Endeavour Energy Electrical Safety Rules – July 2016

Associated Procedures List

Document No.	Title
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GSY 0091	Low Voltage Access Authority
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GNV 1044	Commissioning of electrical apparatus which has never been commissioned or which has been worked on
GNV 1051	Working on structures with communications transmitters
GNV 1058	Fallen Conductors
GNV 1068	Application of yellow taped areas in zone and transmission substations
GNV 1070	Access Authority procedure for work on transmission mains and joint use mains
GNV 1086	Switching Folder

Company Procedure

NETWORK	Document No	:	GAM 0089
	Amendment No	:	2
	Approved By	:	DCEO
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(Supersedes Company Procedure (Network) GAM 0089.am1)

GAM 0089 AUTHORISATIONS GOVERNANCE AND MANAGEMENT

1.0 PURPOSE

To establish a framework by which the company will authorise persons to work on or near the company's network, so that only appropriately trained and competent workers are authorised to carry out defined tasks on the network.

2.0 SCOPE

This procedure covers the requirements for the governance and management of the process for the development, issue and application of all authorisations required to work on the company's network.

This procedure applies to employees, Accredited Service Providers (ASPs) and their employees, and contractors and their employees who are required to facilitate and undertake work on or near the company's network.

3.0 REFERENCES

Internal

Company Policy (Information & Records Management) 15.3.2 – Recordkeeping
Company Policy (Network) 9.1.10 – Network Electrical Safety
Company Procedure (Health & Safety) GSY 0037 – Electrical Safety Training
Company Procedure (Health & Safety) GSY 1031 – Electrical Safety Rules
Company Procedure (Information & Records Management) GDM 0006 – Records Disposal
Company Procedure (Information & Records Management) GDM 0013 – Records Access and Security
Company Procedure (Information & Records Management) GDM 0016 – High Risk and High Value Records and Information
Company Procedure (Network) GAM 0018 – Authorisations Process Management
Company Procedure (Network) GAM 0046 – Amendment, Distribution and Communication of Electrical Safety Rules
Company Procedure (Network) GAM 0053 – Temporary Suspension of Network Authorisation Following an Electrical Incident
Company Form (Network) FAM 0015 – Accredited Service Provider (New) Authorised Person (External) Application and Agreement Level 1
Company Form (Network) FAM 0016 – Authorised Person Authorisation Application (Internal Employees New)
Company Form (Network) FAM 0017 – Contracted Service Provider (New) Authorised Person (External) Application and Agreement
Company Form (Network) FAM 0018 – Accredited Service Provider (New) Authorised Person (External) Authorisation Application and Agreement Level 2

Company Form (Network) FAM 0019 – Accredited Service Provider (New) Authorised Person (External) Authorisation Application and Agreement Level 3
Company Form (Network) FAM 0024 – Asbestos Awareness Training Completion
Annexure A – Schedule 1 – Functions Requiring Authorisation

External
General Retention and Disposal Authority: Administrative Records GA40
Handbook HB 5031–2011 Records classification

4.0 DEFINITIONS

Accredited Service Provider (ASP)
A company or individual accredited by the Department of Trade and Investment to undertake contestable service work as defined by the Scheme for ASPs.

Annual electrical safety training
Training conducted by the company's Technical Training Branch, or an endorsed Registered Training Organisation (RTO), in accordance with Company Procedure GSY 0037 – Electrical Safety Training.

Authorised
A person with technical knowledge or sufficient experience who has been approved as competent and is then authorised in writing by the company to perform the function requiring authorisation on or near the company's electricity network or in any other situation determined by the Chief Engineer. This definition holds for various forms of the word, eg authorisation, authorise and Authorised Person (AUP).

Authorised Person (AUP)
A person who has been authorised in accordance with this procedure.

Authorisations renewal period
The period of time from one month prior to an authorisation anniversary date to one month after an authorisation anniversary date.

Cancellation
The permanent removal of a person's authorisation to work on or near the company's network.

Competent
Having the skills and demonstrated adequate understanding and ability to identify and mitigate the risks when carrying out the authorised work practices, safely without mentoring and having the knowledge and attributes a person needs to complete a task.

Contractor
Any individual or body corporate that is engaged by the company under a purchase order or contract to perform services of a non-trivial nature at a company site including suppliers that install or maintain equipment. Itinerant visitors or suppliers that are delivering goods to a company site such as couriers are generally not contractors.

Contract owner
The company employee who has the accountability and responsibility for confirming that contract service providers to the company satisfy the health, safety and environmental statutory requirements for contracted services and the company's requirements for authorisation of all their employees who will be employed on a specific contract.

Document control
Employees who work with printed copies of document must check the BMS regularly to monitor version control. Documents are considered "UNCONTROLLED IF PRINTED", as indicated in the footer.

Electrical apparatus
Any electricity power lines or associated equipment or electricity structures that form part of a transmission or distribution system.

Electricity network
Transmission and 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.

Electrical Safety Committee (ESC)
The ESC is the peak committee established to manage the electrical safety process for the company.

Electrical Safety Rules (ESR)
The company's rules defining minimum requirements for safe work on or near the network. The requirements of these rules must always be supported by hazard and risk assessments and work method statements.

Network Access Authorisation System (NAAS)
The corporate database used to store records of persons' authorisation to work on the network.

Near (on or 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 specified in the Electrical Safety Rules in Table A – Safe Approach Distances for Authorised Persons and Instructed Persons.

Recognition of Current Competency (RCC)
An assessment process conducted by a RTO that assesses an individual's skills, knowledge and experience in order to formally recognise competency for a particular work task.

Recognition of Prior Learning (RPL)
A process conducted by a RTO that assesses an individual's knowledge and understanding obtained from prior experience or formal training against the knowledge and understanding expected to be obtained from a current qualification.

Recordkeeping
Making and maintaining complete, accurate and reliable evidence of business transactions in the form of recorded information. (Source: Handbook HB 5031–2011 Records classification)

Registered Training Organisation (RTO)
Training organisations that have been registered in accordance with the Australian Recognition Framework to provide Vocational Education & Training (VET) Services.

Review date
The review date displayed in the header of the document is the future date for review of a document. The default period is three years from the date of approval however a review may be mandated at any time where a need is identified due to changes in legislation, organisational changes, restructures, occurrence of an incident or changes in technology or work practice.

Suspension
The temporary removal of a person's authorisation to work on the company's network.

Valid evidence
Copies of certificates and not original documents submitted as evidence of training and assessment qualifications. All copied evidence of training and assessment from Registered Training Organisation (RTO), other than evidence of training carried out by the company's Technical Training Branch for employees must be certified by a Justice of the Peace or other person recognised by the Australian Government as being entitled to certify copies of documents, prior to submission to the Electrical Safety Authorisations Section.

5.0 ACTIONS

5.1 Authorised functions

All persons required to work on or near the company's electricity network must be authorised in accordance with the requirements of this procedure and individual authorisation procedures.

All company line managers and contract owners, ASPs and contract service providers are responsible for allowing only appropriately authorised persons to be allocated work on or near the network.

A person required to carry out specific functions on or near the company's electricity network will be required to provide evidence of their competency to carry out such functions before they will be authorised to carry out these functions. The competency requirements that must be satisfied prior to authorisation will be detailed in individual authorisation procedures.

All persons required to work on or near the network must demonstrate an understanding of the company's Electrical Safety Rules and satisfy the other applicable requirements of Company Procedures GSY 0037 – Electrical Safety Training and GAM 0046 – Amendment, Distribution and Communication of Electrical Safety Rules.

A list of functions requiring individual authorisation is provided in Annexure A – Schedule 1 – Functions Requiring Authorisation of this procedure.

The development of procedures setting out requirements for authorisation to carry out specific functions is provided in Company Procedure GAM 0018 – Authorisation Process Management.

5.1.1 Maintenance of authorisation

Where a person holds an authorisation in writing for a function not listed in Schedule 1 of this procedure, that authorisation will be retained until superseded or withdrawn by an individual authorisation procedure.

No person will be issued a new authorisation to carry out a function not listed in Schedule 1 of this procedure.

5.2 Authorisation application

All applications for authorisation must obtain the appropriate authorisation information pack from the Electrical Safety Authorisations Section which must nominate the function specific authorisation requirements as set out in the relevant authorisations procedure.

Applications must be accompanied by valid evidence that all competency requirements as defined in the function specific authorisation procedure and the information pack.

For company employees, the declaration of competency must be signed by the authorised person's line manager or higher. For employees of ASPs or contractors to the company, the declaration of competency must be signed by an appropriately delegated officer of the authorised person's employer.

Contract managers are required to endorse all contracted service submissions confirming compliance to all requirements.

Application forms, certificates, training transcripts and other forms of valid evidence will be electronically stored in the company authorisation database, Network Access Authorisation System (NAAS).

All applications for new authorisations must be made on one of the following forms:

- Company Form FAM 0015 – Accredited Service Provider (New) Authorised Person (External) Application and Agreement Level 1.
- Company Form FAM 0016 – Authorised Person Authorisation Application (Internal Employee New).
- Company Form FAM 0017 – Contracted Service Provider (New) Authorised Person (External) Application and Agreement.
- Company Form FAM 0018 – Accredited Service Provider (New) Authorised Person (External) Authorisation Application and Agreement Level 2.
- Company Form FAM 0019 – Accredited Service Provider (New) Authorised Person (External) Authorisation Application and Agreement Level 3.

5.3 Authorisations renewal

Authorisations must be renewed annually. Renewal timing will be as detailed in Company Procedure GAM 0018 – Authorisations Process Management

All applications for renewal of authorisation must be made on the second reminder form automatically generated by NAAS. If this form is misplaced, a new form will be generated by the Electrical Safety Authorisations Section.

Applications for renewal must be accompanied by valid evidence that all competency requirements as defined in the function specific authorisation procedure have been completed.

All applications for renewal of authorisation must be accompanied by a declaration of the competency of the authorised person to carry out the authorised function by their responsible employer.

For contractors, the contract owner must endorse the competency declaration and must be requested to annually endorse that the health, safety and environment system of the contractor remains in accordance with statutory obligations.

All applications for renewal of authorisation must be accompanied by a declaration of the competency of the authorised person to carry out the authorised function by their responsible employer.

For employees, the declaration of competency must be signed by the authorised person's line manager or higher. For employees of ASPs or contractors to the company, the declaration of competency must be signed by an appropriately delegated officer of the authorised person's employer.

Authorised persons whose authorisations are not renewed prior to the expiry date will not be permitted to access the network, unless under the supervision of a person authorised to undertake the work.

5.3.1 Renewal reminder

The company authorisations section must send reminder notices in accordance with the requirements of Company Procedure GAM 0018 – Authorisations Process Management.

5.3.2 Authorisation anniversary and expiry dates

The authorisation anniversary date will be set in accordance with Company Procedure GAM 0018 – Authorisations Process Management. The authorisation expiry date will be a one month after the anniversary date. Provided that all renewal requirements for all authorisations held by an authorised person are satisfied within the authorisation renewal period (one month either side of the anniversary date), the authorisation will be renewed, and the anniversary date will remain.

5.4 Issue of authorisations

5.4.1 Legitimate need for authorisation

A person will only be authorised to work on or near the company's electricity network if they are employed by a company that has a legitimate need to employ authorised persons.

Companies other than the company must be registered in NAAS before their employees will be authorised.

5.4.1.1 Employees of the company

All employees will be authorised subject to them meeting the competency and administrative requirements of an individual authorisation and having a nominating endorsement from their manager as required by Section 5.2.

Where a new employee is being recruited into a role requiring authorisation for a specific function/s, the ability of the candidate to meet all relevant authorisation criteria must be confirmed by the line manager of the role prior to any offer of employment.

5.4.1.2 Accredited service providers

An ASP must hold current ASP accreditation issued by the Department of Trade and Investment in order to be registered in NAAS.

The authorisations of an authorised person will remain valid until the requirements specified for the specific authorisations expire but will not be renewed if their ASP is no longer accredited, even if all other requirements for renewal of authorisation have been met. Additionally their authorisation will be suspended upon loss of accreditation by their ASP.

5.4.1.3 Contractors to the company

The contract owner must request the authorisations group to register a company that has a contract of service with the company or that is on a contractor panel to provide services to the company in NAAS.

Contracting companies will only remain registered in NAAS while they have a contract with the company or are on a contractor panel. The authorisations of employees of contracting companies will remain valid until the requirements specified for the specific authorisations expire but will not be renewed if a contracting company is not registered in NAAS, even if all other requirements for renewal of authorisation have been met.

5.4.2 Non-transfer of authorisations

Authorisations are unique to the employer of the authorised person who endorsed their nominating application and are not transferable. This does not prohibit an alternate employer seeking independent authorisation of the same individual as an authorised person.

5.4.3 Training and qualification requirements

The training and qualifications that a person must hold to obtain authorisation to carry out a specific function will be detailed in individual authorisation procedures.

5.4.4 Application process

Application for authorisation must be submitted on an endorsed application form.

Authorisations will be issued by the Electrical Safety Authorisations Section following submission of evidence confirming all qualifications and training/assessment requirements have been met.

5.4.5 Nominating endorsement

All company employees applying for authorisation for access to the network must have their direct manager's endorsement (or higher).

Applications for authorisation from employees of external companies must be approved by a delegated responsible controlling officer of that company.

5.4.6 Validity of evidence

Copies of certificates and not original documents are to be submitted as evidence of training and assessment qualifications. All copied evidence of training and assessment from an RTO other than evidence of training carried out by the company's Technical Training Branch for employees must be certified by a Justice of the Peace or other person recognised by the Australian Government as being entitled to certify copies of documents, prior to submission to the Electrical Safety Authorisations Section.

Evidence of training and assessment from RTOs other than evidence of training carried out by the company's Technical Training Branch for employees must be submitted to the Electrical Safety Authorisations Section in one the following forms:

- an individual certificate issued by the RTO and signed by the trainer or representative of the RTO; or

- a matrix clearly showing the full names and companies of persons trained and the training outcomes completed by each person. This matrix must be signed and dated by the trainer or representative of the RTO.

Scanned or copied training passports will not be accepted as evidence of training for any new applications or refresher training for authorisation renewals if the identity of the holder is not shown on same page as the training records.

Only complete packages of complying documentation for authorisations assessment will be considered. Part submissions will not be considered.

Evidence of training carried out by the company's Technical Training Branch for employees must be entered into the company Ellipse within five working days of the training being completed.

5.4.7 Issue of authorisation

Authorisation will be issued to successful applicants by the Chief Engineer. A letter which describes the level of authorisation and an individual Network Access Authorisation Card will be forwarded to the applicant's employer and to the contract owner in the case of employees of contractors to the company as proof of authorisation.

5.4.8 Evidence of authorisation

All authorised persons will be issued with a Network Access Authorisation Card which will indicate the functions which a person is authorised to carry out. The Network Access Authorisation Card must include a photo of the authorised person as positive identification of the authorised person and must indicate the date of expiry of the authorisation.

Each authorised person must carry their Network Access Authorisation Card with them whenever they are undertaking authorised functions.

5.5 Suspension of authorisation

An authorisation may be suspended for any of the following reasons:

- expiry date has been reached and the authorisation renewal requirements have not been met;
- failure to achieve the assessment requirements for Electrical Safety Rules training;
- disciplinary or consequence management reasons in accordance with Company Procedure GAM 0053 – Temporary Suspension of Network Authorisation Following an Electrical Incident;
- expiry of accreditation of an ASP or contract; and
- failure to comply with relevant company procedures.

Requests for suspension for disciplinary or consequence management reasons, must be in accordance with the requirements of Company Procedure GAM 0053 – Temporary Suspension of Network Authorisation Following an Electrical Incident.

A person whose authorisation is suspended must not undertake work for which the authorisation is required unless under the direct supervision of a person authorised to undertake the work.

5.6 Cancellation of authorisation

Cancellation of authorisation will only occur in accordance with the requirements of Company Procedure GAM 0018 – Authorisations Process Management.

Where a person whose authorisation has been cancelled seeks to be re-authorised, they will be subject to all of the requirements of a new application.

A person whose authorisation is cancelled must not undertake work for which the authorisation is required unless under the direct supervision of a person authorised to undertake the work.

5.7 Non-authorised persons

5.7.1 Supervision

A person who is not authorised to undertake a particular task that requires authorisation under this procedure must only undertake that task where they are under the direct supervision of a person authorised to undertake that task and the authorised person does not have an explicit restriction on the supervision of personnel who are not authorised for that function. This supervision is to be such that the non-authorised person remains under the direct supervision of the authorised person for the duration of the task requiring authorisation. Numbers to be supervised must be manageable.

5.7.2 Training

Persons undergoing training to carry out a specific authorised function may carry out that function without holding the required authorisation provided they are under the supervision of a person authorised to carry out the function.

5.7.3 Short term workers

In situations where, because a person will only be working on the company's network for a short time or will only require infrequent access to the network, and in the opinion of the relevant level 4 manager the safety benefits to be achieved from authorisation will be efficiently and equally achieved by other means, then written dispensation from the requirement to be authorised will be granted, subject to the requirements of Section 5.7.5. Written evidence of this dispensation must be carried with the unauthorised worker, and be able to be presented upon request.

5.7.4 Other dispensation from authorisation requirements

If, in the opinion of the relevant level 4 manager, the safety benefits of authorisation will be equally achieved by other means then dispensation from the requirement to be authorised may be granted, subject to the requirements of Section 5.7.5.

5.7.5 Authority to grant dispensation from authorisation requirements

Dispensation from the requirement to be authorised must be requested by a level 5 manager and endorsed by the relevant level 4 manager, acknowledging their responsibility for the safety obligation controls of the individuals under supervision and supported by a detailed risk assessment.

All dispensation requests must be submitted to the ESC for their approval.

A record of all dispensations granted from the requirement to hold authorisation must be kept by the Manager Electrical Safety & Authorisations.

The ESC will regularly review the reasons that dispensation from the need to authorise persons has been granted and take any associated actions that it deems appropriate.

5.7.6 Emergency situations

In emergency situations (referring only to life threatening situations) the System Operator may request an unauthorised person to conduct authorised functions. Such requests must only be made once the System Operator is satisfied that an emergency situation exists and that no authorised person is available to attend the emergency within a satisfactory period of time.

The un-authorised person and System Operator must agree that the function to be performed is understood and can be carried out safely.

The person requested to perform the authorised function retains the right to refuse the request if they consider it unsafe to carry out the authorised function.

A record of such requests must be maintained by the System Operator.

5.8 Competency and training

Each authorisation procedure must specify the criteria by which competency to carry out the authorised function will be demonstrated.

Competency requirements will be achieved by a combination of formal qualification, theoretical or practical training, which will be tailored to provide the specific competencies determined to be required for authorisation.

Competency may be demonstrated by successful completion of theoretical and/or practical assessment of skills as nominated in the relevant procedure.

Authorisation procedures must specify whether a RCC or RPL process will be an acceptable means of determining competency to carry out a particular authorised function.

The Manager Electrical Safety & Authorisations will specify and review training courses required to provide the required competencies for each individual authorisation.

6.0 RECORDKEEPING

All documents that are generated from this procedure are considered vital records, and as such will be captured into NAAS by a member of the Electrical Safety Authorisations Section as soon as practical after the event or transaction so that evidence is readily available. All scanned documents are visually checked for quality and association to the correct NAAS identification number is confirmed.

A bi-annual check to confirm that the documents are being captured will be undertaken by the Electrical Safety Authorisations Manager. Ultimate accountability for these documents being captured rests with Electrical Safety Authorisations Manager.

Access to these records must be managed in accordance with the requirements of GAM 0018 – Authorisations Process Management.

The table below identifies the types of records relating to the process, their storage location and retention period.

Type of Record	Storage Location	Retention Period*
Authorisation records for ASPs	Network Access Authorisation System	7 years after expiry, suspension or cancellation of agreement, or 7 years after action completed, whichever is longer, then destroy – as determined by GA40 section 6.9

Type of Record	Storage Location	Retention Period*
Authorisation records for employees or contractors to the company	Network Access Authorisation System	7 years after expiry or termination of agreement, then destroy – as determined by GA40 section 6.7

* The following retention periods are subject to change, eg if the records are required for legal matters or legislative changes. Before disposal, retention periods must be checked and authorised by the Records Manager.

7.0 AUTHORITIES AND RESPONSIBILITIES

Deputy Chief Executive Officer has the authority and responsibility for:

- approving this procedure; and
- providing appropriate resource allocation for this process.

Chief Engineer has the authority and responsibility for:

- endorsing the technical content of this procedure;
- providing appropriate resource allocation for this process;
- approving the issue of authorisations to successful applicants;
- certificating RTOs to carry out training and assessment to support authorisation competency requirements; and
- reviewing this procedure regularly to align with the needs of the company.

Manager Electrical Safety & Authorisations has the authority and responsibility for:

- confirming that the requirements of this procedure are met;
- developing competency criteria for each authorised function;
- reviewing and endorsing the authorisations aspects of all external network service contracts for the company;
- informing the Chief Engineer of the application of this procedure;
- notifying authorised persons' managers of employees due for authorisation renewal;
- specifying and reviewing training courses for all authorisations; and
- establishing the requirements for the assessment of competency of persons as appropriate to the requirements of the authorisation.

Manager Network Connections, with respect to ASPs has the authority and responsibility for:

- conducting audits of authorised persons employed by ASPs where this is a requirement of authorisation procedures;
- providing input to the performance of authorised persons applying for renewal of authorisation;
- communicating the authorisation process requirements to ASPs;
- providing recommendations to the Chief Engineer regarding outcomes of investigations into disciplinary matters relevant to authorised persons employed by an ASP; and
- communicating issues regarding the suspension of authorisations for disciplinary reasons with the ASPs.

Level 4 managers have the authority and responsibility for:

- identifying all authorisation needs for their respective employees;
- applying for authorisation for all employees who are required to carry out the function requiring authorisation and who are appropriately qualified and competent;
- communicating the requirements of this procedure to all employees;
- confirming that employees attend the required training on the date and time specified;
- enabling employees to maintain authorisation;
- assessing and attesting to the competency of their respective employees to carry out the authorised function annually;
- approving any request for dispensation from the requirement to authorise a person; and
- confirming that authorised persons working for them work within the limits of their authorisation.

Electrical Safety Authorisations Manager has the authority and responsibility for:

- confirming that the requirements of this procedure are met;
- developing competency criteria for each authorised function;
- reviewing and endorsing the authorisations aspects of all external network service contracts for the company;
- informing the Chief Engineer of the application of this procedure;
- notifying authorised persons' managers of employees due for authorisation renewal; and
- administering the authorisation process.

Managers have the authority and responsibility for:

- assessing to the competency of their respective employees to carry out the authorised function annually;
- attesting to the competency of their respective employees to carry out the authorised function annually; and
- assigning work so that authorised persons working for them work within the limits of their authorisation.

Contract owners have the authority and responsibility for:

- reflecting all authorisations requirements as established by the company clearly in contracts as developed, assigning responsibilities between the contractor, contract owner and users of the contracted services;

- identifying all authorisation needs to be covered within external contracted services;

- establishing within contracts the administrative processes that facilitate single, complete, complying documentation submissions for authorisation approval to the Manager Electrical Safety & Authorisations;

- managing the communication of authorisations requirements at contract establishment and through the duration of the contract;

- timely notification to the Manager Electrical Safety & Authorisations of the registration and de-registration of contracted service providers;

- establishing the contract parameters with respect to Work Health & Safety (WHS) provisions, of no less a nature than the NSW ASP regime for all contract service providers;

- assessing initially and on an ongoing basis all contracted services providers attainment and sustainment of the WHS parameters;

- approving initially and on an ongoing basis all contracted services providers attainment and sustainment of the WHS parameters;

- liaising with the Manager Electrical Safety & Authorisations on all authorisations requirements; and

- managing all authorisations under the contract.

Authorised persons have the authority and responsibility for:

- applying the conditions of their authorisation as described in this procedure;
- carrying their Network Access Authorisation Card with them at all times while carrying out the authorised function;
- not exceeding the level of authorisation granted (except in the case of emergency involving threat to life); and
- not undertaking work that requires an authorisation if that authorisation has been suspended or cancelled.

8.0 DOCUMENT CONTROL

Content Coordinator **:** Manager Electrical Safety & Authorisations

Distribution Coordinator **:** GRC Process Coordinator

Annexure A – Schedule 1 – Functions Requiring Authorisation

Function	BMS Reference
System Operator (Control Room)	GAM 0002
Low Voltage Network Switching	GAM 0092
Install and Remove Working Earths	GAM 0096
Distribution Network Switching Level 1	GAM 0027
Distribution Network Switching Level 2	GAM 0028
Distribution Network Switching Level 3	GAM 0029
Transmission Mains Switching	GAM 0100
Transmission Substation Switching Level 1	GAM 0101
Transmission Substation Switching Level 2/3	GAM 0101
Hold Approval To Work (ATW)	GAM 0074
Cancel and Reissue Access Authorities (AA)	GAM 0076
Hold Access Authority for Work (AA) – Personal Issue	GAM 0074
Hold Access Authority for Work (AA)	GAM 0074
Hold Access Authority for Test (AA)	GAM 0074
Low Voltage Ancillary Equipment Access	GAM 0042
Distribution Substation Access	GAM 0042
Zone/Transmission Substation Access	GAM 0042
Operate or Observe Plant Near Overhead Powerlines	GAM 0032
Carry Out Excavation Work Near Assets (Public Place)	GAM 0060
Observe Excavation Work Near Assets (Public Place)	GAM 0060
Carry Out Installation Inspection	GAM 0052
Disconnect and Reconnect Service Lines (Level 2 Category 1)	GAM 0055
Carry Out Underground Service Work (Level 2 Category 2)	GAM 0056
Carry Out Overhead Service Work (Level 2 Category 3)	GAM 0057
Installing Metering and Energising Installations (Level 2 Category 4)	GAM 0058
High Voltage Live Work – Glove & Barrier up to and including 33kV	GAM 0034
High Voltage Live Work – Stick up to and including 33kV	GAM 0034
High Voltage Live Work – Stick over 33kV up to and including 66kV	GAM 0034
Vegetation Control Worker	GAM 0031
OLI/GLI Inspection	GAM 0090
OLI Inspector – Remote	GAM 0090
OLI Inspector	GAM 0090
Carry Out Pole Top Inspection from an EWP	GAM 0090
Enter Private Property	GAM 0044
Use Force to Enter Private Property	GAM 0043
Carry out Spotter Duties	GAM 0041

Note: This schedule is complete as of the time of issue of this procedure. An up to date schedule of approved Authorisation procedures will be maintained on the company's website.

Company Procedure

HEALTH & SAFETY	Document No	:	GSY 0091
	Amendment No	:	0
	Approved By	:	CEO
	Approval Date	:	26/04/2016
	Review Date	:	26/04/2019

GSY 0091 LOW VOLTAGE ACCESS AUTHORITY

1.0 PURPOSE

To outline the procedure for issuing, receiving and signing on to a company Low Voltage Access Authority (LVAA).

2.0 SCOPE

This document lists the actions to be followed for issuing, receiving and signing on to a LVAA for work associated with Low Voltage (LV) isolation only.

This procedure applies to situations where workers are required to carry out work on or near the company's LV network electrical apparatus that is not subject to High Voltage (HV) Access Authority (AA) conditions. This includes Accredited Service Providers (ASPs).

Note: For the purposes of defining LV network electrical apparatus, it shall be considered upstream of the "connection point" shown in Annexure B – LV connection point.

Annexure A – Isolation applications provides further detail for the application of this procedure.

3.0 REFERENCES

Internal

Board Policy (Health & Safety) 3.0 – Work Health and Safety
Company Policy (Health & Safety) 3.18 – Work Health and Safety
Company Policy (Network) 9.8.3 – Network Operations
Company Procedure (Health & Safety) GSY 0092 – Operating Agreement
Company Procedure (Health & Safety) GSY 0093 – Non-Network System Isolations
Company Procedure (Health & Safety) GSY 1031 – Electrical Safety Rules
Company Procedure (Health & Safety) GSY 1066 – Worksite Hazard and Risk Assessment
Company Procedure (Health & Safety) GSY 1088 – Access Authority for High Voltage Work and/or Test
Company Procedure (Network) GAM 0074 – Authorisation to hold an Access Authority or Approval to Work
Company Procedure (Network) GAM 0092 – Authorisation for Low Voltage Switching
Division Procedure (Network) GNV 1044 – Commissioning Network Electrical Assets
Company Workplace Instruction (Network) WAM 0006 – Network Electrical Safety Auditing
Company Form (Health & Safety) FSY 0050 – Access Authority for Test
Company Form (Health & Safety) FSY 0051 – Access Authority for Work
Company Form (Health & Safety) FSY 0052 – Danger Tag
Company Form (Health & Safety) FSY 0054 – Switching Folder
Company Form (Health & Safety) FSY 0118 – Worksite Hazard and Risk Assessment
Company Form (Health & Safety) FSY 0215 – Low Voltage Access Authority

Division Form (Network) FNV 1043 – Certificate of availability for service for network electrical assets
Branch Form (Network Data & Performance) FAD 2001 – Notification of Network Alteration Sheet (White Sheet)
Branch Form (System Control) FCL 0015 – Operating Agreement
Electrical Safety Rules Handbook
Annexure A – Isolation applications
Annexure B – LV connection point

External
Work Health and Safety Act 2011 (NSW)
Work Health and Safety Regulation 2011 (NSW)
AS/NZ 2832.1:2004 Cathodic protection of metals – Pipes and cables
ENA Doc 01–2008 National Electricity Network Safety Code
ENA NENS 03–2006 National Guidelines for safe access to electrical and mechanical apparatus
Service and Installation Rules of New South Wales August 2012 (Amendment 30 June 2015)
General Retention and Disposal Authority: Administrative Records GA40
Handbook HB 5031–2011 Records classification

4.0 DEFINITIONS

Access Authority (AA)
Any form of authorisation which allows access to, work on or near, or testing of electrical apparatus in accordance with Company Procedure GSY 1088 – Access Authority for High Voltage Work and/or Test. An AA:

- is issued by an authorised person (AUP);
- is received by an authorised AA Holder (on behalf of single or multiple work crews);
- is what the work party signs before commencing work;
- gives clearance to carry out specific work on specific electrical apparatus on the HV network;
- records the isolation points operated to isolate the electrical apparatus;
- records the number and location of operational earths installed; and
- records the number and location of working earths.

Access Authority Holder (AA Holder)
The AUP signing on to (or accepting) the AA.

Access Authority Issuer (AA Issuer)
The AUP issuing the AA.

Accredited Service Provider (ASP)
An individual or single entity accredited in accordance with part 10 of the *Electricity Supply (General) Regulation 2001 (NSW)*.

Authorised
A person with technical knowledge or sufficient experience who has been approved as competent and is then authorised in writing by the company to perform the function requiring authorisation on or near the company's electricity network. This definition holds for various forms of the word for example, authorisation, authorise and Authorised Person (AUP).

Authorised Person (AUP)
A person who has been authorised in accordance with the relevant procedure.

Competent person
Worker who has been trained and assessed in a specified task.

Customer installation
An electrical installation owned by a network customer that can be isolated from the network by removing service fuses, opening main switch(es) or disconnecting service mains.

Danger tags
Isolation points are secured by means of danger tags associated with LVAA, AA for work or test, non-network system isolation or an operating agreement. They display the words “Danger Do Not Operate” and are affixed to all points of isolation (including their remote controls). The purpose is to provide a warning against any inadvertent or unauthorised operation of the electrical apparatus.

Document control
Employees who work with printed copies of documents must check the Business Management System regularly to monitor version control. Documents are considered “UNCONTROLLED IF PRINTED”, as indicated in the footer.

Electrical apparatus
Any electricity power lines or associated equipment or electricity structures that form part of a transmission or distribution system (including service mains and apparatus).

Electrical equipment
Means any apparatus applicable, for example cable, conductor, fitting, insulator, material, meter or wire that is:

- used for controlling, generating, supplying, transforming or transmitting electricity at a voltage greater than an extra-low voltage; or
- that is operated by electricity at a voltage greater than extra-low voltage; or
- 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
- is, or is part of, an active impressed current cathodic protection system within the meaning prescribed AS/NZ 2832.1:2004 Cathodic protection of metals – Pipes and cables.

Electrical Safety Rules (ESR)
The company’s rules defining minimum requirements for safe work on or near the network. The requirements of these rules must always be supported by hazard and risk assessments and work method statements.

High Voltage (HV)
Electrical energy greater than 1,000 volts alternating current or 1,500 volts direct current.

Isolated (and isolate)
Disconnected from all possible sources of electrical energy by opening switches, withdrawing circuit breakers, removing fuses, opening links, opening connections, tying back bonds and rendering them incapable of being made live unintentionally by the application of danger tags (and locks where possible).

Local safety precautions
Additional control measures taken by the AA Holder and work party to supplement the actions taken to issue the AA. These actions could include verifying cables are discharged, erecting warning signs or barriers, releasing stored energy, etc.

Low Voltage (LV)
A voltage exceeding 50 volts alternating current (ac) or 120 volts direct current (dc) but not exceeding 1000 volts alternating (ac) or 1500 volts direct current (dc).

LV auto isolation
Control system at a source of LV supply designed to automatically isolate and remain isolated whilst the network element to which it is connected is de-energised. (Customer installed LV generation systems with active anti-islanding protection in accordance with Australian Standards are deemed to achieve LV auto isolation.)

Low Voltage Access Authority (LVAA)
A form of authorisation which allows access to work on or near or testing of electrical apparatus. A LVAA:

- is issued by an AUP;
- is received by an authorised LVAA Holder (on behalf of single or multiple work crews);
- is what the work party signs before commencing work;
- gives clearance to carry out specific work on specific electrical apparatus on the LV network;
- records the isolation points operated to isolate the electrical apparatus; and
- records the number and location of Low Voltage Protective Bonds (LVPBs) installed (if applicable).

