Queensland Electricity Entity Standard
for Safe Access to High Voltage Electrical Apparatus

October 2018

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Queensland *Electricity Entity* Standard

for Safe Access to *High Voltage Electrical Apparatus*

Book No.

Issued to: _____

Signature of Receiver: _____

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NOTE: - This *Standard Shall* be returned to the ISSUER

on request or on termination of employment.

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Amendment History

Date	Summary of Changes
1 May 2008	First edition of new Queensland *Electricity Entity* Procedures for Safe Access to *High Voltage Electrical Apparatus*
29 March 2010	Annual review. *Validation* process added to Appendix C. *Access / Test Permit* Forms added. Other minor changes throughout the document.
28 May 2012	Annual review. Changes to *Operator Earths* requirements prior to issue of *Access/Test Permits*. Reviewed use of the word "Should" and it was removed and replaced as applicable to comply with Queensland Electricity Legislation and Codes. Other minor changes throughout the document.
28 February 2013	Mid-term review. Clarify the definition of "Work Area" and application of "*Work Area*" in Section 5.3
28 August 2015	Annual review. Update and align with QLD Legislation changes etc.
31 October 2018	Annual review, Update and align with QLD Legislation changes etc.

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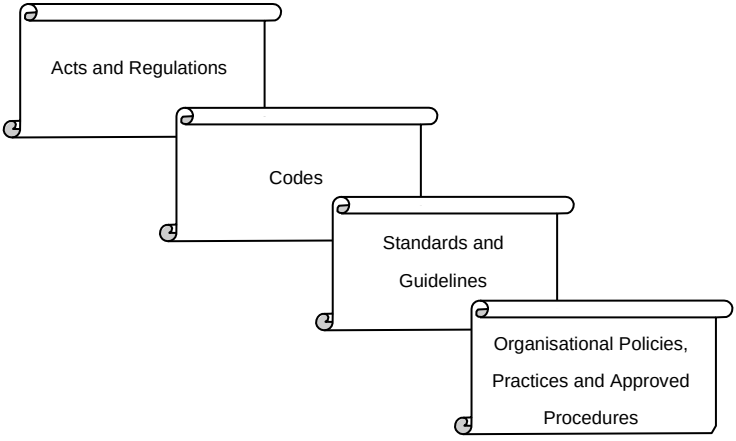
Foreword

The Queensland *Electricity Entity Standard* for Safe Access to *High Voltage Electrical Apparatus* has been developed to support the objectives of the Queensland Electrical Safety Act & Regulation, National Electricity Network Safety Code (ENA Doc 001-2008) and the National Guidelines for Safe Access to Electrical and Mechanical Apparatus (ENA NENS 03 - 2006).

In developing this *Standard*, Powerlink Queensland, Ergon Energy and Energex (Energy Queensland) adopted the National Guidelines for Safe Access to Electrical and Mechanical Apparatus (ENA NENS 03 - 2006) as the replacement for the superseded Queensland Government document - "*High Voltage* Isolation and Access Basic Principles". The Queensland *Electricity Entity Standard* for Safe Access to *High Voltage Electrical Apparatus* has been developed through consultative mechanisms within *Electricity Entity*, and Industry Union representatives.

This *Standard* fits within the following framework.



This *Standard* is an essential part of providing a safe system of work for all persons to safely access the *HV* system.

The key elements are:-

- The application of *Operator Earths* and *Working Earths*
- *Other Precautions* provided at the *Work Area*
- The documented isolation and access procedures

Where this *Standard* exceeds regulatory requirements, this *Standard Shall* take precedence.

Acknowledgements

Queensland *Electricity Entity High Voltage Switching* & Access Reference Group:-

- Tony Niven
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1 PRELIMINARY

1.1 Application

The Queensland *Electricity Entity Standard* for Safe Access to *High Voltage Electrical Apparatus* details the minimum general requirements for work to be carried out under an *Access* / *Test Permit* on *Electricity Entity* assets and may be supplemented by *Electricity Entity Approved Procedures*.

This *Standard Shall* be issued or made available to all persons who may be associated with planning, designing, constructing, commissioning, operating, and maintaining the *Electricity Entity's High Voltage Electrical Apparatus.*

It is the responsibility of all such persons to make themselves thoroughly conversant with this *Standard* and any supplementary *Electricity Entity Approved Procedures.*

Consequently, it is expected that each person concerned *Shall*, at all times, strictly observe the requirements of this *Standard* and any supplementary *Electricity Entity Approved Procedures*, thereby assisting in minimising risk.

1.2 Notification / Investigation of breaches associated with this *Standard*

Any departure from the requirements of this *Standard* could lead to serious injury or death, not only to the electrical worker who fails to observe them, but also to other workers. Additionally, this may result in damage to important *Electrical Apparatus*.

The *Electricity Entity Shall* be notified in accordance with the *Electricity Entity* policy for any breach associated with this *Standard*.

The *Electricity Entity Shall* investigate and report all breaches in accordance with their policy and share as appropriate at the Industry Forum.

1.3 Introduction

Safety is of paramount importance. This *Standard* is provided to support a safe system for work on or *Near High Voltage Electrical Apparatus* associated with the transmission and distribution of electricity.

It is essential that all personnel strictly adhere to the requirements of this *Standard* to ensure safe working conditions and practices are established and maintained. Whenever a person has concern for safety of personnel or *Electrical Apparatus*, they *Shall* cease work and advise relevant personnel.

Before commencing work on or *Near High Voltage Electrical Apparatus,* one of the following types of *Permits Shall* be issued:-

a) an *Access Permit* for work on or *Near High Voltage Electrical Apparatus*

b) a *Test Permit* for testing where *Lethal Currents* are involved.

An *Access / Test Permit Shall* only be issued after the associated *High Voltage Electrical Apparatus* has been *Isolated*, proved *De-energised, Earthed* and short-circuited.

1.4 Standard Scope

This Standard for Safe Access to *High Voltage Electrical Apparatus Shall* apply to all personnel who work on or *Near Electricity Entity High Voltage Electrical Apparatus*.

This *Standard* does not apply to:-

a) *High Voltage Live Work*
b) *Low Voltage* Work
c) *Not Electrically Connected Electrical Apparatus*
d) *Switching* to reconfigure the *High Voltage* System
e) Work outside *Exclusion Zones*
f) Non Access Work
g) Isolation of Mechanical Apparatus.

1.5 References

- Queensland Electrical Safety Legislation (Act, Regulation & Codes of Practice)
- ENA National Electricity Network Safety Code
- ENA National Guidelines for Safe Access to Electrical and Mechanical Apparatus
- *Electricity Entity* Electrical Safety Rules and *Procedures*

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2 DEFINITIONS

Note: - Where defined words / phrases are used in this *Standard* they will be shown in italics and start with capital letters.

Access Permit (Access Authority) – a document that forms part of a safe system to work, to provide electrically safe access to *High Voltage Electrical Apparatus*.

Applicant – a trained person who applies to an *Outage Co-ordinator* requesting an *Access / Test Permit*.

Approved – having appropriate organisation endorsement in writing for a specific function.

Authorised Person – a person with technical knowledge or sufficient experience who has been *Approved*, or has the delegated authority to act on behalf of the organisation, to perform the duty concerned.

Barrier – a rope, tape, barricade or alternative erected in accordance with this *Standard.*

Cable – an insulated *Conductor*, or two or more such *Conductors*, laid together, whether with or without fillings, reinforcements or protective coverings. (Note: - *Cable* for the purpose of these Guidelines also means aerial bundled *Cables*.)

Cancellation of an Access / Test Permit – an *Access / Test Permit* has been *Surrendered* and authorisation for access to work on or *Near*, or test, *Electrical Apparatus* has been terminated.

Competent – means a person who has acquired, through training, qualifications, experience or a combination of these, the knowledge and skill to carry out the task.

Conductor – a wire, *Cable* or form of metal designed for carrying electric current.

Control Authority – an organisation that is responsible for the control of the *Electrical Apparatus* concerned.

Control Measures – *Policies, Standards*, *Procedures* or actions to eliminate, avoid or minimise risks.

De-energised – separated from all sources of *Supply* but not necessarily *Isolated*, *Earthed*, discharged or out of commission.

Disconnected – means that the parts are not connected to an electrical source. Disconnection may be achieved by de-energising, isolating, separating or breaking connections, or through all of these methods. A part that is *Disconnected* may still require discharging to remove all electric and other energy.

Disconnection Point – An adequate break created by the removal or absence of *Conductor*s and deemed no longer a source of inadvertent energisation.

The break *Shall*:-

- not be able to be re-established by normal *Switching* operations, and
- maintain Exclusion Zone appropriate to the voltage or maintain electrical non-flashover distance appropriate to the voltage as defined by the *Electricity Entity*, and
- be created in accordance with an *Electricity Entity Approved Procedure* to establish a *Disconnection Point*.

Do Not Operate Board (DNOB) – A Safety *Sign* bearing the words "Do Not Operate" used to identify *Isolation Point*s or *Operator Earths*. Refer Clause 3.10.1 and Appendix B.

Earthed – electrically connected to the general mass of earth by a *Conductor* to ensure and maintain the effective dissipation of electrical energy.

Earthing Switch – a permanently installed device which, when closed, ensures that the *Electrical Apparatus* at that point is *Earthed*.

Earths – *Approved* earthing devices applied for the earthing and short-circuiting of *Electrical Apparatus*.

Electric Line – a wire or *Conductor* or associated equipment used for transmitting, transforming, or supplying electricity at a voltage greater than extra *Low Voltage*.

However, an *Electric Line* does not include -

a) a wire or *Conductor* directly used in converting electricity into another form of energy; or
b) a wire or *Conductor* within the internal structure of a building.

Electrical Apparatus – any *Electrical Equipment* or *Electric Line* the *Conductors* of which are *Live* or can be made *Live*.

Electrical Equipment – any apparatus, appliance, *Cable, Conductor*, fitting, insulator, material, meter or wire that -

a) is used for controlling, generating, supplying, transforming or transmitting electricity at a voltage greater than extra *Low Voltage*; or
b) is operated by electricity at a voltage greater than extra *Low Voltage*; or
c) is part of an electrical installation located in an area in which the atmosphere presents a risk to health and safety from fire or explosion; or
d) is, or is part of, a cathodic protection system.

Electricity Entity – For the purposes of this *Standard*: Powerlink, Energex and Ergon Energy (Energy Queensland).

Emergency Switching – Immediate *Switching* for safeguarding personnel, preventing damage to *Electrical Apparatus*, restoring *Supply* or providing

access for emergency repair of *Electrical Apparatus*.

Energised – connected to any source of electrical energy.

Exclusion Zone – *Exclusion Zone*, for a person, operating plant or vehicle for *Electrical Apparatus*, means the distance from the *Electrical Apparatus* stated for the person, plant or vehicle in the Electrical Safety Regulation 2013 Part 5 Sect 69 (4).

Exposed – bare; or not effectively insulated; or not effectively guarded by either a fixed *Barrier* or an *Earthed* metal shield.

Hazardous Condition Warning Tag – a warning *Sign* indicating a particular hazard or hazardous condition. Operation of a device with this tag affixed is not likely to be life threatening although it may result in injury, equipment damage or an outage. Refer *Clause 3.10.2* and *Appendix B*.

High Voltage (HV) – a nominal voltage exceeding 1,000 volts alternating current or exceeding 1,500 volts direct current.

Individual of Work Group – a person authorised to carry out work under an *Access / Test Permit.*

Instructed Person – a person who is acting under the supervision of an *authorized person* for the *Electrical Apparatus*.

Isolated – *Disconnected* from all possible sources of electricity *Supply* and rendered incapable of being made *energised* without premeditated and deliberate action.

Isolation Point – An adequate break *Approved* by the *Electricity Entity* that prevents any inadvertent energisation, for example from lightning, *Switching* or back energisation. (A *DNOB Shall* be attached at the *Isolation Point*.)

Lethal Current – current in excess of 40 mA alternating current or 150 mA direct current through the human body.

Live – *Energised* or subject to hazardous induced or capacitive voltages.

