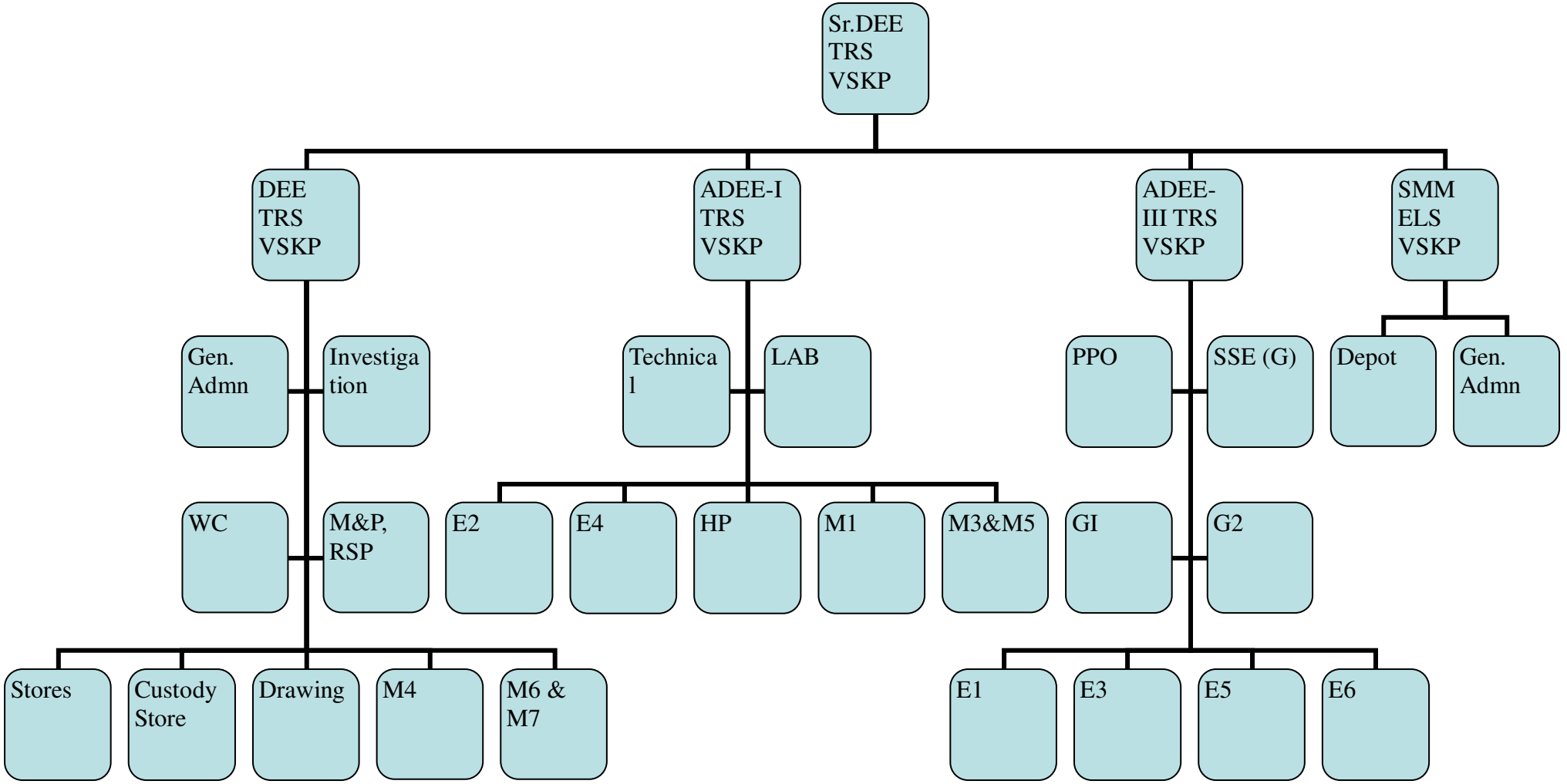
Electric Loco Shed, Visakhapatnam



In Dedicated Service to Nation
Electric Loco Shed, Visakhapatnam

Background:

Electric Loco Shed / Visakhapatnam was commissioned in Dec'82 with a holding of 30 Electric locomotives as a captive Loco shed on KK line. There was steady increase in the loco holding due to increase of traffic demand over the years thereafter for transporting the iron ore from Baliadilla mines to Visakhapatnam port for export.

