

## 1 Electric Traction Distribution:

Western Railway has now only have 25 KV Traction system ( from Feb' 12)

Division wise route km & track km of Western Railway are as under.

Division	Traction			
	2011-12		2012-13	
	RKM	TKM	RKM	TKM
BCT (SUB)	63.66	442.5	63.66	450
BL	508.01	981.06	508.01	1037.66
BRC	424.5	1092.18	426.5	1092.20
ADI	47	197.80	47	197.80
RTM	532	1222.96	578.72	1307.76
<b>TOTAL</b>	<b>1575.17</b>	<b>3936.5</b>	<b>1623.89</b>	<b>4085.42</b>

The increase in the holding of electrified track (RKM and TKM) has been on account of electrification of the following sections:

- (i) **BL division** – Electrification of New line between AN – DXG (31.6 TKM) & VYA – USD (25 TKM) in connection with doubling of UDN – JL section.
- (ii) **BRC division** - Electrification of APPL (Dahej) siding (6 TKM) and JRIL private siding at MYG (0.6 TKM).
- (iii) **RTM division** - Electrification of DWX – MKC section (36.9 TKM).
- (iv) **BCT Sub division** - Electrification of VR Carshed & BA siding(7.5 TKM).

### 1.1 Major TRD Installation for BCT(SUB) are as under :

ITEMS	25 KV AC.
RKM	63.66
TKM	442.5
22/2.2 KV Sub Station	13
Traction Sub station	5
SP	5
SSP	11
OHE Depot	5
PSI Depot	8
<b>Tower Wagons</b>	
4 Wheelers	4
8 Wheelers	3
OHE workshop	1

## 1.2 25 kV AC TRACTION

Division wise major TRD assets of 25 kV AC traction are as under.

SN	Item	Type	BCT (Sub)	BL	BRC	ADI	RTM	TOTAL
1	RKM		63.66	508.1	423	47	578.57	<b>1620.3</b>
2	TKM		442.5	1037.66	1088.6	197.8	1307.76	<b>4074.32</b>
3	OHE Depots		5	8	9	1	11	<b>34</b>
4	T. Wagon	4 W	4	3	7	0	8	<b>22</b>
		8 W	3	4	2	1	3	<b>13</b>
6	PSI depots		8	6	4	1	8	<b>27</b>
7	TSS		5	9	7	1	9	<b>31</b>
8	SP		5	10	7	1	10	<b>33</b>
9	SSP		11	24	23	3	32	<b>93</b>
11	Cap. bank		0	9	7	1	9	<b>26</b>
12	SCADA system	PC based	1	2	3	0	2	<b>8</b>

## 1.3 Traction Power Supply :

Power supply for AC traction is made available from the traction substations located along the track and owned / maintained by Rly. These traction sub-stations draw power supply at 132 kV / 110 kV / 100 kV / 66 kV from the respective State Electricity Authorities of Maharashtra, Gujarat and Madhya Pradesh & M/s TATA

## 1.4 Details of AC traction Sub-station is enclosed as Annexure - I

## 1.5 Energy Consumption : (AC Traction)

Details of energy consumed and the average cost per units are as under-

SEB	2012-13		
	Energy Consumption in MU	Bill paid (Rs in Crores)	Average cost per unit (Rs.)
TATA	270.90	159.34	5.88
MSEB	240.59	190.04	7.90
GEB	704.06	440.83	6.26
MPSEB	276.56	170.61	6.17
<b>Total</b>	<b>1492.11</b>	<b>960.83</b>	<b>6.44</b>

## 1.6 Staff strength of AC-TRD as on March 2013 is as under :

Division	BL	BRC	ADI	RTM	Total
TKMs	1037.66	1088.6	197.8	1307.75	3631.81
Sanctioned	406	463	77	534	1480
Staff on Roll	302	347	66	419	1134
Vacancies	104	116	11	115	346
Sanctioned/TKM	0.391	0.425	0.389	0.408	0.407
On Roll/TKM	0.291	0.319	0.334	0.320	0.312

## 1.7 Maintenance Activities

- Pre-monsoon-precautions / maintenance works like trimming / cutting of tree, insulator cleaning, application of silicon grease compound, bird nest removal etc were completed in time.
- In highly polluted areas washing of OHE was done to avoid OHE tripping during first monsoon showers.
- Yearly targeted maintenance schedule for AOH and POH of OHE and PSI installations have been completed in time.
- In order to avoid panto-entanglement, 100% tower wagon checking of OHE at crossovers and turnouts has been ensured.
- The Overhead power line crossings of state electricity board have been jointly checked with SEBs. Strengthening of structures and termination arrangement wherever necessary had been insisted.
- Special drives launched to ensure proper functioning of ATDs, SS wire ropes and cleaning of insulators in extreme weather conditions.

## 1.8 Measures taken to improve the OHE reliability-

- 41 point action plan is implemented to improve OHE performance.
- Current collection test conducted by OLIVER-G.
- All insulators are cleaned by Water jet method in polluted area.
- 5427 no. of Porcelain Insulators have been replaced by Composite type in polluted area.
- 652 no. of rusty Cantilevers have been replaced on this Railway .
- 19 Nos. of old TMG make, 25KV oil type interrupters have been replaced by SF6/ Vacuum type in BL division.
- Aluminum cross feeder jumpers have been replaced by 150 sq mm copper jumpers at 22 locations.
- Total 9.55 kms of worn out OHE Contact Wire & 7.76 kms Catenary Wires have been replaced to improve the OHE profile.
- New SCADA systems conforming to latest RDSO specification have been commissioned in UDN-JL section of BL unit & BH-DHF section of BRC div.
- Protection systems at ATUL TSS in BL division and NAD, NKI & MKC TSS of RTM division have been up-graded by providing Numerical Relays to suit parallel operation of Traction Transformers.

