

## 1. SCOPE

This document defines the method to be used when obtaining an insulating oil sample from distribution switchgear whilst the equipment is energised. This is referred to as a **LIVE TANK OIL SAMPLE** or LTOS.

The work covers an annual programme undertaken by suitably trained and authorised staff.

## 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
Dec 2010	3	David Naylor	Review due to business change.
May 2013	4	Alan MacGregor	Additional text in 10.7 & format update
02/05/2019	5	Colin Rundell	Enhancement of PPE guidance Photographs added of cover plate and sampling kit.

## 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 Management Safety Procedures 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>DEFINITIONS</b> .....	<b>3</b>
<b>8.</b>	<b>INTRODUCTION</b> .....	<b>3</b>
<b>9.</b>	<b>INITIAL PRECAUTIONS</b> .....	<b>4</b>
<b>10.</b>	<b>METHOD OF WORK</b> .....	<b>4</b>

## 7. DEFINITIONS

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

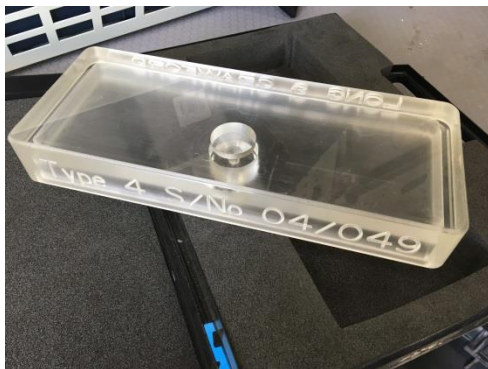
## 8. INTRODUCTION

The **Live** Tank Oil Sampling (LTOS) system enables the assessment of the internal condition of selected switchgear types whilst the switchgear is still in service. This is achieved by analysing a sample of oil extracted from the switchgear using specially designed and **Approved Apparatus** applied via the test access facility. The LTOS system can be applied to a number of switchgear types on the **System**, at present SPEN have limited the application to the following:

Manufacturer	Model	Switchgear Type
Long and Crawford	T3GF3	Ring Main Unit
Long and Crawford	T4GF3	Ring Main Unit
Long and Crawford	J3	Oil Switch
Long and Crawford	J4	Oil Switch
Reyrolle	ROKSS	Ring Main Unit
Reyrolle	ROS	Oil Switch
Reyrolle	RMS	Oil Switch
South Wales Switchgear	IF4X	Oil Switch

EA Technology provides all equipment used in the system, this includes the cover plate, which is placed over the test access orifice, and the sampling kit used to extract the oil sample through the cover plate.

Cover plate:



Sampling kit:



## 9. INITIAL PRECAUTIONS

- 9.1 Prepare and submit Switching schedule. Enter into header and 1st line of schedule the following: Oil sampling in accordance with OPSAF-11-057 MSP 2.4.8.
- 9.2 On-site START Safety Check shall be completed.
- 9.3 Suitable personal protective equipment shall be worn, including:
- Fire retardant coveralls, fastened to the ankles, wrists and neck.
  - Appropriate safety footwear,
  - Minimum of light eye protection.
  - Appropriate oil handling gloves shall be worn.
- 9.4 Work shall be completed by suitably trained and authorised staff holding OP-1 or OP-2 L-17 at 11kV and WI-LTOS authorisation.
- 9.5 Proceed only if prevailing weather conditions are suitable or the switchgear is appropriately protected from the weather.
- 9.6 Ensure the appropriate **Switching** schedule is **Approved** and dated correctly.
- 9.7 All **Switching** shall be by agreement and to the instruction of the appropriate **Control Person**.
- 9.8 The **Approved** sampling kit should be examined to ensure it is unused and in a sterile condition.
- 9.9 The cover plate should be inspected to ensure it is not damaged and is within its test date (cover plates should be inspected by EATL every 12 months and by the user before and after use).

## 10. METHOD OF WORK

- 10.1 Establish the remote **Point of Isolation** (i.e. open appropriate feeder switch/open and isolate circuit breaker and lock off shutters or confirm open point. Apply safety lock and **Caution Notice**).
- 10.2 At the **Location** where the **Live** tank oil sample is to be extracted, establish the local **Point of Isolation** (i.e. open appropriate feeder switch, apply safety lock and **Caution Notice**).
- 10.3 At the **Location** where the **Live** tank oil sample is to be extracted, close the appropriate feeder earth switch.
- 10.4 Remove any debris from the selected test access cover and adjacent surfaces to eliminate risk of debris/contaminant entering the switchgear when the test access cover is open. Ensure no debris or equipment can fall into the test access orifice (empty coverall pockets and secure spectacles, etc).
- 10.5 Inspect and clean the **Live** sampling cover plate, ensure the correct cover plate is selected for the switchgear type.
- 10.6 Open test access cover with caution and immediately fit the **Approved Live** sampling cover plate.
- 10.7 Remove the **Approved** sterile sampling equipment (syringe) from the sealed package, inspect for damage/defect (discard if damage or defect is found) and assemble for use.

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- Ensure that the tube is secure on the syringe and unable to fall into the tank during the procedure.
- 10.8 Insert the sampling equipment (syringe) through the sampling cover plate orifice and carefully extract the oil sample. The extraction of the oil sample will be indicated on the **Approved Switching** schedule as a text item and shall read: At ABC S/S the XYZ feeder switch test access – Live Tank Oil Sample as per MSP 2.4.8 document OPSAF-11-057.
  - 10.9 Remove the sampling equipment (syringe) complete with oil sample to an area remote from the switchgear, snip off the sampling tube approximately 3cm from the syringe body and fit end cap. Attach unique identification label to syringe and place the complete sample into the packaging ready for dispatch to EATL.
  - 10.10 Remove the **Live** sampling cover plate and immediately close the test access cover ensuring that the test access lid gasket is fitted correctly.
  - 10.11 Clean the **Live** sampling cover plate and return to the storage container.
  - 10.12 At the **Location** where the **Live** tank oil sample has been extracted, open the appropriate feeder earth switch.
  - 10.13 At the **Location** where the **Live** tank oil sample has been extracted, remove the isolation (i.e. remove the safety lock and **Caution Notice** and close the appropriate feeder switch as required).
  - 10.14 Remove remote isolation (i.e. remove the safety lock and **Caution Notice** and close or rack in to service and close the appropriate feeder switch/circuit breaker as required).
  - 10.15 Check supplies as required.