



**WORK STUDY TO REVIEW THE  
STAFFSTRENGTH OF DIESEL  
SHED(Mechanical Wing) /ERS –  
TVC DIVISION  
G.275/WSSR – 351819/2019 - 20**



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**SOUTHERN RAILWAY**

**PLANNING BRANCH**

**G.275/WSSR-351819/2019-20**

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**STAFF STRENGTH OF DIESEL SHED/ERS**  
**- TVC DIVISION**

**STUDIED BY**

**WORK STUDY TEAM**  
**OF**  
**PLANNING BRANCH**

**JUNE 2019**

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**(i)****ACKNOWLEDGEMENT**

The study team acknowledges the valuable guidance and co-operation rendered by DME/DSL/ERS, SSE/General/Mechanical and other supervisory staff of the Diesel shed in completing the study in time.

**(ii)****AUTHORITY**

Annual Programme of work studies for the year 2018 -19.

**(iii)****TERMS OF REFERENCE**

Work study to review the staff strength of Diesel Shed (Mech wing)/ERS.

**(iv)****METHODOLOGY**

- 1) Collection of data.
- 2) Observation of present system of working.
- 3) Interaction with DME and supervisors of Diesel shed/ERS.
- 4) Analyse the data collected and assessed the manpower requirement based on the present and future workload of Diesel Locos duly incorporating the Yardstick/Benchmarking.

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**(v)**

**SUMMARY OF RECOMMENDATION**

- NIL -

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## **CHAPTER – I**

### **1.0 INTRODUCTION**

1.1 Locomotives are the most significant assets of the Railways which provide motive power for both Passenger and Freight services. Timely availability and reliability of performance of Locos are critical to the train operations. For this, regular and adequate maintenance for ensuring their good running condition is necessitated.

1.2 In order to cater the requirements, each locomotive is assigned to a designated loco shed to monitor as per the schedules and unscheduled maintenance as and when needed at 4 Diesel loco sheds and 3 Electric loco sheds over Southern Railway. TNP, GOC, ED and ERS are the four Diesel sheds whereas RPM, AJJ, and ED are Electric loco sheds.

In addition to the above mentioned activities, two workshops viz., CWS/GOC and LW/PER. is also functioning for Periodic overhauling, heavy repairs and Midterm Rehabilitation. CWS/GOC is maintaining Diesel Locos whereas LW/PER for Electric locos and DEMUs.

1.3 In Indian Railways, two kinds of Locos are rolling viz., Diesel and Electric. Diesel engines are of two types namely ALCO and EMD. The BG locos are available in different versions and variants like WDM2, WDM3A, WDP3A, WDG3A, WDP4B, WDP4D, WDG4, WDG4D and MG Locos are YDM2 and YDM4 and DEMUs of 700 & 1400 HP. Generally the HP more than 4000 is termed as HHP (High Horse power) and the remaining is ALCO.

1.4 Today's modern Diesel locomotive with electric transmission have all the benefits of modern technology. Even though diesel locomotive is able to work under all conditions and terrains compared to Electric locomotives, Indian Railway prefers electric ones because the expenditure incurred on Fuel is very high i.e., 30% of the Ordinary Working Expenses, the second biggest component of Expenditure.

### **1.5 The classification Codes of Locos**

W - indicates Gauge - Broad Gauge; Y for Metre gauge;

D - indicates Traction - Diesel; A- for AC traction.

P - indicates Service - Passenger; G for Goods, M for Mixed and S for Shunting, U for EMU and R for Rail cars.

3A - indicates Power - 3100 (3 X 1000 +100) and A represents 100 Hp  
Whereas B and D is 200 Hp and 500 Hp respectively

In addition, each loco is numbered with 5 digits for easy identification.

In HHP /EMD Locos, the letter 'D' in the end denotes Dual Cab.

1.6 Diesel shed /ERS is an engine shed or otherwise known as Loco shed for maintenance of Diesel locos, located towards TCR end of ERS Railway station falling under TVC division in Southern Railway with a holding of 58 Main line locos and 1 shunting locos.

