EASTERN RAILWAY

WORK STUDY REPORT

ON

REVIEW OF WORKLOAD VIS-À-VIS STAFF STRENGTH OF G SHOP (MACHINE SHOP) AT LILUAH WORKSHOP

(STUDY NO. WSER - 10/20-21)

(Submitted on 07.12.2020)

Study guided by:- Sri S.Chandra, AEO
Study conducted by:- Sri P.K. Mondal, CPLI

BY

GM'S EFFICIENCY CELL
EASTERN RAILWAY
KOLKATA

CONTENTS

Sl. No.	*Particulars*	*Page Nos.*
1.	Acknowledgement	3
	Methodology Adopted	
	Terms of Reference	
	Summary of Recommendations	
2.	Executive Summary	4
3.	*CHAPTER-I* Introduction	5 - 6
4.	*CHAPTER-II* Existing Scenario	7 - 18
5.	*CHAPTER-III* Critical Analysis	19 - 30
6.	*CHAPTER-IV* Financial Appraisal	31

ACKNOWLEDGEMENT

The study team hereby acknowledges its deep gratitude to Chief Works Manager/ Liluah for allowing the study team to conduct the study.

The study team will ever thankful to Dy. CME/Production/ Liluah, PE/ Liluah and WPO/Liluah for their appropriate opinion and co-operation by supplying the necessary data to the study team.

The study team is also very thankful to Senior Section Engineer, Junior Engineer and other staff of G-shop for providing necessary information in connection with the subject study.

METHODOLOGY ADOPTED

The following methodology has been adopted in carrying out the study:

- Collection of data
- Discussion with concerned officers and Supervisors of G-Shop
- Study of existing workload
- Critical analysis of workload and manpower

TERMS OF REFERENCE

The subject work study has been undertaken by the GM's Efficiency Cell during the current financial year 2020-21 as per recommendation done vide CWE's L.No. MG/791/MPP (WS) dtd. 10/07/20 with the following terms of references:

(i) Evaluate the quantum of existing workload.

(ii) Examine the deployment of Staff against workload.

(iii) To identify saving achievable in terms of manpower.

SUMMARY OF RECOMMENDATION

Sl. No.	***Recommendations***	***Para reference***
1	It is recommended that the Revised total requirement of Artisan & Helper to carry out the entire departmental workload presently catered by G shop's staff will be 167 posts which would result in surrender of **53 posts** as against the present total sanctioned strength of 220 posts.	*3.12*

EXECUTIVE SUMMARY

Study Name & No.:	"REVIEW OF WORKLOAD VIS-A-VIS STAFF STRENGTH OF G-SHOP (MACHINE SHOP) AT LILUAH WORKSHOP" ***(STUDY NO.WSER -10/20-21)***
Year of conducting the study:	**2020 - 21**
Terms of reference:	(i) Evaluate the quantum of existing workload. (ii) Examine the deployment of Staff against workload. (iii) To identify saving achievable in terms of manpower.
Methodology:	• Collection of data • Discussion with concerned officers and Supervisors of Tool Room • Study of existing workload • Critical analysis of workload and manpower.
Existing Sanctioned Strength *(Artisan staff Helper category staff only)*	***220***
Existing Men on Roll *(Artisan staff Helper category staff only)*	***116***
Vacant post	***104***
Revised Requirement	***167***
Proposed Surrender	**53**

Justification
For assessment of Revised requirement of manpower in G Shop (Machine Shop) at Liluah workshop, study team analyzes the effective utilization of manpower vis-a- vis assessment of Monthly Production. The review of manpower of G Shop at Liluah workshop is assessed considering the outturn of the shop for the year 2017-18, 2018-19 and 2019-20. For assessment, study team takes reference from *Chapter IV of 'Indian Railway Mechanical Code'* regarding various aspects of **"Production Control Organization"** to analyze in a more scientific way.

CHAPTER-I

1.0 *INTRODUCTION:*

Indian Railways is the life-line of nation for providing Transportation facility over the length and breadth of the country. Its vision is to provide efficient, affordable, customer-focused, environmentally sustainable integrated transportation solutions and to be the vehicle of inclusive growth, connecting regions, communities, ports and centres of industry, commerce, tourism and pilgrimage across the country.

1.1 Indian Railways manufactures much of its rolling stock and heavy engineering components at its six manufacturing plants, called Production Units, which are managed directly by the Ministry. Popular rolling stock builders such as CLW and DLW for electric and diesel locomotives; ICF and RCF for passenger coaches are Production Units of Indian Railways. Over the years, Indian Railways has not only achieved self-sufficiency in production of rolling stock in the country but also exported rolling stock to other countries. Each of these production units is headed by a General Manager, who also reports directly to the Railway Board. Thus, Indian Railways manages and maintains all those infrastructures. Management of those huge infrastructures have to be done in accordance with the organization's vision.

1.2 Besides the above, in Indian Railways, various Railway Workshops plays a very vital Role in connection with POH/ROH/IOH/NPOH repair of different kinds of Wagons, coaches *(both AC & Non-AC)* and Locomotives *(both Diesel & Electric)*.

1.3 To cope up with the above changing scenario, Infrastructural development is not only required in the area of manufacturing & periodical overhauling of various types of passenger coaches, goods wagons and Diesel/Electric Locomotives only, overall infrastructural development is necessary in whole Indian Railway system.

1.4 For any kind of development, money is the most important but limited resources. An organisation, like Indian Railways, may also provide a good financial support for its development, if good financial discipline can be practiced and expenditure due to man, materials & overheads can be managed optimally & economically.

1.5 In view of the above, Rly. Board issued nos. of circulars, orders, etc. The Zonal Railways also implement various measures for financial discipline.

1.6 At this juncture, the role of Railway Efficiency & Research Directorate is also very important in connection with 'Benchmarking', 'Rationalising of Man-Power', etc.

1.7 Indian Railway is facing tremendous financial crunch after implementation of 6th 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 1. Performance Efficiency Index shown in the corporate plan published by the Eastern Railway is given below.

2015-16	:	180.75%
2016-17	:	165.25%
2017-18	:	181.15%
2018-19	:	185.98%
2019-20	:	169.75%

1.8 The aim of conducting this Workstudy is to review the manpower of G Shop of Liluah Workshop for optimization. In the analysis, the effective utilization of human resource is considered keeping in mind of the present working pattern. The objective is to explore financial savings of the Railways.

CHAPTER-II

2.0 Existing Scenerio:

In Eastern Railway, there are three major Workshops for POH/ROH/IOH/NPOH and repair of different kinds of Wagons, coaches *(both AC & Non-AC)* and Locomotives *(both Diesel & Electric)*. These Workshops are as follows-

(I) Liluah Carriage & Wagon Workshop/Liluah/E.Rly.

(II) Kanchrapara Carriage & Wagon Workshop & Kanchrapara Locomotive Workshop/ Kanchrapara/E.Rly.

(III) Jamalpur Locomotive Workshop/Jamalpur/E.Rly.

2.1 Liluah Carriage & Wagon Workshop *(An ISO-9001:2008 & ISO-14001-2004 Certified Organisation)* is one of the IR's oldest & biggest Railway Carriage & repair Workshop of India. The Liluah Workshop is functioning under Chief Workshop Manager.

2.2 The Workshop is engaged in Periodical Overhauling of all kinds of coaches & wagons. It also facilitates repair and overhauling of coach & wagon components. The above mentioned activities are performed in different shops.

2.2.1 Different shops or workpoints along with their respective activities of LLH Workshop are as under:

S.No.	***Shops***	***Activities catered by the shops***
1	M	Coaching Repair Shops
2	CR	
3	MR	
4	N	Paint Shop
5	T	Trimming Shop
6	L	Wagon Repair Shop
7	J	Sheet metal works, shearing, bending, drilling, punching, pressing work, etc
8	A	Blacksmith
9	C	Tin smith
10	E	Spring shop
11	G	Machine shop
12	HT	Heat treatment
13	K	Wheel shop
14	TR	Tool room
15	H	Mill Wright

2.3 Machine shop of a Workshop is allocated for all the machining jobs of the workshop. G-Shop (Machine shop) of LLH workshop was also entitled for machining job of various components of coaches and wagons.

Later, Railways had changed the policy to procure machined items/ components rather than to manufacture it in the workshops for the purpose of cost savings. Due to this, machining workload of the Machine shops reduced considerably, which had led to switching of the activities of G-shop from 'machining job' to 'maintenance job of coaches and wagons'.

All the working machines of Machine shop have been transferred to Tool Room where all the necessary machining work of LLH workshop are being carried out.

