

# Access for Work on Low Voltage and Mechanical Apparatus

## Summary

This document supports the Power System Safety Rules and its requirements assembled under Work on Low Voltage (LV) and Mechanical (MECH) Apparatus - Category 4.

It applies to the issue, suspension, transfer and cancellation of Low Voltage and Mechanical Access Authorities for work on Low Voltage and Mechanical power system apparatus.

## Document Control

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<b>Process owner:</b>	Head of Health, Safety and Environment				
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# 1. Purpose

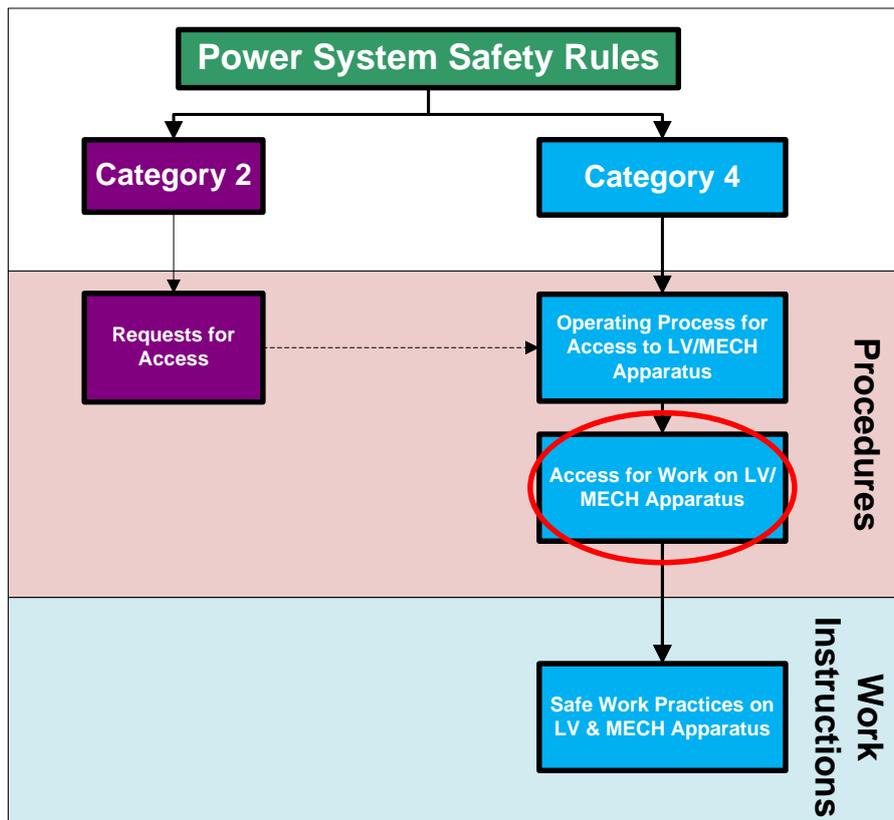
This document supports the Power System Safety Rules and its requirements assembled under Work on Low Voltage (LV) and Mechanical (MECH) Apparatus - Category 4.

# 2. Scope

This procedure applies to the issue, suspension and cancellation of LV/MECH access authorities for work on Low Voltage and Mechanical power system apparatus.

## 2.1 Document Location

This diagram shows the location of this document in the PSSR supporting document structure.



# 3. Definitions

Term	Definition
Low Voltage and Mechanical Apparatus	<p>Apparatus that falls within the scope of apparatus in the charge of a Controller Power System Safety Rules section 4.1. Such apparatus could affect operation of the High Voltage (HV) power system because:</p> <ul style="list-style-type: none"> <li>(a) It is capable of causing operation of HV apparatus (for example: trip or prevent tripping of circuit breakers).</li> <li>(b) It could affect the operation of HV apparatus (for example: cause or prevent tap changing of transformer);</li> <li>(c) It requires an outage of HV apparatus for safety of staff. This includes situations where work is to be carried out under an Access Authority on low</li> </ul>

