

ISSC 37

Guide for Working On, Near or in the Vicinity of the Apparatus of another Network Operator

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PREFACE

This document – Guide for Working On, Near or in the Vicinity of the Apparatus of another Network Operator (Guide) has been prepared by a working group of representatives from New South Wales Network Operators and the NSW Department of Planning, Industry and Environment (the Department).

This Guide supports the requirements of Electrical Supply (Safety and Network Management) Regulation 2014 and Australian Standard AS 5577 – Electricity Network Safety Management System.

This Guide sets minimum industry standards but is advisory only. It does not substitute for, or override, any legislation, regulation, code, or safety rules implemented by jurisdictional regulators or Network Operators.

DISCLAIMER

While due care has been exercised in the compilation of this Guide, much of the content has been sourced externally to the Industry Safety Steering Committee (ISSC) and the Department. Thus the Department cannot accept responsibility for the content.

This Guide is designed on the basis that it will be used in its entirety, and persons who use or observe parts of the publication without paying heed to the entirety of the publication do so at their own risk.

This Guide has been prepared on the basis that the user will be appropriately trained, qualified, authorised, and competent. This Guide is not intended for use by untrained or unqualified persons, and anyone in that category using the Guide does so at their own risk.

This Guide does not purport to ensure compliance with all relevant statutes and regulations, such as work health and safety laws. Users must satisfy themselves as to the requirements of all relevant laws.

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1. Regulatory Basis

This Guide supports the New South Wales Electricity Supply Industry in the prevention of occupational illness, injuries and fatalities of persons working on or near electricity networks, members of the public and customers supplied from the electricity network. This is consistent with the intentions of the *NSW Work Health and Safety Act (2011)*, the *NSW Work Health and Safety Regulation (2017)*, the *Electricity Supply Act 1995* and the *National Electricity Network Safety Code (ENA DOC 01-2019)*.

In 1997 the New South Wales Government moved away from prescriptive regulations to outcome driven regulations in the electricity supply industry. All regulations in New South Wales have a five-year life. After five years the need for the regulation is considered and assessed for its relevance to the industry and the general community.

2. Scope

This Guide has been developed to assist Network Operators in providing a consistent approach to the conduct of its own activities where proposed to come within the vicinity, is constructed on the same supporting infrastructure as another Network Operators apparatus or is interconnected with another Network Operators apparatus and so requires coordination with another Network Operator for safe access.

Includes work carried out by or for an NSW Network Operator but excludes contestable work by Accredited Service Providers (ASPs).

3. Definitions

Access Authority – Access control used by the working organisation (e.g. Access Permit).

Asset owner – The Network Operator who owns or operates the assets of which the working organisation intends to work, on, near or in the vicinity.

Apparatus – Any electrical equipment, including overhead lines and underground cables, the conductors of which are live, or can be made live.

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

Authorised Person – A person with the 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.

Competent – Having the skills, knowledge and attributes a person needs to complete a task.

Electricity Network – Transmission and/or distribution systems consisting of *electrical apparatus* which are used to convey or control the conveyance of electricity between generators' points of connection and customers' points of connection.

Field Operator – A person with the technical knowledge or sufficient experience who has demonstrated competency and has been authorised to perform isolation or isolation and earthing steps as part of a switching instruction.

Industry Safety Steering Committee (ISSC) – means a committee established by the Minister for Energy and Environment formed of representatives of the electricity transmission

and distribution industry, trade unions and other relevant stakeholders to examine and provide recommendations and documentation for use by the industry to improve safety for the public and workers.

Isolated – Disconnected from all possible sources of electricity supply by means that both prevent unintentional energisation of the apparatus and are assessed as a suitable step in the process of making safe for access purposes.

May – Indicates the existence of an option.

Near – A situation where there is a reasonable possibility of a person, either directly or through any conducting medium, coming within the relevant safe approach distances for authorised persons.

Network Operator – Owns and maintains the transmission or distribution electricity network.