2.4 Earlier, there were 7 sections present in G shop, they are:

i) Rolling Shutter Section
ii) Turning Section
iii) Drilling Section
iv) Speedo meter Section
v) VSA, SAB, BMBC Section
vi) Vestibule & Foot Plate Section
vii) Chair Car Section

2.4.1 Out of the above mentioned 7 sections, 5 sections were assigned with the workload of maintenance work of coaches and wagons and their components, while 2 sections i.e Turning section and Drilling section were assigned with machining workload. Presently, these two sections dealing with machining job were closed and the workload of these two sections were borne by Tool Room. Presently, there are 5 sections in G-shop and the description of workload of these sections has been mentioned in details in further paragraphs.

2.5 The existing position of Supervisory, Artisan and Erstwhile Group-D category staff of G-shop as on 01.09.2020 are mentioned underneath.

2.5.1 The category-wise Sanctioned strength vis-à-vis On-roll position of Supervisors of G-shop *(furnished by Personnel Branch)* is tabulated as under:

S. No	Category	Sanctioned Strength	On-Roll Strength	Vacancy
1	Sr. Section Engineer	10	8	2
2	Junior Engineer	5	2	3
Total		***15***	**10**	**5**

2.5.2 The category-wise Sanctioned strength vis-à-vis On-roll position of Artisan and Erstwhile Gr. D staff of G-Shop/LLH Workshop (as on 01.09.2020 *(furnished by Personnel Branch*) is tabulated underneath:

S. No	Category	Sanctioned Strength	On-Roll Strength	Vacancy
	Artisan			
1	Sr. Tech.	50	47	3
2	Technician I	98	25	73
3	Technician II	15	7	8
4	Technician III	29	37	-8
Sub-Total		***192***	***116***	***76***
	Erstwhile Group-D			
5	Helper	28	0	28
6	Peon	1	1	0
Sub-Total		***29***	***1***	***28***
Grand Total		**221**	**117**	**104**

2.6 The subject study is carried out to review the manpower of G Shop directly or indirectly involve with the workload of G Shop. The category-wise position of Supervisors, Artisan and Erstwhile Group-D staff are shown in paras 2.5.1 and 2.5.2.

From the total position of Artisan and Erstwhile Group-D category staff, Peon category are not directly related with shop's assigned workload and have no contribution towards shop's outturn. So, study team kept the category of Peon out of the purview of the study. Also, Supervisory category is not considered in the assessment as their work is to supervise the sectional staff and they did not directly carry out the sectional work.

2.6.1 So, from above discussion, the category-wise position of staff considered during the assessment is tabulated as under:

S. No.	Category	Sanctioned Strength	On-Roll Strength	Vacancy
Artisan Category Staff				
1	Sr. Tech.	50	47	3
2	Technician I	98	25	73
3	Technician II	15	7	8
4	Technician III	29	37	-8
Erstwhile Group 'D' Category Staff				
5	Helper	28	0	28
Total		***220***	***116***	***104***

2.7 The workload carried out by the various sections of G-Shop (Machine Shop) is mentioned in details in paragraphs below:

2.7.1 ***Rolling Shutter Section:***

2.7.1.1 The workload carried out by this section along with the deployment of staff is mentioned underneath:

Workload related to	Description of Workload	Deployment of staff
ICF coaches	Maintenance of Rolling Shutter, C-Gate, 1st Class Bunk, etc.	14
LHB coaches	Maintenance of Rolling Shutter and 1st Class Bunk.	5

2.7.1.2 Staff strength of Artisan and Erstwhile Gr 'D' of Rolling Shutter section *(furnished by concerned section)* as on September'2020 is tabulated below:

S. No.	Category	On-Roll Strength
1	Sr. Tech.	5
2	Technician I	1
3	Technician II	2
4	Technician III	11
5	Helper	0
Total		***19***

2.7.1.3 The statement showing outturn of Rolling Shutter section separately for ICF coaches and LHB coaches for the year 2017-18, 2018-19 and 2019-20 is tabulated below:

Months	For year 2017-18		For year 2018-19		For year 2019-20	
	For ICF	For LHB	For ICF	For LHB	For ICF	For LHB
April	82	1	81	2	78	1
May	86	0	87	2	86	1
June	83	2	73	2	85	3
July	76	2	98	4	85	0
August	93	2	108	3	80	2
September	67	2	75	1	64	4
October	76	3	87	1	68	4
November	81	3	88	7	82	2
December	72	3	101	3	78	1
January	69	3	100	3	101	3
February	62	2	97	1	84	5
March	73	4	95	6	63	0
Total	**920**	**27**	**1090**	**35**	**954**	**26**
Average	**76.67**	**2.25**	**90.83**	**2.92**	**79.50**	**2.17**

2.7.2 ***Speedometer Section:***

2.7.2.1 The workload carried out by this section along with the deployment of staff is mentioned underneath:

Workload related to	Description of Workload	Deployment of staff
LHB coaches/ trolleys	Maintenance of Speedometer.	1
	Maintenance of Phonic Wheel, speed sensor earthing equipment, etc.	10

2.7.2.2 Staff strength of Artisan and Erstwhile Gr 'D' of Speedometer section *(furnished by concerned section)* as on September'2020 is tabulated below:

S. No.	Category	On-Roll Strength
1	Sr. Tech.	2
2	Technician I	2
3	Technician II	0
4	Technician III	7
5	Helper	0
Total		***11***

2.7.2.3 The statement showing outturn of Speedometer section for the year 2017-18, 2018-19 and 2019-20 is tabulated below. The outturn of Speed sensors is mentioned in terms of LHB coaches while the outturn of Phonic Wheel, earthing equipment, etc. are mentioned in terms of trolleys.

Months	For year 2017-18		For year 2018-19		For year 2019-20	
	For LHB		For LHB		For LHB	
	Coach	Trolley	Coach	Trolley	Coach	Trolley
April	46	0	39	34	52	78
May	45	0	52	70	49	72
June	50	0	46	80	52	66
July	62	0	39	84	59	83
August	55	0	44	83	53	78
September	43	18	45	52	47	88
October	45	22	33	40	31	68
November	56	32	41	56	47	90
December	47	40	49	72	55	84
January	45	30	46	74	50	99
February	55	10	52	78	53	92
March	51	30	53	78	29	50
Total	**600**	**182**	**539**	**801**	**577**	**948**
Average	**50.00**	**15.17**	**44.92**	**66.75**	**48.08**	**79.00**

2.7.3 ***VSA, SAB, BMBC Section:***

2.7.3.1 The workload carried out by this section along with the deployment of staff is mentioned underneath:

Workload related to	Description of Workload	Deployment of staff
ICF coaches	Maintenance of VSA and BMBC	22
LHB coaches	Maintenance of Anti Roll Bar, Testing of damper of LHB coaches.	6
Wagons	Maintenance of VSA, SAB and BMBC of wagon	14

2.7.3.2 Staff strength of Artisan and Erstwhile Gr 'D' of VSA, SAB, BMBC section *(furnished by concerned section)* as on September'2020 is tabulated below:

S. No.	Category	On-Roll Strength
1	Sr. Tech.	21
2	Technician I	14
3	Technician II	3
4	Technician III	6
5	Helper	0
Total		***44***

2.7.3.3 The statement showing outturn of VSA, SAB, BMBC section separately for various components of ICF coaches, LHB coaches and wagons for the year 2017-18, 2018-19 and 2019-20 is tabulated below:

Months	For year 2017-18							For year 2018-19							For year 2019-20						
	For ICF		For LHB		For Wagon			For ICF		For LHB		For Wagon			For ICF		For LHB		For Wagon		
	VSA	BMBC	Anti Roll Bar	Damper Testing	VSA	SAB	BMBC	VSA	BMBC	Anti Roll Bar	Damper Testing	VSA	SAB	BMBC	VSA	BMBC	Anti Roll Bar	Damper Testing	VSA	SAB	BMBC
April	*785*	721	50	196	44	101	32	542	682	41	336	120	100	117	601	599	82	1742	86	120	84
May	*855*	834	45	296	76	85	76	714	704	55	494	48	102	60	638	662	86	1542	76	121	92
June	*842*	760	45	307	54	82	56	629	735	61	792	66	101	52	577	602	86	1341	76	117	76
July	*847*	777	62	418	12	104	20	697	721	64	533	53	94	40	630	754	97	604	92	130	96
August	*827*	784	66	414	64	98	48	700	817	76	857	57	99	62	628	726	102	900	80	115	80
September	*688*	670	25	420	54	94	52	566	685	66	793	84	91	50	565	634	101	756	68	112	64
October	*646*	580	46	203	75	78	88	639	657	68	630	20	97	20	634	557	74	900	40	106	48
November	*749*	741	58	220	104	99	100	628	784	79	1192	56	126	56	640	639	95	828	60	101	60
December	*721*	691	55	318	107	84	84	627	777	86	1175	80	126	80	669	702	104	864	32	86	24
January	*716*	612	58	321	109	85	112	611	664	70	1300	90	126	76	607	646	99	1026	88	100	80
February	*617*	626	58	138	108	96	120	661	667	81	1626	67	115	72	581	578	112	954	82	107	92
March	*635*	758	62	404	83	101	84	590	579	81	1082	71	114	68	434	357	64	711	48	58	32
Total	**8928**	**8554**	**630**	**3655**	**890**	**1107**	**872**	**7604**	**8472**	**828**	**10810**	**812**	**1291**	**753**	**7204**	**7456**	**1102**	**12168**	**828**	**1273**	**828**
Average	**744.00**	**712.83**	**52.50**	**304.58**	**74.17**	**92.25**	**72.67**	**633.67**	**706.00**	**69.00**	**900.83**	**67.67**	**107.58**	**62.75**	**600.33**	**621.33**	**91.83**	**1014.00**	**69.00**	**106.08**	**69.00**