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Term	Definition
	<p>voltage/mechanical apparatus, but access to high voltage exposed conductors is not required.</p> <p>LV or mechanical apparatus includes the following equipment where such equipment affects the operation of the high voltage system or operating facilities:-</p> <ul style="list-style-type: none"> <li>• Alarm and metering circuits and equipment</li> <li>• Automatic generation control (AGC) equipment</li> <li>• Load shedding equipment of any description</li> <li>• Automatic voltage control equipment (on generating units, synchronous condensers, transformers and static compensators)</li> <li>• Auxiliary transformers and auxiliary supplies</li> <li>• Fire protection equipment associated with HV apparatus or LV apparatus (E.g. Deluge Systems)</li> <li>• Intertrip protection signalling equipment</li> <li>• LV or mechanical apparatus requiring HV apparatus out of service to provide personal safety requirements for the LV or mechanical work</li> <li>• LV or mechanical apparatus, which, if withdrawn from service, would preclude the associated HV apparatus staying in service</li> <li>• Protection relays and associated circuitry</li> <li>• Signalling controls instrumental to the operation of HV or LV apparatus</li> <li>• Supervisory control and monitoring equipment of any description (E.g. SCADA)</li> <li>• Equipment associated with provision of sustained auxiliary supplies</li> <li>• HV equipment ancillary apparatus such as: cooling system fans and pumps; tap changer motors; performance monitoring facilities etc.</li> </ul> <p>Any other Low Voltage or Mechanical apparatus is regarded as apparatus not in the charge of a controller and for which PSSR Section 3.1.3 applies and is outside the scope of this procedure.</p> <p>If unsure of whether LV apparatus falls into the category of being in the charge of a controller, contact Network Operations staff for clarification.</p>
Serviceable	<p>When an Access Authority is suspended, serviceable indicates that the apparatus could be returned to service if required by Network Operations.</p> <p>When cancelling an Access Authority, serviceable indicates whether your portion of the work has been completed successfully. Where this is a single portion of a structured series of outages cancelling serviceable does not necessarily mean that the apparatus would be suitable for return to immediate service.</p>

## 4. Introduction

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The issue of a LV/MECH Access Authority is required before work is commenced on any Low Voltage and Mechanical apparatus in the charge of a Controller.

A LV/MECH Testing Access Authority is required when the modification of some or all safety isolations are required for the work on the LV/MECH apparatus in the charge of a Controller.

The apparatus shall be made safe for work and a LV/MECH or LV/MECH Testing Access Authority shall be issued in accordance with Section 4 of the Power System Safety Rules.

This document covers the sequence required to safely issue a LV/MECH or LV/MECH Testing Access Authority and the sequence required after completion of work for cancellation of a LV/MECH or LV/MECH Testing Access Authority.