On – *Coming into direct contact with mains and apparatus.*

Operating Agreement – An agreement on which an undertaking is given by an authorised person for a Network Operator or other organisation that the electrical apparatus specified will remain isolated and/or earthed/rail connected/short circuited until the agreement has been cancelled. It is used in cases where the Asset Owner is performing isolation or isolation and earthing on behalf of the working organisation.

Qualification – A planned combination of learning outcomes that have a defined purpose.

Shall or must – Indicates that a statement is mandatory.

Should – Indicates a recommendation.

System Operator – An authorised worker who is part of a continuously staffed control room and holds responsibility for the operation of all or a designated part of a Network Operator's electricity network.

Vicinity – means a situation where it is likely that a person will, either directly, or through any conducting medium, come within the relevant safe approach distance for an ordinary person, but unlikely to come within the relevant safe approach distance for an authorised person.

Voltage – Differences of potential normally existing between conductors and between conductors and earth as follows:

(a) Extra-low voltage not exceeding 50 Volts (V) alternating current (a.c.) or 120 V ripple-free direct current (d.c.)

(b) Low Voltage (LV) exceeding extra-low voltage, but not exceeding 1000 V a.c. or 1500 V d.c.

(c) High Voltage (HV) exceeding LV

Working Organisation – The Network Operator intending to carry out work on, near or in the vicinity of another Network Operator's mains and apparatus.

4. Managing Health and Safety

One of the objectives of this Guide is to provide assistance for companies to meet the requirements of NENS 03 – National Guidelines for Safe Access to Electrical and Mechanical Apparatus in order to protect the health and safety of persons carrying out work on or near the electricity network, through risk management principles and safe systems of work.

5. Training & Authorisation

All workers must meet the minimum competency and authorisation requirements of identified in ENA DOC 01.

In addition, companies Safety Management Systems need to consider the need for periodic assessment of competency of workers performing connections in accordance with this guideline.

6. Principles associated with working on, near or in the vicinity of the apparatus of another Network Operator

Persons authorised for work on, near or in the vicinity of one NSW Network Operator mains and apparatus may carry out work on, near or in the vicinity of another NSW Network Operator mains and apparatus within the following framework.

6.1 Work in the vicinity

For any work planned within Safe Approach Distances for work performed by Ordinary Persons as defined in the table below, with voltages in kilovolts (kV) and distances in metres (m).

Nominal Phase to Phase a.c. Voltage (kV)	Safe Approach Distance (m)
Up to and including 132	3
Above 132 up to and including 330	6
Above 330	8

The working organisation shall notify the asset owner with the following information:

- Location of work
- Nature of work
- Proposed time and date of work
- Relevant working organisation Safe Approach Distances to be maintained by Authorised Persons

The asset owner shall assess the work and either provide an approval to proceed with work in the vicinity, or an operating agreement for work on or near.

The working organisation's safe systems of work shall apply.

6.2 Work on or near

The working organisation shall request the isolation, earthing, and short-circuiting as appropriate, of the mains and apparatus to be worked on or near, by the asset owner. The request is to include:

- Location of work.
- Nature of work.
- Proposed time and date of work.

This isolation and earthing are to be secured via an Operating Agreement issued by the asset owner to the working organisation. Once the Operating Agreement is issued, the working organisation's safe systems of work shall apply.

An Operating Agreement procedure must be incorporated within each Network Operator's network isolation and access procedures.

Operating Agreements must be established and issued by an authorised representative of the asset owner responsible to operate and provide access to the network apparatus involved.

To issue an Operating Agreement over an asset, the mains and apparatus must be:

- Isolated from all network sources of electrical energy by the opening of switches, removal of fuses or links, or other disconnection from the energy source.
- Secured in an isolated state by the attaching of Danger/Do Not Operate tags at each isolation point, as well as through the use of locks where available.
- Proved de-energised using appropriate test equipment.
- HV mains and apparatus are to be short circuited and connected to earth by suitably rated bonding conductors and equipment.
- LV mains and apparatus are to be short circuited or isolated from all customer sources of supply.
- 1500V d.c. mains and apparatus are to be rail connected.