Low Voltage Access Authority Holder (LVAA Holder)
The AUP signing on to (or accepting) the LVAA.

Low Voltage Access Authority Issuer (LVAA Issuer)
The AUP issuing the LVAA.

Low Voltage Protective Bonds (LVPBs)
Approved bonds which short circuit all phase and neutral conductors when required under the ESR.

Non-network System Isolation
A system of establishing and maintaining isolations of non-network Low Voltage electrical systems and non-electrical sources of energy.

Operating Agreement (OA)
A written agreement on which an undertaking is given by an authorised person for a network operator or other company, that the electrical apparatus specified will remain isolated and/or earthed until the written agreement has been cancelled. The document is used in cases where the network operator or other company concerned is undertaking switching operations for another party.

Note: an Operating Agreement is not a LVAA, AA or non-network system isolation.

Person Conducting a Business or Undertaking (PCBU)
Has the meaning as prescribed under the *Work Health and Safety Act 2011 (NSW)* and for the purpose of this procedure, is either the company or a contractor of the company who employs workers to undertake duties on its behalf.

Recordkeeping
Making and maintaining complete, accurate and reliable evidence of business transactions in the form of recorded information. (Source: Handbook HB 5031–2011 Records classification)

Review date
The review date displayed in the header of the document is the future date for review of a document. The default period is three years from the date of approval. However, a review may be mandated at any time where a need is identified due to changes in legislation, organisational changes, restructures, occurrence of an incident or changes in technology or work practice.

System operator
The authorised employee responsible for the operational control of all, or a designated part of, the company's electrical network.

Secured
Being physically restricted from being operated by (if necessary) tying back, locking, removing or other means and danger tagging in an approved manner.

The company
Refers to Endeavour Energy. Also may be referred to as the PCBU as defined in the *Work Health and Safety Act 2011 (NSW)*.

Work
Any activity (whether electrical or otherwise) performed on or near electrical apparatus.

Worker
A person is a worker if the person carries out work in any capacity for a person conducting a business or undertaking, including work as:

(a) an employee; or
(b) a contractor or subcontractor; or
(c) an employee of a contractor or subcontractor; or
(d) an employee of a labour hire company who has been assigned to work in the person's business or undertaking; or
(e) an outworker, that is a person who performs work for an employer at their own home or at another location that is separate from their employer's factory, workshop, office or worksite; or
(f) an apprentice or trainee; or
(g) a student gaining work experience; or
(h) a volunteer.

Work party
Workers signing on and off the LVAA.

5.0 ACTIONS

5.1 Preliminary

Isolations of LV network electrical apparatus (not requiring the issue of an AA) must be covered by a LVAA. The LVAA must be used to plan and/or carry out LV isolations for workers (including ASPs), performing work on or near the network.

5.2 Issuing a LVAA

The following is a description of each section of Company Form FSY 0215 – Low Voltage Access Authority and the requirements for its completion.

5.2.1 Section 1 – Purpose of a LVAA

A complete and accurate description of the equipment to be worked on (the electrical apparatus), including the voltages concerned, needs to be written here. Reference is made throughout the LVAA to the electrical apparatus. This reference directs the reader back to the description given here.

Prefixed by the word “at” requires an accurate description of the location of the work site. Geographic location, identification numbers, pole numbers, etc must be included where available. This is often the only place where a work location is defined and therefore it must be clear.

Prefixed by the word “to” requires details of all work to be carried out. It is important that this section be completed accurately. Tasks outside or beyond those described in this section cannot be carried out within the scope of the LVAA.

5.2.2 Section 2 – Isolation points and actions taken

The AA Issuer will describe in detail, to the holder and all persons on site who are to sign on the LVAA, what has been done to make the workplace safe or to allow work to be done. This will include which customer installations have been isolated and are to remain isolated until after the LVAA is cancelled.

LV points of isolation must be recorded where they provide isolation for the equipment to be worked on and have a Danger Tag (refer to Company Form FSY 0052 – Danger Tag) applied in accordance with the Electrical Safety Rules section 6.20.1.1 – Use of Danger Tags.

Details of the step(s) taken to secure each isolation point must be clearly noted. Examples include:

- LV transformer links at substation #45678 open and danger tagged;
- LV parallel Cnr Jones and Smith St open and danger tagged;
- OH LV bonds adjacent to pole #123 open, secured and danger tagged;
- LV Distributor Fuses #321 at substation #98765 removed and danger tagged;
- mid-span isolator installed between poles #987 and #988 and danger tagged;
- LV UGOH bonds adjacent to pole #999 open, secured and danger tagged; and
- UG cable between pillars #1222 and #1223 open at #1222, secured and danger tagged.

Where customer installations have been isolated in accordance with the Electrical Safety Rules, to manage the risks associated with unknown sources of supply, each will be noted on the LVAA.

Statements such as “low voltage service mains to number 6 Smith Street have been disconnected, secured and danger tagged and phase rotation noted” can be used to describe the actions taken or a clear reference to an attached table of disconnections if insufficient space is available on the LVAA form.

5.2.3 Section 3 – LVPBs

5.2.3.1 General

As required by the Electrical Safety Rules, one set of LVPBs must be applied to each isolated LV circuit whose active conductors are in electrical contact with a customer installation.

Note: Continuity of a circuit through closed fuses or switching devices must not be relied upon. Therefore, the application of more than one set of LVPBs may be required for each continuous circuit in contact with a customer installation.

Isolated conductors that are not in electrical contact with a customer installation do not require the mandatory application of LVPBs. Such apparatus could include isolated distribution mains which do not directly supply customers or distribution mains with any associated customer installations being isolated in accordance with the requirements previously listed in sub-section 5.2.2 Section 2 – Isolation points and actions taken.

For the avoidance of doubt, it is not mandatory for LVPBs to be installed in visibility of the worksite between all points of isolation, however, the application of additional LVPBs in sight of the worksite is both allowed and advised to provide additional visual confirmation in conjunction with relevant testing requirements as specified in sub-section 5.2.8.2 Specific testing and proving de-energised requirements of this procedure.

The location of all LVPBs must be clearly recorded on the LVAA form (including any work party LVPBs applied) along with confirmation of connection and removal by initials.

LVPBs must not be removed until the LVAA has been surrendered or the apparatus to which they are connected has been disconnected from all customer installations.

5.2.3.2 Application requirements

The basic principles in relation to LVPBs are:

Wherever LV phase conductors within the safe area of work are in electrical contact with a customer installation, at least one set of LVPBs must be applied.

Where required, all LVPBs must be applied before the LVAA or AA is issued.

Whenever a conductor that is in electrical contact with a customer installation is disconnected from a conductor to which LVPBs have been applied, the disconnected conductor must be treated as live.

LVPBs must not be removed until the LVAA or AA has been surrendered or the apparatus to which they are connected has been disconnected from all customer installations.

LVPBs must be removed before the LVAA or AA is cancelled.

If work is to be carried out on the distribution network, that is, to be de-energised under a LVAA, the following will apply after first fitting LV insulating gloves and approved leather outers on each hand for the isolation, testing, temporary bond application/removal and re-energisation of the LV network:

- isolate the electrical apparatus in accordance with section 7.1.2 of the ESRs and danger tag all points of isolation, with the exception of those equipped with LV auto isolation;
- prove de-energised using an approved testing device;
- apply approved LVPBs between the distribution neutral and each distribution phase on the distribution mains (connection to the neutral conductor must be made first in every case);
- clearly note the location of LVPBs on the LVAA; and
- issue a LVAA prior to commencing work.

On completion of all work activities, the LVPBs must be removed, with the connection to the neutral conductor disconnected last in every case, and that they are signed off on the LVAA as being removed. Particular care must be taken to confirm all LVPBs are removed prior to re-energisation.

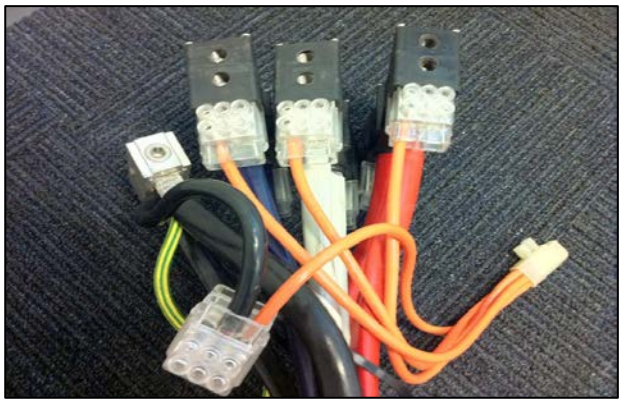


Figure 1 – Underground application

Figure 2 – Overhead application

Figure 3 – IPC connection

An Insulation Piercing Connector (IPC), shown in Figure 4 – IPC, is available and can be used for a temporary application of bonds. However, once installed, they must remain in place. LV Aerial Bundled Cable (ABC) is not water blocked and once the insulation is pierced by the IPC connectors, they are to remain in service to prevent the entry of water into the cable. The IPC then remains available for future use, if required. The stock code for these IPCs is 1558485 (Approved product number OL0097A).

To provide a suitable bonding point on the LV ABC, the IPCs must be installed with the inclusion of a 100mm X 12mm stainless steel bolt (see Figure 3 – IPC Connection). On completion of work, the stainless steel bolt must be removed and the insulated covers secured onto the IPCs.

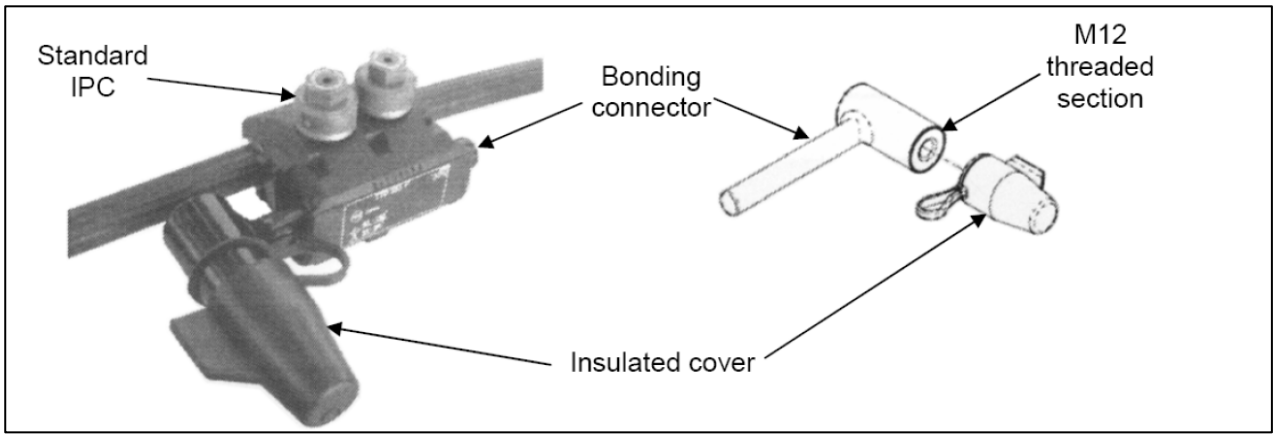


Figure 4 – IPC

5.2.3.3 Disconnected conductors under LVAA conditions

Whenever a conductor that is in electrical contact with a customer installation is disconnected from a conductor to which LVPBs have been applied, the disconnected conductor must be treated as live.

The LVAA may be endorsed to enable the disconnection of customer installations using live working procedures and the subsequent removal of LVPBs for the purpose of mains augmentation or re-tensioning, etc. Example endorsement: “Endorsed for removal of LV Protective Bond at (b) following disconnection of all customer installations using live working procedures”.

Note: In situations where there are no customer installations in electrical contact with the electrical apparatus being worked on, for example isolated distribution mains not directly supplying customers, the application of LVPBs is advised. However, it is not mandatory to allow various work activities to be carried out such as:

- overhead conductor augmentation;
- tensioning overhead conductors; and
- underground cable replacement activities.

5.2.4 Section 4 – Special conditions

The AA Issuer must indicate any actions deemed necessary that the AA Holder needs to fulfil prior to commencing work. Statements such as “the AA Holder must prove LV electrical apparatus de-energised before commencing work” or “endorsed for the removal of LV protective bonds at (b) following disconnection of all appropriate customer installations using live working procedures” can be used.

The AA Holder will be responsible for advising all workers required to sign the LVAA that the extent of the isolation is compatible with the planned Safe Work Method Statements (SWMS) and that the apparatus is safe to work on.

5.2.5 Section 5 – Issue of LVAA

The issue of a LVAA is limited to workers authorised to carry out LV Switching in accordance with Company Procedure (Network) GAM 0092 – Authorisation for Low Voltage Switching.
The check boxes must be ticked as appropriate. Whether the work party is on site or not, the appropriate box must be ticked. Any item that has not or cannot be carried out must be ruled out and initialled by the AA Issuer. A LVAA may also be self-issued.

“This LVAA is issued to” requires the name of the worker and their network authorisation number.

Notes:

- If the work party is present and have been given the required warnings and instructions from the AA Issuer and have signed onto the LVAA, the AA Issuer must underline under the signatures and initial the line.

- If the AA Issuer has reason to believe that any or all of the work party (including the LVAA Holder) have not paid close attention to the warnings given, or it is clear that they do not understand the conditions of the issue, the LVAA must not be issued. The work party must be requested to pay attention to the warnings given or the line manager advised that the LVAA will not be issued. The AA Issuer will advise the appropriate work party leader of the situation.

5.2.6 Section 6 – Acceptance by LVAA Holder (See Section 5.9 – Transitional arrangements)

LVAA Holders must be authorised to hold an Approval to Work in accordance with Company Procedure GAM 0074 – Authorisation to hold an Access Authority or Approval to Work.

The LVAA Holder must agree with the statements in this section, tick the boxes and then print their name, authorisation number, phone number as well as sign, time and date the declaration. If there are any concerns, omissions or discrepancies the LVAA must not be signed by the LVAA Holder until these issues have been rectified.

Note: A LVAA must be issued by the AA Issuer in the presence of the LVAA Holder that is a LVAA cannot be left onsite for acceptance.

5.2.7 Section 7 – Transfer of a LVAA

Transfer of a LVAA is only allowed provided that both the new LVAA Holder and AA Issuer are onsite.

Note: The LVAA and associated documentation must remain onsite at all times.
In the event that the LVAA Holder has to leave the worksite for an extended period of time (in excess of 30 minutes), the LVAA will be cancelled and re-issued by a person authorised to carry out LV Switching in accordance with Company Procedure GAM 0092 – Authorisation for Low Voltage Switching.

5.2.8 Section 8 – Members of the work party

5.2.8.1 General

Each worker signing and printing their name is agreeing with all the statements shown under “Members of the Work Party”, and under the “Sign on” column. All members of the work party must comply with the instructions given at the top of the LVAA regarding the work party.

Notes:

- The AA Issuer must underline under the signatures and initial the line. This responsibility reverts to the LVAA Holder if the work party is not present at the time of issue.

- The statement under “Sign off” column regarding the removal of “all LVPBs” applies only to those bonds applied by that worker.

5.2.8.2 Specific testing and proving de-energised requirements

All members signing on to a LVAA must either witness an initial test to prove de-energised or carry out their own test to prove de-energised where no LVPBs are traceable from the worksite prior to commencing work.

This requirement applies to all members of the work party at any time prior to commencing work regardless of any work activities already being carried out.

5.2.9 Temporary surrender of a LVAA

Temporary surrender of a LVAA is not allowed.

5.2.10 Section 9 – Work party LVPBs

The installation and removal of all LVPBs applied by the work party must be recorded in Section 9 – Work part LVPBs accordingly.

5.2.11 Section 10 – Surrender of a LVAA

Prior to surrender of LVAA, the authorised LV switching officer must confirm requirements specified in Division Procedure GNV 1044 – Commissioning Network Electrical Assets have been completed as well as Division Form GNV 1043 – Certificate of Availability for Service of Network Electrical Assets.

The LVAA Holder must tick the boxes in this section confirming that the work party has completed their work under the LVAA and the equipment that was worked on is now regarded as being live.

The LVAA Holder must make any comments that may assist the authorised LV switching officer in the restoration process, including confirmation of specific actions taken as result of endorsements recorded elsewhere on this LVAA. The comments will include any information on limitations or conditions of the electrical apparatus that could affect the restoration of the electrical apparatus.

5.2.12 Section 11 – Cancellation of a LVAA

The authorised LV switching officer must check all items are completed and signed off, that all LVPBs have been removed and then cancel the LVAA by signing and adding their authority number, time and date of cancellation.

No electrical apparatus that is being worked on under the authority of a LVAA or that has LVPBs installed will be restored. Restoration will only commence once the LVAA has been cancelled. Care must be taken to check all signatures under “Sign On” have been counter signed off. Care must also be taken to check that all LVPBs have been removed, and that they have all been initialled as removed.

The authorised LV switching officer must check remaining sections are complete and signed off and then cancel the AA by signing and adding their authority number, time and date of cancellation.

5.3 Proxy sign off of a LVAA

Failure to cancel or sign off a LVAA is a serious matter. Where workers leave the site without doing so, all practical steps must be taken to obtain their signatures. Where this is not possible, the following applies:

- where a worker is unable to sign the “Sign off” column or cancel the LVAA due to accident, sickness or any other legitimate reason, the LVAA Holder (or delegated representative) must obtain authority from the worker’s supervisor for the sign off on behalf of the absent worker (in addition to physically locating the worker); and

- if this authority is obtained, the following endorsement must be hand written across the back of the LVAA by the LVAA Holder prior to cancellation:

> *I hereby state that _____, whose signature appears under "Sign on", (or as Low Voltage Access Authority Holder), is incapable of signing under "Sign off", (or as Access Authority Holder) and has ceased work on the electrical apparatus referred to in this Access Authority.*
>
> *Signed: _____ Time:_____ am/pm.*
>
> *Witness: _____Date:_____*

The supervisor who authorised the cancellation of a worker's signature will be responsible for advising the absent worker of this cancellation immediately on, or before, their return to duty.

If this clearance is received as verbal instruction from the LVAA Holder (or delegated representative), the AUP on site will complete the endorsement above including a statement that the LVAA Holder (or delegated representative) has obtained the required clearance from the supervisor.

5.4 Missing LVAA

When an LV switching officer reports that a LVAA is missing from a work site, it is the LVAA Holder's responsibility to:

- patrol the section of isolated electrical apparatus;
- notify the relevant section manager, assistant or the relevant supervisor immediately responsible for the work and request to take whatever steps necessary to locate the LVAA and/or the workers involved on the LVAA; and
- co-operate with the section manager or relevant supervisor in their investigation.

Note: Clearance to restore the electrical apparatus to service must only be accepted from the section manager, assistant or supervisor immediately responsible for the work.

5.5 AA and LVAA used in conjunction on the same worksite

5.5.1 General

Ideally a single AA will be issued on the one worksite to adequately cover the HV apparatus required to be isolated and extended to allow any LV apparatus that may form part of the scope of works to be included.

Examples of AA extended scope (LV and HV combined) activities include but are not limited to:

- extended LV extremity isolations to allow Pole Substation retrofit/replacement activities involving both HV and LV apparatus; and
- extended LV extremity isolations to allow Padmount Substation and associated switchgear maintenance/replacement activities.

In particular cases it may be required that both an AA and LVAA exist simultaneously on the one worksite. This application may allow LV work to begin ahead of the HV work and enable restoration of LV supply whilst HV activities are still being undertaken.

Examples of separate AA and LVAA activities used in conjunction simultaneously include but are not limited to:

- combined HV and LV overhead augmentation activities where separately sequenced isolations are required; and
- pole replacement activities where multiple circuits are present.

It is expected that in these circumstances both the AA and LVAA be acknowledged on the AA switching folder to identify the existence of both documents. In these cases the LVAA must be stored and submitted with the AA documentation.

Furthermore, the Worksite Hazard and Risk Assessment (WHRA) refer to Company Form FSY 0118 – Worksite Hazard and Risk Assessment, must include any cases where AAs and LVAAs exist simultaneously and also reflect any changes in scope of activities.

5.5.2 Workers on both the AA and LVAA

Any worker required to carry out work within the scope of work of both an AA and LVAA must be required to sign on and off each document accordingly.

Where either the AA or LVAA is to be cancelled and supply restored whilst work is still being carried out, all workers must cease work immediately and maintain three metres from any network apparatus. All workers must have the re-defined scope of work explained and be made aware of any newly introduced risks on Company Form FSY 0118 – Worksite Hazard and Risk Assessment by the AA or LVAA Holder.

Prior to recommencing work, all isolation points must be visually inspected and confirmed as being open with apparatus proven to have no hazardous voltages present. This can be achieved by either an electrical test to prove de-energised for LV apparatus, or the visual trace of operational earthing on the HV apparatus.

5.5.3 LV isolation as a source of supply to HV apparatus

Wherever a LV isolation is identified as a source of supply to HV apparatus subject to the AA, the LV isolation must be danger tagged and listed as one of the isolation points under the AA. A separate LVAA for the LV isolation will not be issued because it has already been documented and controlled under the AA.

5.5.4 Common isolation for work on LV and HV apparatus

A LVAA must be issued for work on LV apparatus that needs to be isolated from HV apparatus, for example where the apparatus is a pole, which has already been subject to a AA. Any LV isolation common to both the AA and LVAA must be double danger tagged under the respective AA and LVAA documentation.

Note: As a further precaution, all common isolation points must be noted on Company Form FSY 0118 – Worksite Hazard and Risk Assessment.

5.5.5 Work under converged (intersecting) AA and LVAA conditions

If the LV isolation required for work on HV apparatus is not covered under sub section 5.5.3 because it is not a source of supply to that HV apparatus, a LVAA must be issued to cover the LV isolation. This scenario usually arises where LV and HV apparatus converge at a support structure or crossover area. Whenever the work program or outage schedule prohibits simultaneous issuance or cancellation of an AA or LVAA, work must be suspended before signing on or signing off on either the AA or LVAA.

Company Form FSY 0118 – Worksite Hazard and Risk Assessment must be reviewed to reflect the new set of conditions as the status of these safety documents are changed. Work must not resume and partial restoration cannot commence until all employees on site have signed the new Company Form FSY 0118 – Worksite Hazard and Risk Assessment and observed the appropriate precautions.

For example, a LVAA may be cancelled earlier than the AA to restore customers connected on the LV apparatus. After the cancellation of the LVAA, employees can continue to work on the HV apparatus as covered by the ongoing AA alone but they must observe the precautions for work above live LV apparatus. Alternatively, the AA may be cancelled earlier than the LVAA to restore the HV apparatus for securing load on the HV distribution feeder. After cancellation of the AA, employees can continue to work on the LV apparatus as covered by the ongoing LVAA alone but they must observe the safety approach distance from the live HV apparatus above.

5.6 Emergency situations requiring LV de-energised work

Except in emergency situations, LVAAs must be in writing. Where there is immediate risk to life or property, for example in the case of a building fire, clearance can be given to make safe LV electrical apparatus without writing a LVAA. All steps required for the issue of a LVAA must be carried out and all warnings and advice must be given as would normally be done in the issue of a LVAA. The LVAA must be written and issued in accordance with this procedure as soon as possible after making the electrical apparatus safe.

5.7 Alteration to a LVAA

Where a LVAA is found to be incorrect or the conditions under which the LVAA has been issued have changed, the LVAA must not be accepted by the LVAA Holder nor will the work party sign on to the LVAA. The LVAA must be withdrawn and a new LVAA issued.

5.8 Work party signatures or additional LVPBs

If there is a requirement to add either additional work party members or LVPBs and there is insufficient space on the LVAA form, an additional LVAA form can be used to record the additions and both documents cross-referenced.

5.9 Transitional arrangements

During a 12 month transitional period from the approval date of this procedure, those authorised to hold an Approval to Work (ATW), in accordance with Company Procedure GAM 0074 – Authorisation to hold Access Authority or Approval To Work, will be authorised to hold a LVAA in accordance with this procedure.

5.10 Alteration to the network

If, as a consequence of the work carried out under the LVAA, the network configuration changes (for example links are installed), the LVAA Holder must confirm that Branch Form FAD 2001 – Notification of Network Alteration Sheet (White Sheet) is completed and submitted.

5.11 Audit process

Worksites and paperwork will be subject to audit and routine reviews by the Health, Safety & Environment Division, or supervisory workers. These audits can be specialised audits or part of other audit processes such as Network Safety Worksite Audits (Company Workplace Instruction WAM 0006 – Network Electrical Safety Auditing). Access will be required to all documentation for these audits. Records will be retained for at least three months for this purpose. All documentation associated with a LVAA related to any incident or accident must be supplied to the Investigating Team.

6.0 RECORDKEEPING

The table below identifies the types of records relating to the process, their storage location and retention period.

Type of Record	Storage Location	Retention Period*
Completed Company Form FSY 0215 – Low Voltage Access Authority	Store in FSC and archive after three months	7 years after expiry or termination of agreement – as determined by GA40 section 6.7

* The following retention periods are subject to change, for example if the records are required for legal matters or legislative changes. Before disposal, retention periods must be checked and authorised by the Records Manager.

7.0 AUTHORITIES AND RESPONSIBILITIES

Chief Executive Officer has authority and responsibility for approving this procedure.

General Manager Network Services has the authority and responsibility for:

- allocating appropriate resources to this process; and
- monitoring compliance to this procedure.

General Manager Asset Management has the authority and responsibility for:

- endorsing this procedure as chair of the Electrical Safety Committee;
- allocating appropriate resources to this process; and
- monitoring compliance to this procedure.

Regional managers have the authority and responsibility for:

- allocating appropriate resources to this process; and
- monitoring compliance to this procedure.

Manager System Control has the authority and responsibility for:

- endorsing this procedure; and
- monitoring compliance to this procedure by system operators.

Manager Network Connections has the authority and responsibility for monitoring compliance to this procedure by ASPs.

Authorised switching officers have the authority and responsibility for:

- verifying that isolation, application of LVPBs and LVAA requirements are correct; and
- providing appropriate warnings to the LVAA Holder and work party.

LVAA Holders have the authority and responsibility for:

- verifying that the isolation, application of LVPBs and LVAA will allow them to carry out the work safely; and
- providing appropriate warnings to the work party.

Work party has the authority and responsibility for:

- understanding the conditions of the LVAA;
- signing on after receiving appropriate warnings; and
- signing off at completion of work.

8.0 DOCUMENT CONTROL

Content Coordinator **:** Manager Electrical Safety, Authorisations & Compliance

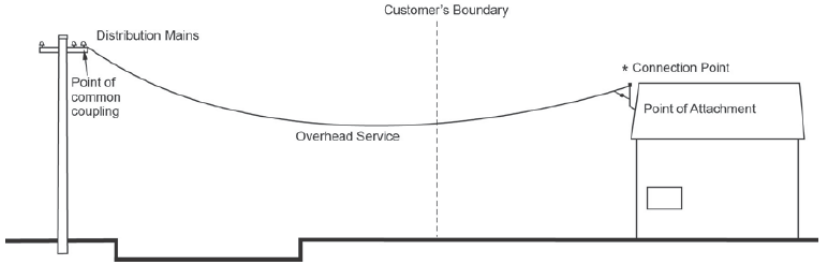
Distribution Coordinator **:** GRC Process Coordinator

Annexure A – Isolation applications

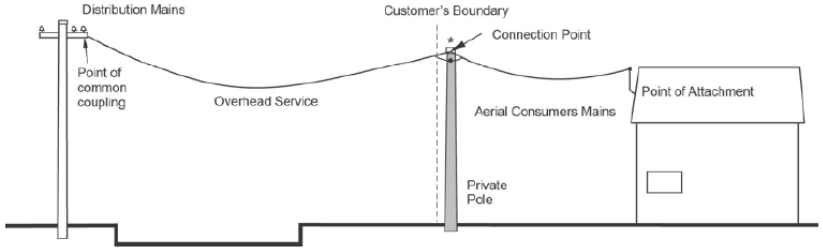
Risk	De-energised LV	De-energised HV	Disconnected Apparatus	Isolations for 3rd Parties	Non-Network Systems	Non Electrical Sources of Energy
	LV network isolations including: Isolations for workers requiring primary LV network access (such as LV network mains and apparatus, service mains and apparatus, etc.) Street Light circuit isolation AC network supply (external street supply) to the substation	**HV network isolations including:** All work involving primary HV access All work involving HV testing	**Disconnected Apparatus including:** Any LV/HV mains and apparatus satisfactorily meeting the requirements to be considered ”Disconnected Apparatus” from the ESRs closer than three metres but greater than the relevant Safe Approach Distance from any source of network supply Racked out HV circuit breakers (separated physically by locked and DT’d shutters	**LV isolations for 3rd party private installations/ external work including** LV isolations for customer’s contractors (domestic or industrial) including isolations to allow construction activities, eg vegetation control, assembly of scaffolding, building repairs/access, relocation of assets, etc. **HV Operating Agreement** HV Operating Agreements between parties	**LV isolations for secondary/auxiliary equipment including:** Isolations for tap changer motor box maintenance AC Panel Isolations for access auxiliary supply, eg lights and power inside a station VT supplies AFIC Control Wiring LV Service and Metering work beyond the Connection Point as defined by the NSW Service and Installation Rules 2012 (Amendment 30 June 2015)	**Isolation of secondary supplies including:** Spring mechanisms, compressed air, hydraulic pressure, etc.
System to be used	**LVAA**	**AA**	**Declaration of Disconnected Apparatus**	**Operating Agreement**	**Non-network system isolations Or LVAA if required**	**WHRA**
Further Guidance	**GSY 0091 Low Voltage Access Authorities**	**GSY 1088 Access Authority for High Voltage Work and/or Test**	**Electrical Safety Rules**	**GSY 0092 Operating Agreement**	**GSY 0093 Non-network System Isolations within electrical stations**	**GSY 1066 Worksite Hazard and Risk Assessment**

Annexure B – LV connection point

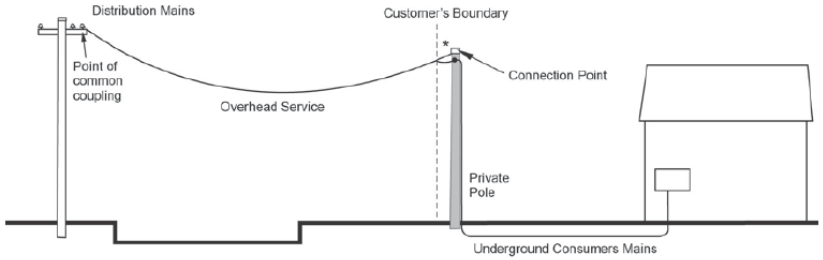
Figure 1.1: Definitions – Supply from Overhead Distribution Mains



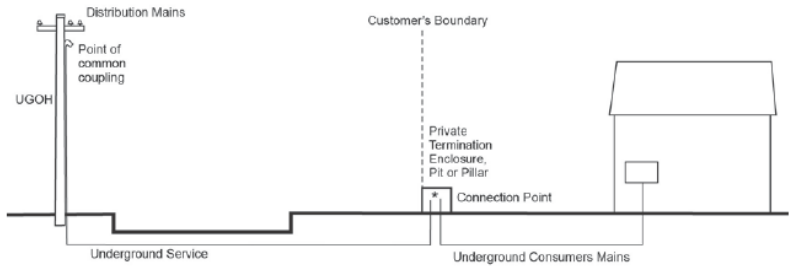
(a) Overhead Service



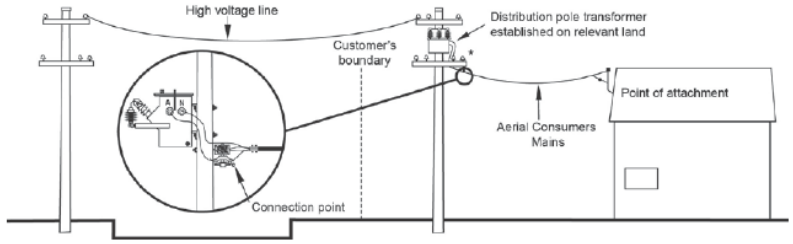
(b) Overhead Service and Aerial Consumers Mains



(c) Overhead Service and Underground Consumers Mains

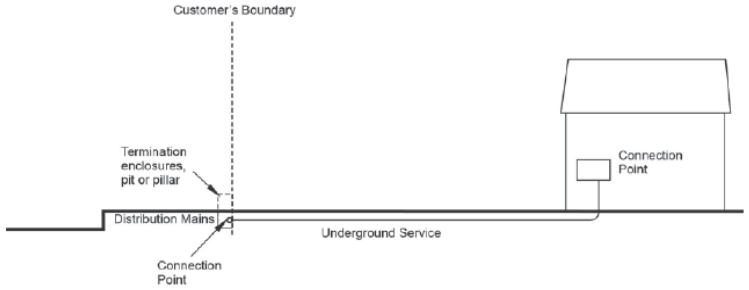


(d) Underground Service and Consumers Mains from overhead mains on electricity distributor's pole

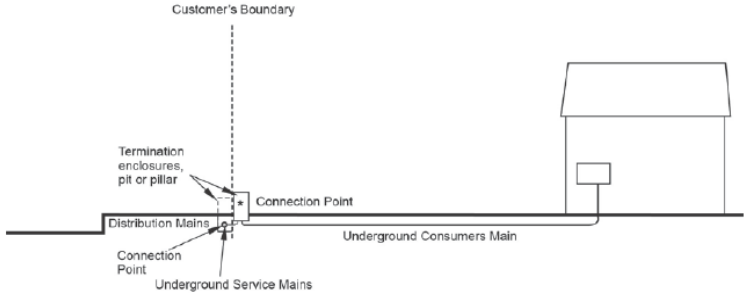


(e) Overhead Service from substation or relevant land

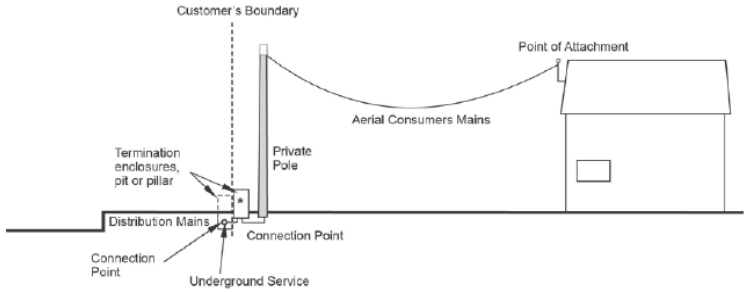
Figure 1.2: Definitions – Supply from Underground Distribution Mains



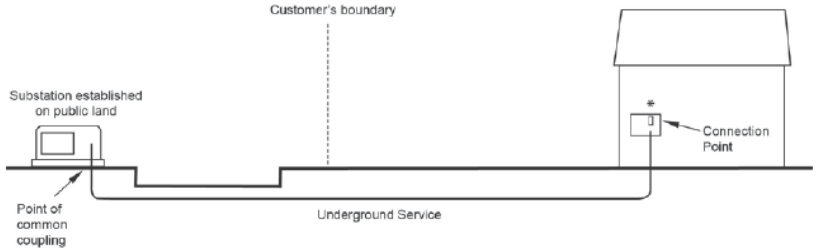
(a) Underground Service



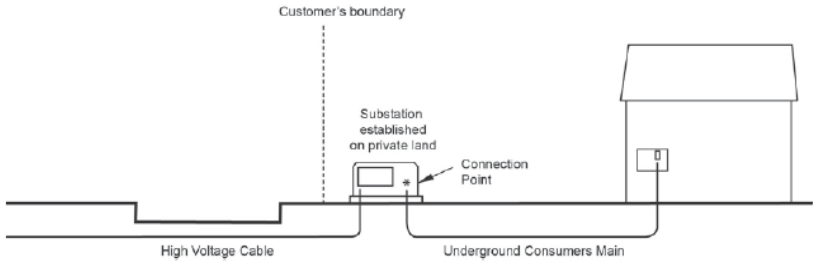
(b) Underground Service and Underground Consumers Mains



(c) Underground Service and Aerial Consumers Mains



(d) Underground Services from Substation on public land



(e) Underground Services from Substation on relevant land

* A connection must be able to be made at the Connection Point.