1.7 Due to technological advancement and introduction of electrical locos, and aged diesel locos, the workload of maintaining diesel locos is meager.

1.8 An attempt has been made to review the staff strength of Diesel Shed/ ERS in commensurate with the present and future workload duly taking in to account of increased

Electric locos. It is to be mentioned that the number of Main line Diesel Locos owned by Southern Railway is steadily decreasing for the past few years.

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## **2.0 PRESENT SCENERIO**

- 2.1 The Diesel Shed/ERS is headed by Divisional Mechanical Engineer who is assisted by the team of Mechanical & Electrical supervisors.
- 2.2 WDP locos of ERS shed serve the following coaching terminals : ERS, KTYM, TVC and GUV. WDS locos perform shunting in different places of TVC, PGT, SA Divisions. Now-a-days WDM2 locos are used for shunting purposes.
- 2.3 Diesel Shed/ERS is equipped with 6 Light Schedule Bays and 2 Heavy schedule Bays. Apart from this, HSD Oil capacity 800 KL with two storage tanks of 400 KL each are available. Lube oil tank capacity of 70 KL is situated in the same complex and the distance between HSD oil tank to Lube oil storage tank is 12 mtrs. One Wheel Lathe, One Loco wash Bay, one ETP and Four EOT cranes are also provided. One CMT lab and DTTC is also attached to the Diesel Shed.
- 2.4 The detailed Category wise Sanction, Actual & Vacancy statement is shown in Annexure I.  
The actual staff strength of Mechanical wing as on 21.02.2019 is 143 against the sanctioned strength of 158 with a net vacancy of 15 staffs.
- 2.5 The maintenance of locos are performed by two sections namely,
  - i) Heavy Schedule Section.
  - ii) Light Schedule Section.
- 2.6 The works carried out in these sections is checking of locos on the track for minor repairs attending Trip Schedule, Monthly at Light Schedule Bays Quarterly, half yearly and Yearly schedules of locos at Heavy Schedule Bays. In order to detect leaky joints, faulty valves and clamp Intactness, Initial Running Check (IRC) is done prior to Schedule attention. After Schedule attention, the Final Running Check (FRC) is done before Dispatch of Loco for Traffic.
- 2.7 The heavy Schedule works are carried out through the following units/Section.
  - Air Brake
  - Under Truck
  - Pump and Blower
  - Compressor
  - Cylinder Head/Exhaust Arm & Injector Arm (HHP)
  - Fuel Injection Pump/Woodward Governor
  - Power Pack
  - Heat Exchanger
  - Turbo Supercharger
  - Control Gear
  - Small Motor-DC
  - Speedometer
  - Speed Sensor/Pulse generator
  - Traction Motor
  - Wiring
  - Battery
  - Auxiliaries
  - DEMU
- 2.8 The maintenance of Diesel and DPC (DEMU) locos is carried out through the following units and the activities involved in each section is detailed under the respective heads.



(I) Air Brake SectionList of

<i>Overhauling and testing of</i>		
<ul style="list-style-type: none"> <li>○ A9 Brake Valve</li> <li>○ SA9 Brake Valve</li> <li>○ C3W Distributor Valve</li> <li>○ C2W Relay Valve</li> <li>○ D24B Feed Valve</li> <li>○ AFM Valve</li> <li>○ Horn Magnet Valve</li> <li>○ Sander Magnet Valve</li> <li>○ Auto Drain Valve</li> </ul>	<ul style="list-style-type: none"> <li>○ Air Dryer Valve</li> <li>○ F2 Feed Valve</li> <li>○ F1 Selector Valve</li> <li>○ Angle Cock</li> <li>○ D1 Emergency Valve</li> <li>○ Wiper Motor</li> <li>○ Run Release Valve</li> <li>○ Limiting Valve</li> <li>○ R6 Relay Valve</li> </ul>	<ul style="list-style-type: none"> <li>○ 24 A Double Check Valve</li> <li>○ MU2B Valve</li> <li>○ 28VB Valve</li> <li>○ H5A Air Relay Valve</li> <li>○ HB5 Air Relay Valve</li> <li>○ PVERI/PVBC Piston Valve</li> <li>○ PVBIT Piston Valve</li> <li>○ CCB 1.5 Valves</li> <li>○ DL Filter</li> </ul>