Live Work – all work performed on components of *Electrical Apparatus*, not *Isolated*, not proved *De-Energised* and not *Earthed*.

Low Voltage – a nominal voltage exceeding 50 volts alternating current or 120 volts direct current, but not exceeding 1,000 volts alternating current or 1,500 volts direct current.

Manual Switching – all *Switching* not performed via *Remote Control*.

Mobile Plant (Operating Plant) – cranes, elevating work platforms, tip trucks or similar plant, any equipment fitted with a jib or boom and any device capable of raising or lowering a load.

Near – a situation where there is a reasonable possibility of a person, either directly or through any conducting medium, coming within the relevant *Exclusion Zones*.

Nearby – *Electrical Apparatus* which is outside the scope of the *Access / Test Permit*, but identified by the *Switching Operator* as a potential electrical hazard at the *Work Area* e.g. adjacent *HV* overhead strung bus.

Not Electrically Connected – *Electrical Apparatus Disconnected* from all sources of *Supply* by the removal or absence of *Conductors*, appropriate to the voltage and insulating medium and, not able to be *Energised* by *Switching* and identified in accordance with an *Electricity Entity Approved Procedure*.

Operator Earth (Access Authority *Earth*) – *Approved* earthing and short-circuiting equipment applied to *Electrical Apparatus* (with *DNOB* attached), as a requirement for the issue of an *Access / Test Permit*, to ensure the *Electrical Apparatus* is *Earthed*.

Other Precautions – safety *Signs*, *Barrier*s and other *Approved* measures applied at the *Work Area* to contribute to the electrical safety of the work group prior to or after the issue of an *Access / Test Permit*.

Outage Co-ordinator – an *Authorised Person* who negotiates and determines access / test requirements with an *Applicant,* and arranges for the production and issue of *Switching Sheets* and related *Access / Test Permits*.

Overhead Line – any aerial *Conductor* or *Conductors* with associated supports, insulators and other apparatus, erected, or in the course of erection, for the purpose of the conveyance of electrical energy.

Permanent Earthing Point – a permanent earth connection such as a *Substation* earthing grid, steel tower, *High Voltage* earth or *Low Voltage* neutral on a bonded earth network.

Permit to Work Tag (PTW) – a safety *Sign* attached to a point of isolation (such as dampers, valves and switchgear) bearing the words "Do Not Operate" signifying that this is a point of isolation.

Phasing Out – a test to determine whether *Electrical Apparatus* phasing is correct to allow connection.

Procedure – the documentation of a systematic series of actions (or activities) directed to achieve a desired result.

Recipient (Authorised Person In Charge) – an *Authorised Person* to whom an *Access / Test Permit has* been issued and is the person responsible for compliance with the requirements of the *Access / Test Permit*.

Remote Control – a facility for indirectly initiating the operation of *Electrical Apparatus* remotely from the *Electrical Apparatus*.

Safety Observer (when working *Near Exposed Electrical Apparatus*) – a person *Competent* for the task and specifically assigned the duty of observing and warning against unsafe approach to *Electrical Apparatus* or other unsafe conditions.

Safety Precautions – *Isolation Points, Disconnection Points* and *Operator Earths* provided to guard against and reduce the effects of inadvertent re-

energisation while working under an *Access / Test Permit* and identified on the *Switching Sheet* and *Access / Test Permit* by a unique alphabetic character (not I or O) unless not required by an *Electrical Entity Approved Procedure)*.

Shall – is to be interpreted as mandatory.

Sign – a board, label, tag or other delineated space used to convey a message.

Standard – written definition, limit, or rule, *Approved* and monitored for compliance by an authoritative agency or professional or recognised body as a minimum acceptable benchmark. *(*This *Standard)*

Substation – a switchyard, terminal station or place, at which *High Voltage Supply* is switched, converted or transformed.

Supply – provide electrical energy.

Surrender of an Access / Test Permit – documented by the *Recipient* that all persons signed on the *Access / Test Permit have* ceased work and have signed off the *Access / Test Permit* as recognition that their access to the *Electrical Apparatus* has been relinquished.

Suspension of an Access Permit – that all persons signed on an *Access Permit* have ceased work and have signed off the *Access Permit* as recognition that their work is suspended and *Shall* not recommence until access is granted by the *Control Authority* and they have re-signed on the *Access Permit*.

Switching (Electrical Operating Work) – work involving the operating of *Switching* devices, links, fuses or other connections intended for ready removal or replacement, proving electrical *Conductor*s *De-energised*, Earthing and short-circuiting, locking and tagging of *Electrical Apparatus* and erection of *Barrier*s and *Signs*.

Switching Co-ordinator – an *Authorised Person* who co-ordinates *Switching*, performs *Switching* by *Remote Control* and approves the issue of *Access / Test Permits*.

Switching Operator – an *Authorised Person* who performs *Switching*, and issues *Access / Test Permits*.

Switching Operator's Assistant – an *Authorised Person* who assists a *Switching Operator* perform *Switching*.

Switching Sheet – a document that is part of a safe system of work. Each *Switching Sheet Shall* have a unique reference and *Shall* list a process of isolation and access step by step.

Switching Sheet Authoriser – a trained person who authorises a *Switching Sheet* to proceed on a nominated date and time.

Switching Sheet Checker – an *Authorised Person* who verifies that *Switching Sheet*s are correct.

Switching Sheet Writer – a trained person who writes a *Switching Sheet* to provide isolation and access to *Electrical Apparatus*.

Test Permit – a documented form of authorisation that allows access to *HV Electrical Apparatus* for testing and minor works associated with testing, and the removal of *Operator Earths*.

Validation – a documented process between organisations to ensure *HV Electrical Apparatus* is suitable for the purpose of isolating and earthing and is correctly identified and in the correct sequence to enable safe access and testing.

Work Area – the defined area where work is to be carried out under an *Access / Test Permit*.

Work Group Member – this includes Individuals of Work Group, and *Instructed Person*s required to sign on an *Access / Test Permit*.

Working Earth – *Approved* earthing and short-circuiting equipment, applied to *Electrical Apparatus*, additional to *Operator Earths* following the issue of an *Access / Test Permit*.

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3 WORKING ON *ELECTRICITY ENTITY* ASSETS

3.1 Responsibilities of the Employer

Any Employer wanting to perform work or testing on an *Electricity Entity's* assets under this *Standard Shall* first seek approval from the relevant *Electricity Entity*.

The Employer *Shall* be responsible for:-

a) ensuring all persons requiring access to *High Voltage Electrical Apparatus* to perform work or testing are *Authorised* and trained to perform the roles for which they are responsible or are *Instructed Persons* under the supervision of an *Authorised Person*.

b) ensuring regular audits for compliance with this *Standard* are carried out.

The *Electricity Entity Shall* consider, and if appropriate, approve training packages that meet the objectives of this *Standard*.

3.2 Training and Assessment for Authorised Roles

The Employer is responsible for ensuring that all people performing authorised roles receive training and are assessed as *Competent* before authorisation / re-authorisation. The Employer is responsible for maintaining a register of all *Authorised Person*s with details of any restrictions.

The *Electricity Entity Shall* maintain records of approvals and the employer *Shall* submit records of *Authorised Persons* and any associated restrictions.

3.2.1 Period of Authorisation

An *Authorised Person* under this *Standard Shall* be assessed as *Competent* to perform such tasks, and be reassessed at intervals not exceeding three years to ensure their competency is maintained. A breach of this *Standard* may lead to the withdrawal of a person's authorisation(s) by the *Electricity Entity* or the Employer.

3.2.2 **Authorised Persons**

The following roles are *Authorised Persons*:-

a) *Switching Co-ordinator*

b) *Outage Co-ordinator*

c) *Switching Sheet Checker*

d) *Switching Operator*

e) *Switching Operator's Assistant*

f) *Recipient*

g) Individual of Workgroup

Authorisation under this *Standard* may be restricted according to:-

h) Voltage level

i) Location

j) Type of *Electrical Apparatus*

k) Any other factor, as determined by the *Electricity Entity* (E.g. Electrical Licence).

An appropriately *Authorised Person* may perform multiple designated functions.

The Employer *Shall* maintain a record of individual authorisations that identifies authorisations, restrictions, and expiry dates.

3.3 Trained Roles

The following are Trained Roles for this *Standard*:-

a) *Applicant*

b) *Switching Sheet Writer*

c) *Switching Sheet Authoriser*

The employer is responsible for ensuring that all people performing trained roles receive training and are assessed as *Competent*.

3.4 Auditing

The *Electricity Entity* / Employer *Shall* have an effective audit process to allow auditing of compliance with this *Standard*. The Employer *Shall* ensure that they audit activities on a periodic basis and make results available to the *Electricity Entity* upon request. Processes *Shall* be in place to ensure all completed field copies of *Switching Sheets*, *Access / Test Permits* and associated documents are forwarded for auditing.

3.5 Changes to *Standard*

The *Queensland Electricity Entity High Voltage Switching & Access Reference Group Shall* review this *Standard* every two years or sooner as agreed by the *Reference Group*. *Electricity Entity* employees have the opportunity to provide comments for improvements to this *Standard*. These comments can be submitted to the *Electricity Entity's High Voltage Switching & Access Reference Group* in accordance with the *Electricity Entity's Procedures*.

Changes endorsed by the Queensland *Electricity Entity High Voltage Switching & Access Reference Group* and *Approved* by a nominated representative from each *Electricity Entity Shall* be given revision numbers and issued by the *Electricity Entities* to the appropriate personnel for inclusion in their *Standard*.

3.6 Document Control

All documentation associated with this *Standard Shall* be subject to document control standards.

3.7 Identification of *Electrical Apparatus*

The *Electricity Entity Shall* ensure that all *Electrical Apparatus* nominated as a *Switching Sheet* item is clearly identified by *Signs*. Discrepancies that exist between the *Switching Sheet* apparatus description and the signage *Shall* be reported to the *Control Authority* and corrected as soon as practicable.

3.8 Safety Equipment

Inspection and testing of safety equipment and tools used in relation to work associated with this *Standard Shall* be in accordance with the *Electricity Entity's Electrical Safety Rules* or *Procedures*, *Queensland Electrical Safety Act* and *Queensland Electrical Safety Regulations*.

3.9 Risk Management

A documented risk management process *Shall* be in place to address risks associated with work practices, the work environment, and the use of materials, *Mobile Plant*, tools and equipment.

Such a process *Shall* :-

a) identify the hazard

b) assess the risk

c) determine and implement *Control Measures* and

d) monitor and review the effectiveness of the risk management process.

3.10 Tags / Boards

3.10.1 Do Not Operate Board (DNOB)

Any device used to control and / or maintain a point of isolation, or *Operator Earth Shall* have a *DNOB* affixed.

DNOBs attached to *Isolation Points Shall* only be applied and removed by a *Switching* Operator as an operation on a *Switching* Sheet or under the direction of a *Switching Co-ordinator*.

Operator Earths with DNOBs attached, in addition to being applied and removed by a *Switching Operator* as an operation on a *Switching Sheet* or under the direction of a *Switching Co-ordinator* may also be removed under the direction of a *Recipient* under an *Access / Test Permit* in accordance with this *Standard*.

3.10.2 **Hazardous Condition Warning Tag**

In situations where the operation of *Switching* equipment (e.g. isolators, earth switches or circuit breakers) is likely to be hazardous, a *Hazardous Condition Warning Tag Shall* be used to warn of known operational problems that are not likely to be life threatening.

When a *Hazardous Condition Warning Tag* is warranted, the *Control Authority Shall* be advised and *Shall* record the reason for the application of the tag.

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4 ISOLATION OF *ELECTRICAL APPARATUS* FOR WORK

4.1 General

Electrical Apparatus is *Isolated* when electrical non-flashover distance appropriate to the voltage as defined by the *Electricity Entity*, exists between the *Electrical Apparatus* and the remainder of the *High Voltage* system.

Neutral earthing resistors and reactors normally form part of the *High Voltage* system. When bypassed and/or *Isolated* by *Approved* means they become part of the earthing system and *Exclusion Zones* no longer apply.

