



# TEST REPORT

B.R.Industrial Services ( Mobile Transformer Oil Testing Laboratory)

"Chivvan", Plot No. 2&4, Rd No. 5 Sector 11, New Panvel 410206, Dist Raigad, Phone : 022-27450081, E-Mail : siddeshmu@sanchamnet.in

Test Report No. M-511/7 Date: 24/8/2007

TR-2

Name of the Client: The Executive Engineer EHV (O&M) Dn. M.S.E.T.Co.Ltd. PUNE  
 Location Of Sub Station: 132 KV Narayangaon

a) Make: VOLTAS      b) Ratio: 132/11 KV      c) Capacity: 16 MVA      d) Sr. No. RY/3216/2      e) Year Of Manuf.: 1987

f) Date Of Commissioning: -      g) Sampling By: Laboratory      h) Dt. Of Sampling: 18/8/2007      i) Sampling Point: BOTTOM

j) Condition Of Sample: -

Oil Temp: 45 °C      Date Of Testing: 18/8/2007      Conditions at time of testing:      i) Temp: 26 °C      ii) Humidity: 30%

Sampling done by Lab. as per Annexure B of IS 9434:1992

S.No.	Name Of Test	Method Of Test As Per IS.	Characteristics as per IS				Results Derived	Conforms/ Not Conforms	Remarks	
			IS Number	Specified Values						
1	Appearance	IS 335 : 1993	IS 1866 : 2000	Clear			Amber	Conforms		
2	Density at 29.5 °C	IS 1448- P-16 :1990	IS 1866 : 2000	0.89 g/cm <sup>3</sup> ( Max )			0.87	Conforms		
3	Kinematic Viscosity at 27 °C	IS 1448- P-25 :1976	IS 1866 : 2000	27 cSt ( Max )			15	Conforms		
4	Inter Facial Tension	IS 6104 : 1971	IS 1866 : 2000	15 mN/m ( Min )			29	Conforms		
5	Flash Point	IS 1448- P-21 :1992	IS 1866 : 2000	125 °C (Min.)			> 140 °C	Conforms		
6	Pour Point	IS 1448- P-10 :1970	IS 1866 : 2000	-6 °C (Max.)			< -6 °C	Conforms		
7	Neutralization Value	IS 1448- P-2 :1967	IS 1866 : 2000	0.3 mgKOH/g (Max.)			0.22	Conforms		
8	Break Down Voltage	IS 6792 : 1992	IS 1866 : 2000	40 KV (Min.)			56	Conforms		
9	Dielectric Dissipation Factor at 90 °C	IS 6262 : 1971	IS 1866 : 2000	1 ( Max )			0.727	Conforms		
10	Resistivity at 90 °C	IS 6103 : 1971	IS 1866 : 2000	0.1X10 <sup>12</sup> Ohmcm(Min)			0.021 X10 <sup>12</sup>	Not Conforms		
11	Water Contents	IS 13567 : 1992	IS 1866 : 2000	40 PPM (Max)			21	Conforms		
12	Dissolved Gas Analysis (BDL: Below Detection Level)	IS 9434 : 1992		CO	CH <sub>4</sub>	CO <sub>2</sub>	C <sub>2</sub> H <sub>4</sub>	C <sub>2</sub> H <sub>6</sub>	C <sub>2</sub> H <sub>2</sub>	H <sub>2</sub>
		Quantity in PPM		364	57	2065	18	36	BDL	40

Evaluation: All the results except Specific Resistance are within the Limits as prescribed in the I.S. 1866 : 2000 ( Code of Practice for Electrical Maintenance and Supervision Of Mineral Insulating Oil in Equipment). It is recommended that the transformer Oil be got filtered with dehydration at your earliest. If the Specific Resistance does not improve after filtration then the oil be reconditioned or replaced.  
 The Quantity and Proportion of the Dissolved gases in Oil are well within limits.

Prepared by:      Checked by:

Manager Technical



# TEST REPORT

**B.R.Industrial Services ( Transformer Oil Testing Laboratory)**

Accredited by NABL in accordance with the standard ISO/IEC 17025:2005

"Chitvan", Plot No. 2&4,Rd.No. 5, Sector 11, P.B. No.15,New Parvel 410206, Dist Raigad,Phone : 022-27450081,



Certificate No.T-0292

**Test Report No. P-1194/7 Date: 23/11/2007**

Name of the Client: The Executive Engineer EHV(O&M)Dn. M.S.E.T.Co.Ltd. PUNE

Location Of Sub Station: TR-2 132kV Narayangaon

a)Make: VOLTAS

b) Ratio: 132/11kV

c)Capacity: 16 MVA

d)Sr. No. RY/3216/2

e)Year Of Manuf.: 1987

f) Date Of Commissioning:

g)Sampling By: Client

h)Date Of receipt of sample 23/11/2007

i) Sampling Point: Bottom

j) Condition Of Sample :

