

Summary

This work instruction supports the Power System Safety Rules and its requirements assembled under 'Safe Access to Substations' Category 1.

It describes instructions for employees, delivery partners and ordinary persons to safely access substations and covers activities for observation and for escorting instructed persons within the substation.

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1. Overview

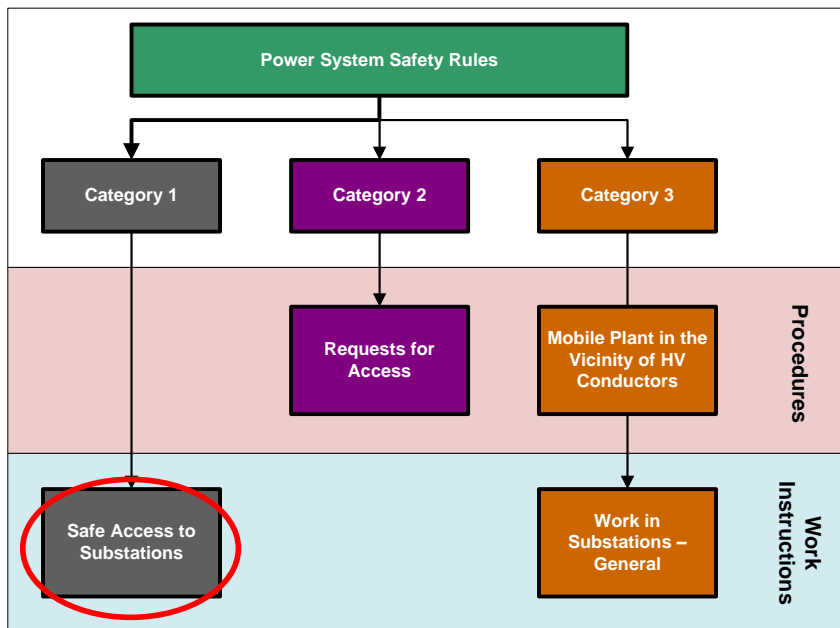
This document describes instructions for employees, delivery partners and ordinary persons to safely access substations and High Voltage areas. This work instruction supports the Power System Safety Rules and its requirements assembled under 'Safe Access to Substations' Category 1.

1.1 Scope

This work instruction applies to activities for observation and for escorting instructed persons within the substation.

1.2 Document Location

The following block diagram shows the position of this document in relation to other PSSR procedures.

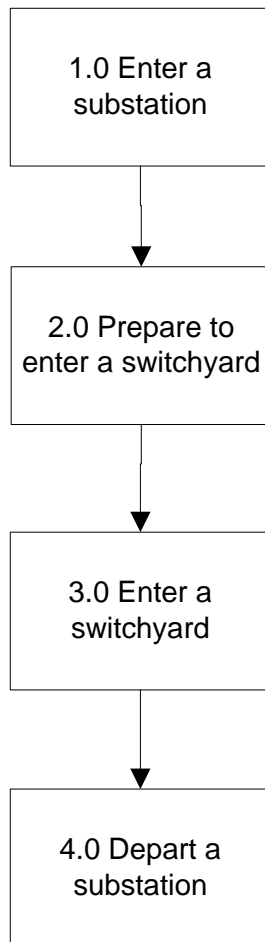


2. Safe Access to Substations Process

Safe access to substations is required to protect employees, delivery partners and ordinary persons from the dangers present within substations and switchyards.

The information contained within this document outlines the general process to be followed, detailed instructions and an awareness of equipment within a substation.

2.1 Safe access to substations process diagram



2.2 Safe access to substations process steps

Step and Who	Action	Resources
1.	<p>Enter a substation Access substation building by presenting your security card at the Arm/ Disarm station (Typically adjacent to main entrance door of building).</p> <p>Do not allow unsupervised access to anyone who cannot identify themselves as being authorised under this category.</p> <p>Provide supervised access to others who are not authorised. They shall remain your responsibility for the duration of their time within the substation boundary.</p> <p>Close and lock all doors and gates used or found unlocked.</p>	PSSR Authorisation recorded and available via card or through the Worker Safety Authorisation and Training (WSAT) System. Security Card
2.	<p>Prepare to enter a switchyard Check if anyone has medical implants (eg Pacemaker) and if they do, before allowing access, have them consult their medical practitioner on the likely response of their implant to the interference, as well as to the most effective ways of</p>	Personal Protective Equipment Switchyard Entry Briefing – PSSR - Attachment A

