EASTERN RAILWAY

WORK STUDY REPORT
ON
REVIEW OF STAFF STRENGTHVIS-À-VIS WORKLOAD OF ELECTRIC LOCO SHED/ASN BASED ON BENCHMARK CONCEPT

(STUDY NO.WSER-09/18-19)

(Submitted on: 26.09.2018)

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ACKNOWLEDGEMENT

The study team is thankful to Sr.DEE/TRS/ASN, Sr.DPO/ASN, Sr.DEE/TRS/HWH and all concerned staff of Asansol and Howrah Division for their heartiest co-operation and guidance in conducting the subject work study.

TERMS OF REFERENCE

The subject work-study has been conducted based on the following terms of references –

i) Existing sanctioned strength and MOR of ELS/ASN as on April'18.

ii) The work load of loco shed i.e. total loco holding at ELS/ASN as on April'18.

iii) Activities being done completely in house and number of staff deployed.

iv) Activities outsourced.

v) Practices/Activities which may be outsourced or need to be improved.

vi) Analysis done based on IR MPR avg. published on April'18 by Efficiency & Research Directorate, Railway Board.

SUMMARY OF RECOMMENDATION

Division	Existing			Proposed requirement of staff (Gr.C + Gr. D)
ASN	Sanctioned (Gr.C + Gr. D)	MOR (Gr.C + Gr. D)	Vacancy	
ELS/ASN	629	577	52	577

The study team recommends that 52 vacant posts should immediately be surrendered from the existing sanctioned strength of ELS/ASN. **Thus, revised sanctioned strength of ELS/ASN will be 577 instead of 629.**

CHAPTER-I

1.0 INTRODUCTION:

1.1 Indian Railways (IR) has one of world's largest railway network spread over 67368 route km connecting 7349 stations and serving people of this glorious nation since 1853. In 2016-'17, Indian Railways transported 8.12 billion passengers to their destinations, i.e. more than 23 million passengers a day. In addition, it transported around 1.12 billion tons of freight across length and breadth of country. IR acts as a vehicle of inclusive growth connecting regions, communities, ports and centers of industry, commerce, tourism and pilgrimage across country. Indian Railways, along with national highways and ports, is backbone of India's transport infrastructure. Currently, more than 33% of total freight traffic (in terms of ton-kilometers) of country moves on rail. Further, share of Railways in certain core infrastructure sectors such as coal, power, steel, cement and in other ritical sectors like fertilizer is as high as 70%. The reach and access of its services are continuously expanding with continuous improvement in its services through its dedicated team of 1.32 million and by use of cutting-edge technologies.

1.2 In order to control spiraling fuel bill, reduce dependence on imported fossil oil, increase energy security of nation, reduce pollution, improve operational efficiency and operating ratio of IR, it is imperative that electrification is accorded priority in Railways. Electric traction improves throughput and section capacity by about 15%, as it enables haulage of eavier freight and longer passenger trains at higher speed.

Reliability of Electric locos has been improved consistently and percentage share of trains lost punctuality on account of Electric locomotives & Electric loco running staff is generally 1.2-1.4% in total trains lost punctuality over Indian Railways

1.3 In the context of human resource planning, Indian Railways is presently on the threshold of major technological changes. Some categories of staff are likely to become surplus, there may be shortage in few categories and some new categories may get boom as substantial inputs in areas like electrification, communications, computerization, new production units become unavoidable in due course of time.

1.4 Indian Railway is facing tremendous financial crunch after implementation of 7th Pay Commission. Operating ratio is gradually increasing. Though Indian Railway is not a business organization but to survive, it is always essential to make the organization in profit i.e. operating ratio should be less than 100. The "Operating Ratios" from 2012-13 to 2017-18 shown in the corporate plan booklet published by the Eastern Railway are given below –

2012-2013	178.86%
2013-2014	173.32%
2014-2015	177.27%
2015-2016	180.75%
2016-2017	165.25%
2017-2018	178.76% (Proposed)

1.5 In view of the above, Rly Board issued nos. of circulars, orders, etc to minimize expenses and increase earnings to Zonal Railways to achieve better Operating Ratio. The Zonal Railways also implement various measures for financial discipline.

At this juncture, the role of Railway Efficiency & Research Directorate is also very important in connection with the productivity without hampering normal progress and activity by employing technique of 'Benchmarking', 'Rationalizing of Man-Power' and eliminating diminishing categories/redundant activities, etc. The Railway has also invested huge amount in capital expenditure to improve its infrastructure by adopting new technology time to time.

1.6 Benchmarking, as an approach for determining operational and productivity goals based on the best practices in a given industry is one of the most promising tool in the field of quality management today. Among the various quality and productivity management tools available to the organizations, benchmarking is the one that can be used without much prior preparation and the costs. As the technique helps the staff to learn as they work out their way in discovering and implementing the best practices in the industry. It fills them with self esteem and with a sense of achievement that they are capable of improving upon even the best in their industry.