Registers:

- Schedule Inspection Register
- Sanding Gear Inspection Record
- Air Drier Schedule Attention Register

(II) Under Truck Section

<i>Truck Stripping and Attention/Overhauling of</i>		
<ul style="list-style-type: none"> <li>○ Bogie Frame</li> <li>○ Brake Rigging</li> <li>○ Brake Cylinder</li> <li>○ Pipelines</li> <li>○ Axle and Axle Box</li> <li>○ Wick Lubricator</li> <li>○ Wheel and Traction Motor Assembly</li> <li>○ Suspension Components</li> <li>○ Traction Motor Suspension Resilient Pad Assembly</li> </ul>	<ul style="list-style-type: none"> <li>○</li> </ul>	<ul style="list-style-type: none"> <li>○ Break in Test</li> <li>○ Chassis</li> <li>○ Truck Application</li> <li>○ Couplers, Buffers and Guards.</li> <li>○ Bolster and Bogie Frame</li> <li>○ Wheel and Axle Assembly</li> <li>○ Coupler assembly, Side Buffer and Coil Spring.</li> <li>○ Wheel Turning of Locos</li> <li>○ Hand Brake</li> <li>○ Sanding Gear.</li> <li>○ Truck Assembling</li> </ul>

(III) Pump & Blower Section

<i>Overhauling and Testing of</i>		
<ul style="list-style-type: none"> <li>○ Front Truck Traction Motor Blower</li> <li>○ Rear Truck Traction Motor</li> </ul>	<ul style="list-style-type: none"> <li>○ Blower</li> <li>○ Lube Oil Pump</li> <li>○ Water Pump</li> </ul>	<ul style="list-style-type: none"> <li>○ After Cooler Gear Unit</li> <li>○ Scavenging Oil Pump</li> <li>○ Main Lube Oil and Piston Cooling Oil Pumps.</li> </ul>

**(IV) Compressor Section**

<b>Overhauling of</b>	
<ul style="list-style-type: none"> <li>○ Compressor</li> <li>○ Inlet, Discharge Valve and Unloader Valve Assembly</li> </ul>	<ul style="list-style-type: none"> <li>○ Inter Cooler Assembly</li> <li>○ Lube Oil Pump Assembly</li> </ul>

**(V) Cylinder Head Section**

<b>Overhauling of</b>	
<ul style="list-style-type: none"> <li>○ Cylinder heads</li> <li>○ FIP Support Assembly</li> <li>○ Valve Lever Assembly</li> </ul>	<ul style="list-style-type: none"> <li>○ Valve Lever Casing, FIP Support Cover, Sump Door and Explosion Door</li> <li>○ Valve Bridge Assembly</li> <li>○ Rocker Arm Assembly</li> </ul>

**(VI) Fuel Injection Pump & Governor**

<b>Overhauling /Attention</b>	
<ul style="list-style-type: none"> <li>○ Fuel Injection Pumps</li> <li>○ Fuel Injector</li> <li>○ High Pressure Tube</li> </ul>	<ul style="list-style-type: none"> <li>○ Woodward Governor</li> <li>○ Driver Gear</li> </ul>