2.7.4 ***Vestibule and Foot Plate:***

2.7.4.1 The workload carried out by this section along with the deployment of staff is mentioned underneath:

Workload related to	Description of Workload	Deployment of staff
ICF coaches	Maintenance of Vestibule & Foot Plate	11
LHB coaches	Maintenance of Inter Car Gangway mounting and Inter Car Gangway Bridge mounting of LHB coaches.	11

2.7.4.2 Staff strength of Artisan and Erstwhile Gr 'D' of Vestibule and Foot Plate section *(furnished by concerned section)* as on September'2020 is tabulated below:

S. No.	Category	On-Roll Strength
1	Sr. Tech.	7
2	Technician I	1
3	Technician II	2
4	Technician III	12
5	Helper	0
Total		***22***

2.7.4.3 The statement showing outturn of Vestibule and Foot Plate section separately for ICF coaches and LHB coaches for the year 2017-18, 2018-19 and 2019-20 is tabulated below:

Months	For year 2017-18		For year 2018-19		For year 2019-20	
	For ICF	For LHB	For ICF	For LHB	For ICF	For LHB
April	102	31	84	33	74	37
May	97	31	96	42	74	37
June	87	32	73	37	75	35
July	82	33	73	35	75	37
August	102	32	75	37	75	37
September	69	28	75	36	62	37
October	70	30	73	37	72	33
November	100	29	73	28	73	37
December	72	29	75	32	104	37
January	72	31	75	37	75	35
February	72	36	73	38	75	37
March	93	40	74	36	59	27
Total	**1018**	**382**	**919**	**428**	**893**	**426**
Average	**84.83**	**31.83**	**76.58**	**35.67**	**74.42**	**35.50**

2.7.5 ***Chair Car Section:***

2.7.5.1 The workload carried out by this section along with the deployment of staff is mentioned underneath:

Workload related to	Description of Workload	Deployment of staff
ICF coaches	Maintenance of chairs of ICF AC/Non-AC chair car.	11
LHB coaches	Maintenance of chairs of LHB AC/Non-AC chair car.	6

2.7.5.2 Staff strength of Artisan and Erstwhile Gr 'D' of Chair car section *(furnished by concerned section)* as on September'2020 is tabulated below:

S.No	Category	On-Roll Strength
1	Sr. Tech.	4
2	Technician I	10
3	Technician II	1
4	Technician III	2
5	Helper	0
Total		***17***

2.7.5.3 The statement showing outturn of Chair car section separately for ICF coaches and LHB coaches for the year 2017-18, 2018-19 and 2019-20 is tabulated below:

Months	For year 2017-18		For year 2018-19		For year 2019-20	
	For ICF	For LHB	For ICF	For LHB	For ICF	For LHB
April	4	0	9	1	4	0
May	3	0	13	3	4	0
June	4	0	8	6	3	0
July	8	0	10	2	6	0
August	6	0	10	0	4	1
September	4	1	4	0	1	1
October	6	0	5	0	8	1
November	5	0	2	0	5	1
December	4	0	4	0	7	0
January	5	0	3	0	8	2
February	5	0	6	0	6	1
March	6	1	5	0	4	0
Total	**60**	**2**	**79**	**12**	**60**	**7**
Average	**5.00**	**0.17**	**6.58**	**1.00**	**5.00**	**0.58**

2.8 The section-wise vis-à-vis month-wise Allowed time and Time Taken of G shop for the Year 2017-18, 2018-19 and 2019-20 are shown in tables below.

2.8.1 *For the Year 2017-18:*

S. No.	Sections	April'17			May'17			June'17			July'17			August'17			September'17		
		Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved
1	Rolling Shutter Section	3379	2287	1092	3731	2518	1213	3428	2310	1118	3853	2594	1259	3650	2456	1194	2942	1984	958
2	Turning Sec	1188	830	358	1138	788	350	1110	769	341	1152	796	356	838	582	256	676	467	209
3	Drilling Sec	1573	1092	481	2032	1411	621	2454	1698	756	1681	1160	521	1630	1121	509	885	610	275
4	Speedometer Section	2146	1435	711	2598	1743	855	2763	1855	908	2764	1855	909	2151	1447	704	2876	1924	952
5	VSA, SAB Sec	11564	7785	3779	13522	9101	4421	13325	8969	4356	13569	9135	4434	14432	9715	4717	11797	7941	3856
6	Vestibule Sec	4654	3122	1532	5942	3988	1954	5370	3604	1766	5652	3794	1858	5660	3799	1861	4489	3011	1478
7	Chair Car Sec	4648	3212	1436	5599	3941	1658	4929	3330	1599	5463	3667	1796	5841	3921	1920	4909	3294	1615
TOTAL		**29152**	**19763**	**9389**	**34562**	**23490**	**11072**	**33379**	**22535**	**10844**	**34134**	**23001**	**11133**	**34202**	**23041**	**11161**	**28574**	**19231**	**9343**
Total Working hours in the Month		**162.5**			**187.5**			**177.5**			**182.5**			**187.5**			**155**		

S. No	Sections	October'17			November'17			December'17			January'18			February'18			March'18		
		Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved
1	Rolling Shutter Section	2480	1676	804	3893	2620	1273	3612	2432	1180	3546	2394	1152	3178	2145	1033	3384	2280	1104
2	Turning Sec	996	691	305	776	541	235	724	502	222	564	392	172	394	272	122	917	662	255
3	Drilling Sec	1192	822	370	1033	711	322	1325	914	411	1002	690	312	993	686	307	1358	943	415
4	Speedometer Section	2443	1636	807	2810	1880	930	3045	2040	1005	3159	2133	1026	3029	2026	1003	3346	2327	1019
5	VSA, SAB Sec	11333	7627	3706	13756	9258	4498	13166	8862	4304	12509	8416	4093	11840	7971	3869	12760	8589	4171
6	Vestibule Sec	5916	3970	1946	5145	3452	1693	4862	3261	1601	4981	3341	1640	4952	3321	1631	5097	3420	1677
7	Chair Car Sec	4674	3136	1538	5491	3684	1807	5084	3412	1672	5028	3374	1654	4995	3350	1645	5593	3761	1832
TOTAL		**29034**	**19558**	**9476**	**32904**	**22146**	**10758**	**31818**	**21423**	**10395**	**30789**	**20740**	**10049**	**29381**	**19771**	**9610**	**32455**	**21982**	**10473**
Total Working hours in the Month		**160**			**180**			**177.5**			**177.5**			**170**			**170**		

2.8.2 *For the Year 2018-19:*

S. No.	Sections	April'18			May'18			June'18			July'18			August'18			September'18		
		Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved
1	Rolling Shutter Section	2865	1928	937	3546	2384	1162	2900	2009	891	3578	2408	1170	3076	2074	1002	3239	2194	1045
2	Turning Sec	769	531	238	1145	788	357	1240	869	371	1235	859	376	1096	777	319	1065	760	305
3	Drilling Sec	1432	988	444	1297	895	402	1418	1000	418	1462	1018	444	1248	887	361	1535	1089	446
4	Speedometer Section	2838	1910	928	3293	2246	1047	2935	2039	896	3005	2086	919	3078	2137	941	2754	1915	839
5	VSA,SAB Sec	11446	7677	3769	12919	8695	4224	12520	8667	3853	12627	8711	3916	12976	8741	4235	11731	7903	3828
6	Vestibule Sec	5460	3665	1795	4858	3260	1598	5254	3626	1628	5577	3849	1728	5377	3707	1670	5087	3421	1666
7	Chair Car Sec	5466	3667	1799	5571	3762	1809	5090	3532	1558	5465	3690	1775	5368	3608	1760	4669	3178	1491
TOTAL		**30276**	**20366**	**9910**	**32629**	**22030**	**10599**	**31357**	**21742**	**9615**	**32949**	**22621**	**10328**	**32219**	**21931**	**10288**	**30080**	**20460**	**9620**
Total Working hours in the Month		**165**			**187.5**			**177.5**			**185**			**185**			**170**		