## 1.9 Energy Conservation :

For conservation of energy, Western Railway is adopting following measures.

### i. Switching off standby transformer in Traction Sub-station ;

Standby traction transformer is kept in off position in Traction sub-stations to save energy on account of no load losses.

### ii. Monitoring of maximum demand ;

The contract demand for each traction sub station is regularly reviewed.

In order to contain penalties on account of overshooting of Maximum Demand (MD), constant watch is being made to maintain demand under the contract demand.

### iii. Provision / Augmentation of Capacitor Banks ;

Augmentation of capacitor banks at GDA-TSS in BRC division and BMI-TSS & NKI-TSS in RTM division

***During 2012-13, savings Rs 18.13 Cr have been achieved on account of improved power factor in AC Section.***

### v. Coasting Board;

Coasting Boards have been provided in the section to enable drivers to coast the train for conserving energy.

## 1.10 ACHIEVEMENTS & HIGHLIGHTS:

- Refund of **Rs. 75.30 Lakhs** was received back from DGVCL, which was charged by them as excess MD charge for BHET and NWU TSS of BL division.
- During the year 2012-13, a saving of **31.33 crores** was achieved by adopting various energy economy measures like Power Factor incentives, prompt payment rebate etc. The cumulative saving at Rs 31.33 crores is **higher by 33.71 %** as compared to saving of Rs. 23.43 crores during last year 2011-12

## 1.11 New Electrification Works :

- (i) **BL division** – Electrification of New line between AN – DXG (31.6 TKM) & VYA – USD (25 TKM) in connection with doubling of UDN – JL section.
- (ii) **BRC division** - Electrification of APPL (Dahej) siding (6 TKM) and JRIL private siding at MYG ( 0.6 TKM).
- (iii) **RTM division** - Electrification of DWX – MKC section (36.9 TKM).
- (iv) **BCT Sub division** - Electrification of VR Carshed & BA siding(7.5 TKM).

## 1.12 Tariff reduction measures

Saving of **Rs. 17.80 Cr** achieved in Traction bill of 2013-14 due to petition filed by W.Rly with GERC.

## Annexure I

**AC Traction Sub-station and their capacity as on 31.3.2012**

S. No	Div	Location of TSS/FP	Grid Supply available at TSS/FP in KV	Type owned by Railway or SEB	No. of existing X'er with capacity in MVA	Power supply Authority	Contract Max. Demand. in MVA	Average Recorded Max. Demand in MVA during 2012-13	Avg. monthly consumption during 2012-13 in MUs.
1	2	3	4	5	6	7	8	9	10
1	BCT (SUB)	Mahalaxmi	110	RLY	2*30	TATA	70.00	47.68	19.78
2		Bandra	110	RLY	3*30	TATA			
3		Jogeshwari	110	RLY	2*30	TATA			
4		Borivali	110	RLY	2*21.6	TATA			
5	BCT (AC)	Vasai Rd	100	RLY	2*21.6	MSEDCL	5.00	14.00	3.70
6		Palghar	132	RLY	2*21.6	MSEDCL	15.00	14.53	5.05
7		Gholvad	132	RLY	2*21.6	MSEDCL	10.00	13.17	4.07
8		Nandurbar	132	RLY	21.6 , 12.5	MSEDCL	10.00	10.92	2.84
9		Nardana	132	RLY	21.6 , 12.5	MSEDCL	6.00	8.21	2.27
10		Dharangaon	132	RLY	12.5, 21.6	MSEDCL	6.00	7.85	2.13
11		Atul	132	RLY	2*12.5	DGVCL	17.00	16.42	5.68
12		Bhestan	132	RLY	12.5, 2*21.6	DGVCL	23.00	20.91	7.91
13		Madhi	66	RLY	2*21.6	DGVCL	8.00	9.08	2.09
14		Navapur	66	RLY	21.6	DGVCL	10.00	9.97	2.72
15	BRC	Bharuch	132	RLY	2*21.6	DGVCL	20.00	18.92	6.88
16		Makarpura	132	RLY	2*21.6	MGVCL	21.00	20.48	7.98
17		Mehmadabad	132	RLY	12.5, 21.6	MGVCL	12.00	13.87	3.14
18		Anand	132	RLY	12.5, 21.6	MGVCL	12.00	15.76	3.45
19		Samlaya	132	RLY	21.5, 12.5	MGVCL	16.00	10.94	3.99
20		Godhra	132	RLY	2*21.6	MGVCL	18.00	10.60	5.28
		Vagra	220	RLY	2*21.6	DGVCL	5.00	3.51	0.88
21		Gandhinagar	132	RLY	2*21.6	UGVCL	5.50	5.24	1.44
22	RTM	Dahod	132	RLY	2*21.6	MGVCL	24.00	23.45	7.22
23		Bamania	132	RLY	2*21.6	MPPKVCL	23.00	21.86	5.96
24		Ratlam	132	RLY	2*21.6	MPPKVCL	14.00	13.25	3.75
25		Nagda	132	RLY	2*21.6	MPPKVCL	20.00	20.10	5.53
26		Naikheri	132	RLY	2*21.6	MPPKVCL	13.00	12.96	2.40
27		Maksi	132	RLY	2*21.6	MPPKVCL	12.00	10.90	1.43
28		Mohammedk her a	132	RLY	2*12.5	MPPKVCL	13.00	11.94	1.70
29		Sehore	132	RLY	2*12.5	MPPKVCL	11.00	10.37	1.61
30		Mangaliagoa	132	RLY	1*21.6	MPPKVCL	8.00	5.81	0.68
			<b>427.50</b>			<b>402.69</b>	<b>121.53</b>		