**(VII) Power Pack**

<b>Overhauling/Renewal/Attention/Alignment of</b>		
<ul style="list-style-type: none"> <li>○ Cylinder Liners</li> <li>○ Main Bearing</li> <li>○ Piston and Connecting Rod Assembly</li> <li>○ CamShaft and Gear</li> <li>○ Exhaust Manifold</li> <li>○ Water Riser Pipe</li> <li>○ Exhaust Chamber</li> <li>○ Accessory End Flexible Drive and Coupling Rubber Bushes</li> <li>○ Engine Block Pressure</li> <li>○ Lower Liner Inserts</li> </ul>	<ul style="list-style-type: none"> <li>○ Air Inlet Elbows</li> <li>○ Over Speed Trip Assembly</li> <li>○ Water Glow Rod Gauge</li> <li>○ Expansion Tank</li> <li>○ Engine Sump</li> <li>○ Engine Cranking</li> <li>○ Load Testing</li> <li>○ Main Alternator Assembly</li> <li>○ Engine Block to Main Alternator</li> </ul>	<ul style="list-style-type: none"> <li>○ Changing Traction Alternator/Generator</li> <li>○ Extension Shaft</li> <li>○ Power pack One Revolution</li> <li>○ Measuring of Power Pack Assembly Lead Wire</li> <li>○ Main Bearing Lower</li> <li>○ Connecting Rod Bearing</li> <li>○ Unloading, Overhauling and Assembling of Power Assembly</li> </ul>

**(VIII) Turbo Supercharger Section**

<b>Overhauling/Changing/Attention to</b>		
<ul style="list-style-type: none"> <li>○ GE Turbo</li> <li>○ ABB-VTC304 Turbo</li> <li>○ ALCO 720 Turbo</li> <li>○ Water Cooled Large after Cooler</li> <li>○ Cleaning and Blowing Air Cooled after Cooler</li> </ul>	<ul style="list-style-type: none"> <li>○ Twin After Cooler Housing</li> <li>○ Turbo Super Charger</li> <li>○ Dynamic Balancing of Turbo Rotor Assembly</li> <li>○ Soak Back Pump</li> <li>○ Fuel Pipelines, Primary and Secondary Filters</li> </ul>	<ul style="list-style-type: none"> <li>○ Fuel Booster Pump</li> <li>○ Relief and Regulator Valve</li> <li>○ Fuel Oil Glow Rod Gauge</li> <li>○ Specific Fuel Consumption</li> <li>○ Test Stands.</li> </ul>

**(IX) Heat Exchanger Section**

<b>Attention/Overhauling/Testing/Regulating</b>		
<ul style="list-style-type: none"> <li>○ Lube oil relief and Bypass valves.</li> <li>○ Online Centrifuge</li> <li>○ Lube oil Strainer</li> <li>○ Lube Oil Filter Assembly</li> <li>○ Lube oil system Pipelines</li> </ul>	<ul style="list-style-type: none"> <li>○ Lube oil relief and Bypass valves.</li> <li>○ Online Centrifuge</li> <li>○ Lube oil Strainer</li> <li>○ Lube Oil Filter Assembly</li> <li>○ Lube Oil Cooler</li> </ul>	<ul style="list-style-type: none"> <li>○ Cooling water system pipelines</li> <li>○ Radiator Fan Assembly</li> <li>○ Plate type Lube oil cooler</li> <li>○ Right Angle Gear Box</li> <li>○ Hot oil Detector</li> <li>○ Lube oil cooler for DEMU</li> <li>○ Radiator Core for</li> </ul>

**(X) Light Schedule (Mechanical)**

<b>Overhauling /Attention</b>	
<ul style="list-style-type: none"> <li>○ Trip Schedule (T1) Schedule</li> <li>○ Trip Schedule (T2) Schedule</li> <li>○ Monthly Schedule</li> </ul>	<ul style="list-style-type: none"> <li>○ Seasonal Summer/Winter Precautions:</li> <li>○ Super Check of Locos</li> </ul>

**(XI) DEMU**

<b>Attention to</b>	
<ul style="list-style-type: none"> <li>○ Trip Schedule for 700 HP &amp; 1400 HP</li> <li>○ Monthly Schedule (Both Mechanical &amp; Electrical)</li> <li>○ Quarterly Schedule</li> </ul>	<ul style="list-style-type: none"> <li>○ Half yearly Schedule</li> <li>○ Quality Plan – Trip – Electrical</li> </ul>

**(XII) Auxiliaries Section**

<b>Overhauling of</b>	
<ul style="list-style-type: none"> <li>○ Auxiliary Generator/Exciter Generator</li> <li>○ Eddy Current Clutch</li> <li>○ Braking Blower</li> </ul>	<ul style="list-style-type: none"> <li>○ Electronic/Dust Bin Blower Motor</li> <li>○ Dynamic Brake Grid Blower Motor</li> <li>○ Radiator Cooling Fan</li> </ul>

