or within the **Safety Distance** of an exposed **Conductor** or on any part of a **High Voltage System** unless such parts of the **System** are:

- (a) **Dead**;
- (b) **Isolated** and all practicable steps taken to lock off from all points of supply, including voltage and auxiliary transformers, common neutral earthing equipment and other sources from which the **Apparatus** and **Conductors** may become **Live**, and **Caution Notices** fixed at all points of isolation;
- *(c) connected to **Earth** by **Approved** means at all points of disconnection of **High Voltage** supply from the **System** or between such points and the point(s) of work;
- (d) screened where necessary to prevent **Danger** and **Danger Notices** attached to **Apparatus** containing **Live Conductors** and attached adjacent to other **Live Conductors**;
- *(e) identified at the point of work by **Approved** means; and
- *(f) released for work and the measures taken under this rule are formally communicated to the **Working Party**, using an **Approved** Procedure which involves the issue of appropriate **Safety Documents** which **Shall** not be issued unless the issuer and the recipient are fully conversant with the precise parts of the **Systems**,

Apparatus and **Conductors** to be worked upon, the nature and also the extent of the work to be done and the safety precautions to be taken.

It is the duty of the **Person** issuing the appropriate **Safety Document** to ensure compliance with the foregoing provisions in the correct sequence.

EXCEPTIONS

- *(i) Work such as cleaning and painting of **Earthed** metal enclosures, connections or disconnections of circuits to or from **Live High Voltage Systems**, **Live** line testing and **Live** insulator washing may be carried out but only in accordance with **Approved** procedures;
- *(ii) **High Voltage Live Line Work** on **High Voltage** overhead lines may be carried out but only in accordance with Section 6 of these rules;
- *(iii) Where the design of **Apparatus** precludes strict compliance with all the requirements of Rule 4.1.1 the work **Shall** be carried out in accordance with an **Approved** procedure or to the special instructions of a **Senior Authorised Person**, and after agreement with the **Control Engineer**, to ensure that safety is achieved in another way. Such work **Shall** be carried out under the **Personal Supervision** of a **Senior Authorised Person**;
- (iv) Where work will proceed at a single point on an overhead line, and where that work will not interfere with the continuity of the **Conductors**, one **Circuit Main Earth** applied at the point of work is acceptable; and
- (v) Where work is carried out on an overhead **System** and where it is not reasonably practicable to isolate all connected consumers in accordance with rule 4.1.1(b), an **Additional Earth** **Shall** be provided and maintained between that consumer and the point of work unless a **Circuit Main Earth** is provided in that position.

4.2 ISOLATION OF APPARATUS AND CONDUCTORS

4.2.1 No isolation or reconnection of **High Voltage Apparatus** or **Conductors** **Shall** be initiated except with the sanction of the **Control Engineer**.

4.2.2 SAFETY LOCKS

- *(a) Where a locking facility exists **Safety Locks** **Shall** be used to lock open all switchgear at points where the circuit on which work is to be carried out could be energised. The keys for such locks **Shall** be kept in a **Key Safe**, if provided, in the possession of a **Senior Authorised Person** or in accordance with an **Approved** procedure.
- *(b) Details of the isolation referred to in Rule 4.2.1 and deposit of **Safety Lock** keys associated with the isolation, **Shall** be recorded at centres specified in **Approved** procedures.

*4.2.3 FUSES OR LINKS

When the circuit on which work is to be carried out is controlled only by fuses or links, the fuses, links (and carriers) **Shall** be removed and kept in a safe place which may include custody by the **Person** responsible for issuing the **Safety Document**. Where such removal is not practicable, **Approved** procedures to ensure safety **Shall** be followed.

4.2.4 CAUTION NOTICES

Caution Notices **Shall** be fixed at all points of isolation and secured with a **Safety Lock** where reasonably practicable.

4.3 EARTHING

*4.3.1 When **High Voltage Apparatus** and **Conductors** are to be discharged and **Earthed** in accordance with Rule 4.1.1(c) it **Shall** be done:

- *(a) where reasonably practicable by the use of a circuit breaker or earthing switch provided for the purpose to make the earthing connection. When the circuit breaker is used, the trip feature **Shall** normally be rendered inoperative before closing, unless this is not practicable when it **Shall** be done afterwards. After

closing, the circuit breaker or earthing switch **Shall** be locked in the **Earthed** position, so that it remains inoperative while it is the **Circuit Main Earth**; or

- *(b) where (a) is not reasonably practicable or not applicable, the **High Voltage Apparatus** and **Conductors** **Shall** be checked by means of an **Approved** voltage testing device or other **Approved** means to verify that they are not **Live**, and may then be discharged and **Earthed** by an earthing lead applied by means of an **Approved** earthing pole or other **Approved** appliance.
- *(c) in addition to the requirements in sections (a) and (b) above the first **Earth** applied to, and the last earth removed from a circuit **Shall** where reasonably practicable be achieved utilising a circuit breaker or earthing switch provided for that purpose. It is not normally considered reasonably practicable to disrupt electricity supplies in order to meet these requirements.

*4.3.2 EARTHING LEADS AND CONNECTIONS

Earthing leads and associated clamps **Shall** be of **Approved** type and of adequate capacity for the duty at the point of application. They **Shall** be adequately maintained and always examined immediately prior to use.

4.3.3 PROCEDURE FOR THE USE OF EARTHING LEADS

Subject to Rule 4.3.1 the general procedure to be followed when using earthing leads **Shall** be as follows:

- *(a) the circuit **Shall** be verified that it is not **Live** and, where practicable, checked by means of an **Approved** voltage testing device or other **Approved** means;
- *(b) earthing leads **Shall** be connected to **Earth** before being connected to the phase **Conductors**. They **Shall** only be connected to the phases by means of an **Approved** earthing pole or other **Approved** appliance. Care **Shall** be taken to ensure that good contact is made and that earthing leads are clearly visible;
- (c) all phases **Shall** be **Earthed**, even if work is to be carried out only on one phase;

- *(d) earthing leads **Shall** not be applied in any cell or compartment in which there is any exposed metal **Live** at **High Voltage** which may be a source of **Danger**. Earthing leads **Shall** be applied in such a manner that they remain clearly visible so far as reasonably practicable;
- *(e) when earthing leads are being removed each one **Shall** be disconnected from its phase **Conductor** by means of an **Approved** earthing pole or other **Approved** appliance before it is removed from its **Earth** connection; and
- *(f) for the purpose of earthing on spout contacts of metal-enclosed switchgear, only **Approved** appliances **Shall** be used. The insertion of the hand or any tool into contact spouts for this purpose is forbidden.

4.3.4 CIRCUIT MAIN EARTHS

- *(a) Operation
No **High Voltage** earthing switch **Shall** be operated or **Circuit Main Earth** connected or disconnected except with the consent of the **Control Engineer** (or under the terms of a **Sanction-for-Test** or under 5.1.2 or 5.5.4(i)).
Where a locking facility exists, **Circuit Main Earths** **Shall** be secured by an **Approved** lock.
- (b) Recording of **CIRCUIT MAIN EARTHS**
Completed earthing operations **Shall** be confirmed to the **Control Engineer** as agreed and without unnecessary delay. The location of each **Circuit Main Earth** **Shall** be recorded on the **Safety Document**.
- *(c) The **Control Engineer** **Shall** record in their log the time of application and the location of each **Circuit Main Earth** connection and the time of its removal except under the terms of a **Sanction-for-Test**.

4.3.5 ADDITIONAL EARTHS

- *(a) **Additional Earths** applied after the issue of a **Permit-to-Work** or **Sanction-for-Test** may only be attached or removed by the recipient of the **Safety Document** or a **Competent Person** under their **Personal Supervision**.

- *(b) Where work is carried out on an overhead **System** and where it is not reasonably practicable to isolate all connected consumers in accordance with rule 4.1.1(b), an **Additional Earth Shall** be provided and maintained between that consumer and the point of work unless a **Circuit Main Earth** is provided in that position.
- *(c) When the recipient of a **Permit-to-Work** clears and returns the **Permit-to-Work** to a **Senior Authorised Person** the recipient clearing the **Permit-to-Work Shall** ensure that the **Senior Authorised Person** is aware of the position of any **Additional Earths** that have not been removed.

4.4 APPROACH TO EXPOSED LIVE HIGH VOLTAGE CONDUCTORS OR INSULATORS SUPPORTING THEM

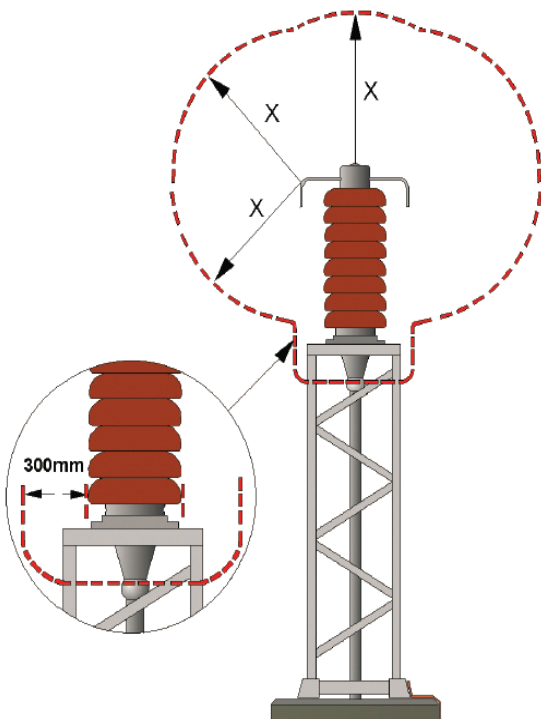
***4.4.1 SAFETY DISTANCES**

- (a) The **Safety Distances** (designated 'X' in Table 1 and Diagram 1 below) **Shall** be maintained at the respective **System** voltages between any part of the person or object and the nearest exposed **Live High Voltage Conductor**.
- (b) A distance of 300mm **Shall** also be maintained, at all **System** voltages, from the portion of insulators supporting **Live High Voltage Conductors** which is outside the appropriate **Safety Distance** from the **Conductors**.

Table 1 - Safety Distances

Nominal System Voltage			Safety Distance 'X'	
Up to and including			33kV	0.8m
Exceeding 33kV	but not exceeding	66kV	66kV	1.0m
Exceeding 66kV	but not exceeding	132kV	132kV	1.4m
Exceeding 132kV	but not exceeding	275kV	275kV	2.4m
Exceeding 275kV	but not exceeding	400kV	400kV	3.1m

**SAFETY DISTANCE 'X'
(FROM LIVE HIGH VOLTAGE CONDUCTORS)**



4.4.2 APPROACH OF PERSONS

- (a) Subject to the provisions of Rule 4.4.2(b), and 4.4.2 (c), no person **Shall** allow any part of their body to approach exposed **High Voltage Conductors**, or insulators supporting such **Conductors**, within the **Safety Distances** specified in Rule 4.4.1 unless the **Conductors** have been made safe for work and a **Safety Document** issued as required by Rule 4.1.1.
- *(b) When a **Person** is applying an **Approved** voltage testing device to **High Voltage Conductors** contained within the open spouts of metal-enclosed switchgear, it is allowable for those parts of the body required to perform the task to approach within the **Safety Distances** specified in Rule 4.4.1 subject to **Approved** procedures. **Approved** insulating gloves **Shall** be worn.
- (c) When **High Voltage Live Line Work** is being carried out in accordance with **Approved** Hot Glove Procedures, it is allowable for the body to approach within the **Safety Distances** specified in Rule 4.4.1.

4.4.3 OBJECTS BEING HANDLED

- *(a) When exposed **High Voltage Conductors** are not **Isolated** the only objects which **Shall** be caused to approach them, or insulators supporting them, within the **Safety Distances** specified in Rule 4.4.1 **Shall** be those **Approved** for **High Voltage Live Line Work** and **Approved** voltage testing devices.
- *(b) When exposed **Conductors** are **Isolated** but not proved **Dead**, the only objects which **Shall** be caused to approach them, or insulators supporting them, within the **Safety Distances** specified in Rule 4.4.1 **Shall** be insulated devices **Approved** for **High Voltage Live Line Work** and **Approved** voltage testing devices.

4.4.4 WORKING AND ACCESS CLEARANCES

Taking account of the nature and location of the work, the hazards and the presence of persons, the **Senior Authorised Person** or the person in charge of the work as listed below, **Shall** establish **Working and Access Clearances** such as to ensure that the **Safety Distances** specified in Rule 4.4.1 are maintained both in respect of those persons present and the objects being handled.

NB Recommended **Working and Access Clearances** for the guidance of **Senior Authorised Persons** are specified in Appendix D.

The following persons may also establish **Working and Access Clearances** provided that the **Working and Access Clearances** are not less than those recommended in Appendix D.

- (a) An **Authorised Person** responsible for the **Personal Supervision of Live Line Work**;
- (b) An **Authorised Person** with authority to issue **Limitation of Access** documents; or
- (c) A **Competent Person** when responsible for the **Personal Supervision** of work in accordance with Rule 5.10.5.2.

