MAINTENANCE INSTRUCTIONS FOR POWER TRANSFORMERS

Maintenance Schedule

Sl No	Inspection frequency	Items to be inspected	To be checked	Action required if inspection shows unsatisfactory conditions
1	Hourly	Ambient temperature		
2	Hourly	Winding temperature	Ensure that temperature rise is within specified limits.	
3	Hourly	Oil temperature	Ensure that temperature rise is within specified limits.	
4	Hourly	Load (amps)	Check against rated figures given on the name plate	
5	Hourly	Voltage		
6	Daily	Oil level in transformer	Check oil level gauge	If low, top with dry oil find whether there is any leak.
7	Daily	Oil level in bushing	--	--
8	Daily	Dehydrating breather	Check that air passages are free. Check colour of active agent	If silicagel is pink, change by new charge. The old charge may be reactivated for using again.
9	Daily	Oil level in OLTC conservator	Check oil sight window or oil level gauge	If low, top with new dry oil
10	Daily	Relief diaphragm of OLTC explosion vent	--	Replace if cracked or broken
11	Daily	Cooler fan, bearing motor & operating mechanism	Check the bearings. Examine contacts, check manual control and interlock	Lubricate the bearing. Replace burnt or worn contacts.
12	Quarterly	Bushings	Examine for cracks and dirt deposit	Clean the dirt. If cracked or broken replace the bushing.
13	Quarterly	Oil in transformer	Check for dielectric strength and water content	Take suitable action to restore quality of oil.
14	Half yearly or at the end of 5000 operations	Oil in the diverter switch of OLTC	a. Dielectric strength b. Water content	Filter or replace if BDV is less than specified value. Measure the water content using KARL FISHER method. Replace/

				recondition if exceeds that limits specified
15	Yearly	Oil in transformer	Check acidity resistivity, tan delta and sludge	Filter or replace
16	Yearly	Oil filled condenser bushing	Refer to the maintenance schedule for OIP condenser bushings	As recommended
17	Yearly	Gasket joints		Tighten the bolts evenly to avoid uneven pressure
18	Yearly	Cable boxes	Check sealing arrangements and find out whether there is any leak	Replace gasket if leaking
19	Yearly	Relays alarm and other circuits	Examine relay and alarm contacts, their operation fuses etc. check relay accuracy.	Clean the components. Replace contacts and fuse if necessary
20	Yearly	Painting	Rusting/colour	Touch up to be done
21	Yearly	Earth resistance	--	Take suitable action if earth resistance is high
22	After 50000 operations of the OLTC	Arcing contacts	--	Replace if necessary
23	-do-	Lubricating oil in the gear box of driving mechanism	Low oil level	Add or replace with lubricating oil
24	5 yearly 7 – 10 yearly	1000 kVA to 2000 kVA above 3000 kVA	Overall inspection including core and coil	Wash the core and coils with clean oil

Note : In case of abnormal phenomena occurring during service, inform the manufacturer the exact nature of the phenomena together with the name plate particulars for easy identification.

Maintenance steps

1. Hourly/Daily Maintenance:

- Check the ambient temperature for reference.

- Check the oil/winding temperature and ensure that the temperature rise is within the limit.

- Check the load, voltage, and current against the rated figures.

- If any abnormal temperature rise or tripping is observed, investigate the cause.

2. Weekly Maintenance:

- Check the dehydrating breather for desiccant color and oil seal. Replace the desiccant or make up the oil as required.

- Check the oil level in the main tank against the oil temperature. Investigate the oil leak and top up with dry oil if low.

- Check the Buchholz relay for gas collection and take suitable action to prevent any potential fault.

- Check the gasket joints and radiators for tightness and oil leakage. Arrange for replacement/repair as required.

- Check the explosion vent/pressure relief device for proper sealing/indicator. Rectify/investigate the damage/malfunction.

3. Quarterly Maintenance:

- Check the oil for dielectric strength/sludge. Take suitable action to restore the quality of oil.

- Check the cable box/terminal bushings for tightness/dirt/damage. Clean thoroughly if needed and take remedial measures.

- Check the on-load tap changer (OLTC) for smooth operation. Replace oil/worn-out parts if required.

4. Half-Yearly Maintenance:

- Check the earthing terminals for tightness and earth resistance. Take remedial action if the earth resistance is high.

- Check the accessories/auxiliary circuits for operation and switching contacts.

5. Yearly Maintenance:

- Clean the components and replace the item if found faulty.

- Check the Buchholz relay/surge relay for mechanical inspection and check floats/contact switch operation.

- Check the insulation resistance (IR) values and investigate and take action to restore insulation if low.

- Check the fastening bolts/screws/clamps for tightness. Tighten if found loose and replace the defective fasteners.

- Check the paintwork for peelings/rusting/damage. Repaint as required.

- Check the temperature indicator for operation and switching contacts. Clean the components and replace the item if found faulty.

- Check the oil gauge for operation and switching contacts. Clean the components and replace the item if found faulty.

- Check the oil conservator for internal inspection and clean if necessary.

6. 3-5 Year Maintenance:

- Check the overall paintwork for deterioration and consider full repaint to match the original specification.

- Check the off-circuit tap changer (OCTC) switches for arcing/welding/wearing. Replace/repair defective components as necessary.

- Check the core and windings for tightness/cleanliness. Replace/repair defective components as necessary.

It is important to note that the respective accessories manuals should be referred to for the maintenance schedule. Additionally, the PDF file recommends keeping records of any abnormalities during service and periodic test results taken to demonstrate compliance with the general requirements of ISO: 9000.