**(XIII) Battery Section**

<b>Overhauling of</b>	
<ul style="list-style-type: none"> <li>○ Quarterly Schedule of Maintenance</li> <li>○ Half yearly Schedule of Maintenance</li> </ul>	<ul style="list-style-type: none"> <li>○ Yearly Schedule of Maintenance</li> <li>○ Commissioning of New Battery</li> </ul>

**(XIV) Control Gear Section**

<b>Overhauling/Attention to:</b>		
<ul style="list-style-type: none"> <li>○ Resistor Panels</li> <li>○ Relays</li> <li>○ Magnetic Contactors</li> <li>○ Power Contactors</li> <li>○ Magnet Valves</li> <li>○ Meter Calibration -TA/ BE Meter</li> <li>○ Meter Calibration-Speedometer</li> <li>○ GP Relays of HHP Locos</li> <li>○ GR Relays of EMD Locos</li> <li>○ TCC Blower Contactor</li> <li>○ DPC Motor Contactors</li> </ul>	<ul style="list-style-type: none"> <li>○ Electro-Pneumatic Governor/Horn/Sander</li> <li>○ Master Controllers</li> <li>○ Breakers, Switches and Wheel Slip Buzzer and Alarm gang</li> <li>○ BKT/REV Power Switches</li> <li>○ Twin Beam Head Light</li> <li>○ SCR Assembly</li> <li>○ Battery Charging Assembly</li> <li>○ ST Contactor</li> <li>○ STA Contactor</li> <li>○ DPC Traction Alternator</li> <li>○ Test Stands</li> </ul>	<ul style="list-style-type: none"> <li>○ Voltage Regulation Panel</li> <li>○ Engine Control Panel</li> <li>○ Transition Panels with Cards</li> <li>○ Excitation Control Panel</li> <li>○ Electronic Components</li> <li>○ DCL Motor</li> <li>○ DCL Switch Assembly</li> <li>○ Braking Contactor</li> <li>○ TA Rectifier</li> <li>○ Radiator Fan Contactor</li> <li>○ Generator Field Contactor</li> <li>○ Generator Field Decay Contactor</li> <li>○ Power Supply Modules of EM 2000</li> </ul>

**(XV) Light Schedule (Electrical)**

<b>Attention to</b>	
<ul style="list-style-type: none"> <li>○ Track through Schedule</li> <li>○ T1 and T2 Schedule</li> </ul>	<ul style="list-style-type: none"> <li>○ M2 Schedule</li> <li>○ Trip Schedule</li> </ul>

### **List of Registers**

- Calibration History Register
- Verification History Register
- Customer Complaints Register
- Locomotive History Register
- T1/T2 Schedule Card
- M2 Schedule Card
- Trip/Monthly Schedule Card
- Rework/Deviation Approval Register
- Staff Training File
- Summer Precautions Register

### **(XVI) Small Motors Section (DC)**

<b>Overhauling of</b>		
<ul style="list-style-type: none"> <li>○ DC Fuel Pump</li> <li>○ AC Fuel Pump</li> <li>○ DC Crank Case Exhaust Motor</li> </ul>	<ul style="list-style-type: none"> <li>○ AC Crank Case Exhaust Motor</li> <li>○ AC Dust Exhaust Motor</li> <li>○ Axle Driven Alternator</li> <li>○ Vertical Fuel Pump Motor</li> </ul>	<ul style="list-style-type: none"> <li>○ Starting Motor</li> <li>○ Governor Booster Pump</li> <li>○ DC Turbo Lubrication Motor</li> <li>○ AC Turbo Lubrication Motor</li> </ul>

### **(XVII) Speedometer Section**

<b>Attention to</b>	
<ul style="list-style-type: none"> <li>○ Schedule of Maintenance</li> <li>○ Yearly Schedule Attendance of Radar</li> </ul>	<ul style="list-style-type: none"> <li>○ Speed Time Distance Recorder</li> <li>○ Pulse Generator/OPSS</li> </ul>