Note: A terminal enclosure, pit or pillar is required if the service would exceed 50 metres. Refer to Clause 2.6.2.

Additional drawings may be added in later editions of the Rules.

Company Procedure

HEALTH & SAFETY	Document No	:	GSY 0093
	Amendment No	:	0
	Approved By	:	CEO
	Approval Date	:	26/04/2016
	Review Date	:	26/04/2019

GSY 0093 NON-NETWORK SYSTEM ISOLATIONS

1.0 PURPOSE

To provide a system of establishing and maintaining isolations of non-network Low Voltage electrical systems and non-electrical sources of energy.

2.0 SCOPE

This procedure applies to situations where workers are required to carry out work on or near the company's electrical apparatus that is not subject to High Voltage Access Authority (AA) conditions, Low Voltage Access Authority (LVAA) condition or Operating Agreements. This includes Accredited Service Providers (ASPs).

Where the entire isolation (including all extremities) is within the boundary of an electrical station, this procedure will apply. If any part of the isolation extends to the Low Voltage (LV) network (external street supply), a LVAA must be utilised.

This document lists the actions to be followed to allow de-energised work practices on non-network LV electrical systems such as:

- LV supply to Substation Voltage Transformers;
- auxiliary 230/400 Volt station systems (fans, pumps, motor supplies, etc);
- 230/400 Volt station supply (lights, power, etc);
- Audio Frequency Injection Cell (AFIC) 230/400 Volt supply systems;
- LV service and metering work beyond the connection point; and
- non-electrical sources of energy.

Network LV electrical equipment (excluded from this procedure) includes:

- primary LV network access (such as LV network mains and apparatus, service mains and apparatus, etc);
- LV Public Lighting systems and equipment; and
- LV network supply (external street supply) to the substation up to the LV detection and changeover initiation relay.

Limited LV service and metering work must be carried out utilising the principles of this procedure provided the work is beyond the connection point as specified in the NSW Service and Installation Rules 2012 (Amendment 30 June 2015).

Additionally, this procedure can be used for the isolation of non-electrical energy where required such as gas, oil, water and other fluids, air, steam, oxygen or other stored energy source, flywheel, mechanical, spring, gravitational, kinetic and chemical, the level or intensity of which could pose a threat to a person(s) safety.

Annexure A – Isolation Applications provides further detail for the application of this procedure.

3.0 REFERENCES

Internal

Board Policy (Health & Safety) 3.0 – Work Health and Safety
Company Policy (Health & Safety) 3.18 – Work Health and Safety
Company Procedure (Health & Safety) GSY 0091 – Low Voltage Access Authority
Company Procedure (Health & Safety) GSY 0092 – Operating Agreement
Company Procedure (Health & Safety) GSY 1031 – Electrical Safety Rules
Company Procedure (Health & Safety) GSY 1066 – Worksite Hazard and Risk Assessment
Company Procedure (Health & Safety) GSY 1088 – Access Authority for High Voltage Work and/or Test
Branch Procedure (Network Connections) NPJ 2009 – Low Voltage Access for Accredited Service Providers (ASPs)
Branch Procedure (Regional) PRG 0052 – Work On or Near Control, Protection and Metering Equipment within Transmission and Zone Substations
Company Workplace Instruction (Network) WAM 0006 – Network Electrical Safety Auditing
Company Form (Health & Safety) FSY 0050 – Access Authority for Test
Company Form (Health & Safety) FSY 0051 – Access Authority for Work
Company Form (Health & Safety) FSY 0057 – Approval to Work
Company Form (Health & Safety) FSY 0118 – Worksite Hazard and Risk Assessment
Company Form (Health & Safety) FSY 0217 – Isolation Sheet
Branch Form (System Control) FCL 0015 – Operating Agreement
Electrical Safety Rules Handbook
Annexure A – Isolation Applications
Annexure B – LV Connection Point
Annexure C – Sample Personal Danger Tag Template
Annexure D – Option to use the standard Danger Tag as a Personal Danger Tag

External

Work Health and Safety Act 2011 (NSW)
Work Health and Safety Regulation 2011 (NSW)
ENA Doc 01–2008 National Electricity Network Safety Code
ENA NENS 03–2006 National Guidelines for safe access to electrical and mechanical apparatus
NSW Service and Installation Rules 2012 (Amendment 30 June 2015)
General Retention and Disposal Authority: Administrative Records GA40
Handbook HB 5031–2011 Records classification
Service and Installation Rules of New South Wales August 2012 (Amendment 30 June 2015)

4.0 DEFINITIONS

Access Authority (AA)
Any form of authorisation which allows access to, work on or near, or testing of electrical apparatus in accordance with Company Procedure GSY 1088 – Access Authority for High Voltage Work and/or Test. An AA:

- is issued by an authorised person (AUP);
- is received by the delegated AA Holder (on behalf of single or multiple work crews);
- is what the work party signs before commencing work;
- gives clearance to carry out specific work on specific electrical apparatus on the HV network;
- records the isolation points operated to isolate the electrical apparatus;
- records the number and location of operational earths installed; and
- records the number and location of working earths.

Access Authority Holder (AA Holder)
The AUP signing on to (or accepting) the AA.

Access Authority Issuer (AA Issuer)
The AUP issuing the AA.

Accredited Service Provider (ASP)
An individual or single entity accredited in accordance with part 10 of the *Electricity Supply (General) Regulation 2001 (NSW)*.

Authorised
A person with technical knowledge or sufficient experience who has been approved as competent and is then authorised in writing by the company to perform the function requiring authorisation on or near the company's electricity network. This definition holds for various forms of the word, for example authorisation, authorise and Authorised Person (AUP).

Authorised Person (AUP)
A person who has been authorised in accordance with the relevant procedure.

Competent person
Worker who has been trained and assessed in a specified task.

Customer installation
An electrical installation owned by a network customer, that can be isolated from the network by removing service fuses, opening main switch(es) or disconnecting service mains.

Danger tags
Isolation points are secured by means of danger tags associated with LVAA, AA for work or test, non-network system isolation or an operating agreement. They display the words "Danger Do Not Operate" and are affixed to all points of isolation (including their remote controls. The purpose is to provide a warning against any inadvertent or unauthorised operation of the electrical apparatus.

Document control
Employees who work with printed copies of documents must check the Business Management System regularly to monitor version control. Documents are considered "UNCONTROLLED IF PRINTED", as indicated in the footer.

Electrical apparatus
Any electricity power lines or associated equipment or electricity structures that form part of a transmission or distribution system.

Electrical equipment
Means any apparatus applicable, for example cable, conductor, fitting, insulator, material, meter or wire that is:

- used for controlling, generating, supplying, transforming or transmitting electricity at a voltage greater than an extra-low voltage; or
- that is operated by electricity at a voltage greater than extra-low voltage; or
- 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
- is, or is part of, an active impressed current cathodic protection system within the meaning prescribed AS/NZ 2832.1:2004 Cathodic protection of metals – Pipes and cables.

Electrical Safety Rules (ESR)
The company's rules defining minimum requirements for safe work on or near the network. The requirements of these rules must always be supported by hazard and risk assessments and work method statements.

High Voltage (HV)
Electrical energy greater than 1,000 volts alternating current or 1,500 volts direct current.

Isolated (and isolate)
Disconnected from all possible sources of electrical energy by opening switches, withdrawing circuit breakers, removing fuses, opening links, opening connections, tying back bonds and rendering them incapable of being made live unintentionally by the application of Danger Tags (and locks where possible).

Local safety precautions
Additional control measures taken by the AA Holder and work party to supplement the actions taken to issue the AA. These actions could include confirming that cables are discharged, erecting warning signs or barriers, releasing stored energy, etc.

Low Voltage (LV)
A voltage exceeding 50 volts alternating current (ac) or 120 volts direct current (dc), but not exceeding 1000 volts alternating (ac) or 1500 volts direct current (dc).

LV auto isolation
Control system at a source of LV supply designed to automatically isolate and remain isolated whilst the network element to which it is connected is de-energised. (Customer installed LV generation systems with active anti-islanding protection in accordance with Australian Standards are deemed to achieve LV auto isolation.)

Low Voltage Access Authority (LVAA)
A form of authorisation which allows access to work on or near or testing of electrical apparatus. A LVAA:

- is issued by an AUP;
- is received by the delegated LVAA holder (on behalf of single or multiple work crews);
- is what the work party signs before commencing work;
- gives clearance to carry out specific work on specific electrical apparatus on the LV network;
- records the isolation points operated to isolate the electrical apparatus; and
- records the number and location of Low Voltage Protective Bonds (LVPBs) installed (if applicable).

Low Voltage Access Authority (LVAA) Issuer
The authorised person signing the LVAA.

Low Voltage Access Authority Holder (LVAA) Holder
The authorised person signing on to (or accepting) the LVAA.

Low Voltage Protective Bonds (LVPBs)
Approved bonds which short circuit all phase and neutral conductors when required under the Electrical Safety Rules (ESR).

Non-electrical sources of energy
Other than electrical including: gas, oil, water and other fluids, air, steam, oxygen, flywheel, mechanical, spring, gravitational, kinetic, chemical or other stored energy source, the level or intensity of which could pose a threat to a person(s) safety.

Non-network System Isolation
A system of establishing and maintaining isolations of non-network LV electrical systems and non-electrical sources of energy.

Operating Agreement (OA)
A written agreement on which an undertaking is given by an authorised person for a network operator or other company, that the electrical apparatus specified will remain isolated and/or earthed until the written agreement has been cancelled. The document is used in cases where the network operator or other company concerned is undertaking switching operations for another party.

Note: an Operating Agreement is not a LVAA, AA or non-network system isolation.

Person Conducting a Business or Undertaking (PCBU)
Has the meaning as prescribed under the *Work Health and Safety Act 2011 (NSW)* and for the purpose of this procedure, is either the company or a contractor of the company who employs workers to undertake duties on its behalf.

Personal Danger Tags (PDT)
Danger tags applied and removed by individual workers to allow de-energised work to be carried out on non-network LV electrical equipment within an electrical station exclusively for individual purposes as a mechanism to warn against inadvertent or unauthorised operation of the electrical apparatus.

A personal danger tag shall display the words “Danger Do Not Operate” and include at least the following details:

- name;
- position; and
- contact details.

Recordkeeping
Making and maintaining complete, accurate and reliable evidence of business transactions in the form of recorded information. (Source: Handbook HB 5031–2011 Records classification)

Review date
The review date displayed in the header of the document is the future date for review of a document. The default period is three years from the date of approval. However, a review may be mandated at any time where a need is identified due to changes in legislation, organisational changes, restructures, occurrence of an incident or changes in technology or work practice.

System Operator
The authorised employee responsible for the operational control of all or a designated part of the company’s electrical network.

Secured
Being physically restricted from being operated by (if necessary) tying back, locking, removing or other means and danger tagging in an approved manner.

The company
Refers to Endeavour Energy. Also may be referred to as the PCBU as defined in the *Work Health and Safety Act 2011 (NSW)*.

Work
Any activity (whether electrical or otherwise) performed on or near electrical apparatus.

Worker
A person is a worker if the person carries out work in any capacity for a person conducting a business or undertaking, including work as:

(a) an employee; or
(b) a contractor or subcontractor; or
(c) an employee of a contractor or subcontractor; or
(d) an employee of a labour hire company who has been assigned to work in the person's business or undertaking; or
(e) an outworker, that is a person who performs work for an employer at their own home or at another location that is separate from their employer's factory, workshop, office or worksite; or
(f) an apprentice or trainee; or
(g) a student gaining work experience; or
(h) a volunteer.

Work party
Workers signing the LVAA.

5.0 ACTIONS

All work considered to be de-energised on non-network LV electrical equipment will be subject to the actions outlined in this section.

Non-network LV electrical equipment includes but is not limited to the following:

- LV supply to Voltage Transformers;
- auxiliary 230/400 Volt station systems (fans, pumps, motor supplies, etc);
- 230/400 Volt station supply (lights, power, etc); and
- Audio Frequency Injection Cell (AFIC) 230/400 Volt supply systems.

Note: Energised work practices on non-network LV electrical equipment within an electrical station are not subject to the following actions, however will be subject to the conditions specified with Division Procedure (Network) WNV 1114 – Work on or near Low Voltage Control, Protection and Metering Equipment within Transmission and Zone Substations.

Company Form FSY 0118 – Worksite Hazard & Risk Assessment (known as the WHRA form) must be used to record hazard and risk assessments in accordance with Company Procedure GSY 1066 – Electrical Safety Rules prior to the commencement of any work on LV electrical apparatus.

All sources of LV supply must be identified, isolated or removed. The apparatus must be proven de-energised and have a personal danger tag applied by each individual worker subject to coming in contact with or closer than 500mm of electrical equipment for the particular apparatus to be considered isolated.

5.1 Non-network LV electrical equipment isolation process

5.1.1 Isolation of electrical apparatus and proving de-energised

All sources of supply must be identified utilising the station circuit diagrams (where applicable) and visually traced if applicable/required.

Any worker who will come within 500mm of exposed LV electrical equipment considered as being isolated will either carry out a test to prove de-energised or witness a test to prove de-energised. Where a non-electrically qualified worker is required to come within 500mm of LV electrical

equipment, they must witness a test to prove de-energised and have the isolation identification process explained so that they are satisfied their work can be carried out safely.

5.1.2 Application of personal danger tags prior to work

All workers who will come within 500mm of exposed LV electrical equipment considered as being de-energised must apply a personal danger tag to all points of isolation with their name and contact details clearly marked.

All personal danger tags applied to electrical apparatus (and who applied them) must be recorded in a central location readily available on the worksite in order to track and identify apparatus activity. Company Form FSY 0217 – Isolation Sheet can be used to record this information, or alternatively, the isolation points can be noted on the WHRA form.

5.1.3 Removal of personal danger tags on completion of work

Personal danger tags must be removed upon completion of work only by the individual who applied it (whose name is clearly identified on the tag). In the event that the worker is unable to remove the personal danger tag, the supervisor must be contacted and a delegate appointed to remove the personal danger tag on their behalf after all reasonably practicable attempts are made to contact the worker.

The removal of personal danger tags (and who removed them) must be recorded in the same central location specified in sub-section 5.1.2 – Application of personal danger tags prior to work.

5.1.4 Restoration of supply

Restoration of supply can only be carried out after all members of the work party have removed their personal danger tags associated with the equipment being worked on.

5.1.5 Isolations over multiple days

No personal danger tags are permitted to be left on overnight.

In the event that equipment will be left unserviceable or members of the work party have to leave site, all members of the work party must remove their personal danger tags and the worksite coordinator, as appointed on the WHRA form, must apply a warning tag detailing the condition of the apparatus.

5.1.6 Documentation

Where the isolation formed part of any associated disconnect and reconnect instruction from the System Operator, the personal danger tag recording documentation must be stored in the associated switching folder, where applicable, or otherwise stored and submitted with the WHRA form.

5.2 Multiple workgroups on site

Where multiple workgroups are on the same worksite, contact must be made between the groups to cross reference WHRA forms and to verify work can be carried out safely.

Where possible overlaps in isolation points exist, both parties will be subject to combine activities as specified in Section 5.1 above so that no inadvertent or unauthorised operation of electrical apparatus is carried out.

5.3 Hierarchy of isolation process

A LVAA, in accordance with Company Procedure GSY 0091 – Low Voltage Access Authority, can be utilised for non-network LV electrical equipment isolation purposes where it is determined that the use of Personal Danger Tags is not practical.

For example, a large scale project that involves multiple work groups may necessitate numerous personal danger tags to be applied. In this case a LVAA will streamline the isolation process and allow one authorised switching officer to coordinate the isolation process and allow the work party to sign on to a single LVAA form. This decision will be made by risk assessment.

Note: LVAAs used for non-network purposes do not require system operator notification if not subject to disconnect and reconnect instruction and therefore, are only required to be stored with the WHRA form onsite.

5.4 Non-electrical applications

The WHRA form provides an adequate mechanism to control non-electrical sources of energy, however, in particular cases where it is identified that non-electrical sources of energy are required to be isolated, the principles of the actions specified in sub-sections 5.1.2 and 5.1.3 may be applicable, that is application of personal danger tags to isolate non-electrical sources of energy).

5.5 LV service and metering applications

NSW Service and Installation Rules 2012 (Amendment 30 June 2015) specifies that electrical apparatus beyond the connection point are deemed to be customer installations by virtue that they are mutually exclusive from network apparatus.

In particular cases where service and metering work beyond the connection point (non-network electrical apparatus) is required to be isolated, the principles of Sections 5.1 – 5.3 may be applicable.

Annexure B – LV connection point provides further detail on the connection point.

5.6 Audit process

Worksites and paperwork will be subject to audit and routine reviews by the Health, Safety & Environment Division, or supervisory workers. These audits can be specialised audits or part of other audit processes such as Network Safety Worksite Audits (as detailed in Company Workplace Instruction WAM 0006 – Network Electrical Safety Auditing). Access will be required to all documentation for these audits. Records will be retained for at least three months for this purpose. All documentation associated with non-network LV isolations within an electrical station related to any incident or accident must be supplied to the investigating team.

6.0 RECORDKEEPING

The table below identifies the types of records relating to the process, their storage location and retention period.

Type of Record	Storage Location	Retention Period*
Company Form FSY 0217 – Isolation Sheet	Store in FSC and archive after three months	7 years after expiry or termination of agreement – as determined by GA40 section 6.7

* The following retention periods are subject to change, for example if the records are required for legal matters or legislative changes. Before disposal, retention periods must be checked and authorised by the Records Manager.

7.0 AUTHORITIES AND RESPONSIBILITIES

Chief Executive Officer has authority and responsibility for approving this procedure.

General Manager Network Services has the authority and responsibility for:

- allocating appropriate resources to this process; and
- monitoring compliance to this procedure.

General Manager Asset Management has the authority and responsibility for:

- endorsing this procedure as chair of the Electrical Safety Committee;
- allocating appropriate resources to this process; and
- monitoring compliance to this procedure.

Regional managers have the authority and responsibility for:

- allocating appropriate resources to this process; and
- monitoring compliance to this procedure.

Manager System Control has the authority and responsibility for:

- endorsing this procedure; and
- monitoring compliance to this procedure by System Operators.

Manager Network Connections has the authority and responsibility for monitoring compliance to this procedure by ASPs.

Authorised switching officers have the authority and responsibility for:

- verifying that isolation, application of LVPBs and LVAA requirements are correct; and
- providing appropriate warnings to the LVAA Holder and work party.

LVAA Holders have the authority and responsibility for:

- verifying that the isolation, application of LVPBs and LVAA will allow them to carry out the work safely; and
- providing appropriate warnings to the work party.

Work party has the authority and responsibility for:

- understanding the conditions of the LVAA;
- signing on after receiving appropriate warnings; and
- signing off at completion of work.

8.0 DOCUMENT CONTROL

Content Coordinator **:** Manager Electrical Safety, Authorisations & Compliance

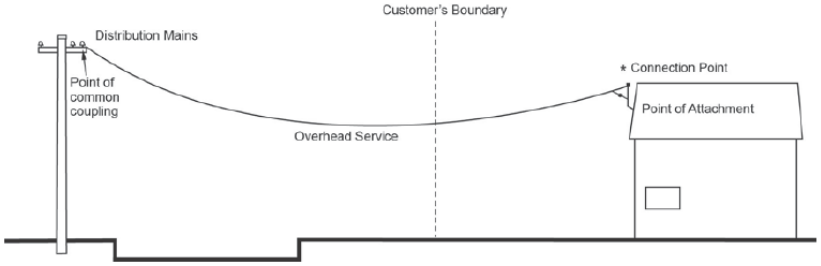
Distribution Coordinator **:** GRC Process Coordinator

Annexure A – Isolation applications

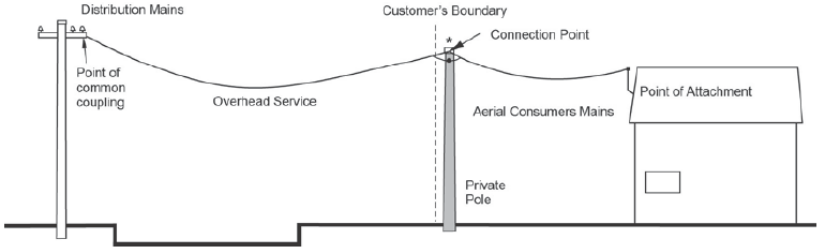
Risk	De-energised LV	De-energised HV	Disconnected Apparatus	Isolations for 3rd Parties	Non-Network Systems	Non Electrical Sources of Energy
	LV network isolations including: Isolations for workers requiring primary LV network access (such as LV network mains and apparatus, service mains and apparatus, etc.) Street Light circuit isolation AC network supply (external street supply) to the substation	**HV network isolations including:** All work involving primary HV access All work involving HV testing	**Disconnected Apparatus including:** Any LV/HV mains and apparatus satisfactorily meeting the requirements to be considered "Disconnected Apparatus" from the ESRs closer than three metres but greater than the relevant Safe Approach Distance from any source of network supply Racked out HV circuit breakers (separated physically by locked and DT'd shutters	**LV isolations for 3rd party private installations/ external work including** LV isolations for customer's contractors (domestic or industrial) including isolations to allow construction activities, eg vegetation control, assembly of scaffolding, building repairs/access, relocation of assets, etc **HV Operating Agreement** HV Operating Agreements between parties	**LV isolations for secondary/auxiliary equipment including:** Isolations for tap changer motor box maintenance AC Panel Isolations for access auxiliary supply, eg lights and power inside a station VT supplies AFIC Control Wiring LV Service and Metering work beyond the Connection Point as defined by the NSW Service and Installation Rules 2012 (Amendment 30 June 2015)	**Isolation of secondary supplies including:** Spring mechanisms, compressed air, hydraulic pressure, etc.
System to be used	**LVAA**	**AA**	**Declaration of Disconnected Apparatus**	**Operating Agreement**	**Non-network system isolations Or LVAA if required**	**WHRA**
Further Guidance	**GSY 0091 Low Voltage Access Authorities**	**GSY 1088 Access Authority for High Voltage Work and/or Test**	**Electrical Safety Rules**	**GSY 0092 Operating Agreement**	**GSY 0093 Non-network Low Voltage Isolations within electrical stations**	**GSY 1066 Worksite Hazard and Risk Assessment**

Annexure B – LV Connection Point

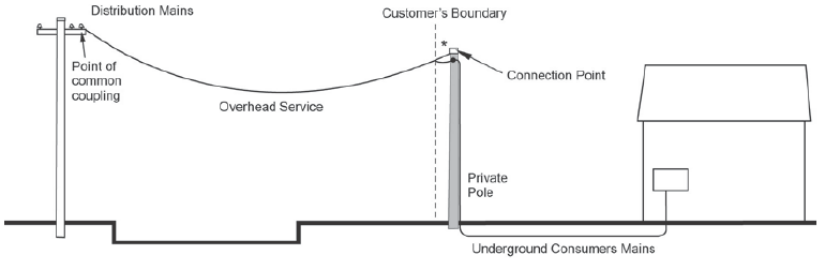
Figure 1.1: Definitions – Supply from Overhead Distribution Mains



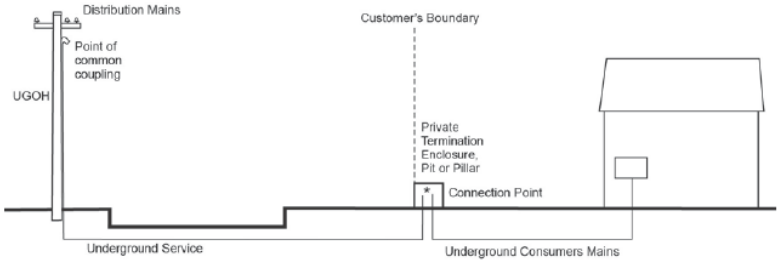
(a) Overhead Service



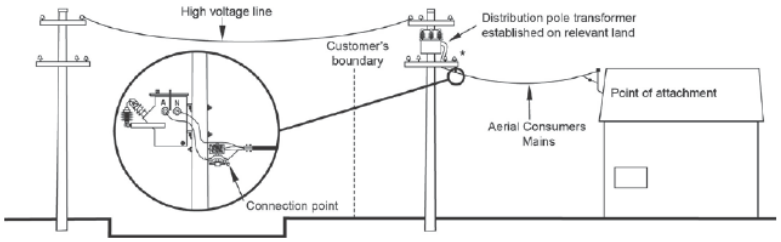
(b) Overhead Service and Aerial Consumers Mains



(c) Overhead Service and Underground Consumers Mains

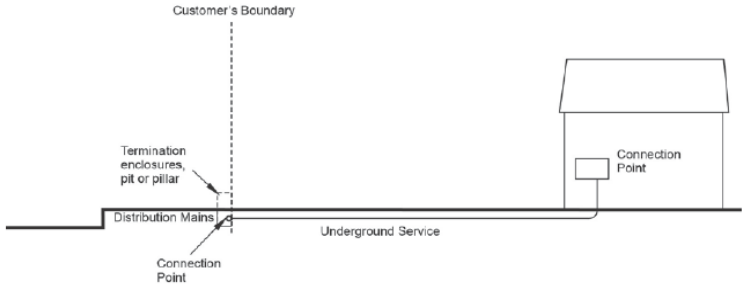


(d) Underground Service and Consumers Mains from overhead mains on electricity distributor's pole

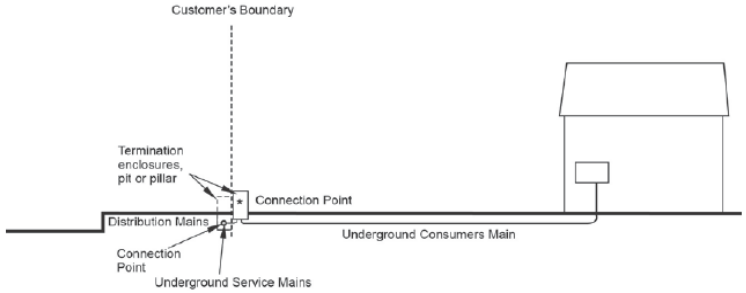


(e) Overhead Service from substation or relevant land

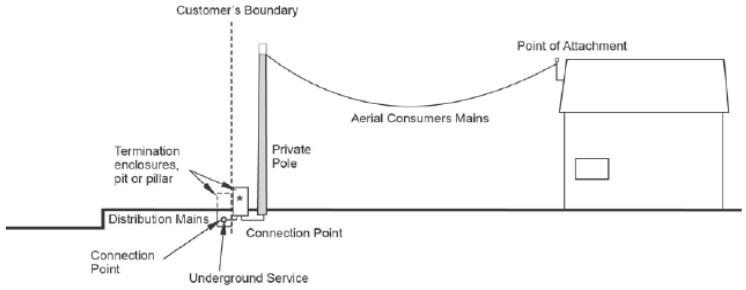
Figure 1.2: Definitions – Supply from Underground Distribution Mains



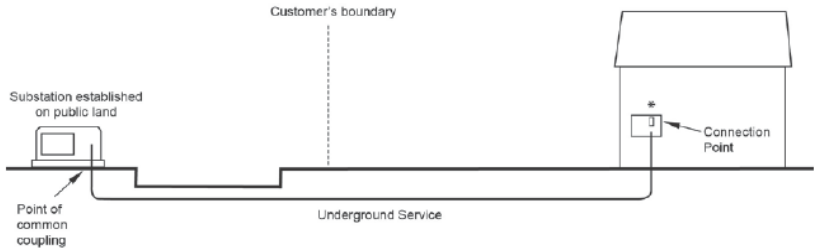
(a) Underground Service



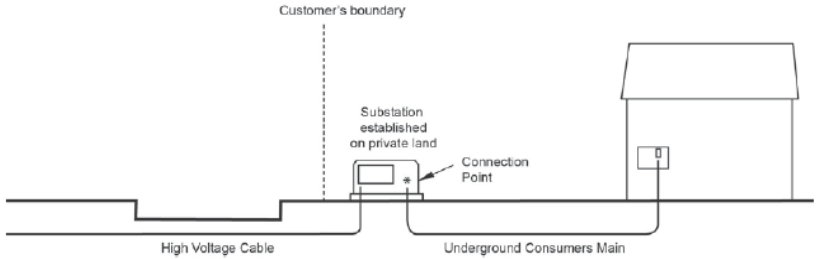
(b) Underground Service and Underground Consumers Mains



(c) Underground Service and Aerial Consumers Mains



(d) Underground Services from Substation on public land



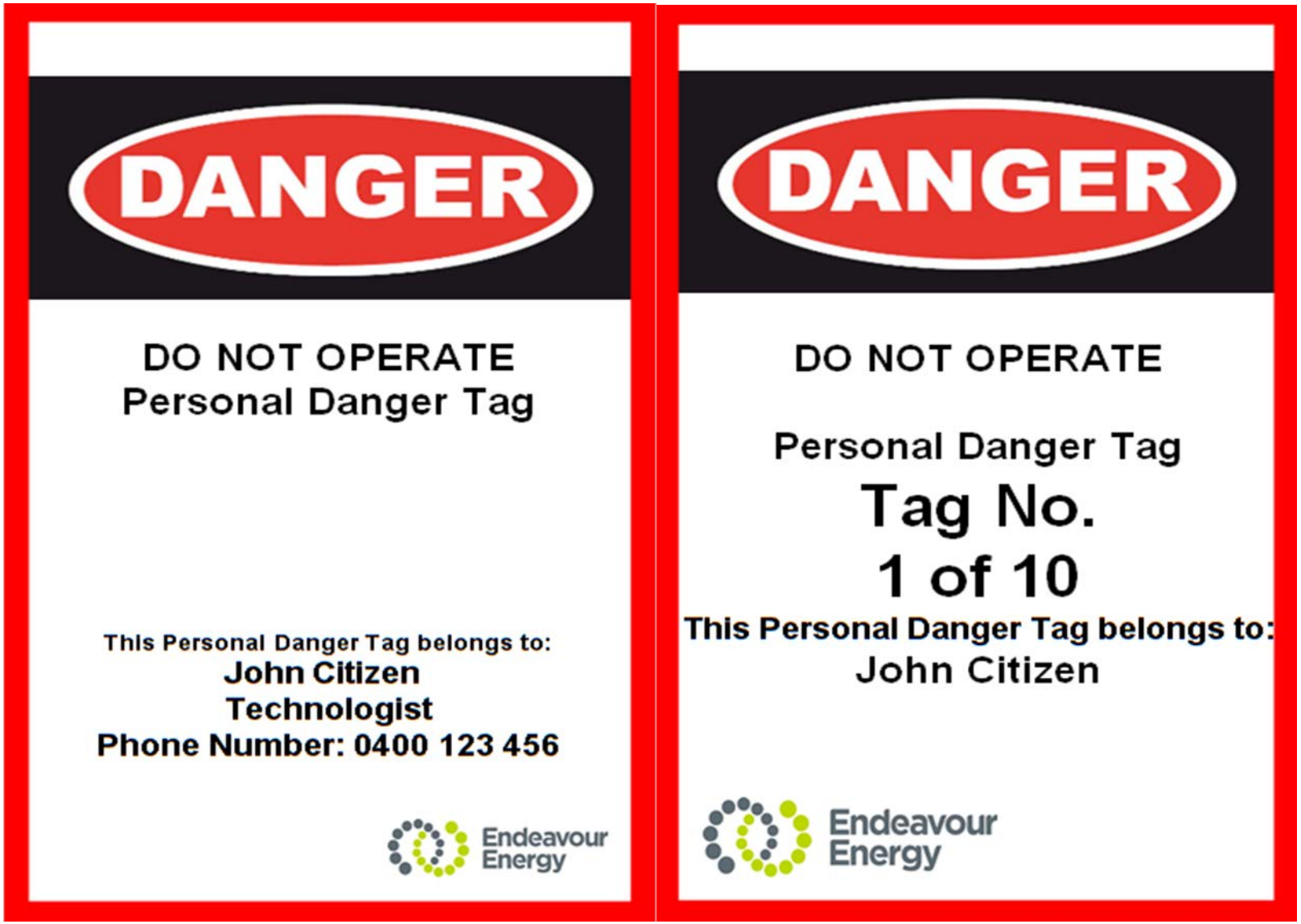
(e) Underground Services from Substation on relevant land

* A connection must be able to be made at the Connection Point.