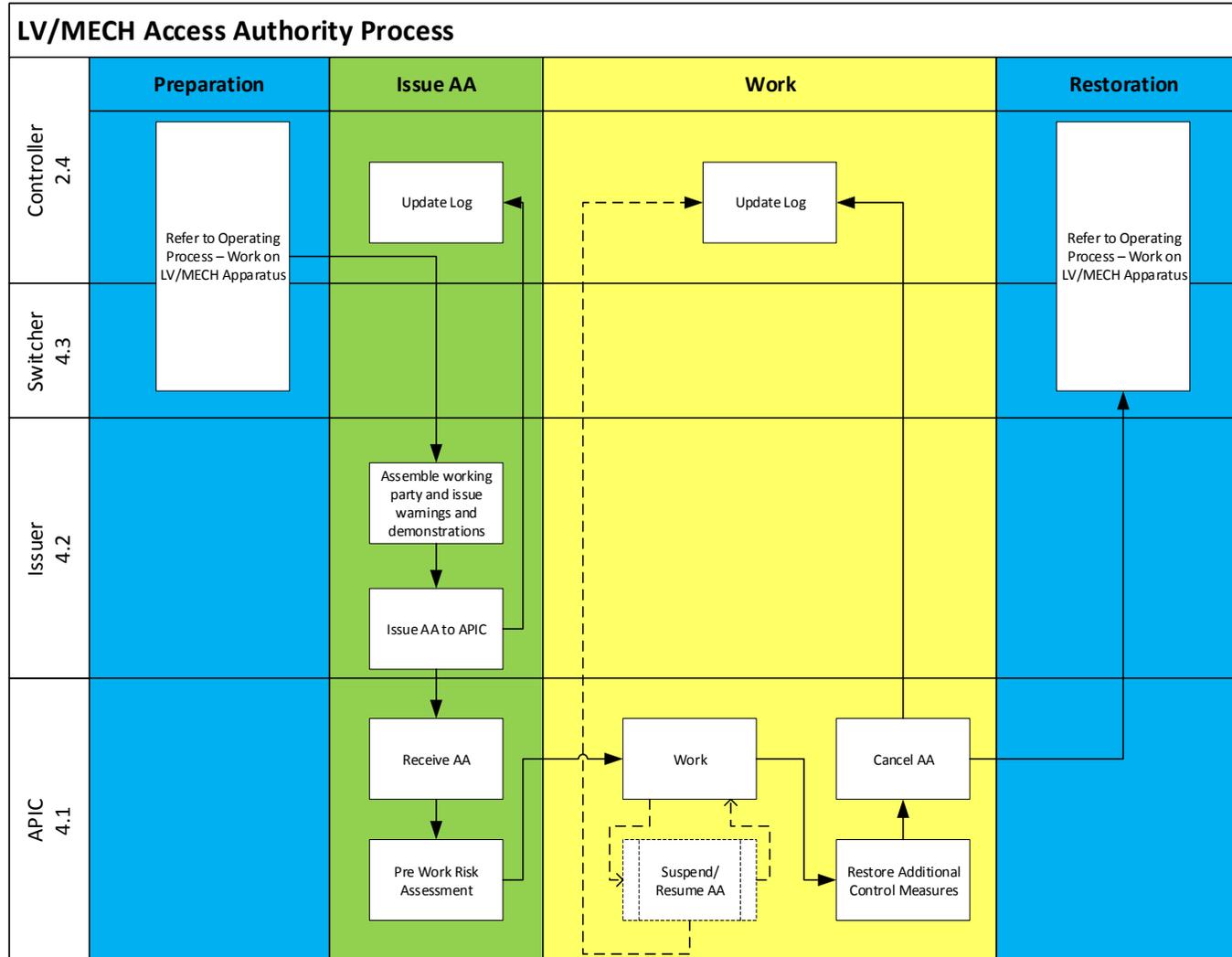
This document should be read in conjunction with 'Operating Process for Access to Low Voltage and Mechanical Apparatus', which covers the generic sequence for preparation and restoration of Low Voltage and Mechanical apparatus and 'Safe Work Practices on Low Voltage and Mechanical Apparatus' which describes the hazards and controls associated with work on Low Voltage and Mechanical apparatus.

### 4.1 Special usage of LV and Mechanical Access Authorities

LV/MECH Access Authorities are also utilised in two special cases to provide access to perform work where the HV asset requires isolation for contingency safety reasons but where there is no requirement to come on or near the HV exposed conductors to perform the work. These situations are as follows:

- An LV/MECH Access Authority is used to perform work on HV substation equipment where the work does not require the worker to come on or near but where to manage a contingency risk the HV apparatus is isolated only. E.g. CT oil sample to manage the contingency of the CT losing excessive oil during the sample and therefore compromising its insulation.
- An LV Access Authority is used to perform work on HV Transmission Cables where the Cable is isolated only. For more information refer to Safe Work Practices on HV Transmission Cables.

