Powertech

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OIL SAMPLING PROCEDURE

It is imperative that the oil samples be taken by experienced equipment maintenance personnel, who are thoroughly aware of the risks and difficulties of taking oil samples from high-voltage substation apparatus. In particular, the precautions described in ASTM D923-91 "Standard Test Method for Sampling Electrical Insulating Liquids" should be observed at all times.

Maintain the insulating fluid within the electrical apparatus being sampled at a level that will not reduce the electric strength of the insulation system. Take extreme caution when samples are drawn from electrical apparatus having a small volume of insulating fluid.

The unit must be equipped with a sampling device, usually fitted to the bottom oil drain valve. This sampling device should have an adapter which can accept the plastic tube attached to the oil sampling syringe. Take the "Quart Sample" using the following instructions taken from ASTM D923 –91.

QUART OIL SAMPLE

1. Check for positive pressure at the sample outlet by placing a slug of insulating fluid in a piece of clear plastic tubing and attaching it to the sample outlet. While observing the slug of insulating fluid, slowly crack the sample outlet valve open. If the slug moves towards the electrical apparatus, a negative pressure exists, and sampling should be discontinued. If the slug moves away from the electrical apparatus, a positive pressure exists, and samples can be obtained safely. Take extreme care in performing this procedure.

2. Place a flush-oil container under the main drain valve and remove the security pipe plug from the drain valve. Wipe the inside of the valve and threads with a clean lint-free cloth. Drain at least 2 liters of fluid into the flush-oil container to flush the drain valve and drain valve extension. The oil behind the valve will represent the most contaminated oil, since most contaminants such as water and particles of carbon will tend to collect at the bottom of the tank. Inspect the sample for signs of water, carbon, sludge or emulsion and record observation in the sample submission form.

3. One of two procedures may then be used to prepare the sample outlet:

    a) Procedure A – Install a sample adaptor on the drain valve (suitable thread size bushing adaptor IPS to 3/8-in bayonet) with a piece of oil-resistant tubing attached. Flush the valve and installed sample adaptor by flushing at least 1 liter of fluid into the flush-oil container before collecting sample.

b) Procedure B – Remove the drain valve security plug. Attach oil resistant tubing to the sample port on the drain valve and flush at least 1 liter of fluid into the flush oil container before collecting sample.

4. When collecting the sample, hold the sample container so that the fluid will run down the sides and limit aeration of the fluid. Partially fill the sample container several times and slosh the fluid around to warm the container in order to prevent condensation. Discard the fluid after each rinse. The flow of liquid should be gentle but not interrupted from the start of flushing the valve and container to the completion of the final filling of the sample container.

5. Obtain the sample for evaluation by allowing the fluid to flow down the sides of the container, or from the bottom up, filling the container to overflowing. Once the container is full install the cap immediately.

SAMPLE LABEL

6. On the sample label write the manufacturer, serial number, sample date and temperature of the oil and the place where the sample was taken. (Top, Bottom , Radiator etc)

After taking the quart sample, take the syringe sample. If the sampling valve has already been flushed, then proceed to step 3 of the next page "Transformer Oil Sampling Using Glass Syringe".

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TRANSFORMER OIL SAMPLING USING GLASS SYRINGE

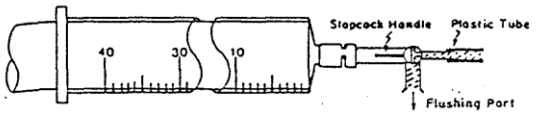

FIG. 1 Stopcock with Two Open Ports

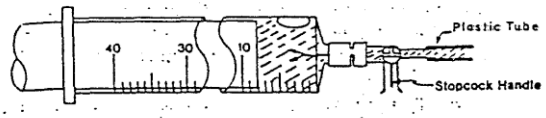

FIG. 2 Stopcock with Handle in Line with Flushing Port

FIG. 3 Stopcock Up, Handle Away from Syringe

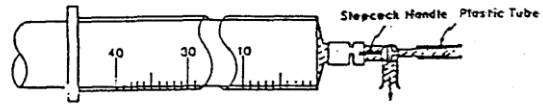

FIG. 4 Stopcock with Handle Towards Syringe

1. Ensure transformer is under positive pressure.
2. Connect flexible clear tubing-to sampling valve of transformer and drain at least 2 quarts of oil into flush-container.
3. Attach free end of tubing to end nipple of syringe (Fig. 1) and flush tubing.
4. Turn stopcock to the open position (Fig. 2) and allow 10 ml oil to enter syringe and close stopcock (handle to syringe).
5. Hold syringe in vertical position (Fig. 3) stopcock up, and expel bubbles and oil, leaving 1-2 ml. Close stopcock.
6. With syringe-bubble-free, open stopcock (Fig. 2) and allow oil pressure to fill syringe to $80% full.
7. Close stopcock (Fig.4), (handle toward syringe). Remove tubing and inspect for bubbles. If present go to step 5.

7. Close the drain valve; remove the sample adaptor, if used, and install the drain valve security plug with non-hardening thread sealant. Do not reuse the plastic tubing. Clean the sample adaptor before reusing on other oil-filled apparatus.

For each unit send:

1. 50 ml syringe
2. 1L quart bottle

SHIPPING

Care should be taken when sending out oil samples. Pack the syringe in the same box it was in originally. (Box number and syringe number should match.)

Pack the samples in a rigid box with absorbent material or rags and send samples to:

Powertech Labs Inc.
12388 88th Avenue,
Surrey, B.C.
CANADA
V3W 7R7
Attn: Insulating Oil Laboratory

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INSULATING OIL TEST

CUSTOMER INFORMATION

COMPANY: _____

P.O. NO.: _____

REPORT TO: _____

ADDRESS: _____

_____

SAMPLE INFORMATION

STATION/SITE: _____

EQUIP. TYPE: _____

MANUFACTURER: _____

_____

SERIAL NO.: _____

ID/BCH NO.: _____

SAMPLE LOC.: _____

SAMPLED BY: _____

DATE: _____

TOP OIL TEMP (°C): _____

REMARKS: _____

❑ GAS IN OIL ❑ OIL QUALITY

❑ FURALS ❑ OTHER TESTS

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