***4.5 WORK IN SUBSTATIONS AND SWITCHING STATIONS CONTAINING EXPOSED LIVE HIGH VOLTAGE CONDUCTORS**

4.5.1 WORK AREA

- *(a) When work is to be carried out in a substation or switching station in which there are exposed **Live High Voltage Conductors**, the work area **Shall** be properly identified by a **Senior Authorised Person**. The work area **Shall** then be defined as far as possible by the use of **Approved** barriers, chains or by other **Approved** means. These **Shall** be so arranged that the specified **Working and Access Clearances**, from the nearest exposed **Live Conductor** or supporting insulator to ground level or platform or access way which may be required to be used, are established.
- (b) The work area to be defined at ground level **Shall** only be that in which the work is to be carried out.
- *(c) If the work cannot be carried out without leaving ground level or a platform or access way, the **Working and Access Clearances Shall** also be obtained from the nearest exposed **Live High Voltage Conductor** to the points from which work is actually carried out. In such cases access **Shall** only be by means of an

Approved ladder or other **Approved** means in accordance with Rules 4.5.4 and 4.5.5. The climbing of structures to gain access is forbidden. In the case of terminal poles, or towers in substations, access **Shall** be in accordance with an **Approved** procedure.

- (d) If the work is such that the specified **Working and Access Clearances** are not sufficient to avoid **Danger** other suitable arrangements **Shall** be made.
- (e) The **Approved** barriers or chains **Shall** be clearly visible and **Shall** not be supported by any structure carrying electrical **Apparatus** or **Conductors** and **Shall** not carry any notice. At ground level the section so defined **Shall** be clearly distinguished in accordance with an **Approved** procedure. **Danger Notices** **Shall** be attached to adjoining **Apparatus** containing **Live Conductors** or adjacent **Conductor** supports at the limits of the work area.

*4.5.2 ACCESS TO THE WORK AREA

Where necessary to prevent **Danger** the access and egress ways to and from the work area **Shall** be clearly defined in an **Approved** manner.

4.5.3 WORKING AND ACCESS CLEARANCES

The **Working and Access Clearances** required at the work area under Rule 4.5.1 **Shall** be as specified in Rule 4.4.4. (See also Appendix D – Diagram 4.)

4.5.4 USE OF PORTABLE LADDERS AND LONG OBJECTS WHERE THERE ARE EXPOSED LIVE CONDUCTORS

- *(a) Portable ladders **Shall** be of **Approved** type and of no greater length than is required for the work involved.
- *(b) Portable ladders and other long objects **Shall** not be used without the permission of a **Senior Authorised Person**, who **Shall** define the conditions of use to the **Authorised Person** in charge of the work. The movement and erection of such ladders and objects **Shall** then be carried out only under the **Personal Supervision** of the **Authorised Person** in charge of the work, and when moved at ground level they **Shall** be carried only in a horizontal position and as near to the ground as reasonably practicable.

- (c) Portable ladders provided to allow access to fixed ladders which terminate above ground level, and to provide access in other **Approved** cases, **Shall** be padlocked in position or otherwise secured by an **Authorised Person** while work is being carried out.
- (d) All portable ladders within substations or switching stations **Shall** be securely locked to a suitable anchorage when not in use.

*4.5.5 USE OF CRANES, SCAFFOLDS, MOBILE ELEVATED WORK PLATFORMS AND OTHER EQUIPMENT

- (a) When cranes, scaffolds, Mobile Elevated Work Platforms and other equipment and materials transported by vehicles or otherwise are taken into or out of a substation the route to be followed **Shall** be agreed by a **Senior Authorised Person**. The cranes or other equipment **Shall** be connected to the substation **Earth System** as soon as reasonably practicable.
- (b) The limits of operation of such equipment **Shall** be defined by a **Senior Authorised Person** to an **Authorised Person** who **Shall** be in charge of the work and thereafter the equipment **Shall** be erected or moved only within these limits under the **Personal Supervision** of the **Authorised Person**.

4.5.6 DANGER NOTICES, BARRIERS AND SCREENS

Danger Notices, barriers and screens **Shall** be fixed or moved only by, or under the **Personal Supervision** of a **Senior Authorised Person**.

*4.5.7 ADVERSE WEATHER CONDITIONS

In the event or near approach of a lightning storm, work on exposed **Conductors** in outdoor substations or outdoor switching stations, or on **Apparatus** directly connected to exposed **Conductors**, **Shall** cease immediately where necessary to prevent **Danger** and the **Control Engineer** **Shall** be informed.

***4.6 PERMITS-TO-WORK**

4.6.1 AUTHORITY FOR ISSUE

- (a) A **Permit-to-Work** **Shall** be issued by a **Senior Authorised Person** before any work is carried out on any **Apparatus** or **Conductor**.
- (b) **Permits-to-Work** **Shall** only be issued with the authority of the **Control Engineer**, who **Shall** maintain a written or electronic record of the issue and cancellation of each **Permit-to-Work**.

4.6.2 PROCEDURE FOR ISSUE AND RECEIPT

- (a) A **Permit-to-Work** **Shall** be explained and issued to the **Person** in direct charge of the work, who after reading its contents and confirming that they understand it, and are conversant with the nature and extent of the work to be done, **Shall** sign its receipt and its duplicate. The recipient **Shall** confirm their understanding by explaining the safe working area, the work to be carried out, and precautions required. The recipient **Shall** also ensure that the **Permit-To-Work** is effectively explained to the other members of the **Working Party** in accordance with an **Approved** procedure.
- (b) The recipient of a **Permit-to-Work** **Shall** be a **Competent Person** who **Shall** retain the **Permit-to-Work** in their possession at all times whilst work is being carried out.
- *(c) Where more than one **Working Party** is involved a **Permit-to-Work** **Shall** be issued to the **Competent Person** in direct charge of each **Working Party** and these **Shall**, where necessary, be cross-referenced one with another.

4.6.3 PROCEDURE FOR CLEARANCE AND CANCELLATION

- (a) A **Permit-to-Work** **Shall** be cleared and cancelled:
 - (i) when work on the **Apparatus** or **Conductor** for which it was issued has been completed;
 - (ii) when it is necessary to issue a **Sanction-for-Test** in which case all **Permits-to-Work** that are associated with the **Apparatus** and **Conductors** to be tested

Shall be cleared and cancelled or cleared and suspended in accordance with rule 4.6.4;

- (iii) when it is necessary to change the **Person** in charge of the work detailed on the **Permit-to-Work**; unless the document is transferred in accordance with rule 4.6.5; or
 - (iv) at the discretion of a **Senior Authorised Person** when it is necessary to interrupt or suspend the work detailed on the **Permit-to-Work**.
- *(b) The recipient **Shall** sign the clearance and return the **Permit-to-Work** to a **Senior Authorised Person** who **Shall** cancel it and inform the **Control Engineer**. In all cases the recipient **Shall** indicate in the clearance section whether **Additional Earths** have been "removed" or "accounted for", whether the work is "complete" or "incomplete" and that all gear and tools "have" or "have not" been removed.
- (c) Where more than one **Permit-to-Work** has been issued for work on **High Voltage Apparatus** or **Conductors** associated with the same **Circuit Main Earths**, the **Control Engineer** **Shall** ensure that all such **Permits-to-Work** have been cancelled before the **Circuit Main Earths** are removed.

*4.6.4 PROCEDURE FOR TEMPORARY WITHDRAWAL OR SUSPENSION

Where there is a requirement for a **Permit-to-Work** to be temporarily withdrawn or suspended this **Shall** be in accordance with an **Approved** procedure.

*4.6.5 PROCEDURE FOR TRANSFER

Where there is a requirement for a **Permit-to-Work** to be transferred between appropriately **Competent Persons** this **Shall** be done in accordance with an **Approved** procedure.

*4.6.6 MINOR TESTING UNDER A PERMIT-TO-WORK

Where there is a requirement for minor testing under a **Permit-to-Work**, this **Shall** be in accordance with an **Approved** Procedure.

*4.7 SANCTIONS-FOR-TEST

4.7.1 AUTHORITY FOR ISSUE

- (a) A **Sanction-for-Test Shall** be issued by the **Senior Authorised Person** initiating the testing under these Safety Rules before any testing is carried out on any **Apparatus** or **Conductor**.
- (b) A **Sanction-for-Test Shall** only be issued with the authority of the **Control Engineer**, who **Shall** maintain a written or electronic record of the issue and cancellation of each **Sanction-for-Test**.

4.7.2 PROCEDURE FOR ISSUE AND RECEIPT

- (a) A **Sanction-for-Test Shall** be explained and issued to the **Authorised Person** in direct charge of the testing, who after reading its contents and confirming that they understand it, and are conversant with the nature and extent of the testing to be done, **Shall** sign its receipt and its duplicate. The recipient **Shall** confirm their understanding by explaining the **Apparatus** to be tested, the testing to be carried out, and precautions required. The recipient **Shall** also ensure that the **Sanction-for-Test** is effectively explained to the other members of the testing party in accordance with an **Approved** procedure.
- (b) The recipient of a **Sanction-for-Test Shall** be an **Authorised Person** who **Shall** retain the **Sanction-for-Test** in their possession at all times whilst tests are being done.

*4.7.3PROCEDURE FOR CLEARANCES AND CANCELLATIONS

When testing on **Apparatus** for which a **Sanction-for-Test** has been issued is suspended or completed the recipient **Shall** sign the clearance and return the **Sanction-for-Test** to a **Senior Authorised Person** who **Shall** cancel it and inform the **Control Engineer**.

*4.7.4PROCEDURE FOR TEMPORARY WITHDRAWAL OR SUSPENSION

Where there is a requirement for a **Sanction-for-Test** to be temporarily withdrawn or suspended this **Shall** be in accordance with an **Approved** procedure.

*4.7.5 MINOR WORK UNDER A SANCTION-FOR-TEST

Where there is a requirement for minor work under a **Sanction-for-Test**, this **Shall** be in accordance with an **Approved** Procedure.

*4.8 LIMITATIONS-OF-ACCESS

4.8.1 AUTHORITY FOR ISSUE

- (a) A **Limitation-of-Access** **Shall** be issued by a **Senior Authorised Person** or an **Authorised Person** specially authorised to do so when it is considered necessary to have written instructions to avoid **Danger** and when a **Permit-to-Work** or a **Sanction-for-Test** is not applicable.
- *(b) In particular, a **Limitation-of-Access** may be issued for the following types of activity when there is **Danger**:
 - (i) work in proximity to, but outside the **Working and Access Clearance** from, exposed **Live High Voltage Conductors**;
 - (ii) work on **Plant** operated by or containing compressed air or other gases; or
 - *(iii) such other access or work as specified by an **Approved** procedure.

4.8.2 PROCEDURE FOR ISSUE AND RECEIPT

- (a) A **Limitation-of-Access** **Shall** be explained and issued to the person in direct charge of the work who after reading its contents and confirming that they understand it, and are conversant with the nature and extent of the work to be done, **Shall** sign its receipt and its duplicate. The recipient **Shall** confirm their understanding by explaining the work to be carried out, and precautions required. The recipient **Shall** also ensure that the **Limitation-of-Access** is effectively explained to the other members of the **Working Party** in accordance with an **Approved** procedure.
- (b) The recipient of a **Limitation-of-Access** **Shall** be a **Competent Person** who **Shall** retain the **Limitation-of-Access** in their possession at all times whilst work is being carried out.

- (c) Where more than one **Working Party** is involved, a **Limitation-of-Access** **Shall** be issued to the **Competent Person** in direct charge of each **Working Party**.

4.8.3 PROCEDURE FOR CLEARANCE AND CANCELLATION

A **Limitation-of-Access** **Shall** be cancelled by the recipient signing the clearance and then returning the **Limitation-of-Access** for cancellation to a **Senior Authorised Person** or **Authorised Person** specially authorised to do so.

SECTION 5

PROCEDURES FOR WORK ON PARTICULAR ITEMS OF PLANT, APPARATUS OR CONDUCTORS

5.1 GENERAL PRECAUTIONS

5.1.1 The safety precautions detailed in Section 4 for work on or near **High Voltage Systems** Shall apply.

*5.1.2 ZONE OF WORK

When, in order to work on particular items of **Plant, Apparatus** or **Conductors**, a section of the **System** larger than the zone of work is **Isolated** and **Earthed** (as, for example, in the case of work on ring main units) the Safety Rules specified in Section 5 relating to isolation and earthing and the requirements for **Personal Supervision** by the **Senior Authorised Person**, for such work may be waived in **Approved** circumstances provided that:

- (a) before the waiver the normal requirements of Rule 4.1.1 are applied in full;
- (b) all **High Voltage Apparatus** and **Conductors** within the zone of work are connected to the **Circuit Main Earths** at the time when the specified **Apparatus** or **Conductors** are released for work or testing by the issue of a **Safety Document**; and
- *(c) an **Approved** procedure applies.

In these circumstances, the recipient of the **Safety Document** may, in the course of work or testing, disconnect from the **Circuit Main Earths** as required any **Apparatus** or **Conductors** within the zone of work.

The **Senior Authorised Person** Shall, at the time of issue of the **Safety Document**, demonstrate to the recipient by **Approved** means that the **Apparatus** or **Conductors** are **Dead**.

The **Apparatus** and **Conductors** Shall be reconnected to the **Circuit Main Earths** before the **Safety Document** is cleared, unless they have been permanently removed from the **System**.

Precautions **Shall** be taken to avoid **Danger** from potential differences arising from remote **Earth** points, by bonding and earthing **Conductors** in an **Approved** manner at a point as near as possible to the point of work.

5.2 REMOTELY AND AUTOMATICALLY CONTROLLED EQUIPMENT

Before work is carried out on remotely or automatically controlled equipment such as circuit breakers, isolators, tap changing gear or air compressors, all remote control and automatic features **Shall** first be rendered inoperative and, where the facility exists, locked off and **Caution Notices** posted. Whilst such work is in progress no work **Shall** be carried out on the controlling equipment and associated wiring or relays, except by an **Authorised Person** or **Competent Person** acting under their **Personal Supervision**. In this case the **Control Engineer** **Shall** be informed but no work of this kind **Shall** be carried out if it could restore the remote control or automatic features.