1.7 The Efficiency and Research Directorate of Railway Board publishes month wise MPR (Man power Ratio) of 15 activity centres of different department of all divisions in Indian Railway. **To bring the uniformity of staff deployed in same activity centre in different railways, the railway board has advised time to time to different railways to conduct work study based on MPR published and identify the excess man power deployed.**

1.8 The subject work-study has been undertaken by GM's Efficiency Cell/E.Rly during the current financial year 2018-2019 to improve the productivity index of the Railway. As per terms of reference, the study team has critically analyzed the MPR of ELS/ASN and applies the concept of Benchmarking, where in the Railway Board has advised to achieve the Avg. BM among the same activity centers in the 1st phase and then try to achieve the Indian Railway Benchmark of the similar activity.

CHAPTER-II

2.0 EXISTING SCENARIO:

2.1 Electric Loco Shed (ELS) in Asansol division functions under the administrative control of Sr. Divisional Electrical Engineer (Traction Rolling Stock). The activities of overhauling, assembly and different schedule and non-schedule maintenance of 25 KV AC electric Locos are carried out at ASN Electric Loco Shed.

2.2 The study team has collected the sanctioned strength and men on roll position of staff working in ELS/ASN from Personnel Department (Annexure-A) as well as Sr. DEE/TRS office of ASN division (Annexure-B). There is a huge variation in MOR position in these statements. After discussion with concerned official, the study team has taken the sanctioned strength given by the Personnel Department and corresponding MOR position is taken from the data given by ELS/ASN.

The category wise sanctioned and MOR position of ELS/ASN is tabulated below-

TABLE-A

SL. No.	Category	Sanctioned Strength	Men On Roll (MOR)	Vacancy
1	SSE	43	42	1
2	JE	21	13	8
3	Lab. Supdt.	2	1	1
4	**Sub Total**	**66**	**56**	**10**
5	Sr. Tech./MCM	128	126	2
6	Tech-I (Fitter)	237	161	76
7	Tech-II (Fitter)	29	51	-22
8	Tech-III (Fitter)	35	18	17
9	Tech-I (Machinist)	6	4	2
10	Tech-II (Machinist	3	1	2
11	Tech-III (Machinist)	1	0	1
12	Tech-I (Welder)	7	4	3
13	Tech-II (Welder)	4	2	2
14	Tech-III (Welder)	3	0	3
15	Tech-I (Driver)	6	4	2
16	Tech-II (Driver)	3	2	1
17	Tech-III (Driver)	3	0	3
18	Tech-III (Painter)	0	1	-1
19	**Sub Total**	**465**	**374**	**91**

20	Chief OS	1	1	0
21	OS	10	9	1
22	CG-I	1	0	1
23	**Sub Total**	**12**	**10**	**2**
24	Helper	82	136	-54
25	Safaiwala	0	1	-1
26	Chowkidar	3	0	3
27	Peon	1	0	1
28	**Sub Total**	**86**	**137**	**-51**
29	**TOTAL**	**629**	**577**	**52**

2.3 The above staffs are deployed in various sections for smooth functioning of the shed. The various sections and their activities are elaborated in the fore coming paragraph.

The various sections are given below:

i) E1
ii) E2
iii) E3
iv) E4
v) E5
vi) TM
vii) M1
viii) M2
ix) M3
x) M4/MW
xi) M5
xii) G1
xiii) PPO
xiv) Store
xv) Purchase
xvi) Laboratory
xvii) CTA/Technical section
xviii) SSE(IC)

2.4 The activities of the above sections as per ACTM are illustrated below-

E-1:-

a) To carry out preventive maintenance schedule inspections and overhauling schedules on battery charger and rectifier block.

b)Trouble shooting and investigations of Unusual Occurrence Report (UOR), withdrawal and failures of Electric Locos.

c) To oversee checking and complete testing of Elect. Locomotives nominated for VIP/SUPER FAST trains and special trains.

d) To oversee checking and complete testing of the nominated loco is EMUs/by PPO. E-1 section shall have a Quality Assurances Group consisting of competent supervisors and artesian staffs who will carry out super checking on nominated

schedule/unscheduled locos.

E-2:-

a) Test before and test after of all schedule inspection.
B) Electrical Inspection and repairs (minor) of parts noticed defective during inspection i.e. head lights, flasher lights and electrical equipments in BA panels. TFT,RSP,SL, Programmed switch, MP,EMC, DBR,SMGR,CGR,Tap Changer, cables, cables sockets and cable connections.