## 5. LV/MECH Access Authority Process



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## 5.1 Preparation

Step	Safety Rules Authorisation	Task	Comment	Reference Document
1	4.3	Carry out the Low Voltage and Mechanical Preparation and Restoration Instruction (LVMPRI) up to the point of issue of the LV/MECH Access Authority		Operating Process for Access to LV/MECH Apparatus

## 5.2 Issue LV/MECH Access Authority

Step	Safety Rules Authorisation	Task	Comment	Reference Document
5	4.2	Assemble the working party. Issue warnings and demonstrate isolations to all staff involved in work.		
6	4.2	Issue LV/ MECH Access Authority to Authorised Person in Charge (APIC).	Advise controller of Access Authority recipient if you have not already done so.	PSSR - Section 4.2
7	4.1	Receive LV/MECH Access Authority	Operational control is now with the APIC.	PSSR - Section 4.1
8	4.1	Pre-Work Risk Assessment PWRA	All members of the work party to participate	Safe Work Practices on LV/MECH Apparatus

## 5.3 Work

Step	Safety Rules Authorisation	Task	Comment	Reference Document
1	4.1	Work.		PSSR - Sect 4.1
2	4.1	At completion of work remove any additional control measures implemented in the PWRA.		
3	4.1	Cancel LV/MECH Access Authority	If the person holding the LV/MECH AA is not authorised category 4.3 they shall	

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Step	Safety Rules Authorisation	Task	Comment	Reference Document
		(serviceable/unserviceable).	ensure that arrangements have been made for the restoration of the LV/MECH apparatus. They shall communicate these arrangements to the Controller when they cancel the LV/MECH Access Authority.	

#### 5.4 Restoration

Step	Safety Rules Authorisation	Task	Comment	Reference Document
1	4.3	LVMPRI restoration		Operating Process for Access to LV/MECH Apparatus

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## 6. Low Voltage and Mechanical Access Authority

### 6.1 Preparation of a LV/MECH Access Authority

The LV/MECH Access Authority is normally printed to the relevant substation switching printer by the Controller, blank Access Authorities are also supplied in book form. The LV/MECH Access Authority shall be prepared for issue by filling in details as shown in the following examples:

- Detail of Work**

The numbers of the Request for Access (RFA) and the LV/MECH Access Authority (issued by the Controller) shall be entered in the spaces provided.

The description of apparatus and description of work entered shall be identical to the relevant details on the associated RFA.

1. Detail of Work			
Location / Call Sign:	RFA Number:	HV PRI Number:	Access Authority No.:
Canberra	2015-965		135024

	Description of Apparatus:	Description of Work:	Access Given (“X” appropriate boxes)
High Voltage			<input type="checkbox"/> HV <input checked="" type="checkbox"/> LV/Mech <input type="checkbox"/> Field <input type="checkbox"/> Cable <input type="checkbox"/> Testing - HV <input type="checkbox"/> Testing – LV/Mech <input type="checkbox"/> Testing - Cable
LV / Mechanical	Parallel Operation Panel 34	Replace faulty relay	

- Status of Apparatus at Start of Work**

The issuer of the LV/MECH Access Authority shall delete all of the listed options that are NOT applicable at the time of issue.

2. Status of Apparatus at Start of Work (delete conditions not applicable)	
Above HV apparatus is:	In-service / <del>off load</del> / <del>de energised</del> / <del>isolated</del> / <del>earthed</del> / <del>disconnected</del>
Above LV/Mech apparatus is:	<del>In-service</del> / <del>serviceable</del> / <del>out of service</del> / <del>isolated</del> / <del>earthed &amp; short circuited</del> / <del>discharged</del>
LV/Mech isolations (LVMPRI/PMWI):	2015-965/1

### 6.2 Warnings and Demonstrations

The person issuing the LV/MECH Access Authority shall give relevant warnings and record these on the [Access Authority Warning form – LV/MECH](#) and sign the form with the understanding that the work party have been made aware of the hazards. The Access Authority Warning form – LV/MECH, shall be attached to the LV/MECH Access Authority when it is issued.

The person issuing the LV/MECH Access Authority shall demonstrate to the work party all points of isolation and control that have been tagged to make the apparatus safe for work.