5.3 WITHDRAWABLE APPARATUS

5.3.1 When withdrawable **High Voltage Apparatus** has been disconnected from all supplies and removed from its normal housing, its **Conductors** **Shall** be discharged to **Earth**, but need not remain connected to **Earth**. Where a risk assessment shows there is no **Danger** from stored electrical energy, it is not necessary to discharge the withdrawable **Apparatus**.

*5.3.2 All spout shutters not required to be opened for immediate work or operation **Shall** where practicable be locked shut or otherwise made inaccessible.

*5.3.3 Work, at the location, on withdrawable **High Voltage Apparatus** that has been disconnected in accordance with Rule 5.3.1 **Shall** be carried out under a **Limitation-of-Access**.

5.4 BUSBAR SPOUTS, BUSBARS AND BUSBAR CONNECTIONS OF MULTI-PANEL SWITCHBOARDS

5.4.1 ISOLATION

When work is to be carried out on busbar spouts, busbars and busbar connections, all of the following isolation procedures **Shall** be carried out:

- (a) the section of the busbars on which work is to be carried out **Shall** be **Isolated** from all points of supply from which it can be made **Live**;
- (b) the isolating arrangements **Shall** be locked so that they cannot be operated and, where practicable, the shutters of **Live** spouts locked shut. Where duplicate circuit breakers or switches in one tank or on-load selectors are installed, and it is not possible to isolate them from all points of supply, then all circuit breakers or switches that can be closed on to the busbars on which work is to be carried out **Shall** have their mechanisms locked in the open position and the closing mechanism **Shall** be made inoperative;
- (c) **Caution Notices Shall** be attached at all points where the busbars can be made **Live**; and
- (c) **Danger Notices Shall** be attached on or adjacent to **Apparatus** containing **Live Conductors** at the limits of the work area.

5.4.2 EARTHING

- *(a) Where practicable the section of busbar on which work is to be carried out **Shall** be checked by means of an **Approved** voltage testing device to verify that it is not **Live**. The checking with the voltage testing device **Shall** be done on the panel at which the **Circuit Main Earth** is to be applied.
- *(b) **Circuit Main Earths** of **Approved** type **Shall** be applied at a panel, other than that at which work is to be undertaken, on the **Isolated** section of busbars. The insertion of the hand or any tool into contact spouts for this purpose is forbidden.

5.4.3 A **Permit-to-Work** or **Sanction-for-Test** **Shall** be issued in accordance with Rules 4.6 and 4.7.

***5.4.4 WORK**

Before obtaining the receipt signature on the **Permit-to-Work** the **Senior Authorised Person** who is issuing the **Permit-to-Work** **Shall**, at the point of work, satisfy themselves that the recipient is aware of the location of all adjacent **Live High Voltage Apparatus** and of the safety precautions to be taken by the recipient. Immediately after the **Senior Authorised Person** has obtained the receipt signature on the **Permit-to-Work** and before any work is carried out, then:

- *(i) where work is to be carried out on busbar spouts it **Shall** be carried out under the **Personal Supervision** of the **Senior Authorised Person** who **Shall** identify the busbar spouts to be worked on and where necessary provide access by removing any locks applied to such spout shutters. They **Shall** then prove that each spout is **Dead** by means of an **Approved** voltage testing device or other **Approved** means before any work is undertaken on the spout;
- *(ii) where work is to be carried out on busbars or busbar connections the **Senior Authorised Person** **Shall** identify in an **Approved** manner where access is to be made. Access **Shall** then be made, by the removal of the appropriate cover plates, under the **Personal Supervision** of the **Senior Authorised Person** who **Shall** not leave site until they are satisfied that no further access is required to complete the work and that they have taken such action to prove, where practicable, that each busbar or busbar connection in the working area is **Dead** by means of testing with an **Approved** voltage testing device or other **Approved** means. No further access **Shall** be made to other parts of the switchboard during the course of the work.

***5.5 FEEDER SPOUTS AND CONNECTIONS, VOLTAGE TRANSFORMER SPOUTS AND CONNECTIONS AND SINGLE PANEL BUSBAR SPOUTS AND CONNECTIONS**

5.5.1 ISOLATION

When work is to be carried out on feeder and voltage transformer spouts or connections, or on the busbar spouts or connections of a single panel, the following procedures **Shall** be carried out:

- (a) the spouts or connections on which work is to be carried out **Shall** be **Isolated** from all points of supply from which they can be made **Live**;
- (b) the isolating arrangements **Shall** be locked so that they cannot be operated and the shutters of **Live** spouts **Shall** be locked shut;
- (c) **Caution Notices Shall** be attached at all points where the circuit can be made **Live**; and
- (d) **Danger Notices Shall** be attached, where applicable, on or adjacent to the **Apparatus** containing **Live Conductors** at the limits of the work area.

5.5.2 EARTHING

- *(a) Where practicable the spout contacts or connections **Shall** be checked by means of an **Approved** voltage testing device to verify that they are not **Live**.
- *(b) The circuit **Shall** be **Earthed** with **Approved** earthing equipment at the point of work and, where reasonably practicable, at all points of isolation from the supply. Any special appliances used for the purposes of earthing metal-enclosed switchgear **Shall** also be **Approved** but the insertion of the hand or any tool into contact spouts for this purpose is forbidden.
- *(c) Where the spouts are connected to an overhead line circuit a **Circuit Main Earth** or **Additional Earth Shall** be applied at a point nearest to the point of work where access to the **Conductors** can safely be obtained.

*5.5.3A **Permit-to-Work** or **Sanction-for-Test Shall** be issued in accordance with Rules 4.6 or 4.7. Where the work to be done requires removal of the **Circuit Main Earths** at the point of work the **Permit-to-Work Shall** state how this is permitted under Rule 5.5.4(i).

*5.5.4 WORK

Before obtaining the receipt signature on the **Permit-to-Work**, the **Senior Authorised Person** who is issuing the **Permit-to-Work** **Shall**, at the point of work, satisfy themselves that the recipient is aware of the location of adjacent **Live High Voltage Apparatus** and of the safety precautions to be taken by the recipient. Immediately after the **Senior Authorised Person** has obtained the receipt signature on the **Permit-to-Work**, and before any work is carried out, then:

- *(i) where the work is to be carried out on the feeder, voltage transformer or busbar spouts on a single panel unit, it **Shall** be carried out under the **Personal Supervision** of a **Senior Authorised Person** who, notwithstanding the requirements of Rule 4.3.4.(a) may, where necessary, remove the **Circuit Main Earths** at the point of work and provide access by removing any locks applied to such spout shutters. They **Shall** then prove that each spout is **Dead** by means of an **Approved** voltage testing device or other **Approved** means before any work is undertaken on the spout. On completion of the work, the **Circuit Main Earths** **Shall** be re-applied, if necessary, before the **Permit-to-Work** is cancelled. If the only earthing devices that can be applied to the circuit are those applied to the spouts and are **Circuit Main Earths** then, while the work is in progress no other work **Shall** be carried out to the circuit connected to those spouts.
- *(ii) where work is to be carried out on feeder or voltage transformer connections and single panel busbars or connections the **Senior Authorised Person** **Shall** identify in an **Approved** manner where access is to be made. Access **Shall** then be made by the removal of the appropriate cover plates under the **Personal Supervision** of the **Senior Authorised Person** who **Shall** not leave site until they are satisfied that no further access is required to complete the work and that they have taken such action to prove, where practicable, that each connection or busbar in the working area is **Dead** by means of testing with an **Approved** voltage testing device or other **Approved** means. No further access **Shall** be made to other parts of the switchboard during the course of the work.

***5.6 HIGH VOLTAGE APPARATUS AND PLANT OPERATED BY OR CONTAINING COMPRESSED AIR OR OTHER GASES OR OPERATED BY HYDRAULIC POWER**

5.6.1 COMPRESSED AIR

All of the following precautions **Shall** be taken before any work other than operating adjustments is carried out:

- (a) if the work area includes the compressor plant, then the supply to the prime mover of the compressor **Shall** be switched off and any such switch and/or control handle operating the switch locked in the off or neutral position as appropriate, and a **Caution Notice Shall** be attached at each such position;
- (b) all valves positioned between the part of the system to remain in service and the work area **Shall** be closed and locked in the closed position by **Safety Locks**, and a **Caution Notice Shall** be attached at each position. In addition, the supply to any such valve that is power operated **Shall** be rendered inoperative and where the facility exists the power supply locked in the off position;
- *(c) the compressed air in any work area **Shall** be released before work commences, and **Approved** methods **Shall** be used to ensure that the equipment or pipes concerned **Shall** remain open to atmosphere for the duration of the work; and
- *(d) all keys for **Safety Locks** fitted under the provisions of this Rule **Shall** be placed in a **Key Safe** if provided, in the possession of a **Senior Authorised Person** or in accordance with an **Approved** procedure.

***5.6.2 OPERATING ADJUSTMENTS**

Notwithstanding the requirement of Rule 5.6.1, operating adjustments on equipment operated by or containing compressed air, which require the normal air supply, may be carried out but only under the **Personal Supervision** of an **Authorised Person**.

***5.6.3 EQUIPMENT CONTAINING SF₆**

Access to or work on equipment containing SF₆ **Shall** be carried out in accordance with an **Approved** procedure.

*5.6.4 Where the additional safety precautions required for work on associated **Apparatus** are not detailed on a **Permit-to-Work**, then a **Limitation-of-Access Shall**, where necessary, be used in accordance with Rule 4.8.

5.7 TRANSFORMERS

5.7.1 ISOLATION

- *(a) When work within the terms of Rule 4.1 is to be carried out on the connections to or the windings of a transformer, the switchgear or fuse gear controlling all windings **Shall** be opened or the windings or connections **Isolated** by other **Approved** means from **Live Conductors**.
- (b) Additionally, to prevent the possibility of the transformer being made **Live** by back-feed all **Low Voltage** fuses or links on associated voltage and auxiliary transformers **Shall** be withdrawn or, the voltage and auxiliary transformers **Isolated**.
- *(c) The transformer **Shall** be **Isolated** from all common neutral earthing equipment from which it may become **Live**. Except for the isolation of transformers supplying traction loads, which **Shall** be in accordance with an **Approved** procedure, this does not require the disconnection of solidly **Earthed** neutrals or neutral equipment connected solely to the transformer on which work is to be done.
- *(d) Where work is to be carried out on a **High Voltage to Low Voltage** transformer and the **Low Voltage** windings of the transformer are controlled by a switch or isolator, the switch or isolator **Shall**, be secured open in an **Approved** manner.

In other cases arrangements **Shall** be made to ensure that the **Low Voltage** windings are **Isolated** from all sources of **Low Voltage** supply.

- *(e) Before any withdrawable voltage transformer is **Isolated** or re-connected the associated **High Voltage** connections **Shall**, where reasonably practicable, be made **Dead**. If it is suspected that a voltage transformer is faulty the associated busbars or feeder connections **Shall** be made **Dead** before it is **Isolated**.

(f) **Caution Notices Shall** be attached at all points of isolation including those of **Low Voltage**.

*(g) All keys for **Safety Locks** fitted under the provisions of this Rule **Shall** be placed in a **Key Safe** if provided, in the possession of a **Senior Authorised Person**, or in accordance with an **Approved** procedure.

*5.7.2 EARTHING

The transformer **Shall** be **Earthed** with **Approved** earthing equipment at all points of isolation from **High Voltage** supplies.

*5.7.3 Before a **Permit-to-Work** or **Sanction-for-Test** is issued the **Senior Authorised Person Shall**, so far as reasonably practicable, at the point of work, identify the transformer to be worked on.

5.7.4 A **Permit-to-Work** or **Sanction-for-Test Shall** be issued in accordance with Rules 4.6 or 4.7.

5.8 HIGH VOLTAGE STATIC CAPACITORS

5.8.1 ISOLATION

The static capacitors **Shall**, in accordance with Rule 4.1.1, be **Isolated** from all **Live Conductors**, locked off where practicable and **Caution Notices** fixed.

*5.8.2 EARTHING

After the **Circuit Main Earths** have been applied to the instructions of the **Control Engineer**, the following earthing operations **Shall** be carried out under the **Personal Supervision** of a **Senior Authorised Person** in the following sequence:

- (i) apply **Approved** capacitor earthing devices to the capacitor frames;
- (ii) apply **Approved** capacitor earthing devices to the common connections of each group of capacitors. (See Rule 5.8.4(b).)

5.8.3 A **Permit-to-Work** or **Sanction-for-Test Shall** then be issued in accordance with Rules 4.6 or 4.7.

*5.8.4WORK

- (a) **Approved Additional Earths Shall** then be applied to the capacitor units at the point of work. These **Additional Earths Shall** be applied or removed only under the **Personal Supervision** of a **Senior Authorised Person**.
- (b) Capacitor units **Shall** be short-circuited and remain short-circuited when removed from the circuit or in cases where earthing in accordance with Rule 5.8.2(ii) is impracticable.

5.9 HIGH VOLTAGE CABLES

- *5.9.1 All cables **Shall** be treated as **Live** [especially cables which are either damaged, or have exposed **Conductors**], until proved **Dead** by an **Approved** procedure. No person **Shall** touch the insulation which covers any **Conductor** subject to **High Voltage** unless the **Conductor** has been made safe in accordance with Rule 4.1.1.
- *5.9.2 Before issuing a **Permit-to-Work** for work on a **High Voltage** cable, the **Senior Authorised Person**, in addition to the procedure of Rule 4.1.1 **Shall**, by the use of **Approved** spiking procedures or other **Approved** means, at the point of work identify the cable to be worked on and then prove it **Dead**. The **Control Engineer Shall** be informed before and immediately after any cable is spiked.
- *5.9.3 Where work is to be carried out on the insulated sheath system of a **High Voltage** cable route, additional precautions to prevent **Danger** from any sheath voltages **Shall** be taken in accordance with **Approved** procedures.
- *5.9.4 Where work is to be carried out on any cable or ancillary equipment associated with a **High Voltage** cable route which may be subjected to induced voltages from other **Live** circuits in their proximity, then such work **Shall** only be carried out in accordance with **Approved** procedures. (See also Rule 8.3.2)
- 5.9.5 A **Permit-to-Work** or **Sanction-for-Test Shall** be issued in accordance with Rules 4.6 or 4.7.

