12 A brief write up:

Brief as per the format is as under :

(i) Unit Profile :

The first Train not only in India but in Ashia started in Central Railway from Boribunder (CSTM) to Thane over a distance of 33 KM on 16th April 1853. The first Electric Train also started in Central Railway from VT (CSTM) to Kurla via Harbar line on 3rd Feb. 1925.Central Railway consists of 5 Divisions i.e. Bhusawal, Nagpur, Mumbai, Pune & Solapur with route kms 3835.18 KM {BG(1.767m)- 3259.66kms, NG(0.762m)- 552.23km &NG(0.610m)-20.39kms} and total TKM 5817.96kms. Out of which 1833 kms(RKM) are Electrified (25KV AC- 1453 kms and 1500V DC-380kms.). Central Railway covers 3 states i.e. Maharastra, Karnatka and Madhaya pradesh.

The Zonal Headquarters of Central Railway is at Mumbai. It is headed by General Manager who is assisted by additional General Manager and Principal heads of Depts. of Finance & Accounts, Engg, Mech, Elect, Signal & Telicommunications, Transport, Comml, Medical, Stores & Rly Protection force.

At present C.Rly. serves the entire state of Maharashtra, part of Karnataka and Madhya Pradesh. The economical capital of India, i.e. Mumbai Nava Seva Port Trust is served by C.Rly.

The suburban section of C.Rly. in Mumbai extends from CSTM, the city's business and residential centre, to Kasara in North-East, Khopoli in South-East and Panvel in New Mumbai. Also in Pune division, Pune to Lonavla.

There are 416 Electric locomotives, 254 Diesel locomotives, 134 rakes in terms of 9 Car, Electric multiple Units (428 motor coaches and 866 trailer coaches).

(ii) Energy consumption :

SPECIFIC ENERGY CONSUMPTION REDUCTION

TRACTION (ELECTRIC)	**2005-06**	**2006-07**	**2007-08**
Unit consumption (Lakhs kWH/year)	14602	15637	15894
Money value (Rs. Lakhs/year)	58116	68560	68440
GTKM for GOODs (in thousand)	59006295	68377028	69066912
GTKM for Passenger (in thousand)	24656347	26584436	28044696
SEC for GOODs (kWG/1000 GTKM)	7.99	8.06	7.70
SEC for Passenger (kWG/1000 GTKM)	20.42	20.21	20.12

SPECIFIC ENERGY CONSUMPTION REDUCTION

TRACTION (DIESEL)	**2005-06**	**2006-07**	**2007-08**
Unit consumption (Lakhs kWH/year)	159156	169772	180278
Money value (Rs. Lakhs/year)	49408	55579	56680
GTKM for GOODs (in thousand)	12635829	13279273	13070788
GTKM for Passenger (in thousand)	82523618	9660240	11901927
SEC for GOODs (kWG/1000 GTKM)	3.03	2.97	2.97
SEC for Passenger (kWG/1000 GTKM)	4.69	4.56	4.53

SPECIFIC ENERGY CONSUMPTION REDUCTION

NON-TRACTION (ELECTRIC)	2005-06	2006-07	2007-08
Unit consumption (Lakhs kWH/year)	1193	1180	1195
Money value (Rs. Lakhs/year)	4675	5364	5658
SEC (Kwh/KW)	762.97	740.75	739.75

Graphic presentation related to Specific Energy Conservation for th period of 2005-06, 2006-07 & 2007-08 are enclosed.

(iii) Major activities implimened to reduce energy consumptions, economy in energy expenditure and implimentation of energy conservation measures:

a) Tarrif containing measure -

Energy tarrif plays a vital role in economic and efficiency of traction system. Dual purpose initiative has been taken to avail the incentive available on power factor as well as reduction in demand and minimization of loss.

b) Demand side management to conserve energy -

Central Railway continuously monitors the demand of the sub-stations with the demand approaching/overshooting buzzers to alert the traction power controller to control the maximum demand by the way of extension of feed.

By effective energy management, the demand has been restricted to save the demand charges for Railways and thereby helping the supply authorities in managing the system without extra burden of exceeding demand or losses.

In addition to that, Central Railway by effective switching off the stand by transformers, the losses have been restricted.

i) The Central Railway has issued instructions to switch off the standby transformers at the traction sub-stations. This has resulted in minimization of losses.

ii) The Central Railway has provided capicitor bank in 13 traction sub-stations.

iii) Rationalisation of demand.

c) Provision of energy saving devices -

Central Railway draws power from 25 kV AC traction sub-stations. Capicitor banks has been provided at 13 traction sub-stations. Since the installation of capicitor banks, the power factor has been improved in the order of 0.90 to 0.99 resulting into handsome saving in restricting the power consumption. The benefits are achieve are as under:-

i) Saving in restricting the demand.

ii) Saving on account of avoided losses due to improved power factor (kWH*(1-(pf1-pf2)^2).

d) Improvement in operational efficiency by training the locomotive operation staff resulting in improvement in Specific Eenergy Consumption (SEC).

