DEP SPECIFICATION

ELECTRICAL SAFETY RULES

DEP 80.64.10.10-Gen.

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DESIGN AND ENGINEERING PRACTICE

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1. INTRODUCTION

1.1 SCOPE

This DEP specifies requirements and gives recommendations for the development of Electrical Safety Rules (ESRs) by Shell companies and their business units (BUs).

Appendix 1 of this DEP is an example of ESRs that can be adopted by a BU as far as they are consistent with applicable regulations (see 1.2).

This is a revision of the DEP of the same number dated June 2007; see (1.5) regarding the changes.

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorised by Shell GSI, the distribution of this DEP is confined to Shell companies and, where necessary, to Contractors and Manufacturers/Suppliers nominated by them. Any authorised access to DEPs does not for that reason constitute an authorization to any documents, data or information to which the DEPs may refer.

This DEP is intended for use in facilities realted to oil and gas production, gas handling, oil refining, chemical processing, gasification, distribution and supply/marketing. This DEP may also be applied in other similar facilities.

When DEPs are applied, a Management of Change (MOC) process should be implemented; this is of particular importance when existing facilities are to be modified.

If national and/or local regulations exist in which some of the requirements could be more stringent than in this DEP, the Contractor shall determine by careful scrutiny which of the requirements are the more stringent and which combination of requirements will be acceptable with regards to the safety, environmental, economic and legal aspects. In all cases the Contractor shall inform the Principal of any deviation from the requirements of this DEP which is considered to be necessary in order to comply with national and/or local regulations. The Principal may then negotiate with the Authorities concerned, the objective being to obtain agreement to follow this DEP as closely as possible.

1.3 DEFINITIONS

1.3.1 General definitions

The **Contractor** is the party that carries out all or part of the design, engineering, procurement, construction, commissioning or management of a project or operation of a facility. The Principal may undertake all or part of the duties of the Contractor.

The **Manufacturer/Supplier** is the party that manufactures or supplies equipment and services to perform the duties specified by the Contractor.

The **Principal** is the party that initiates the project and ultimately pays for it. The Principal may also include an agent or consultant authorised to act for, and on behalf of, the Principal.

The word **shall** indicates a requirement.

The word **should** indicates a recommendation.

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1.3.2 Specific definitions

Term	Definition
Additional Earth	An approved earthing device that may be applied by the recipient of an electrical permit-to-work, or of a sanction for test, to electrical equipment in addition to the circuit main earths.
Approved	Of a type or method acceptable for use in the BU or site management, as applicable.
Caution Notice	A portable notice, attached to points of isolation, which warns persons not to interfere with, or to operate, the electrical equipment to which it is attached.
Circuit Main Earth	An approved earthing device applied to the main circuit conductors prior to the issue of an electrical safety document or sanction for test.
Dead (De-energized)	Equipment at or about zero potential and disconnected from any live electrical power source.
De-Isolation	Electrical equipment that has been restored to its normal service position from its previously isolated position.
Earth, Earthed or **Earthing (Ground, Grounded, Grounding)**	Connected to the general mass of earth in such a manner that the body being earthed discharges immediately any electrical energy stored in it and furthermore is maintained at a safe potential with respect to the general mass of earth.
Earthed Notice (Grounding Tag)	A portable notice that warns persons where temporary earths are installed.
Electrical Equipment	The electrical machines, apparatus and circuits forming part of an electrical installation of an electrical power system.
Electrical Power System	All electrical installations and electrical equipment provided for the purpose of generating, transmitting and distributing electricity.