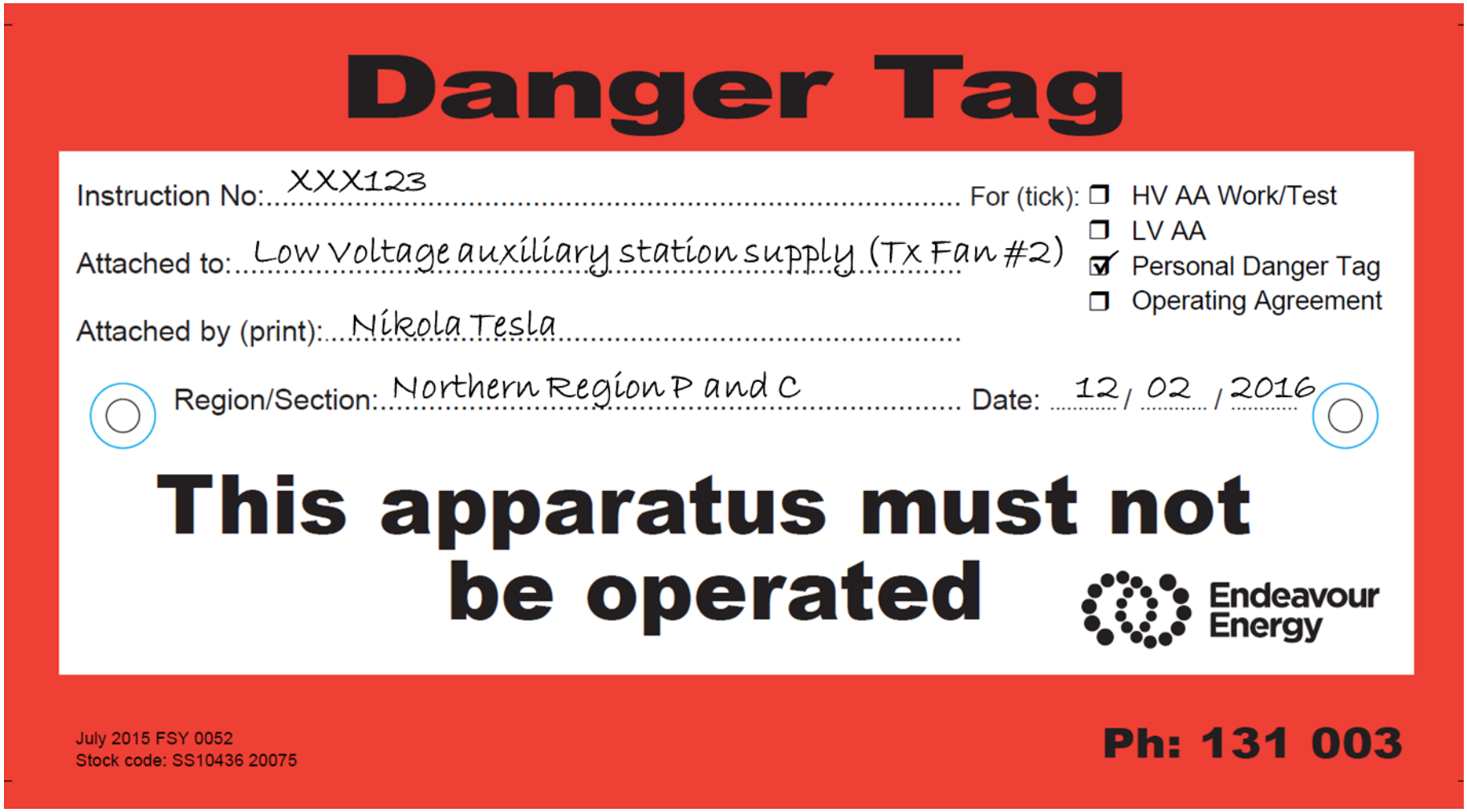
Note: A terminal enclosure, pit or pillar is required if the service would exceed 50 metres. Refer to Clause 2.6.2.

Additional drawings may be added in later editions of the Rules.

Annexure C – Sample Personal Danger Tag Template



Annexure D – Option to use the standard Danger Tag as a Personal Danger Tag



COMPANY PROCEDURE

HEALTH & SAFETY	Document No: GSY 1004 Amendment No: 6 Approved By: CEO Approval Date: 29/11/12 Review Date: 29/11/15

GSY 1004 ISOLATION AND DANGER TAGGING

1.0 PURPOSE

To ensure the Company defines actions needed to be carried out to provide an effective isolation prior to proving de-energised to comply with the requirements of the National Electricity Network Safety Code, ENA Doc 001.

1.0 SCOPE

To describe isolation and danger tagging of electrical apparatus by authorised persons.

2.0 REFERENCES

Board Policy 3.0 – Occupational Health and Safety
Company Policy (Health & Safety) 3.18 – Work Health and Safety
Company Procedure (Health & Safety) GSY 1031 – Electrical Safety Rules
ENA Doc 001 - National Electricity Network Safety Code
ENA NENS 03 - National Guidelines for Safe Access to Electrical and Mechanical Apparatus
ENAA NENS 04 - National Guidelines for Safe Approach Distances to Electrical Apparatus
System Diagrams
Electrical Safety Rules
Work Health and Safety Act 2011 (NSW)
Work Health and Safety Regulation 2011 (NSW)
Electricity Supply (Safety and Network Management) Regulation 2008 (NSW)

4.0 DEFINITIONS

authorised
A person with technical knowledge or sufficient experience who has been approved as competent and is then authorised in writing by the Company to perform the function requiring authorisation on or near the Company's electricity network. This definition holds for various forms of the word, eg, authorisation, authorise and authorised person (AUP).

danger tags
Open points are secured by means of danger tags associated with access authorities for work/test and operating agreement. They display visibly the words "Danger Do Not Operate" and are affixed to all points of isolation (including their remote controls), ie, operating handle. Their purpose is to provide a warning against any inadvertent or unauthorised operation of the electrical apparatus.

Executive Leadership Team
Chief Operating Officer, General Manager Health, Safety & Environment, General Manager People & Services, Chief Engineer, General Manager Network Development, General Manager Network Operations, General Manager Finance & Compliance and General Manager Information, Communication & Technology.

isolation
Disconnection from all possible sources of supply by opening every switch and removing every link, fuse or connection through which the electrical apparatus could be energised and danger tagging (and locking where available) each point of possible supply. This is to ensure current cannot pass across the break in circuit (suitable to the voltage concerned). If possible, isolation should be via a visible break, a racked-out circuit breaker, air break switch or similar means.

Person Conducting a Business or Undertaking (PCBU)
Has the meaning as prescribed under the *Work Health and Safety Act 2011 (NSW)* and for the purpose of this procedure, is either the Company or a Contractor of the Company who employs workers to undertake duties on its behalf

review date
The review date displayed in the header of the document is the future date for review of a document. The default period is three years from the date of approval however a review may be mandated at any time where a need is identified due to changes in legislation, organisational changes, restructures, occurrence of an incident or changes in technology or work practice.

the Company
Endeavour Energy. Also may be referred to as the PCBU as defined in the *Work Health and Safety Act 2011 (NSW).*

worker
A person is a worker if the person carries out work in any capacity for a person conducting a business or undertaking, including work as:

(a) an employee; or
(b) a contractor or subcontractor; or
(c) an employee of a contractor or subcontractor; or
(d) an employee of a labour hire company who has been assigned to work in the person's business or undertaking; or
(e) an outworker, ie, a person who performs work for an employer at their own home or at another location that is separate from their employer's factory, workshop, office or worksite; or
(f) an apprentice or trainee; or
(g) a student gaining work experience; or
(h) a volunteer.

5.0 ACTIONS

In general to secure an isolation the following actions shall be carried out.

CAUTION: Sometimes otherwise isolated electrical apparatus can be energised via another source such as a connection to an underground cable, a generator, a transformer, a capacitor, solar cell supplies, induction or other sources of supply.

5.1 Operating practice

5.1.1 In general transformer (TX) equipment is off loaded on the secondary voltage prior to the primary voltage.

5.1.2 Check Circuit Breakers (CB) open before opening Isolators.

A 'no load isolator' means – the isolator can only be operated under no load conditions.

5.2 Special situations

5.2.1 Attention is drawn to the fact that voltage transformers (VT) as well as distribution transformers are a possible source of supply and care shall be taken to ensure that they are isolated from both the high and low voltage sides. Note: A VT may be isolated either from the HV or LV sides and in some circumstances from both HV and LV.

5.2.2 Individual capacitors of a bank that has been isolated, earthed and short circuited shall be regarded as alive if it becomes segregated (disconnected) from the bank and is to be treated as alive until it has been discharged and earthed.

5.2.3 Overhead mains and sections of bus-bar (within electrical stations) which are separated from the high voltage (HV) network at every possible source of supply by either the removal of a span or spans of mains or, in the case of bus-bar, a section of bus-bar shall be considered as not forming part of the high voltage network.

5.2.4 A capped, earthed and short circuited cable is considered as not forming part of the high voltage system when separated from all sources of supply by the minimum safe working distance. (Note: Unterminated cables shall be capped on all ends and labelled for identification purposes).

5.2.5 Capacitors, frequency injection cells and long lengths of HV cable (especially cables of higher voltage) can store a direct current voltage when de-energised. Suitable time should have elapsed to allow the charge to bleed off. (Note: Some testers will not indicate that this voltage/charge is present).

5.3 Company equipment to be isolated at zone and transmission substations

5.3.1 Remove and danger tag VT and CVT secondary fuses (Note: DT's shall be applied to the isolation points - not the fuse wedges).

5.3.2 Lock open and danger tag isolators.

5.3.3 Lock closed and danger tag shutters on isolated CBs and VTs.

5.3.4 Open and danger tag Transmission Station neutral system isolators.

5.3.5 Lock open and danger tag clutches and motor fuses.

5.3.6 Remove and danger tag 415 V Aux TX fuses/switches (at the fuse base - not on the fuses).

5.3.7 Remove and danger tag 1050 Hz load control links.

5.3.8 Open and DT Aux 11kV switchgear (various).

5.4 Field situations

5.4.1 Open danger tag under slung links, (USL); drop out fuses (DOFs) (Note: Fuses shall be removed from carriers).

5.4.2 Lock open and danger tag ABS (use plastic envelope for danger tag).

5.4.3 Isolate, lock open and danger tag field circuit breakers (customers).

5.4.4 Open and danger tag TX LV links, parallel points TX fuses and switch fuses or any other devices used to achieve the isolation.

5.4.5 Receive Operating Agreement on High Voltage Customer isolations where appropriate.

5.4.6 Open and danger tag customer's main switches (low voltage).

5.4.7 Check open and danger tag open bond points (any loose tails should be firmly secured).

5.4.8 Open lock and danger tag 11/22kV distribution switchgear switches and close and danger tag earth switch where applicable.

5.5 Checking successful operation of apparatus

5.5.1 Check flicker blades of ABS are all open.

5.5.2 Check visible air gap as per minimum fixed clearances.

5.5.3 Check sight glass on equipment with this facility.

5.5.4 Check for adjacent live equipment.

5.5.5 Use indication devices, on/off flags, voltmeters/ammeters, semaphores, indicators (neons, etc) and ammeters and voltmeters use SCADA screen indication.

5.5.6 View operation arm position on single operation mechanisms.

5.5.7 Re-check neon indicators.

5.5.8 Remove all associated fuses or links.

5.5.9 Confirm with System Operations (if applicable).

5.6 Access authority danger tags

5.6.1 Access authority danger tags are to be affixed directly to the isolation device or as close as practicable to the isolation point/device or in the case of USL and DOF's adjacent to identification number.

5.6.2 Where possible they should be placed out of reach of the general public.

5.6.3 Utilise locking devices and tamper proof envelopes where provided.

5.6.4 Are to be affixed to closed apparatus used to provide earthing continuity.

5.6.5 Are to be affixed to tripping devices to prevent tripping of indirect earthing arrangements.

5.6.6 Multiple danger tags are to be used at common isolation points.

5.6.7 Danger tags will record the name of person affixing, the date and the switching instruction number as well as the apparatus to which it is attached (refer to Electrical Safety Rules for use of danger tag and hazardous condition tag).

5.7 Isolation process

5.7.1 Isolation analysis

5.7.1.1 After receiving switching instruction (either written or verbal) check on system diagrams (schematic).

5.7.1.2 Verbal instructions are to be recorded and reconfirmed with the Network Controller.

5.7.1.3 Check equipment constraints eg, current breaking capacity of apparatus.

5.7.1.4 Check alternate supply arrangements.

5.7.1.5 Check system control devices.

5.7.1.6 Check load control, ie, A.F.I.C (Automatic Frequency Injection Cell) Signals despatched.

5.7.1.7 Check regulators/reclosers and/or special duplicated frequency injection cell situation.

5.7.1.8 Check customer interruption times re computers/life support systems.

5.7.1.9 Check generators/ mobile substations.

5.7.1.10 Check for ferroresonance situations.

5.7.1.11 Check protection requirements SEF (Sensitive Earth Fault), Under Voltage, Under Frequency, Reclosers, etc.

*5.7.2 Special operations requirements (considerations***)**

5.7.2.1 Fuse dummies.

5.7.2.2 Portable earths.

5.7.2.3 Special testers.

5.7.2.4 Dust covers.

5.7.2.5 Link sticks (Special).

5.7.2.6 LV Bonds.

5.7.3 Work site identification

5.7.3.1 Complete a Worksite Hazard and Risk Assessment.

5.7.3.2 Identify work site.

5.7.3.3 Check on preliminary switching.

5.7.3.4 Check labelling/numbers.

5.7.3.5 Check if electrical apparatus is serviceable.

5.7.3.6 Check status of Zone substation and Transmission substations, eg, Under Frequency, Aux supply, radial feed, etc.

5.7.3.7 Check for other work parties.

5.7.3.8 Note any adjacent live equipment.

5.7.4 Isolation using switchgear

Where circuit isolating devices or switches that are to be worked on are spring, hydraulically or pneumatically operated, the stored energy shall be discharged prior to work commencing so that the switches cannot be operated inadvertently. Secondary circuits such as DC supplies shall be isolated as required. (Normally this function shall be carried out by the work party.)

5.8 Removal of danger tags and warning tags

5.8.1 Danger tag principles

Prior to the removal of any danger tag the details noted on the tag must be read to confirm that it is the correct tag to be removed. Any discrepancy must be referred to the System Operator for clarification. Only authorised persons can remove danger tags.

5.8.1.1 High voltage applications

When attached as part of high voltage isolation, danger tags shall remain affixed at the isolation point until authorisation for removal has been received from the System Operator.

5.8.1.2 Low voltage applications

When attached as part of a low voltage isolation, danger tags shall remain affixed at the isolation point until no longer required, and may be removed by the authorised person who attached them, or at that authorised persons immediate direction or on clearance from that authorised person's supervisor.

5.8.2 Warning tags

Warning tags can only be removed once the reason for their application has been resolved or rectified. The authorised person rectifying the cause of the hazard can remove warning tag.

6.0 AUTHORITIES AND RESPONSIBILITIES

Chief Executive Officer has the authority and responsibility for approving this procedure.

General Manager Network Operations has the authority and responsibility for:

- appropriate resource allocation for this process;
- monitoring compliance to this procedure; and
- monitoring of its implementation.

All authorised switching workers and **personnel accepting or signing on to access authority for work, access authority for test or operating agreements** have the authority and responsibility for the correct application of this procedure.

7.0 DOCUMENT CONTROL

Content Coordinator : Chief Engineer

Distribution Coordinator : Business Process Coordinator, Finance & Compliance

COMPANY PROCEDURE

HEALTH & SAFETY	Document No: GSY 1015 Amendment No: 5 Approved By: CEO Approval Date: 15/7/13 Review Date: 15/7/16

GSY 1015 EXCAVATION

1.0 PURPOSE

The Company's obligation under the *Work Health & Safety Act 2011 (NSW)* is to ensure a safe workplace extends to others present at the workplace or effected by the work, including workers, contractors, visitors and the public. The Company must also ensure that excavation works do not damage assets belonging to infrastructure owners.

The purpose of this procedure is to provide rules and guidance for all excavation work which includes network sites and public spaces to ensure that it is carried out in a manner that enables the company to meet these obligations.

2.0 SCOPE

This procedure applies to all workers (including contractors and accredited service providers) who are required to undertake, supervise, manage or coordinate excavation operations near Company underground assets.

3.0 REFERENCES

Board Policy 3.0 – Occupational Health and Safety
Company Policy (Health & Safety) 3.11 – Personal Protective Equipment
Company Policy (Health & Safety) 3.18 – Work Health and Safety
Company Procedure (Network Asset Management) GAM 0060 – Authorisation to Carry Out Excavation Work or Observe Excavation Work in a Public Place
Company Procedure (Health & Safety) GSY 0031 – Operating Plant near Overhead Powerlines
Company Procedure (Health & Safety) GSY 0051 – Occupational Health and Safety Incident Management
Company Procedure (Health & Safety) GSY 0062 – Traffic Control
Company Procedure (Health & Safety) GSY 0068 – Contractor Management
Company Procedure (Health & Safety) GSY 0074 – Work Health and Safety Management Plans
Company Procedure (Health & Safety) GSY 1031 – Electrical Safety Rules
Company Procedure (Health & Safety) GSY 1066 – Worksite Hazard and Risk Assessment
Company Procedure (Health & Safety) GSY 1067 – Appointment of Worksite Coordinators
Company Form (Health & Safety) FSY0118 – Worksite Coordination / Hazard and Risk Assessment
Division Workplace Instruction (Network) WNV 1037 – Excavation in Public Areas (Streets)
Division Form (Network) FNV1038 – Excavation Near Assets Assessment Form
Safe Work Method Statement SWMS 1.004 – Excavation Work (Trenching, Hole Boring, etc)
Electrical Safety Rules Handbook
Environmental Management Standard EMS 0001 – Environmental Due Diligence and Environmental Management Plans
Environmental Management Standard EMS 0007 – Waste Management

Environmental Management Procedure GPE 0010 – Spoil Management
Endeavour Environmental Guidelines Handbook
WorkCover Guide – Work Near Underground Assets 2007
WorkCover Code of Practice – Excavation
WorkCover Code of Practice – Moving Plant on Construction Sites
Electricity Supply Act 1995 (NSW)
Work Health and Safety Act 2011 (NSW)
Work Health and Safety Regulation 2011 (NSW)

4.0 DEFINITIONS

authorised
A person with technical knowledge or sufficient experience who has been approved as competent and then authorised in writing by the Company to perform the function requiring authorisation on or near the Company's electricity network. This definition holds for various forms of the word (for example, authorisation, authorise and authorised person).

assets
Buildings, walls, structures, footings, towers, tanks, ducts, pipes, poles, cables, etc.

Dial Before You Dig (DBYD)
DBYD (Ph.1100 or www.1100.com.au) underground services search.

EMP
Environmental Management Plan prepared to ensure compliance with the requirements of EMS 0001 and the Company's Environmental Guidelines Handbook.

excavation
Work involving the penetration of the ground or surface of the earth including cutting or caisson, chasing, boring, piering or the digging of trenches, ditches, shafts, wells, tunnels, drifts and rises below the finished levels of the ground surface or finished ground levels. This also includes works involving the movement or placement of soil or other surface materials by removing, boring or forcing objects into the ground or the surface of the earth.

hand excavation
A method of excavating using tools in a non-aggressive manner which no power source supplements or replaces manual effort, including but not limited to shovels, picks and mattocks, forming a driving force into the ground with other than hand pressure.

near (on or near)
Closer to the Company's underground assets than the minimum approach distance for powered excavation specified in the WorkCover Guide - Work Near Underground Assets.

This extends to any situation where there is a reasonable possibility of a person, either directly or through any conducting medium, coming within the relevant safe approach distances of live exposed electrical apparatus specified in Company Procedure GSY 1031 – Electrical Safety Rules, Section 6.4, Table A.

network site
The land within the property boundaries of a Field Service Centre, Zone Substation, Transmission Substation, Cottage Substation, Indoor/Outdoor Substation, Switching station, Pumping station and Ground Based Regulator site. A network site includes easements.

observer
Is a worker whose sole duty is to observe the work that is in progress and to ensure that work is carried out in accordance with approved procedures and the Electrical Safety Rules.

plant
Mechanical equipment items used for excavation.

SWMS
Safe Work Method Statement

TMP
Traffic Management Plan prepared in accordance with Company Procedure GSY 0062 - Traffic Control.

vacuum extraction
A method of excavating using water or air aided by vacuum extraction to achieve non-destructive excavation.

WHRA
Worksite Hazard and Risk Assessment as prepared in accordance with Company Procedure GSY 1066 - Worksite Hazard and Risk Assessment.

worker
A person is a worker if the person carries out work in any capacity for a person conducting a business or undertaking, including work as:
(a) an employee; or
(b) a contractor or subcontractor; or
(c) an employee of a contractor or subcontractor; or
(d) an employee of a labour hire company who has been assigned to work in the person's business or undertaking; or
(e) an outworker, ie, a person who performs work for an employer at their own home or at another location that is separate from their employer's factory, workshop, office or worksite; or
(f) an apprentice or trainee; or
(g) a student gaining work experience; or
(h) a volunteer.

Work Health & Safety Management Plan (WHSMP)
Work Health & Safety Management Plan prepared in accordance with Company Procedure GSY 0074 – Work Health and Safety Management Plans.

worksite coordinator
An appointed employee in accordance with Company procedure GSY 1067 – Appointment of Worksite Coordinators, whose role is to coordinate all works as well as the implementation of agreed controls at the worksite. The appointed Worksite Coordinator must be in attendance at the worksite whilst workers and visitors are present.

5.0 ACTIONS

5.1 General

The Company's obligation under the *Work Health & Safety Act 2011* is to ensure a safe workplace extends to others present at the workplace or effected by the work, including workers, visitors and the public. This includes appropriately managing risk of:

- striking/damage to underground services;
- a person falling into an excavation;
- a person being trapped by the collapse of an excavation;
- a person working in an excavation being struck by a falling object; and
- a person working in an excavation being exposed to an airborne contaminant.

The Company must ensure that in managing these risks all relevant matters are taken into consideration including:

- the nature of the excavation;
- the nature of the excavation work, including range of possible methods of carrying out that work;
- the means of entry into and exit from the excavation (if applicable); and
- the controls necessary to minimise risk when the site is left unattended.

The Company's obligation under the *Electricity Supply Act 1995 (NSW)* is to ensure that excavation works do not damage assets belonging to infrastructure owners (including Endeavour Energy). By law, these obligations require that a Dial Before You Dig enquiry be made to determine the location of all underground assets no longer than 20 days prior to the excavation works being initiated. This may require that multiple inquiries be made for planning as well as actual work to comply with the 20 day timeframe. It should be noted that civil and criminal penalties may apply by law for failure to meet these and other obligations under this Act.

Management of all contractors engaged to carry out excavation work must be carried out in compliance with Company Procedure GSY 0068 – Contractor Management.

All workers and visitors on site must wear approved clothing, high visibility wear, enclosed footwear and helmets in accordance with Company Policy 3.11 – Personal Protective Equipment.

Any work where traffic/pedestrians would be affected, a traffic/pedestrian management plan is to be prepared in accordance with Company Procedure GSY 0062 – Traffic Control.

All works must consider the requirements of EMS 0001 – Environmental Due Diligence and Environmental Management Plans

All works are to comply with the Company's Electrical Safety Rules.

Only workers authorised in accordance with GAM 0060 – Authorisation to Carry out Excavation Work or Observe Excavation Work in a Public Place may be utilised for the purpose of excavation within minimum approach distances for excavation set out in the WorkCover Guide – Work Near Underground Assets.

An authorised observer must be dedicated to physically monitoring all proposed excavation processes, other than hand excavation or vacuum extraction.

Prior to any excavation work the WHSMP and SWMS must be reviewed with all workers involved in the process in compliance with Company Procedure GSY 0074 – Work Health and Safety Management Plans. Reference should be made to WorkCover Code of Practice – Moving Plant on Construction Sites, WorkCover Code of Practice – Excavation and WorkCover Guide – Work Near Underground Assets.

A WHRA is to be carried out in accordance with Company Procedure GSY 1066 – Worksite Hazard and Risk Assessment prior to any excavation work taking place.

When assessing the risks associated with excavation work factors including the following should be considered:

- local site conditions, including access, ground slope, adjacent buildings and structures, water courses (including underground) and trees;
- depth of the excavation;
- other underground assets including but not limited to petroleum and gas;

- soil properties, including variable soil types, stability, shear strength, cohesion, presence of ground water, effect of exposure to the elements;
- fractures or faults in rocks, including joints, bedding planes, dip and strike directions and angles, clay seams;
- any specialised plant or work methods required (e.g. ground support)
- the method(s) of transport, haul routes and disposal;
- what exposures might occur, such as to noise, UV rays or hazardous chemicals;
- the number of people involved;
- the possibility of unauthorised access to the work area;
- local weather conditions; and
- the length of time that the excavation will be open.

Physical hazards which may be present on site can include, but are not limited to:

- possibility of mechanical damage to existing cables or joints when excavating or installing cable;
- collapsing or flooding of trenches;
- traffic hazards;
- other services; and/or
- asbestos cable ducts.

A WHRA must consider the specific risks associated with excavation near underground assets and determine the appropriate excavation methodology (mechanical, hand or non-destructive (vacuum extraction) excavation) to minimise the risk in accordance with Division Workplace Instruction WNV 1037 – Excavation in Public Areas (Streets). Only hand or vacuum excavation must be employed until the location of Company assets is established. Vacuum extraction must not be used where asbestos-containing material is present or is suspected to be present.

5.2 Minimum approach distances

For excavation near assets belonging to asset owners other than the Company, the minimum approach distances for excavation set out in the WorkCover Guide – Work Near Underground Assets must be maintained. This also applies to all workers not authorised in accordance with Company Procedure GAM 0060 – Authorisation to Carry out Excavation Work or Observe Excavation Work in a Public Place.

For employees and contractors who have been authorised for excavation near Company assets in accordance with Company Procedure GAM 0060 – Authorisation to Carry out Excavation Work or Observe Excavation Work in a Public Place, the minimum approach distance to Company assets using excavation techniques other than hand excavation or vacuum extraction is as per Division Workplace Instruction WNV 1037 – Excavation in Public Areas (Streets).

5.3 Planned excavation works in a Public Space

The Contract Manager/Project Manager, Supervisor and Team Leaders are to ensure that the proposed excavation work has been suitably investigated, planned, designed, documented, resourced and approved to meet with all statutory and operational requirements. This is to include carrying out a DBYD search for assets in the vicinity of the excavation site and ensuring that the requirements of any asset owner, including the Company, are complied with when planning and carrying out the work.

All excavation works must be conducted and protected in accordance with Division Workplace Instruction WNV 1037 – Excavation in Public Areas (Streets), site specific SWMS, site specific WHSMP, Environmental Management Plan (EMP), Traffic Management Plan (TMP), and WHRA.

In addition**,** all works near overhead network assets must comply with Company Procedure GSY 0031 – Operating Plant near Overhead Powerlines and site specific WHRA.

All excavation works must ensure that the integrity of adjoining or nearby structure(s) is not compromised at any time.

When excavating around a power pole, supervisors are to ensure that the stability of the pole is not weakened. Where necessary the pole must be supported until the excavation has been backfilled and compacted.

5.4 Planned Excavation within a Zone/Transmission Substation Site

The Contract Manager, Project Manager, Supervisor and Team Leaders are to ensure that the proposed excavation work has been suitably investigated, planned, documented, resourced and approved to meet with all statutory and operational requirements.

All excavation works must be conducted and protected in accordance with the site specific WHSMP, EMP and WHRA.

In addition all works near overhead network assets must comply with Company Procedure GSY 0031 – Operating Plant near Overhead Powerlines and site specific WHSMP and WHRA.

All excavation works must ensure the integrity of adjoining or nearby structure(s) is not compromised at any time.

5.5 Unplanned works (emergency works)

There will be times when, due to network reliability or public safety requirements, the timeframe for commencing work will prevent some of the normal controls from being completed. This will not diminish the responsibility of the Worksite Coordinators to do everything which is reasonable and practical that is within their power to ensure the health, safety and welfare of persons and avoid damage to assets. The requirements of Division Workplace Instruction WNV 1037– Excavation in Public Areas (Streets) apply to both planned and unplanned work.

5.6 Incident notification

All incidents and accidents must be reported as required by Company Procedure GSY 0051 – Health & Safety Incident Management.

6.0 AUTHORITIES AND RESPONSIBILITIES

Chief Executive Officer has the authority and responsibility for approving this procedure.

Chief Engineer has the authority and responsibility for:

- endorsing this procedure; and
- authorising people to carry out work in accordance with this procedure.

General Manager Network Operations and **General Manager Network Development** have the authority and responsibility for:

- endorsing this procedure;
- appropriate resource allocation for this process; and
- ensuring compliance to this procedure.

Regional Managers have the authority and responsibility to ensure the application of this procedure to all excavation works proposed within their region.

Program Directors have the authority and responsibility for ensuring the application of this procedure to all projects under their direction that include a requirement for excavation and that all contractors who are available for use on projects have workforces that are trained and authorised in accordance with this procedure.

Contract Managers/Project Managers have authority and responsibility for:

- identification and planning of excavation works required;
- allocation of project resources ensuring awareness of budgets and timelines and focussing on safety as a priority;
- development of project specific WHSMP, EMP, TMP, as required; and
- effective management of excavation contracts to ensure compliance with this procedure.

Project Officer/Team Leaders/Supervisors have authority and responsibility for:

- managing project documentation;
- ensuring relevant stakeholders whose assets are affected by excavation works are notified and given sufficient time for feedback;
- implementation of project specific WHSMP, EMP, TMP, SWMS, as required;
- site investigation, as required, to assess site/project design and to ensure that all searches, surveying etc is completed;
- provision of relevant documentation to supervisor on site to enable full understanding of scope of works and any updated information to enable effective supervision of contractors and management of a safe work site;
- arranging and documenting suitable, appropriate and alternate project site supervision as required including the provision of safety observers; and
- reporting all incidents and unsafe conditions/acts.

Worksite Coordinators have the authority and responsibility for:

- daily supervision of the site requirements for the project;
- inducting contractors onto site;
- liaison with the Project Manager;
- appointment of the Safety Observer;
- ensuring that the work crew (including contractors) and the Safety Observer are instructed in the specific requirements of the works;
- maintaining site documentation;
- monitoring the OHS of contractors on site; and
- reporting all incidents and unsafe conditions/acts.

Observers have the authority and responsibility for:

- ensuring that excavator operators are specifically instructed in the requirements of the project scope;
- observing the specific excavation process within network sites;

- maintaining effective and immediate communication with plant operator, worksite coordinators and work crews;
- temporarily suspending excavation work at any time when it becomes apparent that work is, or is about to pose a hazard to the network asset, workers or members of the public; and
- reporting all incidents and unsafe conditions/acts.

Workers have the authority responsibility for:

- ensuring that all excavation work complies with the requirements of this procedure and relevant workplace instructions;
- providing input into and understanding the onsite safety management requirements;
- compliance with the requirements of the WHSMP, TMP and EMP;
- liaison with safety observers, worksite coordinators and project coordinators; and
- reporting all incidents and unsafe conditions/acts.

7.0 DOCUMENT CONTROL

Content Coordinator : Manager Electrical Safety & Authorisations

Distribution Coordinator : Business Process Coordinator, Finance & Compliance

COMPANY PROCEDURE

HEALTH & SAFETY	Document No: GSY 1088 Amendment No: 5 Approved By: CEO Approval Date: 29/11/12 Review Date: 29/11/15

GSY 1088 ACCESS AUTHORITY FOR HIGH VOLTAGE WORK AND/OR TEST

1.0 PURPOSE

To outline the procedure for issuing, receiving and signing onto a Company Access Authority (AA) for Work or a Company AA for Test.

THIS DOCUMENT IS A CONTROL FOR THE HEALTH AND SAFETY MANAGEMENT SYSTEM (H&SMS).

2.0 SCOPE

This document lists the actions to be followed for the issue of an AA for work or an AA for test associated with High Voltage (HV) isolation an earthing.