TRACTION

Central Railway has taken initiatives on energy efficiency in operation of electric locomotives by -

I) Regular counselling of operation staff/ drivers.

ii) Provision of Coasting Board.

iii) Installation of Energy Meters on electric locomotives/EMUs to monitor the energy consumption.

iv) Comparing the unitwise SECs and take corrective measures.

e) Introduction of 3-phase technology.

Central Railway has adopted 3-phase technlogy reducing about 15% to 18% energy consumption due to regeneration on AC locos and AC EMUs.

Non Traction Energy.

* 7280 nos. of energy efficient T-5 tube lights of 28 W have been provided at stations and service buildings in place of 40 W tube lights.

* Solar heaters have been provided at 20 locations of running rooms and retiring rooms.

* 109 level crossing gates was electrified with solar lighting. 145 LC gates and 75 way side stations also provided with solar lighting as standby

* 660 Nos. of CFLs have been provided in place of incandescent lamps

* Use of automatic power factor correction panels in HT/LT substation: PF correction Panel in 18 Sub-stations provided.

* 4500 Nos. of old 90 watt ceiling fans replaced with energy efficient 60 watt ceiling fans.

* 18380 Nos. of Electronic fan regulators replaced in place of conventional fan regulators.

* 15 Nos.Timer switches provided on high mast towers for yard lighting.

* 3413 Nos. Electronic ballasts replaced in place of conventional ballasts in 40W FTL circuits and 70W metal halide circuits.

* In 10 locations Solar street lights provided in Rly. colonies and Training Instiitute.

* 28 nos. VVF control provided on lifts.

* 26 nos of energy efficient pump sets have been provided.

* 126 nos. of Timer/ photo sensing natural control switches for street lights,/ yard lights, platforms during moon lit nights.

* Significant amount of electrical energy is being saved by adopting the following measures:

a) Auto switching On/Off of 70% platform lights at BSL stations

b) Energy consumption target is fixed for the Zonal railways by Railway Board and onward target is fixed for divisions and workshops by Headquarters.

Future plans & strategy

* Energy Audit of major administrative offices at HQs and Divisional level , major stations, diesel and electric loco sheds, all Workshops, Major pumping installations, Headquarter Divisional Hospital etc.

* Replacement of the existing T12/T5 FT lights with T5 tube light and use of only T5 FT light in future in all new constructions.

* Replacement of Electric Water Heaters with Solar Water Heaters and use of only Solar Water Heaters in future at new installations.

* Provision of Solar Panels at balance 46 nos. manned LC gates.
* Electrification of Way Side Stations using Solar Panels.

* Provision of Solar Panels at LC gates and at way side stations having frequent power failure from power utilities as a stand by arrangement , including other major stations and S&T installations.

* Replacement of domestic electrical fittings namely ceiling fans, fan regulators, switches and ELCBs with energy efficient fittings.

* Replacement of Refrigerators, Deepfreezer, Water Coolelrs, including Master Water Coolers and other electrical appliances etc. with BEE Certified star rated. appliances etc.

* Replacement of the existing Water Pumps of older version with energy efficient pumps.

* Provision of Solar Panels at Railway Colony for street lighting of Railway Colonies .

* Use of LED light extensively by replacing the conventional light in as many areas as possible including lighting of station façade at important stations.

* Provision of Energy Savers , Photo Sensing Devices, Auto timers etc. for controlling the operation of various electrical gadgets as per the need for optimum utilisation of energy.

* Provision of Energy Savers , Photo Sensing Devices, Auto timers etc. for controlling the operation of various electrical gadgets as per the need for optimum utilisation of energy.

* Provision of Shunt Capacitor Bank in Substations and at distribution load points.

(iv) Environment and safety

Central Railway hauled 97112 Million GTKM trough electric traction during 2007-08 which is constituted 80 % of total 122085 Million GTKM. Thus Central Railway has saved the enviromental pollution.

Specific matter concerned to safety has been reported as per the best of my knowledge.

13 Whether any dispute pertaining to statutory requirement of safety and pollution control is pending with any govt. agency. If yes, give details;

No dispute is pending to any statutory body to best of my knowledge.

14 Documents attached :

i) Copies of certificates (year wise marking) pertaining to statutory requirements such as safety and pollution control for the period 2005-08 are enclosed (as applicable).

Not available

ii) One copy each of the audited annual report for the year 05-06, 06-07 and 07-08 are enclosed as applicable.

Not available

iii) A brief write up of the unit as mentioned at SN. 12 along with photograph depicting equipment/locations where energy eficiency activities have been undertaken and a CD containing entire write up is enclosed (Please ensure that the name of the unit is written on the CD and it is virus free).

Brief write up enclosed in CD as desired.

(S.N. Singh)

Date: 08.10.08

Chief Electrical Distribution Engineer

The Energy Manager

Place : Mumbai CST

Central Railway