During 1988, a fleet of 18 locomotives of 6000 HP having a number of special improved features with state-of-the-art technology were imported from Sweden (6 locomotives/ABB make) and from Japan (12 locomotives/Hitachi make) to add to the fleet of indigenous locomotives.

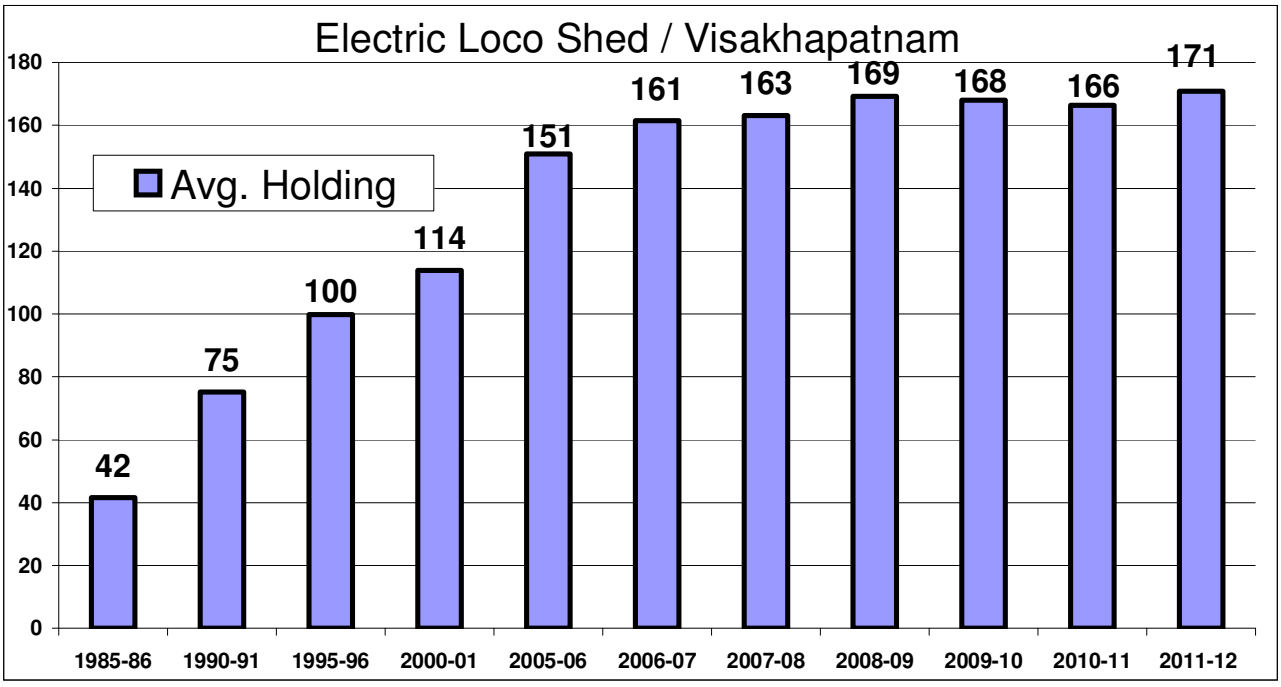
With Electrification of mainline between VSKP-BBS-KGP, shed has started homing coaching locomotives since 2005.

Shed Expansion: The shed has undergone **phase-I** expansion from 75locos to 93 locos (for 18HHP locos) in 1997, **Phase-II** expansion from 93 locos to 120 locos in 2000 and **Phase-III** from 120 locos to 150 locos in 2009. Presently, shed augmentation for homing **175 locos** is under process.

Shed Holding:

As on 04.09.2011, the shed holding is 172 locos, which comprising of 110 WAG5, 23 WAG7, 24 WAM4 and 15 WAG6 (A, B & C) imported locos to meet the traffic requirement of KK line as well as main line for goods and coaching services.

The increase in shed holding after establishment of the shed in 1982 is depicted in the graph below.