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Electrical Safety Documents	a) **Electrical Permit-to-work (EPTW)** A form issued by a Senior Authorised Electrical Person to a Competent Electrical Person in charge of the work to be carried out on specified high voltage electrical equipment, or a low voltage switchboard's bus bars, after they have been made dead, isolated from all live conductors, and connected to earth. The electrical permit-to-work identifies the electrical equipment that has been isolated and the circuit main earths that have been applied. b) **Sanction for Test (SFT)** A form issued by a Senior Authorised Electrical Person to an Authorised Electrical Person in charge of the testing of specified high voltage electrical equipment that has been made dead, isolated from all live conductors, is connected to earth and is prepared to carry out testing. The sanction for test identifies the high voltage electrical equipment that has been isolated and the circuit main earths that have been applied. It also identifies which circuit main earths may be removed and replaced to allow testing to be carried out. c) **Limitation of Access (LOA)** A form issued by an Authorised Electrical Person to a Competent Electrical Person defining the limits and nature of electrical work that may be carried out in the vicinity of exposed live electrical equipment. The limitation of access identifies the conductors that are exposed and live, the electrical safety precautions that have been taken and the procedures to be followed by those carrying out the work.
Exposed	Not suitably guarded, isolated, or insulated.
High Voltage (HV)	Any electrical equipment that is normally operated at a voltage exceeding 1000 V.
Holder/Operating Department	The department that is the asset holder/custodian and/or operates the site or electrical equipment on which work or testing is to be carried out.
Isolated or Isolation	Disconnected from live conductors by an open isolator or adequate physical gap and from all sources of supply, so as to prevent electrical equipment being made live in error.
Live	Electrically charged.
Low Voltage (LV)	Any electrical equipment that is normally operated at a voltage not exceeding 1000 V.
Operations (in Electrical Power Systems)	Actions by which electrical equipment is connected to, disconnected or isolated from an electrical power system. It also includes the earthing of electrical equipment and the switching, isolation and earthing of electrical distribution circuits.

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Persons NOTE: Naming conventions may vary between BUs or sites.	a) **Appointed Person (AP)** A person authorised by the BU, normally not from electrical staff, who is trained on performing specified duties on electrical equipment, e.g. opening or closing motor circuits. b) **Competent Person (CP)** A person authorised by the BU who has sufficient technical knowledge or experience to perform work safely. c) **Competent Electrical Person (CEP)** A person authorised by the BU to carry out specified LV operations on electrical power systems and work on electrical equipment. d) **Authorised Electrical Person (AEP)** A Competent Electrical Person authorised by the BU, to supervise or to carry out specified operations on high and low voltage electrical power systems and work on electrical equipment. The authorisation may include the authority to receive a sanction for test, issue and cancel limitations of access and perform the necessary safety procedures associated with such work or testing. e) **Senior Authorised Electrical Person (SAEP)** An Authorised Electrical Person authorised by the BU, to initiate work on high voltage electrical equipment. The authorisation includes the authority to issue and cancel all electrical safety documents and to perform the necessary safety procedures associated with the issue/cancellation of such documents. f) **Senior Electrical Authority (SEA)** An individual with an electrical engineering degree, authorised by the BU, to develop the BU or site's ESRs and to oversee the assessment of electrical competency, training and experience of persons operating and working on electrical equipment.
Safety Padlock (or **Safety Lock**)	Padlock or lock of a non-standard or unique type that is individually keyed (one person one lock) and used to lock switches, isolators and earthing devices, at points of isolation from where electrical equipment being worked on could be made live.
Substation	Any defined area within a building or outdoor enclosure which contains high voltage or low voltage electrical equipment such as switchgear or transformers.
Switching	Operation of circuit breakers, isolators, fuses or other methods of making or breaking an electrical circuit, including the isolation and de-isolation of electrical equipment.
Switching Programme	A schedule that lists in order the switching necessary to carry out a particular purpose on an electrical power system or circuit.
Testing	Any activity that requires application of a voltage from an auxiliary source to determine the electrical insulation or the operational condition of electrical equipment.

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Work	Any activity that requires the installation, repair, removal, replacement, alteration, extension, adjustment or cleaning of electrical equipment forming part of an electrical power system.
Work Permit	A form signed, issued and cancelled, usually by a representative of the holder department, in accordance with the BU's general permit-to-work system. A work permit can take the form of, but is not limited to, hot work permit, cold work permit, clearance certificate, safety certificate and fire permit.