3.0 REFERENCES

Board Policy 3.0 – Occupational Health and Safety
Company Policy (Health & Safety) 3.18 – Work Health and Safety
Company Policy (Network Asset Management) 9.8.3 – Network Operations
Company Procedure (Health & Safety) GSY 0054 – Approval to Work
Company Procedure (Health & Safety) GSY 1031 – Electrical Safety Rules
Division Procedure (Network) GNV 1055 – Use of Low Voltage (LV) Protective Bonds on LV Distribution Mains
Division Procedure (Network) GNV 1070 – Access Authority Procedure for Work on Transmission Mains and Joint Use Mains
Company Form (Health & Safety) FSY0050 – Access Authority for Test
Company Form (Health & Safety) FSY0051 – Access Authority for Work
Company Form (Health & Safety) FSY0052 – Danger Tag
Company Form (Health & Safety) FSY0053 – Warning Tag
Company Form (Health & Safety) FSY0054 – Switching Folder
Branch Form (System Operations) FCL0143 – Notification of HV System Alterations
Request IT – the Company's Network Access Request System
Switch IT – the Company's Network Switching System
AS/NZ 2832.1:2004 Cathodic protection of metals – Pipes and cables
ENA Doc 01–2008 National Electricity Network Safety Code
ENA NENS 03–2006 National Guidelines for safe access to electrical and mechanical apparatus
Work Health and Safety Act 2011 (NSW)
Work Health and Safety Regulation 2011 (NSW)

4.0 DEFINITIONS

Access Authority (AA)
Any form of authorisation which allows access to, work on or near, or testing of electrical apparatus. An AA:

- is issued by an authorised person;
- is received by the delegated AA Holder (on behalf of single or multiple work crews);
- is what the work party signs before commencing work;
- gives clearance to carry out specific work on specific electrical apparatus on the HV network;
- records the isolation points operated to isolate the electrical apparatus;
- records the number and location of operational earths installed; and
- records the number and location of working earths.

Access Authority Issuer
The authorised person signing the Access Authority in Section 5.

Access Authority Holder (AA Holder)
The authorised person signing the Access Authority in Section 6.

authorised
A person with technical knowledge or sufficient experience who has been approved as competent and is then authorised in writing by the Company to perform the function requiring authorisation on or near the Company's electricity network. This definition holds for various forms of the word, eg, authorisation, authorise and authorised person (AUP).

D&R
Disconnection and Reconnection Instruction

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

electrical equipment
Means any apparatus, applicable, cable, conductor, fitting, insulator, material, meter or wire that is:

- used for controlling, generating, supplying, transforming or transmitting electricity at a voltage *greater than* an extra-low voltage; or
- that is operated by electricity at a voltage greater than extra-low voltage; or
- 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
- is, or is part of, an active impressed current cathodic protection system within the meaning prescribed AS/NZ 2832.1:2004 Cathodic protection of metals – Pipes and cables

Executive Leadership Team
Chief Operating Officer, General Manager Health, Safety & Environment, General Manager People & Services, Chief Engineer, General Manager Network Development, General Manager Network Operations, General Manager Finance & Compliance and General Manager Information, Communication & Technology.

isolated (and isolate)
Disconnected from all possible sources of electrical energy by opening switches, withdrawing circuit breakers, removing fuses, opening links, opening connections, tying back bonds and rendering them incapable of being made live unintentionally by the application of Danger Tags (and locks where possible)

local safety precautions
Those additional control measures taken by the AA Holder and work party to supplement the actions taken to issue the AA. These actions could include ensuring cables are discharged, erecting warning signs or barriers, releasing stored energy etc.

Low Voltage (LV) Protective Bonds
Approved Bonds which short circuit all phase and neutral conductors when required under the Electrical Safety Rules (ESR).

Person Conducting a Business or Undertaking (PCBU)
Has the meaning as prescribed under the *Work Health and Safety Act 2011 (NSW)* and for the purpose of this procedure, is either the Company or a Contractor of the Company who employs workers to undertake duties on its behalf.

System Operator
Officer directing the works from the Control Room.

the Company
Endeavour Energy. Also may be referred to as the PCBU as defined in the *Work Health and Safety Act 2011 (NSW).*

review date
The review date displayed in the header of the document is the future date for review of a document. The default period is three years from the date of approval however a review may be mandated at any time where a need is identified due to changes in legislation, organisational changes, restructures, occurrence of an incident or changes in technology or work practice.

worker
A person is a worker if the person carries out work in any capacity for a person conducting a business or undertaking, including work as:

(a) an employee; or
(b) a contractor or subcontractor; or
(c) an employee of a contractor or subcontractor; or
(d) an employee of a labour hire company who has been assigned to work in the person's business or undertaking; or
(e) an outworker, ie, a person who performs work for an employer at their own home or at another location that is separate from their employer's factory, workshop, office or worksite; or
(f) an apprentice or trainee; or
(g) a student gaining work experience; or
(h) a volunteer.

work party
Workers signing the AA in Section 8.

5.0 ACTIONS

5.1 Preliminary

The actions from Sections 5.1.1 and 5.1.2 below apply to both Access Authority (AA) for work and AA for test.

5.1.1 Company Form FSY0051 – Access Authority for Work

Clause 5.3 of NENS 03 – 2006:

"Authority for Work on or Near High Voltage Exposed Conductors Principles"

(a) An access authority shall be issued before any work commences on or near high voltage exposed conductors except when using approved procedures, for example, using approved water spray equipment for washing insulators.

(b) An access authority for work on or near exposed conductors and an access authority for electrical testing on the same conductors shall not be on issues at the same time."

5.1.2 Company Form FSY 0050 – Access Authority for Test

Clause 5.7 of NENS 03 – 2006:

"Electrical Testing of High Voltage Exposed Conductors Principles

(a) An access authority for electrical testing shall be used when the electrical testing has the potential to produce currents hazardous to the human body.

(b) Electrical testing shall only be carried out in accordance with approved procedures. Approved procedures shall include, but not be limited to, the requirements that:

- an access authority for work on or near the exposed conductors under test shall not be on issue;
- the points of isolation provide separation distances appropriate for the test voltages and the insulation medium;
- control measures are taken to ensure persons are prevented from coming on or near the conductors while under test;
- control measures are taken to ensure adjacent electrical apparatus and equipment do not become unintentionally energised during the test; and
- at the conclusion of the test, ensure any electrical apparatus under test that has become electrically charged during test is fully discharged and left in a safe condition. All access authority earths that were temporarily removed to allow the electrical testing to be carried out should be reapplied immediately.

(c) Where testing requires one or more access authority earth(s) be temporarily removed, the electrical apparatus shall be regarded as being live, irrespective of whether or not the testing voltages have been applied.

Note: Connection and removal of test leads shall only be done with all earths applied (not included in NENS 03).

(d) An access authority for electrical testing may not be required when testing high voltage electrical apparatus that is not electrically connected, however, such testing shall be in accordance with approved procedures to ensure the safety of persons and adjacent electrical apparatus or equipment."

5.2 Issuing an AA

5.2.1 Section 1 – Purpose of AA

A complete and accurate description of the equipment to be worked on (the electrical apparatus), including the voltages concerned needs to be written here. Reference is made throughout the AA to the electrical apparatus. This reference directs the reader back to the description given here.

Prefixed by the word “at” requires an accurate description of the location of the work site. Geographic location, identification numbers, pole numbers, etc, should be included where available. This is often the only place where a work location is defined and therefore it must be clear.

Prefixed by the word “to” requires details of all work to be carried out. This information will be taken directly from the top of the Disconnection and Reconnection (D&R). This wording originates from RequestIT. Any changes to the request require the agreement of the AA Holder and approval from the System Operator. These changes must be initialled and recorded on both the controlled and field copies of the D&R and if required the Pink Sheet (Branch Form FCL0143 – Notification of HV System Alterations) altered to reflect changes to constructed work.

5.2.2 Section 2 – Isolation points and actions taken

Full details of all the points of the isolation as shown on the D&R must be recorded in this section of the AA.

Both High Voltage (HV) and Low Voltage (LV) points of isolation shall be recorded where they provide isolation for the equipment to be worked on. Details of the step(s) taken to secure each isolation point should be clearly noted. Examples include:

- ABS H234 open, locked and Danger Tagged (D/T’d);
- HV and LV at substation 76543 opened and D/T’d;
- Bus and Cable shutters locked closed and D/T’d CB 34567;
- LV transformer links at substation 45678 open and D/T’d;
- LV parallel Cnr Jones and Smith St open and D/T’d; and
- 11kV open bond point pole 26 checked open and D/T’d.

Note: The use of abbreviations (Air Break Switch (ABS), Under Slung Links (USL), Drop Out Fuse (DOF), D/T’d, etc) is acceptable, however, care must be taken to ensure that there is no ambiguity or confusion as to the identity of the apparatus or the steps that have been taken. (An example is “//” for “parallel” is acceptable as long as the work party understand the meaning.)

5.2.3 Section 3 – Operational earths

Operational earths are earths established as directed by the System Operator for the purpose of issuing the AA.

5.2.3.1 Earths shall be recorded by noting a geographical location or relating to an isolation point by number. Examples include:

- cable Spouts Haz SP SW 34523 at Substation 67854;
- Overhead (O/H) 11kV 3 poles south of USL 43278;
- O/H 11kV Cnr of Crown St and Smith St, Bargo; and
- below DOF substation 34598.

(The descriptions of earthing locations should be taken directly from the D&R.)

The unused lines in this section shall be crossed out.

Note: The details of operational earths applied shall be copied exactly as shown on the AA into the "Earthing equipment applied" field of the Switching Folder (Company Form FSY0053 – Warning Tag).

5.2.3.2 Only operational earths applicable to this AA shall be listed. If earths are common to another Switching Folder and work site, they shall be noted under the "unusual conditions" section of the Switching Folder (Company Form FSY0053 – Warning Tag) and the Switching Folder "cross referenced". Earths common to more than one AA will need to be written on each AA where applicable. For further information see Division Procedure GNV 1070 – Access Authority Procedure for Work on Transmission Mains and Joint Use Mains.

5.2.3.3 Earthing sub-transmission mains

Where operational earths are required on sub-transmission mains in joint-use situations, as described inDivision Procedure GNV 1070 – Access Authority Procedure for Work on Transmission Mains and Joint Use Mains, an AA for Work will be endorsed to "erect sub-transmission earths only".

5.2.4 Section 4 – LV Protective Bonds

When the AA includes LV mains and apparatus as part of the isolation, LV Protective Bonds will be required in accordance with Clause 7.1.2 of the Electrical Safety Rules (ESR), that is, where active conductors are in electrical contact with a Customer Installation. The location of all Protective Bonds shall be recorded on the AA, along with confirmation of connection and removal, by initials.

LV Protective Bonds shall not be removed until the AA has been surrendered or the apparatus to which they are connected has been disconnected from all Customer Installations.

Isolated conductors that are not in electrical contact with a Customer Installation do not require the application of LV Protective Bonds. Such apparatus could include auxiliary equipment within a zone substation or isolated distribution mains which do not directly supply customers.

5.2.5 Section 5 – Special conditions

The purpose of this section of the AA is to list all special notations and instructions to the AA Holder and the work party.

Sample notations:

- for workers undertaking work on or near protection equipment associated with HV circuit breakers, where applicable. Example: "Feeder Alive In";

- *regarding the replacement of DOF or the fitting of fire chokes where specific operational earths need to be removed. Example: "Earths below DOF may be removed one (1) phase at a time to allow work";

- *where a specific set of operational earths are to be removed by the AA Holder on the completion of work and the surrender of the AA. Example: "On the surrender of this AA, an authorised person may remove earths (specify the letter) ....."; and

- *where operational earths are to be removed to allow work to proceed, such as the replacement of a HV crossarm on a pole substation or maintenance of switchgear. Example: "Earths below DOF's may be removed and replaced after disconnection of LV bonding from the transformer to the LV switchgear".

(*****earths may only be removed or replaced by an authorised person. Replacing earths may only be done following proving de-energised in accordance with approved procedures.)

Note: An AA for Work may be endorsed for the removal of earths in some circumstances. The electrical apparatus must always be connected to earth while the AA is in use. The type of situation where earths may be removed include:

- replacement of DOF holders on pole substations (in this situation the AA should be "endorsed for removal of earths (identify which earths may be removed) one phase at a time";
- replacement of HV cross arm (carrying DOF) on pole substation (identify which earths may be removed); and
- removal of earthing apparatus, by an authorised person, erected by means of an Elevating Work Platform (EWP), or similar situations, where the restoring officer would require specialised assistance, such as the use of an EWP, to remove specific earths.

5.2.6 Section 6 – Issue of AA

The check boxes shall be ticked as appropriate. Whether the work party is on site or it is not – the appropriate box must be ticked. Any item in Section 6 that has not or cannot be carried out must be ruled out and initialled by the issuer.

"This AA is issued to" requires the name of the worker or the specific description of the position of the worker designated on the D&R to be the Holder. Examples include:

- L/H EFM (Leading Hand Electrical Fitter Mechanic); and
- Fred Jones, L/H Painter (Leading Hand Painter).

Notes:

- If the work party is present and have been given the required warnings and instructions from the Issuer and have signed onto the AA, the Issuing Officer shall underline under the signatures in Section 9 and initial the line. This responsibility reverts to the AA holder if the work party is not present at the time of issue.
- If the Issuer has reason to believe that any or all of the work party (including the AA Holder) have not paid close attention to the warnings given, or it is clear that they do not understand the conditions of the issue, the AA should not be issued. The work party should be requested to pay attention to the warnings given or the System Operator advised that the AA will not be issued. The System Operator shall advise the requesting officer of the situation.

5.2.7 Section 7 – Acceptance by AA Holder

The AA Holder must agree with the statements in this section, tick the boxes and then print their name, authorisation number, phone number and sign, time and date the declaration. If there are any concerns, omissions or discrepancies the AA must not be signed by the AA Holder until these issues have been rectified.

In the event that an unexpected worksite change triggers the need to alter a Pink Sheet (Branch Form FCL0143 – Notification of HV System Alterations) the AA holder shall (directly or through their supervisor/contract inspector) immediately notify the System Operator.

Note: If the AA has been left on site prior to the arrival of the work party, it becomes the AA Holder's responsibility to give all necessary warnings and advice on the isolations, earthing, nearest live electrical apparatus to the work party and any other advice that may be necessary for the safety of workers on the site. The AA Holder shall underline under the signatures in Section 8 and initial the line.

5.2.8 Section 8 – Transfer of AA

Both the current AA Holder and the worker who is to receive it must be present at the time of transfer.

Both the original AA Holder and the new AA Holder must be authorised persons for the purpose of holding an AA.

The worker receiving the AA must agree with all the statements originally agreed to by the original AA Holder in Section 7. If the new AA Holder is already signed on to the AA as a member of the work party, then he/she must sign off under Section 9 before becoming the new AA Holder.
After signing, he/she becomes the current AA Holder from the time and date shown against the signatures. Relevant information regarding the AA, any special conditions and the work associated with it need to be discussed also at this time.

The original AA Holder must sign the AA in the "Received from" column indicating that all necessary warnings, advice or other relevant information has been given to the new AA Holder. If the original AA Holder returns to the worksite while the AA is still issued that worker must receive all necessary warnings and instructions from the new AA Holder and sign on to the AA in in Section 9 and have the new AA Holder underline and initial the line under the new signature.

Note: If working earths have been connected as conditions of this AA the worker receiving the AA as the new AA Holder will need to hold an authorised person's authority to erect/remove working earths.

AA issued to named workers as "Personal Issue" can not be transferred.

5.2.9 Section 9 – Members of the work party

Each worker signing and printing their name is agreeing with all the statements shown under Section 9 "Members of the Work Party", and under "Sign on" column. All members of the work party must comply with the instructions given at the top of the AA under Section 9 regarding the work party.

Notes:

- The Issuing Officer shall underline under the signatures in Section 8 and initial the line. This responsibility reverts to the AA Holder if the work party is not present at the time of issue.

- The statement under "Sign off" column regarding the removal of "all equipotential bonds" applies only to those bonds applied by that worker.

5.2.10 Section 10 – Working earths

If workers are required to erect Working Earths they must be in possession of an authorised person's authority to erect working earths.

Notes:

- Details regarding the location(s) for erecting working earths will be written in this section by the AA Issuer, or the AA Holder where the need is identified during the work process.

- The authorised person erecting working earths must sign in the column “Placed by” and record their authority number in the space provided.

- The authorised person removing working earths must sign in the column “Removed by” and record their authority number in the space provided.

- Prior to surrendering the AA the AA Holder shall confirm that all working earths have been removed and are signed off in the “removed by” column.

- Reconnecting mains and/or apparatus – before reconnection operations are commenced and prior to cancelling the AA for work on the AA folder, the authorised person is to determine if working earths are noted on the AA. If working earths are shown, the authorised person must confirm that they are signed off as removed and that the electrical apparatus is clear of all working earths.

5.2.11 Section 11 – Temporary Surrender of AA for Work

AA’s that are required for multiple days can be temporarily surrendered by the AA Holder (in the Temporary Surrender Column) after all members of the works party have signed off the AA in Section 9.

When the work recommences on a subsequent day the AA Holder from the previous day (only) signs on in the “Reinstatement Column” then all members of the work party can sign onto the “Sign on” column in Section 9.

Note: Even if it is the same work party from the previous day it is the AA Holder’s responsibility to give all necessary warnings and advice on the isolations, earthing, nearest live electrical apparatus to the work party and any other advice that may be necessary for the safety of personnel on the site. The AA Holder shall underline under the signatures in Section 8 and initial the line

5.2.12 Section 12 – Surrender of AA

The AA Holder shall tick the four boxes in this section confirming that the work party have completed their work under the AA and the equipment to be worked on (see Section 1) is now being regarded as live. The AA Holder must make any comments that may assist the authorised person in the restoration process. The comments should include any information on limitations or conditions of the electrical apparatus that could affect the restoration of the electrical apparatus, eg, Work not fully completed, Pink sheet altered and D&R changed (see section 1).

5.2.13 Section 11 – Cancellation of AA for Work

The authorised Switching Officer shall check Sections 9 to 12 are all completed and signed off and then cancel the AA by signing and adding their authority number, time and date of cancellation.

5.3 Proxy sign off of AA

Failure to cancel or sign off an AA is a serious matter. Where worker leave the site without doing so all practical steps should be taken to obtain their signatures. Where this is not possible, the following procedure applies:

- where a worker is unable to sign the “Sign off” column or cancel the AA due to accident, sickness or any other legitimate reason, the System Operator may obtain authority from the worker’s supervising Engineer for the sign off on behalf of the absent worker; and

- if this authority is obtained the following endorsement shall be hand written across the back of the AA by the AA holder prior to cancellation:

> *I hereby state that _____ whose signature appears under "Sign on", (or as Access Authority Holder in Part 7), is incapable of signing under "Sign off", (or as Access Authority Holder in Part 12), and has ceased work on the electrical apparatus referred to in this Access Authority.*
>
> *Signed: _____ Time:_____ am/pm.*
>
> *Witness: _____Date:_____*

The Engineer who authorised the cancellation of a worker's signature shall be responsible for ensuring that the absent worker is advised of this cancellation immediately on, or before, their return to duty.

If this clearance is received as verbal instruction from the System Operator, the authorised person on site will complete the endorsement above including a statement that the System Operator (include name) has obtained the required clearance from the Engineer.

5.4 Missing AA

When an authorised Switching Officer reports that an AA is missing from a work site, it is the System Operator's responsibility to:

- direct the authorised Switching Officer to patrol the section of isolated electrical apparatus;
- notify the Regional Manager, immediate assistant or the Production Supervisor immediately responsible for the work and request to take whatever steps necessary to locate the AA and/or the workers involved on the AA; and
- cooperate with the Regional Manager in their investigation.

Notes:

- Clearance to restore the electrical apparatus to service must only be accepted from the Regional Manager, immediate assistant or the Production Supervisor immediately responsible for the work.
- Should the Regional Manager and immediate assistant be "out of call" the Manager System Operations, Field Operations Manager, or the Senior System Operator must be contacted to determine the alternative action necessary.

5.5 Unaccepted AA

Unaccepted AA are those where:

- there is no AA Holder's signature;
- there are no signatures by worker on the reverse side of the AA; and
- the designated work, for which the AA was issued, has apparently not been carried out.

Authorised Switching Officers who discover unaccepted AAs should contact the System Operator and await instructions.

During normal office hours the System Operator is to negotiate with the requesting business unit/region and ascertain their intentions and advise the Senior System Operator.

After normal office hours the System Operator should endeavour to ascertain the intentions of the requesting business unit/region and advise the Senior System Operator at the first available opportunity of the outcome of the negotiations and the action taken.

Unaccepted AAs which are withdrawn are to be crossed out diagonally on the front page and marked "Withdrawn prior to acceptance", signed and dated by the authorised Switching Officer and returned to the System Operations Branch, Field Operations Manager, together with all other relevant papers in the usual manner.

5.6 AA/Approval to Work (ATW)

It is not intended that both an AA and an ATW be issued in the same location. The expected practice is that if an AA is required for part of the work then the scope of the AA should be extended to include all aspects of the job. An ATW is normally used for individual (stand alone) LV isolations or electrical apparatus that is completely disconnected from the system such as a racked out circuit breaker. Where ever possible the combination of both an AA and an ATW on one location should be avoided. (See Company Procedure GSY 0054 – Approval to Work)

5.7 Emergency situations

Except in emergency situations AAs shall be in writing. Where there is immediate risk to life or property (say in the case of a building fire) clearance can be given to make safe HV electrical apparatus without writing an AA. All steps required for the issue of an AA shall be carried out and all warnings and advice shall be given as would normally be done in the issue of an AA. The AA shall be written and issued in accordance with this procedure as soon as possible following making the electrical apparatus safe. The System Operator must give permission for this clearance to be given and must be advised of all actions taken including the subsequent issue of the written AA.

5.8 Alteration to an AA

Where an AA is found to be incorrect or the conditions under which the AA has been issued change, the System Operator shall be advised and the AA shall not be accepted by the AA Holder nor shall the work party sign on to the AA. The AA shall be withdrawn and a new AA issued.

5.9 Additional space required

5.9.1 Work party signatures or operational earths

If there is a requirement to add either additional work party members or operational earths and there is insufficient space on the AA form, an additional AA form shall be used to record the additions and both documents shall be cross-referenced.

6.0 AUTHORITIES AND RESPONSIBILITIES

Chief Executive Officer has authority and responsibility for approving this procedure.

Executive Leadership Team has authority and responsibility for endorsing this procedure.

General Manager Network Operations has the authority and responsibility for:

- appropriate resource allocation for this process; and
- monitoring compliance with this procedure.

Regional Managers have the authority and responsibility for:

- appropriate resource allocation for this process; and
- ensuring regional workers comply with this procedure.

Manager System Operations has the authority and responsibility for:

- endorsing this procedure; and
- ensuring System Operations workers comply with this procedure.

Manager, Network Connections has the authority and responsibility for ensuring Accredited Service Providers (ASP) comply with this procedure.

Access Authority Issuers have the authority and responsibility for:

- verifying that isolation, earthing and Access Authority (AA) are correct; and
- giving appropriate warnings to AA Holder and work party.

Access Authority Holders have the authority and responsibility for verifying that isolation, earthing and AA will allow them to carry out the work safely and give appropriate warning to the work party.

Work Parties have the authority and responsibility for understanding the conditions of the AA and signing on after receiving appropriate warnings and signing off at completion of work.

7.0 DOCUMENT CONTROL

Content Coordinator : Chief Engineer

Distribution Coordinator : Business Process Coordinator, Finance & Compliance

Division Procedure

NETWORK		
	Document No	: GNV 1044
	Amendment No	: 5
	Approved By	: CE
	Approval Date	: 17/12/2014
	Review Date	: 17/12/2017

GNV 1044 COMMISSIONING NETWORK ELECTRICAL ASSETS

1.0 PURPOSE

To define the processes to apply for the pre-commissioning and certification as available for service and commissioning of electrical plant or equipment that is to become part of the electrical network in accordance with the requirements of Company Policy 9.1.7 – Commissioning Network Electrical Assets.

2.0 SCOPE

The scope of this procedure includes all company electrical network assets including distribution, zone and transmission substations and mains, including low voltage distribution equipment, protection and control and network telecommunications equipment to be placed in service for the first time and assets being returned to service after major repair, refurbishment or relocation. It does not apply to network electrical assets being returned to service following routine works, inspection or maintenance unless otherwise nominated by the Responsible Officer, Manager Primary Systems or Manager Secondary Systems. It does not apply to civil works or other non-electrical assets.

This procedure does not apply to new assets installed and put into service using live working techniques.

3.0 REFERENCES

Internal

Company Policy (Network) 9.1.7 – Commissioning Network Electrical Assets
Company Policy (Network) 9.2.5 – Network Asset Design
Division Procedure (Network) GNV 1062 – Granting Dispensation from Engineering Documents
Division Procedure (Network) GNV 1093.1 – Oil Laboratory Processes: Testing of Insulating Oil
Division Procedure (Network) GNV 1093.2 – Oil Laboratory Processes: Dissolved Gas Analysis (DGA), Furan Results and Degree of Polymerization (DP) Result Interpretation
Division Procedure (Network) GNV 1093.3 – Oil Laboratory Processes: Sampling of Insulating Oil
Division Procedure (Network) GNV 1093.4 – Oil Laboratory Processes: Buchholz Gas Sampling and Analysis
Division Procedure (Network) GNV 1094.1 – Testing of Network Equipment: Surge Arresters (Pre-Commissioning) Tests
Division Procedure (Network) GNV 1094.3 – Testing of Network Equipment: Electrolysis (Corrosion) Testing
Division Procedure (Network) GNV 1094.4 – Testing of Network Equipment: Soil Resistivity Testing
Division Procedure (Network) GNV 1094.5 – Testing of Network Equipment: Withstand Testing
Division Procedure (Network) GNV 1094.10 – Testing of Network Equipment: Earth System Testing

Division Procedure (Network) GNV 1094.12 – Testing of Network Equipment: Insulation Resistance Testing
Division Procedure (Network) GNV 1094.13 – Testing of Network Equipment: Partial Discharge Testing
Division Procedure (Network) GNV 1094.15 – Testing of Network Equipment: Identification of Cables
Branch Workplace Instruction (Primary Systems) HVT 0001 – Electrical Testing Manual
Branch Workplace Instruction (System Operations) WCB 0504 – Commissioning Network Electrical Assets for Transmission Projects
Branch Workplace Instruction (Metering Information) WMT 1503 – High Voltage Metering Pre-Commissioning Tests
Branch Workplace Instruction (Network Engineering) WPC 1300 – Pre-Commissioning and Testing of Protection Schemes
Branch Workplace Instruction (Secondary Systems) WPC 1318 – Protection Relay Maintenance Tolerances
Branch Workplace Instruction (Regional) WRG 0654 – Commissioning Network Distribution Electrical Assets
Division Form (Network) FNV 1043 – Certificate of Availability for Service for Network Electrical Assets
Division Form (Network) FNV 1045 – Commissioning Advice/Authority to Energise System High Voltage Apparatus
Company Electrical Safety Rules
Lighting Design Instruction LDI 0003 – Commissioning of Public Lighting Assets
Mains Maintenance Instruction MMI 0025 – Tests for Transmission/ Subtransmission Underground Cables
Protection Maintenance Instruction PMI 4110 – Commissioning of protection schemes
Protection Maintenance Instruction PMI 4140 – Relay Test Standards
Substation Design Instruction SDI 120 – Pre-Commissioning Checks and Tests for Distribution Systems
Substation Design Instruction SDI 535 – Testing and Commissioning
Substation Maintenance Instruction SMI 113 – Distribution and Field Transmission Data Asset Structure and Nameplate Details
Substation Maintenance Instruction SMI 119 - Transmission and Zone Substation Data Asset Structure and Nameplate Details
Annexure A – Commissioning Network Electrical Assets for Transmission Projects
Annexure B – Commissioning Network Electrical Assets for High Voltage Distribution Projects
Annexure C – Commissioning Network Electrical Assets for Low Voltage Projects
Annexure D – Commissioning Document Hierarchy (not exhaustive)

External
Electricity Supply Act, 1995 (NSW)
Work Health and Safety Act 2011 (NSW)
Work Health and Safety Regulation 2011 (NSW)
ISO 31000:2009 – Risk Management – Principles and Guidelines
AS Records classification handbook – HB5031 – 2011
NSW Treasury Risk Management Toolkit for the NSW Public Sector (TPP12-03)

4.0 DEFINITIONS

Accredited Service Provider (ASP)
A company or individual accredited by the New South Wales Trade & Investment to undertake contestable service work as defined by the Scheme for Accreditation of Service Providers.

Authorised
A person with technical knowledge or sufficient experience who has been approved and authorised in writing by the company to perform the duty concerned as described in Schedule 1 of Company Policy 9.1.3 – Authorisations.
Note: This definition holds for various forms of the word (for example, authorisation, authorise and authorised person).

Available for service
Plant or equipment is available for service to be connected to the electrical network when it has been certified under all necessary Network Asset Management policies; has been assessed against and passed all necessary pre-commissioning checks and tests called for in the nominated threshold safety and performance criteria; and has been duly certified as available for service.

Commissioning
Commissioning is the process of connecting and/or energising electrical apparatus to become part of the electrical network after having been certified as available for service and after withdrawal of all relevant Access Authorities (AAs) or Authorities to Work (ATWs) pertaining to the certified plant or equipment.

Commissioning officer
The person responsible for receiving available for service certification from the Responsible Officer and bringing the piece of equipment into service.

Distribution
Relating to the company's 11kV, 22kV and 12.7kV (SWER) electricity network, excluding the first cable out of zone substations.

Document control
Employees who work with printed copies of documents must check the BMS regularly to monitor version control. Documents are considered "UNCONTROLLED IF PRINTED", as indicated in the footer.

Electrical apparatus
Any electricity power lines or associated equipment or electricity structures that form part of a transmission or distribution system.

Inspection and test plan (ITP)
A document prepared by the Responsible Officer in accordance with Network policies and procedures at the start of a project that details all the tests, checks and certifications that are required against the equipment involved in the project that must be satisfactorily completed before the equipment can be certified as available for service.

Network project
A network construction or major asset repair/relocation project that leads to a need for commissioning under this procedure.

Nominated threshold safety and performance criteria
The subjective and objective criteria nominated for specific equipment, apparatus or systems identified as such or as commissioning or pre-commissioning requirements or listed as reference documents under this procedure.

Qualified assessor
The person responsible for certifying that the subjective/objective results of a pre-commissioning test or check required under this procedure satisfy the nominated threshold safety and performance criteria.

The Qualified Assessor may be a company employee, a contractor to the company or an employee of an Accredited Service Provider (ASP) and must have the relevant experience and competence to certify that the tests that have been carried out meet the nominated threshold, safety and performance criteria.

Recordkeeping
Making and maintaining complete, accurate and reliable evidence of business transactions in the form of recorded information (Source: AS Records classification handbook – HB5031 – 2011).

Responsible officer
The company employee responsible for delivering the agreed business outcomes from a network project.

Review date
The review date displayed in the header of the document is the future date for review of a document. The default period is three years from the date of approval. However a review may be mandated at any time where a need is identified due to changes in legislation, organisational changes, restructures, occurrence of an incident or changes in technology or work practice.

Transmission
Relating to the company's electricity distribution assets operating at voltages of 33kV and above, including all ancillary equipment in zone and transmission substations and the first distribution cable out from zone substations.

5.0 ACTIONS

5.1 General

Electrical apparatus covered by this procedure will require signed certification by the controlling Responsible Officer prior to commissioning by the Commissioning Officer. This certification must state that the nominated threshold safety and performance criteria have been checked, tested and passed by a Qualified Assessor and that the equipment is available for service.

Multiple certifications may be required for large scale projects. A central register of certifications covering the full extent of the project must be maintained by the Responsible Officer providing full visibility of the extent of the project so that the current status of all electrical apparatus associated with the project is known at all times.

At the start of a project, the Responsible Officer will prepare an Inspection and Test Plan (ITP) that details all the certifications that will be required under all the relevant Network Asset Management policies and standards.

5.2 Appointment of a Responsible Officer

A Responsible Officer and an alternate must be appointed to manage each network project. The Responsible Officer has ultimate responsibility for delivering the intended business outcomes of the project, and in particular, for final certification that all electrical apparatus that is to be commissioned as part of the project is certified as available for service prior to commissioning. When the Responsible Officer is for any reason unavailable, the responsibilities of the Responsible Officer under this procedure may be carried out by the appointed alternate.
The Responsible Officer and alternate must be clearly advised of the responsibilities of the role prior to the commencement of the project and both must be formally identified to the System Control Branch.

The General Manager Network Development or their delegate will be responsible for appointing the Responsible Officer and their alternate for the following classes of project:

- major growth, renewal and refurbishment transmission projects;
- all distribution projects carried out as part of the Strategic Asset Management Plan (SAMP) program that have not had responsibility for completion assigned to a Regional Manager; and

The General Manager Network Operations or their delegate will be responsible for managing the process of appointment of a suitable Responsible Officer and their alternate for the following classes of project:

- all projects carried out by ASPs including distribution, asset relocation and street lighting projects.

The relevant Regional Manager or their delegate will be responsible for appointing the Responsible Officer and their alternate for all other projects.

5.3 Appointment of a Qualified Assessor

A Qualified Assessor is required to confirm that the relevant tests and checks nominated in the relevant company standards have been completed by an appropriately competent or supervised person and formally advise the Responsible Officer that the nominated threshold safety and performance criteria have been met.

The Responsible Officer must confirm that the person nominated as the Qualified Assessor has the relevant experience and competence to provide the Responsible Officer with this advice. The qualified assessor must have the relevant experience to competently assess test results and performance and safety criteria and have a clear understanding of the company procedures and standards relevant to the equipment being assessed. The person nominated as the Qualified Assessor must also hold the equivalent of a Certificate III (trade) qualification in the appropriate discipline or other appropriate qualifications relevant to the tests being conducted (chemist, metallurgist, laboratory technician, and the like).

