



September 16, 2008

Project # 0806.000

Company, Inc
9999 Address Street
Seattle, WA 98107

Attn: John Doe

Analysis of Electrical Transformer Oil

As shown in the table, the results of oil analysis indicate that the condition of three of the transformers should be monitored closely to minimize the risk of catastrophic failure.

This report contains the results of transformer oil analysis on samples submitted by J. Doe on 6/20/2008.

LCM Sample ID	Client Sample ID	Transformer Condition - Comment
0806.000-01	--	1 (Normal)
0806.000-02		4 (Very high acetylene; apparent high energy arcing)
0806.000-03		2 (cellulose insulation may be deteriorating)
0806.000-04		3 (slight cellulose degradation by electrical discharge)
0806.000-05		1 (Normal)
0806.000-06		1 (Normal)
0806.000-07		2 (Previous electrical fault appears to have abated)
0806.000-08		3 (Thermal fault – 150-300 ° C)

Comment

The moisture levels in all transformers, although below the recommended limit, have increased since the previous analyses were carried out. This is most likely a sampling issue. A different type of sampling container will be provided for rechecks of several of them for verification. Excess moisture can accelerate the rate of cellulose deterioration substantially. .

The results of index of refraction measurements are included for future reference as this is an excellent method of monitoring oxidation aging of transformer oil.

Comments about each transformer are presented below the tables containing current and previous analytical results.

R. M. Fisher, PhD
Chief Scientist

C. K. Brown
Laboratory Supervisor



Analytical Results: Transformer Oil Analysis – L/C # 0806.000-01

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Sample ID	Condition	Color No. D1500	Dissolved Gases D3612		O ₂ ppm	TDCG	Moisture D1533B	Specific Gravity D1298	Acid Number 5187	H ₂ ppm	CH ₄ ppm	C ₂ H ₆ ppm	C ₂ H ₄ ppm	C ₂ H ₂ ppm
			CO ppm	CO ₂ ppm										
0806.000-01 06/11/2008	1	2.5	79	942	9171	85	19.9	0.884	0.0157	0	3	1	2	0
070000-18 06/14/2007	1	2.0	236	1666	2419	273	4	-	-	6	13	13	5	0

This transformer appears to be stable as the analytical values are all normal and unchanged.

Index of refraction = 1.4853, no sediment detected by ASTM 1698.



Analytical Results: Transformer Oil Analysis – L/C # 0806.000-02

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Sample ID	Condition	Color No. D1500	Dissolved Gases D3612		O ₂ ppm	TDCG	Moisture D1533B	Specific Gravity D1298	Acid Number 5187	H ₂ ppm	CH ₄ ppm	C ₂ H ₆ ppm	C ₂ H ₄ ppm	C ₂ H ₂ ppm
			CO (ppm)	CO ₂ (ppm)										
0806.000-02	4	2.5	781	3465	9196	976	21.7	0.872	0.0157	36	32	4	50	95
070000-15 06/14/2007	2	2.0	551	2150	7240	566	-	-	-	0	12	2	1	0

* Condition 4 rating is based on the C₂H₂ (acetylene) content that exceeds 35 ppm. The high value of 95 ppm acetylene (and the other combustion gases) indicates high-energy arcing. This transformer should be inspected as soon as possible to avoid a potentially serious breakdown.

Index of refraction = 1.4811 (low), small amount of metallic sediment detected by ASTM 1698.