Government of India
Ministry of Railways
Research, Designs & Standards Organisation
Manak Nagar, Lucknow - 226 011

No.EL/3.2.1/3 Dated 02.12.93

SPECIAL MAINTENANCE INSTRUCTIONS NO RDSO/ELRS/SMI/159

USE OF INHIBITED TRANSFORMER OIL TO IS: 12463 IN ELECTRIC LOCO AND EMU TRANSFORMER

1. OBJECT

1.1 EHV grade insulation oil conforming to IS: 335-1983 with the latest ammendments is at present being used on IR system. The useful service life of this oil is only about 5 to 6 years requiring replacement due to sludge formation and increased acidity. in USA and certain European countries, use of "inhibitors" is reported to have prelonged the service life of transformer oil.

1.2 The transformers in WAG- 6A locomotives use inhibited oil resulting in lesser rate of acidity formation. it is therefore, proposed to use the oil to IS: 12463-1988 with latest ammendments which provides for use of inhibitors in Trans former oil. On electric locomotives and EMUs. the characteristics of inhibited oil and test method are indicated in table 1 of this specification. The inhibitor DBPC ditertiary butyl para cresol. Good grade shall be as per IS: 9207-1979 and shall also meet me requirement of clause2.1of IS:12463-1988.

1. INSTRUCTIONS

2.1 The transformer core-coil assembly shall be taken out and the core- coil assembly along with the tank should be cleaned to remove the sludge completely however the active part should be preheated by low voltage short circuit running before the core coil assembly is taken out.

2.2 After re- tanking of the core- coil assembly, 0.3% max. inhibited oil procured to IS: 12463-1988 with latest ammendaments should be filled in. The BDV, acidity and inhibitor content of this oil should be measured and recorded before filling

2.3 In case the dielectric strength of the inhibited oil needs to be improved this oil should be centrifuged with the vacuum centrifuging plant in accordance with the guidelines indicated in para 2:1 of IS Speon 12463-1988. It is recommended that the vacuum centrifuging is carried out at a temperature of 60 (or slightly less) degree celceus maintaining minimum pressure of 0.15 torrcillie. After completion of the centrifuging. oil sample should be taken out and BDV, acidity and presence of inhibitor, should be recorded. Wherever concentration of DBPC can be recorded, the same may be done.

2.4 The condition monitoring of transformer oil should be carried out as per SMI 127 every year along with check for the presence of inhibitor.

2.5 The procedure for identifying the concentration of inhibitor shall be in accordance with appendix "D" of IS: 335-1983.

2.6 In case the topping of oil in transformers filled with inhibited oil is required in the shed, EHV grade oil to IS: 335-1983 with latest ammendments can be used.

2.7 In case this oil needs replacement as per SMI-127, it should be replaced by inhibited oil to IS: 12463 with maximum 0.3 percent inhibiter content by mass.

2.8 It may be noted that no separate lifting is required for changing over to this oil. This may be coordinated with POH or other repair work calling for core lifting when oil requires replacement.

2.9 Subsequent replacement of oil will be in line with existing procedure.

3. INSTRUCTIONS DRAWING

3.1 NIL.

4. APPLICATION OF CLASS OF LOCOMOTIVES/EMUs

All ac Electric Locomotives and EMUs.

5. AGENCY OF IMPLEMENTATION

5.1 All workshops holding ac locos/ac EMUs.

6. DISTRIBUTION

6.1 As per list enclosed.

Note:- The procurement specification for uninhibited transformer oil indicated in SMI-127 shall continue till such time the existing oil is replaced with inhibited oil in all locomotive/EMU transformers.