### **(XVIII)**

### **Traction Motor Section**

<b>Attention/Assembling of</b>	
<ul style="list-style-type: none"> <li>○ Magnet Frame</li> <li>○ Armature</li> <li>○ Bush Arm and Assembly Parts</li> </ul>	<ul style="list-style-type: none"> <li>○ Dismantling</li> <li>○ Pinion Mounting</li> <li>○ Final Attention</li> <li>○ Pre-despatch Examination</li> </ul>

### **(XIX) Wiring Section**

<b>Attention to</b>	
<ul style="list-style-type: none"> <li>○ Stripping of Components</li> <li>○ Wiring Attention</li> <li>○ Lighting Attention Grid Attention</li> <li>○ Sequence Checking</li> </ul>	<ul style="list-style-type: none"> <li>○ No Load Testing</li> <li>○ Load Testing</li> <li>○ Welding Precautions for HHP &amp; EMD Locos</li> </ul>

## **2.9 Time Office**

Apart from ensuring the employees Sign on and Sign Off, the activities in Time office includes,

- General Correspondence of Staff matters.
- Staff Training Programme.
- DAR Cases/ Award.
- Attending OLIC and other meetings conducted by DME/Dsl/ERS and other officials.
- Coordinating with SSE/General in day to day work.
- Preparation of Salary bill for all Group `C` and Group `D` employees.
- Forwarding of TA/NHA/NDA Statements.
- Preparation of Act Apprentice staff bills.
- Making entry of Tokens numbers from the Sign On Board in the Token Book and cross check the token book with daily staff position furnished by the Sections- in- charge.
- Forwarding of daily staff position to DME/Dsl/ERS depicting percentage of staff on duty and ineffective strength of both Mechanical and Electrical Wings.
- Maintenance of nearly 22 Attendance Registers.

## **2.10 Planning and Progress**

The section deals with monitoring of the Incoming Locos, dispatch of Locos for Traffic and is responsible for the daily outage and Laid up of Main line locos. As on DEC 2018, the total holding is 59 of which 01 are allotted for shunting purposes.

## **2.11 Laboratory**

A laboratory under the head of CMS/CMT with a team of junior supervisors is attached with this shed. The following activities are involved in this section.

- Testing of Lube oil taken from the incoming Locos to check viscosity, Flash point, Water contamination, Presence of Hydrogen and Total Base Number.
- Testing of Coolant water taken from the Incoming Locos to check corrosion inhibitors, Hardness, Chloride content and Presence of Hydrogen in water.
- Testing of HSD oil from the incoming Locos to check water contamination and sediments.
- Suitability for any new items received by suppliers through stores. Some of them are Gasket Casing, Hexagonal Head Bolt, Soap used in Loco washing, Lube oil.

## **2.12 Material Control Cell**

This section deals with Indenting, Processing and Procurement of Stock items used for Locomotives as and when needed through the office of PCMM. As on date, there are about 1000 Mechanical items and 430 Electrical items. Besides this, Inspection and certification of stores received and chasing of vital items from Shops and open market are involved.

## **2.13 Machinery & Plant**

The section deals with the Receipt, Commissioning and Repairs of machineries and Plants provided in the Diesel shed. Approximately 150 items are included in the M&P list. Some of the major items are EOT Cranes, Wheel Lathes, Fork Lifts, Power Drilling Machines, Welding Plants, Hydraulic Press, Air Compressor, Platform Truck, Lorries and one Chevrolet Tavera Vehicle.

#### 2.14 **Pit Wheel Lathe**

If any non-conformity noticed in the Initial Running Check, the Section checks the wheel Diameter, Gauge (FRT-Flange, Root and Tread wear) and Buffer height of the Incoming Locos .

