

# Standard

01455

Version: 2 | Released: 15/12/2016



positive energy

## **OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK**

### **1. Foreword**

This standard forms part of Energex's safe system of work and outlines key roles, responsibilities and procedures for all persons switching or working on the isolated Energex Low Voltage (LV) distribution network. This standard details the requirements to isolate, test to prove de-energised and issue LV Permits/Notices/Clearances and the responsibilities of all persons involved in the LV switching process.

This standard should be read in conjunction with [Procedure 00891](#); [Procedure 00238](#), [Operating Practices Manual – Section 12](#) and current work practices.

**Note:** Energex staff performing customer connections work (for example but not limited to: initial energisation of customers' installations, testing for correctness of network connections following Energex or Customer work) have specific work practices providing a safe system of work. These procedures do not apply to work performed under those work practices/ safe system of work.

### **2. Scope**

This standard does not apply to;

- Work on LV apparatus in Substations without a connection to the Energex LV distribution network;
- For work on the Energex LV distribution network using relevant 'Working Live LV' safe systems of work.

This standard applies to:

- Connection and energisation any new LV electrical apparatus to the Energex LV distribution network;
- Planned and emergency LV switching of the Energex LV distribution network;
- All persons working on or near the isolated Energex LV distribution network.
- Disconnected LV apparatus left in situ;

### **3. Definitions**

Energex Business Glossary

Term	Definition
A4S	An Energex developed software program 'Application for Switching' used to manage the process of HV and LV switching.

# Standard

01455

Version: 2 | Released: 15/12/2016



## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

### 4. Changes From Previous Version

Version	Change
1	Initial version.

### 5. Referenced Documents

- [The Queensland Electricity Entity Standard for Safe Access to HV Electrical Apparatus \(SAHV\)](#)
- [Procedure 00238 – Co-ordinate Network Switching](#)
- [Procedure 00891 – Plan Network Switching](#)
- [Operating Practices Manual](#)
- [Form 8102 – Matrix: When to use a Low Voltage Switching Sheet / Low Voltage/De-Energisation Permit / Customer Isolation Notice](#)

# Standard

01455

Version: 2 | Released: 15/12/2016



positive energy

## **OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK**

### **Contents**

1. Foreword.....	1
2. Scope.....	1
3. Definitions.....	1
4. Changes From Previous Version.....	2
5. Referenced Documents.....	2
6. Roles and Responsibilities.....	5
6.1. Application.....	5
6.2. Writing.....	5
6.3. Checking.....	6
6.4. Authorising.....	7
6.5. Activation.....	7
6.6. Coordination.....	7
6.7. Field Switching.....	9
6.8. Summary of Responsibilities.....	10
7. Permits, Notices and Clearances used for works involving Low Voltage.....	11
7.1. LV De-Energisation Permit - Form 1074.....	11
7.2. LV Fault Finding Permit - Form 1174.....	11
7.3. General Requirements of LV De-energisation/ Fault Finding Permit.....	11
7.4. Notice of Customer Isolation From the Energex Network - Form 1668.....	12
7.5. Clearance to Work in Proximity to the Energex Network - Form 1541.....	12
7.6. Safety Signs.....	13
7.6.1. Do Not Operate Board (DNOB).....	13
8. Continuity of Low Voltage Supply.....	14
8.1. LV Ties.....	14
8.1.1. Selection preference.....	14
8.1.2. HV Network reconfiguration.....	15

# Standard

01455

Version: 2 | Released: 15/12/2016



## **OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK**

8.2.	Customer Outages.....	15
8.2.1.	Planned Outages .....	15
8.2.2.	Life Support .....	16
8.2.3.	Notification Waiver .....	16
8.2.4.	Breaches.....	16
9.	Low Voltage Switching Sheets.....	17
9.1.	Energising New LV Electrical Apparatus.....	17
9.2.	Common Isolation Points .....	17
9.2.1.	Integrity of Common Isolation Points .....	18
9.3.	Working on Isolated LV Electrical Apparatus.....	19
9.3.1.	Test to Prove De-energised.....	19
9.3.2.	Other Precautions .....	19
9.3.3.	Sign On .....	20
9.3.4.	Transfer of the LV DP/Fault Finding Permit .....	20
9.3.5.	Surrender of the LV DP/Fault Finding Permit.....	20
9.4.	LV Network Abnormalities .....	21
10.	Works involving Low Voltage and High Voltage .....	22
10.1.	HV switching required for LV work .....	22
10.2.	Combinations of HV and LV Switching sheets.....	22
10.2.1.	Interfacing HV and LV Switching sheets.....	25
10.2.2.	DNOBs left on LV Transformer Switches Following HV Works .....	26

# Standard

01455

Version: 2 | Released: 15/12/2016



## **OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK**

### **6. Roles and Responsibilities**

Roles and Responsibilities are to be read in conjunction with [Procedure 00891](#) and [Procedure 00238](#).