Isolation *Shall* extend to *Remote Controls* associated with *Isolation Points*, and to *Low Voltage* sources of *Supply* capable of back energising the *HV* system.

Any *Switching* leading to the issue of an *Access* / *Test Permit* or to the restoration of the network following *Cancellation* of all *Access* / *Test Permits Shall* be carried out in accordance with a *Switching Sheet*.

If *Isolation Points* change during the course of work, under an *Access* / *Test Permit*, then prior to *Isolation Points* being altered, all current related *Access* / *Test Permits Shall* be *Surrendered* and *Cancelled* and new *Access* / *Test Permits* issued reflecting the new *Isolation Points*.

4.2 *Isolation Points*

The *Electricity Entity Shall* assess and approve *Electrical Apparatus* suitable for use as *Isolation Point*s.

All *Isolation Points* associated with an *Access* / *Test Permit Shall* be clearly marked using *DNOBs*. Where possible the *DNOB Shall* be physically attached to the *Isolation Points*. Where it is impossible to physically attach a *DNOB* to an *Isolation Point*, a *DNOB Shall* be placed in a prominent position and as close as possible to the *Isolation Point* such that operating the device cannot be accomplished without encountering the *DNOB*.

Where it is possible, the *Electrical Apparatus* used for isolation purposes *Shall* be secured in the open position by locking or other *Approved* means. Where possible, primary control circuits *Shall* be electrically *Isolated* through use of a dedicated isolating switch / circuit breaker, or the removal of links / fuses.

Electrical Apparatus Shall be *Isolated* before the application of earthing, unless the design of *Electrical Apparatus* does not allow this to occur. In this situation *Approved Procedures Shall* be used.

4.3 Integrity of *Isolation Point*s

The integrity of all *Isolation Point(s) shall* be confirmed by the *Electricity Entity Approved Procedure*.
Where the integrity of the *Isolation Point* could be jeopardised, all work *Shall* immediately cease. The *Access / Test Permit Shall* be *Suspended* or *Surrendered* and *Cancelled* and work *Shall* not continue until clearance is provided by the *Switching Co-ordinator.*

When an *Isolation Point* has been created to prevent a *Low Voltage* source of *Supply* back energising the *HV* system and *Approved* work is taking place on the *Low Voltage Isolation Point*, the integrity of that *HV* and *LV* isolation *Shall* be maintained by an *Electricity Entity Approved Procedure*.

4.4 *Remote Control*s

Any *Remote Control* associated with *Electrical Apparatus* being worked on *Shall* be disabled.

4.5 Combination Isolation / *Earthing*

Some types of switchgear incorporate isolation and earthing in a combination three (3) position switch or have configurations that require physical removal of a *DNOB* from an *Isolation Point* to place an *Operator Earth*.

In the above situations only one *DNOB* is required. It *Shall* be placed and removed as operations on a *Switching Sheet* for the full sequence of *Switching*.

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5 EARTHING OF ELECTRICAL APPARATUS FOR WORK

5.1 General

Where possible or practicable (providing this does not introduce a hazardous situation) *Electrical Apparatus Shall* be proved *De-Energised* at the proposed point of application of *Earths*. All phases *Shall* be proved *De-Energised* using an *Approved* voltage detector before *Earths* are applied. Correct operation of the voltage detector *Shall* be verified immediately before and after proving *De-energised*. Where the design of *Electrical Apparatus* does not allow the testing to prove *De-energised*, then *Electrical Apparatus* with fault make earthing capability *Shall* be used after first checking other voltage or mechanical indicating devices that *Electrical Apparatus* is *de-energised*.

The purpose of earthing is:-

a) to enable protection equipment to operate and to limit the rise in potential difference at the *Work Area*, in the event that *Supply* is inadvertently restored

b) to safely discharge induced or residual voltage

5.2 Application of *Earths*

Application of *Earths* is considered electrical work and *Shall* only be performed by persons with an appropriate electrical license.

Earths Shall be applied immediately after proving *De-energised*. All *De-energised* phases *Shall* be *Earthed*. Tail(s) of portable *Earths Shall* be connected to a *Permanent Earthing Point* before application to the *Electrical Apparatus*. Where a *Permanent Earthing Point* is not available, the tail(s) of portable *Earths* may be connected to an *Approved* earth electrode driven into the ground to a minimum depth defined by the *Electricity Entity*.

Earths Shall be applied as close as practicable to any persons required to work on the *Isolated* system so that the *Earths*, where possible, are within sight of

such persons.

Where an earth switch is available, it is preferable to close the earth switch prior to applying or removing portable *Earths*.

Where a set of single-phase portable *Earths* is installed at the *Work Area*, all phases of the portable *Earths Shall* be connected individually to a common *Earthing Point*.

For the issue of an *Access* / *Test Permit, Electrical Apparatus Shall* not be *Earthed* through fuses or circuit breakers that are able to open / trip in the event of inadvertent energisation. However, when performing *Switching* prior to the issue of an *Access* / *Test Permit*, *Earthing* through a circuit breaker is permissible without making the circuit breaker inoperable.

Earths Shall be in place on *Electrical Apparatus* prior to and during the placement and removal of test leads. Where the design of the *Electrical Apparatus* does not allow this, *Electricity Entity Approved Procedures Shall* be used.

5.3 *Operator Earths*

Operator Earth(s) Shall be connected to *High Voltage Conductors* at location(s) that *Shall* enable the *Work Area* to be *De-energised* by the operation of a relevant High Voltage protection scheme in the event of inadvertent re-energisation through an *Isolation Point*. This should be achieved by placing *Operator Earth(s)* electrically adjacent to *Isolation Point(s)*. Where this is not reasonably practicable refer to **Section 5.5**.

An *Operator Earth Shall* be clearly identified by the attachment of a *DNOB* in a prominent position. For a set of three-phase portable *Earths* (trifurcated earth), one *DNOB Shall* be attached at the point of common connection of the 3 phases of the portable *Earths* to the earth tail. For single-phase *Earths*, a *DNOB*

Shall be attached in a prominent position to each phase.

Operator Earths may be (in order of preference):-

a) an *Earthing Switch*

b) a portable earth connected to a *Permanent Earthing Point*

c) a portable earth connected to an earth electrode installed in accordance with *Electricity Entity Approved Procedures.*

The method used *Shall* be adequate for the fault/short circuit current at the location and *Shall* enable protection to operate. The placement or removal of an *Operator Earth Shall* only be carried out if one of the following occurs:-

d) under the direction of a *Switching Sheet* with the approval of a *Switching Co-ordinator*

e) under the direction of a *Recipient* of a *Test Permit*

f) under the direction of a *Recipient* of an *Access Permit* with the approval of a *Switching Co-ordinator* in accordance with this *Standard.*

Operator Earths applied for an *Access Permit Shall* remain in place as required under the *Access Permit* except when required to be temporarily removed to allow testing involving non-*Lethal Current* or progress of work in accordance with this *Standard.* They *Shall* be replaced as soon as possible on the completion of the work or testing involving non-*Lethal Current*.

Where possible, Operator *Earths* associated with an *Access / Test Permit Shall* be restored before an *Access / Test Permit* is *Surrendered*.

When restoration of *Operator Earths* is not practical, the *Recipient Shall* obtain approval from the *Switching Co-ordinator to* leave nominated *Operator Earths* removed. On approval, the *Recipient Shall* record details of all *Operator Earths* not replaced in the Abnormalities Section of the *Access / Test Permit*.

If the location of *Operator Earths* change or are to be changed during the

course of work under an *Access / Test Permit*, then prior to *Operator Earths* being changed, all current relevant *Access / Test Permits Shall* be *Surrendered* and *Cancelled* and new *Access / Test Permits* issued to reflect the new location/s of *Operator Earths*.

If using a circuit breaker in the closed position to earth *Electrical Apparatus* for the issue of an *Access / Test Permit,* the circuit breaker *Shall* be made inoperable.

5.4 *Working Earths*

The current-carrying capacity of a *Working Earth Shall* be adequate to discharge stored or induced charge and to limit rise in potential difference at the *Work Area*.

The *Recipient Shall* co-ordinate the placement and removal of *Working Earths*. Only the *Recipient* or an *Individual of Work Group* under the direction of the *Recipient* may place or remove *Working Earths*.

The placement and removal of *Working Earths Shall* be recorded on the *Access / Test Permit* in the *Working Earth* schedule.

All *Working Earths* associated with an *Access / Test Permit Shall*, where practical, be removed before an *Access / Test Permit* is *Surrendered*. When removal of all *Working Earths* is not practical (for example, they are required for the subsequent issue of a new *Access / Test Permit*), the *Recipient Shall* obtain approval from the *Switching Co-ordinator* to leave the nominated *Working Earths* connected. On approval, the *Recipient Shall* record details of all *Working Earths* not removed in the Abnormalities Section of the *Access / Test Permit.*

Where a *Switching Operator* identifies *Working Earths* are still applied in a *Work Area* and the *Recipient* is not on site, the *Switching Operator Shall* make a reasonable effort to contact the *Recipient*. If the *Recipient* is not contactable,

the *Switching Operator Shall* investigate the situation to ensure that no person will be endangered by the removal of the *Working Earths* and ask the *Switching Co-ordinator* for approval to remove these *Earths*.

5.5 Absence of an *Operator Earth* on *High Voltage Electrical Apparatus* Under an Electrical *Access / Test Permit*

Where reasonably practicable *Operator Earths Shall* be applied to *Electrical Apparatus* prior to the issue of an *Access* / *Test Permit*. Where the design or configuration of specific *Electrical Apparatus* requires earthing practices not covered in this *Standard*, a documented risk assessment and *Electricity Entity Procedure Shall* be developed, endorsed and *Approved* by an appropriately qualified and authorised electrical engineer (RPEQ).

Where an *Operator Earth* has not been applied to *Electrical Apparatus* prior to the issue of an *Access* / *Test Permit*, the *Recipient Shall* arrange for earthing using the above *Approved* and documented advice to *Earth* the *Electrical Apparatus* before any *Work Crew Member* comes within the *Exclusion Zone* of the *High Voltage Conductors*.

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6 *Other Precautions*

6.1 General

The requirement for *Other Precautions Shall* be outlined as an item on the *Switching Sheet*. The *Switching Operator Shall* be responsible for initially determining and placing *Other Precautions* at the *Work Area* before issuing the *Access / Test Permit.*

Other Precautions provided by the *Switching Operator Shall* be recorded on the *Access / Test Permit*.

The Recipient Shall be responsible for ensuring that adequate *Other Precautions* are in place and maintained at the *Work Area* to suit the progress of work.

If the *Recipient* alters *Other Precautions*, the *Recipient Shall* record details of the changes on the *Access / Test Permit* and initial the changes.

When an *Access / Test Permit* is *Cancelled*, all *Other Precautions Shall* be removed before the removal of any *DNOB* associated with *Electrical Apparatus*.

6.2 Working under *Access / Test Permits* in *Substation* enclosures

For work under an *Access / Test Permit* in a *Substation* enclosure, the *Work Area Shall* be defined by *Barriers* and *Signs* in accordance with Appendix A and be established only after isolation and earthing have been completed.

6.3 Lines *Work Areas*

Any person wishing to work under an *Access / Test Permit* or approach one circuit of a double circuit *Overhead Line*, which has been made safe in accordance with this *Standard*, whilst the other circuit remains *Energised*, *Shall* positively identify the circuit to which access is permitted by referring to the circuit identification numbers or *Signs* displayed at the base of the structure

before ascending.

When work is being carried out on double circuit towers with one circuit *Energised*, a warning device *Shall* be suitably positioned below the tower waist on the *Energised* side.

6.4 Breaking Bridges under *Access / Test Permit*

Where the work under an *Access / Test Permit* involves the connection, cutting or disconnection of *High Voltage Conductors*, then *Approved* bridging leads *Shall* be applied across the proposed *Conductor* break, or *Earths Shall* be applied either side of (and as close as practicable to) the proposed break and individually connected to a common *Earthing Point* before the break is created. Failure to do so may lead to serious injury or death.