***5.10 HIGH VOLTAGE OVERHEAD LINES - GENERAL**

Before issuing a **Permit-to-Work** for work on a **High Voltage** overhead line, in accordance with Rule 4.1.1, the **Conductors Shall** be bonded together and connected to **Earth**. Where **Earthed** metalwork is present, it **Shall** be bonded to the **Earthed Conductors**.

CLIMBING

No person **Shall** climb or remain on any pole, tower or structure subject to a **Safety Document** unless:

- (i) they have confirmed that the poles, towers or supports are those detailed on the **Safety Document**;
- *(ii) they have also identified the pole, tower or support by any additional means where provided e.g. circuit designation colours;
- (iii) an **Earth** is visible from ground level at the point of work. If not, then before work commences the line **Shall** be proven **Dead** and an **Additional Earth Shall** be applied; and
- (iv) they are instructed to do so by the recipient of the **Safety Document**. All instructions given by the recipient **Shall** be in the presence of the person who is accompanying the climber who **Shall** remain in visual contact for the duration of the work.

LINES IN PROXIMITY

If there are other overhead lines in proximity to the one to be worked on, the issuer and recipient of the **Safety Document Shall** ensure that the climber and the person accompanying the climber are warned of the additional **Danger**.

5.10.1 SAFE ACCESS

- *(a) 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. Unaccompanied access is allowed for **Switching** or testing when it is of limited duration and is covered by an **Approved** procedure.

- *(b) Where ladders are used they **Shall** be of an **Approved** type.
- (c) **Danger Notices**, barriers and screens **Shall** be fixed or moved only under the **Personal Supervision** of an **Authorised Person**.
- *(d) No person **Shall**, at a point more than 3.7 metres from ground level, touch any unearthed pole or structure supporting **Live High Voltage Apparatus** unless adequate precautions have been taken to prevent **Danger** from leakage currents in accordance with an **Approved** procedure.

5.10.2 USE OF CIRCUIT COLOURS, NUMBERS OR SYMBOLS

When circuit colours, numbers or symbols are used as part of the identity of a circuit the following rules **Shall** apply:

- (a) The **Senior Authorised Person** **Shall** inform and agree the circuit colours, numbers or symbols with the **Control Engineer**;
- (b) The **Senior Authorised Person** **Shall** write the circuit colours, numbers or symbols on the **Permit-to-Work**. The **Person** in charge of the work **Shall** check that they are the correct colours, numbers or symbols and initial the statement of circuit colours, numbers or symbols in the presence of the **Senior Authorised Person** issuing the **Permit-to-Work**. The **Senior Authorised Person** **Shall** provide the **Person** in Charge of the work with sufficient numbers of wristlets; and
- (c) Each person who will work on **Apparatus** for which a **Permit-to-Work** bearing circuit colours or symbols has been issued **Shall** be provided with a wristlet marked with the circuit colours or symbols and **Shall** wear it in such a manner that it will be readily visible to the user during the whole period they are engaged on the work. On conclusion of the work the wristlets **Shall** be returned to the **Senior Authorised Person**.

5.10.3 ADDITIONAL EARTHS

- *(a) When required, and before work commences on a **High Voltage** overhead line, **Additional Earths** **Shall** be applied at or as near as practicable to the points of work in accordance with an **Approved** procedure. All

Conductors Shall be bonded together and connected to **Earth**. Where **Earthed** metalwork is present it **Shall** be bonded to the **Earthed Conductors**.

- *(b) The number and position of **Additional Earths** applied after a **Permit-to-Work** is issued **Shall** normally be the responsibility of the recipient of the **Permit-to-Work**. Where special precautions have to be taken the point of application of **Additional Earths Shall** be specified by the **Senior Authorised Person** in accordance with an **Approved** method.
- *(c) Where line **Conductors** are to be disconnected **Approved** earthing devices **Shall** be applied on each side of the intended break before the **Conductors** are disconnected. Where **Conductors** are to be reconnected across an existing break, **Approved** earthing devices **Shall** be applied on each side of the break before the **Conductors** are reconnected.
- (d) **Additional Earths** may only be applied by the recipient of a **Permit-to-Work** or **Sanction-for-Test** or by a **Competent Person** under their **Personal Supervision**.
- (e) The **Additional Earths Shall** remain in position during the progress of the work and may only be removed by a **Competent Person** after all other members of the **Working Party** have descended the pole or tower on completion of the work.
- (f) When painting towers the **Additional Earths** and pennants may be removed by a **Competent Person** in sequence as work proceeds down the tower.
- (g) **Additional Earths** used by a **Working Party Shall** be issued by and **Shall** be returned to the recipient of the **Permit-to-Work** who **Shall** ascertain that all the **Additional Earths** issued have been returned, or accounted for, before the **Permit-to-Work** is cleared. When the recipient of a **Permit-to-Work** clears and returns the **Permit-to-Work** to a **Senior Authorised Person** the recipient clearing the **Permit-to-Work Shall** ensure that the **Senior Authorised Person** is aware of the position of any **Additional Earths** that have not been removed.

*5.10.4 SUSPENSION OF WORK

If a **Working Party** leaves a line at any time then, before work is restarted, the **Competent Person** in receipt of the **Permit-to-Work Shall** re-identify the line in accordance with Rule 5.11.1, **Shall** verify that all earths adjacent to the point of work are still in position and **Shall** re-instruct the **Working Party** on the work covered by the **Permit-to-Work**.

5.10.5 WORK ON OVERHEAD LINES CARRYING LIVE HIGH VOLTAGE CONDUCTORS

5.10.5.1 LIVE LINE WORK ON HIGH VOLTAGE OVERHEAD LINES

High Voltage Live Line Work, connections to or disconnections from a **High Voltage** overhead line or **Live** line testing may be carried out with the **Conductors Live**, but only in accordance with Section 6 of these Rules.

*5.10.5.2 ACCESS TO POLES OR TOWERS BY A COMPETENT PERSON

General access below any **Conductor** may be permitted to a **Competent Person** on any pole or tower supporting **Live High Voltage Conductors** provided that the requirements of Rules 4.4 and 5.10.1 (d) are observed. Where appropriate, a marker or markers **Shall** be placed on the pole or tower as an indication of the safe **Working and Access Clearance** (see also Appendix D – Diagrams 2 and 3).

5.10.6 WORK ON UPPER PORTIONS OF TOWERS CARRYING LIVE CONDUCTORS

(a) When work is to be carried out on towers with all **Conductors Live**, above the position specified in Rule 5.10.5.2, the work area and / or route for climbing **Shall** be established by a **Senior Authorised Person** and a **Limitation-of-Access Shall** be issued and the **Control Engineer** notified.

*(b) Where reasonably practicable work **Shall** be carried out from within the body of the tower where the design of the tower permits. Work and climbing on the outside faces of a tower **Shall** be in accordance with an **Approved** procedure. No part of a **Person's** body or tool that is being carried or used **Shall** at any time encroach the **Safety Distance** surrounding a **Live Conductor**.

- (c) **Danger Notices**, barriers and screens **Shall** be fixed or moved only under the **Personal Supervision** of an **Authorised Person**.

*5.10.7 RUNNING OUT OR LOWERING OF OVERHEAD CONDUCTORS

When any overhead line conductor is to be raised or lowered or otherwise held on temporary supports/connections, **Approved** procedures **Shall** be followed to ensure that no **Danger** is caused at locations such as road/railway crossings, etc. where other persons may be present.

Where the overhead line **Conductors** pass over or under, or are in close proximity to a **High Voltage** overhead line, a **Senior Authorised Person** **Shall** determine whether the overhead line is to be made **Dead** or whether other **Approved** procedures are to be applied to adequately avoid **Danger**. When the **High Voltage** overhead line is to be made **Dead** the requirements of Rule 4.1.1 **Shall** apply and a **Permit-to-Work** **Shall** be issued.

When other **Approved** procedures are to be applied the work **Shall** either be supervised by a **Senior Authorised Person** or a **Limitation of Access** **Shall** be issued. In all instances the **Control Engineer** responsible for the existing overhead line **Shall** be informed of the work and where appropriate, auto-reclosing facilities on the circuit concerned **Shall** be temporarily suspended.

*5.10.8 WORK ON AUXILIARY CABLES SUSPENDED ON A CATENARY BELOW HIGH VOLTAGE OVERHEAD LINES

Where work is to be carried out on auxiliary cables suspended on a catenary below a **Live High Voltage** overhead line, the same clearances as specified in Rule 4.4.4 must be observed and the work must not be carried out at a distance of more than 3m from a supporting pole or tower when the **High Voltage** overhead line is **Live**.

5.10.9 ADVERSE WEATHER CONDITIONS

- (a) On the near approach of a lightning storm all work on overhead lines **Shall** cease immediately and the **Control Engineer** **Shall** be informed.
- (b) No person **Shall** patrol an overhead line alone across country during the hours of darkness or when visibility

is dangerously impaired by fog or snow or when snow drifts or similar hazards exist.

- (c) If overhead lines are to be patrolled during the hours of darkness suitable lighting equipment **Shall** be used.

5.11 SINGLE OR MULTIPLE CIRCUIT HIGH VOLTAGE OVERHEAD LINES WITHOUT KEYED FLAG BRACKETS AND WITH ALL CONDUCTORS DEAD

***5.11.1 PREPARATION FOR A PERMIT-TO-WORK**

The **Senior Authorised Person**, in addition to the procedures of Rules 4.1.1 and 5.10 **Shall** ensure that the line to be worked upon is identified in an **Approved** manner at the point of work and, where practicable, they **Shall** ensure that the line is checked by means of an **Approved** voltage testing device or other **Approved** means to verify that the line is not **Live**. If from the point of work the **Conductor** can be seen to be **Earthed**, the use of a voltage testing device may be dispensed with.

5.11.2 A **Permit-to-Work** **Shall** be issued.

5.12 DOUBLE CIRCUIT HIGH VOLTAGE OVERHEAD LINES WITHOUT KEYED FLAG BRACKETS AND WITH ONE CIRCUIT LIVE

5.12.1 PREPARATION FOR A PERMIT-TO-WORK

- (a) Where work is to be carried out on double circuit overhead lines with one circuit **Live** the following precautions in addition to the provision of Rules 5.10 and 5.11 **Shall** be taken.

- * (b) The **Senior Authorised Person** in charge **Shall** ensure that at the point of work the circuit to be worked upon is identified in an **Approved** manner.

5.12.2 A **Permit-to-Work** **Shall** be issued.

5.12.3 WORK

- * (a) Before commencing work and during the course of the work, the **Senior Authorised Person** in charge **Shall** at the point of work take steps, in accordance with an **Approved** procedure, to avoid **Danger** from steelwork being **Live** or becoming **Live**.

- *(b) A green flag **Shall** be affixed near ground level on the **Dead** circuit side of the pole or tower under the **Immediate Supervision** of the **Senior Authorised Person**. Similarly, a **Danger Notice** **Shall** be affixed on the **Live** circuit side. Before any person is allowed access, a **Competent Person** or **Competent Persons** at the point of work **Shall** climb the pole or tower on the **Dead** side, check that the overhead line is not **Live** using an **Approved** voltage testing device or other **Approved** means, and **Shall** connect to **Earth** all three **Conductors** on that side. Red pennants or **Danger Notices** **Shall** be affixed by a **Competent Person** to the crossarms drawing attention to the **Danger** of the **Live** circuit and, in the case of lattice steel towers, **Shall** be affixed at the junction of the tower with the crossarms carrying the **Live** circuit.
- (c) **The Conductors** **Shall** remain **Earthed** and the green flags, **Danger Notices** and the red pennants **Shall** remain in position throughout the progress of the work. All **Earths**, **Danger Notices** and pennants **Shall** be removed by a **Competent Person** or **Competent Persons** only after all other members of the **Working Party** have descended the pole or tower on completion of the work.

***5.13 SINGLE CIRCUIT HIGH VOLTAGE OVERHEAD LINES WITH KEYED FLAG BRACKETS**

- 5.13.1 In addition to the requirements of Rules 4.1.1 and 5.10 the following Rules **Shall** also apply.
- 5.13.2 The recipient of the **Permit-to-Work** who is also in charge of the **Working Party** **Shall** personally identify at the point(s) of work the circuit to be worked upon by reference to the route identification, the circuit colours and pole or tower number(s).
- 5.13.3 The recipient of the **Permit-to-Work** **Shall** be provided with green flag(s) that fit the keyed flag bracket(s) for the circuit on the pole or tower on which work is to be done, and **Shall** place the green flag in position on the tower before allowing any person to climb the pole or tower. The recipient of the **Permit-to-Work** or the **Competent Person** who is to apply the **Additional Earths** **Shall** then climb the tower and apply **Additional Earths** in accordance with Rule 5.10.3.