1.4 CROSS-REFERENCES

Where cross-references to other parts of this DEP are made, the referenced section number is shown in brackets. Other documents referenced by this DEP are listed in (13).

1.5 SUMMARY OF MAIN CHANGES

This DEP is a revision of the DEP of the same number dated June 2007. The following are the main, non-editorial changes.

Old section	New section	Change
-	-	Document updated to be in line with DEP Specification requirements with few minor editorial changes throughout document
	1.2	Second paragraph updated
	1.3.2	Added word 'approved' to earthing device
	1.5	New section
	1.6	New section
	2.1	Added 'measuring and testing'
	2.2	Replaced the word 'processes' by 'rules and regulations'
	3	Added 'and authorising'
	5.3	Replaced the word 'overview' by 'register'
	8	Updated with the requirement to regularly maintain and inspect electrical PPE
	9.3	Fourth paragraph need to replace earths before signing SFT clearance section

1.6 COMMENTS ON THIS DEP

Comments on this DEP may be sent to the Administrator at standards@shell.com, using the DEP Feedback Form. The DEP Feedback Form can be found on the main page of "DEPs on the Web", available through the Global Technical Standards web portal http://sww.shell.com/standards and on the main page of the DEPs DVD-ROM.

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2. REQUIREMENTS FOR ELECTRICAL SAFETY

2.1 GENERAL

BUs shall establish and maintain written Electrical Safety Rules (ESRs) for their covered operations.

ESRs shall take into consideration:

a) Compliance with applicable regulations,(e.g. “Electricity at Work Regulations” in the UK and OSHA 29 CFR 1910 Subpart S in the USA).

b) The complexity of the BU electrical power systems**,** including the amount of interconnection and the operating voltages chosen for generation and distribution/transmission.

c) The design and nature of existing electrical equipment in use on the electrical power systems (e.g. Manufacturer and types of indoor or outdoor switchgear units, and design and construction of any overhead line circuits).

d) The interface with any other electrical power systems not under the control of the BU (e.g. HV supplies from a local power company).

e) The compatibility of the ESRs with the BU permit-to-work system, (e.g. work permits, hot work permits and cold work permits).

ESRs should be adapted to the size and complexity of the BU or site and its operations. For example, while the basic requirements of having an electrical safety programme apply to all types of facilities (i.e., refinery, chemical plant, terminal, gasoline service station, etc.) the details of the programmes will vary depending on the size, operations and level of complexity of the different facilities.

The scope and detail of the ESRs shall cover the following subjects:

- General requirements for electrical safety
- Responsibilities for electrical power systems
- Competency programme
- Authorisation of personnel
- Switching, isolating and earthing procedures
- Measuring and testing
- Personal protective equipment
- Electrical safety documents
- Precautions before working on or testing on high voltage (HV) and low voltage (LV) electrical equipment
- Precautions for special equipment
- Work at construction sites
- Portable electrical equipment
- Precautions before excavating
- Auditing compliance with the ESRs

2.2 CONTRACTORS, VENDORS AND THIRD PARTIES

When entering into contracts with Contractors, Subcontractors, Vendors and other third parties who will have workers involved in electrical activities as defined in this DEP, the Shell company shall include provisions in the contract that require the contractors, Subcontractors, Vendors and third parties to have rules and regulations consistent with this DEP. When working at a site, the Contractors, Vendors and Third Parties shall follow all applicable site procedures.

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3. DEVELOPING AND AUDITING THE ESRs

The following shall aply:

- The BU or site management shall designate the Senior Electrical Authority (SEA).

  NOTE: Naming conventions used in this section may vary in ESRs.

- The SEA is responsible for developing and authorising the BU or site's ESR.
- The BU shall periodically audit (at least annually) compliance with the ESRs.