The Operating Agreement must be received by an authorised representative for the working organisation so that it can be incorporated into the Working Organisation's safe systems of work. This exchange of Operating Agreements can be carried out between System Operators of the Asset Owner and the Working Organisation in strict accordance with documented communication protocols in place between those Network Operators.

Work practices and equipment used by the Working Organisation are to be as per the documented practice of the Working Organisation.

Prior to any associated isolations or earthing being removed by the asset owner, the Operating Agreement must be surrendered by the working organisation either by the return of appropriately endorsed Operating Agreement forms in the field, or verbally by the System Operator acting on the advice of the work party.

The working organisation must not:

- issue an Access Authority on the mains and apparatus of another Network Operator without the receipt of an Operating Agreement; or
- carry out operating activities including the installation or removal of short circuiting and earthing equipment on another Network Operator's apparatus.

6.2.1 Access to the other organisations mains or apparatus to perform modifications

If the intended work involves modifications to the Asset Owner's asset, approval will be required from the asset owner (Design approval, work duration, inspection, and testing plan etc.) prior to the field group requesting the outage. Detail of work to be performed and associated approval is to be submitted with the outage request.

6.2.2 Work being performed by both organisations in the same location

If both organisations are performing independent work activities at the same location additional precautions are required to manage the safety of each work group with respect to the other work group. The occurrence of coincidental work is to be identified during the planning phase of the outage by the operations groups and referred to the respective field groups to manage.

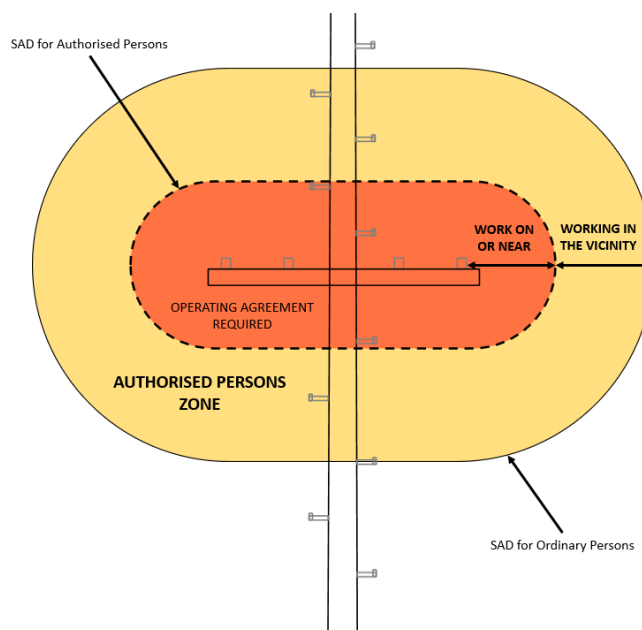


Figure 1: Work classifications

7. Work on or near the apparatus of another Network Operator

Work performed outside a substation switchyard involving access to assets of both the working organisation and the other organisation shall be performed on a single access authority (or equivalently two cross-referenced access authorities) issued by the organisation with operational responsibility.

7.1 Planning Phase

The working organisation shall identify the other organisation's asset to be worked on or near and earthing requirements via physical inspection and/or consultation with staff from the Owner organisation.

The working organisation's operations section shall then request an outage of the Owner organisation's asset and the application of earths at nominated locations as required. The request is to include asset designation, nominal voltage, structure numbers where earthing is required (using the Owner organisation's references) and details of the Asset Owner contacts where consulted to verify asset details.

7.2 Real-time (execution) phase

The Working organisation's System Operator shall request the Owner Organisation's System Operator to isolate and earth/short circuit/rail connect (as required) the asset at the nominated locations, in accordance with the request in the planning phase.

