#52149

ERL MAINTENANCE SUPPORT SDN BHD

(Company No. 498574-T)

E-MAS

Effective Railway Operations; Reliable System Maintenance

ROLLING STOCK DEPARTMENT

IN-HOUSE TECHNICAL INSTRUCTION

TRAIN TRANSFORMER OIL DIELECTRIC TEST GUIDELINE

R00.OMR.M92060.BT.0002.B

Release

Released:	Norazman	RST HOD	07.06.16	
Checked:	Mohamad	RST QEMR	07.06.16	
Author:	Salehhudin	RST Tech. Exec.	07/06/16	
	Name	**Dept./Position**	**Date**	**Signature**

Amendments or additions to this procedure must be indicated with a vertical black line in the adjacent left margin.

Change Record and Configuration Control

B	07-Jun-16	Updated to new RST Technical Instruction template. All the main contents are remain unchanged	Salehhudin
A	20-Feb-08	New - to supersede the existing procedures, (DOCS ref. no. G00.OMR.M92062.PG.0001.A) in order to comply with the current company requirement and overall contains also has been revised.	Nor Azman
Revision	**Date**	**Modification**	**Name**

TABLE OF CONTENTS

Page

1 Objective

This technical instruction is to supersede the existing procedure, Train Transformer Oil Dielectric Test Procedure, [G00.OMR.M92062.PG.0001.A], in order to comply with the current company requirement. The overall contains of previous procedure also has been revised.

This technical instruction is to provide guideline to RST personnel on how to carry out train transformer oil dielectric test during scheduled or unscheduled maintenance efficiently.

2 Scope

This technical instruction is applicable all RST personnel who are involve directly or indirectly to carry out train transformer oil dielectric test. The distribution and access shall be available for all RST and could be viewed and retrieved via EDMS and RST Portal [http://express50/ E-MAS_Portal/RST.html]. The hardcopy of this procedure is available in RST foreman room for reference. The full access for editing this document is only granted to RST MGT.

3 Transformer Oil Dielectric Test

Where applicable or necessary, this document shall be read together with O&M Manual, Main Transformer - R00_RSE_92060_NZ_0001_B_COM_main_transformer.

The train main transformer use SHELL DIALA S4 ZX-1 Diala Oil D, high performance non-inhibited insulating oil as a cooling liquid which meets the following specifications:

- DIN 57370-1 / VDE 0370 Part 1, Class A
- IEC 296, Class II

SHELL DIALA S4 ZX-1 is a replacement to the previous oil type used, i.e Shell Diala Oil D and Shell Diala S2 ZU-I due to no longer available in the local market.

This oil is required for dielectric test at every T4 Scheduled Maintenance (150,000 KM) or when ever necessary.

3.1 Taking Oil Sample.

Necessary oil probes are always taken through the oil drain. It is placed at the deepest position of the vessel and usually contains - with a not working pump and some time of waiting - the highest concentration of impurity in the oil. The oil drain is standardised according to DIN 42 551. The transformer has an A31 oil drain. After taking away the sealing cap the locking screw and the opening hole is accessible. From here you can take with a hose or a larger container the oil for the tests. After this probe the oil drain can be closed carefully with the locking screw and the sealing cap.

CAUTION: **During the tapping of the oil, the environment is to be protected. It is absolutely forbidden to let the oil penetrate the soil. It is necessary to use clean containers (clean and free from grease and fat) to avoid impurity of the oil. Even the hose has to be clean. Forgetting these facts may cause false results of the probe.**

The measurement of the dielectric test is dependent on the cleanliness of the test cell and the sampling apparatus as the condition of the oil itself. The technician must always follow the precautions outlined herewith.

i. Clean the oil test vessel, electrodes, test chamber and chamber cover thoroughly before commencing the test. Rinsing with part of the oil sample is required. Any cloth used should be lint free.

ii. Open the drain cock and drain to waste enough oil to ensure the drain cock is fully flushed.

iii. Always run off a quantity of oil into a glass bottle or test tube for initial check on the appearance of the oil.

iv. Turbulence and air bubbles should be avoided when pouring the oil into the vessel up to 500 ml level mark.

v. Cover the test vessel when transferring the oil from the draining area to the Oil Test Set to prevent contamination.

vi. Shield the oil sample from direct light until ready to tested

After the test, remove drain cock and close the oil drain carefully with locking screw and sealing cap.

Note: The technician is also responsible to check the main transformer oil level and top up if necessary.

3.2 Test Oil.

In RST, the transformer oil dielectric test is carry out using dielectric test set machine model Megger OTS60PB and test specification VDE 0370. Before commencing the test, the technician is responsible to ensure the oil test set machine is in good condition and calibrated.

The test shall be carried out in accordance with Oil Test Set User Manual – Megger OTS60PB, [R00.OMR.M92060.NA.1001.A], refer to Attachment 1

The measurement of the test shall be recorded in the checklist, Transformer Oil Dielectric Strength Test Record, in RST T1-T5 Scheduled Maintenance Checklist, [R00.OMR.M14100.PT.0002.*]. Refer to Attachment 2.

The technician has to carry out three-time test on difference oil sample for each transformer and calculate the overall average value of the three samples.

Do not disturb the test set while the test set in operation to prevent incorrect result. Ensure the test set is fully stopped before displacing the cell from the container.

Upon completion of the test, the technician is responsible to ensure the cleanliness and serviceability of the oil test set and work area. Inform supervisor immediately if any abnormality or doubt found during the test.

Note: The test set circuit contains static sensitive devices and care must be taken during handling the test set.

3.3 Data Verification & Record

The respective group Supervisor or Inspector is responsible to verify the data from the record sheet and to update in \\Express66\rst\RST Maintenance Monitoring & Records\LM Monitoring & Records\LM Scheduled Monitoring.xls. The hardcopy of the record sheet also has to be kept in the designated folder accordingly.

For new dry oil a minimum value of 50 kV breakdowns is required. For oil in service a minimum value greater than 30 kV is defined. If the breakdowns lower than 30 kV the oil must be exchanged by dry oil of a higher quality.

The Supervisor or Inspector also responsible to inform RST HOD if the tests result is less then 35 kV.

Appendix

Appendix 1: O&M Manual, Main Transformer, R00_RSE_92060_NZ_0001_B_COM_main_transformer.

Appendix 2: Oil Test Set User Manual – Megger OTS60PB, [R00.OMR.M92060.NA.1001.A]

Attachment

Attachment 1: Oil Test Set User Manual – Megger OTS60PB, [R00.OMR.M92060.NA.1001.A]

Attachment 2: Transformer Oil Dielectric Strength Test Record Sheet, in RST T1-T5 Scheduled Maintenance Checklist, [R00.OMR.M14100.PT.0002.I].