E-3:-

a) To carry out scheduled inspection, unscheduled repairs, modifications, overhauling of traction motors.
b) Connection & disconnection of traction motors before lifting and after lowering.
c) To carry out scheduled inspection, unscheduled repairs, modifications, overhauling schedule of auxiliary motors.
d) To disconnect & connect auxiliary motors while removing / refitting during overhauling scheduled and unscheduled repairs.

E-4:-

a) To carry out scheduled inspections, unscheduled repairs, modifications and overhauling schedule on all delicate and precision electrical equipment like relays, speedometer connections/DJ connections during unscheduled repair.
b) To disconnect and connect speedometer connections/DJ connections during unscheduled repair.

E-5:-

Major repairs and overhauling of EP and EM contactors, smooth reactor, RPS, flasher light , MP, TFT oil filtration , CGR, SMGR and tap changer(during IOH schedule/ unscheduled visits) and modifications.

E-6:-

a) Removal and fitment of EMCs, EP Cs, RPS, and DBR during AOH schedule.
b) Removal and fitment of SL, SMGR, and TAP changer during AOH schedule.
c) Overhauling of BA panel, head light, TK panel, SB panels rotor switchboard and switches during AOH/IOH schedule.
d) Cleaning of cable junction boxes and cables during overhauling.
e) Overhauling of SMGR and GR during AOH schedule.

M-1:-

a) Inspection and running repairs of mechanical parts, under frame, brake gear, wheels & axles, buffing gear , body doors & windows , locks, side glasses, lookout glasses etc.
b) Special checks.
c) Carry out pre-summer, pre-winter and monsoons check.

M-2:-

AOH/IOH schedule work on i.e. centre pivot, side bearer, roof, buffing gear, tail guard, side glasses, lookout glasses, doors, windows and locks.

M-3:

Inspection and running repairs and overhauling of pantograph.

M-4:-

a) To supervise the work of machine shop.

b) To supervise proper functioning of Tool Room and its upkeep.
c) To supervise and executive the re-profiling of wheel sets of electric locomotives on the pit wheel lathe and its preventive maintenance.

M-5:-

a) To carry out schedule inspections and overhauling schedules on all pneumatic equipment except compressors and exhausters.
b) Testing of all pneumatic equipments on test bench after overhauling.
c) To carry out scheduled inspections, unscheduled repairs, modifications and overhauling of compressors, Exhausters and auxiliary compressors.
d) Removal and fitment of compressors, exhausters and auxiliary compressors during overhauling, scheduled/unscheduled visits.

M-6:-

a) Mechanical disconnection and connection, lifting and lowering of locomotives.
b) Heavy repairs and overhauling of bogies and other mechanical components like wheel sets, springs, axles boxes etc.
c) Traction motors assembly and disassembly.

PPO :-

a) Receipt and dispatch of locomotives/EMUs for their schedule and unscheduled visits.
b) Planning of schedule and unscheduled repairs of locomotives /EMUs
c) Monitoring the performance of developmental equipment.
d) Maintenance of history books, history cards of equipment fitted.
e) Keeping liaison with RSO regarding calling of locomotives/EMUs for schedule /unscheduled work.
f) To keep record of wheel wear and to program re – profiling
g) To scrutinize Electric Loco/EMUs log books on arrival of locomotives and issuing all job cards to the section supervisor for proper attention to the defects and to ensure that the work is done when the job cards are returned.

Store:

All works pertaining to procurement of stores and liaison with HQ for timely procurement of stores and up keep of custody stores for non-stock items.

G:-

a) Electrical and mechanical millwright sections.
b) Maintenance of cranes and M&P items.
c) General upkeep of shed.
d) Road Transport.

Laboratory-

Physical and technical testing of all items including ultrasonic testing of axles and shafts.
Drawing office- All drawing work, preparation of office estimates etc.

Technical Section-

The chief responsibility will be:
1. Operation of Computer- Collection of data and processing.
2. Keeping track of every failure of components. The failure should be analyzed in detail on the basis of which should emerge the analysis of the cause of failure, suggestions for improvements, modifications etc.

3. Documentation of all technical information.
4. Keeping a watch that the maintenance instructions issued to the shed staff are up-to-date and ensuring that the instructions are explained top the concerned staff.