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4. RESPONSIBILITIES FOR ELECTRICAL POWER SYSTEMS

The BU or site management shall clearly define the responsibilities for operating and maintaining electrical power systems so that the personnel in both the holder/operating department and the electrical department are aware of the scope and limits of their operational responsibilities, for example:

- The starting and stopping of motors, the synchronising of generators etc. is normally the responsibility of the holder/operating department.
- Switching operations in electrical power systems is normally under the control of a Senior Authorised Electrical Person.
- Isolation, earthing and testing of electrical equipment is normally the responsibility of the electrical personnel.

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5. COMPETENCY PROGRAMME AND AUTHORISATION

5.1 GENERAL

No persons shall be allowed to carry out operations, work or testing on any part of the electrical power system unless they meet the requirements of the BU competency programme and are authorised to perform the task.

5.2 COMPETENCY PROGRAMME

The BU or site shall have a documented electrical competency programme. This electrical competency programme shall define the competency elements and level for each role (Appointed, Competent, Competent Electrical, Authorised Electrical, Senior Authorised Electrical and Senior Electrical Authority) and address the following:

- Electrical theory
- Hazards associated with electricity
- Techniques for working on or testing on electrical equipment
- Electrical power system upon which work or testing is to be carried out
- Applicable BU electrical safety rules and operational procedures
- Hazardous (classified) area equipment
- First aid and resuscitation
- Switching, earthing and isolation of equipment
- Initial and refresher training

Contractors performing electrical work shall have a documented electrical competency programme. The BU shall have a process for reviewing the content and authorisation process associated with the contractors electrical competency programme.

5.3 AUTHORISATION

Before a candidate is designated by the BU or site management as an Appointed Person, Competent Person, Competent Electrical Person, Authorised Electrical Person or Senior Authorised Electrical Person the Senior Electrical Authority or designees shall assess and establish whether the candidate is competent, has received the necessary training and has the experience to undertake safely the limited tasks associated with their authorisation. This assessment may take the form of theoretical tests and practical demonstrations.

The authorisation shall be properly documented and a copy provided to the individual. The Senior Electrical Authority shall keep an up to date register of all authorised persons.

Individuals may be authorised for more than one role.

The authorised person shall confirm that he/she has understood the work to be performed and measures to be taken and his/her authorisation is valid for the work being performed.

5.4 RENEWAL OF AUTHORISATION

All authorisations shall be valid for a maximum of three years.

When BU or site management renews a person's authorisation the Senior Electrical Authority or designate shall revalidate the individual's competency and should consider the following:

- Whether the person still carries out work or switching that requires this category of electrical authorisation
- Changes to the electrical power system and/or the introduction of new types of electrical equipment for which additional skills or training may be required
- Whether any refresher training is necessary.

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6. SWITCHING, ISOLATING AND EARTHING PROCEDURES

6.1 SWITCHING PROGRAMMES

Switching programmes shall be developed in accordance with (6.2) and (6.3) and shall include the following:

- Sequence of operation
- Isolation and earthing locations
- Specific equipment numbers
- Responsibilities
- Pre start up walk-through precautions (incl. drawings, PPE's, tools, equipment, etc.)

NOTE: There may be two sets of switching programmes – one for isolating and one for de-isolating.

6.2 HIGH-VOLTAGE SWITCHING

HV switching shall not be carried out without a documented and approved switching programme.

High Voltage switching programmes should be prepared by either a Senior Authorised Electrical Person, or an Authorised Electrical Person and then approved or authorised by a Senior Authorised Electrical Person or the Senior Electrical Authority.

HV switching, including the isolation and de-isolation of electrical equipment, shall be carried out or coordinated by a Senior Authorised Electrical Person or an Authorised Electrical Person. A Competent Electrical Person may carry out the actual HV switching operations, but only under the guidance and in the presence of the Senior Authorised Electrical Person or Authorised Electrical Person who is coordinating the switching.

The opening and closing of HV circuit breakers by remote control may be carried out by a Senior Authorised Electrical Person, an Authorised Electrical Person, or an Appointed Person who is authorised to carry out selected items of HV switching from a Control Room or by remote control from some other location.