6.5 Nomination of a *Safety Observer*

The *Recipient Shall* appoint a *Safety Observer* when the work to be performed has the potential to come within the relevant *Exclusion Zone* as defined in the *Electricity Entity's Approved Procedures*.

On appointment of the *Safety Observer*, the *Recipient Shall*:-

a) identify the *Safety Observer* to the work group and
b) instruct the work group to follow safety directions given by the *Safety Observer*
c) instruct the *Safety Observer* that they *Shall* not carry out any work while performing their role of *Safety Observer*

6.6 Fixed *Barriers*

Fixed physical *Barriers* of *Approved* design may be used to prevent the work group coming within the *Exclusion Zone*. These *Barriers* may be a fixed screen or shield of suitable insulating material, or be a metal screen or shield that is permanently *Earthed*.

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7 SWITCHING SHEETS

7.1 General

When an *Access / Test Permit* is required for planned work, a *Switching Sheet* setting out the steps to prepare the *Electrical Apparatus* for access / test *Shall* be written, checked and authorised in accordance with this *Standard*.

In the case of *Emergency Switching*, all *Switching* performed *Shall* be recorded by the *Switching Co-ordinator* and *Switching Operator*.

A *Switching Sheet Shall* not be prepared and checked by the same person unless *Emergency Switching* is required.

Refer to Appendix C for *Switching* at the Generation / Transmission / Distribution / Customer interface.

7.2 Amendments to a *Switching Sheet*

Minor amendments are permitted to *Switching Sheets* when both of the following occur:-

a) the *Switching Co-ordinator* and *Switching Operator* are satisfied that safety *Shall* not be compromised.

b) sufficient space exists to insert amendment(s) on the *Switching Sheet*, or supplementary page/s is / are created and distributed to be inserted into the *Switching Sheet.*

All copies of the *Switching Operator's* and *Switching Co-ordinator's Switching Sheets Shall* be amended. All amendments *Shall* be clearly shown to avoid ambiguity or omission. Additional items *Shall* be numbered in a logical sequence.

Where major alterations to the *Switching Sheet* are required, the *Switching Sheet Shall* be cancelled and a new *Switching Sheet* prepared, checked and authorised.

7.3 *Switching Sheet* Requirements

A *Switching Sheet Shall* include the following:-

a) a unique reference number

b) the identification of the *Electrical Apparatus* to be worked on

c) the description of work to be carried out

d) all *Switching* required (step by step) to isolate, prove *De-energised,* and earth the *Electrical Apparatus* where access / test is required

e) provision for the recording of the time of the completion of each step carried out

f) the points of isolation, and associated *DNOBs*

g) locations at which *Operator Earths* and their associated *DNOBs* are to be applied

h) a unique alpha character identifier appended to the *Switching* operation for each *Isolation Point* and *Operator Earth (*do not use I or O*)* unless not required by an *Electricity Entity Approved Procedure*,

i) requirements for the placement of *Other Precautions*

j) the issue and receipt of any *Access / Test Permit*

k) the *Surrender* of any *Access / Test Permit*

l) the *Cancellation* of any *Access / Test Permit*

m) the *Suspension* and reinstatement of any *Access Permit* where required

n) any other relevant information as may be applicable *Switching Sheets Shall* use standard terminology, where possible, to describe operating actions.

7.4 *Applicant*

7.4.1 Responsibility of the *Applicant*

The *Applicant Shall* be responsible for:-

a) defining the scope of work

b) negotiating requirements for the *Access / Test Permit* with the *Outage Co-ordinator*

c) completing and submitting the request.

7.4.2 Role of the *Applicant*

When access to *Electrical Apparatus* or testing is required, a request for an *Access / Test Permit Shall* be submitted to the *Control Authority*. The format of the request and any associated lead-times *Shall* be as specified by the *Electricity Entity*.

The *Applicant Shall* become familiar with the scope and intent of the work / testing to be performed.

The *Applicant's* request *Shall* provide the following information, as a minimum:-

a) description of *Electrical Apparatus* to be worked on or tested

b) location of *Work Area*

c) work / test details

d) time / date and duration

e) *Applicant's* name and contact details

f) *Isolation Points*

g) earthing requirements

h) *Phasing Out* / phase rotation requirements (where applicable)

i) *Access Permit Suspension* requirements

j) any special requirements.

If the *Applicant* cannot meet the minimum requirements above, then they *Shall* seek further direction from the *Control Authority*.

*Applicant*s *Shall* submit all requests to the *Outage Co-ordinator*.

7.5 Roles and Responsibilities of an *Outage Co-ordinator*

Roles and Responsibilities of the *Outage Co-ordinator* include:-

a) deciding if formal application is required in line with this *Standard*
b) negotiating requirements for an *Access* / *Test Permit* and *Switching Sheet* with the *Applicant* ensuring sufficient information has been provided
c) arranging writing, checking and authorisation of a *Switching Sheet*
d) distributing *Switching Sheets* complete with associated *Access* / *Test Permits*.

7.6 *Switching Sheet Writer*

The *Switching Sheet Writer Shall be responsible for* preparing a *Switching Sheet* to provide safe and appropriate isolation and earthing for the issue of an *Access* / *Test Permit* to cover the scope of work.

7.7 *Switching Sheet Checker*

The *Switching Sheet Checker Shall* be responsible for:-

a) ensuring that the *Switching Sheet* provides safe and appropriate isolation and earthing for the issue of an *Access* / *Test Permit* for the scope of work
b) verify the format and accuracy of a *Switching Sheet*
c) endorse the *Switching Sheet* when it is compliant with the requirements.

7.8 *Switching Sheet Authoriser*

The *Switching Sheet Authoriser Shall* be responsible for:-

a) confirming writer and checker of the *Switching Sheet* are not the same person (excluding *Emergency Switching*)
b) confirming the *Switching* can proceed on the nominated time and date considering the effects on the network
c) endorsing the *Switching Sheet* as authorised.

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8 SWITCHING

8.1 General

The sequence of the *Switching*, including forward and reverse *Switching*, is critical and the sequence of the *Switching Sheet Shall* be adhered to at all times. If there are any perceived errors in the *Switching Sheet,* the *Control Authority Shall* be contacted for clarification.

All *Switching Shall* be performed by a *Switching* Operator; or a *Switching Operator's Assistant* under the direct supervision of a *Switching Operator*.

A trainee *Switching Operator's Assistant* can participate in the process of *Switching* under the direct supervision of a *Switching Operator* when accompanied by a *Switching Operator's Assistant*.

A trainee *Switching Operator* who is authorised as a *Switching Operator's Assistant* can perform the role of a *Switching Operator* under the direct supervision of a *Switching Operator.*

Switching operations *Shall* be carried out in accordance with this *Standard* and under the direction of a *Switching Co-ordinator*.

While *Switching* operations are being carried out, only the *Switching Operator*, *Switching Operator's Assistant* or trainee *Switching Operator* / *Switching Operator's Assistant Shall* be in the vicinity of the *Electrical Apparatus* being switched.

8.2 Approval to Proceed

Before commencing any *Switching* on a *Switching Sheet*, a *Switching Operator Shall* obtain approval from the relevant *Switching Co-ordinator*.

The *Switching Co-ordinator Shall* verify that the *Switching Sheet* has been prepared and checked by different people (except for *Emergency Switching*) and assess the potential impact of the *Switching* on the network, before

granting approval.

Electrical Apparatus Shall not be *Energised* or re-energised unless:-

a) all relevant *Access* / *Test Permits* are *Cancelled* and all persons are clear the *Electrical Apparatus* is in a state suitable for energisation
b) all equipment, *Mobile Plant*, tools and materials are removed as appropriate all *Earths*, short-circuits and equipotential bonds, if used, are removed
c) appropriate checks and tests are carried out to ensure *Electrical Apparatus* is safe for service
d) approval is given by the *Control Authority* to energise or re-energise.

8.3 Roles and Responsibilities of a *Switching Co-Ordinator*

A *Switching Co-ordinator* may enquire if a person is appropriately authorised. The *Switching Co-ordinator Shall*:-

a) assess the impact of the *Switching* on the network
b) co-ordinate *Switching* with relevant *Switching Co-ordinator*s and organisations
c) direct and co-ordinate the progress of *Switching* with all *Switching Operators*
d) approve the issue of an *Access* / *Test Permit*
e) issue an *Access* / *Test Permit*
f) *Suspend* / reinstate *Access Permit*
g) *Cancel* an *Access* / *Test Permit* except where there is no effective communications with the *Switching Operator* and in this case *Cancellation Shall* be performed in accordance with the *Electricity Entity's Approved Procedures*.
h) maintain an up-to-date record of the status of all *Switching Sheets* and *Access* / *Test Permits* as they are executed

i) maintain an up-to-date record of network configuration and status, including location of *DNOBs* and hazard / warning *Signs*

j) direct any or all *Switching* to cease if any danger arises to personnel, *Electrical Apparatus* or network security

k) where applicable, undertake *Switching* via *Remote Control*

l) on advice of any abnormalities on the *Access / Test Permit*, take appropriate action for reverse *Switching* to be carried out safely.

8.4 Roles and Responsibilities of a *Switching Operator*

While performing *Manual Switching*, a *Switching Operator*, *Shall* be assisted by a *Switching Operator*'s Assistant.

The *Switching Operator Shall* be responsible for:-

a) carrying out *Switching*

b) issuing *Access / Test Permits*

c) erecting and removing *Other Precautions* if required

A *Switching Operator Shall*:-

d) confirm that they are in possession of the appropriate *Switching Sheet* (check *Switching Sheet* number, time, day, date and details of work)

e) familiarise themselves with the intent of the *Switching* and understand the consequences of each operation before commencing any *Switching Sheet*

f) advise the *Switching Co-ordinator* of any *Switching Sheet* errors or anomalies found before commencing *Switching*

g) obtain approval from the *Switching Co-ordinator* before *Switching* is commenced

h) record and read back any verbal directions issued by the *Switching Co-ordinator* for verification

i) ensure *Electrical Apparatus* is only operated as an item on a *Switching*

Sheet or on approval of the *Switching Co-ordinator*

j) ensure the *Electrical Apparatus* is correctly identified (for *Substation* / location and equipment designation) before performing each operation

k) record the time of each *Switching* operation performed

l) ensure any *Electrical Apparatus* with a *DNOB* affixed is only operated as an item on a *Switching Sheet*, or on approval of the *Switching Co-ordinator*

m) report any *Switching* performed in error, or any problem / anomaly encountered during *Switching*, immediately to the *Switching Co-ordinator* before proceeding further

n) ensure *Operator Earths* are only applied or removed as an item on a *Switching Sheet* or on approval of the *Switching Co-ordinator*

o) ensure *Electrical Apparatus* with two or more *DNOBs* attached is not operated; (One *DNOB* may be removed as a *Switching Sheet* item or on approval of the *Switching Co-ordinator*. The operating handle / mechanism of an existing *Isolation Point* is not to be unlocked to apply or remove additional *DNOBs*.)

p) place *Other Precautions* if required

q) issue an *Access / Test Permit*

r) notify the *Switching Co-ordinator* when *Switching* is completed

s) ensure *Switching* is carried out using *Approved* operating equipment in current test date.

8.5 Roles and Responsibilities of a *Switching Operator's Assistant*

A *Switching Operator's Assistant Shall* assist the *Switching Operator* by:-

a) consulting with the *Switching* Operator to become familiar with the basic intent of the *Switching Sheet*

b) understanding the consequences of each operation when performing

tasks as directed by the *Switching Operator*

c) advising the *Switching Operator* of any abnormality observed during *Switching* operations (e.g. dangerous situations, switch malfunctions).

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9 *ACCESS / TEST PERMIT*

9.1 General

An *Access / Test Permit Shall* be issued for all work or testing on or *Near High Voltage Exposed Electrical Apparatus*. A person *Shall* not work on or test such *Electrical Apparatus* unless signed on to an *Access / Test Permit* for such *Electrical Apparatus*.

An *Access / Test Permit Shall* only be issued after such *Electrical Apparatus* has been *Isolated*, proved *De-energised* and *Earthed*.