2.4.1 The category wise existing deployment of staff against the above mentioned sections is tabulated below.

Category	Trip shed	E1	E2	E3	E4	E5	TM	M1	M2	M3	M4/ MW	M5	G1	PPO	Store	Pur	Lab	CTA	SSE (IC)	TOTAL
SSE	2	2	4	2	2	4	2	2	5	1	1	3	1	5	2	1		2	1	**42**
JE	2	1	2	1	1							2	1			1	1			**12**
CMA																	1			**1**
Sr. Tech.	7	10	5	7	5	11	6	9	22	2	10	10	9	6	3	1			1	**124**
Tech-I	7	5	14	13	11	15	5	19	15	5	4	18	15	2	6	4	2	2		**162**
Tech-II	1	8	8	6	1	5	2	1	3	2	5	3	2	2				1	2	**52**
Tech-III	1	2		1	2	1		1				1			1				1	**11**
Tr. Tech-III			1	1					1	2		3								**8**
Mach-I											4									**4**
Mach-II																				**0**
Mach-III											1									**1**
Weld-I							1	1	2											**4**
Weld-II																				**0**
Weld-III												1	1							**2**
Cr. Driver-I									4											**4**
Cr. Driver-II																				**0**
Cr. Driver-III									2											**2**
Sr. MV/ Dr.															1					**1**
MV/ Dr.-I																				**0**
MV/ Dr.-II															1					**1**
Painter-III																				**0**
Helper	9	6	7	13	4	10	8	15	15	7	10	11	6	4	6		1		3	**135**
Safaiwala																			1	**1**
Minis.															3	1			6	**110**
Total	**29**	**34**	**41**	**44**	**26**	**46**	**24**	**48**	**69**	**19**	**35**	**52**	**35**	**19**	**23**	**8**	**5**	**5**	**16**	**577**

2.5 A position regarding total Loco holding and corresponding inspection schedule of locos as on April'18 is tabulated below:-

Type of Loco	Holding	Inspection Schedule	
		Minor Inspection	Major Inspection
WAG-5 (Hitachi)	65 nos.	60 days	2 years for TOH & 6 years for IOH
WAG-5 (Tao chi)	29 nos.	60 days	1 year for AOH & 3 years for IOH
WAG-7	35 nos.	60 days	2 years for TOH & 6 years for IOH
WAM-4	6 nos.	40 days	1 year for AOH & 3 years for IOH

2.6 The frequency of maintenance schedule and duration of work of above locos is given below.

Freight locos (WAG-5, WAG-7) Maintenance Schedule :-		
Maintenance Schedule	Periodicity	Duration
Trip Inspection	20 days	2 Hrs
IA	60 ± 3 days	4 Hrs
IB	120 ± 3 days	6 Hrs
IC	180 ± 3 days	8 Hrs
TOH /AOH	24 months ± 15 days	6 days
IOH	72 months ± 1 months or 6 Lakh Kms whichever is earlier	11 days

Maintenance of IOH is carried out at Workshops.

2.7 The performance i.e. Minor & Major maintenance carried out at ASN Loco shed in 2017-18 (April'17 to March'18) is tabulate below.

Type of Inspection	Loco Type	April'17	May'17	June'17	July'17	August'17	Sept'17	Oct'17	Nov'17	Dec'17	Jan'18	Feb'18	March'18	TOTAL
Trip	All types	330	340	397	382	400	327	387	378	373	386	356	391	**4447**
IA	G5	15	14	10	16	17	13	15	14	16	19	11	10	**170**
	G7	2	8	3	5	2	2	6	3	2	7	7	3	**50**
	M4	2	1	2	1	4		2	1	2	2	1	1	**19**
Sub total		**19**	**23**	**15**	**22**	**23**	**15**	**23**	**18**	**20**	**28**	**19**	**14**	**239**
IB	G5	10	8	7	10	9	11	5	7	13	5	10	9	**104**
	G7	4	7	1	4	6	6	5	4	7	4	0	6	**54**
	M4	0	1	2	2	1	2	2	1	2	2	2	1	**18**
Sub total		**14**	**16**	**10**	**16**	**16**	**19**	**12**	**12**	**22**	**11**	**12**	**16**	**176**
IC	G5	19	8	13	15	13	1	16	17	8	11	19	10	**150**
	G7	5	3	5	8	3	4	4	6	6	3	6	5	**58**
	M4	0	1	1	2	2	0	2	3	0	2	2	2	**17**
Sub total		**24**	**12**	**19**	**25**	**18**	**5**	**22**	**26**	**14**	**16**	**27**	**17**	**225**
AOH	G5	0	4	5	5	0	5	5	4	4	4	2	5	**43**
	G7	2	0	0	2	2	1	0	1	2	0	0	0	**10**
	M4	2	1	1	0	0	0	0	0	0	0	0	0	**4**
Sub total		**4**	**5**	**6**	**7**	**2**	**6**	**5**	**5**	**6**	**4**	**2**	**5**	**57**
IOH	G5	3	0	1	0	0	0	1	0	0	0	0	1	**6**
	G7	0	1	0	0	0	0	0	0	0	1	0	0	**2**
	M4	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Sub total		**3**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**1**	**8**

CHAPTER-III

3.0 CRITICAL ANALYSIS:

3.1 With the increase in production of electric locos for meeting the traffic demand, the holding of the electric loco sheds on Indian Railways has been increasing steadily. Considering the non-availability of the desired manpower as per the present yard stick in sheds for holding these locomotives, need has been felt to identify areas of maintenance activities which can be undertaken through trade/OEM so that maintenance of locos with increased holding in shed can be done with the available manpower.