#### **6.1. Application**

When switching of the Energex LV distribution network is required, the applicant shall submit an application in the 'Application for Switching' (A4S) program and shall:

- Scope the job requirements in consultation with the LV Outage Officer (LVOO) to ensure all necessary requirements for switching the Energex LV distribution network are satisfied:
  - In the field, check the correctness of LV network configuration, switching points and isolation points and ensure suitable selection of continuity of supply measures - LV ties (Section 8.1. ), LV generators or planned outages ((e.g. confirm Network Attachment Points (NAP), extent of Customer interruptions, LV generator connection points/sites));
  - Determine the effect the LV switching will have on surrounding distribution transformers and LV circuits e.g. avoiding overload situations/voltages outside of statutory limits;
  - Bring to the attention of the LVOO any discrepancies found between EnerGISE/diagrams and the LV network configuration in the field.
- Ensure that all information including isolation points, outage details, clash information and description of the intended work is entered;
- Ensure that any specific LV tie requirements (e.g. a specific tie that must be closed and remain closed to maintain generator synchronism with the LV network or continuity of supply) are included in any associated High Voltage (HV) application (Section 8.1. );
- Include any additional information/other remarks ('Notes' section of A4S application) that are relevant to the scheduling, writing, authorisation and completion of the switching e.g. any associated HV application;
- Include other remarks if there is a requirement to work on an isolation point common to both a HV and LV application (see section 9.2.1 Common Isolation Point Integrity);
- Confirm Customer interruption notification has occurred in accordance with Section 8.2.1. and Customer data is correct ((i.e. all National Metering Identifiers (NMI)s interrupted are listed and napped to the correct Transformer)).

Where an Energex Applicant has entered an application on behalf of Non-Energex employees they take responsibility for ensuring these requirements have been met and correctly recorded.

#### **6.2. Writing**

All switching sheets shall be written in the standard electronic format except for certain circumstances, in consultation with the LVOO. Hand-written switching sheets shall be legible and use the standard terminology and formatting used in electronic formats (Form 1769 – LV Switching Sheet Template).

## Standard

01455

Version: 2 | Released: 15/12/2016



## **OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK**

The Writer shall ensure the switching sheet:

- Satisfies the intent of the application;
- Is written in a logical sequence;
- Is electrically correct i.e. isolation, continuity of supply, testing and phasing/rotation as required;
- Contains any Permit/Notice/Clearance details, including work area and all work details;
- Is submitted > 5 business days prior to the day of switching ((switching sheets submitted < 3 days prior to the date of switching can be authorised but only in exceptional circumstances and in consultation with the LV Outage Coordinator (LVOC)):
  - 2 business days required for checking;
  - 3 business days required for authorising and activation.

**Note:** Where work is being completed by Accredited EnerGEX Service Providers, the notification requirements specified in Work Category Specification WCS31 are to be complied with.

- Status is updated in A4S to 'Field Checked' only after the field checking of switching points and check to confirm the correctness of LV network configuration/NAPs.

**Note:** Any discrepancies found between EnerGISE/diagrams and the LV network configuration/NAPs/NMIs in the field, are to be noted in the A4S application, as well as being communicated to Data Help for updating of records.

### **6.3. Checking**

With the exception of emergency switching, switching sheets are not to be written and checked by the same person.

The Checker shall:

- Check all details of planned LV switching applications and switching sheets. This includes:
  - Planned LV switching sheets written electronic formats;
  - Planned hand-written switching sheets (Form 1769 – LV Switching Sheet Template).
- Verify the applications continuity of supply details (i.e. LV ties, LV generators and planned outages), clash information and any Permit/Notice/Clearance information;
- Check the correctness of the logic of the switching sheet and that the switching items correctly isolate the nominated LV electrical apparatus;
- Confirm that the intent of the switching sheet is satisfied by checking it against EnerGISE/diagrams.
- Refer the switching sheet back to the Applicant/Writer for correction if it fails to meet any of these requirements;
- Update the status of the application in A4S to 'Checked' only after these requirements have been met.

## Standard

01455

Version: 2 | Released: 15/12/2016



## **OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK**

### **6.4. Authorising**

Unless exceptional circumstances exist, all switching sheets shall be authorised electronically.

The Authoriser shall:

- Check if there are any clashes with any LV or HV switching sheets for the nominated date and time;
- Check for obvious errors with continuity of supply details (i.e. LV ties, LV generators and planned outages) however the final responsibility for the correctness of outage information remains with the person conducting the field check;
- Notify the Applicant/Writer and Checker by email if any corrections are made; if the switching sheet is unable to be authorised due to inadequate information; or if it fails to meet the required standard of accuracy and format (the Authoriser is to return the application status to 'Field Checked' in A4S and once corrections have been made, the Checker is to update the status of the application back to 'Checked');
- Update status in A4S to 'Authorised', only after all these requirements have been met.

### **6.5. Activation**

The LV switching sheet shall be activated as close as is practicable to the scheduled switching date, to ensure any changes to network abnormality/s that occur after authorisation do not affect the switching. When activating switching sheets, the person responsible shall ensure that there are no clashes with other planned or emergency switching sheets (LV or HV).

### **6.6. Coordination**

Coordination of all LV switching (and related outage management processes) is the responsibility of Energex Network Control.