## 6.3 Issuing a LV/MECH Access Authority

The LV/MECH Access Authority shall be issued in accordance with the requirements of the PSSR section 4.2. The Access Authority form is to be completed by filling in details as shown in the following example:

The necessary demonstrations and warnings have been given to the person receiving this Access Authority				
Warning and Hazard Form No.:	Name	Signature	Time	Date
2015-965	A. Fortoo	A. Fortoo	0750	10/7/15

Once the entire work party has been given the warnings and demonstrations required by the PSSR, the LV/MECH Access Authority will be issued to the Authorised Person In Charge (APIC), who then has operational control of the apparatus listed on the LV/MECH Access Authority and is responsible for the safety of persons working under the LV/MECH Access Authority. The work party will then sign on to the LV/MECH Access Authority. Once all of the work party has signed on, the APIC shall rule a line across the signature section, confirming that everyone above the line has received the warnings and demonstrations from the Issuer.

3. Persons required to work on this Access Authority							
I understand the warnings and/or demonstrations given and my responsibilities under this Access Authority							
SIGN ON				SIGN OFF			
a) Person to whom this Access Authority is issued or transferred				I understand that Access under this Authority has been suspended			
Name	Signature	Time	Date	Signature	Serviceable	Time	Date
A. Forum	A. Forum	0750	10/7/15		Y <input type="checkbox"/> N <input type="checkbox"/>		
					Y <input type="checkbox"/> N <input type="checkbox"/>		
					Y <input type="checkbox"/> N <input type="checkbox"/>		
b) Other persons allocated to work on this Access Authority							
Name	Signature	Time	Date	Signature	Time	Date	
S. Body	S. Body	0750	10/7/15				
S. Else	S. Else	0750	10/7/15				
<hr/>							

The LV/MECH Access Authority shall be held and retained on site by the APIC.

Additional persons may become part of a work party after the LV/MECH Access Authority has been issued, provided they are given appropriate warnings and demonstrations by the APIC.

**Note:** The LV/MECH Access Authority number is entered on any additional signature sheets. The details of signature sheets shall be included on the LV/MECH Access Authority form as shown in the example below:

If space insufficient continue overleaf
Access Authority Additional Signature Sheet Number(s): 01

## 6.4 Responsibilities of the Person Receiving a LV/MECH Access Authority

### 6.4.1 General

The person receiving the LV/MECH Access Authority is the Authorised Person in Charge (APIC) of the Access Authority. They are responsible for compliance with the requirements of the Access Authority.

The responsibilities of the APIC set out in section 4.1.4 to 4.1.9 of the PSSR.

Where the Access Authority is a LV/MECH Testing Access Authority, additional requirements are set out in section 4.1.10 of the PSSR.

**Note:** Where the apparatus is required operational at the start of work (IS type LVMPRI – See Operating Process for Access to LV/MECH apparatus), some LV/MECH apparatus will be operational when the Access Authority is issued. The APIC is responsible for ensuring that once the initial testing is complete, the apparatus is made safe prior to workers accessing.

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## 6.4.2 Pre-Work Risk Assessment

Prior to commencement of work under a LV/MECH Access Authority, the APIC shall, in conjunction with all other members of the work party, identify any hazards associated with the work and take appropriate additional control measures, as required by the relevant Safe Work Practices, Safe Work Method Statement (SWMS) and Pre-Work Risk Assessment forms for the equipment.

## 6.4.3 Additional control measures

The person receiving the LV/MECH Access Authority shall apply additional control measures as follows:

(a) Co-ordination with other Work Parties

When there are multiple work parties, each Access Authority recipient shall ensure that their work is coordinated with that of the other parties. Coordination arrangements shall be endorsed on the Access Authority Warning form for each Access Authority.

(b) Restoration of additional control measures

On completion of the work, the authorised person holding the LV/MECH Access Authority shall ensure the apparatus is left in a condition that allows the restoration steps of the LVMPRI to be carried out without alteration, provided it is safe to do so. If this is not possible, it shall be noted that on the LV/MECH Access Authority whether the apparatus is or is not serviceable and the controller shall be notified.

When the apparatus is to remain out of service pending the issue of a new LV/MECH Access Authority for further work then, provided all LVMPRI requirements remain unaltered the additional control measures may be left in place in readiness for the issue of a further LV/MECH Access Authority.