IR has been meeting the ever increasing freight and passenger traffic demand throughout the length and breadth of country and the need for such increase is getting stiffer day by day in view of the projected growth and development of the country.

Keeping the above status in view, it is evident that the increase in holding of all the electric loco sheds is unavoidable and it will go on increasing day by day to meet the burgeoning traffic demand.

Therefore, there is a pressing need to review the present maintenance practices of sheds, identify the activities which can be undertaken through OEM/trade so that least difficulties are encountered while maintaining the increased number of locomotives within the available manpower. It is evident that in view of policy of Government to optimize the staff output, it is extremely difficult to get additional staff posted in sheds. Therefore, measures to ensure proper maintenance of electric locomotives with the available set of staff have to be devised and implemented.

3.2 **Concept of Benchmarking:**

The Indian Railways initiated the process of benchmarking in August 2000 when Efficiency & Research Directorate of Railways Board undertook a study which culminated in its first report on the Subject titled "Rightsizing of Indian Railways through Benchmarking" in April 2001. There are various areas where there is ample evidence of the staff getting redundant on slight change in the existing pattern of working/procedure or as a result of progressive introduction of computerization. These actions may point towards the potential for staff reduction in the coming years.

Benchmarking is a continuous process of measuring an organization's product, services, processes and practices against the most successful competitors which have established themselves as leaders in the field and then learning how the excellence was achieved by them so that the system can be set and the processes put in place to match or even surpass them. In other words benchmarking is the implementation of best practices.

Since benchmarking is a search for and implementation of the best Practices, one distinct benefit of benchmarking is that it forces documentation of the work processes so as to enable the organization to continuously compare them with the best of the industry.

As continuous improvements are being achieved towards the benchmarking by all activity centers a fresh look at old way of working and emphasis on innovative work practices is resulting in diminishing resistance to change and improvement of work

culture. There is a growing realization that unless the railways remain competitive by cutting unnecessary costs the railways men can't think of a bright future for them.

Adoption of modernization, maintenance free equipments, tools, change in maintenance schedule, increase/decrease in workload and MOR of a particular work centre may alter the MPR of that work centre.

3.3 Keeping this in view, Railway Board used to update the MPRs of 15 activity centres based on figures supplied by Zonal Railways to compare MPR of similar activity centres over Indian Railway. It is observed that there is a wide variation in the manpower ratio among different sheds and Railways.

3.4 **Types of Maintenance Activities in shed:**

At the time of prescribing the present manpower norms, the concept of undertaking maintenance activities of equipments/locos through trade/OEMs was not envisaged. At present, the activities of sheds undertaken through OEM/trade are limited to repair/rehabilitation of major equipment like Transformers, Compressors, Smoothing Reactor, Tap Chargers, PCB Cards, Valve Sets, etc. This has been done based on the guidelines for repair/rehabilitation of equipment issued by Railway Board from time to time. Some of the sheds in IR have also started undertaking maintenance activities in sheds on a limited basis for equipment like bogies, body filters, cleaning of loco/equipment etc.

However, the basic work of taking up regular maintenance activities of equipment/locomotives through trade has not yet been started on a regular basis by sheds.

As per the present practices of maintenance being adopted by the sheds, the overall maintenance of equipment after removal from the locomotive can be broadly classified into two activities/components.

A) Repair/Rehabilitation of failed/old Equipment
B) Overhauling of equipment during maintenance schedules of locomotives

3.4.1 A) **Repair/Rehabilitation of failed/old Equipment:**

Guidelines have already been issued from time to time by Railway Board for undertaking repair/rehabilitation of various equipments of locomotives through OEMs/trade. This activity is undertaken whenever the equipment has failed for which repair facilities are not available in shed or when the equipment has completed the period of service after which its rehabilitation/ up gradation is required as per the prescribed guidelines of Railway Board/RDSO. Major items in this category are listed below.

- Transformer
- Auxiliary Motors
- Compressors
- Speedometers
- DBR
- VCB
- Relays
- Tap Changers
- Smoothing Reactors
- Power Convertors
- Aux Converters

- PCB Cards
- Three Phase TMs
- Brake Equipments
- DCS & SIV
- BA Panels etc.