The LVOC shall:

- Give approval to commence LV switching;
- Record and monitor Start and Finish times of forward and reverse switching;
- Record contact details of LV Switching Operator/s carrying out switching;
- Issue Permit/Notice/Clearance and record the details of On-site Supervisor/Customer/Individuals who are in receipt of them;
- Record LV network abnormalities e.g. LV tie closed and left in abnormal state after completion of switching;
- Record, monitor and report all Network Outages affecting supply to Customers;
- Record and monitor HV outages which may affect LV switching e.g. where LV circuits are tied into faulted 11 kV areas;
- Monitor Customer Calls associated with LV Switching to identify:
  - Network problems e.g. overloading of an adjacent LV circuit causing loss of supply;

## Standard

01455

Version: 2 | Released: 15/12/2016



### **OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK**

- Quality of supply problems;
  - Extended outage scope/times;
  - Insufficient/incorrect Customer interruption notification.
- Maintain communication with On-site Supervisor/Customer/Individuals who are in receipt of a Permit/Notice/Clearance when network faults are in proximity to the relevant work area, advising to cease work where appropriate;
- Instigate corrective action in the event of network failure as a result of the LV switching;
- Generate eSafe reports for Incidents or Near Misses for works involving LV;
- Report any network or safety related Incidents and National Energy Customer Framework (NECF) breaches to Shift Manager.

The Coordinator has the authority to:

- Cancel switching sheets in circumstances where:
  - It is found that works greatly exceed the nominated scope;
  - There are significant changes to advertised outage times;
  - Isolation affects Customers who were not notified (see 8.2. Customer Outages).
- Make minor changes to authorised switching sheets

For unplanned emergency switching the following control measures shall apply:

- LVOC is to supply the LVSO with an Emergency Switching Sheet Number and approval to commence forward isolation. The LVSO is to identify and carry out isolation on site and then in consultation with LVOC, using EnerGISE/ diagrams, agree that it is correct.  
**Note:** Any discrepancies between EnerGISE/diagrams and the LV network configuration in the field are to be investigated further but responsibility for correct isolation in emergency situations rests with the LVSO on site.
- LVOC to activate all LV switching sheets and check there are no clashes with other switching sheets (LV or HV);
- A permit to commence emergency repair works shall not to be issued until all associated switching has been completed to isolate and test to prove de-energised the relevant apparatus. Emergency repair work requiring access to LV or HV apparatus shall not commence until the appropriate permit has been received;
- If HV and/or LV switching is required to restore supply to areas electrically adjacent to a LV area isolated with a permit on issue for repair work, all work groups in those adjacent areas shall be contacted and directed to remain clear of electrical apparatus while the switching takes place;
- A work group re-commencing work on isolated apparatus following switching of an adjacent electrical area shall test to prove de-energised, at all worksites, before resuming work on that apparatus.



## **OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK**

### **6.7. Field Switching**

Both planned and unplanned LV switching is to be performed by an authorised LV Switching Operator (LVSO) and a Competent Assistant and they are to adhere to the principles of 'Teamwork During Switching'. They shall ensure:

- For planned switching, they have an authorised switching sheet (checking switching sheet number, time, day and details of work) and the basic intent of the switching sheet is established;
- For emergency switching, identify required isolation on site and in consultation with LVOC agree on required switching items.

**Note:** Any discrepancies between EnerGISE/diagrams and the LV network configuration in the field are to be investigated further but responsibility for correct isolation in emergency situations rests with the LVSO on site.

- Approval is gained from the LVOC to commence both the forward and reverse switching;
- Problems encountered during LV switching are reported immediately to the LVOC;
- Prior to issuing a permit/notice/clearance:
  - Testing to prove de-energised LV apparatus is carried out where required;
  - All sections are clear and legibly completed;
  - Approval is gained from the LVOC to issue.
- Permit/notice/clearance is endorsed as having been issued;
- The LVOC is informed (where applicable), of the name and contact number of the On-Site Supervisor receiving the permit or Individual receiving clearance/notice.

The On-Site Supervisor is to be a licensed Electrical Worker and is responsible for receiving permits, supervising electrical safety at the work area and shall ensure all members of the work group are signed on/off the permit and informed of and understands (see 9.3. Working on Isolated LV Electrical Apparatus):

- The electrical apparatus that has been isolated;
- Location of isolation points with safety signs attached;
- Any "other precautions" provided;
- Details of nearby energised HV/LV apparatus at the work area;
- Details of any site specific hazards. Onsite supervisor is to notify the LVOC of abnormalities upon surrendering of the permit.

Prior to reverse switching the LVSO is to ensure that all permit/notice/clearance are surrendered.

All completed field copies of switching sheets and relevant Permit/Notice/Clearance are returned to LVOC.

# Standard

01455

Version: 2 | Released: 15/12/2016



## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

### 6.8. Summary of Responsibilities

Type of Switching Sheet	Write	Check	Authorise	Activate	Coordinate
Electronic	Applicant	LVOO	LVOC	LVOC	LVOC
Non-Electronic	Applicant	LVOO	LVOO	LVOC	LVOC
Emergency	<b>LVSO</b> Identifies required isolation on site and in consultation with LVOC agrees on required switching items.		<b>N/A</b> (Emergency Sheets are not authorised)	<b>LVOC</b> (Clash detection check only. <b>Note:</b> ensure that nearby network incidents won't compromise the safety of persons carrying out works involving LV)	LVOC

Table 1 - Summary of Planned & Emergency Switching Responsibilities

## Standard

01455

Version: 2 | Released: 15/12/2016



## **OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK**

### **7. Permits, Notices and Clearances used for works involving Low Voltage**

Refer to [Form 8102](#) for guidance on the correct application of Permits, Notices and Clearances.