***5.14 DOUBLE CIRCUIT HIGH VOLTAGE OVERHEAD LINES WITH KEYED FLAG BRACKETS AND WITH ONE CIRCUIT LIVE**

5.14.1 In addition to the requirements of Rules 5.10 and 5.13, the following Rules **Shall** also apply.

5.14.2 The recipient of the **Permit-to-Work** or the **Competent Person** who is to apply the **Additional Earths** **Shall** then climb the pole or tower on the side indicated by the green flag, applying **Additional Earths** in accordance with Rule 5.10.3 and then affix red pennants to the crossarms supporting the circuit not being worked on. The red pennants **Shall** be positioned at the junction of the crossarms and the pole or tower body. The person doing this **Shall** be under **Personal Supervision** of the document recipient or another **Competent Person** who is a member of the **Working Party** from ground level. Pennants **Shall** be removed by a **Competent Person** only after all other members of the **Working Party** have descended the pole or tower on completion of work.

*5.14.3 When work is to be done on terminal, tee-off or large angle poles or towers of a double circuit line with one circuit **Live, Danger** may occur due to reduced clearances. The work **Shall** be done under the **Personal Supervision** of a **Senior Authorised Person** at ground level unless special precautions are taken in accordance with an **Approved Procedure**.

***5.15 HIGH VOLTAGE OVERHEAD LINES WITH MORE THAN TWO CIRCUITS WITH ONE OR MORE CIRCUITS LIVE**

5.15.1 When work is to be done on multiple circuit **High Voltage** overhead lines with one or more circuits **Live** Rules 4.1.1, 5.15.2, 5.15.3 and 5.15.4, in addition to either Rules 5.10 and 5.12 or 5.13 and 5.14 **Shall** apply.

5.15.2 PREPARATION FOR A PERMIT-TO-WORK

The **Senior Authorised Person** in charge of the work **Shall** at the point of work identify the circuit to be worked on.

5.15.3A **Permit-to-Work** **Shall** be issued after the work area has been checked and the precautions to be observed have been verified with the **Person** in charge of the work.

5.15.4 WORK

Work on one circuit of multiple circuit lines with one or more other circuits still **Live** **Shall** not be carried out except under the following conditions:

- (a) separate means of access **Shall** be provided to the circuit to be worked on;
- (b) the **Conductors** of each circuit **Shall** be either adequately screened to prevent **Danger** or the **Working and Access Clearances** from the nearest point of work to the remaining **Live** circuits **Shall** be those specified in Rule 4.4.4; and
- (c) Rule 5.12 **Shall** apply where appropriate. The fixing of green flags or red pennants and **Additional Earth** connections **Shall** be carried out under the **Personal Supervision** of a **Senior Authorised Person** from ground level.

***SECTION 6**

SAFETY PRECAUTIONS FOR HIGH VOLTAGE LIVE LINE WORK ON HIGH VOLTAGE OVERHEAD LINES

6.1 AUTHORISATION

- *6.1.1** No **High Voltage Live Line Work** Shall be carried out except in accordance with **Approved** procedures.
- *6.1.2** All staff engaged on **High Voltage Live Line Work** Shall have received appropriate training and **Shall** possess written authorisation from **The Company** to undertake **High Voltage Live Line Work**.
- *6.1.3** **High Voltage Live Line Work** Shall only be undertaken under the **Personal Supervision** of an **Authorised Person** who **Shall** have received training in the procedures and is authorised in writing by **The Company** to act in this capacity. They **Shall** be present throughout the whole of the **High Voltage Live Line Work**.
- *6.1.4** Only **Approved** tools and equipment **Shall** be used for **High Voltage Live Line Work**.

6.2 LIVE LINE TOOLS AND EQUIPMENT

- 6.2.1** Live line tools and equipment **Shall** be kept in a clean and dry condition and before use **Shall** be inspected by the **Authorised Person** referred to in Rule 6.1.3 to ensure that they are clean and dry and in sound condition. If any live line tool or piece of equipment is suspected to be defective it **Shall** not be used.
- *6.2.2** Where **Approved** procedures for **High Voltage Live Line Work** are based on the use of insulating rods, a clear mark **Shall** be maintained on every live line tool and piece of equipment, where appropriate, indicating the limit of the safe handling position which **Shall** be not less than the following:

TABLE 2 - LIVE LINE TOOLS SAFE HANDLING LIMITS

Nominal System Voltage	Minimum Effective Length
Not exceeding 33kV	1.1m
Exceeding 33kV but not exceeding 66kV	1.3m
Exceeding 66kV but not exceeding 132kV	1.7m

6.3 GENERAL PRECAUTIONS

*6.3.1 Subject to the conditions allowed by this Section 6 for **High Voltage Live Line Work** the safety precautions detailed in Section 4 for work on or near **High Voltage Systems** Shall apply.

6.3.2 **High Voltage Live Line Work** Shall not take place on any section of **High Voltage** overhead line where the failure of any component, **Conductor** or tool could energise an associated or adjacent overhead line which is **Dead** and **Earthed** and subject to a **Permit-to-Work** or **Sanction-for-Test**.

*6.3.3 Work **Shall** not commence until the **Authorised Person** in charge of the **High Voltage Live Line Work** has advised the appropriate **Control Engineer** of the nature and location of the work to be carried out.

If the circuit on which work is being carried out becomes **Dead** owing to the operation of protective equipment or for any other reason, the **Control Engineer** Shall not sanction the circuit to be re-energised without reference to the **Authorised Person** in charge of the **High Voltage Live Line Work**.

Auto-reclose and protection equipment controlling the line **Shall** be managed in accordance with an **Approved** procedure.

6.3.4 No **High Voltage Live Line Work** **Shall** commence in unfavourable weather. If in the course of work unfavourable weather develops, work **Shall** be suspended.

*6.3.5 If it is necessary to suspend **High Voltage Live Line Work** for any reason, the line and equipment **Shall** be left in a safe condition and the **Control Engineer** informed.

6.3.6 Before work commences, all **Conductors** and associated pole top, line and tower fittings, steelwork and insulators **Shall** be thoroughly examined at the point of work for signs of incipient failure, through binoculars if necessary, so as to minimise the possibility of failure of these parts during **High Voltage Live Line Work**. The examination **Shall** extend to include the adjacent spans and pole or tower on both sides of the point of work.

*6.3.7 Before displacing **Live Conductors** adequate precautions **Shall** be taken to avoid **Danger** and to ensure safety including that of members of the public. Safe **Working and Access Clearances**, in accordance with **Approved** procedures **Shall** also be maintained between the line and other **Apparatus** and objects.

6.3.8 No vehicle, or person other than a member of the team doing the work, **Shall** be allowed in the near vicinity of the point of work while work is in progress without the sanction of the **Authorised Person** in charge of the **High Voltage Live Line Work**. Where mobile platforms etc are used for access, the limits of movement of the platform **Shall** be established by the **Authorised Person** in charge of the **High Voltage Live Line Work** and strictly controlled so as to ensure that no metalwork, or any part of the platform, places any **Person** in a position of **Danger**.

*6.3.9 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.

*6.3.10 Before any pole is climbed and during the course of **High Voltage Live Line Work** the **Authorised Person** in charge **Shall** take all reasonably practicable steps to avoid **Danger**

from steelwork being **Live** or becoming **Live**, in accordance with **Approved** procedures.

- *6.3.11 Where **Approved** procedures for **High Voltage Live Line Work** are based on the use of insulating rods, no **Person** **Shall** climb, move or work in such a position as to bring any part of their body, clothing or any working tool (other than insulated **High Voltage Live Line Work** tools or equipment **Approved** for those procedures) within the **Working and Access Clearances** referred to in Rule 4.4.4 from **Live** exposed **High Voltage Apparatus** and, where appropriate, a marker or markers **Shall** be placed on the pole or tower as an indication. (See also Appendix D Diagrams 5, 6 and 7).
- 6.3.12 On completion of the **High Voltage Live Line Work**, the **Control Engineer** **Shall** be informed when all persons and tools have been withdrawn from the point of work.

SECTION 7

SAFETY PRECAUTIONS FOR THE TESTING OF HIGH VOLTAGE APPARATUS

*7.1 GENERAL

Testing of **High Voltage Apparatus** may involve a change of state from a condition of **Dead** to **Live Conductor**, possibly involving the issue and cancellation of a **Permit-to-Work** prior to the issue of a **Sanction-for-Test**. It is the duty of the issuer of the **Sanction-for-Test** to avoid **Danger** during the testing by undertaking a risk assessment and identifying appropriate control measures that will be implemented by the person carrying out the testing. This should take due account of the types of test being carried out, the location of the **Apparatus** being tested and its accessibility to Company staff, contractors, members of the public, etc. To allow reasonable flexibility during testing and, at the same time, to ensure the maintenance of appropriate safety standards, the following Rules of this Section require that an **Authorised Person Shall** assume special responsibility in this respect.

*7.2 WORK UNDER THE TERMS OF A SANCTION-FOR-TEST

Any **Apparatus** which has been **Isolated** and **Earthed** for testing under the terms of a **Sanction-for-Test Shall** not be connected to the **System** until such **Apparatus** has passed the **Approved** tests and then connected only with the sanction of the **Control Engineer**. The recipient of the **Sanction-for-Test Shall** be responsible for co-ordinating all testing operations on the **Isolated** equipment and for ensuring safety during the tests. They may, without further reference to the **Control Engineer**, remove and replace **Circuit Main Earths** as necessary and carry out tests including making **Live** the **Apparatus** concerned from a testing supply. The recipient of the **Sanction-for-Test Shall** either make the tests personally or such tests **Shall** be carried out under their **Immediate Supervision**. The re-application of **Earths** at the end of testing may not be necessary. If an **Approved** procedure applies, the earths can be left removed and reported to the **Control Engineer** as exceptions on the **Sanction-for-Test**. Otherwise, each **Circuit Main Earth** removed by the recipient of the

Sanction-for-Test Shall be replaced before the signing of the clearance section of the **Sanction-for-Test**.

7.3 TESTING OF HIGH VOLTAGE APPARATUS

*7.3.1 When any **High Voltage Apparatus** is to be subjected to test voltage before being connected or reconnected to the **High Voltage System**, the **Authorised Person** responsible for applying the test voltage **Shall** ensure that such **Apparatus** and the associated test equipment, leads and connections are adequately guarded to prevent **Danger**. **Danger Notices Shall** be attached in conspicuous positions during the period the **Apparatus** may be subject to voltage. All cables and capacitors **Shall** be discharged before and after the application of test voltage.

*7.3.2 Temporary **Conductors** used for testing purposes **Shall** be of an adequate size and be easily visible.

*7.3.3 Test connections **Shall** not be applied in a cell or compartment in which there is any exposed metal **Live at High Voltage**. (This Rule does not preclude the use of **Approved** voltage testing devices or other **Approved** devices for testing and phasing out circuits in an **Approved** manner).

7.3.4 The requirements of Rule 4.4 **Shall** be observed in respect of access or work in the proximity of **Live** test leads and connections and in respect of testing in the vicinity of **Live Conductors**.

SECTION 8

SAFETY PRECAUTIONS AND PROCEDURES APPLICABLE TO LOW VOLTAGE SYSTEMS

8.1 GENERAL

*8.1.1 The term **Low Voltage System** and this section of the Safety Rules applies to **The Company's** distributing mains and services as defined in an **Approved** procedure.

8.1.2 When work or testing is carried out on or near **Low Voltage Apparatus** and **Conductors**, precautions **Shall** be taken to prevent **Danger** from burn injury due to electric arc and from electric shock, if the **Conductors** are exposed. These precautions are necessary to prevent **Danger to Competent Persons** and, so far as reasonably practicable, **Danger to Third Parties**, i.e. persons that may not have sufficient technical knowledge and/or experience to enable them to maintain safety from the **System**.

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. **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.

*8.1.3 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 or **Approved** leads.

- *8.1.4 Control 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**.
- *8.1.5 Work on, or testing of **Low Voltage Apparatus** and **Conductors** **Shall** only be carried out by a **Competent Person**. Where working arrangements so require, **Approved** procedures for the control of work, including the issue of a **Safety Document**, **Shall** apply.
- *8.1.6 Where work or testing involves the initial connection, or the re-arrangement of **Conductors** to a consumer, supply **Shall** not be commenced or recommenced to that consumer until checks have been made at an appropriate point on the **System** to ensure correct polarity at the supply terminals. Where necessary, in the case of three-phase supplies, the phase rotation **Shall** also be checked.
- *8.1.7 No **Low Voltage** overhead line **Shall** be erected or dismantled under a **Live High Voltage** overhead line without the authority of a **Senior Authorised Person** who **Shall** ensure that when necessary for example because of insufficient clearance the **High Voltage** line is made **Dead** and a **Permit-to-Work** issued. The **Permit-to-Work** **Shall** detail the **Low Voltage** work to be carried out. When a **Low Voltage** overhead line **Conductor** is to be raised or lowered or otherwise held on temporary supports/connections **Approved** procedures **Shall** be followed to ensure that no **Danger** is caused at locations such as road/rail crossing etc. where other persons may be present.
- *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, i.e. persons that may not have sufficient technical knowledge and/or experience to enable them to maintain safety from the **System**.

8.2 GENERAL REQUIREMENTS FOR WORK ON DEAD LOW VOLTAGE APPARATUS AND CONDUCTORS

- *8.2.1 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**. Where the **Isolating Devices** are lockable, **Safety Locks Shall** be applied. If components such as fuses and links are removable they **Shall** be removed. **Caution Notices Shall** be securely fixed at all points of isolation. Keys and removed components **Shall** be kept in a secure place.