On the basis of directives issued by Railway Board, RDSO has been issuing a list of sources for repair/rehabilitation of these equipments over the last couple of years for the guidance of Railways. The last such list was issued by RDSO vide its letter No.EL/3.6.1/3 dated 24.8.2011,

B) **Overhauling of Equipment:**

The second type of maintenance carried out on equipment is their overhauling during major schedules. At present, generally all the sheds are carrying out overhauling of all equipment in sheds through maintenance staff only. However, as mentioned earlier, a very few sheds with less availability of staff are undertaking overhauling of the following components through OEMs/trade:

- Overhauling of Bogies
- Overhauling of Compressors
- Overhauling of Line & Shunting contractors
- Cleaning of loco filters
- PU painting of locomotives
- Cleaning of shed premises and general upkeep/maintenance in shed

3.5 It is also noted that an instruction has been issued on increasing the periodicity of minor inspection schedule (IA, IB & IC) of WAG7 and WAG5H locos from 45 to 60 days as also the increase in AOH inspection periodicity of WAP4 loco from 12 months to 18 months (Annexure-F). **Thus, against 8 minor inspections for a freight loco earlier, now only 6 inspections are required, thereby affecting a saving of 25% in manpower for inspection workload per loco. Hence, there is a scope of 25% direct curtailment of man power from minor maintenance activities.**

3.6 As per the Man Power Ratio (MPR) published by Efficiency & research directorate of Railway Board in April'18, the following figures have been noticed against 30 Electric Loco Sheds in Indian Railway (Annexure-C),

IR average: 3.29 Men per Loco
Benchmark: KUR shed of ECOR at 2.13 Men per loco

3.6.1 Prior to analyze the MPR of ELS/ASN with the MPR of Indian Railway, the study team at first compares the MPR of ASN shed with the MPR of HWH shed in Eastern Railway. For this purpose the study team has collected the MPR figure of these sheds for the month of April'18, Note No. EL/202/6/1/2/Benchmarking (MPR) dated 06.04.2018 (ANNEXURE-D). The figure is tabulated below.

Name of Sheds	Total MOR	Holding of Locos	MPR (Men per Loco)
ELS/HWH	467	137	3.41
ELS/ASN	593	136	4.36

It is observed from the above table that there is a wide variation in the manpower ratio between HWH & ASN Electric Loco Shed in Eastern railway.

3.7 The study team has collected the various data to compare the difference of performance of the above sheds.

3.7.1 The loco holding of ELS/ASN has already been given in para 2.5 in the previous chapter and the loco holding of ELS/HWH is tabulated below:

MONTH	**14-15**	**15-16**	**16-17**	**17-18**	**18-19**
April	110	110	112	126	139
May	110	110	113	127	139
June	110	110	115	128	139
July	110	110	115	129	139
August	110	110	115	130	
September	110	110	116	135	
October	110	110	117	135	
November	110	110	119	135	
December	110	110	120	136	
January	110	110	122	137	
February	110	110	124	138	
March	110	110	125	139	

3.7.2 The trip inspection, minor and major inspection done by ELS/HWH in the year 2017-18 is given below.

MONTH WISE LOCO WISE INSPECTION DONE IN 2017 - 2018														
Type of Inspection	Loco Type	April	May	June	July	August	September	October	November	December	January	February	March	TOTAL
		2017	2017	2017	2017	2017	2017	2017	2017	2017	2018	2018	2018	
Trip	All types	528	540	545	535	515	531	532	557	472	560	438	517	6270
IA	WAP4	20	19	20	19	16	16	19	23	14	17	21	19	223
	WAP7	3	7	4	3	3	3	2	4	7	3	5	7	51
Sub Total		**23**	**26**	**24**	**22**	**19**	**19**	**21**	**27**	**21**	**20**	**26**	**26**	**274**
IB	WAP4	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
	WAP7	1	3	4	6	5	3	7	3	3	1	5	6	47
Sub Total		**1**	**3**	**4**	**6**	**5**	**3**	**7**	**3**	**3**	**1**	**5**	**6**	**47**
IC	WAP4	17	14	16	16	16	18	13	15	16	16	15	14	186
	WAP7	0	2	3	2	3	4	6	4	4	7	7	2	44
Sub Total		**17**	**16**	**19**	**18**	**19**	**22**	**19**	**19**	**20**	**23**	**22**	**16**	**230**
AOH	WAP4	1	2	2	2	1	2	3	2	1	2	2	2	22
	WAP7	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total		**1**	**2**	**2**	**2**	**1**	**2**	**3**	**2**	**1**	**2**	**2**	**2**	**22**
IOH	WAP4	1	1	1	1	1	1	0	1	2	1	0	1	11
	WAP7	0	0	0	0	1	1	1	1	0	1	1	1	7
Sub Total		**1**	**1**	**1**	**1**	**2**	**2**	**1**	**2**	**2**	**2**	**1**	**2**	**18**

3.7.3 Although the work distributed in different sections of the sheds have been outlined in Volume III of the ACTM, it is observed that each shed has its own distribution of activities with the same equipment being maintained in different sections by different sheds. On the basis of utilization of existing staff given by sheds, the section wise deployment of staff for conducting the schedule inspection at ELS/HWH and ELS/ASN is tabulated below.

