



CASE STUDY: MIRACLE BOY ON TRANSFORMERS

CUSTOMER

Tokyo Electric Power Co.

APPLICATION

Transformer insulation oil

STARTING CONDITIONS

- Each transformer is tested before shipment and the oil would become contaminated over several tests. Large amounts of oil were being dumped.
- If problems occurred in the test the oil would have to be changed and tested. The transformer would be serviced to find the problem. This was time consuming and labor intensive.
- If a system failed in the field the service call and oil change were expensive and would sometimes be covered by the company's warranty.

CURRENT CONDITIONS

- The MB filter is now reconditioning the testing oil and very little oil is being dumped.
- Most of the problems that would occur during testing were eliminated.
- Due to the success in the testing area many of the transformers are shipped with a MB filter system.
- Portable MB systems are used in the field to recondition insulation oil and eliminate oil changes.
- With several years of installations many of the transformers have had their lifetime extended.



INDUSTRY STANDARDS	
Total Acid Value,	<0.1 mgKOH/g
Breakdown Voltage 2.5mm,	>40 kV
Surface Tension 25°C	>25 mN/m

STARTING OIL TEST RESULTS	MB OIL TESTING RESULTS	CHANGE
Total Acid Value = 0.062 mgKOH/g	Total Acid Value = 0.036 mgKOH/g	- 58%
Breakdown Voltage 2.5mm = 42 kV	Breakdown Voltage 2.5mm = 50 kV	+18%
Surface Tension 25°C = 14.4 mN/m	Surface Tension 25°C = 24.1 mN/m	+66%
Water = 1.7 ppm	Water = 1.3 ppm	-20%
Kinematic Viscosity 40°C = 9.012 mm ² /s	Kinematic Viscosity 40°C = 8.901 mm ² /s	-1%
Dielectric Tangent 80°C = 46.1%	Dielectric Tangent 80°C = 2.73%	-94%
Volume Resistivity 80°C = 5.0x10 ⁻⁴ TΩ•m	Volume Resistivity 80°C = 7.4x10 ⁻⁴ TΩ•m	14.8 times

TESTING NOTES

- Testing was done on contaminated testing oil for 15 minutes and the test still showed strong results despite many of the contaminants in this application are difficult and generally take a longer time to effect a change. We however know of no other technology that can recover oil like the MB system for this type of application.
- ISO oil rating on contaminants was 13/11 and was reduced to 12/9 by the MB filter.

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