5.4 Test procedures

The Responsible Officer must confirm that all tests are conducted in accordance with the following and in the hierarchical precedence where more than one option exists:

- the Electrical Safety Rules (where applicable);
- company standards or workplace instructions (where available);
- Australian standards (where available);
- national industry standards/guidelines/codes, and the like (where available);
- international standards (where available); and/or
- manufacturers' recommendations.

Documented procedures complying with the above requirements and their safe and effective implementation are the responsibility of the Responsible Officer. Where company procedures or workplace instructions have been prescribed by the Chief Engineer as mandatory, these procedures or workplace instructions must be applied.

5.5 Certification as available for service

A written certification that equipment is available for service must be forwarded to the Commissioning Officer by the Responsible Officer prior to the commencement of the commissioning process.

For electrical apparatus to be certified as available for service, it must satisfy both electrical performance and safety performance criteria.

5.5.1 Electrical performance criteria

This section relates to certification that all nominated electrical performance criteria have been assessed and/or tested in accordance with the criteria established in the pertinent nominated criteria documents. The relevant standards are as follows and as indicated in Annexure D – Commissioning Document Hierarchy (non exhaustive).

For equipment related to the transmission network:

- Company Standard SDI 535 – Testing and Commissioning;
- Company Standard PMI 4110 – Commissioning of Protection Schemes;
- Branch Workplace Instruction WPC 1300 – Pre-commissioning and Testing of Protection Schemes;
- Company Standard MMI 0025 – Tests for Transmission/Subtransmission Underground Cables; and
- Branch Workplace Instruction WMT 1503 – High Voltage Metering Pre-Commissioning Tests.

For equipment related to the distribution network:

- Company Standard SDI 120 – Pre-commissioning Checks and Tests for Distribution Systems.

For street lighting equipment:

- Company Standard LDI 0003 – Commissioning of Public Lighting Assets.

Any additional electrical performance criteria nominated in the Project Commissioning Plan and as called for in any other Network Asset Management policies.

5.5.2 Safety performance criteria

Certification that all pertinent safety tests and checks have been conducted and met the nominated safety criteria is required prior to equipment being certified as available for service.

Essential requirements include:

- labelling and identification; and
- warnings and/or precautionary notices.

Declaration that the equipment can be operated and maintained in accordance with the Electrical Safety Rules and all other relevant company standards. Note that this criterion is satisfied if:

- the equipment is nominated on approved Substation Design Instructions (SDI), Equipment Technical Specifications (ETS) or the company's Approved Equipment list; or

- the equipment is approved by the Manager Primary Systems or Manager Secondary Systems as appropriate;

- declaration that all tools and apparatus required to access or work on the apparatus are on site and their location clearly identified at the apparatus or a statement nominated that generic business equipment is available to operate and maintain the equipment;

- declaration that all documentation relating to the equipment's operation and maintenance has been provided to Engineering; and

- declaration that training of employees required to operate the equipment has occurred or has been approved by the Chief Engineer as not required due to the equipment's generic nature.

Any results of tests or checks that are determined to be outside of the limits that define acceptable performance must be referred to the Manager Primary Systems or Manager Secondary Systems in accordance with the requirements of Division Procedure GNV 1062 – Granting Dispensation from Network Standards in order to determine an appropriate course of action that will result in the equipment being certified as available for service. In reviewing the course of action requirement for outside of limit results or other dispensation submissions, a minimum of 20 working days is required for a judgement to be made. Operational imperatives will be considered and interim arrangement may be provided by the Manager Primary Systems or Manager Secondary Systems based on network impact within the 20 working day period.

The Primary Systems or Secondary Systems Engineering Branch employees will consult with internal and/or external subject matter experts as required in order to determine the appropriate course of action. All design and test data must be forwarded to Primary Systems or Secondary Systems to allow appropriate action to be determined.

The outcome of this consultation, including evidence of approval by the Manager Primary Systems or Manager Secondary Systems, must be documented and a copy kept on the project file.

5.5.3 Certification requirements

A written certification that equipment is available for service must be provided on Division Form FNV 1043 – Certificate of Availability for Service for Network Electrical Assets and include certification by the Responsible Officer that:

- all pre-commissioning tests, checks and procedures associated with the project/work packet have been completed proving the integrity and operability of the equipment in accordance with network design standards and project requirements;

- the system electrical and safety performance has been tested and demonstrated as meeting the network standard and/or nominated threshold criteria;

- any outstanding items deemed not critical for commissioning are listed as exceptions and have been agreed to by the Manager Primary Systems or Manager Secondary Systems as appropriate;

- all supporting pre-commissioning checklists and/or reports have been completed and appropriate records have been retained for entry into relevant network databases; and

- a final site inspection has been completed by the Responsible Officer.

This written certificate, including all information above, must be sent by way of email, internal mail or fax to the Commissioning Officer and its receipt acknowledged by the Commissioning Officer.

When the Commissioning Officer has been nominated as being a District Operator or other field-based operative (generally only for distribution and low voltage projects), a copy of the Certificate of Availability for Service must be left on site by the Responsible Officer or their delegate. A duplicate copy of the certificate must be retained by the Responsible Officer and stored on the project file.

Verbal clearance will not be accepted from the Responsible Officer.

The Certificate of Availability for Service for Network Electrical Assets will generally not be submitted to System Control until all tests, checks and certifications required on the Inspection and Test Plan have been recorded as completed.

On occasion, it may be necessary to conduct final tests immediately prior to placing the equipment in service, when the Responsible Officer is not available to sign the Certificate of Availability for Service. In this situation, the Responsible Officer must complete the Certificate of Availability for Service, listing the outstanding tests in the Exceptions section and submit to the Commissioning Officer. A second copy of the Certificate of Availability for Service must be completed for the equipment to be commissioned, with references to Responsible Officer crossed out and replaced with Qualified Assessor. The Qualified Assessor must complete the outstanding tests and, if satisfactory results have been obtained, sign the Certificate of Availability for Service and submit it to the Commissioning Officer. The Qualified Assessor must submit a copy of the final Certificate of Availability for Service to the Responsible Officer for retention on the project file.

A copy of the Certificate of Availability for Service must be kept on the project file and made available as required for audit purposes.

5.6 Certification clarification

The Commissioning Officer has the ultimate determining decision for commissioning. Where the Commissioning Officer has concerns with respect to the certification as available for service they must, in the first instance, raise the concerns with the Responsible Officer. If the concerns are not satisfied, the Commissioning Officer must discuss them with the Manager Primary Systems or Manager Secondary Systems as appropriate. Any unresolved concerns must be referred to the Chief Engineer for final resolution.

Equipment must not be placed into service if the Commissioning Officer has any concerns with respect to the certification as available for service.

6.0 RECORDKEEPING

The table below identifies the types of records relating to the process, their storage location and retention period.

Type of Record	Storage Location	Retention Period*
Inspection test plan (ITP)	Project folder and then Company document management system	Retain until plant or equipment is disposed of, then destroy in accordance with GA28-05.14.01

Division Form (Network) FNV 1043 – Certificate of Availability for Service for Network Electrical Assets	Project folder and then Company document management system	Retain until plant or equipment is disposed of, then destroy in accordance with GA28-05.14.01
Division Form (Network) FNV 1045 – Commissioning Advice/Authority to Energise System High Voltage Apparatus	Project folder and then Company document management system	Retain until plant or equipment is disposed of, then destroy in accordance with GA28-05.14.01
Test records	Project folder and records relevant to test recording in accordance with associated test procedures and forms: GNV 1094 and HVT 0001 series – Testing of network equipment GNV 1092 series – oil laboratory processes And other WPC's relevant to equipment type	Retain until plant or equipment is disposed of, then destroy in accordance with GA28-05.14.01

* The following retention periods are subject to change eg if the records are required for legal matters or legislative changes. Before disposal, retention periods should be checked and authorised by the Records Manager.

7.0 AUTHORITIES AND RESPONSIBILITIES

Chief Engineer has the authority and responsibility for:

- approving this procedure;
- maintaining appropriate policies and standards to support the application of this procedure; and
- final arbitration on any unresolved concerns regarding the certification of Available for Service.

General Manager Network Development has the authority and responsibility for:

- appointing or delegating the responsibility to appoint a Responsible Officer to any project when required by this procedure; and
- developing a process for formal appointment of Responsible Officers to projects; and
- appropriate resource allocation to enable compliance with this procedure

General Manager Network Operations has the authority and responsibility for:

- appointing or delegating the responsibility to appoint a Responsible Officer to any project when required by this procedure; and
- developing a process for formal appointment of Responsible Officers to projects; and
- appropriate resource allocation to enable compliance with this procedure

Manager Primary Systems and Manager Secondary Systems have the authority and responsibility for:

- approving any deviations from acceptable values for performance criteria specified in the relevant commissioning standard;
- approving any plan for work intended to enable equipment to meet specified performance criteria; and
- developing and maintaining testing and commissioning standards as required by this procedure.

Regional Managers have the authority and responsibility for:

- appointing a Responsible Officer to any project when required by this procedure; and
- developing a process for formal appointment of Responsible Officers to projects.

Manager System Control has the authority and responsibility for appointing a Commissioning Officer for each Network project.

Responsible Officer has the authority and responsibility for:

- confirming that all tests and checks have been performed and that specific clearances have been received from the persons carrying out these tests and checks;

- providing a written certification that equipment is available for service to the Senior System Operator or their delegated System Operator prior to the commencement of the commissioning process; and

- forwarding for review any deviations from minimum performance and safety criteria in accordance with this procedure.

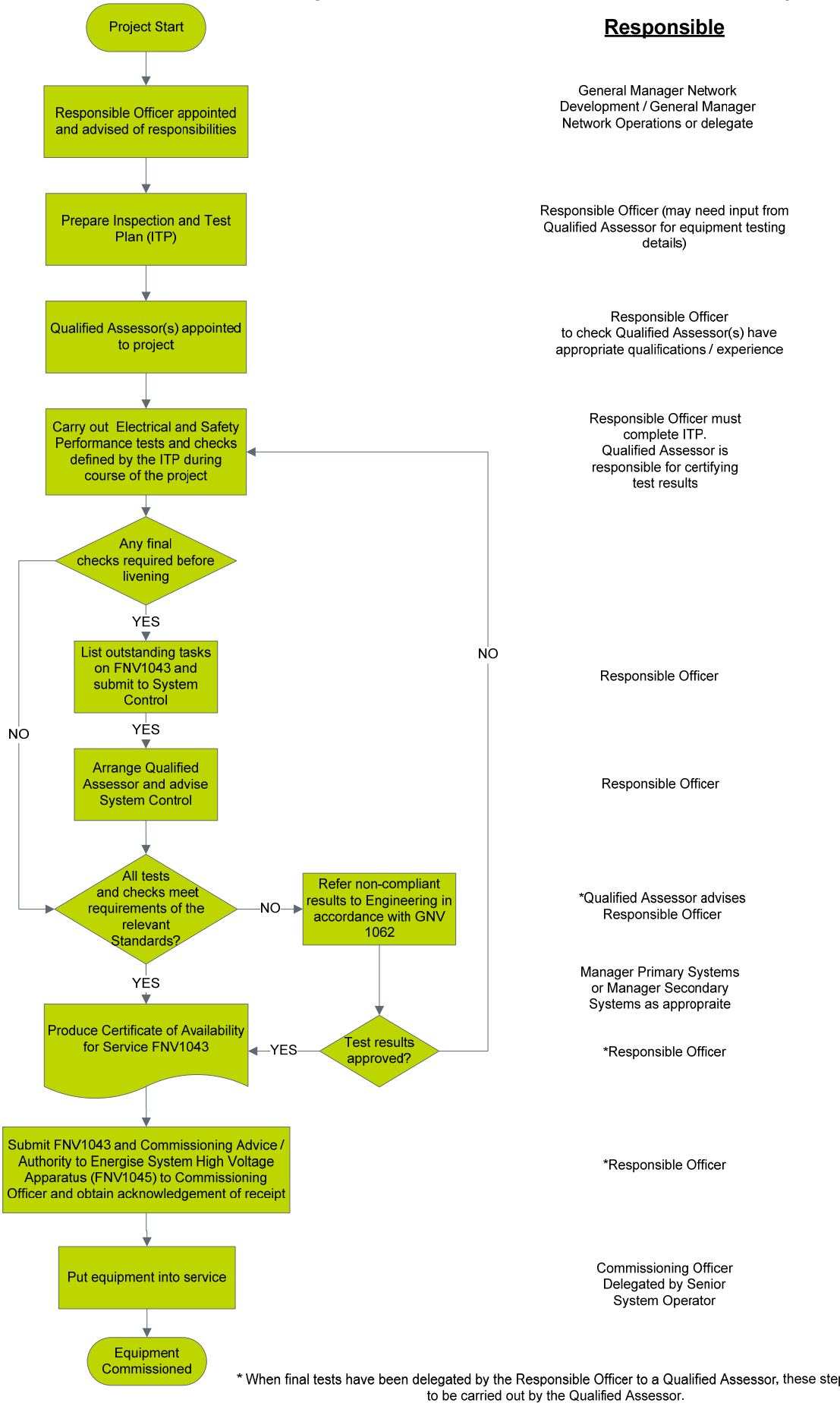
Qualified Assessors have the authority and responsibility for reviewing all performance and safety criteria tests and providing approval or otherwise to the Responsible Officer in accordance will relevant company procedures and standards appropriate to the equipment being tested.

8.0 DOCUMENT CONTROL

Content Coordinator **:** Manager Primary Systems

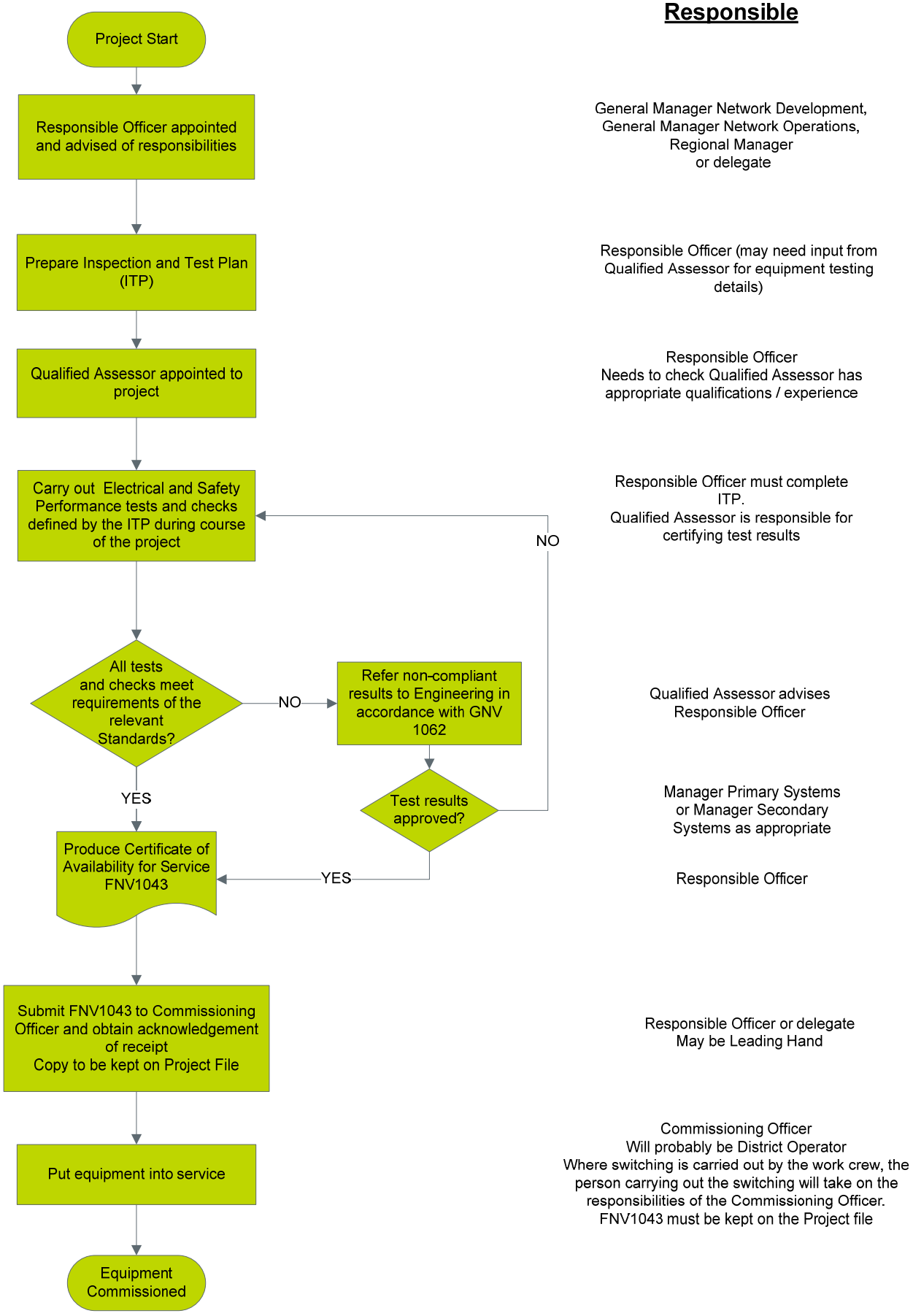
Distribution Coordinator **:** Division Process Coordinator Network

Annexure A – Commissioning Network Electrical Assets for Transmission Projects

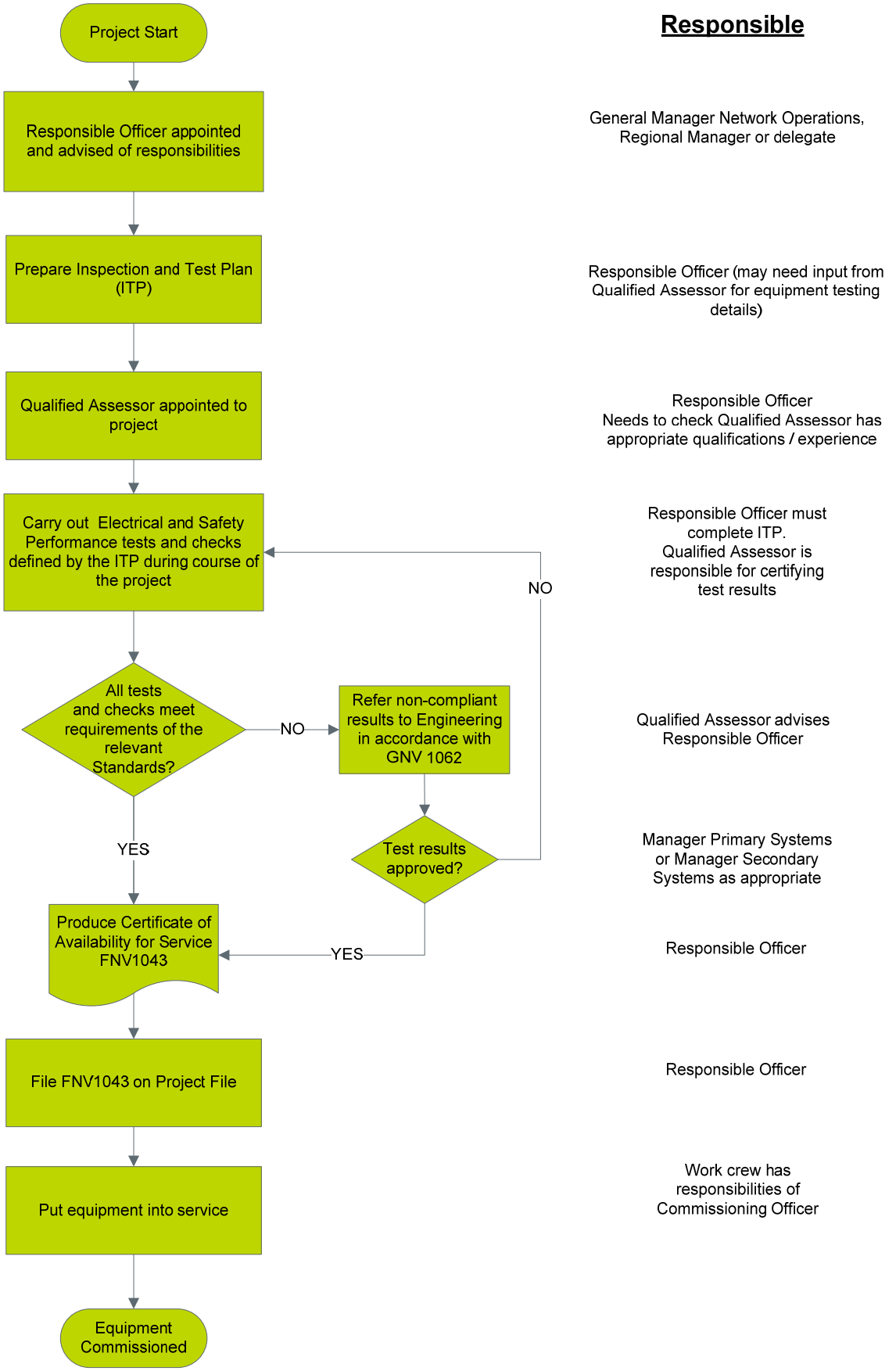


* When final tests have been delegated by the Responsible Officer to a Qualified Assessor, these steps are to be carried out by the Qualified Assessor.

Annexure B – Commissioning Network Electrical Assets for High Voltage Distribution Projects



Annexure C – Commissioning Network Electrical Assets for Low Voltage Projects



Annexure D – Commissioning Document Hierarchy (not exhaustive)

Company Policy
9.1.7
Commissioning Network Electrical Assets

Division Procedure
GNV 1044
Commissioning Network Electrical Assets

Asset class:	Key commissioning procedure(s)	Company standards	Test procedures	Key forms / verification documents;
Primary assets within zone and transmission substations and switching stations*	**WCB 0504** (B WPI Sys Ops) Commissioning network electrical assets for transmission project	**SDI 535** – Site Testing and Pre-Commissioning **MMI 0025** – Tests for Transmission / Sub-Transmission Underground Cables **ETS:** Relevant Equipment Technical Specification (ETS series) *All relevant SDI's*	**HVT** series (High Voltage Test) **GNV 1094** series – Testing of network equipment **GNV 1092** series – oil laboratory processes	**FNV 1043** – Certificate of Availability for Service for Network Electrical Assets **+** **FNV 1045 - C**ommissioning advice / Authority to Energise System + relevant test records
Primary assets in the distribution network	**WRG 0654** (B WPI Regional) Commissioning network distribution electrical assets	**SDI 120** – Testing and Commissioning for Distribution Systems **LDI 0003** – Commissioning of Public Lighting Assets		**FNV 1043** – Certificate of Availability for Service for Network Electrical Assets + relevant test records
		+		
Protection & control / Secondary Systems	**WPC 1300** (B WPI Engineering) Pre-Commissioning and Testing of Protection Schemes **WMT 1503** (B WPI Metering) High Voltage Metering Pre-Commissioning Tests	**PMI 4110** – Commissioning of Protection Schemes **PMI 4140** – Relay Test Standards	**WPC 1318** – Protection Relay Maintenance Tolerances *And other WPC's relevant to equipment type*	Transmission: FPC1019, 58 – 60, 78-82, 89; SPD Distribution, remaining FPC series FMT1263 - Metering

Managing exceptions / variations

Division Procedure
GNV 1062
Granting Dispensation from Network Standards

Data capture

Company Standards
SMI 119 SMI 113
Data Entry, Asset Structure and Details

** Note: Also includes first cable out of ZS*

DIVISION PROCEDURE

NETWORK	Document No: GNV 1051 Amendment No: 1 Approved By: CE Approval Date: 16/04/2014 Review Date: 16/04/2017

GNV 1051 WORKING ON STRUCTURES WITH COMMUNICATIONS TRANSMITTERS

1.0 PURPOSE

To document the process to be used by all authorised workers, when working on or near poles or other structures that have attached communications transmitter installations associated with mobile phone cells and microwave dishes.

2.0 SCOPE

This procedure covers communication transmitter installations within licensed space on the Company's columns, poles or other structures.

This procedure does not apply to the Company's communications transmitters attached to structures owned by the Company.

This procedure does not cover cables and other communications assets installed on Company poles.

3.0 REFERENCES

Board Policy (Health & Safety) 3.0 – Work Health and Safety
Company Policy (Network Asset Management) 9.1.10 – Network Electrical Safety
Company Policy (Network Asset Management) 9.6.9 – Facilities Access (Shared Infrastructure)
Company Procedure (Network Asset Management) GAM 0037 – Network Facilities Access Approval
Company Procedure (Health & Safety) GSY 0072 – Working at Heights
Company Procedure (Health & Safety) GSY 1066 – Worksite Hazard and Risk Assessment
Company Procedure (Network Asset Management) GAM 0089 – Authorisations Governance and Management
ESAA model Agreement between an Electricity Supply Distributor and a Communications Cable Owner
Company Safe Work Method Statement SWMS 11.001 – Accessing Communications Sites
HB87 – 1997 (CJC 1) Joint Use of Poles: The placement on poles of power lines and paired cable communication lines
Work Health and Safety Act 2011
Work Health and Safety Regulation 2011

4.0 DEFINITIONS

Accredited Service Provider (ASP)
Workers Authorised by the Company and employed by an organisation accredited by NSW Trade and Investment to carry out contestable works on electricity distribution networks

authorised worker
Any person, with technical knowledge or sufficient experience who has been approved and authorised in writing by the Company to perform the function requiring authorisation as described in Schedule 1 of Company procedure GAM 0089 – Authorisations Governance and Management. This definition holds for various forms of the word, for example, authorisation, authorise and authorised person.

ELCB
Earth Leakage Circuit Breaker

exclusion zone
Defines the minimum safe working distance from an energised radio frequency transmitter and applies to any portion of the body or a metallic object (refer to Section 5.2).

review date
The review date displayed in the header of the document is the future date for review of a document. The default period is three years from the date of approval however a review may be mandated at any time where a need is identified due to changes in legislation, organisational changes, restructures, occurrence of an incident or changes in technology or work practice.

RF
Radio frequency

Telecommunications carriers
Telecommunications carriers such as Optus, Telstra, Vodafone Hutchison Australia (VHA) and Vodafone own and operate mobile phone cells within licensed space on the Company's columns, poles and transmission towers.

5.0 ACTIONS

5.1 General

Note that communication transmitters associated with mobile phone cells and owned by telecommunications companies are installed on structures owned by the Company as well as on those owned by the Roads and Maritime Services (NSW) and local councils. They are also located on other structures such as buildings, shop awnings, traffic lights and signs, etc, and may impact the work area associated with the Company's assets.

Below: A typical Mobile Phone Cell Installation.

Streetlight Lantern

Nightwatch Lanterns

Mobile phone cell antenna.
Radio emissions from antenna.

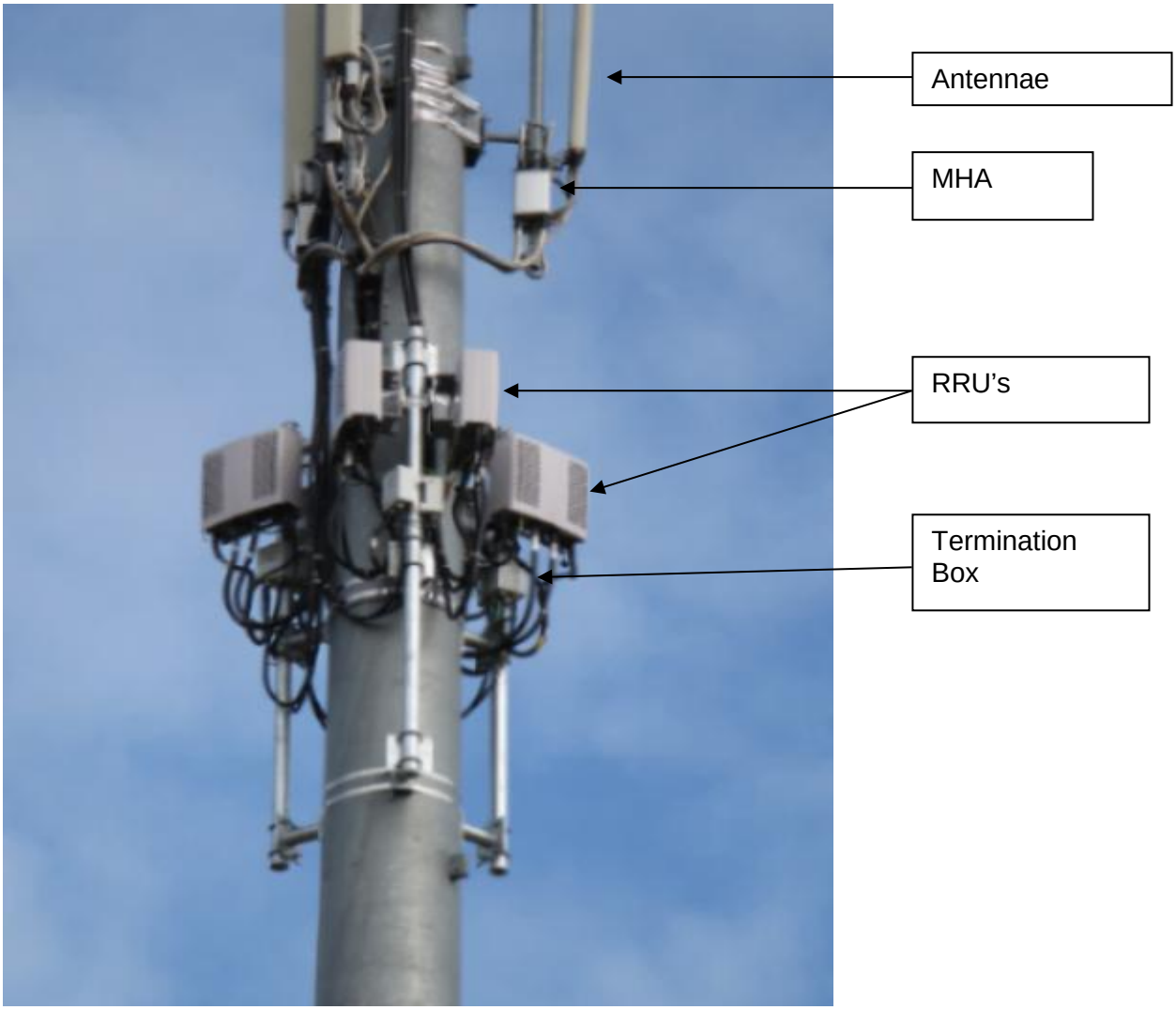
Mobile phone cell control unit.
Power supply equipment beside or under the control unit.

The Carriers site reference number and network operations contact phone number is on an adjacent sign.

Mobile phone cell cable connections:
- Power supply.
- Fibre Optic or other cable. (Inside or outside column).

Microwave Dish (not shown) for external connection.
Refer Panel and Microwave Parabolic Dish types.

Below: Typical mobile phone cell ancillary items. These items do not emit radio signals and therefore do not have an exclusion zone. These items include amplifier type equipment and termination boxes.



Remote radio units (RRU): six RRU's and small termination boxes installed below the Antennae panels. Note that RRU's usually have fibre optic cable connections between the RRU and the ground mounted telecommunications control unit.

Amplifiers: Mast Head Amplifiers (MHA) or Tower Mounted Amplifiers (TMA) are also used.

Below: Typical safety signs placed on structures with communications transmitters attached.

5.2 Identification of antenna types and exclusion zones

All sites have signs installed (a) below the antennae, warning of the possible danger of radio emissions and (b) advising the carriers site reference number and network operations contact phone number.

All antennae, not owned by the Company, located on the Company network structures, under current Facilities Access Agreements are listed on:

- Intranet: Network and Assets/Communications Transmitters/List of sites.
- Internet: ASP Website Endeavour Energy – ASP under Notices – Working on Structures with Communications Transmitter Installations – Procedure and List of sites.

The following sections detail each of the different types of telecommunication devises that may be installed on Company assets, and the appropriate exclusion zone for this type of device.

5.2.1 Whip type

These are similar to a car mobile phone aerial. They are vertical (up or down), one or two per site and may be at the same or slightly different heights and on opposite sides of the structure. They send and receive in all directions.

Left: Whip Type Antenna – Single

Exclusion zone: 0.5m in any direction from the “whip”.

5.2.2 Omni type

Omni are of tubular appearance. They are vertical (up and/or down), one or two per site and may be at the same or slightly different heights and on opposite sides of the structure. They may be expanded to 2 up and 2 down. They send and receive in all directions.

Left: Omni Type Antenna – 2 Up

Exclusion zone: 0.5m in any direction.

Left: Omni Type Antenna – Up and Down

Exclusion zone: 0.5m in any direction.

5.2.3 Panel type antennas and microwave dishes

Panel antennas are mounted vertically with between one and four per site. They may be pointed in one, two or three directions. They send and receive over a wide area in the direction they face, ie, away from the support structure.

Microwave dishes may be round or square. They send and receive a narrow line of sight microwave beam.

Typical installations are shown below, on the next two pages.

Left: Panel Type Antenna

Set of 4 panels below the street light lantern.

Exclusion zone: 1.2m in front or to side and 1m above or below.

Left: Panel Type Antenna

Set of 3 panels above the street light lanterns.

Exclusion zone: The area up to 10m in front, 3m to the side and 1.5m above and below the face of each antenna.

Left: Panel and Microwave Parabolic Dish Type

One microwave dish below the street light lantern, and one panel below the street light lantern.

Exclusion zones: Microwave dish: A cylinder twice the diameter of the dish, which is typically 300mm or 600mm and 1m in front of the dish. Panel: The area up to 10m in front, 3m to the side and 1.5m above and below the face of each antenna.

Microwave dishes send and receive a narrow line of sight microwave beam.

Note: Only VHA and Optus have microwave dishes on Company poles.