Step and Who	Action	Resources
	avoiding interference in a High Voltage substation environment. Check workplace risk assessment and hazard board for current hazards. Comply with PPE requirements including eyewear. Brief others who are not authorised under this category in accordance with PSSR Attachment A.	
3.	Enter a switchyard Obey all signage. Close and lock all switchyard gates after use. Observe the requirements of Warning tags and Do not operate tags. Remain at ground level (no climbing of any structures or equipment) to maintain safe approach distances. If driving a vehicle, it shall be less than 2.4m high and remain on the driveways at all times (height is the maximum that the vehicle can be, eg with everything extended including aerials, so cranes and EWPs are not allowed). Long aerials shall be removed or retracted.	Safe Approach Distances
4.	Depart a substation Report any new hazards in CAMMS and record on the hazard board. Close and lock all doors and gates. Reset security alarms if last to depart a substation.	

3. Equipment

3.1 Barriers

Barriers are erected to guard against mistaken or inadvertent approach to, and contact with, nearby apparatus that could constitute a safety hazard to personnel. (Source: 'NATIONAL GUIDELINES FOR SAFE ACCESS TO ELECTRICAL AND MECHANICAL APPARATUS' ENA NENS 03-2006)

Substations and switchyards are enclosed by a security fence to provide a barrier, preventing unauthorised entry by ordinary persons.

Within substations and switchyards further barriers are used to maintain standard safety clearances from high voltage apparatus.

There are generally two methods utilised for the erection of a barrier within a substation. High voltage cages (barrier out) keep people out and protect people from hazards within the barrier. Designated work area's (barrier in) keep people in and protect people from hazards outside the barrier.

Examples are illustrated below.

Barrier in



Designated work area

Persons shall not enter a designated work area unless the authorised person in charge allows entry and in accordance with the warning, demonstration and sign on requirements of the Access Authority.

Barrier out



High Voltage Cage

A high voltage cage is a fully fenced or walled area, room or compartment identified by a sign, containing exposed high voltage conductors which do not maintain Standard Safety Clearances.

3.2 Signs

Signs are erected to identify particular hazard or hazardous conditions that are present. (Source: 'NATIONAL GUIDELINES FOR SAFE ACCESS TO ELECTRICAL AND MECHANICAL APPARATUS' ENA NENS 03-2006)

Sample Hazardous Conditions Signs



This sign is placed at locations to indicate high voltage testing is in progress.



This sign is placed at locations to indicate that there are conductors, which should be regarded as live and from which persons need to maintain safe approach distances.

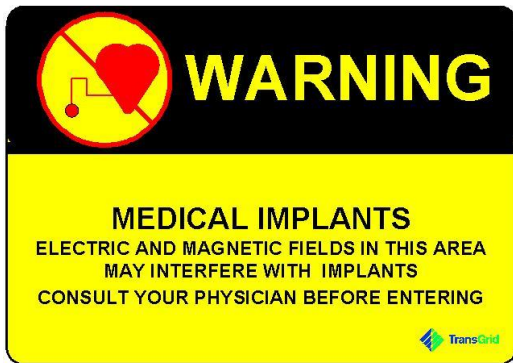
Sample Hazardous Conditions Signs



This sign is placed at locations to indicate the presence of live conductors adjacent to the work area. It will be accompanied, where necessary, by barriers or additional signs.



This sign is placed at locations to indicate the presence of a confined space and the requirement for access to the confined space.



This sign is placed at locations to indicate the presence of electric and magnetic fields that may interfere with medical implants.