S. No.	Sections	October'18			November'18			December'18			January'19			February'19			March'19		
		Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved
1	Rolling Shutter Section	2532	1714	818	2958	1995	963	3200	2157	1043	3320	2288	1032	3161	2192	969	2802	1942	860
2	Turning Sec	876	614	262	1170	804	366	1279	874	405	1054	728	326	1163	814	349	1298	915	383
3	Drilling Sec	1130	775	355	998	687	311	1222	837	385	1239	856	383	1124	792	332	1124	793	331
4	Speedometer Section	2345	1596	749	2280	1548	732	2550	1728	822	2711	1888	823	2234	1532	702	2572	1765	807
5	VSA, SAB Sec	10267	6914	3353	11538	7767	3771	12222	8228	3994	12314	8428	3886	10996	7529	3467	11669	7990	3679
6	Vestibule Sec	3868	2595	1273	4273	2870	1403	5131	3447	1684	4999	3421	1578	4447	3035	1412	4486	3061	1425
7	Chair Car Sec	4169	2917	1252	4335	3029	1306	4098	2968	1130	4370	3055	1315	4111	2850	1261	3599	2497	1102
TOTAL		**25187**	**17125**	**8062**	**27552**	**18700**	**8852**	**29702**	**20239**	**9463**	**30007**	**20664**	**9343**	**27236**	**18744**	**8492**	**27550**	**18963**	**8587**
Total Working hours in the Month		**152.5**			**167.5**			**177.5**			**180**			**170**			**170**		

2.8.3 *For the Year 2019-20:*

S. No.	Sections	April'19			May'19			June'19			July'19			August'19			September'19		
		Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved
1	Rolling Shutter Section	3541	2450	1091	3562	2465	1097	3249	2249	1000	3849	2665	1184	3601	2487	1114	3353	2317	1036
2	Turning Sec	783	542	241	791	547	244	1050	732	318	404	279	125	303	214	89	487	341	146
3	Drilling Sec	1234	853	381	523	363	160	792	554	238	727	504	223	679	470	209	486	338	148
4	Speedometer Section	2603	1786	817	2384	1637	747	2421	1665	756	2454	1688	766	2522	1744	778	2423	1665	758
5	VSA, SAB Sec	12474	8547	3927	11517	7890	3627	11298	7740	3558	12692	8693	3999	11816	8098	3718	11040	7570	3470
6	Vestibule Sec	4888	3336	1552	4918	3356	1562	4174	2850	1324	5421	3701	1720	5182	3537	1645	4666	3187	1479
7	Chair Car Sec	3779	2620	1159	3665	2526	1139	3397	2345	1052	4175	2878	1297	3823	2648	1175	3671	2531	1140
TOTAL		**29302**	**20134**	**9168**	**27360**	**18784**	**8576**	**26381**	**18135**	**8246**	**29722**	**20408**	**9314**	**27926**	**19198**	**8728**	**26126**	**17949**	**8177**
Total Working hours in the Month		**180**			**180**			**167.5**			**192.5**			**182.5**			**170**		

S. No	Sections	October'19			November'19			December'19			January'20			February'20			March'20		
		Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved	Allowed Time	Time Taken	Time Saved
1	Rolling Shutter Section	3134	2165	969	3483	2405	1078	3262	2250	1012	3903	2836	1067	3608	2618	990	3903	2836	1067
2	Turning Sec	432	299	133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Drilling Sec	725	504	221	850	596	254	1001	697	304	624	451	173	410	290	120	624	451	173
4	Speedometer Section	1832	1260	572	2198	1524	674	2103	1448	655	2301	1666	635	2303	1634	669	2301	1666	635
5	VSA, SAB Sec	9668	6627	3041	9870	6771	3099	10158	6969	3189	10421	7565	2856	9014	6995	2019	10421	7565	2856
6	Vestibule Sec	4326	2959	1367	4462	3063	1399	5004	3427	1577	4877	3513	1364	4525	3209	1316	4877	3513	1364
7	Chair Car Sec	3333	2299	1034	3548	2443	1105	3162	2180	982	3949	2867	1082	3232	2337	895	3949	2857	1092
TOTAL		**23450**	**16113**	**7337**	**24411**	**16802**	**7609**	**24690**	**16971**	**7719**	**26075**	**18898**	**7177**	**23092**	**17083**	**6009**	**26075**	**18888**	**7187**
Total Working hours in the Month		**155**			**172.5**			**180**			**177.5**			**177.5**			**115**		

CHAPTER-III

3.0 *CRITICAL ANALYSIS*

The subject work study has been conducted to review the manpower deployed in Machine Shop (G-Shop) of Liluah Workshop under the control of Dy. CME (Production) and overall control of CWM/Liluah.

3.1 Keeping in view of the present financial condition of Railways and the increasing trend of operating ratio of Eastern Railway, the subject study is conducted with the objective to explore the ways to attain financial savings of the Railways by right sizing human resources along with the motive to improve the effective utilization of staff.

3.2 It has been mentioned in para 2.6 and 2.6.1, that study team is considering only Artisan and Helper Category staff for assessment.

3.3 The revised requirement of staff for Machine shop has been assessed in ongoing paragraphs through analysis of various datas in regards to shop's workload and outturn mentioned in details in Chapter II.

For assessment, study team takes reference from *Chapter IV of 'Indian Railway Mechanical Code'* regarding various aspects of **"Production Control Organization"** keeping the infrastructural setup of concerned shop of Liluah Workshop in view. The related aspects considered in the present work study are:

Originally this scheme was introduced in the Railway Repair Workshops of the Mechanical Department and the same is extended to Signal & Telecommunication workshops, Civil Engineering Workshops and the Electrical Sections attached to the Mechanical Workshops. This incentive scheme is also known as "the system of payment by results." The incentive workers are classified as Direct, Essential Indirect and Indirect Workers:

(a) ***Direct workers (DW)*** *are those engaged in work which can be assessed through time studies.*

(b) ***Essential Indirect workers (EIW)*** *are those who contributed to the continuity of the work and whose services are essential but whose work cannot be assessed through time studies.*

(c) ***Indirect Workers (IW)*** *are those who are provided for cleaning etc. do not contribute directly or indirectly to production and do not earn any incentive bonus.*

Allowed Time: *The total of the normalized time arrived from time study and all the allowances stated is termed as "allowed time"'. The allowed time as issued by the Rate Fixing Department with the approval of Production Engineer, is the time within which a worker shall complete an operation and earn bonus. It is expected that the average worker will complete an operation in 75% of the allowed time when he will earn 33 ⅓ % bonus.*

3.3.1 During analysis, study team also takes the reference of *percentage of EIW staff* for different activities as per *IR Mechanical code* as tabulated below, for calculating EIW staff:

Name of the sub-shop	***Strength of unskilled workers engaged as indirect workers including essential indirect worker***
Erecting	15% of the total strength of the erecting/shop.
Boiler	10% of the total strength of the Boiler shop.
Tender	15% of the total strength of the Tender shop.
Fitting	15% of the total strength of the Fitting shop.
Copper & Tin	15% of the total strength of the Copper & Tin shop.
Welding	12% of the total strength of the Welding shop.
Motion	10% of the total strength of the Motion shop.
Saw Mill	30% of the total strength of the Saw Mill shop.
Carriage Building	10% of the total strength of the Carriage Building shop.
Carriage Repair	10% of the total strength of the Carriage Repair/Shop.
Paint	10% of the total strength of the Paint shop.
Trimming	10% of the total strength of the Trimming shop.
Wagon building	12% of the total strength of the Wagon Repair shop.
Wagon repair	15% of the total strength of the Wagon repair shop.
General Iron Foundry	20% of the total strength of the General Iron Foundry.
Brass Foundry	25% of the total strength of the Brass Foundry.
Smith & Forge	10% of the total strength of the Smith & Forge shop.
Machine	10% of the total strength of the Machine shop.
Wheel	10% of the total strength of the Wheel shop.
Tool Room	10% of the total strength of the Tool Room.
Mill Wright	25% of the total strength of the Mill Wright.

3.4 The details of workloads related to maintenance of ICF coaches, LHB coaches and wagons carried out by different sections of Machine shop has been mentioned in Chapter II. It has been observed from outturn figure of LLH workshop that in recent years the outturn of LHB coaches has increases gradually. Railways has stopped the production of ICF coaches few years back, presently, only LHB coaches are being manufactured by the Railways. The nos. of ICF coaches maintained every year is more or less same and this will decrease in future.

On scrutiny of the maintenance activities, it is observed that the LHB coaches needs less maintenance than ICF coaches. The coach body of LHB coaches is manufactured from stainless steel which is rust free. Majority of components of LHB coaches requires less maintenance. Thus, the maintenance activities on LHB coaches are less and requires less manpower.