Following the completion of requested earthing/short circuiting/rail connection, the Owner Organisation's System Operator issues an Operating Agreement to the Working Organisation.

The Operating Agreement shall confirm:

- That the asset/s have been isolated and earthed/short circuited/rail connected at the nominated locations.
- All required details have been exchanged as per the request.
- The status of the asset shall remain in this condition until the Operating Agreement is returned (i.e. when isolation and earthing is no longer required).

Following the issue of the Operating Agreement, operational responsibility is transferred to the Working Organisation's System Operator for the Asset Owner's apparatus within the defined limits (e.g. between structures X and Y) and Access Authorities may be issued by the Working Organisation.

After all work is completed by the Working Organisation and all associated Access Authorities are cancelled:

- The Working Organisation's System Operator shall request their field staff to surrender the Operating Agreement and return it to the Owner Organisation advising operational responsibility is returned.
- The Owner Organisation may remove earths and return their feeder to service.

7.3 Clarifications and Exceptions

At completion of the work and following appropriate inspection and approval of the work by the Asset Owners field representative, access authorities will be cancelled and an operational clearance given that as far as the working organisation is concerned the other organisation may remove earths. The provision of an appropriate clearance certificate to the operations group prior to placing the modified feeder in service will be the responsibility of the Owner organisation's field representative.

7.3.1 Work only involving access to another organisations asset

If the work being performed by the working organisation does not involve work on an asset under the control of their operations group (i.e. work on assets being constructed or considered disconnected from their network) then outage requests on the other organisation's assets will be made directly to the owner organisation's operation group by the working organisation's field group.

All access authorities associated with this work will be controlled by the Owner organisation's operations group.

8. Testing of interconnected circuits

HV testing work involving injection across the operational boundary will require coordination between the field groups and system operators of both organisations.

The following process is developed to manage testing scenarios where earthing is initially required by the owner organisation for the test setup and then required to be removed to facilitate the testing work.

Principles:

- All efforts are to be taken to eliminate the need to perform HV testing across operational boundaries.
- It is preferable that the organisation for whom the testing is required is to be responsible for the testing.
- Works are to be planned and coordinated such that there is no test voltage injection onto conductors at one end, at the same time as HV access to those same conductors at the other end.

8.1 Planning Phase

Field representatives from each organisation determine appropriate coordinated test plan and submit outage requests to their respective operating groups. Request to include details of the test, representative from the other organisation involved in the test, and the work party responsible for the test source.

The respective organisation's operations section shall then exchange outage requests detailing the isolation requirements for the coordinated test. The request is to include a test plan that states; feeder designation, nominal voltage, earthing requirements, officer from the other organisation involved in the test and the organisation responsible for the test source.

8.2 Real-time (execution phase)

The System Operator from each organisation shall conduct switching sequence to provide equipment in requested state for the start of the work.

The respective System Operators shall exchange operational clearance confirming:

- Isolation status of the equipment under coordinated test in accordance with planning request.
- Nominated organisation in control of the test source.
- Confirm field groups responsible for communication associated with the test.

The System Operator from each organisation will provide approval to respective field staff to issue testing access authorities for the testing work. The approval is to confirm:

- Testing is to be in accordance with the submitted test plan.
- Nominate the organisation in control of the test source.
- Confirm communication between the two field groups has been established.

Respective field staff will then perform testing in accordance with the coordinated test plan.

This will include:

- Setup for testing, removal of earths (under direction from the organisation in control of the test source) and completion testing.
- Restoration of earthing (under direction from the organisation in control of the test source) and removal of test setup.
- Cancellation of access authorities.

After cancellation of access authorities the System Operator from each organisation shall confirm:

- Testing work has been completed and all access authorities cancelled.
- Status of equipment at completion of coordinated test.
- Approval to initiate switching sequence to return equipment to service.