An *Access / Test Permit* is not required:-

a) when urgent human rescue is required, and processes are in place to ensure safety is maintained

b) for work on withdrawable *Electrical Apparatus* such as circuit breakers and voltage transformers that have been removed and withdrawn from their busbar with shutters closed and locked and *DNOBs* attached.

9.2 *Access / Test Permits* (Forms)

Each *Access / Test Permit Shall* have a unique reference number. An *Access / Test Permit Shall* be issued directly by a *Switching Operator* on approval of a *Switching Co-ordinator*, or verbally by a *Switching Co-ordinator* or *Switching Operator* via Radio / Phone.

As a minimum, an *Access / Test Permit Shall* include:-

a) a reference to the associated *Switching Sheet* number

b) location of the *Work Area*

c) expected issue time / day / date

d) expected *Surrender* time / day / date

e) provision for the *Switching Co-ordinator's* name

f) identification of the *Electrical Apparatus* to be worked on or tested

g) a description of work or testing to be carried out or the extent of access

to the *Electrical Apparatus*

h) a unique alpha character identifier appended to the *Switching* operation for each *Isolation Point* (do not use I or O) unless not required by *Electrical Entity Approved Procedures*

i) a unique alpha character identifier appended to the *Switching* operation for each *Operator Earth* (do not use I or O) unless not required by *Electrical Entity Approved Procedures*

j) details of any *Other Precautions* taken to contribute to the electrical safety of the work group

k) details of *Nearby Exposed Live HV/LV* that may affect the *Work Area*

l) provision for signing on and off by the work group

m) provision for the recording of the placement and removal of any *Working Earths*

n) an Abnormalities Section for recording anything a *Switching Operator* / *Switching Co-ordinator* is to be advised of before reversing the *Switching*

o) provision for declaration of issue and receipt

p) provision for declaration of *Surrender*

q) provision for the recording of any associated attachments or supplementary pages

r) provision for recording temporary *Suspension* (*Access Permit* only)

s) provision for transfer

t) provision for recording temporary removal of *Operator Earths*

The issue, receipt, *Suspension* (*Access Permit* only), *Surrender* and *Cancellation* of all *Access* / *Test Permits Shall* be recorded on their related *Switching Sheets*.

9.3 *Test Permit*

A *Test Permit Shall* be used where the electrical test may produce *Lethal*

Current.

Operator Earths may be removed and replaced under the direction of the *Recipient*. When applying and removing test leads and / or test equipment, the *Operator Earths* (and also *Working Earths* if required) *Shall* always remain in place.

Minor works may be carried out under a *Test Permit*. Minor works may include:-

- Phase identification of *HV Lines* and *Conductors*
- Circuit Breaker timing tests
- Protection testing
- *HV* Current Transformer and Voltage Transformer oil change / sample.

9.4 Testing Under an *Access Permit*

Testing is normally carried out under a *Test Permit*. However, where testing devices do not produce *Lethal Currents*, testing may be performed under an *Access Permit* in accordance with this *Standard*.

Some devices used to provide *High Voltage* for testing purposes may only produce small currents that are not lethal to the human body. If such devices are used to charge a length of *Cable* or capacitor to a *High Voltage*, sufficient charge can be stored to produce *Lethal Current*. Where such lethal conditions are created a *Test Permit Shall* be used. If there is any doubt as to whether

Lethal Current can be created, a *Test Permit Shall* be used.

When applying and removing test leads and / or test equipment, the *Recipient Shall ensure* the *Operator Earths* always remain in place. In addition to *Operator Earths*, *Working Earths* may need to be applied in certain situations. Failure to follow this process may lead to serious injury or death.

9.5 Removal of *Operator Earths* under an *Access Permit*

Operator Earths applied under an *Access Permit Shall* only be removed in accordance with this *Standard* to allow testing involving non-*Lethal Currents* or to allow the progress of work.

To remove *Operator Earths* the criteria listed below *Shall* be met:-

a) the *Recipient Shall* request approval from the *Switching Co-ordinator* before proceeding

b) the *Switching Co-ordinator Shall* give clearance that the removal of the *Operator Earths* may proceed. Before approval is granted, the *Switching Co-ordinator Shall*:-

   i) check if other work groups *Shall* be affected and advise affected *Recipients* that *Operator Earths Shall* be removed, and to *Suspend* or *Surrender* their *Access Permits*

   ii) receive and record confirmation from affected *Recipients* that their *Access Permits* have been *Suspended* or *Surrendered*

   iii) record the removal and replacement of *Operator Earths*.

c) electrical tests *Shall* not involve *Lethal Current* (or have the ability to create *Lethal Current* in the *Electrical Apparatus* under test)

d) *Exclusion Zone*s for *Electrical Apparatus* not covered by this *Access Permit Shall* not be encroached.

On completion of work or test the criteria listed below *Shall* be met:-

e) the *Recipient Shall* ensure that at the conclusion of the test or work, any *Electrical Apparatus* that may have become electrically charged during the course of the test or work, is fully discharged and is in a safe condition before the testing equipment is removed

f) the *Operator Earths Shall* be restored to their original position as soon as possible on completion of work or test

g) the *Recipient Shall* advise the *Switching* Coordinator the *Operator Earths* have been restored to their original position

h) the *Switching Co-ordinator Shall* inform all affected *Recipients* that they may reinstate their *Access Permits* and resume work

i) the *Switching Co-ordinator Shall* record the time for re-instatement of *Access Permits*.

9.6 Number of *Access / Test Permits* Required

Where access involves a large *Work Area*, a single *Access Permit* may be used, provided the *Recipient* can adequately supervise the electrical safety throughout the *Work Area*. This may include, but would not be restricted to, situations where all members of the work group have audible contact or are in visual range of the *Recipient*.

Where the *Work Areas* of concurrent *Access Permits* overlap, a single *Control Authority Shall* control all *Switching*.

No more than one *Test Permit Shall* be on issue for the same *Electrical Apparatus*.

Where a test involves work groups at more than one location, a single *Test Permit* may be used providing the *Recipient* can manage the testing *Procedure* such that the electrical safety at the other location(s) is not compromised:-

a) the original *Test Permit Shall* remain with the *Recipient*

b) *Test Permit* Supplementary Pages and a copy of the *Test Permit Shall* be held at the other location(s). The work group at the other location(s) *Shall* use the *Test Permit* Supplementary Pages to sign on and off the *Test Permit*

c) the *Recipient Shall* be responsible for maintaining up-to-date status for all locations of:-

    i) *Work Group Members* signing on and off

ii) a record of earthing.

9.7 *Recipient*

9.7.1 Responsibilities of the *Recipient* of an *Access Permit*

The *Recipient* of an *Access Permit Shall* be responsible for:-

a) receiving an *Access Permit*

b) erecting and altering *Other Precautions* in addition to those provided by the *Switching Operator,* and initialling the changes

c) ensuring all *Work Group Members* sign on / off the *Access Permit*

d) recording in the Abnormalities Section the absence of a *Work Group Member*, who has not signed off the *Access Permit*. A *Recipient Shall* not sign off on behalf of the absent *Work Group Member*

e) directing suitably *Authorised Persons* on the placement and removal of *Working Earths* and recording in the *Working Earth* schedule

f) directing suitably *Authorised Persons* on the removal and replacement of *Operator Earths* for testing with non-*Lethal Current* to allow the progress of work and recording in the *Operator Earth* schedule

g) supervising electrical safety at the *Work Area*

h) awareness of any absence of *Work Group Members* from the *Work Area*

i) reporting a lost or damaged *Access Permit*

j) transferring an *Access Permit*

k) *Suspending* and reinstating an *Access Permit*

l) completing the Abnormalities Section

m) *Surrendering* an *Access Permit*

n) if work proceeds for more than one day, briefing the work group regarding the *Access Permit* conditions at the start of each working day

o) advising an *Instructed Person* in accordance with the requirements of

Clause 9.12 of this *Standard*

p) supervising an *Instructed Person* or delegating the responsibility to supervise an *Instructed Person* to an *Individual of Work Group* in accordance with the requirements of Clause 9.12 of this *Standard.*

9.7.2 Responsibilities of the *Recipient* of a *Test Permit*

The *Recipient* of a *Test Permit Shall* be responsible for:-

a) receiving a *Test Permit*

b) ensuring *Test Permit* Supplementary pages and a copy of the current *Test Permit* is at the other locations (where applicable)

c) erecting and altering *Other Precautions* in addition to those provided by the *Switching Operator,* and initialling the changes

d) ensuring all *Work Group Members* sign on / off the *Test Permit*

e) recording in the Abnormalities Section the absence of a *Work Group Member*, who has not signed off the *Test Permit*. A *Recipient Shall* not sign off on behalf of the absent *Work Group Member*

f) directing suitably *Authorised Persons on the* removal and replacement of *Operator Earths* and *Working Earths* for testing and recording in the *Operator Earth* and *Working Earth* schedules

g) supervising electrical safety at the *Work Area*

h) awareness of any absence of *Work Group Members* from the *Work Area*

i) reporting a lost or damaged *Test Permit*

j) transferring a *Test Permit*

k) completing the Abnormalities Section

l) *Surrendering* a *Test Permit*

m) advising an *Instructed Person* in accordance with the requirements of Clause 9.12 of this *Standard*

n) if work proceeds for more than one day, briefing the work group

regarding the *Test Permit* conditions at the start of each working day

o) supervising an *Instructed Person* or delegating the responsibility to supervise an *Instructed Person* to an *Individual of Workgroup* in accordance with the requirements of Clause 9.12 of this *Standard*

9.7.3 Roles of a Recipient of an Access / Test Permit

The *Recipient Shall* undertake the following tasks or ensure that the following conditions have been met before receiving an *Access* / *Test Permit*:-

a) confirm the *Access* / *Test Permit* is endorsed as having been issued

b) confirm correct *Access* / *Test Permit* (location of *Work Area*, day and date of access, specified *Recipient* and work / test details)

c) confirm the *Access* / *Test Permit* provides access for work / test, as requested, and is appropriate for the work / testing to be undertaken

d) understand the limits of the *Access* / *Test Permit* including location of *Nearby Exposed Live HV*/*LV* at the *Work Area*

e) confirm the *Safety Precautions* are adequate

f) confirm *Other Precautions* are adequate

Before allowing persons to sign on to an *Access* / *Test Permit* to commence work / test, ensure that all persons:-

g) are instructed as to the *Electrical Apparatus* to be worked on, its identification details and the description of work or testing to be carried out

h) understand the limits of the *Access* / *Test Permit* including location of *Nearby Exposed Live HV*/*LV* at the *Work Area*

i) are made aware of the *Safety Precautions*

j) are made aware of *Other Precautions*, including the location of any *Barriers* and signage erected for the purposes of issuing the *Access* / *Test Permit*

k) understand their responsibilities under the *Access* / *Test Permit.*

For supervising electrical safety at the *Work Area*, the *Recipient Shall* ensure that:-

l) test equipment is connected and removed with *Operator Earths* applied. In addition to *Operator Earths, Working Earths* may need to be applied in certain situations. Failure to follow this process may lead to serious injury or death.

m) electrical testing is conducted in accordance with *Approved Procedures*

n) any *Earths* applied are only removed for the minimum amount of time possible

o) at the conclusion of the test, any *Electrical Apparatus* under test that may have become electrically charged during the course of the test, is fully discharged and is in a safe condition before the testing equipment is removed

p) the *Access* / *Test Permit* is readily available for the duration of issue

q) if there is a change in the scope of the work a review of the *Access* / *Test Permit Shall* be undertaken with the *Switching Co-ordinator* before that work / testing proceeds

r) where exceptional circumstances exist that require entry or exit to the *Work Area* by means other than the designated entry point, a risk assessment on each activity *Shall* be undertaken

s) when an *Access* / *Test Permit* is lost or damaged, the Work Group has been advised that the *Access* / *Test Permit* is lost or damaged and any work is to cease until a replacement *Access* / *Test Permit* is issued and the *Switching Co-ordinator* is advised that the *Access* / *Test Permit* has been lost or damaged and make arrangements for a replacement *Access* / *Test Permit.*

In addition to the above the *Recipient Shall* ensure for a *Test Permit* that the

Work Area is secure and apply *Other Precautions* where required.