Below: Panel Type Antenna Mounted on HV Transmission Tower
(Example VHA Site 253003 and Telstra Site KAKC Kanahooka) Set of 9 panels above the tower.

Exclusion zones:

On some HV Transmission Towers the exclusion zone includes the area around the earth wire attachment points. Care must be exercised when working above the horizontal plane between the two top 132kV conductor insulator attachment points

Microwave dish: A cylinder the diameter of the dish, (typically up to 600mm) and 1m in front of the dish.

Transmission Tower Panel: The area up to 13m in front, 3m to the side and 1.5m above and below the face of each antenna.

Note: The number of panels varies. Some installations include one or more microwave dish. Some installations include antennae owned by more than one carrier.

5.3 Isolation procedures for control unit – Microcell installations

Microcells usually have a control unit box mounted on the pole, rather than the ground nearby. Isolation switches are accessible, keys are not required.

Details of the methods of isolation of microcell control unit for mobile phone cells mounted on Company structures are as follows:

5.3.1 Type VA Vodafone (Ericsson)

5.3.1.1 *Emergency:*

Notify Vodafone as soon as possible of the action taken or to be taken.

5.3.1.2 Routine:

As part of the job hazard and risk assessment consider whether or not personnel or metallic implements may come within the exclusion zone of a communications transmitter.

The following routine will be followed where personnel or metallic implements could come within the exclusion zone of a communications transmitter:

- Notify Vodafone as soon as possible before switching the cell off. Quote the carriers site reference number and the location/address.
- Read and follow all instructions displayed at the site, in addition to the following.
- Turn the “RF Antenna Isolate Switch” to the OPEN position.
- For safety turn the power supply off (circuit breaker beside the Communications box).
- Carry out the work.
- Turn the power supply circuit breaker on.
- Turn the “RF Antenna Isolate Switch” to the ON position.
- Notify Vodafone by phone as soon as possible after completing the work.

If in doubt phone Vodafone for advice or assistance or ask your supervisor.

Note: Do not rely on the Radio Frequency (RF) output to be isolated by opening the Earth Leakage

Circuit Breaker (ELCB), (this does not isolate the battery back up for approximately 5 to 20 minutes).
There is NO fibre optic cable on the Company pole associated with this cell.

Vodafone Control Centre 24 hour 7 day Contact 1800 683 683.

5.3.2 Type TA – Telstra (Microlite made by Telstra)

5.3.2.1 *Emergency:*

Notify Telstra as soon as possible of the action taken or to be taken.

5.3.2.2 Routine:

As part of the Worksite Hazard Risk Assessment consider whether or not personnel or metallic implements may come within the exclusion zone of a communications transmitter.

The following routine will be followed where personnel or metallic implements could come within the exclusion zone of a communications transmitter:

- Notify Telstra as soon as possible before switching the cell off. Quote the carriers site reference number and the location/address. Two hours notice preferred.
- Read and follow all instructions displayed at the site, in addition to the following.
- Telstra will isolate the antenna remotely. There is no battery.
- For safety turn the power supply off (switch below the main Communications box).
- Carry out the work.
- Turn the power supply switch on.

- Notify Telstra by phone as soon as possible after completing the work.

If in doubt phone Telstra for advice or assistance or ask your supervisor.

Note: Do not rely on the RF output to be isolated by opening the ELCB.

CAUTION**:** Fibre optic cable IS on the Company pole associated with this cell.

Telstra Control Centre 24 hour 7 day Contact 1300 652 235.

5.3.3 Type TB – Telstra (Microcell Ericsson)

5.3.3.1 *Emergency:*

Notify Telstra as soon as possible of the action taken or to be taken.

5.3.3.2 Routine:

As part of the Worksite Hazard Risk Assessment consider whether or not personnel or metallic implements may come within the exclusion zone of a communications transmitter.

The following routine will be followed where personnel or metallic implements could come within the exclusion zone of a communications transmitter:

- Notify Telstra as soon as possible before switching the cell off. Quote the carriers site reference number and the location/address. Two hours notice is preferred.
- Read and follow all instructions displayed at the site, in addition to the following.
- Telstra will isolate the antenna remotely.

- For safety turn the power supply off (circuit breaker beside the Communications box).
- Carry out the work.
- Turn the power supply circuit breaker on.
- Notify Telstra by phone as soon as possible after completing the work.

If in doubt phone Telstra for advice or assistance or ask your supervisor.

Note: Do not rely on the RF output to be isolated by opening the ELCB, (this does not isolate the battery back up for approximately 5 to 30 minutes).

There is NO fibre optic cable on the Company pole associated with this cell.

Telstra Control Centre 24 hour 7 day Contact 1300 652 235.

5.3.4 Type TC - Telstra (Microcell Ericsson)

Note the steel brackets top and bottom.

5.3.4.1 *Emergency:*

Notify Telstra as soon as possible of the action taken or to be taken.

5.3.4.2 Routine:

As part of the Worksite Hazard Risk Assessment consider whether or not personnel or metallic implements may come within the exclusion zone of a communications transmitter.

The following routine will be followed where personnel or metallic implements could come within the exclusion zone of a communications transmitter:

- Notify Telstra as soon as possible before switching the cell off. Quote the carriers site reference number and the location/address. Two hours notice is preferred.
- Read and follow all instructions displayed at the site, in addition to the following.

- Telstra will isolate the antenna remotely.
- Turn the RF isolation switch (under the main Communications box) to the ISOLATE position.
- For safety, turn the power supply off (circuit breaker beside the main Communications box).
- Carry out the work.
- Turn the RF isolation switch to the OFF position and power supply circuit breaker on.
- Notify Telstra by phone as soon as possible after completing the work.

If in doubt phone Telstra for advice or assistance or ask your supervisor.

Note: Do not rely on the RF output to be isolated by opening the ELCB, (this does not isolate the battery back up for approximately 5 to 30 minutes).

The Green LED located near the switch under the main Communications box indicates that cell is not operating when illuminated. The cell is operating when the LED is NOT illuminated.

CAUTION: Fibre optic cable IS on the Company pole associated with this cell.

Telstra Control Centre 24 hour 7 day Contact 1300 652 235.

5.3.5 Type OA – Optus (Nokia)

5.3.5.1 *Emergency:*

Notify Optus as soon as possible of the action taken or to be taken.

5.3.5.2 Routine:

As part of the Worksite Hazard Risk Assessment consider whether or not personnel or metallic implements may come within the exclusion zone of a communications transmitter.

The following routine will be followed where personnel or metallic implements could come within the exclusion zone of a communications transmitter:

- Notify Optus as soon as possible before switching the cell off. Quote the carriers site reference number and the location/address.
- Read and follow all instructions displayed at the site, in addition to the following.
- Optus will isolate the antenna remotely. There is no battery.
- For safety turn the power supply off (circuit breaker beside the Communications box).
- Carry out the work.
- Turn the power supply circuit breaker on.
- Notify Optus by phone as soon as possible after completing the work.

If in doubt phone Optus for advice or assistance or ask your supervisor.

Note: Do not rely on the RF output to be isolated by opening the circuit breaker.

Optus prefers not to install an antenna isolator switch (signal losses and security).

There is NO fibre optic cable on the Company pole associated with this cell.

Optus Control Centre 24 hour 7 day Contact 1800 505 777 or 9775 8441.

5.4 Isolation procedures for control unit – Macrocell or Base Station installations

The antenna and, if installed, the microwave dish, are most likely powered from a ground mounted communications control unit usually located near the structure (column, pole or tower). At a few sites this is some distance away, eg, VHA site 250012 Wollongong, where the antennae is in Mailer Ave and the control unit is 80m away in Strathearn Ave.

The carriers site reference number and network operations contact phone number are printed on signs located on the control unit.

5.4.1 Base Station – Type OB Optus

Most Optus OB Base Stations are Company NA2 key accessible.

5.4.1.1 *Emergency:*

Notify Optus as soon as possible of the action taken or to be taken.

5.4.1.2 Routine:

As part of the Worksite Hazard Risk Assessment consider whether or not personnel or metallic implements may come within the exclusion zone of a communications transmitter.

The following routine will be followed where personnel or metallic implements could come within the exclusion zone of a communications transmitter:

- Notify the carrier as soon as possible before commencing work, two hours notice is preferred. Quote the carriers site reference number and the location/address.

- On arrival at site, contact the Optus Network Management Centre and confirm antennas require to be powered down as previously arranged. Optus will make an appointment within two hours of the notice. Or else advise the site will be shut down due to emergency electrical authority work.

Note: Read and follow all instructions displayed at the site, in addition to the following:

> If Optus can not be contacted, or there is an emergency, carry out the isolation as follows, but without Optus involvement.

- Use an NA2 key on the compound gate and the Telecommunications Equipment Isolation box.

- The Carrier will isolate the antenna remotely.
- Turn all circuit breakers OFF.
- Remove all links.
- Carry out the work.
- Replace all links.
- Turn all circuit breakers ON.
- Close and lock the Telecommunications Equipment Isolation box and the compound gate.
- Notify the Carrier as soon as possible after completing the work.

If in doubt phone Optus for advice or assistance or ask your supervisor.

There is NO fibre optic cable on the Company structure associated with these sites.

Optus Control Centre 24 hour 7 day Contact 1800 505 777 or 9775 8441**.** Minimum 2 hours notice.

5.4.2 Base Station Type HA – VHA

VHA Base Stations (formerly Hutchison Orange) are Company NA2 key accessible.

5.4.2.1 *Emergency:*

Notify VHA as soon as possible of the action taken or to be taken.

5.4.2.2 Routine:

As part of the Worksite Hazard Risk Assessment consider whether or not personnel or metallic implements may come within the exclusion zone of a communications transmitter.

The following routine will be followed where personnel or metallic implements could come within the exclusion zone of a communications transmitter:

- Notify VHA by phone as soon as possible before switching the cell off. Quote the carriers site reference number and the location/address.

- On arrival at site, contact VHA Network Management Centre and confirm antennas require to be powered down as previously arranged. VHA will make an appointment within two hours of the notice. Or else advise the site will be shut down due to emergency electrical authority work.

Note: Read and follow all instructions displayed at the site, in addition to the following:

If VHA can not be contacted, or there is an emergency, carry out the isolation as follows, but without VHA involvement.

- Use an NA2 key to enter the compound and open the Emergency Antenna Isolation box.
- VHA will isolate the antenna remotely, but not the microwave dish emission.
- Turn all isolation circuit breakers OFF. All voltmeters should change from 240v or 48v to zero.
- This will isolate the antenna and microwave dish emissions.
- Carry out the work.
- Turn all isolation circuit breakers ON. All voltmeters should change from Nil to 240v or 48v.
- Close and lock the Emergency Antenna Isolation box and the compound.
- Notify VHA by phone as soon as possible after completing the work.

If in doubt phone VHA for advice or assistance or ask your supervisor.

Note: Air cooling equipment and the approximately 30 minute backup battery are also isolated at step 4 above.

There is NO fibre optic cable on the company column/pole associated with this cell.

VHA Network Management Centre 24 hour 7 day Contact 1800 555 544.

5.4.3 Base Station Outdoor Unit Type 3O (VHA) and TO (Telstra)

VHA and Telstra Base Stations are Company NA2 key accessible.

5.4.3.1 *Emergency:*

Notify VHA/Telstra as soon as possible of the action taken or to be taken.

5.4.3.2 Routine:

As part of the Worksite Hazard Risk Assessment consider whether or not personnel or metallic implements may come within the exclusion zone of a communications transmitter.

The following routine will be followed where personnel or metallic implements could come within the exclusion zone of a communications transmitter:

Step 1: Notify VHA/Telstra by phone as soon as possible before switching the cell off. Quote the Carriers site reference number and the location/address.

Step 2: On arrival at site, contact VHA/Telstra Network Management Centre and confirm antennas require to be powered down as previously arranged. VHA/Telstra will make an appointment within two hours of the notice. Or else advise the site will be shut down due to emergency electrical authority work.

Note: Read and follow all instructions displayed at the site, in addition to the following:

> If VHA/Telstra cannot be contacted, or there is an emergency, carry out the isolation as follows, but without VHA/Telstra involvement.

Step 3: Use an NA2 key to open the Telecommunications Equipment Isolation box.

Note the LED lights on the isolation switches. At least one LED light should be lit when AC isolation switch is energised. At least one LED light should be lit when DC isolation switch is energised. Should either AC or DC LED lights not be extinguished, please contact VHA/Telstra Network Management Centre before commencing work.

Step 4: Ask the VHA/Telstra Network Management Centre to power down the site while you watch the LED lights.

Note that the LED lights on the AC isolation and DC isolation switch will be extinguished.

Step 5: Switch the DC isolation switch to the *isolated* (off) position.

Warning – Internal cooling fan may activate in the event of any excessive heat build up in the hut during the AC/DC isolation period.

Step 6: Switch the AC isolation switch to the isolated (off) position.

Step 7: Carry out necessary site work.

Step 8: Contact VHA/Telstra Network Management Centre and advise that you have completed the work and will close the isolation switches.

Step 9: To power up site, switch the DC isolator switch to the energised (on) position.

Step 10: Switch the AC isolation switch to the energised (on) position.

Step 11: If time permits and VHA/Telstra intend to power up the site immediately, wait to assist VHA/Telstra with verification that the site is powered up.

Note that if VHA/Telstra power up the site the LED lights on the AC isolation switch and DC isolation switch will be lit.

Step 12: Close and lock Telecommunications Equipment Isolation box.

Note: Air cooling equipment and the approximately 30 minute battery backup battery are also isolated at step 6 above.

There is NO fibre optic cable on the company structure associated with this cell.

VHA Network Management Centre 24 hour 7 day Contact 1800 555 544.

Telstra Control Centre 24 hour 7 day Contact 1300 652 235.

6.0 AUTHORITIES AND RESPONSIBILITIES

Chief Engineer has the authority and responsibility for:

- approving this procedure; and
- appropriate resource allocation for this process;

General Manager Network Development, Regional Managers and Manager Network Connections have the authority and responsibility for:

- informing employees of the requirements for safe access to this equipment as outlined in this procedure, and
- monitoring compliance with this procedure.

Network Facilities Access Manager has authority and responsibility for updating the advice contained within this procedure as technology changes.

Authorised Workers have the authority and responsibility for:

- understanding and complying with the requirements of this procedure; and
- the requirements of telecommunications companies.

7.0 DOCUMENT CONTROL

Content Coordinator: Facilities Access And Commercial Analyst

Distribution Coordinator: Business Process Coordinator

DIVISION PROCEDURE

NETWORK	Document No: GNV 1058 Amendment No: 0 Approved By: DCEON Approval Date: 15 September 2011 Review Date: 15 September 2014

(Supersedes Company Procedure (Health & Safety) GSY 1076am2)

GNV 1058 FALLEN CONDUCTORS

1.0 PURPOSE

To ensure the Company provides information for employees who encounter fallen conductors.

2.0 SCOPE

This document covers the procedure to be adopted when encountering fallen conductors. It applies to employees, contractors, accredited service providers and emergency service employees if they are utilised in fallen conductor situations.

3.0 REFERENCES

Board Policy 3.0 – Occupational Health & Safety
Company Procedure (Health & Safety) GSY 1031 – Electrical Safety Rules
Division Procedure (Asset Management) GNV 1009 – Use of Spotters During Major Network Incidents
Division Workplace Instruction (System Operations) WNV 1043 – Use of Live Line Cutters by Authorised Switching Employees
Company Form (Health & Safety) FSY0051 – Access Authority for Work
Company Network Management Plan
ESAA Electrical Safety Handbook for Emergency Service
Occupational Health and Safety Act 2000
Occupational Health and Safety Regulations 2001

4.0 DEFINITIONS

Access Authority
Company Form FSY0051 – Access Authority for Work.

Electrical Safety Rules
Company Procedure GSY 1031 – Electrical Safety Rules.

General Managers
Includes Chief Engineer.

HV
High Voltage

LV
Low Voltage

mains down
This is a reference to fallen conductors.

make safe
To isolate and danger tag (where possible), earth and short circuit HV (if possible), or take other steps to ensure employees or property are not placed at risk of exposure to live electrical apparatus.

Outage Management System (OMS)
This is the internal system used to monitor and manage network outages.

responsible employee
An employee considered able to safely guard the conductors. The name of this employee must be recorded by the Network Controller.

review date
The review date displayed in the header of the document is the default date for review of a document. A document review may be required at any time where a need is identified due to changes in legislation, organisational changes, restructures, occurrence of an incident, or changes in technology or work practices.

5.0 ACTIONS

This procedure provides information for employees to maintain their own safety as well as that of others when encountering fallen conductors.

5.1 General

When the Company receives a report of mains down, employees are to attend as soon as possible to investigate and make safe the hazard.

All fallen conductors must be treated as live and appropriate precautions shall be taken when approaching these conductors.

5.2 Contractors, accredited service providers and unauthorised employees

If unqualified or unauthorised employees encounter a fallen conductor/s they must stand by that conductor/s but remain eight (8) metres away. A call must be placed to the Call Centre and a job created in the OMS. At no time shall employees approach the conductor/s and they should do whatever is possible to keep other employees in the vicinity of the conductor/s as far away as possible.

5.3 Company trained Spotters

Spotters, if utilised, shall work in accordance with Division Procedure GNV 1009 – Use of Spotters During Major Network Incidents and apply the level of training and authorisation they have received under the Company spotter training courses and associated documentation.

5.4 Authorised employees

5.4.1 Safe approach distance

The safe approach distance to fallen overhead conductors is eight (8) metres. This safe approach distance from live fallen conductors ensures the step potential, (across the body from foot to foot), will not be greater than 32 volts. Taking into account the effect of concrete footpaths and variations

in ground conditions, the safe approach distances have been worked out using typical soil resistivity readings taken across the Company's geographical area.

5.4.2 Fallen High Voltage (HV) conductors

In the case of HV, authorised switching employees must isolate, prove de-energised, earth and short circuit the conductors, then issue an Access Authority before any attempt is made to handle them.

Note: In cases of extreme emergency, involving danger to life or property, it will not be necessary to issue an Access Authority, providing the conductors are first isolated, proved de-energised, earthed and short circuited in accordance with the Electrical Safety Rules.

5.4.2.1 Arrival at the fault site

If the conductors are down at a location where it is considered they could be a risk to the general public, a responsible employee must guard the conductors to ensure there is minimum risk to the public.

Preferably that employee should be electrically trained and with an awareness of the dangers involved and precautions being taken. This employee's responsibilities (including the approximate time they will be required to stand by) must be explained by the authorised switching employee on site and his/her name recorded by the network controller. The authorised switching employee should only leave his/hers assistant as a standby employee as a last alternative or if he/she is not required to assist with the operating work.

The authorised switching employee should then proceed to identify the relevant isolation points and after receiving direction from the network controller, isolate the conductors. Consideration must be given to the HV, Low Voltage (LV), street light circuits and the type of isolating devices available, depending on whether the authorised switching employee has a suitably qualified assistant in attendance.

5.4.2.2 On completion of the isolation

The authorised switching employee on site must confirm with the System Operator that all switching has been carried out and advise the network controller the extent of the fault. The System Operator will then discuss the manner in which the site is to be made safe before re-energisation occurs.

One of the following procedures shall be adopted:

- prove de-energised, earth, short circuit and issue an Access Authority to cut away the conductors so they are out of the reach of the public. The network controller must be consulted as to whether the conductors are to be cut away or left connected, but secured in such a location as to avoid a physical hazard, until repaired by regional employees;

- use live line cutters (refer to Branch Workplace Instruction WNV 1043 – Use of Live Line Cutters by Authorised Switching Employees), cut away the conductors so they are secure and out of reach of the public. The System Operator must be consulted as to whether the conductors are to be cut away prior to carrying out this action;

- prove de-energised, earth and short circuit the fallen conductors at the nearest safe location, using a minimum of one set of earths. Employees adopting this method must take appropriate steps to avoid step potential situations;

- at the discretion of the authorised switching employee on site, if the conductors can be guarded safely by a responsible employee, have that employee stand by the conductors; or

- carry out a full isolation and full earthing.

Note: On completion of point five (5) above the authorised switching employee must prove the isolation points by proving the conductors de-energised at the earthing points before issuing an Access Authority.

In the case of radial lines, where the System Operator confirms that there is no possibility of re-energising the line, the conductors may be proved de-energised at the point of isolation, earthed and short circuited, the fallen conductors may be regarded as “safe” for the purpose of continuing line patrolling for further fallen conductors on the same radial feeder from the point of isolation and earthing. The fallen conductors may now be regarded as “safe” for the purpose of “standing by”, however, this does not allow any approach within the safe approach distances of any fallen conductors.

Further locations found with fallen conductors on the same radial feeder need not be isolated, earthed and short circuited, but the System Operator must be notified of any additional fallen conductors as they are found. Prior to any approach within the safe approach distance to any conductor the conductor must be earthed and short circuited in accordance with the Electrical Safety Rules and an Access Authority issued.

As the network is repaired these fallen conductors must be isolated, earthed and short circuited ahead of the restoration work.

At the fault site the appropriate actions must be carried out to allow the repair of the conductors at the fault site, eg, prove de-energised, earth, short circuit and issue Access Authority for work.

5.5 Fallen LV conductors

In the case of LV, authorised employee must identify conductors as LV, isolate and prove de-energised the conductors or adopt live line working methods before attempting to handle them. (Refer also to Company Procedure GSY 1031 – Electrical Safety Rules for the handling of fallen LV conductors).

Caution: There may be HV conductors down as well, and these may be tangled in the LV conductors. Before attempting to work on any fallen conductors, it is essential to establish that either no HV conductors are involved or any fallen HV conductors have been isolated and proved de-energised (before earthing).

6.0 AUTHORITIES AND RESPONSIBILITIES

Deputy CEO Network has the authority and responsibility for approving this procedure.

General Managers and **Regional Managers** have the authority and responsibility for:

- appropriate resource allocation for this process; and
- monitoring compliance with this procedure.

Manager System Operations has the authority and responsibility for the provision of response to reports of fallen conductors.

Authorised Switching Employees have the authority and responsibility for complying with the actions in this procedure.

Other Employees, contractors and **accredited service providers** have the authority and responsibility for applying the actions in this procedure to the extent of their training.

7.0 DOCUMENT CONTROL

Content Coordinator: Chief Engineer

Distribution Coordinator: Division Process Coordinator, Network

Division Procedure

NETWORK	Document No	:	GNV 1068
	Amendment No	:	1
	Approved By	:	GMNO
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	Review Date	:	23/02/2019

GNV 1068 APPLICATION OF YELLOW TAPED AREAS IN ZONE AND TRANSMISSION SUBSTATIONS

1.0 PURPOSE

To provide instruction to Authorised Switching Officers on the application of yellow tape barriers, signage, documentation and location, for network equipment controlled under Access Authority (AA) conditions for Work or Test.

2.0 SCOPE

This document provides instruction for where yellow tape barriers are used to define a controlled area in conjunction with an AA for Work or Test, within outdoor High Voltage (HV) switchyards, indoor HV switch rooms and miscellaneous situations both in Zone and Transmission Substations.

3.0 REFERENCES

Internal
Company Procedure (Network) GAM 0089 – Authorisations Governance and Management
Company Procedure (Health & Safety) GSY 1031 – Electrical Safety Rules
Company Form (Health & Safety) FSY 0050 – Access Authority for Test
Company Form (Health & Safety) FSY 0051 – Access Authority for Work

External
Work Health and Safety Act 2011 (NSW)
Work Health and Regulation 2011 (NSW)
Distances to Electrical and Mechanical Apparatus
Energy Networks Association – ENA NENS 001–2008 – National Electricity Network Safety Code
Energy Networks Association – ENA NENS 03–2006 – National Guidelines for Safe Access to Electrical and Mechanical Apparatus
Energy Networks Association – ENA NENS 04–2006 – National Guidelines for Safe Approach
Handbook HB 5031–2011 Records classification
Industry Safety Steering Committee – ISSC 35 – Guideline to Safe Work Area Taping in Outdoor Switchyards

4.0 DEFINITIONS

Access Authority (AA) for Work or Test
Is a pre-printed form which, when issued in accordance with company procedure, gives permission to the AA holder and work party to access, work on or near, or testing of electrical HV apparatus.

Apparatus
An item or combination of items of plant or equipment.

Authorised person
A person with technical knowledge or sufficient experience who has been approved and authorised in writing by the Company to perform the function requiring authorisation as described in Schedule 1 of Company Policy 9.1.3 – Authorisations. Note: This definition holds for various forms of the word (eg authorisation and authorise).

Authorised switching officer
An employee of the company, authorised in writing for operation of the HV network within the limitations specified on their authority card.

Document control
Employees who work with printed copies of documents must check the Business Management System regularly to monitor version control. Documents are considered “UNCONTROLLED IF PRINTED”, as indicated in the footer.

Executive Leadership Team
Deputy Chief Executive Officer, Chief Engineer, General Manager Network Development, General Manager Network Operations, Chief Financial Officer, Company Secretary, General Manager Safety, Human Resources & Environment, General Manager Customer & Corporate Services and General Manager Strategy & Transformation.

Employee
Includes all employees who are paid a wage or salary by the company (whether under contract of employment or apprenticeship), an agency temporary employee or consultant and includes a contractor and a person employed by a contractor, who carries out work for the company.

High Voltage (HV)
A voltage nominally exceeding 1,000 volts Alternating Current (AC) or 1,500 volts Direct Current (DC).

Live
Connected to a source of electrical supply or capable of becoming live, or subject to hazardous induced or capacitive voltages.

Substation
Any location where electrical energy is transformed or switched at or above distribution level voltages (240V or above) but not field located pole mounted switches, such as, Air Break Switches (ABS), Underslung Links (USL) or Drop Out Fuses (DOF).

Switches
Includes ABS and Load Break Switches (LBS), USL, DOF, Field Reclosers (AR) supplying radial feeders and any associated Low Voltage (LV) isolating facilities (such as, LV transformer links, LV transformer fuses and LV paralleling points).

Switching folder
A printed envelope which documents all Access Authorities for Work or Test and Operating Agreements issued and cancelled and associated conditions for the AA work site, including the connection and removal of earthing apparatus. AA, Worksite Hazard & Risk Assessments and all switching instructions must be stored in the switching folder.

Switching station/switch yard
Any premises or structure containing or carrying electrical apparatus, but does not include any structure carrying only one switch and/or fuse unit (such as an ABS).

Recordkeeping
Making and maintaining complete, accurate and reliable evidence of business transactions in the form of recorded information. (Source: Handbook HB 5031–2011 Records classification)

Review date
The review date displayed in the header of the document is the future date for review of a document. The default period is three years from the date of approval. However a review may be mandated at any time where a need is identified due to changes in legislation, organisational changes, restructures, occurrence of an incident or changes in technology or work practice.

Work area/site
A location at which work is to be performed. Under AA conditions the AA defines the work site. Where live line work is within a work site, it takes precedent over all other work.

5.0 ACTIONS

5.1 General procedures

Yellow tape barriers are to be used to define a controlled area for work in association with the issue of an AA for Work or Test. Yellow tape barriers are used to indicate the dividing line between live electrical apparatus and the apparatus on which it is safe to perform work under an Access Authority for Work or Test.

Only an Authorised Switching Officer will erect, remove or alter the position of yellow tape barriers.

Persons working or testing in a yellow tape area must not pass over, under or interfere with such tape however the Access Authority Holder may temporarily disturb the yellow tape barrier to permit the passage of plant or materials. Precautions must be taken so that risks are controlled to prevent harm to employees and or damage to plant or material. Such tape must be replaced in its original position as soon as the necessary passage of plant or materials has been completed. Extreme care must be taken so that safe approach distances are maintained at all times during the period that the yellow tape has been disturbed.

When applied for the purpose of HV testing, the yellow taped barrier must be supplemented by the signage indicating “HIGH VOLTAGE TEST IN PROGRESS”. This sign must be placed at the entrance to the work area. While testing is underway the entrance must be closed with yellow tape by the Access Authority Holder.

Structures that support live HV equipment must not be used to support the yellow tape barrier unless inside the Switch Room.

There are many different substation layouts constructed on the network and to produce a guide for each possible scenario for work in these would not be practical. However, before erecting a yellow tape barrier, the Authorised Switching Officer must give consideration to the extent of the area governed by the AA, for example, where it is proposed to form the opening in the yellow tape barrier, what equipment will remain alive adjacent to the work area and if any special equipment or plant will have to enter during the course of the work.

In rare situations the nature of the substation configuration and switchgear arrangements make it extremely difficult to accurately tape the AA area in strict accordance with the Electrical Safety Rules principles for taping (eg GIS switchgear is one prime example).

Wherever possible these instances are to be alerted by the Requestor during their job planning, and they are to include a diagram with their Request paperwork illustrating their preferred taping

arrangements. Where a diagram is not provided, or the suggested diagram is not practical to implement, the AA issuer and the AA recipient are to agree on site to the most practical method of taping for that situation. Once agreement has been reached the AA special conditions are to be notated with the following comment: “Site constraints inhibit yellow tape, limitations discussed and agreed between issuer and recipient”.

Yellow tape barrier “in”

A yellow tape barrier is erected around the equipment under AA conditions. The area within the yellow tape barrier is the defined area for work, as shown in Figure 1 – Barrier “in” method for the erection of a barrier in a substation.

In open HV switchyards the yellow tape barrier “in” method is commonly used as it is the most practical method of identifying the equipment to be worked on and establishing a defined area for work.

When using the barrier “in” method, an opening must form the entrance to the work area in the yellow tape barrier. This opening can be identified by a two metre by two metre entry, formed by four high visibility bollards. This opening must be clearly marked with the notice “CAUTION – Entry to Access Authority Area”. If the opening encroaches on other equipment or there is insufficient room available, the entrance can be reduced but will be as large as practical up to the standard opening size. With indoor equipment two entry bollards can be used.

Figure 1 – Barrier “in” method for the erection of a barrier in a substation

Yellow tape barrier “out”

A yellow tape barrier is erected between the equipment under AA and all other live equipment within the substation. The equipment outside the yellow taped barrier is the defined area for work, as shown in Figure 2 – Barrier “out” method for the erection of a barrier on totally enclosed switchgear. This method is primarily used when the barrier “in” method is not practical.

The switching folder is to be attached by an Authorised Switching Officer at the location specified by the person requesting the electrical isolation, where the AA can be found.

Figure 2 – Barrier "out" method for the erection of a barrier on totally enclosed switchgear

5.2 Indoor HV switch rooms

When work is to be carried out on indoor metal clad switchgear which involves access to cable ends, busbar or current transformer chambers by the removal of bolted covers or doors, and the work party requires that yellow tape barriers be erected to define the area for work, then one of the following two procedures can be adopted:

5.2.1 Taping out in-service equipment

- assess the work site and carry out the isolation and earthing as required;

- using the barrier out method, apply a yellow tape barrier to identify the in-service equipment within the vicinity of the cover to be removed. Leave a gap where the cover is to be removed to allow the work to be carried out, as shown in Figure 3 – Access to circuit breaker housing with in service equipment defined by yellow tape.

- issue the requested AA, noting in special conditions "in-service equipment taped out"; and

- where covers need to be removed from busbar, current transformer or cable termination chambers, the Authorised Switching Officer and the AA holder need to be present so that the yellow taped area is correct for the work to be carried out. Once the cover is removed if a visible earth switch is not present the primary conductors must be proven not alive to the AA holder and that AA can then be issued.

Figure 3 – Access to circuit breaker housing with in service equipment defined by yellow tape. This is an example of "barrier out" taping.

5.2.2 Taping in out-or-service equipment

- assess the work site and carry out the isolation and earthing as required;

- using the barrier in method, apply a rare earth magnet with hook/eyelet or orange bollard at an appropriate position on each side of the door or housing. Extend yellow tape to two orange bollards, as shown in Figure 4 – Switchgear under Access Authority with yellow tape defining entry area. Loosening off bolts on switchgear panel to support tape is not suitable;

- issue the requested AA; and

- where covers need to be removed from busbar, current transformer or cable termination chambers, the Authorised Switching Officer and the AA holder need to be present to confirm the yellow taped area is correct for the work to be carried out. Once the cover is removed if a visible earth switch is not present the primary conductors must be proven not alive to the AA holder and that AA can then be issued.

Figure 4 – Switchgear under Access Authority with yellow tape defining entry area

When maintenance is to be carried out on a withdrawable type circuit breaker, it is not necessary to define the work area by means of a yellow tape barrier. The shutters must be locked and the circuit breaker doors must be closed

Where the work site is a caged or single entry room, the AA area entry will be defined with yellow tape barrier and two high visibility bollards and a notice “CAUTION – Entry to Access Authority Area”, as shown in Figure 5 – Auxiliary Switchgear under Access Authority with yellow tape defining entry area.