The above mentioned facts has been taken into consideration by the study team during assessment for requirement of manpower done in ongoing paragraphs.

3.5 For assessment of revised requirement of manpower (i.e *Artisan and Helpers*) for Machine Shop, effective utilization of manpower is kept in consideration. The out-turn of the Machine shop has been mainly given attention by the study team for assessment.

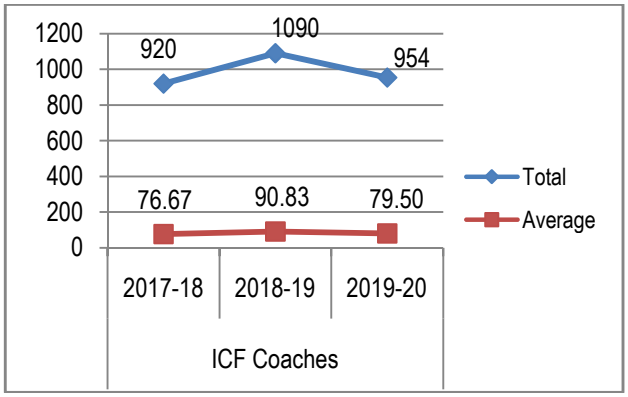
The month-wise out-turn, Allowed time and Time Taken is depicted in the para 2.8.1, 2.8.2 and 2.8.3. In paragraphs below, the assessment for requirement of staff for different sections has been done seperately.

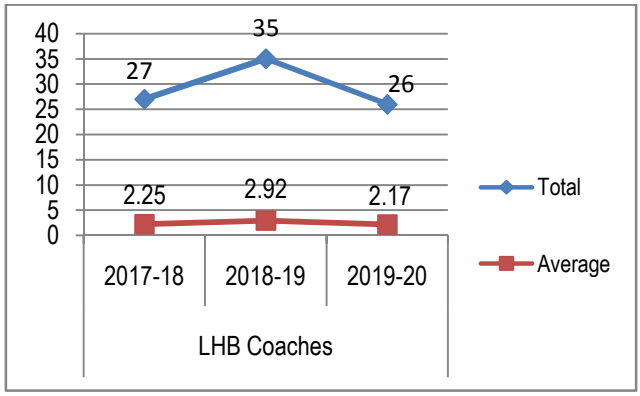
3.6 It can be seen from the data collected from Machine shop, the outturn varies every month, so study team considers outturn for the year 2017-18 and 2018-19 and 2019-20 to get a more realistic and accurate assessment.

The outturn for the year 2020-21 has not been considered for assessment since April'20 and May'20 were under lockdown period. However, the workshop opened from June'20, but till now, the working of the workshop has not returned to normalcy.

3.7.1. ***Rolling Shutter Section:***

3.7.1.1 The details of workload and manpower of Rolling Shutter section is mentioned in para 2.7.1. From para 2.7.1.3, the outturn of Rolling shutter section separately for ICF Coaches and LHB coaches for the year 2017-18, 2018-19 and 2019-2020 is graphically represented below :





This section mainly deals with the workload of ICF coaches. It is observed from the above graph that the outturn for ICF coaches as well as for LHB coaches is almost similar in the year 2017-18 and 2019-20, however, there is increase in outturn in year 2018-19.

3.7.1.2 The requirement of manpower for Rolling shutter section has been assessed considering the average value of outturn for the years 2017-18, 2018-19 and 2019-2020. From the outturn figure in terms of manhours shown in table under para 2.8.1, 2.8.2 and 2.8.3, the average value of available working hours/month, Allowed time/month, Time taken/month for Rolling shutter section is shown below:

Average No. of available hours/ month	***Average value of Allowed Time per Month***	***Average value of Time Taken per Month***	***Average value of Time Saved per month***
	(a)	***(b)***	***(c=a-b)***
172.91	**3352.8**	**2297.8**	**1055**

In table above, the average value of Allowed time (AT) reflects the timing for average outturn in terms of man-hours.

Average Time Taken denotes the utilized man-hours to get the corresponding average outturn. It actually resembles the input factor of manpower and time i.e duty hours to get the outturn.

Therefore, the requirement of DW *(Direct Worker)* staff to achieve the average outturn (*i.e average AT 3352.8 manhours*) is calculated below.

From above table, Utilised Man-hours (i.e Time Taken) for average Outturn of AT 3352.8 manhours	***2297.8***
Average no. of available hours	***172.91***
Requirement of DW staff on the basis of assessment based on Average Outturn	*2297.8* / 172.91 = 13.28 ***≈ 14***

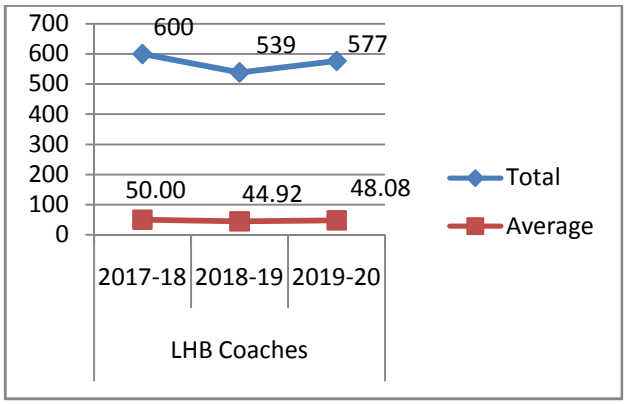
3.7.1.3 The requirement of EIW staff of Machine shop as per *percentage of EIW staff* for different activities as per *IR Mechanical code* tabulated in para 3.3.1 is assessed underneath:

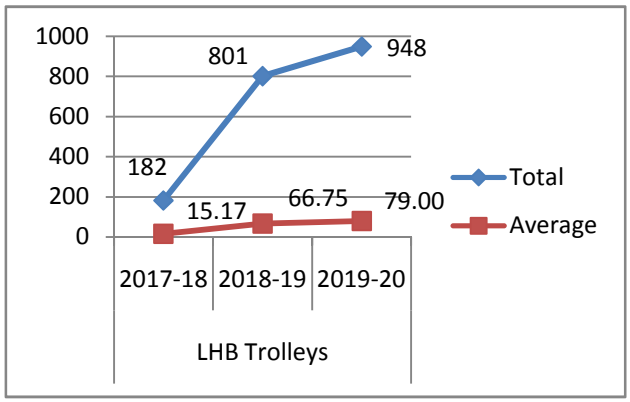
Requirement of EIW staff on the basis of assessment based on average outturn	*= 10 % of DW staff of Rolling Shutter sec = 10% X 13.28* = 1.32 ***≈ 2***

3.7.1.4 Thus, the requirement of DW and EIW staff at Rolling shutter section based on assessment on the basis of Average Outturn is calculated as 14 + 2 = **16**.

3.7.2 ***Speedometer Section:***

3.7.2.1 This section deals with the workload of various components of LHB coaches only. The details of workload and manpower of Speedometer section is mentioned in para 2.7.2. From para 2.7.2.3, the outturn of Speedometer section for the year 2017-18, 2018-19 and 2019-2020 is graphically represented below :





It is observed from the above graph that the outturn of speed sensor is almost flat for 2017-18, 2018-19 and 2019-20, but the outturn of rest of the components (*mentioned in terms of trolleys*) has increased manifolds from 2017-18.to 2019-20.

However, the outturn is more or less same for these three years, when the outturn observed in terms of man-hours.

3.7.2.2 The requirement of manpower for Speedometer section also has been assessed considering the average value of outturn for the years 2017-18, 2018-19 and 2019-2020. From the outturn figure in terms of manhours shown in table under para 2.8.1, 2.8.2 and 2.8.3, the average value of available working hours/month, Allowed time/month, Time taken/month for Speedometer section is shown below:

Average No. of available hours/ month	***Average value of Allowed Time per Month***	***Average value of Time Taken per Month***	***Average value of Time Saved per month***
	(a)	***(b)***	***(c=a-b)***
172.91	**2645.11**	**1803.69**	**841.41**

The requirement of DW *(Direct Worker)* staff to achieve the average outturn (*i.e average AT 2645.11 manhours*) is calculated below.