#### **7.1. LV De-Energisation Permit - Form 1074**

The LV De-energisation Permit (DP) [Form 1074](#) is part of Energex's safe system of work and ensures that:

- The work area has been isolated and tested to prove de-energised;
- Safety precautions are documented;
- The work area is not inadvertently re-energised.

If a LV switching sheet provides more than one distinct electrically isolated area then a specific DP is required for each of those isolated areas. Each DP will record only the isolation points applicable to that specific isolated area.

#### **7.2. LV Fault Finding Permit - Form 1174**

Fault finding on LV apparatus may involve the use of equipment capable of producing lethal currents. When any test is performed which may produce lethal currents on an isolated LV area, a LV Fault Finding Permit [Form 1174](#) is to be used.

- A LV Fault Finding Permit is only to be issued if any DPs issued for the same LV electrical apparatus have been surrendered.
- No more than one LV Fault Finding Permit can be on issue for the same LV electrical apparatus.

#### **7.3. General Requirements of LV De-energisation/ Fault Finding Permit**

The relevant Permit:

- Defines a work area within a single electrically isolated area and is issued by a LVSO to an On-Site Supervisor;
- Can be issued by a LVSO and left at the work area;
  - On arrival at the work area the On-Site Supervisor is to contact the LVOC and advise that they have received the permit.
- Is to be surrendered and cancelled and a new one is to be issued if there is a requirement to change the nominated isolation points.

## Standard

01455

Version: 2 | Released: 15/12/2016



## **OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK**

### **7.4. Notice of Customer Isolation From the Energex Network - Form 1668**

Energex [Form 1668](#) issued by a Switching Operator or Energex Representative, to a Customer or a Customer's Electrical Contractor, when Energex has isolated their connected installation from the Energex network to allow:

- A Customer's Electrical Contractor to carry out electrical work on the installation e.g. Replacement of a main switchboard;
- Any other work by the Customer on their property where it is identified that isolation from the Energex network is required.

**Note:** A Notice of Customer Isolation is not to be issued to Energex employees (see [Operating Practice Manual – Section 12](#), for full details of the process).

### **7.5. Clearance to Work in Proximity to the Energex Network - Form 1541**

Energex [Form 1541](#) is issued by a Switching Operator or Energex Representative to persons to enable them to work in proximity to either the HV or LV Energex Network. A Proximity Clearance does not permit the Individual to work on Energex apparatus.

**Note:** A Proximity Clearance is not to be issued to Energex employees (see [Operating Practice Manual – Section 12](#), for full details of the process).

# Standard

01455

Version: 2 | Released: 15/12/2016



positive energy

## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

### 7.6. Safety Signs

#### 7.6.1. Do Not Operate Board (DNOB)

A standard Energex Safety Sign that is applied to all isolation points identified on an LV De-energisation/Fault Finding Permit.



Figure 1 - Standard Energex DNOB



Figure 2 - Standard Energex DNOB hook

# Standard

01455

Version: 2 | Released: 15/12/2016

## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

### 8. Continuity of Low Voltage Supply

#### 8.1. LV Ties

LV ties are to be selected in consultation with the LVOO to ensure all necessary requirements for the security of the Energex distribution network are satisfied.

- If LV ties remain closed for a period greater than 48 hours they are to be appropriately fused, following consultation with the LVOO/LVOC.
- When LV ties are closed and left in an abnormal state after completion of switching, A4S Network Abnormality System is to be updated by the Outage Coordinator.

**Note:** When LV ties are used for voltage improvement, a 'voltage tie' warning sign shall be attached to the tie point/s and an A4S Network Abnormality System is to be updated and the following warning sign is used.



Figure 3 - Voltage Tie Sign

#### 8.1.1. Selection preference

When selecting LV ties the following order of preference is to be used:

- **Same Feeder** (excluding across protective device/s)  
Any LV tie that when closed will tie together the LV areas of transformers fed from the same HV feeder.
- **Between Feeders**  
Any LV tie that when closed will tie together the LV areas of transformers fed from different HV feeders supplied from the same zone substation.
- **Across protective device/s**  
Any LV tie that when closed will tie together the LV areas of transformers across a protective device on the same feeder (e.g. Master Drop Out fuses & Pole Mounted Reclosers)
- **Between Zones**  
Any LV tie that when closed will tie together the LV areas of transformers fed from HV feeders supplied from different Bulk Supply substations.

# Standard

01455

Version: 2 | Released: 15/12/2016



positive energy

## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

### 8.1.2. HV Network reconfiguration

Any HV network reconfiguration for LV tie purposes should be based on a risk assessment.

The key factors to be taken into consideration being:

- Tie types available;
- Anticipated period of time that the LV network will remain abnormal;
- Potential impact on security of supply (e.g. Brisbane CBD);
- Extent of HV network configuration required.

### 8.2. Customer Outages

#### 8.2.1. Planned Outages

When work is to be carried out that will require a Customer outage, affected Customers are to receive a Planned Interruption notice 4 full business days before the commencement of the outage (this includes all work up to and including work on the meter).

The following conditions apply:

- This cannot include the day they receive the notification or the day the outage starts;
- It cannot include weekends or public holidays;
- Notifications to include date, time and duration;
- An extra three business days (7 full business days) to be added for notifications delivered via mail;
- All outage information is to be entered into the relevant system;
- Each Customer record will have own 'notification method', 'notification date', and 'notified by' fields.