9. Examples

9.1 Example 1 – Work in the vicinity

A transmission operator is planning a 12-month program of work upgrading one of their 132kV transmission lines. They determine that to manage the works above a 415V feeder, owned by a distribution company, they will install a hurdle which will remain in place for the duration of the upgrade program. Due to the site constraints, the transmission operator determines that the best place to install the poles supporting the hurdle will be 2m away from the outside conductors on either side of the 415V feeder. As this is within the vicinity to the 415V feeder, the transmission operator notifies the distribution company owning the 415V feeder. After reviewing the proposed works and control measures the distribution company agrees that the transmission company can proceed with boring and installing the poles with the 415V feeder in service. Both parties agree that to install the hurdle netting an outage of the 415V feeder is required and this will be managed in accordance with the Operating Agreement process.

9.2 Example 2 – Vegetation work in the vicinity

A vegetation worker, working on behalf of a distribution company is required to remove branches above a distribution network feeder. However, the branches are measured to be 5m away from a 330kV conductor. The distribution company notifies the transmission company about performing the work. The transmission company agrees that the work can proceed but decides as an additional requirement to provide a safety observer to monitor the work which is within the vicinity from the 330kV line.

9.3 Example 3 – Work in the ordinary person zone

A transmission company is performing spacer repairs from a conductor trolley on a 330kV line. There is an 11kV feeder, owned by a distribution company, crossing under the transmission line where the work is being performed. Whilst the conductor trolley will pass

directly over the 11kV feeder there is no risk of coming within 3m of the 11kV feeder due to a 15m clearance between the two lines. As there is no risk of coming within the ordinary person approach distance to the 11kV feeder no consultation is required with the distribution company prior to performing the work.

9.4 Example 4 – Work on or near apparatus

A distribution company is performing a hands-on inspection of a 33kV pole and its associated hardware however there is an 11kV feeder attached to the pole from another distribution company. The work will be performed using an insulated elevated work platform (EWP) which will come within 1m of the 11kV. As the EWP will come within the safe approach distances for mobile plant and loads, an operating agreement from the distribution company who owns the 11kV feeder will be required prior to commencing work.

Appendix A Sample Operating Agreement Form

OPERATING AGREEMENT

Issued in accordance with disconnection/reconnection instruction no: _____

1. Purpose of Operating Agreement An agreement with _____

 _____ (name of authority/customer/contractor with whom this Operating Agreement is being issued)
 on the following _____
 _____ (the electrical apparatus)
 at _____
 _____ (the location of electrical apparatus)

2. Isolation The following actions have been taken: (list all points of isolation and danger tags used to disconnect the electrical apparatus)

3. Earthing/Low Voltage Protective Bonds Earths/Low Voltage Protective Bonds (LVPBs) have been connected to the conductors at: (cross out if not applicable)

A. _____ B. _____
 C. _____ D. _____

4. Special conditions _____

5. Issue of Operating Agreement (to be signed by the worker who has operational control of the electrical apparatus. The electrical apparatus must remain in this condition until this agreement is cancelled)

Signed by	Print name	Classification	Time	Date	Issued for (name of authority/customer/contractor)

6. Acceptance of Operating Agreement (to be signed by the worker agreeing to the above issue of Operating Agreement)

Signed by	Print name	Classification	Time	Date	Accepted for (name of authority/customer/contractor)

7. Surrender of Operating Agreement (to be surrendered by the accepting authority/customer or contractor)

Signed by	Print name	Classification	Time	Date	Surrendered for (name of authority/customer/contractor)

8. Cancellation of Operating Agreement (to be cancelled by the worker who has operational control of the electrical apparatus)

Signed by	Print name	Classification	Time	Date	Cancelled for (name of authority/customer/contractor)

Appendix B Relevant Documentation

- ENA DOC 01 National Electricity Network Safety Code
 - ENA NENS 03 National Guidelines for Safe Access to Electrical and Mechanical Apparatus
 - ENA NENS 04 National Guidelines for Safe Approach Distances to Electrical and Mechanical Apparatus
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