#### 2.15 **Deployment of Section wise staff strength of Mechanical Wing**

Sl. No.	Section	SSE	J E	Sr. Tech	Tech Gr. I	Tech Gr. II	Tech Gr. III	KHP	TOTAL
1	Heat exchanger	1	1	3	4	0	2	0	11
2	Air brake	1	0	2	4	1	0	0	8
3	Compressor	1	0	1	2	1	1	0	6
4	Turbo	1	0	1	2	0	0	1	5
5	FIP	1	0	2	1	2	0	2	8
6	Power pack	1	0	0	4	2	2	2	11
7	CHS	1	0	1	2	0	0	1	5
8	Under truck	2	0	3	4	2	3	1	15
9	M & P	1	0	2	0	4	1	2	10
10	Material Control Cell	1	0	1	1	0	0	3	6
11	RCD	0	0	2	0	0	1	6	9
12	INF CELL	1	0	0	1	0	0	2	4
13	LAB	4	0	0	0	0	0	1	5
14	L.SCH	0	4	10	10	2	3	10	39
	<b>TOTAL</b>	<b>16</b>	<b>5</b>	<b>28</b>	<b>35</b>	<b>14</b>	<b>13</b>	<b>31</b>	<b>142</b>

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### **CHAPTER – III**

#### **3.0 CRITICAL ANALYSIS**

- 3.1 In the present technologically advanced scenario, many of the components provided in the HHP and also modern ALCO types are of high end technologies like Microprocessor Excitation, Propulsion Controlled System, Microcontroller based Governors, PTLOCs, IGBT, DC Link, CCB which requires higher educational and intelligence level. The constant need of up gradation of proprietary software leads to outsourcing and the need of

awarding AMC to OEM is inevitable. Moreover, many of the assemblies have distinct parts which have to be supplied by the original manufacturer only.

3.2 In this context, it has already been awarded AMC to OEM like Medha, EMD and other like companies for the following activities.

- IGBT based TCC along with LCC.
- Microprocessor based control system.
- Computer controlled bench top rotating disc electrode Spectrometer.
- SLI system of Cummins engine of 140 T BD crane.
- D-Check for Cummins make engine of DPC.
- Housekeeping, Cleaning and gardening of premises.

3.3 Since manpower is the biggest component of the expenditure of Indian Railways, rightsizing of its manpower is essential to increase efficiency and economy. For this purpose, Railway Board has issued frequent policy guidelines in restricting the intake of staff and utilization of the existing manpower to the optimum level.

Keeping this objective in view, Railway Board has been conducting Benchmarking exercise for all the departments. Member Staff has directed all the Railways to take the following action on Benchmarking Report.

(a) For the activity centers/divisions with MPRs (Man Power Ratio) above the average should bring down their MPR to the IR average.

(b) Other activity centres/divisions already having the benchmark below the Indian Railway average should try to move towards the best benchmarking figures on the IR.

3.4 As far as locomotives are concerned, focus has now shifted at the Apex level to have a phased elimination of diesel locos and proliferation of Electric engines. Instructions were given to stop Rehabilitation and investment on diesel locos, instead scaling up of electrification of the entire rail network for ecofriendly rail transportation. It is to be mentioned at this juncture that nearly 50% of its Route Kilometers are electrified as on March 2018 and steps are being taken by CORE/ALD to complete the electrification of the entire RKM by the year 2022 under 'Mission Electrification' involving RVNL, IRCON and PGCIL for speedy implementation in RE works. 6000 Route Kms is targeted for 2018-19.

3.5 In this context, as far as Southern Railway is concerned, progress of electrification as on March 2018 is 70%. Southern Railway comprises mainly the states of Kerala and Tamilnadu. In Kerala state, 855 out of 1024 RKM are electrified which accounts for 84% whereas in Tamilnadu it is 55.5% i.e., 2034 out of 3669 RKMs. The Target for 2019-20 is 239 Kms.

Hence, it is imperative to have a hard look at reviewing the staff strength involved in the maintenance of diesel locos in the event of electrification works being in full swing.

