

Guidance Note - Management of HV Conductors Accessible at Ground Level

1. Purpose

This guidance note defines the requirements for the temporary management of exposed conductors connected to Transgrid power system apparatus that:

- have been made accessible such that persons at ground level may inadvertently breach Safe Approach Distances;
- are not controlled by an Access Authority; and
- do not meet the requirements for Disconnected Apparatus.

The requirements apply to temporary arrangements associated with construction, asset replacement and maintenance activities.



2. General Principles

The Power System Safety Rules require that Safe Approach Distances (SADs) are maintained from all exposed HV conductors, unless they are controlled by an Access Authority, or meet the requirements for Disconnected Apparatus.

Where reasonably practicable, exposed HV conductors that are not controlled by an Access Authority and do not meet the requirements of Disconnected Apparatus must be either:

- fully removed from service, or
- completely installed and connected to HV apparatus in accordance with standard designs.

Where this is not reasonably practicable to achieve, and conductors become accessible while remaining connected, additional controls must be implemented in accordance with this guidance note to prevent persons from inadvertently breaching Safe Approach Distances.

2.1. Determining what is Reasonably Practicable

Examples of circumstances where it may not be reasonable for a conductor to be fully removed or installed include:

- **network and outage constraints:** the network outages required to fully remove and subsequently reconnect the HV conductors are not reasonably practicable due to network constraints such as system loading, radial supply arrangements, outage availability or generation constraints
- **work execution requirements:** the network outages required to fully remove and subsequently reconnect the HV conductors are not reasonably practicable due to work sequencing, project duration, switcher availability, or other operational constraints

Exposed HV conductors must not be left in a connected state where a person at ground level could inadvertently breach SADs unless the controls specified in this guidance note are implemented and maintained.

3. Controls

The following controls must be implemented prior to the cancellation of the relevant Access Authority or Disconnected Apparatus state. They must remain effective until the conductors are again controlled by either an Access Authority or Disconnected Apparatus.

3.1. Isolation and Earthing

The conductors must be isolated from all sources of supply, including LV sources that can cause the conductors to become energised at HV. All isolations must be secured with an O1 lock, in accordance with the requirements of the HVPRI.

The conductors must be earthed unless a documented risk assessment determines earthing is not required. Earthing must:

- comply with OM906 – Primary Earthing Requirements; and
- be secured by a means that prevents inadvertent removal during normal switching operations, such as a bolted connection.

3.2. Restraints

Where there is potential for movement, conductors must be restrained. The method for restraint must ensure:

- conductor movement is prevented, or where that is not reasonably practicable, minimised as far as practicable
- there is no potential for flashover from either conductor movement or the restraint medium
- equipment and conductors will not be damaged by the method of restraint
- the conductors cannot be damaged by movement against other conductors or adjacent equipment
- the restraint medium used is in good working condition

3.3. Exclusion Zones

An exclusion zone must be established to prevent workers from inadvertently accessing the conductors.

3.3.1. Barrier requirements

Barriers used to delineate the exclusion zone must:

- be secured such that neither workers nor the barrier can breach the applicable SADs (persons) to exposed HV conductors;
- be visible to all workers and installed at an effective height to indicate the boundary of the exclusion zone; and
- where conductive temporary fencing is utilised, it must comply with substation temporary fencing earthing requirements outlined in design standard STD-859002.

Note: Yellow tape must not be used as a barrier to avoid confusion between the exclusion zone and a HV Access Authority designated work area. Other tape or rope systems are acceptable provided they meet the above requirements.

3.3.2. Signage

The exclusion zone must include signage at regular intervals stating, “Exclusion Zone -Do Not Enter”. All signage must be secured.

3.3.3. Limited Access

Access to the exclusion zone is permitted only where necessary for the preparation, maintenance or removal of these additional controls, or for activities associated with the issue or cancellation of an Access Authority, Preparation and Restoration Instruction or Disconnected Apparatus.

Workers may access the exclusion zone where:

- the site manager has approved the access;
- the Controller and worker have verified the isolation and earthing status of the conductors; and
- the Controller has granted verbal clearance.

The verbal clearance must specify the expected task duration and cannot extend over multiple work shifts.

4. Site Management

The Construction/Project Manager is responsible for ensuring:

- the decision to leave conductors connected is reasonable and justified;
- the decision is documented;
- appropriate controls are identified, documented and recorded;
- a site manager is nominated for the duration of the arrangement; and
- an Advice of Alteration is prepared and submitted to Operations Planning for approval.

The site manager is responsible for ensuring:

- controls are implemented onsite;
- all persons accessing the site are notified of the exclusion zone; and
- the effectiveness of controls is maintained.

4.1.1. Documenting Controls

All controls must be documented on an approved Advice of Alteration, including:

- the name and contact details of the nominated site manager; and
- a diagram showing the location of the conductors, isolation, earthing and exclusion zone.

A copy of the approved Advice of Alteration must be retained onsite for the duration of the project.

4.1.2. Notification

All workers onsite must be notified of the exclusion zone prior to beginning work. This may be communicated to workers via the site hazard board or other construction site notice boards.

An approved Advice of Alteration must be provided to the Controller prior to the cancellation of the relevant Access Authority or Disconnected Apparatus.

4.1.3. Maintaining Effectiveness

The condition of restraints, barriers, signage and earths must be periodically inspected to ensure their effectiveness. Where a control is found to be damaged, missing or ineffective it must be rectified as soon as practicable, or the conductors must be returned under the control of an Access Authority or managed as Disconnected Apparatus.

The inspection period may vary dependent on the restraint medium, barrier and signage used, but must be performed:

- at least once per month;
- after any significant weather event or site disturbance; or
- prior to recommencement from work after an absence from site.

4.1.4. Return to Service

The site manager must ensure the conductors are visually inspected for damage or defects prior to being returned to service.