**Note:** If the LVMPRI(s) includes Warning Tagged isolations, the Access Authority Number on the warning tags will have to be updated by the issuer of the new LV/MECH Access Authority.

(c) Safe Work Area

The safe work area should be identified. Consider the use of barriers and/or signage to assist with delineating the extent of the work area. Details of how to assess the work area and implement controls to define the work area are detailed in section 4.3 of 'Safe Work Practices on Low Voltage and Mechanical Apparatus'.

## 6.5 Suspension and Resumption of a LV/MECH Access Authority

When work under a LV/MECH Access Authority ceases, and it is intended to resume work under the same LV/MECH Access Authority, then the LV/MECH Access Authority shall be suspended. All staff shall sign off the LV/MECH Access Authority and the APIC shall indicate whether or not the apparatus is serviceable as far as their work is concerned and inform the Controller of the details of the suspended LV/MECH Access Authority.

3. Persons required to work on this Access Authority							
I understand the warnings and/or demonstrations given and my responsibilities under this Access Authority							
SIGN ON				SIGN OFF			
a) Person to whom this Access Authority is issued or transferred				I understand that Access under this Authority has been suspended			
Name	Signature	Time	Date	Signature	Serviceable	Time	Date
A. Forun	A. Forun	0750	10/7/15	A. Forun	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	1600	10/7/15
					Y <input type="checkbox"/> N <input type="checkbox"/>		
					Y <input type="checkbox"/> N <input type="checkbox"/>		
b) Other persons allocated to work on this Access Authority							
Name	Signature	Time	Date	Signature	Time	Date	
S. Body	S. Body	0750	10/7/15	S. Body	1600	10/7/15	
S. Else	S. Else	0750	10/7/15	S. Else	1600	10/7/15	

Before resuming work under a LV/MECH Access Authority that has been suspended, the APIC shall:

- (a) Obtain clearance from the Controller,
- (b) Confirm the identity of the apparatus;
- (c) Verify that the conditions of the LV/MECH Access Authority covering the apparatus are still valid;
- (d) Complete the resumption details on the Access Authority;
- (e) Ensure all members of the work party shall sign on the LV/MECH Access Authority; and
- (f) Give appropriate warnings and demonstrations to any person not signed on to the LV/MECH Access Authority prior to its suspension.

**Note 1:** If the APIC is not the same person who held the original LV/MECH Access Authority, then the requirements of the PSSR section 4.1.5 for transferring a LV/MECH Access Authority shall be followed.

### 6.6 Issuing of a LV/MECH Testing Access Authority

The requirements listed above for LV/MECH Access Authorities are generally applicable to LV/MECH Testing Access Authorities.

A LV/MECH Testing Access Authority is required when the modification of some or all the safety isolations are required for the work and shall be issued in accordance with the general requirements of the Power System Safety Rules section 4.2.3.

The Authorised Person issuing a LV/MECH Testing Access Authority shall:

- (a) Ensure that any current Access Authorities relevant to the equipment under test are suspended or cancelled and all staff are signed off;
- (b) Appropriate instructions, warnings and demonstrations are given to the Authorised Person in Charge, including reference to the testing permitted as detailed on the RFA;
- (c) Ensure that the recipient of the LV/MECH Testing Access Authority is authorised category 4.1.

A LV/MECH Testing Access Authority may be suspended, but during a period of suspension no person shall be permitted to work on the apparatus covered by the LV/MECH Testing Access Authority. Any LV/MECH Testing Access Authority must be cancelled before work is permitted to proceed or resume under any other Access Authority on the apparatus. This is to ensure that safe working conditions have been restored before work is resumed under any other Access Authority.

It is the responsibility of the person in receipt of a LV/MECH Testing Access Authority to ensure that all conditions and isolations changed by them under the LV/MECH Testing Access Authority are restored prior to suspension or cancellation of the LV/MECH Testing Access Authority.