Notification Parameter	Notification Timing
Latest Customer Notification Date – Mail Method	7 Business Days
Latest Customer Notification Date – Other Method: <ul style="list-style-type: none"><li>• Doorknock</li><li>• Letter drop – Planned Int. Notice</li><li>• Phone</li><li>• Radio</li><li>• Newspaper</li><li>• Email</li><li>• Electronic Notice Board</li></ul>	4 Business Days
Latest Life Support Customer Notification Date – Letter drop <b>ONLY</b>	4 Business Days
Latest Life Support Customer Notification Date – Mail Method <b>ONLY</b>	7 Business Days

Table 2 - Planned Interruption notification timing parameters and delivery methods

## Standard

01455

Version: 2 | Released: 15/12/2016



## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

### 8.2.2. Life Support

If the planned outage includes registered life support Customers, written notification is required. The following delivery methods are deemed written and acceptable for life support notification:

- Letter drop;
- Mail out.

Unless a Notification Waiver (Section 8.2.3) is obtained, a planned outage affecting a registered life support Customer cannot proceed without 4 full business days' written notification.

### 8.2.3. Notification Waiver

Where 4 full business days' notification for a planned interruption is unable to be given, a Customer Notification Waiver [Form 8798](#) can be used if agreed to and signed by the Customer. The waiver covers all Customers, including registered Life Support Customers.

Signing the waiver means that the Customer accepts that supply will be interrupted without 4 full business days' notification. If the Customers don't agree to and sign the conditions of the Waiver, the work will need to be postponed and a new notification with the required 4 full business days' will need to be sent.

The following conditions apply if the waiver is signed before the switching sheet is "Activated":

- Applicant to add additional Customers in A4S;
- Applicant to record unique waiver number in A4S.

The following conditions apply if the waiver is signed on the day of the outage:

- The applicant/field crew to verbally advise that they have the signed waiver from additional Customers;
- The applicant/field crew to enter the waiver into A4S within 5 business days of the job being completed.

If a Customer doesn't sign a waiver and is not a Life Support Customer, the Hub manager is required to authorise the planned outage to proceed.

Customers that are missed or have not been notified (and with no agreed waiver) prior to the outage occurring will be recorded and a NECF breach will be triggered.

### 8.2.4. Breaches

Planned outage notification failures are reportable breaches, and may be subject to civil penalties as per the NECF standard. This includes work that is not completed within the notified outage duration time.



# Standard

01455

Version: 2 | Released: 15/12/2016



positive energy

## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

### 9. Low Voltage Switching Sheets

All switching of LV electrical apparatus including energising new electrical apparatus is to be documented on a switching sheet. The switching sheet is to have:

- A standard format and provide a work location, scheduled dates/times and a detailed description of the work to be carried out;
- A unique “Authorised” reference number generated by A4S;
- An alpha suffix added to the “Authorised” number, when the sheet is hand-written.

#### 9.1. Energising New LV Electrical Apparatus

Where new LV Electrical apparatus is being energised a switching sheet is to be used. The switching sheet is to ensure:

- The electrical apparatus that is to be energised is clearly defined;
- Any electrical apparatus not ready to be energised is to be isolated and left in a safe condition with appropriate safety signs attached. The isolation of the de-energised apparatus is to be checked on the switching sheet, e.g. Check Open, Place DNOB;
- LV apparatus that is associated with non-commissioned HV apparatus (i.e. padmount, pole or ground transformer) is to remain Not Electrically Connected until the non-commissioned HV apparatus is under the control of a HV switching sheet.

#### 9.2. Common Isolation Points

Separate DNOBs are to be placed on common isolation points used for the issuing of separate:

- LV Permits e.g. An LV link that is common to two DPs;
- HV and LV Permits e.g. LV transformer switch that is common to both a DP & AP.

Switching sheets are to be written to direct the placement/removal of the DNOB that pertains to each switching sheet, for example:

- “Check OPEN, Place ADDITIONAL DNOB”;
- “Remove ONE DNOB only”.

Bribie Island Rd Ningi. (Spinnaker Sound)	LV Switch SC260/TR1	Check Open, Place ADDITIONAL DNOB
--	------------------------	--------------------------------------

Figure 4 – Example switching Sheet Item

## Standard

01455

Version: 2 | Released: 15/12/2016



## **OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK**

### **9.2.1. Integrity of Common Isolation Points**

Work performed on LV apparatus that is an isolation point is not to be of a nature that will compromise the integrity of that isolation point. An exception to this is when the isolation point is common to related HV and LV switching sheets.

When it is intended to work on an isolation point common to both an AP & DP:

- The HV and LV applications are to note that the common isolation point is to be worked on/removed/replaced;
- Both switching sheets are to note that the common isolation point is to be worked on/removed/replaced and reference each other.

The common isolation point maintains its integrity as an isolation point when worked on/removed/replaced only when the following conditions are met:

- The work is to be performed by a single work group under the supervision of the Recipient of the AP;
- The Recipient of the AP is also the On-Site Supervisor of the DP;

When the conditions above have been met, the Recipient is to:

- Direct the removal of the DNOBs from the common isolation point for work/removal/replacement;
- Confirm that the common isolation point is returned to its correct state and integrity at the completion of work/removal/replacement and then direct the attachment of the previously removed DNOBs;

The Switching Operator is to ensure:

- The installation and status of the restored common isolation point is correct and that the isolation point provides effective isolation;
- On reversal of either switching sheet the common isolation point is checked open, with 2 DNOBs placed;
- If only 1 DNOB is found, confirm with the Switching Coordinator that the associated switching sheet has removed the additional DNOB.

