

FIELD TRIAL OF ESI TAP-CHANGER FILTER UNIT

Transformer *Unindo 40/60 MVA, 150/20 kV, 1997, Serial No. A9715218-05*
Tap-changer *Reinhausen, 1997, Serial No. 360559*

HISTORY

The Tap-changer had not been serviced since the transformer was installed at this site approximately 2 years previously.

TRIAL

Tap-changer conservator and drain valves were opened to remove water. 400ml of free water plus carbon deposits were drained from the conservator and 300ml of free water, carbon and copper particulates were removed from the OLTC drain valve.

The Filter Inlet was connected to the OLTC Drain Valve and the Filter Outlet returned to the Conservator Drain ensuring that no air is introduced into the system. The Filter Unit uses a Velcon SD-718P3 SuperDri cartridge, specially designed for Tap-changer oil, removing both particulates and moisture.

OIL SAMPLING/TESTING

On start-up, a sample was taken from the incoming side of the filter. This sample showed high Moisture, low Voltage Breakdown and high Particulate counts throughout the whole range. A second sample was taken from the out-going side of the Filter showing a dramatic reduction in Moisture content and Particulates with an increase in Voltage Breakdown.


Further samples were taken from the Inlet and Outlet sides of the filter unit on 26/1/05 by local staff but sample bottles were only 80% full, affecting kV and Moisture results. Further samples were taken at trial end on 29/3/05. These show the filter cartridge was

still maintaining good Moisture and Particle removal qualities despite the poor condition of the oil at the beginning of the trial.

Table of results

Parameter	Filter In 17/10/04	Filter Out 17/10/04	Filter In 26/1/05	Filter Out 26/1/05	Filter In 29/3/05	Filter Out 29/3/05
Particle 5-15mic	3,293,690	1,180	154,265	10,440	31,165	1,890
Particle 15-25mic	298,900	70	2,310	430	735	165
Particle 25-50mic	47,950	20	145	50	105	50
Part. 50-100mic	3,370	5	5	0	5	0
Part. >100mic	165	0	0	0	0	0
Moisture	58ppm	12ppm	40ppm	16ppm	18ppm	13ppm
Dielectric BV	35kV	72kV	43kV	79kV	72kV	80kV
Acid Number	0.01	<0.01	0.01	0.01	0.02	0.01
IFT	31.9mN/m	31.0mN/m	32.4mN/m	31.7mN/m	29.8mN/m	30.3mN/m
Colour Number	4.0	0.5	<1.0	<1.0	<1.0	1.0
TASA Assess	Level 2	Level 1	1	1	1	1

RESULT SUMMARY

The results show very conclusively that the ESI Tap-changer filter units will maintain insulating oil quality and reduce contact wear in OLTC Tap-changers, allowing reduced maintenance costs and providing increased reliability for both the transformer and power system. 



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