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MANAGING TRANSFORMER OIL & THERMAL SURVEYING

MEMBER OF CK 1999/047116/23 M.E. WARD www.acticell.co.za

Transformer Oil Analysis & Inspection Report

CUSTOMER DETAILS		ACCOUNT No.	SITE CONTACT		Page 1 of 2
Customer:	(KwaZulu/Natal)		Name:		
Vat No:			Phone No:	031	
Physical Address:	Road,		Fax No:	031	
			Cell No:	082	
			E-Mail:	@	.co.za

TRANSFORMER SUB STATION & NAME PLATE DETAILS					
Site Location:	Sub Station 1	Serial No:		DB Asset No:	AN00026
User Reference:	Tx 1	Manufacturer:		Tx Breather:	Yes
Rate KVA:	2000	Y.O.Manufacture:		Tx Breather Size:	Tx 3
Dual HV Voltage:	No	Impedance %:	7.39	Oil Qty - Litres:	1336
HV/LV Volts Ratio:	11000/420	Tap Changer:	Yes	Buchloz Relay:	Yes
HV/LV Amps Ratio:	105/2749	No of Taps:	5	Temperature Relay:	Yes
Vector Group:	Dyn 11	Tap Position:	1	PCB Analysis - PPM:	0.10
Conservator Tank:	Yes	Bridged:	No	PCB Analysis - Date:	08/03/2012
Transformer Type:	3 Ph-Oil Filled Dist	Transformer Design:	Serviceable - Bolted	Transformer Access:	All

TRANSFORMER SITE INSPECTION	PREVIOUS INFORMATION	CURRENT INFORMATION
Reason for Sampling:	DG Monitor	DG Monitor
Data Base Sample No:	84	104
Project ReferenceNo:		
Project Quotation No:	DG 0212/08/2012	DG 0222/09/2012
Date Sampled:	05/09/2012	06/11/2012
Sampled By:	Max Ward	Max Ward
Sample Point:	Bottom Main Tank	Bottom Main Tank
Breather Silica Gel:	Blue	Blue
Oil Level:	Normal	Normal
Top Oil temperature - °C:	42.8	41.3
Bottom Oil Temperature - °C:	32.3	32.6
LV - I.Max:	837	525
Condition of Transformer:	Satisfactory	Satisfactory
Condition of Paint Work:	Good	Good
Condition of Sub Station:	Dusty & Dirty	Satisfactory
Oil Laboratory Report No:		

DG MONITOR IN MONTH: Dec 2012

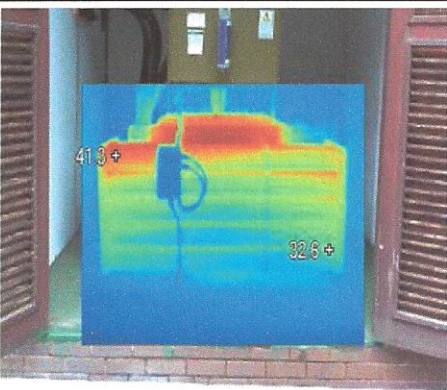
TRANSFORMER OIL RESULTS	PREVIOUS RESULTS	CURRENT RESULTS
Reviewed By:	Max Ward	Max Ward
Date Recorded:	05/09/2012	06/11/2012
DI-Electric Strength: (> & =) 60kV	83	73
Moisture Content: (< & =) 20 PPM	14	18
Acid Content: (< & =) 0.19 mg KOH/g	0.05	0.04
Glass Test:	Pass	Pass
Colour:	Yellow	Yellow
Clarity:	Clear	Clear
Sludge:	No	No
Sediment:	No	No


DISSOLVED GAS ANALYSIS	PREVIOUS RESULTS	CURRENT RESULTS
Hydrogen - H2	70	45
Oxygen - O2	299	10526
Nitrogen - N2	58152	65164
Methane - CH4	51	39
Carbon Monoxide - CO	863	454
Carbon Dioxide - CO2	7624	6742
Ethylene - C2H4	76	87
Ethane - C2H6	55	24
Acetylene - C2H2	0	0
Total Gas Content - %	6.72	8.31
Total Combustible Gases - V/V @ NTP	1115	649