Selected items of HV switching may be carried out by an Appointed Person who is authorised to carry out the specified items of HV switching. (Examples include the opening and closing of HV motor circuits by an Appointed Person in the holder department.)

When HV switching results in an abnormal configuration of the electrical power system, the configuration shall be clearly communicated and documented (i.e. substation or control room diagram, substation log book, etc.) so that both electrical personnel and holder department personnel are aware of the potential affect on the security (availability) of the electrical supply to the main plant at the installation. For example:

- When a plant or unit is normally supplied by two or more feeders/transformers and one of the feeders/transformers is out of service.
- When restrictions are imposed on starting large motors, etc.
- When the supply capacity is restricted or a subsequent generator/ feeder circuit failure might require load shedding of selected plant to safeguard more vital supplies.

6.3 LOW-VOLTAGE SWITCHING

LV switching, including the isolation and de-isolation of electrical equipment where there is a possibility of back feeds, shall be carried out or coordinated by a Senior Authorised Electrical Person or an Authorised Electrical Person. A Competent Electrical Person may carry out the actual LV switching operations, but only under the guidance and in the presence of the Senior Authorised Electrical Person or Authorised Electrical Person who is coordinating the switching.

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All other switching of LV electrical equipment without the possibility of back feeds may be carried out by a Competent Electrical Person or an Appointed Person who is authorised to carry out specified items of LV switching.

Documented switching programmes shall be developed for complex LV switching sequences. LV switching programmes should be prepared by the individual performing the switching, and approved or authorised by the Senior Authorised Electrical Person or an Authorised Electrical Person.

Documented switching programmes are not required when LV switching is carried out to avoid immediate danger to life or damage to electrical equipment. The person who takes the action should promptly inform the Senior Authorised Electrical Person.

6.4 ELECTRICAL ISOLATION (DE-ENERGIZATION)

All electrical equipment shall be regarded as being live until properly isolated and proved to be dead.

Before carrying out any maintenance, repairs, alterations, cleaning, or testing on electrical equipment the equipment shall be isolated (de-energized) from its power source. Isolation is the disconnection from live conductors by an open isolator or adequate physical gap from all sources of supply so as to prevent electrical equipment being made live in error.

Provided that safe methods are used and that approved equipment, tools and instruments required for testing are properly insulated for the rated voltage of the circuit, electrical isolation of LV electrical equipment is not required for diagnostic testing or adjustments. An additional Competent Electrical Person may need to accompany the Competent Electrical Person performing the work depending on the hazards of the work.

The operation of switching out a circuit and making it dead from all sources of supply does not by itself provide proper isolation of that circuit.

Safety padlocks (lock out devices) shall be applied to points of isolation for electrical equipment to prevent de-isolation or unexpected start-up until the safety padlock (lock out device) is removed. Caution notices (tagout tags) shall also be attached at all points of isolation from live sources of supply, to warn personnel not to interfere with such points of isolation, as work or testing may be taking place on electrical equipment.

NOTE: If a BU decides not to adopt the use of safety padlocks with unique keys, any padlocks or locks used to secure points of isolation for LV electrical equipment should be of a special series and the master keys to these shall only be issued to Authorised Electrical Persons. Similarly, if a BU decides not to use lock-out boxes to contain keys of padlocks used to secure points of isolation they shall provide an alternative 'safe method of work' to ensure that such keys cannot be used in error for the de-isolation of LV electrical equipment on which work or testing is still being carried out.

If electrical equipment does not have facilities for applying safety padlocks (lockout device) at points of isolation, additional steps shall be taken to protect workers from unexpected deisolation and startup. These steps may include one or more of the following:

- removal of fuses,
- racking out of circuit breakers or contactors,
- disconnecting of circuit conductors,
- etc.

Caution notices (tagout tags) shall also be attached at all points of isolation, from live sources of supply, to warn personnel not to interfere with such points of isolation as work or testing may be taking place on the electrical equipment.