3.6 Loco holding of mainline locos in Diesel Shed/ERS is 59 ALCO locos.

3.7 **The types of schedules and the periodicity are as follows**

Type of heavy schedule	WDM-2	WDM-3A	WDM-3D	WDG-2	WDP-4D
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Quarterly	Once in 4 months	Once in 4 months	Once in 4 months	Once in 4 months	Once in 3 months
Half yearly	12 months	12 months	12 months	12 months	
Yearly Schedule					
M 24	24 months				
M 48	48 months				
M 72	72 months				
POH	96 months				

#### a. Passenger Locos

Type of Light schedule	WDM-3A	WDP-3A	WDP-4B	WDP-4D
T1	Between 7 – 10 days			
T2	Once in 15 days			
Monthly	Once in 30 days			

#### b. Freight Locos

Type of Light schedule	WDG-3A	WDG-4	WDG-4D	WDM-2
T1	20 days			
T2	20 days		30 days	20 days
Monthly	Once in 30 days		Once in 40/60 days	Once in 60 days

- 3.8 WDM-2 and WDM-3A are presently used for yard purposes and in general, locos of any old version which have run for more than 20 years is decommissioned from Main line traffic.
- 3.9 The duty hours of Running Shift i.e., Trip and Monthly schedule is round the clock. Totally 4 shifts are running including one General shift as follows  
06.00-14.00 hrs  
14.00-22.00 hrs  
22.00-06.00 hrs  
08.15 - 17.00 hrs (General Shift)
- Quarterly, Half yearly and Yearly maintenance are done in General shift i.e., 07.30 to 16.30 hrs with Sunday Holidays.
- 3.10 The workforce deployed per shift in the Light Schedule is
- Mechanical - 4 Technicians and 3 Helpers/Shift  
Electrical - 6 staff including Helpers/Shift  
Shunter - 2 per shift  
Points man - 2 per shift
- 3.11 The Bench marking figures of April 2019 furnished by Railway Board (Holding less than 80 locos) is for both maintenance of Mechanical and Electrical wing

IR Average for Mechanical & Electrical wing is 4.57 Men/Loco  
Current bench marking for Mechanical & Electrical wing is 2.20 Men/Loco at BL Shed

General pattern of distribution of Mechanical & Electrical wing is 60 : 40 ratio.

By applying this ratio of mechanical wing i.e. 60% of 4.57 IR AVG is 2.74 per men per loco.

It is to be mentioned that the Bench marking norms clearly indicates that the men on roll for a particular activity includes that actual number of officers, supervisors, artisans, direct and indirect staff, support staffs and all other group C & D staffs utilized.

Since adoption of current benchmark will adversely affect the present working system, the work study team has taken the Indian railway average (60 % of 4.57 is 2.74) for arriving at the requirement of manpower for Diesel shed Mechanical wing.

3.12 Accordingly,

The IR average for ALCO Locos in Mechanical wing - 2.74 staff/Loco (Present diesel loco holding is 59)

ALCO Locos - 59 x 2.74 men	:	161.66 Say 162 staffs
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As per IR average bench marking, the requirement is 162 staffs against the sanction of 158. Hence the existing sanction is allowed as it is.

3.13 **Sanction Vs Requirement**

**Group C, D & Ancillary** staffs

Sanction	Actual	Requirement	Surplus
158	161	162	--

3.14 **Recommendation** : NIL

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## **CHAPTER IV**

4.0 **PLANNING BRANCH REMARKS ON CO – ORDINATING OFFICER'S VIEWS**

**NIL**

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## CHAPTER V

### 5.0 FINANCIAL SAVINGS

- Nil -

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**ANNEXURE – I**

**SCALE CHECK OF DIESEL SHED/ERS(Mechanical wing) AS ON 21.02.2019**

<b>Sl. No</b>	<b>Category</b>	<b>Sanction</b>	<b>Actual</b>	<b>Vacancy</b>	<b>Excess</b>
1	SSE/M	11	12	--	01
2	JE/M	05	05	--	--
3	Sr. Technician	28	28	--	--
4	Technician Gr. I	54	39	15	--

5	Technician Gr.II	08	03	05	--
6	Technician Gr.III	16	14	02	--
7	Helper	32	30	02	--
8	Ancillary staffs	04	07	--	03
9	Ministerial staffs	--	23	--	23
	Total	158	161	24	27

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