FURANIC ANALYSIS	PREVIOUS RESULTS	CURRENT RESULTS
Degree of Polymerisation - DP	623	632
Furanic Compound - PPM	0.33	0.30

ADDITIONAL ANALYSIS - SANS 555	PREVIOUS RESULTS	CURRENT RESULTS
Density @ +20°C - g/ml		
Kinetic Viscosity @ +40°C - mmsg/s		
Kinetic Viscosity @ -15°C - mmsg/s		
Flash Point - °C		
Pour Point - °C		
Corrosive Sulphur		
Acid Oxidation -mg KOH/g		
Sludge Oxidation - %		
Dissipation Factor (Tan Delta) @90°C - 50Hz		
Interfacial Tension - NMtr		
Moisture in Paper - %		

No	Date	Reason	kV	H2O	Acid	Temp	H2	O2	N2	CH4	CO	CO2	C2H4	C2H6	C2H2	DP	FUR	LV
0	08/03/2012	Annual Oil Sample	66	22	0.04	37.3	68	9233	54235	30	556	9436	113	31	2	614	0.35	1545
1	05/04/2012	DG Monitor	66	21	0.04	42.4	47	12581	86468	35	720	10802	130	46	0	587	0.44	1688
2	03/05/2012	DG Monitor	65	14	0.03	36.4	75	29703	148774	76	1364	69782	247	54	3	588	0.44	1188
3	04/06/2012	DG Monitor	77	12	0.04	34.3	27	16276	94909	28	553	7319	85	27	1	578	0.48	1402
4	04/07/2012	DG Monitor	78	11	0.03	33.7	108	13813	80835	35	669	8174	301	37	0	591	0.43	1324
5	07/08/2012	DG Monitor	63	14	0.04	28.5	79	9523	58663	31	560	10093	105	34	0	586	0.44	1558
6	05/09/2012	DG Monitor	83	14	0.05	32.3	70	299	58152	51	863	7624	76	55	0	623	0.33	837
7	06/11/2012	DG Monitor	73	18	0.04	32.6	45	10526	65164	39	454	6742	87	24	0	632	0.30	525

THERMAL IMAGE OF TRANSFORMER	SUMMARY OF CURRENT TRANSFORMER OIL ANALYSIS & INSPECTION REPORT
 <p>Transformer Oil Cooling Radiator Date of Thermal Image = 06/11/2012 Top Oil Temperature = 41.3 °C Bottom Oil Temperature = 32.6 °C</p>	<ul style="list-style-type: none"> - The Oil Analysis - (Di-Electric Strength - Moisture - Acid - Visual) - indicates - Tx Insulating Oil - Satisfactory Condition - Annual Tx Oil Sample Analysis to Continue. - The Dissolved Gas Analysis indicates - Elevated Ethane - Low Temperature Thermal Degredation - Inside Transformer Main Tank. - It is strongly recommended - Tx Oil Sample to be drawn - 1 Month from date of Last Tx Oil Sample - In order to Monitor the Production of the Associated Dissolved "Hydro-Carbon" Gases. - The Furanic Analysis - Note 6 - Between 600 to 900 - Solid Paper Insulation Degradation - Mild to Minimal Paper Ageing. - The Tx Inspection Report indicates - Tx Oil Level - Normal - Satisfactory. - The Tx Inspection Report indicates - Breather Silica Gel - Blue and Oil Level in Oil Bowl is Correct - Satisfactory. - The Tx Inspection Report indicates - Condition of Sub Station Enclosure & Transformer - Satisfactory.

<p style="text-align: center;">METHOD OF ANALYSIS</p> <p>Disolved Gas Analysis - IEC 567 Water Content - IEC 814 Di-Electric Strength - IEC 156 Acidity - ASTM D974</p> <p style="text-align: center;">Dissipation Factor - IEC 247 Interfacial Tension - ASTM D971 Polychlorinated Biphenyl (PCB) - ASTM D4059</p>	<p>Signed By: M.E. Ward</p> 
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