Before work is done on equipment that has been isolated, test equipment shall be used to verify that the circuit elements and equipment parts are deenergized. The test shall also determine whether any energized condition exists as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized. The approved test equipment shall be checked immediately before and after use to make sure it is working correctly.

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If mechanical work is to be carried out on plant equipment driven by electrical equipment, e.g. motors, the circuit incorporating the electrical equipment concerned shall be isolated in accordance with the requirements in this section, except for voltage verification, which is not required.

6.5 EARTHING (GROUNDING)

6.5.1 High voltage

Before work or testing is carried out on HV electrical equipment that is part of the electrical power system, the equipment concerned shall be de-energized, isolated and earthed. Earthing shall be carried out by a Senior Authorised Electrical Person or a Competent Electrical Person in the presence of the Senior Authorised Electrical Person. All conductors of a circuit shall be earthed by short-circuiting and effectively connecting the conductors to earth. Any of the following earthing methods are acceptable:

- HV earthing switches

  After closing to earth, the HV earthing switch shall have a safety padlock applied, locking it into the earth position, and an earthed notice attached.

- Circuit breakers

  A circuit breaker is closed to make the earth connection. The circuit breaker should have its trip feature made inoperative before closing to earth. After closing to earth the circuit breaker shall have a safety padlock applied locking it in the earth position. An earthed notice shall be attached to the circuit breaker to indicate it is in the earth position.

- Temporary earthing leads

  Before approved temporary earthing leads are installed, it shall be verified by means of an approved HV testing device, suitable for the rated voltage of the circuit, that all conductors of the HV electrical equipment are de-energized. Then approved portable earthing leads with an approved insulating pole shall be applied to all conductors.

6.5.2 Low voltage

If work is to take place on a LV switchboard's isolated bus bars or its incoming connections, which are directly fed from a HV/LV transformer, a circuit main earth shall be applied on the HV side of the transformer circuit or, if necessary for operational safety reasons, applied on the LV switchboard's bus bars. Any circuit main earth applied on the HV side of the transformer circuit shall be applied in accordance with the HV earthing methods in (6.5.1).

If there is a possibility of induced voltages, stored electrical energy or unexpected energization due to backfeed, LV electrical equipment shall be earthed in addition to the required de-energization and isolation. LV electrical equipment isolation and earthing may be performed by a Competent Electrical Person.

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7. GUARDING

Guarding shall be used, as necessary, when performing electrical work in close proximity to exposed live electrical equipment to prevent accidental contact. Guarding includes the use of covers, shields, barriers, screens or mats to eliminate the possibility of inadvertent contact by persons or objects to exposed live parts.

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8. ELECTRICAL PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE appropriate for the task shall be worn by persons working on or near live electrical equipment to protect them from shock and/or arc flash hazards. When work is carried out on electrical equipment constructed with arc containment technology, arc flash PPE is not required if the work being done is in accordance with the equipment design. PPE shall be regularly maintained and inspected to ensure overall condition to meet safety requirements.

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9. ELECTRICAL SAFETY DOCUMENTS

9.1 GENERAL

Each BU's permit-to-work system shall address the hazards associated with working on or near electrical equipment. This system shall include Electrical Permit-to-work and Sanction for Test documents. The permit-to-work system shall also include provisions for limiting access to electrical equipment (e.g. barriers, signs, or a Limitation of Access form).

Any electrical safety documents required by the ESRs are always additional to those required by the BU permit-to-work system.

A list of typical electrical safety procedures is given in Appendix 1, Annex 1.9.

9.2 ELECTRICAL PERMIT-TO-WORK (EPTW)

The EPTW applies to the following:

- Work on any HV electrical equipment connected to the HV electrical power system.
- Work on a LV switchboard's bus bars or its incoming connections, which are directly fed from a HV/LV transformer and where it may be considered necessary to apply a circuit main earth.

The EPTW shall be issued and signed by a Senior Authorised Electrical Person and given personally to the Competent Electrical Person in charge of the work to be carried out. The EPTW shall state the electrical equipment that has been isolated and the circuit main earths that have been applied.