The *Recipient Shall* remove and replace *Earths* associated with the *Test Permit*.

The *Recipient* has the authority to stop the work while being absent from the *Work Area*. The *Recipient Shall* only leave the *Work Area* for a short period while work is in progress if the electrical safety of the work group is not compromised.

In situations where a *Access / Test Permit* is on issue and the *Recipient* and Work Group leave the work-site with the intention of returning and continuing work under that permit (e.g. overnight or in an emergency) then the *Recipient Shall* ensure that *Electrical Entity Approved Procedures* are followed.

For other absences, the *Access / Test Permit Shall* be either transferred, *Suspended* (*Access Permit* only) or *Surrendered* and *Cancelled*.

9.8 Approving the issue of an *Access / Test Permit*

Before approving the issue of an *Access Permit*, the *Switching Co-ordinator Shall* ensure that:-

a) any pre-existing *Test Permit* issued for the *Electrical Apparatus* concerned has been *Surrendered* and *Cancelled*
b) there are no altered system conditions that may affect the safety of work under the *Access Permit.*

Before approving the issue of a *Test Permit*, the *Switching Co-ordinator Shall* ensure that:-

c) any pre-existing *Access / Test Permit*, issued for the *Electrical Apparatus* concerned has been *Suspended*, or *Surrendered* and *Cancelled*
d) there are no altered system conditions that may affect the safety of

work under the *Test Permit.*

9.9 Issuing an *Access / Test Permit*

The *Switching Operator* or *Switching Co-ordinator* issuing an *Access / Test Permit Shall* ensure that:-

a) all relevant sections of the *Access / Test Permit* are completed

b) the *Recipient* understands:-

   i) the extent of access to *Electrical Apparatus* to be worked on or tested

   ii) the location of *Safety Precautions*:-

      - *Isolation Point*s
      - *Disconnection Point*s
      - *Operator Earth*s

   iii) *Other Precautions* applied at the *Work Area*

   iv) the risk of any *Nearby Exposed Live HV/LV Conductor*s

   v) any other hazards associated with the *Work Area*

   vi) the *Access / Test Permit* is endorsed as having been issued

If the *Recipient* is not on site at the time of issue of the *Access / Test Permit*, then:-

c) *Access / Test Permit Shall* be left in an appropriate location on site and;

d) The *Switching Coordinator Shall* be notified of the location of the *Access / Test Permit* by the *Switching Operator*.

When the *Recipient* arrives on site, they *Shall* notify the *Switching Coordinator*:-

e) *Switching Sheet* number

f) *Access / Test Permit* number

g) Name of *Recipient*

h) Time and date received and

i) Confirm that they understand the conditions identified in *Section 9.9 (b).*

9.10 *Access / Test Permits* Issued Verbally (via Radio / Telephone)

Where an *Access / Test Permit* is issued verbally, the *Switching Co-ordinator / Switching Operator* and the *Recipient Shall* both maintain a copy of the *Access / Test Permit*. The *Switching Co-ordinator / Switching Operator Shall*:-

a) confirm that the *Recipient* has a legible copy of the correct *Access / Test Permit*

b) ensure the *Recipient* understands the extent of access to *Electrical Apparatus* to be worked on or tested

c) ensure the *Recipient* understands the location of *Safety Precautions*:-

- *Isolation Points*
- *Disconnection Points*
- *Operator Earths*

d) request that the *Recipient* provides and records details of *Other Precautions* taken to contribute to the electrical safety of the work group, and details of any *Nearby Exposed Live HV/LV* that may affect the *Work Area*

e) record details as provided by the *Recipient* on the *Switching Co-ordinator's / Switching Operator's* copy

f) sign the *Access / Test Permit* as being issued on the *Switching Co-ordinator's / Switching Operator's* copy

g) record the *Recipient's* name on the *Switching Co-ordinator's / Switching Operator's* copy.

9.11 Roles and Responsibilities of *Individual of Work Group*

The *Individual of Work Group Shall* be responsible for carrying out *Access / Test* requirements as directed by the *Recipient*.

An *Individual of Work Group* required to work under an *Access / Test Permit Shall*:-

a) understand the limits of the *Access / Test Permit*, including location of *Nearby Exposed Live HV/LV* at the *Work Area*
b) understand the *Safety Precautions* in place
c) understand the *Other Precautions*
d) sign on the *Access / Test Permit* once satisfied with the above
e) if work proceeds for more than one day under an *Access Permit*, be briefed by the *Recipient* regarding *Access Permit* conditions at the start of each working day
f) follow any safety directions given by the *Recipient* and / or *Safety Observer*
g) when entering or leaving the *Work Area*, do so only via the opening in the *Barrier* which defines the *Work Area* unless otherwise *Approved* by the *Recipient* for exceptional circumstances after the *Recipient* has undertaken a risk assessment on each activity
h) where required, advise or supervise *Instructed Persons* on the avoidance of any hazards
i) apply and remove *Working Earths* only as directed by the *Recipient* providing the *Individual of Work Group* is suitably *Authorised*
j) apply and remove *Operator Earths* only as directed by the *Recipient* providing the *Individual of Work Group* is suitably *Authorised*
k) sign off an *Access / Test Permit* and treat the *Electrical Apparatus* as *Live*.

9.12 Roles and Responsibilities of an *Instructed Person*

An *Instructed Person Shall* be responsible for complying with instructions given by *Authorised Persons* as outlined in this *Standard*.

An *Instructed Person* required to work under an *Access / Test Permit Shall*:

a) understand the limits of the *Access / Test Permit* including location of *Nearby Exposed Live HV/LV* at the *Work Area*
b) understand the *Safety Precautions*
c) understand the *Other Precautions*
d) sign on the *Access / Test Permit* once satisfied with the above
e) confirm they understand the instructions given on the work / testing to be undertaken
f) receive a brief on the access conditions by the *Recipient* at the start of each working day
g) follow any safety advice and directions given by the *Recipient*, *Individual of Work Group* and / or *Safety Observer*
h) when entering or leaving the *Work Area*, do so only via the opening in the *Barrier* which defines the *Work Area* unless otherwise *Approved* by the *Recipient* for exceptional circumstances after the *Recipient* has undertaken a risk assessment on each activity
i) not apply or remove *Working Earths* or *Operator Earths*
j) sign off an *Access / Test Permit* and treat the *Electrical Apparatus* as *Live*

9.13 Visitors to the *Work Area*

The safety requirements for an *Instructed Person Shall* be enacted for any visitor who is not appropriately authorised entering a designated *Work Area* under an *Access / Test Permit*.

9.14 Supplementary Pages and Attachment Pages

When insufficient space exists on an *Access / Test Permit* to record *Isolation Points* description (Section 8(a)) and / or *Operator Earth* locations (Section 9) an attachment page *Shall* be used. The *Recipient Shall* indicate the existence

of any attachment pages on the related *Access / Test Permit*.

Attachment pages *Shall* be attached to their associated *Access / Test Permits*.

9.15 Temporary Absence from *Work Area*

A person working under an *Access / Test Permit* may only leave the *Work Area* for a short period while work is in progress without signing off, provided that:-

a) the *Recipient* is advised before leaving
b) *Access / Test Permit* conditions are not likely to change during the person's absence
c) the *Access / Test Permit* is not intended to be *Surrendered / Suspended* during the person's absence
d) the person reports to the *Recipient* on returning to the *Work Area* to ensure that *Access / Test Permit* conditions have not altered.

In all other circumstances, the person *Shall* sign off the *Access / Test Permit*.

9.16 Suspension of an Access Permit

Suspension of an Access Permit Shall be in accordance with this Standard:-

a) *Suspension Shall* be at the discretion of the *Control Authority*
b) *Suspension Shall* only occur once
c) before approval is granted, the *Switching Co-ordinator Shall*:-
    i) check if other work groups will be affected and advise affected *Recipient/s* to *Suspend* or *Surrender* their *Access Permits*
    ii) confirm with affected *Recipient/s* that their *Access Permits* have been *Suspended* or *Surrendered* and *Cancelled*
    iii) confirm the status of the *Electrical Apparatus* at the time of the suspension of the work
    iv) *Cancel* any *Surrendered Access Permits*
d) the affected *Recipient/s Shall* ensure that all persons working under

the *Access Permit* sign off the *Access Permit* and inform them that their permission to work has been suspended until further notice

e) the *Recipient Shall* notify the *Switching Co-ordinator* that the work has been suspended and the status of the *Electrical Apparatus* at the time of the suspension of the work

f) the *Switching Co-ordinator Shall* record on the *Switching Sheet* the time of *Suspension* of the *Access Permit*

g) the affected *Recipient/s Shall* record on the *Access Permit* the time and date of *Suspension*.

9.17 Reinstatement of an *Access Permit*

Reinstatement of an *Access Permit Shall* not recommence until the *Switching Coordinator* has:-

a) confirmed with the affected *Recipient/s* that there are no alterations or modifications to the conditions of work under the *Access Permit*

b) provided clearance to the affected *Recipient/s* to reinstate the *Access Permit*

c) the *Switching Co-ordinator Shall* record on the *Switching Sheet* the time and date the *Access Permit/s* is reinstated

d) the affected *Recipient/s Shall* record on the *Access Permit* the time and date the *Access Permit* is reinstated.

9.18 Transfer of an *Access / Test Permit*

An *Access / Test Permit* may be transferred to another *Recipient* and *Shall* only occur once. A *Suspended Access Permit* may also be transferred to another *Recipient*.

The outgoing *Recipient Shall*:-

a) confirm that the incoming *Recipient* is authorised

b) advise the *Switching Co-ordinator* of the name of the incoming

Recipient and time and date of transfer

c) ensure that the incoming *Recipient* is briefed in person of the *Safety Precautions*, *Other Precautions* and any *Nearby Exposed HV* / *LV Electrical Apparatus*.

The incoming *Recipient Shall* advise the work group of the change of *Recipient*.

Where the original *Recipient* is absent from the *Work Area* or is incapacitated the incoming *Recipient Shall*:-

d) become familiar with the conditions of the *Access* / *Test Permit*

e) confirm the details of the Access / Test Permit and the *Safety Precautions*, *Other Precautions* and any *Nearby Exposed HV* / *LV Electrical Apparatus*

f) make a reasonable attempt to advise the outgoing *Recipient* of the transfer

g) advise their understanding of the *Access* / *Test Permit* conditions with the *Switching Co-ordinator* and obtain approval for the transfer from the *Switching Co-ordinator*

h) advise the work group regarding the change of *Recipient.*

9.19 Abnormalities Section

Prior to *Surrendering* the *Access* / *Test Permit,* the *Recipient Shall* record any abnormalities in the Abnormalities Section of the *Access* / *Test Permit.*

For example, any *Earths* not removed, unserviceable *Electrical Apparatus*, or absent personnel who have not signed off the *Access* / *Test Permit Shall* be identified and recorded in this section.

9.20 *Surrender of an Access / Test Permit*

When work / testing covered by an *Access* / *Test Permit* is completed, the *Recipient Shall* indicate that permission to work / test is relinquished by *Surrendering* the *Access* / *Test Permit*.

When an *Access / Test Permit* is to be *Surrendered*, the *Recipient Shall* ensure:-

a) any *Working Earths* applied during the work have been removed unless recorded in the Abnormalities Section
b) that all *Operator Earths* removed have been re-applied unless recorded in the Abnormalities Section
c) all persons signed on the *Access / Test Permit* have signed off
d) that any person not signed off is notified as soon as possible that the *Access / Test Permit* has been *Surrendered* and that they no longer have access and record their absence in the Abnormalities Section
e) when applicable, complete the Abnormalities Section
f) sign to indicate that the *Access / Test Permit* has been *Surrendered*
g) the *Switching Operator / Switching Co-ordinator* is informed that the *Access / Test Permit* is *Surrendered* and advise of any abnormalities (if applicable).

