

	
<h1>Snowy Technical Standards</h1>	
<b>SHL-ELE-156 (O)</b>	<b>Annexure O - Asset Identification Requirements General Low Voltage Electrical Requirements</b>
<b>Subject Matter Expert</b> <i>Kapila Nanayakkara</i> <i>Principal Electrical Engineer</i>	Version Date: 1 January 2017
	Revision: <i>Original</i>

This annexure forms part of the General Low Voltage Electrical Requirements Standard ([SHL-ELE-156](#)).

## 1. Scope

This Annexure sets out the requirements for Asset Identification.

Assets must be identified and labelled conforming to the [General Electrical Requirements](#) and this Annexure.

All labelling must be provided to clearly identify all key components and equipment as reference for operation and maintenance documentation and activities.

### 1.1. Applicable Standards

The design, manufacture and testing of equipment and components detailed in this annexure must comply with the requirements of all relevant Australian Standards or in the absence of appropriate Australian Standards, with relevant IEC, ISO or International Standard, together with the requirements of competent authorities having jurisdiction over all or part of the manufacture, installation or operation of the equipment, except where modified by this specification.

All works must comply with the requirements of the most recent releases of the regulations and standards noted in Snowy Standard [SHL-ELE-156](#). In the event of a conflict between different Codes, Standards or Regulations, the highest requirement must apply.

## 2. Technical Requirements

### 2.1. Identification Schemes

Due to the history of Snowy Hydro and the diverse range of generation assets, both Kraftwerk Kennzeichensystem (KKS) and ANSI asset identification schemes are used.

#### 2.1.1. KKS

KKS is an identification scheme designed to clearly identify all plant items in power plants. The identification scheme is designed to indicate the items purpose, type and location. It extends from large items such as control rooms or pumps down to individual IO signals.

Sites that utilise the KKS identification scheme will have a site specific KKS standard that details how the KKS standard is to be applied.

#### 2.1.2. ANSI

The ANSI identification system was developed by the American National Standards Institute. This identification system is typically used on the hydro-generators sites. SHL drawing set D-GEN-2-22 outlines the application of

the ANSI numbering system for sites utilising it.

## 2.2. Equipment labels

### 2.2.1. General

The labels must be permanently fixed to or immediately adjacent to the equipment so that they are clearly visible from the normal access position. Where the visibility and functionality of the labels is not reduced by fixing to a permanent structure adjacent to the equipment (i.e. a wall), this location must be used.

Fixing must be by mechanical means (i.e. zinc plate steel screws, stainless steel cable ties). Gluing or double sided tape must not be used except with approval by SHL.

The labels must have the following layout and include the following information:

- Unit number: eg, UNIT 4
- System: GOVERNOR PUMPING SET
- Sub-system (if appropriate): eg, UNLOADER 'A'
- Description which identifies the item and its purpose

Refer to SHL document E-GEN-194-13 for further details for styles and sizes for characters on engraved labels.

### 2.2.2. Indoor labels

All indoor labels must be engraved in plastic laminate composed of white and black layers so that there are black letters of not less than 4mm high on a white background.

### 2.2.3. Outdoor labels

Outdoor labels must be stainless steel matt finish, with engraved letters not less than 4 mm, filled with black paint.

### 2.2.4. Valve labels

In addition the requirements above, valve labels must also include valve number and the notation NO or NC indicating the valve is normally open or normally closed where appropriate. Valve labels must be fastened to a galvanised sheet steel bracket held in place by the valve flange bolts, or by two galvanised steel straps around the pipe adjacent to the valve. Label sizes must generally comply with MP-GEN-158.

### 2.2.5. Pipe labels

Pipe labels must indicate the pipe service, e.g. supply oil, drain oil, control oil, cooling water and, where appropriate, the normal direction of flow. Pipe markers must comply with AS 1345.

Hydraulic pipework must be identified by colour coded enamel finish painted bands or proprietary pipe identification stickers.

## 2.3. Equipment identification

### 2.3.1. General

All equipment within the cubicles must be clearly labelled and labels must be clearly visible after all equipment and wiring is in place, and in its operational state.

The following devices mounted in cubicles must have a unique identification system to avoid incorrect connection or application:

- Modules, cards and card racks.
- Plugs and sockets of connecting and interconnecting cables.
- Power cable termination terminals of different voltage type, and differing voltage levels.
- Relays and their sockets (where there is a group within a cubicle with similar physical appearance but having different applications or coil voltages).
- Switches, circuit-breakers and/or fuses must be clearly labelled for circuit and rating and must be logically grouped to reflect the type of supply voltage which they control.
- All panels must be provided with panel identification (including functional details) labelling.