# Standard

01455

Version: 2 | Released: 15/12/2016



## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

### 9.3. Working on Isolated LV Electrical Apparatus

Prior to working on LV electrical apparatus all electrical persons are to:

- Confirm that the apparatus has been suitably isolated;
- Test to prove de-energised at each place of work, and immediately before each session of work commences.

Permission is required from the On-Site Supervisor when work is to be performed on electrical apparatus that contains an isolation point.

#### 9.3.1. Test to Prove De-energised

Before commencing each session of work, all isolated electrical apparatus within the work area is to be treated as energised until it has been tested to prove de-energised, using an approved device.



Figure 5 – Example switching Sheet item

#### 9.3.2. Other Precautions

Other Precautions are placed in addition to isolation and testing to prove de-energised, and may be provided at the work area to contribute to the electrical safety of the work group.

The placing of Other Precautions:

- To be directed as an item on the LV switching sheet;
- Details of all 'Other Precautions' recorded by Switching Operator in the relevant section of the LV DP/ Fault Finding Permit;
- The On-Site Supervisor may alter or add Other Precautions at the work area to suit the progress of work. These Other Precautions are to be recorded on the relevant DP/ Fault Finding Permit;



Figure 6 – Example switching Sheet item

## Standard

01455

Version: 2 | Released: 15/12/2016



### **OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK**

#### **9.3.3. Sign On**

All members of the work group are to sign on to the LV DP/ Fault Finding Permit and in doing so acknowledge that:

- They understand the purpose and limits of the permit and the apparatus that has been isolated.
- They have been made aware of all potential hazards and associated control measures.
- They will test to prove de-energised at any Worksite within the Work Area.
- They will notify the On-Site Supervisor prior to leaving the Work Area and immediately upon returning to the Work Area.

#### **9.3.4. Transfer of the LV DP/Fault Finding Permit**

If LV DP/ Fault Finding Permit is required to be transferred to another On-Site Supervisor:

- The LVOC is to be advised of the name of the incoming On-Site Supervisor at the time of transfer.
- The incoming On-Site Supervisor is to ensure that all personnel signed on to the permit are made aware of the transfer.
- It is only to be transferred once. If there is a requirement to transfer a second time, the DP/ Fault Finding Permit is to be surrendered and cancelled and new DP/ Fault Finding Permit issued.

#### **9.3.5. Surrender of the LV DP/Fault Finding Permit**

Before a LV DP/ Fault Finding Permit is surrendered, the On-Site Supervisor is to ensure that:

- All members of the work group have signed off the permit, and they have been informed to treat electrical apparatus covered by the permit as energised.
- If members of the work group are not present:
  - a. Record their absence in the permit abnormalities section , and
  - b. Advise absent individuals as soon as practicable that the permit has been surrendered.
- Any required pre-energisation checks/tests have been completed.
- Any abnormalities are listed on the DP/ Fault Finding Permit, e.g. unserviceable electrical apparatus, absent individuals, any pre-energisation checks/tests that failed or were not completed.

When the On-Site Supervisor is satisfied that it is appropriate to do so, they will surrender the LV DP/ Fault Finding Permit and advise the LVOC that the DP/ Fault Finding Permit has been surrendered.

## Standard

01455

Version: 2 | Released: 15/12/2016



---

## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

---

### 9.4. LV Network Abnormalities

In cases where the LV network is left in an abnormal state following work (e.g. placement of voltage ties, cable isolated due to damage/fault, apparatus operating restrictions or changes to the normal LV network configuration), the On-Site Supervisor performing the work is to advise the LVOC of the details of the abnormality including:

- Details of the abnormality/condition e.g. ties closed for Voltage improvement, restricted CFS pillar etc.
- Anticipated time frame before the system will be returned to normal.

The LVOC who is advised of any abnormalities is to ensure the:

- Details of these abnormalities are entered into the A4S Network Abnormality System.
- HV Switching Coordinator is advised of any LV network abnormalities which may have an effect on the operation of the HV network (e.g. LV ties across feeders, distribution transformers tied together).
- Escalation of the abnormality in situations where it is deemed that the abnormality poses an unnecessary risk to the network (e.g. LV ties across zones) is managed.

# Standard

01455

Version: 2 | Released: 15/12/2016



positive energy

## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

### 10. Works involving Low Voltage and High Voltage

All LV apparatus within the work area is to be tested to prove de-energised prior to the issue of any permit.

#### 10.1. HV switching required for LV work

If HV isolation is required for LV work, then a HV switching sheet may be used to issue the permit required to perform the work. The highest voltage of exposed electrical apparatus that will be encroached upon determines the permit type i.e.

- AP required for exposed HV electrical apparatus.
- DP required for exposed LV electrical apparatus.

#### 10.2. Combinations of HV and LV Switching

Any reconfiguration of the LV network requires a separate LV Switching Sheet.

**Note:** The closing and opening of LV ties as part of a HV switching sheet for the purpose of tying in a transformer, checking open LV tie points or checks/tests on the LV network resulting from HV works does not constitute reconfiguration of the LV network.