From above table, Utilised Man-hours (i.e Time Taken) for average Outturn of AT 3352.8 manhours	***1803.69***
Average no. of available hours	***172.91***
Requirement of DW staff on the basis of assessment based on Average Outturn	*1803.69* / 172.91 = 10.43 ***≈ 11***

3.7.2.3 The requirement of EIW staff of Speedometer section as per *percentage of EIW staff* for different activities as per *IR Mechanical code* tabulated in para 3.3.1 is assessed underneath:

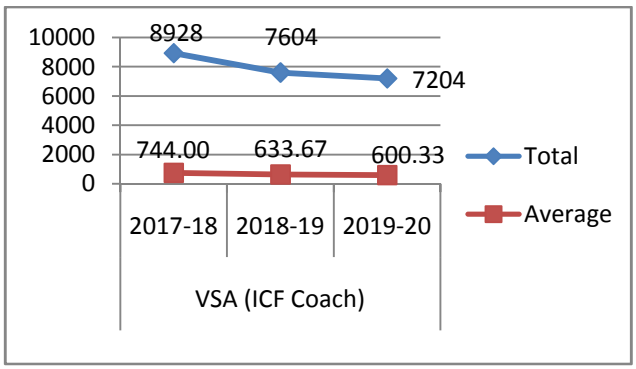
Requirement of EIW staff on the basis of assessment based on average outturn	*= 10 % of DW staff of Speedometer Sec = 10% X 10.43* = 1.04 ***≈ 2***

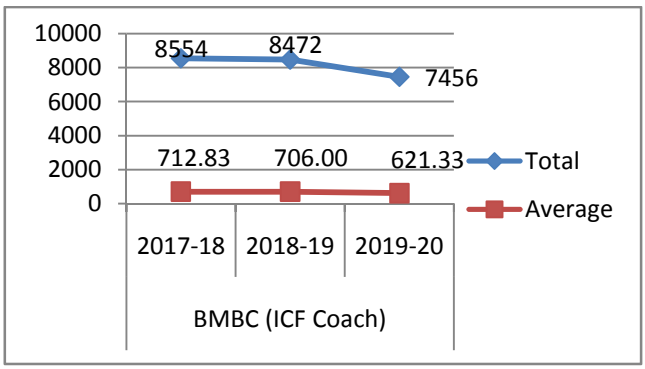
3.7.2.4 The requirement of DW and EIW staff at Speedometer section based on assessment on the basis of Average Outturn is calculated as 11 + 2 = **13**.

3.7.3. ***VSA,SAB and BMBC Section:***

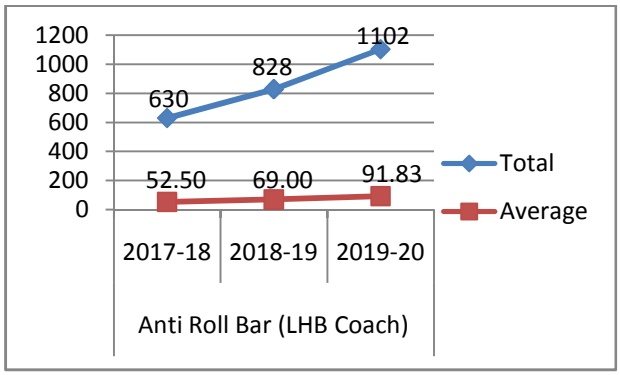
3.7.3.1 This section deals with workload of different components of LHB coaches, ICF Coaches and Wagons. The outturn of various components of VSA, SAB and BMBC section for the year 2017-18, 2018-19 and 2019-2020 is graphically represented below :

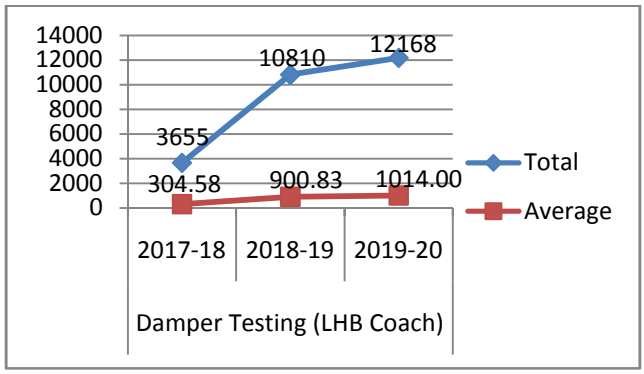
Outturn of components of ICF Coaches



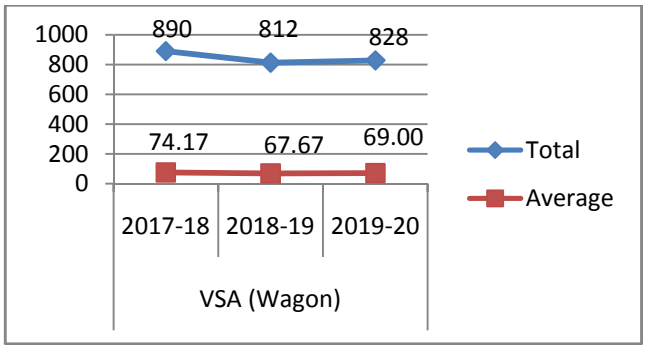


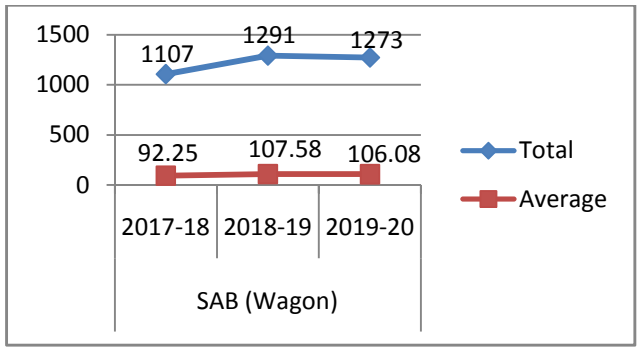
Outturn of components of LHB Coaches

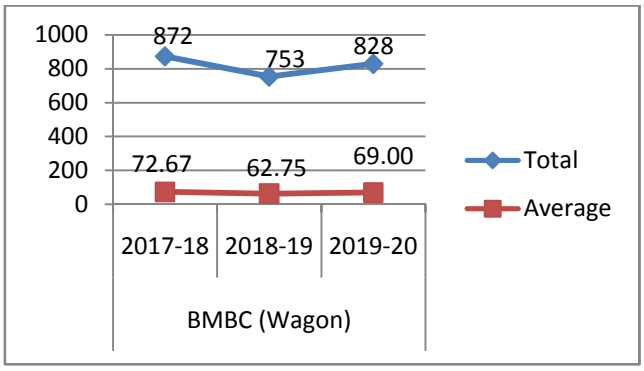




Outturn of components of Wagons







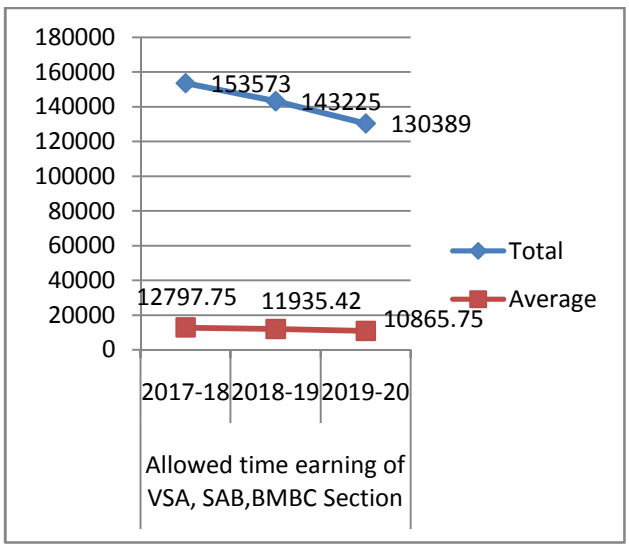
3.7.3.2 The observations noted from the above graphs are as under:

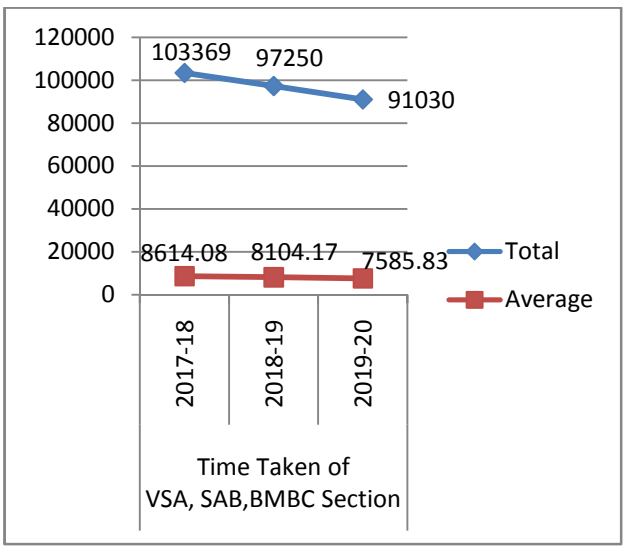
i) The outturn of both the components of ICF coaches has declined from year 2017-18 to 2019-20.

ii) As far as outturn of components of LHB coaches is concerned, the outturn of both the components of LHB coaches increased significantly from the year 2017-18 to 2019-20.

iii) The outturn components for wagons is more or less flat, for the year 2017-18 to 2019-20.