Activities in the shed:

Due to tough terrain, locos working on KK line, are being subjected to higher thrust on bogie and higher loading on TM's. Therefore, in addition to the regular schedule maintenance activities in IA/IB/IC, shed is carrying additional maintenance activities over and above the prescribed activities for some of equipments like CBC, Bogie frame/Liners, Axle box, Equalisers, Traction Motor etc. The major schedules like Annual (AOH) and Intermediate (IOH) overhauling are undertaken in the Shed. POH of IRS locos is being done by various workshops as per RB's nomination.

POH of HHP locos: Since none of POH workshops are able to carry the POH of HHP locos, which were imported from Sweden/Japan as prototype, Railway Board has entrusted this task to ELS/VSKP. In spite of limited know-how, with aid of innovations, indigenous substitution of imported parts/ equipments and need-based modifications, shed has carried out their first POH. ELS/VSKP is the first shed, where such activity, which normally is carried out in POH shop, was undertaken in the Loco Shed.

Improved Performance:

The team of ELS/VSKP is consistently putting their untiring efforts for improving maintenance practices with innovative thoughts over and above the stipulated maintenance instructions.

Parameter	Actual 2010-11	2011-12 Target	Actual 2011-12	% Improvement over Target
Average Loco Holding	166.32	--	**170.89**	--
No. of ELS/VSKP based Loco failures	42	68	**40**	41.2%
Failures for 100 locos	25.3	--	**23.4**	--
Average loco outage	155.54	140.62	**158.81**	12.9%
Loco Outage per 100 Locos	93.52	82.29	**92.93**	12.9%
Statistical Ineffective %	3.2	10.00	**3.5**	65%
Hourly ineffective %	6.49	17.7	**7.06**	60.1%

Technological Up gradation:

With advent of new technology equipments getting cleared from RDSO, ELS/VSKP has provided /putting continuous efforts in providing latest developed equipments in loco like Air dryer, Speed cum Energy meter, LED marker lights/Flasher lights, Twin beam head lights, VCB, DVTCS, Micro processor based fault diagnostic system, Cable Head Termination, AC MVRF, Static Inverter etc.

Schedule Periodicity:

The VSKP shed has implemented the enhanced periodicity of AOH for WAG5 goods locos working on KK line from 18 months to 21 months as a trial in 3 locos. On getting encouraging results, further trial in 3 more locos is being carried out for further observation. It is planned for extension of AOH for WAG5 goods locos on KK line for saving Revenue. Also as per RDSO's instructions, trail for WAG7 locos IA/IB/IC schedule from 45 days to 60 days is being continued.

System improvement:

The performance of equipments is closely monitored by implementing Reliability Action Plan since 2005-06, which is updated periodically. Reliability Action Plan has been prepared by analysing the past failures and taking into account RDSO's modifications/SMIs/TC for improving reliability and availability of locomotives. Checklists have been prepared for recording values of different parameters of the equipments during overhauling/testing duly indicating the standard/normal value. Quality gangs have been formed for Electrical, Pneumatic & Mechanical equipments separately, whose job is to carry out quality audit after normal inspection done by concern section. The shortcomings noticed are discussed in weekly failure review meeting. As a follow up, staff is also being counselled and educated.

Innovations & Improvement for Reliability

Besides regular maintenance and system improvement measures, the team of ELS/VSKP has made excellent efforts in the area of innovations. The following are some of such innovations developed by shed.

- Provision of ELGI TRC 20100 compressor of WAG9 loco in WAG6A Locos
- Development of Gauge for Axle Box & Tool for Cotter Pin.
- Gauge for checking Traction motor axle cap bore diameter
- Fabrication of CBC cleaning tank:
- Jig for Line contactor.
- Jig for pressing TM nose suspension block / for removing axle box bearing
- Jig for removing WAG7 loco secondary suspension rubber block
- Temperature indication arrangement for Induction heater
- Hydraulic puller & pusher for MVSI/MVSL bearing.

Recent major innovations are as mentioned below.

Fabrication Pneumatic test bench:- The unified pneumatic test bench for testing & calibration of all pneumatic valves, gauges & pressure switches, has been designed & fabricated by ELS/VSKP.

Fabrication of elevated bogie stand:- Universal elevated stand for WAM4/WAG5/WAG7 bogie overhauling has been fabricated by ELS/VSKP. With this stand, saving of 12 man hours and 4 crane hours is being achieved per loco.