Figure 5 – Auxiliary Switchgear under Access Authority with yellow tape defining entry area

5.3 Outdoor HV switchyards

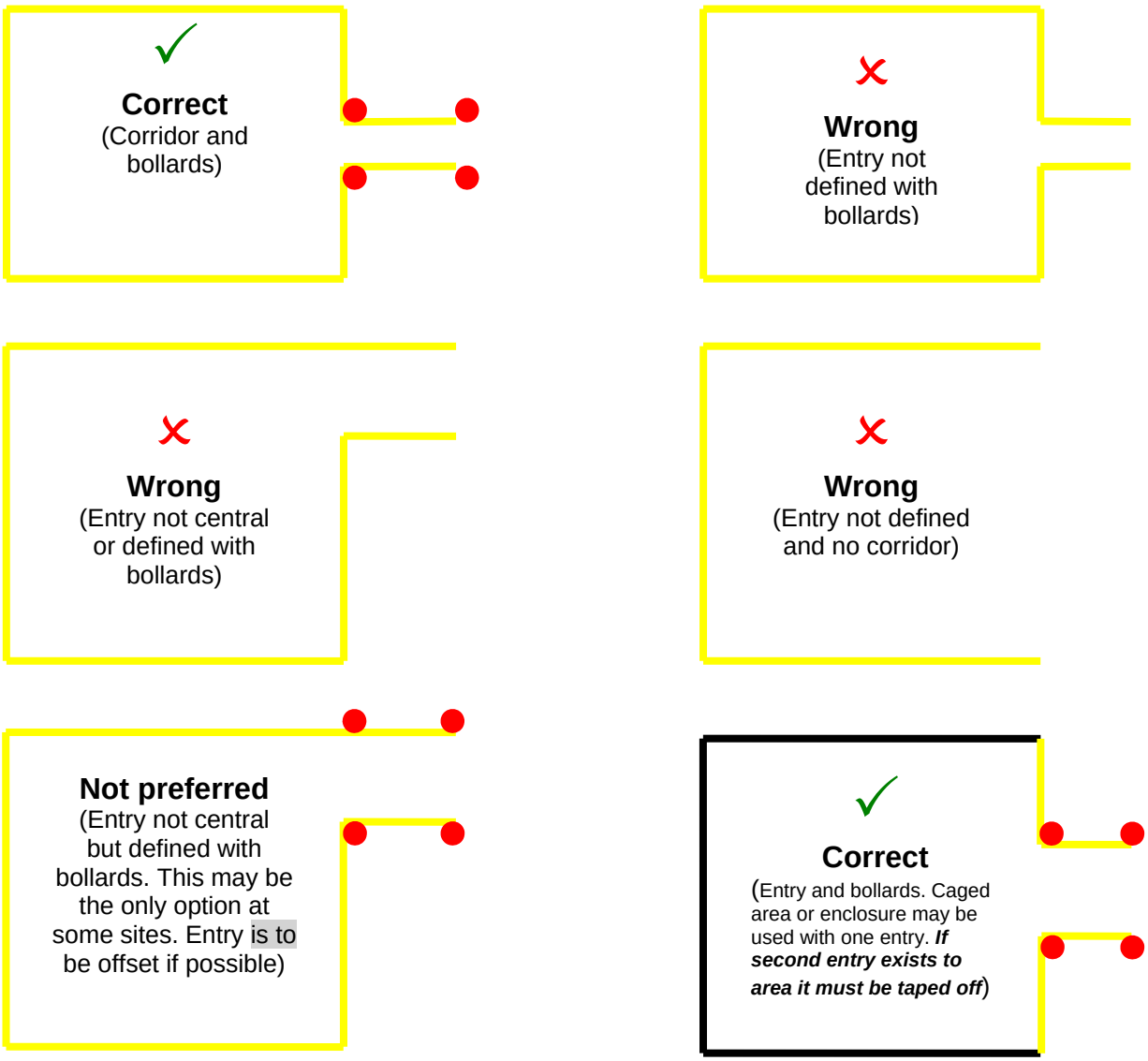
Where work is being carried out in outdoor HV switchyards, the following procedure will be adopted:

- assess the work site and carry out the isolation and earthing as required;
- define the area to be yellow taped, as shown in Figure 6 – Yellow taped area defining an AA area;
- lay out stands and bollards where applicable. Structures that support live HV equipment must not be used to support the yellow tape barrier. Affix yellow tape barrier to stands and bollards to identify safe area to work and entrance, as shown in Figure 7 – Entries to Access Authority areas in outdoor switchyards;
- create a two metre by two metre entry formed with four high visibility bollards; and

- erect the warning sign “CAUTION – Entry to Access Authority Area” at the entrance and provide adequate warnings in special conditions on the AA indicating the existence of yellow tape barriers, eg, “Work area defined by yellow tape and entry sign”.

Figure 6 – Yellow taped area defining an AA area

Figure 7 – Entries to Access Authority areas in outdoor switchyards



5.4 High Voltage apparatus above Access Authority area

Where an area is to be defined by a yellow tape barrier and there are live high voltage conductors above the area, then the warning sign “DANGER live HV conductors above” is to be displayed in the appropriate position/s within the yellow tape area, as shown in Figure 8 – Live High Voltage apparatus above Access Authority area. This will also be noted in the special conditions.

Figure 8 – Live High Voltage apparatus above Access Authority area

5.5 Miscellaneous situations

Where work in miscellaneous situations, such as padmount substations or auxiliary busbars with metal clad switchgear installed and requires the removal of covers then the following procedure is to be adopted:

- assess the work site and carry out the isolation and earthing as required;
- apply a yellow tape barrier to identify the in service equipment within the vicinity of the cover to be removed. Leave a gap where the cover is to be removed to allow the work to be carried out, as shown in the example in Figure 9 – SM6 HV switchgear under AA with equipment in-service or unavailable for work or test defined by yellow tape;
- issue the requested AA, noting in special conditions “In-service equipment taped out”; and
- where covers need to be removed from busbar, current transformer or cable termination chambers, the Authorised Switching Officer and the AA holder need to be present to make sure the yellow taped area is correct for the work to be carried out. Once the cover is removed if a visible earth switch is not present the primary conductors must be proven not alive to the AA holder and that AA can then be issued.

Figure 9 – SM6 HV switchgear under AA with equipment in-service or unavailable for work or test defined by yellow tape.

6.0 RECORDKEEPING

The table below identifies the types of records relating to the process, their storage location and retention period.

Type of Record	Storage Location	Retention Period*
No Entry		

* The following retention periods are subject to change, eg if the records are required for legal matters or legislative changes. Before disposal, retention periods must be checked and authorised by the Records Manager.

7.0 AUTHORITIES AND RESPONSIBILITIES

General Manager Network Operations has the authority and responsibility for approving this procedure.

Chief Engineer has the authority and responsibility for endorsing this procedure.

Manager System Control has the authority and responsibility for endorsing this procedure.

Network Field Resource Manager has the authority and responsibility for reviewing this procedure.

Field Operations Manager has the authority and responsibility for:

- appropriately allocating resources for this process; and
- maintaining compliance to this procedure.

Authorised Switching Officers and **Access Authority (AA) Holders** have the authority and responsibility to carry out the actions in this procedure in accordance with Company Procedure GSY 1031 – Electrical Safety Rules.

8.0 DOCUMENT CONTROL

Content Coordinator : Manager System Control

Distribution Coordinator : Division Process Coordinator, Network

COMPANY PROCEDURE

NETWORK	Document No: GNV 1070 Amendment No: 0 Approved By: AEGMN Approval Date: 24 September 2012 Review Date: 24 September 2015

Supersedes Company Procedure (Health & Safety) GSY 1074.am2

GNV 1070 ACCESS AUTHORITY PROCEDURE FOR WORK ON TRANSMISSION MAINS AND JOINT USE MAINS

1.0 PURPOSE

To ensure the Company provides instructions for proving de-energised, earthing and short circuiting transmission mains for work.

THIS DOCUMENT IS A CONTROL FOR THE HEALTH AND SAFETY MANAGEMENT SYSTEM (H&SMS).

2.0 SCOPE

To ensure that the procedures for proving de-energised, earthing and short circuiting, issuing and cancelling Access Authorities (AA) are implemented.

3.0 REFERENCES

Board Policy 3.0 – Occupational Health and Safety
Company Policy (Network Asset Management) 9.1.3 – Authorisations
Company Procedure (Health & Safety) GSY 1031 – Electrical Safety Rules
Company Procedure (Health & Safety) GSY 1034 – Switching Folder
Company Procedure (Health & Safety) GSY 1088 – Access Authority for High Voltage Work and/or Test
Company Procedure (Network Asset Management) GAM 0089 – Authorisations Governance and Management
Division Procedure (Network) GNV 1046 – Earthing and Short Circuiting High Voltage Apparatus
Company Form (Health & Safety) FSY0050 – Access Authority for Test
Company Form (Health & Safety) FSY0051 – Access Authority for Work
Branch Form (System Operations) FCL0143 – Notification of HV System Alterations
Work Health and Safety Act 2011 NSW
Work Health and Safety Regulations 2011 NSW

4.0 DEFINITIONS

authorised person
A person with technical knowledge or sufficient experience who has been approved and authorised in writing by the Company to perform the function requiring authorisation as described in Schedule 1 of Company Procedure GAM 0089 – Authorisations Governance and Management. This definition is relevant to the terms “authorisation”, “authorise” and “authorised person”.

Authorised Switching Officer
An employee of the company, authorised in writing for operation of the high voltage network within the limitations specified on their authority card.

cross reference
Special notation on the switching folder to log all AA issued concurrently at separate locations on a common isolation where practicable.

distribution mains
Up to 22kV network mains.

electrical station
Any enclosed substation or switching station, whether of the indoor, outdoor or underground type. (Typically a 132kV, 66kV or 33kV transmission station or zone substation).

General Managers
Includes Chief Engineer.

joint use mains
Transmission and distribution mains erected on the same pole, including those of other authorities (excepting low voltage).

non joint use mains
Mains erected on poles that carry only transmission mains (excepting low voltage).

operational earths
Earthing and short circuiting equipment applied to electrical apparatus to satisfy the requirements for the issuing of an Access Authority, as distinct from working earths. Operational earths may only be applied or removed, with the approval of the System Operator

operating work
Work involving the operation of switches, the opening or closing of links or other connections intended for ready removal, the removal or replacement of fuses, proving that electricity works are de-energised and the earthing and short circuiting of electricity works.

review date
The review date displayed in the header of the document is the default date for review of a document. A document review may be required at any time where a need is identified due to changes in legislation, organisational changes, restructures, occurrence of an incident or changes in technology or work practice.

switching folder
A printed envelope which documents all Access Authorities for Work or Test, Operating Agreements or Approval to Work forms issued and cancelled and associated conditions for the associated work site including the connection of earthing apparatus. Access Authorities, hazard assessments and all switching instructions shall be stored in the folder. All associated paperwork shall be returned to the folder and the folder returned for filing.

System Operator
The authorised person responsible for the operation of all or a designated part of the electrical network.

transmission mains
132kV, 66kV or 33kV network mains.

working earths
Earthing and short circuiting equipment erected, in addition to operational earths, to fulfil the requirements of the Company's Electrical Safety Rules.

work crew
Employees or contractors.

5.0 ACTIONS

Except for the application of approved live line working techniques, transmission mains must be earthed and short circuited and AA issued before work is carried out. Authorised Switching Officers are utilised to prove de-energised, earth and short circuit the transmission mains and issue Company Form FSY0051 – Access Authority for Work.

5.1 Procedures for single work locations – non joint use transmission mains

5.1.1 Authorised Switching Officer's under the control of the System Operator, in conjunction with other authorities as required, must isolate the transmission mains, provide danger tagging at all points of isolation and provide earthing. This earthing can be located at either or both ends of the feeder, e.g. line earth switches at Company electrical stations or line earth switches at other authorities supply points.

5.1.2 On arrival at the worksite, the Authorised Switching Officers must contact the System Operator to establish isolation and operational earthing points.

Note: If operational earths are not applied at each end of the transmission feeder, the System Operator must instruct the Authorised Switching Officers to prove de-energised and erect operational earths as required, prior to the issue of Company Form FSY0051 – Access Authority for Work.

5.1.3 Authorised Switching Officer's who are to issue Company Form FSY0051 – Access Authority for Work, prove de-energised and erect working earths if required (each working earth must be noted on the AA in section ten (10).

5.1.4 Having issued Company Form FSY0051 – Access Authority for Work, the Authorised Switching Officer is to advise the System Operator of:

- the location and number of operational earths applied to the transmission mains;
- the location of the switching folder and identification number of AA issued;
- the location and number of any working earths already applied; and
- the name of AA recipient/s if personal issue.

5.1.5 The System Operator is to record the information as defined in section 5.1.4 above.

5.1.6 On completion of work on the transmission mains:

- all working earths to be removed and signed off the AA;

- members of the work crew and AA holder to sign off AA;

- the Authorised Switching Officer is to check that the AA is surrendered, then cancel the AA and sign off the switching folder and advise the System Operator of the number of the cancelled AA and that all working earths that were applied have been removed;

- the System Operator is to check and record cancellation of the AA;

- the System Operator is to instruct the Authorised Switching Officer is to remove any operational earths erected. The Authorised Switching Officer is to advise the System Operator of the number of operational earths removed and the locations from which they were removed. In addition, the Authorised Switching Officer is to record the removal of each operational earth at the appropriate position on the switching folder by their initials;

- the System Operator is to record the removal of operational earths;

- the System Operations Branch will coordinate with other authorities as required for removal of operational earths and to restore the network to normal; and

- all paperwork should be returned to the Authorised Switching Officer's Supervisor.

5.2 Procedures for multiple work locations - involving non joint use transmission feeders

When only one Authorised Switching Officer is involved in the proving de-energised and erection of operational earths on transmission mains and the issue of AA, the same procedures as outlined in section 5.1 above must apply, but must be repeated for each work location.

Note : When more than one Authorised Switching Officer is involved, the coordination of their activities will be the responsibility of the System Operator.

Note: All switching folders issued concurrently for work within a common isolation must be cross referenced (where practicable). If not, they must be coordinated through the System Operator.

5.3 Procedure for earthing multiple work locations within a common isolation

Careful consideration is needed for earthing at multiple work locations. In particular the Authorised Switching Officers must take particular note of whether there is:

- independent earthing for each worksite; and
- earthing common to multiple worksites.

The two situations are illustrated in the diagrams below, and in particular it should be noted that:

- for worksites controlled by separate AA with independent earthing, the AA at any worksite can be cancelled and operational earths relating to that AA removed whilst other AA are current (refer to Figure A – Independent transmission field earthing for each worksite);

- common earthing situations for multiple worksites require switching folders to be cross referenced (where practicable) and all AA's must be cancelled before any operational earthing is removed (refer to Figure B – Both transmission earths common to each worksite). Recording of common earthing and cross reference situations must be made in the unusual conditions section of the respective switching folders; and

- working earths may also be an option in Figures A – Both transmission earths common to each worksite and B – Both transmission earths common to each worksite below to provide visual earths for respective work parties.

It must always be remembered that when working earths are used, operational earths must first be erected to satisfy the requirements of Company Procedure GSY 1031 – Electrical Safety Rules then an AA issued before proving de-energised and erecting working earths as required.

Note: All switching operations and earthing, issuing and cancellation of AA's will be coordinated through the System Operator.

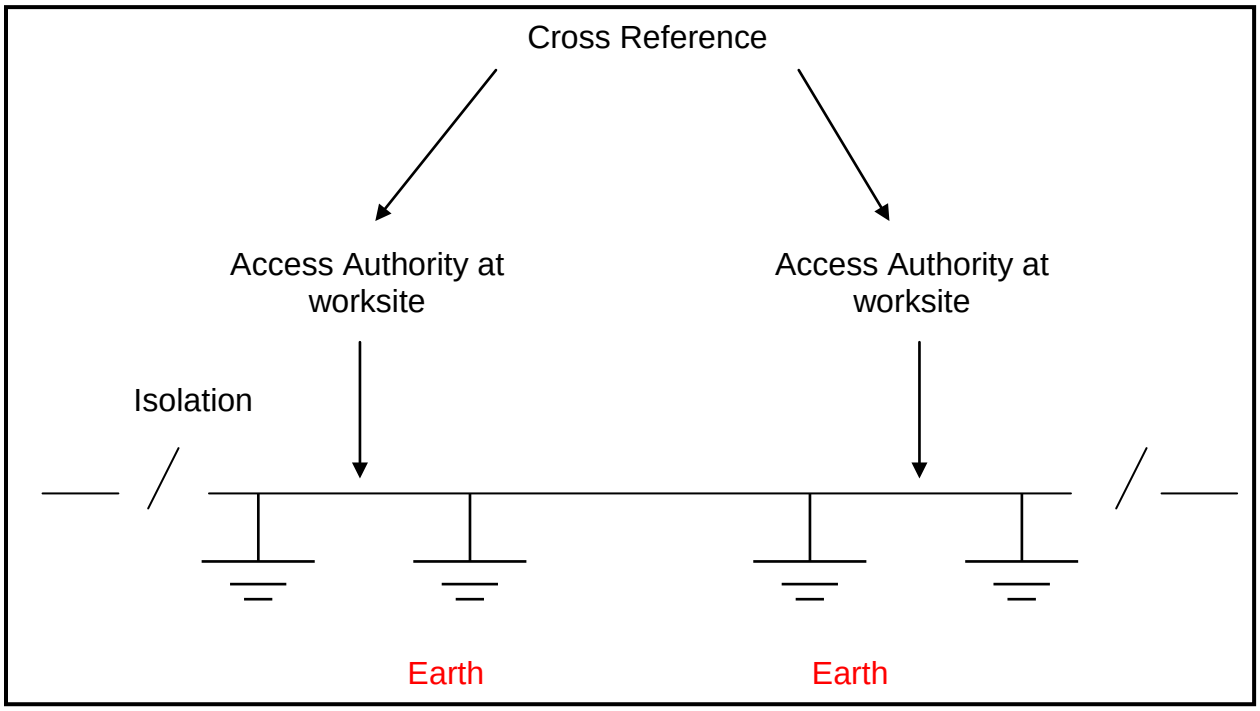


Figure A – Independent transmission earthing for each worksite

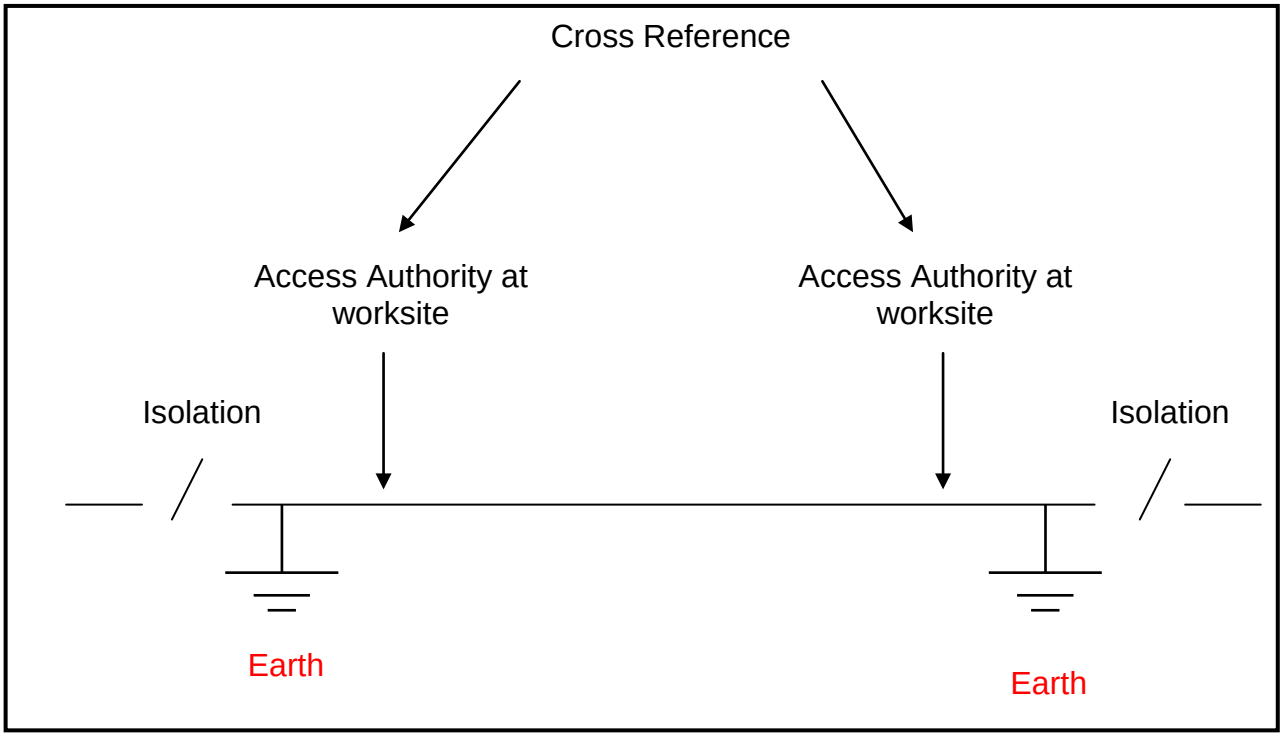


Figure B – Both transmission earths common to each worksite

5.4 Procedures for single work location involving joint use transmission feeder where operational (field) earths are required to be erected on the transmission feeder

5.4.1 Isolate and earth the Transmission Mains

Authorised Switching Officer's under the control of the System Operator, in conjunction with other authorities as required, must isolate the transmission mains, provide danger tagging at all points of isolation and provide earthing. This earthing must usually be located at either or both ends of the feeder, e.g. line earth switches at the Company's electrical stations or line earth switches at other authorities supply points.

5.4.2 Isolate and earth the distribution mains

The Authorised Switching Officer is to isolate and earth the distribution mains and issue an AA for the erection of the distribution earths. This will allow the Authorised Switching Officer is to pass through the distribution mains for the purpose of erecting the transmission earths on the transmission mains.

5.4.3 Issue AA on distribution mains

The Authorised Switching Officer issues an AA on the distribution mains to allow for the erection of transmission earths. The System Operator is advised. (Note: This AA can be temporarily surrendered see section 5.4.4)

5.4.4 Erect transmission earths

Under the distribution AA the Authorised Switching Officer can then pass through the Distribution Mains to prove the transmission mains de-energised and erect the transmission mains earths.

On completion of the erection of the transmission earths, the AA issued in section 5.4.3 above can be temporarily surrendered by the AA holder and the System Operator advised.

5.4.5 Issue of AA for the transmission mains

The Authorised Switching Officer will now issue Company Form FSY0051 – Access Authority for Work. The AA must contain:

- a complete job description;
- all distribution and transmission mains isolation points; and
- all earthing associated with the particular job site, i.e. distribution and transmission earthing.

Work can now be carried out on the transmission mains.

5.4.6 Surrender of the transmission AA

On completion of all work as covered by the transmission AA, all members of the work crew must sign off the transmission AA and the AA holder surrenders the AA.

5.4.7 Reinstatement of the Distribution AA to remove transmission earths

The distribution AA that was temporarily surrendered in section 5.4.4 can now be taken up by an Authorised Switching Officer (eg, patrolman) for the removal of the transmission earths by passing through the earthed distribution mains.

5.4.8 Cancellation of the transmission AA

The Authorised Switching Officers must cancel the transmission AA and signs off the switching folder.

The Authorised Switching Officer cancels the transmission AA and advised the System Operator. The Authorised Switching Officer also advises the System Operator the number and location of transmission earths removed.

5.4.9 Cancellation of the Distribution AA

The Authorised Switching Officer is to record the cancellation of the distribution AA and the removal of each distribution earth as noted on the appropriate position on the switching folder.

The System Operator is to check and record cancellation of the distribution AA and record removal of operational earths on the transmission mains.

The distribution system can now be returned to normal.

5.4.10 Returning the transmission system to normal

Upon receiving advice form the Authorised Switching Officer the System Operator is to restore the transmission system to normal e.g. e.g. line earth switches at the Company's electrical stations or line earth switches at other authorities supply points.

5.4.11 All paperwork must be returned to the Authorised Switching Officer's Supervisor.

5.5 Particular circumstances when working parties contain authorised switchers

5.5.1 If all work is carried out by Company employees, the following simplified process can apply:

- the Authorised Switching Officer contacts the System Operator to ensure clearance is given on condition of AA earths on transmission feeder;
- the joint use mains are isolated proved de-energised and earthed by the Authorised Switching Officer to satisfy Company Procedure GSY 1031 – Electrical Safety Rules; and
- a single AA may be issued by the Authorised Switching Officer with the condition that the working earth/s on the transmission mains are to be erected at the worksite.

5.6 Multiple work location on transmission mains with multiple joint use situations

Each isolation is to be separately controlled by its own AA and to follow the steps as described in section 5.4 above.

6.0 AUTHORITIES AND RESPONSIBILITIES

Acting Executive General Manager Network has the authority and responsibility for approving this procedure.

Chief Engineer has the authority and responsibility for endorsing this procedure.

General Managers have the authority and responsibility for:

- appropriately allocating resources for this process; and
- monitoring compliance with this procedure.

Manager System Operations has the authority and responsibility for:

- establishing the procedure for carrying out safe isolation and earthing for work on or near transmission feeders; and
- monitoring compliance with this procedure.

Electrical Safety Manager has the authority and responsibility for ensuring the Electrical Safety Rules are in place to govern this procedure.

System Operators have the authority and responsibility for:

- recording information as defined in the procedure; and
- coordinating with Authorised Switching Officer's to implement the actions required in this procedure.

Authorised Switching Officers have the authority and responsibility for carrying out the actions in this procedure.

7.0 DOCUMENT CONTROL

Content Coordinator: Manager System Operations

Distribution Coordinator: Division Process Coordinator, Network

Division Procedure

NETWORK	Document No	:	GNV 1086
	Amendment No	:	1
	Approved By	:	GMNO
	Approval Date	:	08/12/2015
	Review Date	:	08/12/2018

GNV 1086 SWITCHING FOLDER

1.0 PURPOSE

To explain the correct procedure for how the switching folder is used throughout the company.

2.0 SCOPE

This procedure outlines the application of the switching folder as a coordination tool for network switching activities.

3.0 REFERENCES

Internal
Board Policy (Health & Safety) 3.0 – Work Health and Safety
Company Procedure (Health & Safety) GSY 1031 – Electrical Safety Rules
Company Procedure (Health & Safety) GSY 1066 – Worksite Hazard and Risk Assessment
Company Form (Health & Safety) FSY 0050 – Access Authority for Test
Company Form (Health & Safety) FSY 0051 – Access Authority for Work
Company Form (Health & Safety) FSY 0054 – Switching Folder (A5)
Company Form (Health & Safety) FSY 0142 – ***Stock code 1560879*** Switching Folder (A4)
Company Form (Health & Safety) FSY 0118 – Worksite Coordination/Hazard & Risk Assessment
Branch Form (System Control) FCL 0015 – Operating Agreement (HV Equipment Outage Book)

External
Work Health & Safety Act 2011
Work Health & Safety Regulation 2011
Handbook HB 5031–2011 Records classification

4.0 DEFINITIONS

Access Authority (AA)
A pre-printed form which when accepted by an authorised person, and signed onto by the work party, allows work to be carried out as described on Company Form's FSY 0050 – Access Authority for Test or FSY 0051 – Access Authority for Work.

Authorised person
An employee, contractor or Accredited Service Provider (ASP) with technical knowledge or sufficient experience who has been approved by the company to perform the duty concerned.

Operating Agreement (OA)
A written agreement on which an undertaking is given by an authorised person for a network operator or other company, that the electrical apparatus specified will remain isolated and/or earthed until the written agreement has been cancelled. The document is used in cases where the

network operator or other company concerned is undertaking switching operations for another party.

Note: an Operating Agreement is not an AA.

Document control
Employees who work with printed copies of documents must check the Business Management System regularly to monitor version control. Documents are considered “UNCONTROLLED IF PRINTED”, as indicated in the footer.

Recordkeeping
Making and maintaining complete, accurate and reliable evidence of business transactions in the form of recorded information. (Source: Handbook HB 5031–2011 Records classification)

Review date
The review date displayed in the header of the document is the future date for review of a document. The default period is three years from the date of approval. However a review may be mandated at any time where a need is identified due to changes in legislation, organisational changes, restructures, occurrence of an incident or changes in technology or work practice.

5.0 ACTIONS

The switching folder provides important information for an authorised person prior to removal of operational earths and the re-connection of isolated electrical apparatus. For example, the following information could be included on the switching folder:

- AA’s issued;
- location of operational earths applied;
- location of additional earths other than working earths applied;
- OA issued and received; and
- any unusual condition that the authorised person making the re-connection is to be aware of.

The switching folder also provides a receptacle for all associated paperwork including AA for work, AA for test, OA, danger tags, warning tags, switching instructions, disconnection and reconnection (D&R) and Worksite Hazard and Risk Assessment (WHRA).

It is critical that upon carrying out any action associated with this folder the action is first verified to be complete and correct and the folder filled in or signed immediately after this verification. If there is any delay or distraction after verification then the action is to be verified again and the folder filled in or signed immediately.

All information entered on the switching folder must be investigated and checked. Any anomalies must be resolved by the authorised person before any attempt is made to remove operational earths and re-energise the isolated electrical apparatus.

All information entered on the switching folder must be investigated and checked. Any anomalies must be resolved by the authorised person before any attempt is made to remove operational earths and re-energise the isolated electrical apparatus.

5.1 Information to be entered on the front of the switching folder at the time of AA issue

5.2.1 Date

The day the switching folder is filled out.

5.2.2 D&R No's

The switching instruction number located on the bottom left corner of the D&R number must be noted. During emergency switching where a D&R is not used, then the word "verbal" must be noted.

5.2.3 Location of work

A geographic description of the work location.

5.2.4 Documents issued details

Work (W), Test (T), Secondary (S), Erection (E), Removal (R), Operating Agreement (OA) must be noted.

No: ..... Time: ..... Date: ..... By: .....

Enter the document type, the number, followed by the time, date, and name of the authorised person issuing the document.

5.2.5 Cancelled: details

Time: …… Date: …….. By: …….

Upon checking the cancellation of the document, the document must be immediately signed off the switching folder in the appropriate space with the time and date being recorded.

5.2.6 Cross referenced switching folders

All other switching folders involved with a common isolation must be listed. An accurate description of the location is essential. If there are no other switching folder locations strike this section out or write NIL.

Where other switching folders are involved under a common isolation a reference to these must also be made on the rear of the switching folder. The notation in the "UNUSUAL CONDITIONS" section must be "X-REF Folders" or "Cross Reference Folders", and the location of all other cross referenced switching folders involved under the same isolation.

5.2 Information to be entered on the rear of the switching folder

5.3.1 Earthing equipment applied

The number of operational earths (AA earths) applied to the electrical apparatus must be recorded and their locations recorded accurately. Additional earths such as earths related to non-visible breaks and earths that were not listed on the D&R must also be recorded in this section.

Upon installation of any earth to the network their location must be immediately recorded on the switching folder. There must be no distraction between application of the earth, verification of its location and recording that earth on the switching folder

5.2.2 Earthing equipment removed

Removed by:……

Upon checking the cancellation of the AA and signing it off (refer 5.2.5), any earths that are removed must be signed off by the authorised person. Upon removal of an earth the authorised person must verify the earth is removed then immediately sign that earth off on the folder.

5.2.3 Fuse dummies applied

The location of fuse dummies that have been installed must be recorded. The signature of the authorised person removing the fuse dummies must be recorded. If there are no fuse dummies installed, strike this section out or write NIL. The folder must be signed immediately after it is verified that the fuse dummies are removed.

5.2.4 Phase rotation taken

When phase rotation has been taken the location and rotational direction must be noted. If there is no phase rotation taken, strike this section out or write NIL.

5.2.5 Unusual conditions (for the information of the Restoring Officer)

Any unusual conditions or information that would assist the reconnecting authorised person must be listed in this section:

- cross reference folders;
- common earthing points;
- difficult locations, a description of how to find switching points that were hard to find, etc;
- common isolation points; and
- any other information that will be useful for the authorised person restoring the switching.

5.4 Notes

5.4.1 After isolation and earthing is complete, an AA can be prepared, issued by the authorised person and left in the switching folder at a designated location.

5.4.2 In the AA areas defined by yellow tape, the switching folder must be left at the entry to the yellow tape area.

5.4.3 On completion of the work or test the cancelled AA must be left in the switching folder at the designated location.

5.4.4 If the switching folder is to be placed out in the weather, it will be left in the weatherproof plastic bag provided for the purpose (or some other noted location).

5.4.5 It is the duty of the authorised person responsible for removing earths and the reconnection of the electrical apparatus to confirm that all relevant documentation is accounted for, correctly cancelled and all operational, switching and working earths and equipotential bonds relevant to this switching folder are removed before energising part or all of the isolated electrical apparatus.

5.4.6 The authorised person can accept specific information from another authorised person or the System Operator concerning earths that have been removed, but which have not been signed off the switching folder as removed. In such cases, the authorised person reconnecting the electrical apparatus must initial the removed earths and must add "As per ..... (The name of the authorised person who gave the information)". Such information must only be accepted when the authorised person cannot readily see the earths concerned, due to remote location and, upon receiving clear details of the number and location of the earths concerned.

5.4.7 Nothing must be taken for granted and blanket statements such as "all earths removed" must not be accepted or acted upon by any authorised person.

On completion of the reconnection all paperwork pertaining to the job must be placed in the switching folder and forwarded to the manager/supervisor of the authorised person carrying out the restoration. The manager/supervisor must file the returned switching folders for auditing purposes and retain them for a minimum of three months.

6.0 RECORDKEEPING

The table below identifies the types of records relating to the process, their storage location and retention period.

Type of Record	Storage Location	Retention Period*
Completed switching folder containing D&R, DT's, and AA's.	Archiving	7 years after action completed as determined by GA40 section 6.6 s

* The following retention periods are subject to change, eg if the records are required for legal matters or legislative changes. Before disposal, retention periods must be checked and authorised by the Records Manager.

7.0 AUTHORITIES AND RESPONSIBILITIES

General Manager Network Operations has the authority and responsibility for:

- approving this procedure;
- appropriately allocating resources for this process; and
- monitoring compliance to this procedure.

Manager System Control has the authority and responsibility for endorsing this procedure.

Managers/Supervisors have the authority and responsibility for verifying that the requirements of this procedure are carried out.

Authorised persons using the switching folder have the authority and responsibility for the correct application of this procedure.

8.0 DOCUMENT CONTROL

Content Coordinator **:** Manager System Control

Distribution Coordinator **:** GRC Process Coordinator