

		<h1>Working with Extra Low Voltage (ELV)</h1>
<h2>Procedure</h2>		
Issue: D	ID: QP24-65	

1. Purpose and Scope

The purpose of this procedure is to detail appropriate control measures for work on Extra Low Voltage.

This procedure applies to all workers employed or engaged by Snowy hydro to work on extra low voltage installations/equipment. Personnel following this procedure are in compliance with SHL Life Saving Rules.

2. Activity Description

2.1. Extra Low Voltage Installations

AS 3000 defines that there are 3 kinds of ELV. If the ELV is Separated Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV) then no special precautions need exist as they are "safe to touch".

Separated extra-low voltage (SELV) - An extra-low voltage system that is electrically separated from earth and from other systems in such a way that a single fault cannot give rise to the risk of electric shock.

Protected extra-low voltage (PELV) - An extra-low voltage system that is not electrically separated from earth, but that otherwise satisfies all the requirements for SELV.

To be SELV or PELV (safe to touch) the source supplying the installation must be one of the following:

- A safety isolating transformer complying with AS/NZS 61558.
- A "source of current " independent of a higher voltage supply, such as an Engine-driven generator, or an electrochemical source, such as a battery.
- A "source of current" separated from higher voltage electrical installations, such as a motor-generator set, with electrically separate windings having a degree of electrical separation equivalent to that required by item
- Certain electronic devices complying with appropriate Standards, where, in the case of an internal fault, the voltage at the output terminals cannot exceed extra-low voltage. Higher voltages at the output terminals may be used, provided that the voltage at the output terminals is immediately reduced to extra-low voltage if contact is made with live parts under normal or fault conditions.

Such devices include insulation testing equipment.

2.2. Not complying with PELV and SELV requirements

Where an electrical installation operates at extra-low voltage but does not comply with the SELV or PELV requirements of AS/NZS 3000:2007 (section 7.5.1 p305), it must be treated as if it were operating at low voltage and SP24-67 Working on or near Low Voltage Installations /Equipment must be followed.

2.3. Safe Work Practices with SELV and PELV.

Prior to commencing work on SELV and PELV apparatus it will be necessary to confirm the equipment is compliant with the SELV or PELV requirements and a Hazard / Risk Analysis carried out to identify if any of the Hazards identified below exist and if additional controls are required. If additional controls are required then it must be treated as if it were operating at low voltage and SP24-67 Working on or near Low Voltage Installations /Equipment must be followed.

2.4. Hazards

The impedance of the human tissue generally determines the amount of electric current that can flow through human tissue, at a particular voltage.

The key factors determining the severity of the electric shock are:

- the impedance of the human tissue, which can vary due to:
 - gender;
 - individual biology types;
 - climatic conditions;
 - substances consumed, etc, (AS/NZS 60479. 2002. p. 5.);
- the pathway taken by the current through the body;
- the magnitude of the current;
- the conductor surface area in contact with the human tissue; and
- the current density and duration of current flow (AS/NZS 60479. 2002. p.6.)

When working with SELV or PELV these factors need to be considered when determining the risk levels and consequential controls.

3. Accountabilities

Nil

4. Retained Information

Nil

5. Associated Documentation

Nil

6. Revision History

Date	Issue Original, A, B ...	Description What has been changed and why?	Record of Review Who has been involved?
8.4.22	D	Formatting changed, no update to content	Amy Grose, Drew Twigg