**Note:** Where clarification is required regarding combination of HV & LV switching a HV Outage Coordinator can determine if the LV switching can be incorporated into a HV switching sheet. i.e. separate HV and LV switching sheets or combined HV/LV switching sheets.

The following table is used to illustrate the principles:

Scenario	Example(s)	LV switching sheet (DP for LV works)	HV & LV Combined switching sheet (all work performed under an AP)
Work performed requires specific LV tests at other locations on the LV network as a result of the LV works	Replace HV Pole with LV cross-check (requires specific testing i.e. phase-out)	Yes	No
Work performed at a site requiring the interruption of an entire Transformer LV area	1. Replace Pole Transformer/Pole	Optional	Yes
	2. Re-conductor 11 kV mains at various sites with de-energised LV mains below that aren't being worked on		

# Standard

01455

Version: 2 | Released: 15/12/2016



positive energy

## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

Scenario	Example(s)	LV switching sheet (DP for LV works)	HV & LV Combined switching sheet (all work performed under an AP)
Work performed at a site requiring the partial interruption of a Transformer LV area	<ol style="list-style-type: none"> <li>1. Replace Pole Transformer/Pole</li> <li>2. Replace Padmount transformer</li> </ol>	Yes	No
Different HV and LV sites	<ol style="list-style-type: none"> <li>1. Replace Pole Transformer/Pole and install LV protection on the adjacent poles</li> </ol>	Yes	No
	<ol style="list-style-type: none"> <li>2. Replace Pole Transformer/Pole and LV Poles at different sites with straight through construction* e.g. pin or shackle construction with no transposition bridging and/or no bridging to fuse/ link switches i.e. No LV tests at other locations on the LV network required</li> </ol>	Optional	Yes
	<ol style="list-style-type: none"> <li>3. Replace Pole Transformer/Pole and Re-conductor an LV Area that has no LV Ties and all testing resulting from the work is completed under established work practices/procedures and is not required in the switching sheet*</li> </ol>		
Work performed at a site with the LV area supplied by another transformer outside the HV isolation.	Replace HV/LV Pole	Yes	No

Table 3 - HV and LV switching scenarios

\* Due to combined works being performed under an AP, the Recipient is to be capable of fulfilling their responsibilities as per SAHV procedures i.e. Supervise Electrical Safety at all work areas.

# Standard

01455

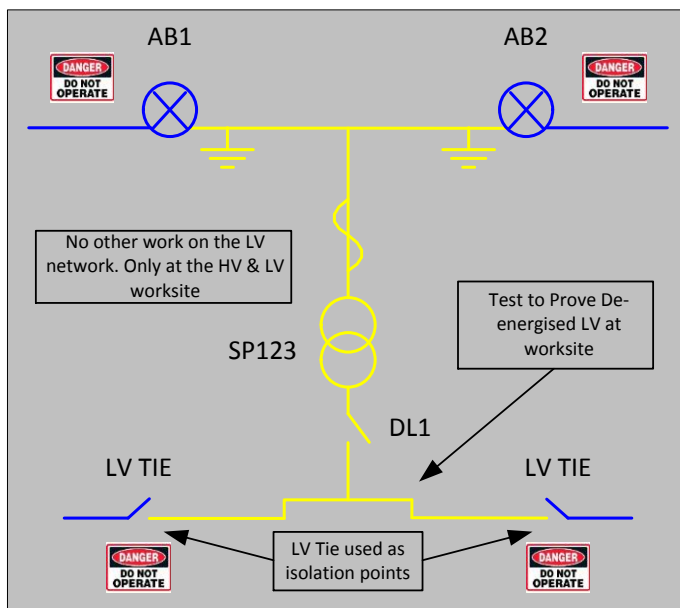
Version: 2 | Released: 15/12/2016

## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

**Note:** A HV application nominating apparatus on the LV network as isolation points is not to be submitted unless the status of the LV network has been confirmed on-site. An application will not be processed unless the isolation points nominated on that application have been confirmed as field checked.

The following figures are used to illustrate the principles for separate and combined HV and LV switching:

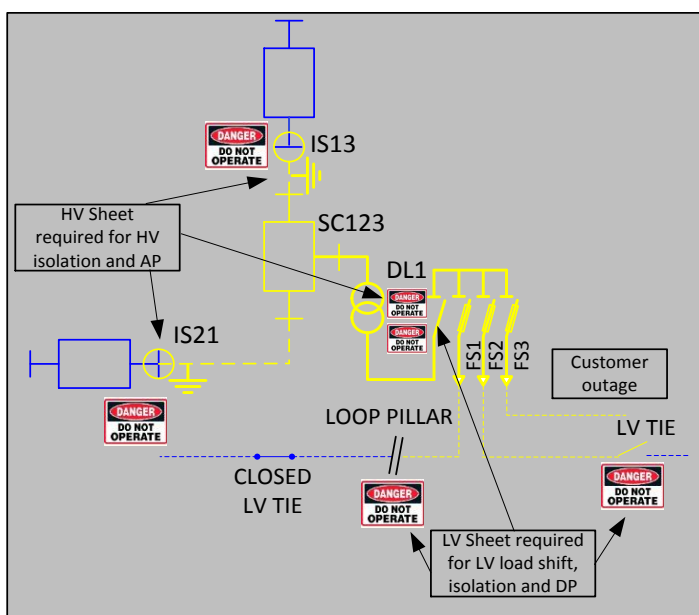
### Combined HV and LV switching sheet



Replace Pole Transformer SP123 and Pole Interruption to the entire Transformer SP123 LV area. AP for 11 kV Transformer SP123 only i.e. No LV tests at other locations on the LV network required.

