

Annexure-11

For 80MVAR, 765kV, 1-Ph, Reactor reimpregnation, following procedure is adopted:

- (i) After filling the oil in the main tank (Reactor), HOC for 48hrs needs to be completed.
- (ii) Then, drain the oil from Reactor to the storage tank.
- (iii) Then, again circulation in the storage tank till we achieve the desired parameters of insulating oil like PPM and BDV, simultaneously vacuuming in the Reactor tank for 48/72hours needs to be done
- (iv) Then, pushing the oil in the storage tank to Reactor tank under vacuum, completes the reimpregnation.
- (v) Refer enclosed OEM document.

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FIRST OIL FILLING PROCEDURE- IF PAPER INSULATION IS KEPT DRY **(WITHOUT OIL) FOR MORE THAN 6 MONTH**

1. The procedure to be followed in presence of CGPISL representative.
2. Check transformer/ reactor to have dry air pressure inside tank and check its dew point. Physical inspection of transformer/ reactor must be done for its healthiness and dryness of insulation.
3. Transformer/ reactor should have dry air inside tank with acceptable dryness of insulation (RH of air < 0.5%)
4. If there is no/ low pressure inside the transformer/ reactor, first dry air with dew point < (-60°C) must be filled inside tank to a pressure above 3 PSI and left for 24 hours to stabilize before measuring dew point.
5. This below procedure may be followed, if the measured RH value of air inside tank is measured below 0.5%. If the RH value is above 0.5%, procedure to restore dryness of insulation has to be followed as per the CGPISL procedure and guideline.
6. Oil filling as per below procedure (from step 7 onwards) will be the first step prior to any installation activities on transformer/ reactor. At no point of time, the transformer/ reactor must be left unattended during vacuum and oil filling process.
7. The transformer/ reactor must be checked for any leak with soap water solution under positive pressure in tank, approximately 8-10 PSI depending on the design pressure withstand value of tank
8. Vacuum must be pulled from top valve of tank and continued for 72 hours after achieving 1 mbar vacuum level. A vacuum drop test must be conducted as per section 4.8.3.2 of IEEE, method B. The test must be done after 24 hours of achieving vacuum <1 mbar
9. Oil in a storage tank must be prepared parallel to the vacuum cycle in a storage tank, preferably higher volume capacity than the total volume of transformer/ reactor. The oil properties to be tested prior filling in the transformer/ reactor. The values of dielectric breakdown must be above 80 kV and moisture PPM below 5.
10. After oil properties are achieved and vacuum hold duration is more than 72 hours, the oil can be pushed in the transformer/ reactor at a calculated speed, so as to achieve rise in oil level 300 mm per hour. The temperature of oil must be kept close to insulation temperature in a range (-0 to +10°C, oil being on high side).
11. Fill complete transformer/ reactor till top and bleed oil from topmost plug on cover. Complete oil should be filled under vacuum.
12. Start hot oil circulation in main tank to elevate insulation temperature to accelerate impregnation process in step of 5 degree rise per hour. Maximum temperature of oil setting in

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filter machine to be 60°C. Continue circulation of oil until bottom temp of oil is reached 55 °C. If in cold weather condition, the bottom temperature if could not be achieved in 48 hours, CG representative to talk to CGPISL after sales team.

13. Drain the oil under dry air (dew point < -60°C).
14. After draining complete oil, pull vacuum for 72 hours and fill it with prepared oil as described in step no 8 & 9. Repeat step 8 to 12
15. Keep the oil filled and now the transformer/ reactor can be taken for installation of accessories. All routine steps of installation must be followed and minimum 24 hours of oil soaking should be respected at this stage.
16. If there is any need to drain oil for assembly of accessories/ bushing/ for any internal work, and the oil need to be drained below coil clamping ring, complete oil has to be drained and filled back in the transformer/ reactor to avoid trapping of air bubble inside insulation.
17. Power factor and capacitance measurement of winding should be done and result should be sent to CGPISL for analysis. Based on the analysis further process (if required) shall be drawn.

T&P requirements:

1. Pressure gauge
2. Dew point meter with fitments
3. 5kV digital IR tester
4. Vacuum gauge
5. Vacuum machine
6. Dry air generator
7. Oil BDV and PPM tester
8. Soap water with sprinkler
9. Suitable temperature gauge
10. Power factor and capacitance measuring kit