3.7.3.3 Due to dissimilarity of the pattern of outturn of ICF coaches, LHB coaches and wagons, no clear conclusion can be drawn from the above graphs. Thus, for purpose of further analysis, the graphical representation of the earning of Allowed time and Time taken of VSA, SAB,BMBC section for the year 2017-18, 2018-19 and 2019-2020 *(from para 2.8.1,2.8.2 and 2.8.3)* has been plotted below:





It is clearly observed from the above graphs that represents the collective outturn of components of ICF coach, LHB coach and wagons *(in manhours)*, both earning of Allowed time and Time taken have declined from year 2017-18 to 2019-20.

3.7.3.4 However, inspite of the declining outturn of VSA,SAB,BMBC section, study team has assessed the requirement of manpower of this section considering the average value of outturn for the years 2017-18, 2018-19 and 2019-2020 as because lots of different types of vital items are dealt by this section. From the outturn figure in terms of manhours shown in table under para 2.8.1, 2.8.2 and 2.8.3, the average value of available working hours/month, Allowed time/month, Time taken/month for VSA,SAB,BMBC section is shown below:

Average No. of available hours/ month	***Average value of Allowed Time per Month***	***Average value of Time Taken per Month***	***Average value of Time Saved per month***
	(a)	***(b)***	***(c=a-b)***
172.91	**11866.31**	**8101.36**	**841.41**

The requirement of DW *(Direct Worker)* staff to achieve the average outturn (*i.e average AT 11866.31 manhours*) is calculated below.

From above table, Utilised Man-hours (i.e Time Taken) for average Outturn of AT 11866.31 manhours	***8101.36***
Average no. of available hours	***172.91***
Requirement of DW staff on the basis of assessment based on Average Outturn	*8101.36* / 172.91 = *46.85* **≈ 47**

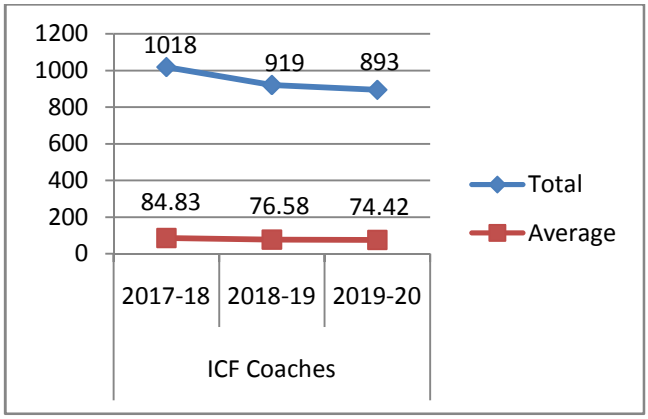
3.7.3.5 The requirement of EIW staff of VSA,SAB,BMBC section as per *percentage of EIW staff* for different activities as per *IR Mechanical code* tabulated in para 3.3.1 is assessed underneath:

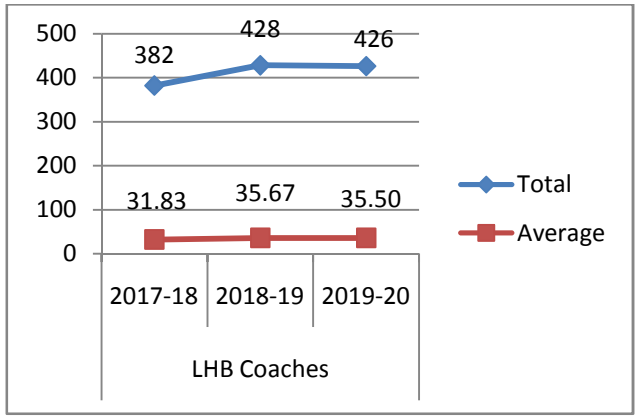
Requirement of EIW staff on the basis of assessment based on average outturn	*= 10 % of DW staff of VSA,SAB,BMBC Sec* *= 10% X 46.85* = 4.68 **≈ 5**

3.7.3.6 The requirement of DW and EIW staff at VSA,SAB,BMBC section based on assessment on the basis of Average Outturn is calculated as 47 + 5 = **52**.

3.7.4 ***Vestibule & Foot Plate Section:***

3.7.4.1 The details of workload and manpower of Vestibule and Foot Plate section is mentioned in para 2.7.4. From para 2.7.4.3, the outturn of Vestibule & Foot Plate section separately for ICF Coaches and LHB coaches for the year 2017-18, 2018-19 and 2019-2020 is graphically represented below:





It is observed from the above graph that the outturn associated with ICF coaches declines slightly from year 2017-18 to 2019-20 while the outturn associated with LHB coaches increases slightly from year 2017-18 to 2019-20.

3.7.4.2 On scrutiny, the requirement of manpower for Vestibule and Foot Plate section has been assessed by the study team by considering the average value of outturn for the years 2017-18, 2018-19 and 2019-2020. From the outturn figure in terms of manhours shown in table under para 2.8.1, 2.8.2 and 2.8.3, the average value of available working hours/month, Allowed time/month, Time taken/month for Vestibule and Foot Plate section is shown below:

Average No. of available hours/ month	***Average value of Allowed Time per Month***	***Average value of Time Taken per Month***	***Average value of Time Saved per month***
	(a)	***(b)***	***(c=a-b)***
172.91	**4968.25**	**3380.3**	**1587.94**

The requirement of DW *(Direct Worker)* staff to achieve the average outturn (*i.e average AT 4968.25 manhours*) is calculated below.

From above table, Utilised Man-hours (i.e Time Taken) for average Outturn of AT 4968.25 manhours	***3380.3***
Average no. of available hours	***172.91***
Requirement of DW staff on the basis of assessment based on Average Outturn	*3380.3* / 172.91 = 19.55 ***≈ 20***

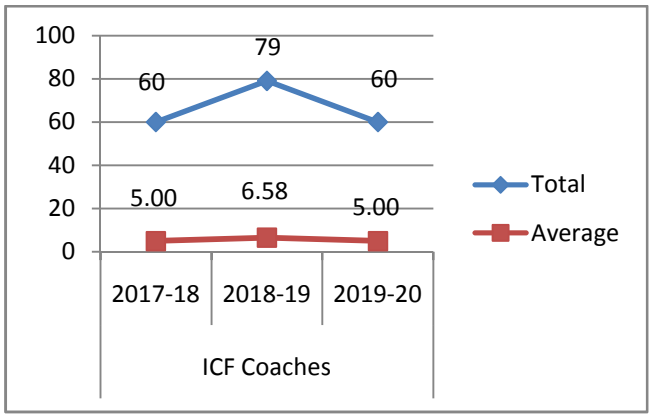
3.7.4.3 The requirement of EIW staff of Vestibule and Foot Plate section as per *percentage of EIW staff* for different activities as per *IR Mechanical code* tabulated in para 3.3.1 is assessed underneath:

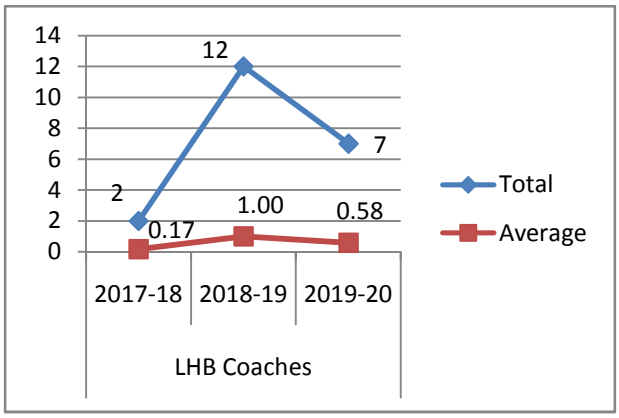
Requirement of EIW staff on the basis of assessment based on average outturn	*= 10 % of DW staff of Vestibule Sec = 10% X 19.55* = 1.95 ***≈ 2***

3.7.4.4 The requirement of DW and EIW staff Vestibule and Foot Plate section based on assessment on the basis of Average Outturn is calculated as 20 + 2 = **22**.