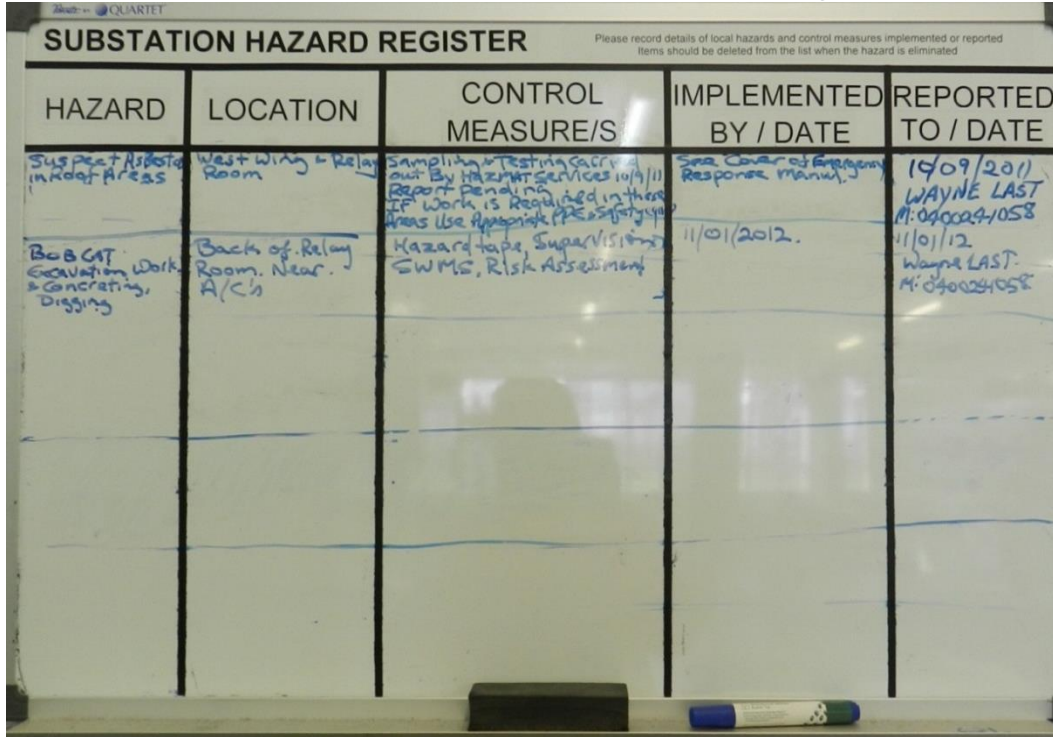
This sign is placed at locations to indicate a fully fenced or walled area, with a locked means of access, containing high voltage exposed conductors which do not maintain standard safety clearances.

3.3 Workplace Risk Assessment and Hazard Board

Each substation has a Workplace Risk Assessment (WRA) and Hazard Board which list hazards and controls relevant to the site and current conditions.




- The WRA lists 'permanent' hazards for the site
- The Hazard Board lists any abnormal 'temporary' hazards (e.g. open cable trenches and open excavations)

The WRA and the hazard board shall be reviewed prior to entering the switchyard. Examples are given below:



Site Risk Assessment Haymarket Substation

Summary
 This site risk assessment details the site specific hazards associated with Haymarket Substation. It should be used in conjunction with the Hazard Identification Board (Whiteboard). Risks associated with specific tasks need to also be assessed prior to commencing work.

Risk Category	Hazard	Potential Consequences	Control Measures
 Fire	Fire in enclosed underground substation environment	Personal injury from burns/toxic fumes and property damage	If evacuation alarm sounds and red lights flash, proceed without delay via the STAIRS at either end of the substation (not the lift) to the mustering point outside the substation on Thomas St. Call 555 or (02) 9620 0555.
 Hazardous Substances and Dangerous Goods	Escape of a large amount of SF6 Gas	Engulfment, asphyxiation. Personal injury.	Sign on to SF6 register outside lift on B1 if going to B2 or B3. Sign off when leaving. Monitoring, alarms and evacuation procedures. If evacuation alarm sounds and yellow lights flash, proceed without delay via the STAIRS at either end of the substation (not the lift) to the mustering point outside the control room. Call 555 or (02) 9620 0555. Confined Space training and associated procedures (where applicable). Refer SDS sheet for handling guidelines and appropriate PPE.
	Hazardous Chemicals	Risks as set out in the SDS for the substance	Comply with Hazardous Chemicals Storage & Transport procedure. Apply controls as set out in the chemical SDS
 Electricity	Compressed Gases.	Injuries due to release of compressed gas.	Comply with Hazardous Chemicals Storage & Transport procedure - Use correct storage & handling procedures. Ensure adequate ventilation. Apply controls as set out in the chemical SDS.
	Live High Voltage	Electric shock/ burns injury or death	Comply with Power System Safety Rules- Maintain safe approach distances (Attachment B). Do not come on or near exposed HV conductors or interfere with cables, GIS, GILs, GITs or GIR except under a HV Access Authority
	Live Low Voltage, including in-service cables and CT secondary circuits (e.g. moving in service cables or open-circuiting CT secondary circuits).	Electric shock/ burns injury or death	Comply with Power System Safety Rules - Maintain safe approach distances (Attachment B). Do not contact exposed LV conductors except under a LV Access Authority. Isolate, Tag and verify. PPE - Insulated gloves, barriers & tools etc. Comply with Rules for building services isolations - Isolate, Tag and verify. PPE - Insulated gloves, barriers & tools etc. as required
EMF	Personal injury. Failure of Medical implant.	Comply with Power System Safety Rules - HV area access restricted for persons with medical implants unless medical approval obtained.	