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

8.2.3 Except when work on a **Low Voltage System** is being carried out as part of **Approved High Voltage Live Line Work** the following requirements **Shall** apply:

- (a) if the work requires a point of isolation to be established on a **High Voltage System**, a **Safety Document Shall** be issued with the consent of the **Control Engineer of the High Voltage System**;
- (b) if the work requires a **High Voltage System** to be made **Dead, Isolated** and **Earthed**, a **Permit-to-Work Shall** be issued; or
- (c) if the work is being done in conjunction with work on the **High Voltage System** which has been made **Dead, Isolated** and **Earthed**, then unless the **Low Voltage** work is included on the **Permit-to-Work** issued for the **High Voltage** work, a separate **Safety Document** for the **Low Voltage** work **Shall** be issued, with the consent of the **Control Engineer of the High Voltage System**.

*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.

8.2.5 Where **Conductors** may become **Live** due to the operation of a consumer's generator 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 in accordance with rule 8.5 and rules 8.6 or 8.7 as appropriate.

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

8.3 ADDITIONAL PRECAUTIONS FOR WORK ON DEAD LOW VOLTAGE CABLES

*8.3.1 The cable to be worked on **Shall** be identified in accordance with an **Approved** procedure which **Shall** include the following:

*(a) all damaged cables **Shall** be treated as **Live** until identified and proved **Dead** by an **Approved** procedure;

(b) 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

*(c) 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, unless an **Approved** procedure has specific provisions which allow testing at the point of damage. 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**.

*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.

8.4 ADDITIONAL PRECAUTIONS FOR WORK ON DEAD LOW VOLTAGE OVERHEAD LINES

*8.4.1 Bare open-wire **Low Voltage Conductors Shall** be **Earthed** using **Approved** earthing leads. Where insulated but unscreened **Conductors** are present the requirements for **Live** working **Shall** be observed until the **Conductors** have been proved **Dead**.

8.4.2 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 or the **Conductors** have been proved **Dead**.

8.5 WORK ON LIVE LOW VOLTAGE APPARATUS AND CONDUCTORS

8.5.1 No **Low Voltage Live** work **Shall** be carried out except in accordance with an **Approved** procedure. This **Approved** procedure **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.

All persons who carry out **Live** working **Shall** be **Competent Persons** and **Shall** have received appropriate training in the particular **Approved** procedure. They **Shall** be adequately instructed by the **Competent Person** in charge of the **Working Party**.

*8.5.3 Only tools and equipment **Approved** for that purpose **Shall** be used for work on, or the testing of, **Low Voltage Apparatus** and **Conductors**.

*8.5.4 No person **Shall** carry out work which involves, or is equivalent to, the manipulation of bare **Live Conductors** unless accompanied by another person who **Shall** be available to render or obtain assistance in an emergency.

8.6 ADDITIONAL PRECAUTIONS FOR WORK ON LIVE LOW VOLTAGE CABLES

*8.6.1 The cable to be worked on **Shall** be identified by an **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.

*8.6.2 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.

8.7 ADDITIONAL PRECAUTIONS FOR WORK ON LIVE LOW VOLTAGE OVERHEAD LINES

*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.

*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.

8.8 APPLICATION OF HIGH VOLTAGE RULES TO WORK ON LOW VOLTAGE APPARATUS AND CONDUCTORS

*8.8.1 Where Safety Rules applicable to work on **High Voltage Systems, Apparatus and Conductors** are applied to **Low Voltage Systems, Apparatus and Conductors**, this **Shall** be in accordance with **Approved** procedures.

8.9 TESTING AND ADJUSTMENT OF LOW VOLTAGE APPARATUS

*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** to be made **Dead** in order to avoid **Danger** appropriate requirements of safety rules 8.2, 8.3 and 8.4 **Shall** be applied.

SECTION 9

RESPONSIBILITIES OF PERSONS

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. Ignorance of the relevant legal requirements, Safety Rules, Codes or Procedures **Shall** not be accepted as an excuse for neglect of duty.
- 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 **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 sanctioning the issue of **Safety Documents** and (after completion of work) acknowledging cancellation of **Safety Documents** 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 issuing **Safety Documents** and (after completion of work) cancelling **Safety Documents** and taking action to restore **Apparatus** and **Plant** to service; and

- (iii) work - which includes receipt of a **Safety Document**, execution of the required work to its completion or termination and clearance of the **Safety Document**.

9.2 COMPETENT PERSONS

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 **Safety 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 **Safety Document**;
- (iv) retain any **Safety Document** and (where appropriate) keys 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 **Senior Authorised Person** or **Control Engineer**.

9.2.5 **Competent Persons Shall** not start or restart work under a **Safety Document** issued to another **Competent Person** without the permission of that other **Competent Person**.

*9.2.6 **Competent Persons** clearing a **Safety Document Shall** do so only after all persons working under the **Safety Document** have been withdrawn from, and warned not to work on, the **Apparatus** and **Plant** concerned. Where appropriate, they **Shall** ensure that all tools, gear and loose material have been removed, guards and access doors replaced and the workplace left tidy. Where appropriate they **Shall** also return, or account for, the correct number of **Additional Earths**, circuit identification flags and wristlets and associated keys and documents.

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 Certificates of Authorisation.

9.3.2 When participating in achieving safety from the inherent **Dangers** of the **System**, **Authorised Persons Shall** correctly implement specified procedures before work commences, including all of the following:

- *(i) the keeping of a proper record of all messages, passed by telephone or otherwise, relating to the operation of the **High Voltage System**;
- (ii) the reading back to the sender of every such message relating to the operation of the **High Voltage System** to ensure that the message has been accurately received; and
- (iii) carrying out operations instructed by the **Control Engineer** without unnecessary delay, the implementation of the instructions to be reported back to the **Control Engineer** as soon as possible after completion.

9.3.3 As the recipient of a **Sanction-for-Test** an **Authorised Person** is responsible for all of the following:

- (i) meeting the particular requirement of Section 7 of these Safety Rules;
- (ii) being present during the testing, being responsible for co-ordinating all testing operations on the **Isolated** equipment and for ensuring safety during the tests. Such tests may include making **Live** the **Apparatus** and **Plant** from a testing supply; and
- (iii) carrying out the temporary removal and re-application of **Earths** as necessary without further reference to the **Control Engineer**.

9.3.4 When given the authority to issue and cancel a **Limitation of Access**, to ensure:

- (i) that the recipient of the **Safety Document** understands the nature and extent of the work to be undertaken and the safety precautions to be taken; and
- *(ii) where applicable, the authority of the **Control Engineer** has been obtained for the issue of the **Safety Document**.

9.4 SENIOR AUTHORISED PERSONS

9.4.1 In addition to responsibilities as **Authorised Persons**, **Senior Authorised Persons** Shall have some or all of the following responsibilities.

9.4.2 Correctly implementing **Approved** procedures to ensure that all precautions to achieve safety from the inherent **Dangers** or the **System** are completed, including:

- (i) confirming through the **Control Engineer** that safety precautions at all locations are complete; and
- (ii) meeting the requirements of the relevant sections of these Safety Rules.

9.4.3 Prior to the issue of a **Safety Document**, deciding where appropriate:

- (i) whether **Additional Earths** are required, and if so, the number and points of application;
- (ii) whether any action is required to contain or dissipate stored energy;
- (iii) whether any additional precautions are necessary;
- (iv) whether **Personal Supervision** is required, and
also ensuring that:
- (v) safety from the inherent **Dangers** of the **System** has been achieved and will be maintained when the requirements of the **Safety Document** are completely implemented;
- (vi) the contents of the **Safety Document** to be issued are correct and unambiguous; and
- (vii) the authority of the **Control Engineer** has been obtained for the issue of a **Permit-to-Work** or **Sanction-for-Test**.

9.4.4 When issuing a **Safety Document**:

- (i) fully explaining the contents of the **Safety Document** to the recipient and ensuring that the recipient understands the nature and extent of the work or testing to be done and the safety precautions to be taken; **and**
- *(ii) issuing the **Safety Document** together with (as appropriate) any keys, circuit identification flags and wristlets and noting all **Additional Earths**.

9.4.5 When cancelling a **Safety Document**:

- (i) ensuring that the requirements of the clearance section have been completed correctly;
- *(ii) checking that all items issued with the **Safety Document** have been returned or accounted for;
- (iii) checking the operational state of the **Apparatus** and **Plant**; and
- *(iv) informing the **Control Engineer** of the cancellation of the document and confirming the operational state of the **Apparatus** and **Plant**.

*9.4.6 When a **Senior Authorised Person** is in control of a **System** then their responsibilities will be extended to embody those of a **Control Engineer** as set out in Rule 9.5 whilst they have control of that **System**.

*9.5 CONTROL ENGINEERS

9.5.1 The responsibilities of **Control Engineers** within their sphere of operation which arise from the implementation of these Safety Rules include the following:

- (i) giving authority for the release of **Apparatus** and **Plant** from service;
- (ii) giving authority for all **High Voltage Switching** except in cases of emergency or in other **Approved** cases;
- (iii) communicating directly with the **Authorised Person** who is to carry out the **Switching**;
- *(iv) consulting with **Control Engineers** of other **Systems** to agree and initiate **Switching** where there is interconnection across control boundaries; also agreeing responsibility for control of circuits in the **Isolated** state preparatory to sanctioning the issue of **Safety Documents**;
- (v) before giving authority for the issue of a **Safety Document** to ensure that the necessary operations to obtain safety from the inherent **Dangers** of the **System** are carried out;
- (vi) giving authority for the issue, and acknowledging cancellation of, **Permits-to-Work** and **Sanctions-for-Test**; and
- (vii) maintaining a written or electronic record of all **High Voltage Switching**, application and removal of **Circuit Main Earths** and the issue and cancellation of **Permits-to-Work**, **Sanctions-for-Test** and, where applicable, **Limitations-of-Access**.

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

NORTHERN POWERGRID Permit to WorkNo. PW

1. IssueByTo

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 B: Sanction-for-Test form (front)**NORTHERN POWERGRID**

Sanction-for-Test

No. ST

1. Issue By To

The following

HV APPARATUS

has been

made SAFE

in accordance

with the

Distribution

Safety Rules

for the testing

described on this

Sanction-for-Test

to proceed.

The points of

isolation are:

Circuit Main

Earths are

applied at:

Brief Description

of Testing to be

carried out

Signed Time Date

2. RECEIPTI accept responsibility for the testing described on this Sanction-for-Test
and for taking the precautions necessary to prevent Danger.

Signed Time Date

Sanction-for-Test form (back)

3. CLEARANCE

All persons under my charge have been withdrawn and warned that it is no longer safe to carry out testing on the Apparatus detailed on this Sanction-for-Test.

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

All additional earths have been removed* / accounted for*.

The testing is complete* / incomplete*

The operational state of the Apparatus is the same as at the time of the issue of this Sanction-for-Test apart from the exceptions noted below:-

Exceptions (if none state 'None')
.....
.....

Signed Time Date.....

*Delete words not applicable

4. CANCELLATION

This Sanction-for-Test 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

WORKING AND ACCESS CLEARANCES

1. The **Working and Access Clearances** contained in the following Diagrams are derived from the **Safety Distances** 'X' specified in Rule 4.4.1 (Table I) with the addition of 'Application Factors' appropriate to the particular work activity.

2. Diagram 1

Specifies the **Safety Distances** for Work on Overhead Lines Carrying **Live High Voltage Conductors** (Rule 4.4.1 refers).

Diagrams 2 and 3

Specify the **Working and Access Clearances** for work on overhead lines carrying **Live High Voltage Conductors**. (Rules 4.4.4 and 5.10.5.2 refer).

Diagram 4

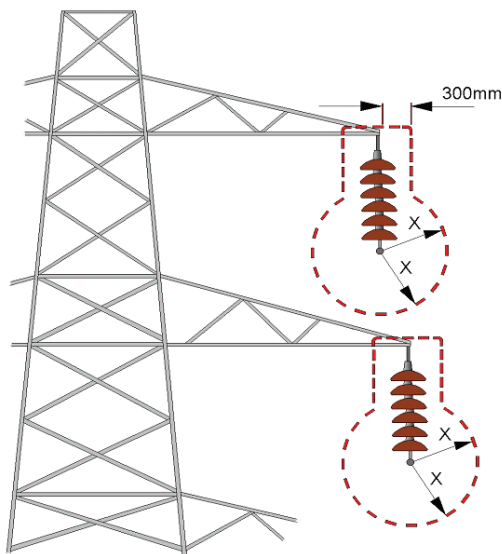
Specifies **Working and Access Clearances** for work in substations and switching stations containing exposed **Live High Voltage Conductors**. (Rules 4.4.4 and 4.5.3 refer).

Diagram 5, 6 and 7

Specify **Working and Access Clearances** for **High Voltage Live Line Work**. (Rules 4.4.4, 6.3.11 and 6.2.2 (Table 2) refer).

DIAGRAM 1 – STEEL TOWER (A REMINDER OF SAFETY DISTANCES)

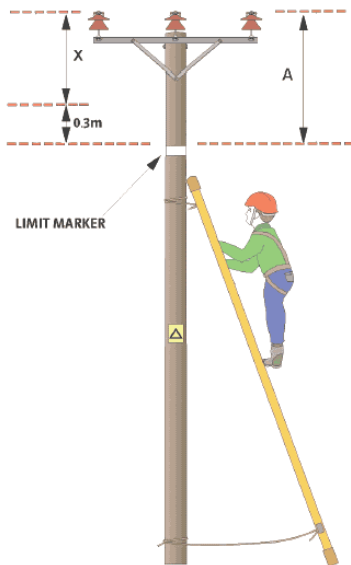
Safety Distances for Work on Overhead Lines Carrying **Live High Voltage Conductors**, (Rule 4.4.1).