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## 6.7 Responsibilities of persons working under a LV/MECH Access Authority

The responsibilities of persons working under a LV/MECH Access Authority are set out in section 4.1.3 of the PSSR.

## 7. Cancellation of a LV/MECH Access Authority

On completion of work, the LV/MECH Access Authority shall be cancelled by the APIC. All staff shall sign off the LV/MECH Access Authority. The APIC shall:

- (a) Ensure the removal any additional control measures (See section 6.4.3(b));
- (b) Indicate whether or not the apparatus is serviceable as far as their work is concerned; and
- (c) Inform the Controller of the details of the cancelled LV/MECH Access Authority.

4. Cancellation of Access Authority					
As far as the above is concerned, this Access Authority is cancelled and the System Controller has been notified of any warnings/adjustments.					
<i>Working Earths removed</i>	<i>Apparatus Serviceable</i>	<i>Name</i>	<i>Signature</i>	<i>Time</i>	<i>Date</i>
Y <input type="checkbox"/> N <input type="checkbox"/>	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	A. Forun	A. Forun	1602	10/7/15
PT21112/003581485					

## 8. Accountability

Title	Responsibilities and Accountabilities
Head of HSE	Ownership of this procedure
PSSR Manager	Maintenance of this procedure
Manager – Training	Implementation of training programs associated with this procedure
Authorised persons	Comply with this procedure

## 9. Implementation

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

## 10. Monitoring and Review

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

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

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## 11. Change from previous version

Revision no	Approved by	Amendment
0	Lionel Smyth, EGM/Network Services & Operations	<ul style="list-style-type: none"> <li>&gt; Replaces in part documents 'Operating Requirements – General' GD SR G2 005; Operating Requirements -Work On System Low Voltage and Mechanical apparatus - GD SR G2 012; and 'Operating Requirements - Local Safety Precautions' GD SR G2 007.</li> </ul>
1	Lionel Smyth, EGM/Network Services & Operations	<ul style="list-style-type: none"> <li>&gt; Deleted Attachment 'A'</li> <li>&gt; Added hyperlink to 'Warning and Hazard Assessment Form – LV/MECH</li> </ul>
2	K McCall, Manager Health, Safety & Environment	<ul style="list-style-type: none"> <li>&gt; LV/MECH Access Authority section updated.</li> <li>&gt; Revised accountability for this work instruction.</li> <li>&gt; Reference to Access Authority updated to LV/MECH Access Authority or LV/MECH Testing Access Authority where relevant.</li> </ul>
3	M Gatt, EM Works Delivery	<ul style="list-style-type: none"> <li>&gt; Procedure updated to new procedure template.</li> <li>&gt; Definitions added.</li> <li>&gt; Reference to Safe Work Practices on LV &amp; Mechanical Apparatus and LV/MECH Testing AA's added to the introduction.</li> <li>&gt; Section 4.1 added.</li> <li>&gt; Section 6.4.1 added to improve linkage from this procedure to all APIC responsibilities in the PSSR. Added note to highlight the need for the APIC to manage subsequent isolation of LV/MECH apparatus not isolated at the time of Access Authority issue.</li> <li>&gt; Section 6.2 – Retitled to Warnings and Demonstrations and requirements for demonstration of isolations added. Similar changes added to section 5.2 step 2.</li> <li>&gt; Section 6.4.2 – Two paragraphs relating to co-ordination when work parties are affected by each other's isolations were removed.</li> <li>&gt; Section 6.4.3 – Point (c) added</li> <li>&gt; Section 6.5 minor amendment to clarify when the resumption section of the AA form is to be completed.</li> <li>&gt; Section 6.6 (b) rewritten</li> <li>&gt; Section 6.7 added for completeness.</li> <li>&gt; Section 7 updated to clarify requirements when the APIC is not authorised category 4.3. Similar changes shown in section 5.3 step 3.</li> </ul>

## 12. References

- > Power System Safety Rules
- > Operating Process – Work on Low Voltage or Mechanical Apparatus
- > Safe Work Practices on Low Voltage and Mechanical Apparatus

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## 13. Attachments

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Nil.