3.7.5. ***Chair Car Section:***

3.7.5.1 The details of workload and manpower of Chair car section is mentioned in para 2.7.5. From para 2.7.5.3, the outturn of Chair car section separately for ICF Coaches and LHB coaches for the year 2017-18, 2018-19 and 2019-2020 is graphically represented below:



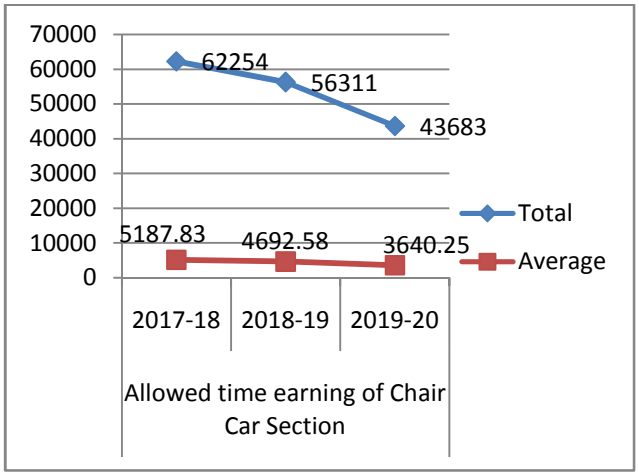


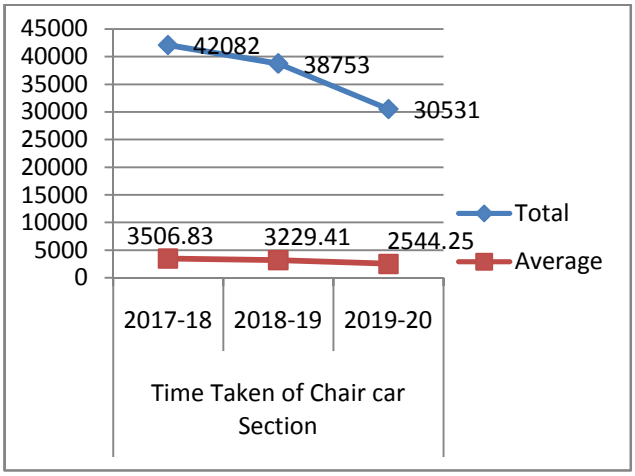
Following observations are noted from above graphs:

i) The outturn associated with ICF coaches is almost same in the year 2017-18 and 2019-20 while in the year 2018-19, it has increased to around 30%.

ii) As far as outturn associated with LHB coaches are concerned, very small volume of LHB coaches are dealt by this section as compared with the total volume of workload. As observed from the outturn pattern, there is a wide variation of yearly outturn.

3.7.5.2 Due to wide variation of the outturn of ICF coaches and LHB coaches, no clear conclusion can be drawn from the above graphs. Thus, for purpose of further analysis, the graphical representation of the earning of Allowed time and Time taken of Chair car section for the year 2017-18, 2018-19 and 2019-2020 *(from para 2.8.1,2.8.2 and 2.8.3)* has been plotted below:





It is clearly observed from the above graphs that represents the collective outturn of components of ICF coach and LHB coach *(in manhours)*, both earning of Allowed time and Time taken have declined from year 2017-18 to 2019-20.

3.7.5.3 However, on scrutiny, study team has assessed the requirement of manpower of this section considering the average value of outturn for the years 2017-18, 2018-19 and 2019-2020. From the outturn figure in terms of manhours shown in table under para 2.8.1, 2.8.2 and 2.8.3, the average value of available working hours/month, Allowed time/month, Time taken/month for Chair car section is shown below:

Average No. of available hours/ month	***Average value of Allowed Time per Month***	***Average value of Time Taken per Month***	***Average value of Time Saved per month***
	(a)	***(b)***	***(c=a-b)***
172.91	***4506.88***	***3093.5***	***1413.38***

The requirement of DW *(Direct Worker)* staff to achieve the average outturn (*i.e average AT 4506.88 manhours*) is calculated below.

From above table, Utilised Man-hours (i.e Time Taken) for average Outturn of AT 4506.88 manhours	***3093.5***
Average no. of available hours	***172.91***
Requirement of DW staff on the basis of assessment based on Average Outturn	*3093.5* / 172.91 = 17.89 ***≈ 18***

3.7.5.4 The requirement of EIW staff of Chair Car section as per *percentage of EIW staff* for different activities as per *IR Mechanical code* tabulated in para 3.3.1 is assessed underneath:

Requirement of EIW staff on the basis of assessment based on average outturn	*= 10 % of DW staff of Chair Car Sec* *= 10% X 17.89= 1.78* ***≈ 2***

3.7.5.5 Thus, the requirement of DW and EIW staff at Chair Car section based on assessment on the basis of Average Outturn is calculated as 18 + 2 = **20**.

3.8 From paras 3.7.1.4, 3.7.2.4, 3.7.3.6, 3.7.4.4 and 3.7.5.5, the total requirement of staff *(including Leave Reserve)* is calculated below:

S. No.	***Sections***	***Existing Deployment***	***Proposed Requirement***	***Reference Para***
1.	Rolling Shutter Section	19	*16*	*3.7.1.4*
2.	Speedometer Section	11	*13*	*3.7.2.4*
3.	VSA, SAB,BMBC Section	44	*52*	*3.7.3.6*
4.	Vestibule & Foot Plate Section	22	*22*	*3.7.4.4*
5.	Chair car Section	17	*20*	*3.7.5.5*
Total		***113***	***123***	
Leave Reserve @12.5%		--	*15.38* ≈ ***16***	
Grand Total		**113**	**139**	

3.9 The assessment of requirement of staff for G shop has been done in above paras in consideration with the outturn as well as effective utilization of manpower. In addition to the above mentioned aspects considered for analysis, it is felt by the Study team to consider the following additional factors also for assessment of the Revised requirement of manpower.

(i) The assessment for the requirement of staff has been done considering the Average Value of Outturn of three years. However, in table 2.8.1, 2.8.2 and 2.8.3, it has been observed that in several months the outturn 'Allowed Time' is much more than the average value of Allowed time considered for assessment. Hence, in consideration with this, some additional staff is recommended over the assessed requirement so that they can cater the higher workloads above the average value.

(ii) The manufacturing of ICF coaches has ceased few years back. At present, only LHB coaches are being produced by Indian Railways. The percentage of ICF coaches is in decreasing trend while the percentage of LHB coaches is increasing in Indian Railways. Thus, it can be concluded that the workload of maintenance of ICF coaches will decline along with the increase in workload of maintenance of LHB coaches.

3.9.1 Therefore, in consideration with the above mentioned facts, study team concludes that an additional 20% staff is required over the assessed requirement. The additional staff can also be utilized to cater the unforeseen and miscellaneous workload.

Thus, the Revised requirement of staff considering additional 20% manpower is calculated as [139 + (20% of 139)] = 166.8 **≈ 167**.

3.10 From para 3.8 and 3.9.1, the Revised requirement of staff is shown underneath:

	Sanctioned Strength *(Artisan & Helper Category staff) (para 2.6.1)*	***Existing Deployment*** *(para 3.8)*	***Proposed Revised Requirement*** *(para 3.9.1)*
Requirement of staff for catering existing workload of G shop including Leave Reserve	**220**	***113***	***167***

3.11 Summarizing the Revised requirement *(including Leave Reserve)* of staff as discussed in above para, the posts to be rendered as surplus against the total existing sanctioned strength with the consideration of assessment made in the above paragraphs, may be seen from the following table.

	Sanctioned Strength *(para 2.6.1)*	***Men-On- Roll*** *(para 3.8)*	***Revised Requirement*** *(para 3.10)*	***Surplus***
Artisan & Erstwhile Gr. D *(only Helper category)*	***220***	***113***	***167***	**53**

3.12 **Recommendation: -**

As mentioned in para 3.11, it is recommended that the Revised total requirement of Artisan & Helper to carry out the entire departmental workload presently catered by G-Shop's staff will be 167 posts which would result in surrender of **53 posts** as against the present total sanctioned strength of 220 posts *(para 2.6.1)*. The total requirement of manpower has been revised by the study team on the basis of assessment & analysis made in the foregoing paragraphs.

CHAPTER-IV

4.0 FINANCIAL APPRAISAL:

4.1 As per recommendation made in Para 3.12, the total surplus posts works out to 53 posts. For an easy and smooth means of calculation the study team has considered the lowest grades of vacant post while calculating the financial appraisal.

A statement showing the total annual financial savings on account of surrender of 53 posts is furnished below.

Category	**Grade Pay** *(Fig. in Rs.)*	**Level**	**Mean Pay**	**DA @ 17%**	**Total /Month**	**No. of Posts surrendered**	**Annual savings** *(Fig. in Rs.)*
			(Fig. in Rs.)				
Helper	1,800/-	1	37,450/-	6,367/-	43,817/-	28	1,47,22,512/-
Technician II	2,000/-	3	45,400/-	7,718/-	53,118/-	8	50,99,328/-
Technician I	2,400	4	53,300/-	9,061/-	62,361/-	17	1,27,21,644/-
TOTAL						**53**	**3,25,43,484/-**

Thus, the annual financial savings works out to ***Rs. 325.43 lakhs.***