9.21 *Cancellation of an Access / Test Permit*

When an *Access / Test Permit* is to be *Cancelled*, the *Switching Co-ordinator Shall* confirm that:-

a) the *Access / Test Permit* has been signed off as being *Surrendered* by the *Recipient*
b) when applicable, consider the impact of items recorded in the Abnormalities Section and take appropriate action.

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10 APPENDIX A – USE OF *BARRIERS* & *SIGNS* TO DEFINE *WORK AREAS* FOR *ACCESS / TEST PERMIT*

The *Work Area* within a *Substation* is an area delineating *Electrical Apparatus* that are under an *Access / Test Permit*.

When establishing a *Work Area* the following *Shall* be observed:-

a) an *Approved Barrier* is to be erected indicating as clearly as possible the area in which work can be safely performed

b) the *Barrier Shall* be arranged so that the *Work Area* is accessible without interfering with or stepping over or under the *Barrier*

c) walls, fences or other impassable permanent *Barriers* can be used as a boundary for the *Work Area*

d) where practical only one entry to the *Work Area* is provided

e) a *Work Area Sign Shall* be clearly displayed in a prominent position at all entry points to the *Work Area*

f) the *Access / Test Permit Shall* be displayed at the entry point

g) established *Barriers* are to be moved or re-arranged only in accordance with this *Standard*

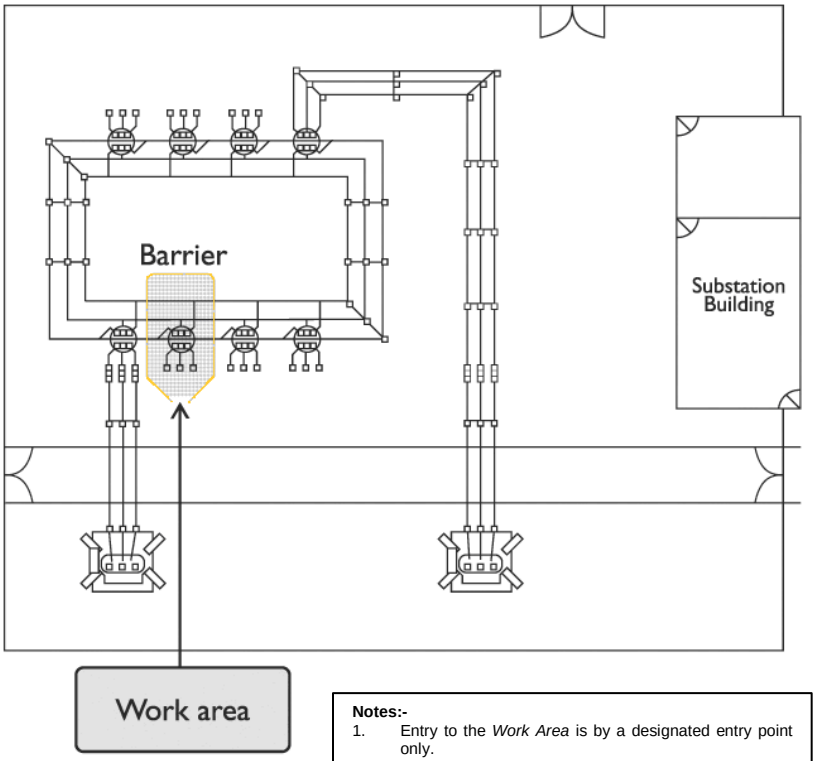
h) If it is possible to move within the *Work Area* in the vicinity of *Exposed Electrical Apparatus* that *Shall* be regarded as *Live*, "*Live HV Conductors Above or Beyond*" *Signs Shall* be placed at points showing there is *Electrical Apparatus* which *Shall* be regarded as *Live*, and from which persons *Shall* maintain the relevant *Exclusion Zone.*

The methods used for defining a *Work Area* in a *Substation Shall* be either the '*Barrier* in' or '*Barrier* out' Method. A yellow rope (of no less than 8mm in diameter) *Shall* be used for this purpose. The rope *Shall* be approximately 1.3 metres from the ground.

The '*Barrier* in' Method typically has an opening of approximately 2 metres as the entrance. This opening may only be increased by the *Recipient / Switching*

Operator (for example if *Mobile Plant* is required inside the *Work Area),* providing it does not introduce a hazard and the *Work Area* is clearly delineated.

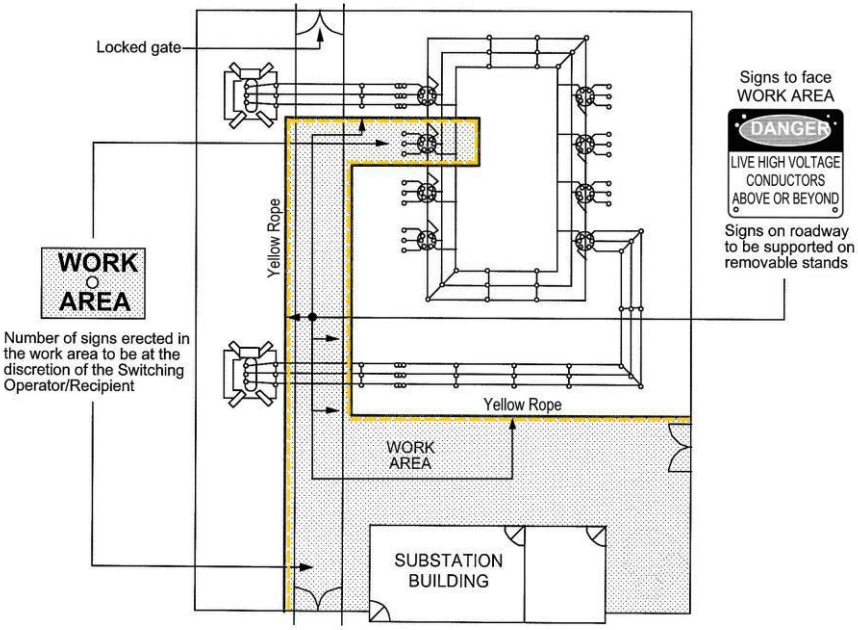
"*Barrier* in" Method



Notes:-

1. Entry to the *Work Area* is by a designated entry point only.
2. The yellow rope *Shall* be erected before issuing the *Access / Test Permit*.
3. The yellow rope is approximately 1.3m from the ground with a 2m opening.
4. *Access / Test Permits Shall* be displayed at the designated entry point.
5. A *Work Area Sign Shall* be prominently displayed at the designated entry point to the *Work Area.*

"*Barrier* out" Method



Examples of multi-panel taping Indoor Switchgear for *Barrier*-out Method.

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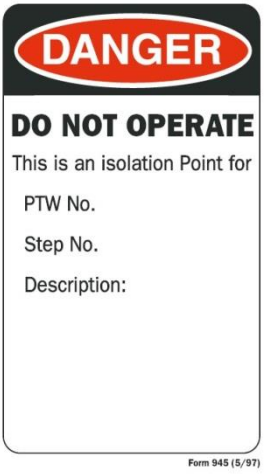
11 APPENDIX B – SAMPLE SIGNS AND TAGS

11.1 *Do Not Operate Board (DNOB)*

DNOBs are affixed to devices to show that they are points of isolation or *Operator Earths* and that they *Shall* not be operated or removed respectively. A *DNOB* has the same markings on both sides.

11.2 *Permit to Work Tag* (*PTW*)

A *PTW Tag* is identified by a number written on the *Tag*. It *Shall* not be operated or interfered with under any circumstances.



Sample Only

11.3 *Live High Voltage* Conductors Above Or Beyond *Sign*

Placed at points to indicate that there are *Conductors*, that *Shall* be regarded as *Live* and from which persons *Shall* need to maintain *Exclusion Zone*.

11.4 *High Voltage* Testing *Sign*

Placed to indicate that *Electrical Apparatus* is under test and that *Lethal Current* may be involved. *Electrical Apparatus Shall* be regarded as *Live* and persons *Shall* need to maintain the relevant *Exclusion Zone*.

11.5 *Hazardous Condition Warning Tag*

Warning Tag. (**Refer Clause 3.10.2**)

11.6 Work Area Sign

Placed to define the entrance to a *Work Area.*

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12 APPENDIX C – GENERATION / TRANSMISSION / DISTRIBUTION / CUSTOMER INTERFACE / DIRECT CONNECT CUSTOMERS

12.1 General

All Generation / Transmission / Distribution and Direct Connect Customers *Shall* have a *High Voltage Isolation and Access System* for safe access / testing of their network or *HV Installations*. These systems should be designed to meet or exceed *ENA NENS 03* for use at the interface must meet *State* and *Federal Acts* and regulations regarding *Switching Procedures*.

Examples are:-

a) Permit to Work *Procedure* (*PTW*)

b) Queensland *Electricity Entity Standard* for Safe Access to *High Voltage Electrical Apparatus* (this *Standard*)

c) Customer's Safe Systems of Work Procedures to allow access to *HV* equipment.

The following principles apply when *High Voltage Access / Testing* is required in the interface area.

12.2 *Validation*

Validation is required for *Approved* use of *Electrical Apparatus* owned by another organisation for the purpose of isolation and earthing to safely access for work / testing *High Voltage Electrical Apparatus* at the interface.

By completing the *Validation* process for a *Switching Sheet*, an external organisation via its *Authorised Persons*, accepts responsibility for providing the necessary isolation from all sources of *Supply* and earthing to prevent inadvertent energisation of the *Work Area* from that external organisation's *HV* network.

12.3 Choice of Safe Systems of Work Procedures

The *Procedure* used *Shall* be the *Procedure* in which the work group is trained.

Where work groups from both organisations are present, both *Procedures* may be applied providing it does not result in one organisation's *Procedure* affecting the *Procedures* required by the other.

When both the *Safe Systems of Work Procedures* and this *Standard* are applied, then concurrent work on either side of the interface that use the same *Isolation Points* may exist together. This is provided no electrical testing that involves *Lethal Current* (or have the ability to create *Lethal Current*) is carried out by any of the work groups and earthing continuity is not compromised.

As part of the planned work scope at the interface, the following rules will apply;

a) *Electrical* testing at the interface can only be carried out by one organisation at any one time, and

b) During *Electrical* testing (as referred to in **Section 12.3** there will be no other *Access* / *Test Permits* / *PTW or* similar currently issued by the other organisation, and

c) the *Access* / *Test Permits* / *PTW or* similar *Work Areas* from either organisation will not overlap.

12.4 Planning and Co-ordination of Work

Each organisation at the interface *Shall* nominate the contact persons for the planning and co-ordination of work, and set up a system to advise the relevant *Control Authority* of any changes to *Switching Sheet* items or the scope of works.

12.5 Preparation of *Switching Sheets*

Switching Sheets Shall be used for all isolation and earthing in the interface

area.

Switching Sheets may be prepared by *Generation, Transmission, Distribution* or *Customer Authorised Persons* with the responsibility for preparation generally falling with the initiator of the outage.

Persons preparing *Switching Sheets Shall* be trained and accredited by the relevant organisation in accordance with that organisation's Policies and *Procedures*.

A *Switching Sheet* involving the operation of *Electrical Apparatus* for isolation and earthing purposes in the interface area will normally be prepared and checked by the initiator of the outage. Before authorisation / approval of the *Switching Sheet*, the *Switching Sheet* items *Shall* be validated by the other organisation's *Authorised Persons*.

Where work groups from both organisations are present, the *Switching Sheet Shall* have items for the relevant *Control Authority* to give approval to the other organisation's *Switching Co-ordinator* to issue the *Access Permit* / *Test Permit* / *PTW* or similar when all forward isolation and earthing has been completed and subsequent *Surrender* of all *Access Permit* / *Test Permit* / *PTW* or similar by the other organisation's working group.

12.6 Co-ordination of *Switching*

The co-ordination of the *Switching Sheet* in the interface area *Shall* be performed by the relevant *Control Authority Switching Co-ordinator*. The overall responsible *Switching Co-ordinator* falls with the initiator of the outage unless otherwise agreed.