ELS/HWH

Type of Loco	Sections	Deployment of staff against Schedule inspection					Duration of work
		IA	IB	IC	AOH	IOH	
WAP4	M1	8		11	24	36	IA=4Hrs IC=8Hrs. AOH=6days IOH=9Days
	M2				95	95	
	M3	6		10	20	20	
	M5	4		4	74	74	
	E1	6		10	16	16	
	E2	6		8	70	160	
	E3	6		10	150	160	
	E4	4		4	48	48	
	G1	4		4	20	20	
TOTAL		**44**	**0**	**61**	**517**	**629**	IA=4Hrs IB=6Hrs IC=8Hrs. AOH=6days IOH=11Days
WAP7	M1	8	8	14	18	30	
	M2	5	5	8	98	107	
	M3	4	4	4	20	20	
	M5	4	4	4	80	96	
	E1	4	4	4	12	9	
	E2	6	6	8	24	80	
	E3	6	6	8	108	162	
	E4	3	3	6	25	25	
	G1	4	4	4	25	25	
TOTAL		**44**	**44**	**60**	**410**	**554**	

ELS/ASN

Type of Loco	Sections	Deployment of staff against Schedule inspection					Duration of work
		IA	IB	IC	TOH	IOH	
WAG-7 & WAG-5	M1	6	6	11	14	18	IA=4Hrs IB=6Hrs IC=8Hrs. AOH=6 days IOH=9 Days
	M2				121	145	
	M3	2	2	4	30	45	
	M4				8	8	
	M5	3	3	9	58	62	
	TM				104	117	
	E1	2	2	3	24	30	
	E2	2	2	8	46	68	
	E3	4	4	8	46	62	
	E4	6	6	6	72	108	
	E5	3	3	6	12	20	
	G1	3	3	5	40	50	
TOTAL		**31**	**31**	**60**	**575**	**733**	

3.7.4 From the above tables, staff deployed for performing various schedule maintenance of passenger locos at ELS/HWH and goods loco at ELS/ASN is tabulated below.

Type of Inspection	Total Inspection done in 2017-18		Total staff deployed for conducting each Schedule Ins.	
	HWH	ASN	HWH	ASN
IA	274	239	44	31
IB	47	176	44	31
IC	230	225	60	60
AOH/TOH	22	57	410	575
IOH	18	8	554	733

3.7.5 All Locos maintained by HWH sheds are passenger loco and out of 139 locos 48 are 3 phases loco whereas the all locos maintained by ASN shed are goods loco. Hence, direct comparisons of MPR of these sheds based on only number of locos is not justified.

3.7.6 The Railway Board has advised time to time that every sections of the organization should try to achieve the Avg. MPR of similar activities in the 1st phase and then try to achieve the Indian Railway benchmark of that activity. In calculation of avg. MPR of Electric Loco Sheds, all types of locos and infrastructures available in Indian Railway are accounted. Hence it is very much scientific to follow the IR avg. and the Railway Board is pressing hard to achieve the IR avg. in the 1st phase to those loco sheds that are above the avg. MPR. **In October '2012 the avg. MPR of electric loco shed in Indian Railway was 3.92** (IR report no. RDSO/2012/EL/RM/0157 (Rev 'O') issued on 25.10.2012) **and in April'2018 it comes down to 3.29** It implies that modernization of electric locos and improvement of infrastructures in sheds improve the MPR in Indian Railway. But, the MPR of ELS/ASN in April '18 is still 4.36 which is very much unusual. To achieve the **IR avg. of 3.29, the staff strength of ELS/ASN should be 445 (135x3.29) instead of 577. Hence, ELS/ASN has an excess staff of 132 (577-445) as per Indian Railway avg. MPR of Electric Loco Sheds.**

During conversation with the concerned official it is informed that the locos maintained by ELS/ASN are over aged and a huge un-schedule work has to be performed for smooth running of locomotives. Though, the ELS/ASN has not been able to provide the exact man-hrs utilized for un-schedule work in 2017-18 as per proforma given by the study team. The other Electric Loco Shed in Eastern Railway i.e. ELS/HWH has already achieved the IR avg. of MPR. Hence, ELS/ASN can't ignore the availability of excess manpower. The study team thinks that the curtailment of man power at a stretch from 575 to 445 is not justified considering the various aspects such as infrastructure, age of locos, in house activities etc.

Hence, study team opines that the Electrical Department of Asansol Division should surrender the existing 52 vacant posts from ELS/ASN in the 1st phase and the remaining 80 posts (132-52) should be surrendered after outsourcing of different activities.