Figure 7 - Combined HV and LV switching sheet

### Separate HV and LV switching sheets UG



Replace Padmount Transformer SC123 with a partial interruption to SC123 LV area.

AP for 11 kV apparatus at SC123 with DNOBs placed on SC123 LV Transformer switch and other relevant 11 kV isolation points. DP for LV apparatus at SC123 with DNOBs placed on SC123 LV Transformer switch and other relevant LV isolation points.

Figure 8 – Separate HV and LV switching sheets UG



# Standard

01455

Version: 2 | Released: 15/12/2016



positive energy

## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

### Separate HV and LV switching sheets OH

Replacing HV/LV P123 with the LV area supplied by another transformer outside the required HV isolation.

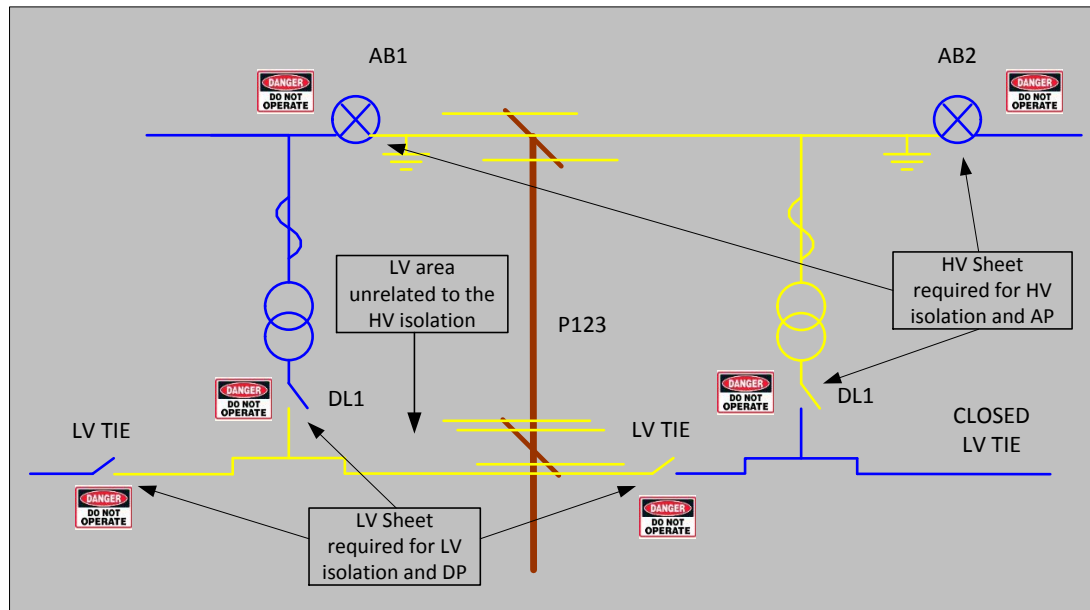


Figure 9 - Separate HV and LV switching sheets OH

**Note:** Table 3 - HV and LV switching scenarios and the illustrated examples do not cover every situation that may arise. Where there is ambiguity regarding combination of HV & LV switching sheets outside of these scenarios, the HV Outage Coordinator can determine if the LV switching can be incorporated into a HV switching sheet. i.e. separate HV and LV switching sheets or combined HV/LV switching sheets.

#### 10.2.1. Interfacing HV and LV Switching sheets

When there is a requirement for separate HV and LV switching sheets, they are to be carried out in a critical sequence in regards to each other. It must be ensured that:

- Both HV and LV applications are cross-referenced to each other in the remarks of the associated applications.
- Both HV and LV applications nominate which sheet is to commence first in the forward and reverse switching.
- Both HV and LV switching sheets cross-reference the associated application at the start of the forward and reversal.
- Switching sheets, where required cross-reference other associated switching sheets at critical stages.

# Standard

01455

Version: 2 | Released: 15/12/2016



positive energy

## OPERATING PRACTICES - WORKS INVOLVING THE ENERGEX LOW VOLTAGE NETWORK

### 10.2.2. DNOBs left on LV Transformer Switches Following HV Works

The HV switching sheet is to leave the LV Transformer switch Open and a DNOB placed, in situations where a Distribution Transformer has been constructed and energised up to the Transformer LV switch and:

- Further LV works must be completed before the LV Transformer switch can be safely closed or;
- There is no LV switching sheet controlling the LV Transformer switch (the switching is controlled by a single DNOB placed by the HV sheet)

An example of a suitable item on the HV switching sheet reversal may be:

SP777479<PSP777479> GITTINS RD WITHCOTT	LV Switch / Fuse TR1	LV Sheet to Remove DNOB, Close
--	-------------------------	-----------------------------------

Figure 10 - Reverse HV switching item for Pole Transformer

Once the LV switch has been left Open with DNOB Placed, ensure that:

- Before work commences on the LV area the LV switch is checked Open and that a DNOB has been placed.
- When the LV works are completed and ready to be energised an LV switching sheet can direct the DNOB to be removed and the switch closed.