Voltage	Safety Distance 'X'
Up to and including 33kV	0.8 m
Exceeding 33kV but not exceeding 66kV	1.0 m
Exceeding 66kV but not exceeding 132kV	1.4 m

DIAGRAM 2 – LADDERS OR CLIMBING IRONS

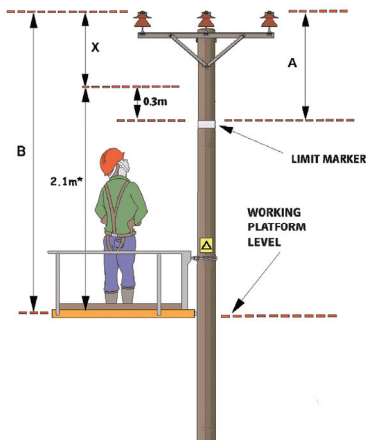
Working and Access Clearances for Work on Overhead Lines Carrying Live High Voltage Conductors, (Rules 4.4.4/5.10.5.2).



Voltage	Safety Distance 'X'	Application Factor	Working and Access Clearance = 'A'
Up to and including 33kV	0.8 m	0.3 m	1.1 m
Exceeding 33kV but not exceeding 66kV	1.0 m	0.3 m	1.3 m
Exceeding 66kV but not exceeding 132kV	1.4 m	0.3 m	1.7 m

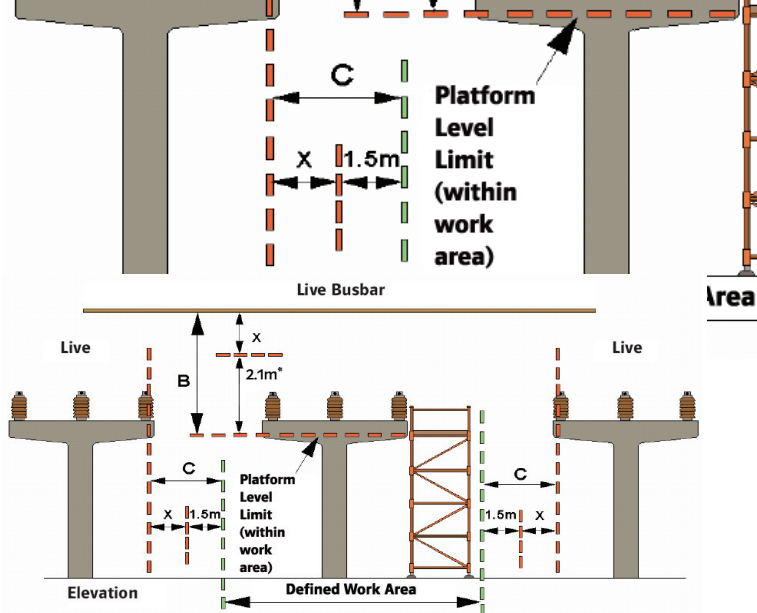
DIAGRAM 3 – POLE PLATFORM OR SCAFFOLDING

Working and Access Clearances for Work on Overhead Lines Carrying Live High Voltage Conductors, (Rules 4.4.4/5.10.5.2).



Voltage	Safety Distance 'X'	Application Factor	Working and Access Clearance = 'A'	Platform Clearance 'B' = Safety Distance 'X' + 2.1m*
Up to and including 33kV	0.8 m	0.3 m	1.1 m	2.9 m
Exceeding 33kV but not exceeding 66kV	1.0 m	0.3 m	1.3 m	3.1 m
Exceeding 66kV but not exceeding 132kV	1.4 m	0.3 m	1.7 m	3.5 m

* The Platform Application Safety Factor of 2.1m is an absolute minimum. The vertical Working and Access Clearances from a platform below a live conductor **Shall** be established such that the Working and Access Clearance "A" is always maintained below the conductor. This must take into account the height of the people doing the work, the tools used and the nature of the work.



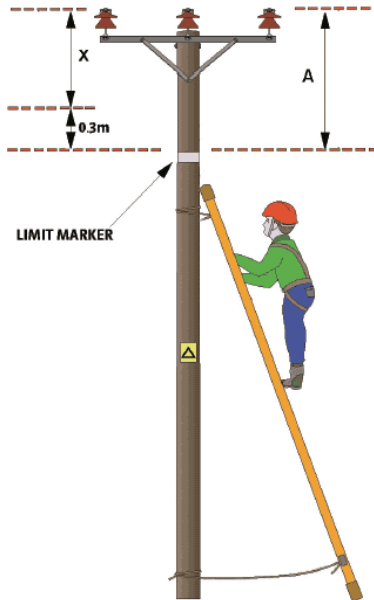
Voltage	Safety Distance 'X'	Horizontal Application Factor	Horizontal Working and Access Clearance = 'C'	Platform Clearance 'B' = Safety Distance 'X' + 2.1m*
Up to and including 33kV	0.8 m	1.5 m	2.3 m	2.9 m
Exceeding 33kV but not exceeding 66kV	1.0 m	1.5 m	2.5 m	3.1 m
Exceeding 66kV but not exceeding 132kV	1.4 m	1.5 m	2.9 m	3.5 m

* The Platform Application Safety Factor of 2.1m is an absolute minimum. The vertical Working and Access Clearances from a platform below a live conductor **Shall** be established such that the Safety Distance is always maintained below the conductor. This must take into account the height of the people doing the work, the tools used and the nature of the work.

Appendix D

DIAGRAM 5 – HV LIVE LINE WORK LADDERS OR CLIMBING IRONS

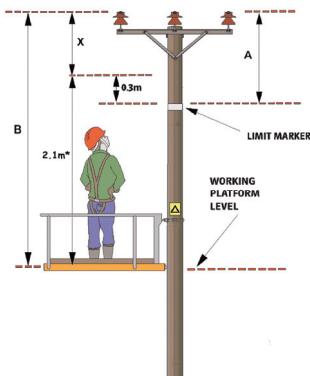
Working and Access Clearances for High Voltage Live Line Work, (Rules 4.4.4, 6.3.11 and 6.2.2)



Voltage	Safety Distance 'X'	Application Factor	Working and Access Clearance = 'A'
Up to and including 33kV	0.8 m	0.3 m	1.1 m
Exceeding 33kV but not exceeding 66kV	1.0 m	0.3 m	1.3 m
Exceeding 66kV but not exceeding 132kV	1.4 m	0.3 m	1.7 m

DIAGRAM 6 – HV LIVE LINE WORK POLE PLATFORM OR SCAFFOLDING

Working and Access Clearances for High Voltage Live Line Work, (Rules 4.4.4, 6.3.11 and 6.2.2)

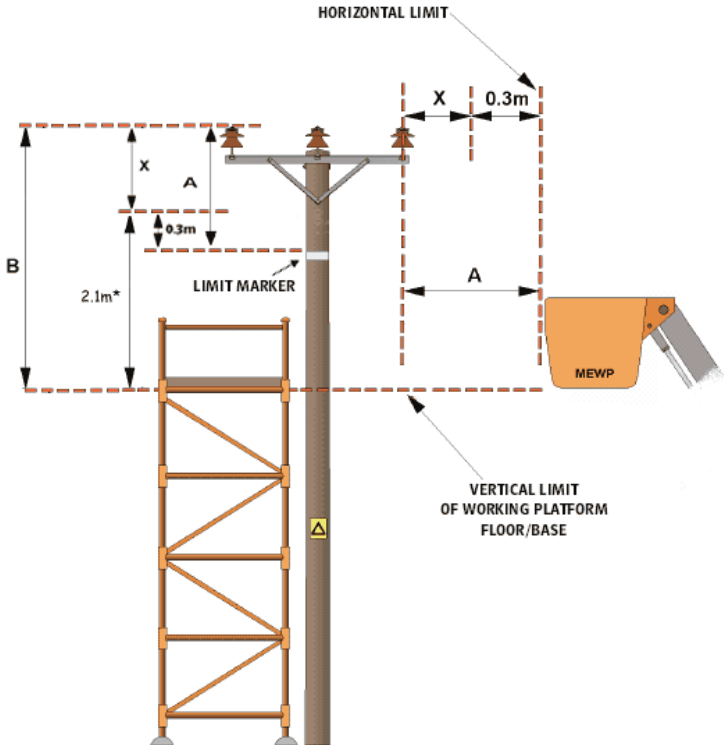


Voltage	Safety Distance 'X'	Application Factor	Working and Access Clearance = 'A'	Platform Clearance 'B' = Safety Distance 'X' + 2.1m*
Up to and including 33kV	0.8 m	0.3 m	1.1 m	2.9 m
Exceeding 33kV but not exceeding 66kV	1.0 m	0.3 m	1.3 m	3.1 m
Exceeding 66kV but not exceeding 132kV	1.4 m	0.3 m	1.7 m	3.5 m

* The Platform Application Safety Factor of 2.1m is an absolute minimum. The vertical Working and Access Clearances from a platform below a live conductor **Shall** be established such that the Working and Access Clearance "A" is always maintained below the conductor. This must take into account the height of the people doing the work, the tools used and the nature of the work.

DIAGRAM 7 – SCAFFOLDING OR MOBILE ELEVATED WORKING PLATFORM

Working and Access Clearances for High Voltage Live Line Work, (Rules 4.4.4, 6.3.11 and 6.2.2)



Voltage	Safety Distance 'X'	Vertical & Horizontal Application Factor	Working and Access Clearance 'A'	Platform Clearance B = Safety Distance 'X' + 2.1m*
Up to and including 33kV	0.8 m	0.3 m	1.1 m	2.9 m
Exceeding 33kV but not exceeding 66kV	1.0 m	0.3 m	1.3 m	3.1 m
Exceeding 66kV but not exceeding 132kV	1.4 m	0.3 m	1.7 m	3.5 m

* The Platform Application Safety Factor of 2.1m is an absolute minimum. The vertical Working and Access Clearances from a platform below a live conductor **Shall** be established such that the Working and Access Clearance "A" is always maintained below the conductor. This must take into account the height of the people doing the work, the tools used and the nature of the work.

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

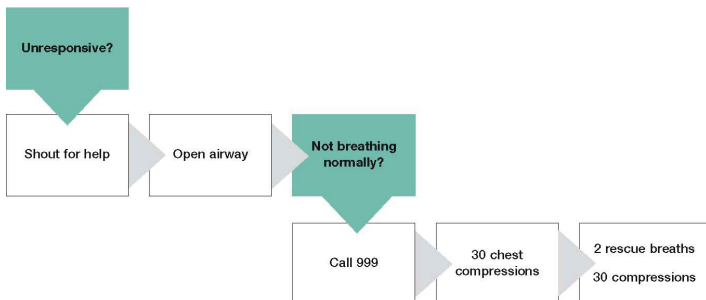
Don't delay - Your priorities are to:

- 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 F

Index of Approved Equipment and Procedure Reference

DSR Ref	OPM Ref	Description
1.2	PA1	Authorisation of third party employees
1.2	PG5, OE	Cross boundary procedures
1.4	PA2	Issue of Safety Rules
1.6	PB2	Approved Procedures
1.8	PC	Reporting Procedures.
1.10	PE	Personal Protective Equipment
2D.19	PF1	Caution Notice
2D.20	PF2	Danger Notice
3.1	AA	Locking Policy
3.1	AB	Operational Access
3.1.2	AB2	Access to confined spaces
3.1.3	AB2	Ventilation
3.1.3	AB2.2.3	Expel vapours before access to vessels
3.1.4	AB2.3.3	Hot processes in the vicinity of vessels
3.2.1	AC1	Auto fire control
3.2.1(b)	PG2.1b	PtW - Other precaution - Auto fire protection
3.2.2	AC2	Portable fire extinguishers
3.2.3	AC3	Precautions after discharge
3.2.3	AB1.3	Ventilation
3.2.3	AB2.3.5	Breathing Apparatus
3.3	AD3.7	Terminal Poles and High Structures
3.3.1	WD1.3	Precautions before climbing.

DSR Ref	OPM Ref	Description
3.3.2	WD1.1	Equipment and rescue procedures (Appendix WD.1)
3.3.2	WD1.2	Second Person - Climbing above 2m..
3.3.3	AA1a	Locks on access ladders and gates.
3.3.3	WD2.2.4	Towers - gates through anti climbing guards
3.4	AB1.1	Access to HV Apparatus (Sw. and Substations)
3.4.1	AB1.2	Access to Live HV conductors
3.4.2	AB1.2	Access to HV Chambers, Cubicles and Cells
3.4.3	WB1.6	Relaxation for locking spouts - Zone of Work
3.5	OB	HV Switching
3.5.1	OB1.3	Agreement for Switching
3.5.1	OB1.3.2	Emergency Switching
3.5.2	OB1.3.3	Switching - no communication
3.5.5	OB1	Requirements for Switching
3.5.7	OA2.1	Distressed Apparatus
3.5.7	OB1	Switching hierarchy and umbilical devices
3.5.8	OB4.2.2	Operating aerial switchgear - PPE
3.5.8	OB4.3.1	Operating aerial switchgear - PPE
3.6.2	OB2.1.1	Operations - recording by Control Engineers
3.7	PC1.1.2	Failure of Supply
3.8	PB2.3	Live testing
3.8	OB4.5.1	Voltage Testing devices
3.9	WC1	Excavation of cables.
3.9	WC1.3	Safe Excavation
3.9	WC6.1	Faulted Cables - prove dead before touching
3.10	AD2	Machines

DSR Ref	OPM Ref	Description
4.1.1	WA2.2.1	Work on HV Apparatus
4.1.1(c)	OB6	Connection to Earth
4.1.1(e)	WC3.1	Identification Procedure
4.1.1(f)	WA2.2	Release for Work
4.1.1 x i	PB1.1	Earthed Metal - Painting etc.
4.1.1 x ii	PB1.2.2	Hot Glove procedure
4.1.1 x iii	PB2	Procedures approved by the Designated Engineer
4.2.2(a)	AA3	Safety Locks
4.2.2(b)	AA3.2.5	Recording deposit of Safety Lock keys
4.2.2(b)	OB1.2	Recording Centres
4.2.3	OB5.1.2	Replacement of non-isolatable fuses
4.3.1	OB6.2.1	Earthing procedure
4.3.1	OB6.4.1	Earthing procedure, open switchgear no integral earthing
4.3.1(a)	OB6.1	Circuit Main Earths via CB or fixed device
4.3.1(a)	OB6.3.3	Circuit Main Earth via CB - remote operation.
4.3.1(a)	OB6.2.7	Application of CME notice and lock
4.3.1(b)	OB4.5.1	Approved voltage testing device
4.3.1(b)	OB6.1	Approved Earthing equipment
4.3.1(c)	OB6.2.2	First Earth at point of Isolation
4.3.2	OB6.1.2	Approved Portable Earthing equipment
4.3.2	OB6.5.1	Portable Earth equipment, Inspect before use.
4.3.2	OB6.5.2	Capacity of Portable Earth equipment.
4.3.3 (a)	OB4.5.1	Approved Voltage Testing Device
4.3.3 (b)	OB6.5.2	Approved Earthing equipment.

