

## 1. SCOPE

This section of the Energy Networks Live Working Manual (LWM) details the procedures to be followed when CT operated meters are to be changed **Live**. The procedures apply the principles established by the ScottishPower Safety Rules (Electrical and Mechanical) 4th Edition, in particular OPSAF-10-012 (PSSI 12) - **Low Voltage Apparatus**, to achieve **Safety from the System**.

## 2. ISSUE RECORD

This is a Reference document. The current version is held on the EN Document Library.

**It is your responsibility to ensure you work to the current version.**

Issue Date	Issue No	Author	Amendment Details
September 08	4	Jack Neilson	Minor editorial changes to re-style document to current PowerSystems format. 8.1 step 3 & step 5 - Inspection of cablehead and earthing arrangements prior to work also removal of requirement to carry out earth loop impedance tests.
July 2019	5	Colin Rundell	Inclusion of PPE, accompaniment and <b>Approved</b> tools. Surface voltage test. Minor editorial changes.

## 3. ISSUE AUTHORITY

Author	Owner	Issue Authority
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## 4. REVIEW

This is a Reference document which has a 5 year retention period after which a reminder will be issued to review and extend retention or archive.

## 5. DISTRIBUTION

This document is part of the Live Working Manual but does not have a maintained distribution list.

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<b>6.</b>	<b>CONTENTS</b>	
<b>1.</b>	<b>SCOPE .....</b>	<b>1</b>
<b>2.</b>	<b>ISSUE RECORD .....</b>	<b>1</b>
<b>3.</b>	<b>ISSUE AUTHORITY .....</b>	<b>1</b>
<b>4.</b>	<b>REVIEW .....</b>	<b>1</b>
<b>5.</b>	<b>DISTRIBUTION .....</b>	<b>1</b>
<b>6.</b>	<b>CONTENTS.....</b>	<b>2</b>
<b>7.</b>	<b>REFERENCE OR RELATED DOCUMENTS .....</b>	<b>3</b>
<b>8.</b>	<b>DEFINITIONS.....</b>	<b>3</b>
<b>9.</b>	<b>GENERAL .....</b>	<b>3</b>
<b>10.</b>	<b>PROCEDURES .....</b>	<b>3</b>
10.1	Personal Protective Equipment, accompaniment, tools and test equipment requirements: .	3
10.2	Procedure WL1.61 - Changing CT Operated Meters .....	4

## 7. REFERENCE OR RELATED DOCUMENTS

OPSAF-10-012 (PSSI 12) **LV Apparatus**  
OPSAF-12-010 (LWM 3.4) Current Transformers  
OPSAF-12-061 (LWM 2.6) **Low Voltage** Mains/Service Continuity and Polarity Testing

## 8. DEFINITIONS

Terms printed in bold type are as defined in the ScottishPower Safety Rules (Electrical and Mechanical) 4th Edition.

## 9. GENERAL

The preferred method of changing CT operated meters is with the **LV Apparatus Isolated** by removal of cutout fuses.

If it is unreasonable for the preferred method to be adopted, a risk assessment shall be carried out in accordance with OPSAF-10-012 (PSSI 12). If, as a result of the risk assessment, **Live** working can be justified, CT operated meters may be changed in accordance with the following procedure provided that the requirements of OPSAF-12-010 (LWM 3.4) are complied with.

## 10. PROCEDURES

### 10.1 Personal Protective Equipment, accompaniment, tools and test equipment requirements:

For this procedure the following are the minimum PPE requirements, besides other normal workwear:

- **Approved** FR coveralls shall be worn, fastened at the ankles, wrists and neck,
- a minimum of light eye protection, upgraded to **Approved** full face visor when making or breaking any **Live** electrical connections,
- **Approved** insulated gloves to be worn at all times when carrying out work using this procedure.

These minimum PPE requirements may be increased by the **Authorised Person** as a result of the site specific risk assessment e.g. wearing leather protective outer glove over insulated gloves etc.

**Persons** undertaking this task need not be accompanied, however if, as part of the risk assessment carried out prior to work commencing, it is concluded that being accompanied by another **Authorised Person** will substantially contribute towards the implementation of a safe system of work, a second **Authorised Person** shall be present.

Only **Approved** insulated tools, shrouding and test equipment shall be used to carry out this procedure.

## 10.2 Procedure WL1.61 - Changing CT Operated Meters

- Step 1 Ensure that there are no special precautions to be taken and that the work instruction is fully understood.
- Step 2 An **Approved** rubber insulating mat shall be placed on the floor at the point of work. Consider if there is a need to apply shrouding to other adjacent metalwork or conductive material.
- Step 3 Test for any surface voltage on meter panel and surrounding metalwork using an **Approved** testing device
- Step 4 Open the meter panel door and carry out a visual inspection to determine whether the condition of the **Apparatus** within the panel is suitable to allow the installation to be worked on safely. In particular when the metering panel is mounted in close proximity or directly above the cable head supplying the metering equipment it shall be examined to ensure that all exposed **Live** conductors are identified.
- Step 5 Shroud any exposed **Live** conductors with **Approved** insulating material.
- Step 6 Check that the existing metering installation is correct by confirming:-
- (i) The meter panel is correctly earthed.
  - (ii) Phase voltages.
  - (iii) Polarity.
  - (iv) Phase rotation.
  - (v) Tong test for presence of current in the CT secondary wiring where the circuit is known to be on load.
- If any of the above are not correct and cannot be rectified, report back to supervisor for instructions. Where defects are found take care to record details found on site as this may help to sort out any subsequent billing adjustment.
- Step 7 On **LV** installations, using an **Approved** voltage indicator prove that the CT secondary wiring to the meter is not **Live**.
- Step 8 Short circuit all CTs at either:-
- (i) test block by closing links, or
  - (ii) connection block by applying short circuit leads, or
  - (iii) CT terminals by applying clamps or bolted short circuit leads.
- When shorting the CTs ensure that the meter registers a decrease in the meter advance.
- Step 9 Remove potential fuses and confirm with an **Approved** voltage indicator that the potential leads to the metering are not **Live**.
- Step 10 Tong test the secondary CT wiring to confirm the CTs have been shorted and no current is present.
- Step 11 Remove surplus wiring, meters, time switches, as appropriate.
- Step 12 Drill meter panel as required. Suitable precautions shall be taken to avoid damage to any internal wiring, terminals, etc during the drilling process.
- Step 13 Blank off all redundant holes, as appropriate.
- Step 14 Fix meter to panel.

- Step 15      Wire potential and current leads to meter or test block.
- Step 16      Replace potential fuses.
- Step 17      Remove each CT short, one phase at a time, ensuring that the meter positively registers the load. Measure the CT primary and secondary currents and phase voltages. Replace the short after each step.
- Step 18      Remove all CT shorts.
- Step 19      Remove all applied shrouding.
- Step 20      Reconnect any previously disconnected remote signalling communication equipment.