The Senior Authorised Electrical Person shall jointly field verify with the recipient of the EPTW that all the conditions of the EPTW have been addressed. The recipient shall then sign the receipt section of the EPTW. The recipient of the permit shall review the EPTW conditions with all persons working on the equipment prior to the start of the work.

The EPTW shall remain at the work site at all times whilst the work is being carried out.

When the work on the electrical equipment for which the EPTW has been issued is completed, the recipient signs the clearance section and returns it to the Senior Authorised Electrical Person. After the removal of all circuit main earths, and caution, danger and earthed notices, etc., the Senior Authorised Electrical Person cancels the EPTW. Returning electrical equipment to service shall be in accordance with the BU's permit-to-work system and shall follow the applicable switching requirements in (6).

9.3 SANCTION FOR TEST (SFT)

Before testing is carried out on HV electrical equipment that is capable of being made live from the electrical power system, a Sanction for Test (SFT) shall be issued by the Senior Authorised Electrical Person to an authorised person in charge of the testing.

The SFT shall state the equipment that has been isolated, earthed and ready to test. The SFT shall also state the circuit main earths (CME's) that may be removed and replaced to allow testing to take place.

The Senior Authorised Electrical Person shall jointly field verify with the recipient of the SFT that all the conditions of the SFT have been addressed. The recipient shall then sign the receipt section of the SFT. The recipient of the SFT shall coordinate all testing operations on isolated electrical equipment and may remove and replace the circuit main earths as necessary, subject to the provisions of the SFT, to carry out the testing.

When the testing on the electrical equipment for which the SFT has been issued is completed, the recipient replaces earths, signs the clearance section and returns it to the Senior Authorised Electrical Person. After the removal of all circuit main earths, and caution, danger and earthed notices, etc., the Senior Authorised Electrical Person cancels the SFT.

If an EPTW has been issued, then a SFT shall not be issued on the same electrical equipment until that document has been cleared and cancelled.

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The SFT shall remain at the work site at all times when testing is being carried out.

9.4 LIMITATION OF ACCESS (LOA)

A LOA can be used when work is carried out in close proximity to exposed live electrical equipment. An example is ground level work in a HV substation that has exposed live overhead conductors from which safe working clearance distances shall be maintained by the working party.

If an LOA is utilized, an Authorised Electrical Person issues the LOA to the Competent Electrical Person in charge of the work to be carried out. The LOA identifies the work to be done and the safety precautions to be taken when working near exposed live conductors.

The Authorised Electrical Person shall jointly field verify with the recipient of the LOA that all the conditions of the LOA have been addressed. The recipient shall then sign the receipt section of the LOA. The recipient of the permit shall review the LOA conditions with all persons working under the LOA prior to the start of the work.

The LOA shall remain at the work site at all times while work is being carried out.

When the work for which the LOA was issued is complete, or the access in the vicinity of the specified electrical equipment is no longer required or allowed, the recipient signs the clearance section and returns it to the Authorised Electrical Person, who shall cancel it.

9.5 TRANSFER OF ELECTRICAL SAFETY DOCUMENTS

An electrical safety document shall not be transferred to another person. If work or testing is not completed by the recipient of an electrical safety document (e.g. because of a shift crew change), the work or testing shall be suspended and the clearance section of the document signed by the recipient.

The electrical safety document shall be cancelled and a new electrical safety document issued before work resumes.

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10. ADDITIONAL PRECAUTIONS TO BE TAKEN ON SPECIFIC TYPES OF ELECTRICAL EQUIPMENT

BUs should include in their ESRs precautions to be taken when working on or near specific types of equipment with electrical hazards not already addressed in (1 through 9).

Examples that may be present at the site may include overhead lines and exposed conductors, electrical protection systems, live-line washing, portable equipment, and rotating equipment.

Sample procedures for some specific types of equipment are given in Appendix 1.

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