Warning labels must be provided on or in all electrical equipment where terminals at dangerous voltages (including 415/240V) may be exposed during maintenance. Warning labels must be of plastic laminate with white lettering on a red background.

### **2.3.2. Electrical labels**

Labels for devices mounted on or in enclosures must be provided on the outside of the enclosure adjacent to the device as well as on the inside of the enclosure. Where a device is accessible on both sides of a panel, two labels must be provided, one for each side of the panel. Device labels must not be located on removable covers of the device.

Device numbering must be done in consultation with the SHL and generally in accordance with IEEE C37.2.

Warning labels must be provided on or in all electrical equipment where terminals at dangerous voltages (including 400/230V) may be exposed during maintenance. Warning labels must be of plastic laminate with white lettering on a red background.

All cables, cable cores and panel wires are to be labelled at both ends with an appropriate permanent labelling system. Label lettering must be clearly legible and black lettering on a white background is preferred.

In all practical instances, labels must be oriented such that the label can be read without moving the cable, core or wire to which the label is affixed.

### **2.3.3. Cubicle identification labels**

Labels for cubicles and equipment mounted within 2.0 m above floor level must be positioned so that they can be read by a person of average height standing in front of the cubicles. The label must meet the following requirements:

- Size: 50 mm high x length to suit inscription;
- Character height: 15 mm.

The label must show the circuit designation of the equipment within the enclosure. This label is designed to cater for a maximum of two lines of lettering. White lettering on a black background is required for this type of label.

The cubicle label will typically comprise of the specific Unit the cubicle belongs, followed by the name of the cubicle.

#### **2.3.4. Device identification labels**

Device identification labels must be used to identify individual items of equipment mounted within each enclosure and on the doors. Labels for fuses must also indicate the rating of the fuses. The label must meet the following requirements:

- Size: 20 mm high x 64 mm long;
- Character height: 3 mm.
- Line 1 Device Name (eg "Unit Excitation On/Off Relay")
- Line 2 Device Number (eg : "4E")

The label is designed to cater for a maximum of three lines of lettering.

#### **2.3.5. Circuit Designations labels**

This size of label must be used to identify small items of equipment and where the 20 mm high label cannot be conveniently used for equipment mounted in cubicles. The label must meet the following requirements:

- Size: 12 mm high x 64 mm long;
- Character height: 3 mm.

The label must contain the following information as a minimum:

- device number
- circuit description
- phase identification (for 2 or 3 phase circuits)
- active/neutral identification (for single phase circuits) or positive/negative identification (for DC circuits)

This label is designed to cater for a maximum of two lines of lettering.

#### **2.3.6. Rating plates**

A rating plate in accordance with AS 1359 must be provided on each motor. Any motor will a mass greater than 100 kg have the weight of the motor and bearing details included on the rating plate. The rating plates must be of engraved or stamped matt stainless steel, brass or of other approved metal.

#### **2.3.7. Fuses and links**

Fuses and links must be identified by their function, voltage, polarity, phase colour and fuse link rating. In circuit diagrams and wiring diagrams, all fuses and links must be designated by an appropriate letter together with a serial number. The following identifications must be regarded as standard:

- Buswire B - To isolate an AC/DC bus supply to circuit;
- Isolating I - To isolate a supply other than a bus supply to a circuit;
- Master M - To prevent a trip relay, the trip of an equipment, on the alarms from being operated by any device within the cubicle on which the master link is located;
- Trip T - To prevent a trip relay from being operated by a particular protection;
- Trip TA - To prevent a circuit-breaker trip coil, being operated directly by a protection or a trip relay.

### **2.4. Cable identification**

Cable identification must comply with the site specific standard.

Typically for sites that utilise KKS, the cable designation will comprise of the KKS identifier for the cubicle or

device that the cable is running to, with a numerical suffix to identify multiple cables running to the same end point (i.e. P6MBL20AN010-1).

For sites that utilise ANSI, the cable designation will take the form of the abbreviated title of the cubicles or devices that the cable runs between (i.e. UC-UR-1). The abbreviated titles are arranged alphabetically, with a numerical suffix to identify multiple cables running between the same cubicles or devices.

Cable labels must be fixed at both ends of the cable. Cable labels are to comply with Annexure D – Low Voltage Cables.

## **2.5. Wire identification ferrules**

Wire cores must be identified at both ends and the core label must be identical on both ends. Wire cores can only change identifier across a terminal block.

Wire core identification will typically be numerical-based identifier within a cubicle. Wire cores within cables that exit the cubicle to equipment must be identified with equipment identifier based on site specific standard. Inter-panelling wiring can maintain the numerical-based identifier.