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3.5 Personal Protective Equipment

All persons visiting or working within TransGrid substations, transmission lines, easements and communications sites require long trousers, long sleeved shirt, enclosed footwear and have access to protective eyewear. Pictured below is an example of a worker suitably dressed for entry to a switchyard:



In addition to the above, the following PPE requirements apply:

- Protective Helmet - Shall be worn:
- i) Within the boundary of a switchyard; and
 - ii) As required by risk assessment or signage.

High Visibility Clothing - High visibility shirts or vests shall be worn:

- i) In any area that requires a safety helmet to be worn;
- ii) In the vicinity of moving plant, equipment or machinery;
- iii) As required by risk assessment or signage.

Eye Protection - Shall be worn:

- i) when performing maintenance tasks in substations/communication sites;
- ii) if any construction activity is evident within the substation; and
- iii) on all other areas as determined by a risk assessment

Notes:

- 1) When working in an enclosed environment such as vehicles, lunchrooms, toilets, buildings or site offices where no activities such as exposure to grinding, cutting or dust generating tasks are underway, safety glasses do not need to be worn.
- 2) Safety glasses are only required in car park areas when activities are underway that identify safety glasses as a control in a risk assessment or as identified by signage.
- 3) Any area a hard hat is required safety glasses should also be utilised.
- 4) Some prescription glasses are manufactured with a life span. Please follow manufacturer's directions as with all products.

Ear Protection - As required by risk assessment or signage.

Footwear - All visitors shall wear enclosed footwear (i.e. no thongs, sandals or open-toed shoes) when accessing a switchyard, switchyard building, transmission line easement or repeater station.

(Source: 'Selection, Inspection, Use and Storage of Personal Protective Equipment and Clothing)

3.6 Security

Authorisation under the Power System Safety Rules is recorded and managed by the TransGrid Worker Safety Authorisation and Training (WSAT) system.

All Authorised Persons must be able to prove that they have a current Authorisation for the activities they are to perform.





Authorisation to work can be demonstrated by:

- Accessing your Authorisation record online in the WSAT system
- Producing a valid WSAT card
- Producing a record of your approved 'Authorisation'.

The security system restricts access to substations and switchyards. Where required, Authorised persons are issued with security passes to allow entry.

4. Prohibited Items

The following prohibited items shall not be taken into a switchyard.

 <p>Metal Ladders</p>	 <p>Extendable metal rulers</p>
 <p>Umbrellas</p>	 <p>Crutches</p>

5. Actions in an Emergency

1. Remove yourself and anyone who you are supervising to a safe area;
2. Ring 555 from any phone in the substation (or 02 96200555 from a mobile) and advise the System Operator of the nature of the emergency.



They will know which substation you are calling from and will co-ordinate the emergency services response; and

3. If required to evacuate the notice of evacuation will generally be by word of mouth. All persons in all work parties are to move to the evacuation assembly area at the main entry gate to the Substation.

The emergency response folder, located near the control room desk, has site specific details and further actions that may be required.

6. Accountability

Title	Responsibilities and Accountabilities
Head of HSE	Ownership of this work instruction
Power System Safety Rules Manager	Maintenance of this work instruction
Training Manager	Implementation of training programs associated with this work instruction
Authorised Persons	Comply with this work instruction

7. Change history

Revision no	Approved by	Amendment
6	Krista-Lee Fogarty, Head of HSE	<ul style="list-style-type: none"> > Section 2.2 and 3.6 - Updated to change references from ATW to WSAT > Section 3.6 – Security System operation details removed > Update of template and minor typographic errors

8. Implementation

This procedure is to be implemented in conjunction with the implementation of TransGrid's Power System Safety Rules. It will be available as a resource, published on the Wire.

9. Monitoring and Review

The Head of Health, Safety & Environment is responsible for the ongoing monitoring and review of the documents associated with the Power System Safety Rules. This can include but is not limited to:

- a. Requesting regular feedback on the effectiveness of procedures and work instructions. Appropriate feedback tools include focus groups and online assessments;
- b. Where a change has occurred in our processes; and
- c. Recommendations arising from incidents.

10. References

- > Power System Safety Rules
- > Selection, Inspection, Use and Storage of Personal Protective Equipment and Clothing