DSR Ref	OPM Ref	Description
4.3.3 (d)	OB6.3.1	Earthing & exposed Live Conductors
4.3.3 (e)	OB6.1.2	Approved Portable Earthing equipment.
4.3.3 (f)	OB6.1.2	Approved Portable Earthing equipment
4.3.3 (f)	OB6.5.3	Approved Earthing equipmen
4.3.4 (a)	OB6.2.7	CME notice & level 1 lock
4.3.4 (c)	OB6.6.1	Removal of CME during work
4.3.4 (c)	OB6.2.10	Earths - position following cancellation of SFT
4.3.5 (a)	OB6.2.9	Additional Earths Responsibility of CP
4.3.5 (b)	WD4.1.1	Protection against backfeed
4.3.5 (c)	PG2.4	Additional Earths accounted for
4.4.1	OB4.5.5b	Safety distances
4.4.1	WD6.1.1	Exception for Hot Glove work
4.4.2(b)	OB4.5.5	Safety distances - Spouts
4.4.3 (a)	OB4.5.1	Approved testing devices
4.4.3 (b)	WD6.1.1	Approved Live Line equipment
4.5	AD3.3	Island working
4.5.1 (a)	AD3.4	Island working, Approved delineation equipment
4.5.1(c)	OB4.5.1	specification and use of Voltage indicators
4.5.1(c)	AD3.7.1	Access to poles & structures in compounds
4.5.1(c)	AD3.7.2	Access - work above ground level in compounds
4.5.2	AD3.5. 1	Island working - Access Route
4.5.4 (a)	WD2.2.1	Portable Ladders for Compounds
4.5.4 (b)	AD3.5.2	Use of ladders, long objects & mobile plant in compounds
4.5.5	AD3.5.2	Access for mobile equipment etc. in compounds

DSR Ref	OPM Ref	Description
4.5.7	OB6.2.8 (c)	Adverse weather
4.5.7	WC7.3	Totem (Inverted) pole (equipment) substations.
4.6	PG2	Permit to Work
4.6.2 (c)	PG2.2.1	PtW - No Cross reference
4.6.3 (b)	PG2.4	Clearance of PtW and Additional Earths
4.6.4	PG2.3	PtW – No suspension
4.6.5	PG2.3	PtW not transferrable
4.6.6	PG2.6	Minor testing under PtW
4.7	PG3	Sanction for Test
4.7.3	PG3.3.1	Clearance of SftT
4.7.4	PG3.2	Sanction for Test – No suspension
4.7.5	PG3.1.2	Minor work under Sanction for Test
4.8	PG4	Limitation of Access
4.8.1(b)	PG4.2	LoA - CE recording issue
4.8.1(b) (iii)	PG4.3	LoA - Other circumstances
5.1.2	WB1.6	Zone of work, relaxation to DSR's
5.1.2	OB6.2.8	GM Apparatus connected to lines
5.1.2(c)	WB1.6.1 d	Zone of Work - prove Dead
5.1.2(c)	PB2	Work on Switchgear & Cables.
5.1.2(c)	WB1.6.3	Exception for testing.
5.1.2(c)	WB2	Zone of Work - switchgear and cables
5.3.2	WB1.1	Withdrawable Apparatus - Locking spout shutters
5.3.2	WB1.6	Relaxation for locking spouts - Zone of Work
5.3.3	PG4.2.3	LoA Work on withdrawable Apparatus

DSR Ref	OPM Ref	Description
5.4.2(a)	OB4.5.1	Specification and use of Voltage Indicators
5.4.2(b)	OB6.5.1	Portable Earths - busbar spouts
5.4.4(i, ii)	OB4.5.1	Voltage Testing Device
5.4.4	WB1.2	Work on busbars/spouts
5.5.2(a)	OB4.5.1	Specification and use of Voltage Indicators
5.5.2(b)	OB6.1	Approved Earthing equipment
5.5.2(c)	OB6.5.5	Portable Earths - earthed poles
5.5.2(c)	OB6.2.8	GM Apparatus and cables connected to lines
5.5.3	OB6.6.1 c	Removal of Earths during work
5.5.4(i & ii)	OB4.5.1	Voltage Testing Device
5.5.4	WB1.2	Work on busbars/spouts
5.6	WB1.5.3	Compressed gas - rules as for compressed air
5.6.1(c)	WB1.5.2	Compressed air - Release to atmosphere
5.6.1 (d)	AA3.2.2	Safety locks - Compressed Air
5.6.2	WB1.5.1	Compressed air - Operating adjustments
5.6.3	WB1.5.4	Apparatus containing SF6
5.6.4	PG4.3.2	LoA work on Compressed Gas installations
5.7.1(a)	OB5.2.1	Transformer - Remote isolation
5.7.1(c)	OB4.6	Traction supplies
5.7.1(d)	OB5.2.2	Transformers etc. - LV Isolation
5.7.1(e)	OB5.2.3	Withdrawable VT's etc.
5.7.1(g)	AA3.2.5	Safety locks - Transformers
5.7.2	WB3.3	CME, transformers fed from lines
5.7.3	WB2.1	Identification of Transformers
5.8.2	OB6.1	Capacitors Approved Earthing devices

DSR Ref	OPM Ref	Description
5.8.4	OB6.1	Capacitors Approved Earthing devices
5.8.4	WB3.4	Additional Earths - Capacitors
5.9.1	WC6.1	Faulted Cables - prove dead before touching
5.9.2	WC3	HV Cable identification
5.9.3	WC3.4	Cable insulated sheath installations
5.9.4	WC3.5	Interconnection between hot & cold sites
5.9.4	WC4.1	Auxiliary cables - induced voltage
5.9.4	PG4.3.4	Auxiliary cables – Limitation of Access for work
5.10	WD3.1.2	Lines in Proximity
5.10	OB6.5.5	Portable Earths - Earthed poles
5.10(ii)	WD2.1	Line identification
5.10.1(a)	WD1.1	Appendix WD.1 rescue procedures
5.10.1(a)	WD1.2	Climbing above 2m
5.10.1(b)	WD2.2.1	Portable ladders
5.10.1(d)	WD3.3	Check for Live steelwork.
5.10.3(a)	WD4.1.1	Additional Earths at point of work
5.10.3(a)	OB6.5.4/5	Application of Additional Earths to lines
5.10.3(b)	PG2.1e	SAP - use of Additional Earth Schedule
5.10.3(b)	OB6.2.9	Additional Earths - responsibility of CP
5.10.3(c)	WD4.1.2	Additional Earths across a break in Conductor.
5.10.4	WD4.5.1	Suspension of Work
5.10.5.2	WD3.1.1	Poles/towers - safe access, Live conductors
5.10.6(b)	WD3.3.4	Climbing Towers above W and A clearance
5.10.7	OB6.2.6	Under running Live Conductors
5.10.7	WD4.2	Auto Reclose on adjacent Live Lines

DSR Ref	OPM Ref	Description
5.10.7	WD4.3.2	Movement etc. of Conductors at crossings
5.10.8	WC4.1.2	Auxiliary cables - catenary supported
5.11.1	WD3.2	Multiple work positions
5.11.1	WD3.4	Line Identification
5.11.1	OB4.5.1	Voltage testing device
5.12.1(b)	WD3.4.1	Identification - Double Circuit lines
5.12.3(a)	WD3.3.3	Precautions against steelwork becoming Live
5.12.3(b)	OB4.5.1	Voltage testing device
5.13; 14; 15	WD3.4.1	Lines with Flag Brackets
5.14.3	WD3.4.3	Supervision by SAP (delegation)
6	WA1	Conditions for High Voltage Live Line work
6	WD6	High Voltage Live Line work
6.1.1	WD6.1.1	Approved Live Line procedures
6.1.2	WD6.2.1	Live Line Authorisation
6.1.3	WD6.2.2	Live Line Supervision
6.1.4	WD6.1.1	Approved Live Line tools and equipment
6.2.2	WD6.1.1	Approved procedures
6.3.1	WD6.1.1	Exception for Hot Glove work
6.3.3	WD6.2.3	Recording procedure. App. WD.1 LL Record
6.3.3	WD6.2.5	Live Line - Protection settings.
6.3.5	WD6.4.3	Incomplete Live Line work.
6.3.7	WD6.1.1	Approach to non Isolated Conductors (hot glove)
6.3.9	WD1.3	Access to damaged poles
6.3.9	WD6.3.1	Precautions before climbing.
6.3.10	WD6.3.1	Live Line - Check for Live steelwork.

DSR Ref	OPM Ref	Description
6.3.11	WD6.1.1	Clearances - exception for Hot Glove
7.1	WE	Testing
7.1	WF3.1.5	Construction work - Testing
7.2	PG3.1	Recording operations and work under SFT
7.3.1	WE1.1.2	Discharge after Test.
7.3.2	WE4c	Test leads
7.3.3	PB2.3	Live phasing checks etc.
7.3.3	OB4.5.1	Specification and use of Voltage Indicators
8.1.1	OC	Procedures - LV System
8.1.3	OC3.4.1	LV Earthing devices
8.1.4	OC1	Authorisation for LV
8.1.4	OC2	Control of LV Systems
8.1.5	WA1.1.1	Work on LV - Safety documents
8.1.6	OC4 f	Checks following energising
8.1.7	WD4.3.2	Movement etc. of Conductors at crossings, LV
8.1.8	OC4	Integrity of low voltage apparatus
8.2.1	OC3.3.1	LV isolation
8.2.2	OC3.4.1	LV Earthing devices
8.2.4	C3.3.2	LV Screening
8.2.6	OC3.1.5	LV voltage testing device
8.3.1	WC2.1	Cable identification
8.3.1	WC6.2.1	LV Cable identification.
8.3.1	WC6.2.3/4	Tracing, testing & making safe
8.3.1 (a)	WC6.1	Faulted Cables - prove dead before touching
8.3.1(c)	OC3.1.7	LV voltage testing device

DSR Ref	OPM Ref	Description
8.3.1(c)	WC6.2.2	Safe excavation in proximity to LV cable fault
8.3.2	WC4	Auxiliary cables - Identification and Induced voltage
8.4.1	OC3.4.1	LV Earthing devices
8.5.1	WA1.1	LV Live work to Approved procedures
8.5.2	WA1.1.1	LV Live work to Approved procedures
8.5.2	WA2.1.3	Working Party - Responsibility.
8.5.3	WA1.1.1	LV Live work with Approved tools etc.
8.5.4	WA1.1.2	Second Person - LV Live Work.
8.6.1	WC2.1	Cable identification
8.6.1	WC2.2.2 b	Insulating material for shrouding
8.6.1	WC2.2.2 c	Insulated bonding Conductors.
8.6.2	PE2.1.3	Insulating Gloves - LV
8.6.2	PE2.2	Insulating mats etc.
8.6.2	WA1.1.1	Work on bare LV conductors.
8.6.2	WA2.1.8	LV cut outs - changing Live
8.6.2	WC2.2.2a	Insulated tools for Live LV work
8.7.1	OC3.1.7	LV voltage testing device
8.7.2	PE2.1.3	Insulating gloves for LV work.
8.7.2	WC2.2.2a	Insulated tools for LV work.
8.8.1	OC	No application of HV rules to LV
8.9.1	OC3.1.7	Instruments for LV testing.
8.9.1	WC2.2.2	Insulated tools and equipment for LV testing.
8.9.2	WA2.1.4	Removal of covers for LV testing
9.1.1	PA1.3	Duties and Responsibilities
9.2.6	PG2.4	Clearance of PtW

DSR Ref	OPM Ref	Description
9.2.6	WD4.6.1	Completion of work, CP
9.3.2 (i)	OB2.2.1	Recording events and messages by Field Staff
9.3.4 (ii)	PG4.2	Control Engineer authority for LoA
9.4.4 (ii)	OB6.2.9	Additional Earths SAP and Earthing Schedules
9.4.4 (ii)	PG2.1 c	Issue (and record) flags & wristlets
9.4.5 (ii)	WD4.6.2	Return of flags and wristlets to SAP
9.4.5 (iv)	PG2.5	Cancellation of PtW
9.4.5 (iv)	PG3.3.3	Changes to operational state under Sft.
9.4.5 (iv)	PG3.4	Cancellation of Sft
9.4.6	OD2.2	SAP as Control Engineer in the field
9.5	OB2.1	Responsibilities of Control Engineers
9.5.1 (iv)	PG5	CE Cross boundary responsibility