Oil Temp: N.A

Date Of Testing : 23/11/2007

Conditions at time of testing :

l) Temp: 27 °C

ii) Humidity: 40%

S.No.	Name Of Test	Method Of Test As Per I.S.	Characteristics as per IS		Results Derived	Conforms/ Not Conforms	Remarks		
			IS Number	Specified Values					
1	Appearance	IS 335 : 1993	IS 1866 : 2000	Clear	Yellow	Conforms			
2	Density at 29.5 °C	IS 1448- P-16 :1990	IS 1866 : 2000	0.89 g/cm <sup>3</sup> ( Max.)	0.85	Conforms			
3	Kinematic Viscosity at 27° C	IS 1448- P-25 :1976	IS 1866 : 2000	27 cSt ( Max )	14	Conforms			
4	Inter Facial Tension	IS 6104 : 1971	IS 1866 : 2000	15 mN/m ( Min.)	34	Conforms			
5	Flash Point	IS 1448- P-21 :1992	IS 1866 : 2000	125 °C (Min.)	>140 °C	Conforms			
6	Pour Point	IS 1448- P-10 :1970	IS 1866 : 2000	-8 °C (Max.)	< -8 °C	Conforms			
7	Neutralization Value	IS 1448- P-2 :1967	IS 1866 : 2000	0.3 mgKOH/g (Max.)	0.03	Conforms			
8	Break Down Voltage	IS 6792 : 1992	IS 1866 : 2000	40 KV (Min.)	71	Conforms			
9	Dielectric Dissipation Factor at 90° C	IS 6262 : 1971	IS 1866 : 2000	1 ( Max.)	0.001	Conforms			
10	Resistivity at 90° C	IS 6103 : 1971	IS 1866 : 2000	0.1X10 <sup>12</sup> Ohmcm(Min)	40.8 X10 <sup>12</sup>	Conforms			
11	Water Contents	IS 13567 : 1992	IS 1866 : 2000	40 PPM (Max.)	6	Conforms			
12	Dissolved Gas Analysis (BDL: Below Detection Level)	IS 9434 :1992	CO	CH <sub>4</sub>	CO <sub>2</sub>	C <sub>2</sub> H <sub>4</sub>	C <sub>2</sub> H <sub>6</sub>	C <sub>2</sub> H <sub>2</sub>	H <sub>2</sub>
		Quantity in PPM	7	1	77	1	1	BDL	BDL

Evaluation: The above oil was tested on 18-08-2007. It was recommended that the oil be replaced as most of the parameters were outside the specified values as per the IS 1866:2000. The Test Report No. was was M-511 dated 24-8-2007. It is learnt that the Oil was put under the process of On Line Regeneration & De Sludging. As a result of above treatment the quality of oil has improved and it is felt no further corrective action is required.

Prepared by:

Checked by:

( S.L.Deshmukh) Manager Technical  
Authorised Signatory

**MAHARASHTRA STATE ELECTRICITY TRANSMISSION CO. LTD.**  
**TRANSMISSION ( O & M ) CIRCLE, PUNE**

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Ref : SE/TRANS/O&MPNT-/

004185

Date : 11 DEC 2007

**PERFORMANCE CERTIFICATE**

**Sub.** - On line Regeneration of Transformer oil at 132KV Narayangaon S/S.

On request of M/S CEE DEE Vacuum Equipment Pvt.Ltd. Pune, the assignment of on line regeneration of transformer oil at 132KV Narayangaon Sub-Station was entrusted to the agency as a free demonstration.

The work was taken in hand by agency on 14<sup>th</sup> November 2007 and completed the same on 23<sup>rd</sup> November 2007.

The results obtained after on line regeneration of III Power Transformer with following details were very good.

Power Transformer Sr.No. : RY/ 3216/2  
Make : Voltas  
Capacity : 18 MVA


Sr. No.	Description	Test result before Regeneration	Test result after regeneration
1.	Inter Facial Tension	29	34
2.	Neutralization Value	0.22	0.03
3.	Break Down Voltage	56	71
4.	Dielectric Dissipation Factor at 90 Degree C.	0.727	0.001
5.	Resistivity at 90 Deg C	0.021 x 10 <sup>14</sup> Ohmcm	40.8 x 10 <sup>14</sup> Ohmcm
6.	Water contents.	20 PPM	8 PPM
7.	Appearance	Amber	Yellow

The results of IR values taken before and after regeneration are as below

Sr. No.	Description	IR Value before Regeneration	IR Value after regeneration
1.	HV to Earth	40 mega-ohm	500 mega-ohm
2.	LV to Earth	30 mega-ohm	400 mega-ohm
3.	HV to LV	50 mega-ohm	500 mega-ohm

The detail report of oil results is enclosed with the letter.

Encl- As above.

  
Superintending Engineer  
Trans O&M Circle, Pune.