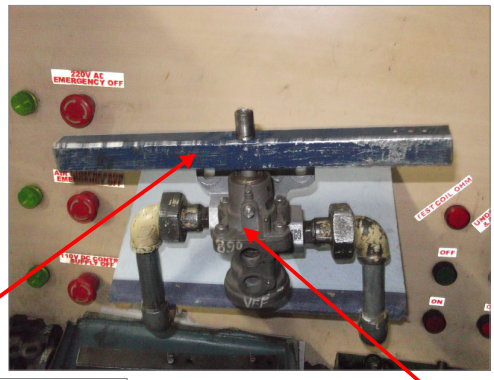
Varnishing chamber for Traction motor / aux. Motors:- Varnishing chamber for traction motor / aux motor for improving the motor reliability has been fabricated by shed.

Induction heater for auxiliary motor bearings:- Induction heater along with temperature sensing unit for heating bearing of auxiliary motors to a pre determined temperature before fitment has been developed by shed.

Provision of Nomex sheet between TM Stator Frame & MP/IP coil:- To avoid earthing of MP or IP coil due to rubbing its insulation with stator frame body, Shed is started providing Nomex sheet, between MP or IP coil and Traction motor stator frame, whenever coil is changed during repair/overhauling.

Test bench for checking of GNP setting and MP/IP coil polarity: A test bench for correct setting of GNP for rocker ring brush holders location and polarity checking of main pole & inter pole coils during overhauling of traction motor, is fabricated by shed.

Tool for removing Rotex valve Armature:- While removing Rotex valve armature during overhauling, difficulty is being experienced by due to non availability of suitable tool. For this purpose, ELS/VSKP has fabricated a tool with requisite projections. This has resulted easy of removal of rotex valve armature.



Fabricated tool for armature removing

Rotex Valve

Test bench for Traction Motor:- The existing test bench, is unable cater the requirement of both motorised bogie run testing as well as single TM testing at overhauling section.

To avoid delay for testing, a separate test bench for testing individual Traction motor has been fabricated

Fabrication of "Electric Loco Trouble Shooting Training Model"

Electric Loco Shed / Visakhapatnam has designed and fabricated an Electric Loco Model for better trouble shooting training to Loco pilots at Electric Loco Training School at Marripalem / VSKP. By using this model, pilots can be trained for trouble shooting of WAM4/WAG5/WAG7/WAP4 locos having either conventional relay based control circuit or Microprocessor based control system.

The special features of this model are as given below.

(a) Vigilance Control Device (VCD).
(b) Tri plate pneumatic panel
(c) Microprocessor Based Fault System
(d) Control circuit having incorporated all Latest RDSO modifications

Human Resource Development Centre:-

This shed is having a Human Resource Development Centre, where regular quality circle meetings, for awareness of good maintenance practices among group of staff about the equipment failure/arisings due to improper attention, are being carried out by SSE/Investigation. The staff are also shown the defective parts for better understanding of arisings. This centre is having the facility for Audio / video systems for better explanation to staff.

Welfare, Sports & Cultural Activities:

Electric Loco Shed has been continuously carrying the various welfare activities like Blood donation camps, Health camps for staffs and supervisors and extracurricular activities like sports, cultural activities are organized on various occasions.

Blood donation camp

Serving of butter milk in summer

Shed is having Sports association, which conducts yearly various sports activates in addition to competitions like drawing, quiz, and essay among staff for recreation.

Prime Mister's Shram Shri Award:-

Shri. DIWAKAR RAO, TECH-I got PRIME MINISTER'S "SHRAM SHREE" award for development of electronic control of starting circuit of phase converter in 2003. It enabled to replace imported phase converter by the indigenous one resulting into the saving of foreign exchange to the tune of Rs. 2.43 Crores.

Future Plans:

Electric Loco Shed, VSKP is gearing up for meeting the infrastructure requirement for maintenance of future generation locomotives. The shed augmentation capacity for homing 175 locos is under process, which includes the facility for maintaining WAG9 locos as well. The wheel pressing shop in shed is under process so that shed will no more depend on wheel shops in getting redisced wheel sets, which is big day to day task for any shed.

Having achieved many laurels, Electric Loco Shed, Visakhapatnam is going into new phase of maintaining three phase locos in coming years. With cost effective innovations and dedicated untiring efforts of ELS team, ELS/VSKP will be a fore front in achieving a great heights in Electric Loco Maintenance on Indian Railways.

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