3.7.6.1 **RECOMMENDATION:**

After going through the above facts and figures, the study team recommends that 52 vacant posts from the existing sanctioned strength of ELS/ASN should be surrendered immediately. **Thus, revised sanctioned strength ELS/ASN will be 577 instead of 629.**

3.7.7 The study team noticed that the following activities at ELS/ASN have been outsourced. Similarly, the works which are outsourced at ELS/HWH are also annexed at Annexure-E.

Sl No.	Description of Work	QTY	Amount in Rs.	Present status
1	Repairing overhauling and rehabilitation/reconditioning of 1 no 45/7.5ton crane at ELS/ASN	1	4259151	work under progress
2	CAMC of SIV AAL make	21	App. 46 lakhs	work under progress
3	CAMC PTWLfor ELS/ASN for 3 yrs n single tender basis.	1	1 crore	work under progress
4	Rewinding of auxiliary motors and repairing of ARNO stator	93 of different types	App. 55 lakhs	work under progress
5	CAMC of MPCS Medha LTD	20	App. 7 lakhs	work under progress
6	CAMC of SIV Medha LTD	6	10.35 lakhs	work under progress
7	CAMC of SIV Siemens LTD	8	16 lakhs	work under progress
8	CAMC of ESMON Medha LTD	73		work under progress
9	ELS & MEMU shed cleaning		10 lakhs	work under progress
10	One time repairing of 45 ton EOT crane KLK end	1	13.03 lakhs	work under progress
11	CAMC of VCD of IC electrical	118	26 lakhs	work under progress
12	Supply and filling of dry sand in Loco sand boxes		5.0 lakhs	work under progress
13	Road transport contract through 9 MT truck for one year		App. 15 lakhs	work under progress

3.7.8 **SUGGESTION:**

3.7.8.1 To cope up with the present trend, every sections of Railway should exert their best effort to become IR Benchmark of the similar activity. For this purpose, priority should be given to every infrastructural development of the work place and identify the activities which can be out sourced. Several guide lines have been issued time to time for the list of items to be outsourced.

Identification of maintenance activities in shed through OEMs trade:

Keeping the above principles of maintenance through outside agencies in view and based on the feedback given by the sheds, the maintenance activities could be undertaken through OEM/trade is given below:

For this purpose, the maintenance activities have been broken in two parts:

- Maintenance/overhauling of locomotive and its equipment
- Activities of shed other than locomotive maintenance

The electric locomotives are maintained by the shed staffs who are trained in the process of electric loco maintenance, trouble shooting of defects, assembly & disassembly of compounds of equipment and final testing of equipment/ locomotives before offering them in service. Over a period of years, all the shed staff gain special expertise in these activities which are vital and considered important from the point of safety during running of the locomotive and the manpower of OEM/trade are not expected to have proper insight into the details of these activities. Therefore, it is considered that as a general principle, core activities of inspection, troubleshooting and testing of locomotive involving manpower inside the locomotive should remain with the shed staff and only those activities should be given to outside agencies where work can be done at separate place and it involves overhaul of an equipment for which experience/expertise is available with these agencies. With this in view, following basic guidelines should be followed for the identification of maintenance activities which can be undertaken through outside agencies.

i) Basic work of inspection, troubleshooting/ planning/testing/assembly & disassembly of equipment from electric locomotives should remain with the shed staff.

ii) Overhauling of all electrical and mechanical items should be planned through trade/OEM gradually & progressively depending upon the availability of staff and their experience. This activity shall be undertaken away from the shed premises to the extent possible.

iii) During the course of undertaking such an activity through OEM/trade, intermingling of maintenance and staff of OEM/trade should not take place.

iv) If the working of staff of OEM/trade in shed is considered inescapable, a separate area in the shed premises should be earmarked for such activities. In this area, intermingling of shed and outside agency staff should only be limited to exchange of equipment/components (healthy/defective).

v) All the works involving electric safety of locomotive and its equipment should remain with the shed staff.

CHAPTER-IV

4.0 **FINANCIAL APPRAISAL:**

4.1 According to recommendation made in para-3.7.6.1 the financial savings achieved on account of surrendering of 52 posts is tabulated below. For easier calculation, the bottom most GP on lower Grade pay is considered.

LEVEL	G.P	PAY	MEAN PAY	D.A	NO OF POSTS	MONEY VALUE	
				7%		MONTHLY	ANNUAL
1	1800	18000-56900	37450	2622	52	Rs.20,83,744/-	Rs.2,50,04,928/-

Thus, consequent upon implementation of recommendation, **the annual savings will be Rs 2, 50, 04,928/- ≈ Rs.2.50 Cores.**