12.7 Operation of *Electrical Apparatus*

Operation of mechanical and *Electrical Apparatus* for the purpose of isolation and earthing *Shall* only be performed by suitably trained and *Authorised Persons* in accordance with an *Authorised* / *Approved Switching Sheet*.

12.8 Safeguarding of Isolation and Earthing

Isolation and *Earthing Points Shall* be designated by the relevant organisation.

In general either a *DNOB* or a *PTW Tag* or similar is used.

These *Signs* are not identical and the following safeguards *Shall* apply:-

a) before commencement of *Switching* the relevant organisation's *Authorised Persons Shall* validate their own *Isolation Points* in the *Switching Sheet*

b) a *DNOB* or *PTW Tag* or similar *Shall* only be placed and removed using an authorised *Switching Sheet* by an *Authorised Person* under the direction of the relevant *Control Authority*

c) a *DNOB* or *PTW Tag* or similar *Shall* have the words **"DANGER DO NOT OPERATE"** as a minimum in accordance with the appropriate *Australian Standard.*

12.9 Testing Across the Interface Boundary

Tests across the interface boundary will involve work groups at more than one location, a single *Test Permit* may be used providing the *Recipient* can manage the testing *Procedure* such that the electrical safety at the other location(s) is not compromised:-

a) the original *Test Permit Shall* remain with the *Recipient*

b) *Test Permit* Supplementary Pages and a copy of the *Test Permit Shall* be held at the other location(s). The work group at the other location(s) *Shall* use the *Test Permit* Supplementary Pages to sign on and off the *Test Permit*

c) the *Recipient Shall* be responsible for maintaining up-to-date status for all locations of:-

    i) *Work Group Members* signing on and off

ii) a record of earthing

d) *Work Group Members* signing on from the other organisation will be signed on as *Instructed Persons* or similar

e) the *Recipient Shall* appoint an *Individual of Work Group* or similar from the organisation holding the permit to be at the remote location to supervise the *Instructed Persons*

f) Operation of *Electrical Apparatus* for the purpose of the testing *Shall* only be performed by suitably trained and *Authorised Persons* from the organisation that owns/controls the equipment. This may require an *Instructed Person* to operate their organisations *Earths* this would only be allowed in this circumstance if they are trained and hold the appropriate authorisation for this organisation.

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13 APPENDIX D – *ACCESS PERMIT* TEMPLATE

Part of the Energy Queensland Group

HV Access Permit

No. _____

1. Switching Sheet No:	2. Nominated Issue:	Time: Date:
3. Issue To:	4. Nominated Surrender:	Time: Date:

5. Work Area Location:

6. Access to the following High Voltage Electrical Apparatus:

7. Work Details:

8. (a) Description of Isolation Points with DNOB's attached: Isolation Points - Attachment Pages ☐ Yes ☐ No

(b) Description of Disconnection Points: (if applicable)

9. Location of Operator Earths with DNOB's attached: Operator Earth - Attachment Pages ☐ Yes ☐ No

10. Other Precautions:

☐ Live HV Conductors Above or Beyond Sign ☐ HV Testing Sign ☐ Work Area Sign
☐ Other (please specify below) ☐ Roping Off ☐ Additional Barriers in Place
☐ Not Applicable

11. Nearby exposed Live HV/LV at the Work Area: ☐ HV Not Applicable ☐ LV Not Applicable

12. ISSUE OF HV ACCESS PERMIT

Approval By — Name of Switching Co-ordinator: (please print)

Switching Operator / Co-ordinator	Name: (please print)	Signature:	Time:	Date:

13. RECEIPT OF HV ACCESS PERMIT

- I am authorised by the Control Authority to receive this HV Access Permit and have confirmed that this Access Permit is appropriate for the work concerned.
- I shall brief all members of the Work Group and describe the isolation points, the limits of this HV Access Permit, Safety Precautions and Other Precautions provided.
- I shall ensure no member of the Work Group commences work until they have signed on this HV Access Permit.
- I shall ensure any testing performed under this HV Access Permit does not involve lethal current.

Recipient name: (please print)	Signature:	Time:	Date:

Part of the Energy Queensland Group

HV Access Permit

No. _____

14. WORK GROUP SIGNATURES

SIGN ON

I acknowledge I only have access to the Electrical Apparatus listed in Section 6 of this HV Access Permit while Earthed and I shall have no difficulty in keeping clear of Electrical Apparatus not covered by this HV Access Permit and Shall not alter Isolation Points. I acknowledge that only Authorised Individuals of Work Group Shall vary Earths or Other Precautions as directed by the Recipient.

SIGN OFF

I acknowledge I no longer have access to the Electrical Apparatus listed in Section 6 of this HV Access Permit and Shall regard the Electrical Apparatus as being Live.

Name (print)	Signature	Time	Date	Signature	Time	Date

15. TRANSFER OF HV ACCESS PERMIT

This HV Access Permit with all conditions is hereby transferred:

Outgoing Recipient	Name: (print)	Signature:	Time	Date
New Recipient	Name: (print)	Signature:	Time	Date

16. SUSPEND / REINSTATE HV ACCESS PERMIT

This HV Access Permit with all conditions is hereby Suspended / Reinstated:

Suspended by Recipient	Name: (print)	Signature:	Time	Date
Reinstated by Recipient	Name: (print)	Signature:	Time	Date

17. WORKING EARTH SCHEDULE

Location of each set of Working Earths	On		Off	
	Time	Date	Time	Date
1.				
2.				
3.				
4.				
5.				
6.				

18. OPERATOR EARTH SCHEDULE (for temporary removal of Operator Earths)

Location of each set of Operator Earths	Off		On	
	Time	Date	Time	Date
1.				
2.				
3.				
4.				
5.				
6.				

19. ABNORMALITIES (The Switching Co-ordinator shall be advised of these)

Supplementary Page(s) is on issue for this permit: ☐ Yes….*Number of pages*_____ ☐ No *Tick one box only.*

20. SURRENDER OF HV ACCESS PERMIT

All required pre energisation checks/tests have been successfully completed **YES** ☐ | ☐ **NO** If "No", record the checks/tests not successfully completed under this permit in Section 19 Abnormalities.

All Working Earths placed have been removed and Operator Earths replaced except as specified in Section 19 Abnormalities and I acknowledge that I no longer have access to the Electrical Apparatus listed in Section 6 and Shall regard the Electrical Apparatus as being Live.

Surrendered by Recipient Name (print): Signature: Time Date

Part of the Energy Queensland Group

HV Access Permit

No. _____

SUPPLEMENTARY PAGE

14. WORK GROUP SIGNATURES (continued)

SIGN ON				**SIGN OFF**		
I acknowledge I only have access to the Electrical Apparatus listed in Section 6 of this HV Access Permit while Earthed and I shall have no difficulty in keeping clear of Electrical Apparatus not covered by this permit and will not alter Isolation Points. I acknowledge that only Authorised Individuals of Work Group Shall vary Earths or Other Precautions as directed by the Recipient.				*I acknowledge I no longer have access to the Electrical Apparatus listed in Section 6 of this HV Access Permit and Shall regard the Electrical Apparatus as being Live.*		
Name (print)	Signature	Time	Date	Signature	Time	Date

17. WORKING EARTH SCHEDULE (continued)

Location of each set of Working Earths		On		Off	
		Time	Date	Time	Date
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					

Note: If this supplementary page is used, tick the YES box after Section 19 Abnormalities of this HV Access Permit

14 APPENDIX E – *TEST PERMIT* TEMPLATE

HV Test Permit

No. _____

1. Switching Sheet No:	2. Nominated Issue:	Time: Date:
3. Issue To:	4. Nominated Surrender:	Time: Date:
5. Work Area Location:		
6. Access to the following High Voltage *Electrical Apparatus:*		
7. Test Details:		
8. (a) Description of Isolation Points with DNOB's attached: Isolation Points - Attachment Pages ☐ Yes ☐ No (b) Description of Disconnection Points: (if applicable)		
9. Location of Operator Earths with DNOB's attached: Operator Earth - Attachment Pages ☐ Yes ☐ No		
10. Other Precautions: ☐ Live HV Conductors Above or Beyond Sign ☐ HV Testing Sign ☐ Work Area Sign ☐ Other (please specify below) ☐ Roping Off ☐ Additional Barriers in Place ☐ Not Applicable		
11. Nearby exposed Live HV/LV at the Work Area: :		☐ HV Not Applicable ☐ LV Not Applicable

12. ISSUE OF HV TEST PERMIT

Approval By	Name of Switching Co-ordinator: (please print)		
Switching Operator/ Co-ordinator Name: (please print)	Signature:	Time:	Date:

13. RECEIPT OF HV TEST PERMIT

- I am authorised by the Control Authority to receive this HV Test Permit and have confirmed that this Test Permit is appropriate for the work concerned.
- I shall brief all members of the Work Group and describe the isolation points, the limits of this HV Test Permit, Safety Precautions and Other Precautions provided.
- I shall ensure no member of the Work Group commences work until they have signed on this HV Test Permit.
- I shall ensure any testing performed under this HV Test Permit is performed in accordance with the Queensland Electricity Entity Standard for Safe Access to HV Electrical Apparatus.

Recipient Name: (please print)	Signature:	Time:	Date:

Part of the Energy Queensland Group

HV Test Permit

No. _____

14. WORK GROUP SIGNATURES

SIGN ON

I acknowledge I only have access to the Electrical Apparatus listed in Section 6 of this HV Test Permit while earthed and I shall have no difficulty in keeping clear of Electrical Apparatus not covered by this HV Test Permit and Shall not alter Isolation Points. I acknowledge that only Authorised Individuals of Work Group Shall vary Earths or Other Precautions as directed by the Recipient.

SIGN OFF

I acknowledge I no longer have access to the Electrical Apparatus listed in Section 6 of this HV Test Permit and Shall regard the Electrical Apparatus as being Live.

Name (print)	Signature	Time	Date	Signature	Time	Date

15. TRANSFER OF HV TEST PERMIT

This HV Test Permit with all conditions is hereby transferred:

Outgoing Recipient	Name: (print)	Signature:	Time	Date
New Recipient	Name: (print)	Signature:	Time	Date

16. WORKING EARTH SCHEDULE

	Location of each set of Working Earths	On		Off	
		Time	Date	Time	Date
1.					
2.					
3.					
4.					
5.					
6.					

17. OPERATOR EARTH SCHEDULE

	Location of each set of Operator Earths	Off		On	
		Time	Date	Time	Date
1.					
2.					
3.					
4.					
5.					
6.					

18. ABNORMALITIES

(The Switching Co-ordinator Shall be advised of these)

Supplementary Page(s) is on issue for this permit: ☐ Yes…*Number of pages* _____ ☐ No *Tick one box only.*

19. SURRENDER OF HV TEST PERMIT

All Working Earths placed have been removed and Operator Earths replaced except as specified in Section 18 Abnormalities and I acknowledge that I no longer have access to the Electrical Apparatus listed in Section 6 and Shall regard the Electrical Apparatus as being Live.

Surrendered by Recipient Name (print)	Signature:	Time	Date

Part of the Energy Queensland Group

HV Test Permit

No. _____

SUPPLEMENTARY PAGE

14. WORK GROUP SIGNATURES (continued)

SIGN ON *I acknowledge I only have access to the Electrical Apparatus listed in Section 6 of this HV Test Permit while earthed and I shall have no difficulty in keeping clear of Electrical Apparatus not covered by this HV Test Permit and Shall not alter Isolation Points. I acknowledge that only Authorised Individuals of Work Group Shall vary Earths or Other Precautions as directed by the Recipient.*				**SIGN OFF** *I acknowledge I no longer have access to the Electrical Apparatus listed in Section 6 of this HV Test Permit and Shall regard the Electrical Apparatus as being Live.*		
Name (print)	Signature	Time	Date	Signature	Time	Date

16. WORKING EARTH SCHEDULE (CONTINUED)

	Location of each set of Working Earths	On		Off	
		Time	Date	Time	Date
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					

Note: If this supplementary page is used, tick the YES box in Section 18 Abnormalities of this HV Test Permit

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