EASTERN RAILWAY

WORK STUDY REPORT

ON

Review of Workload vis-a-vis Staff Strength of Tool Room Section of Wheel Shop at Kanchrapara Workshop

Study No. WSER-16/20-21

(*Report submitted on 30/03/2021*)

Study guided by:- Sri S. Chandra, AEO/E. Rly

Study conducted by:- Sri K.K. Chatterjee, CPLI

BY

GM'S EFFICIENCY CELL

EASTERN RAILWAY

KOLKATA

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Work-study team express its sincere gratitude to CWM/KPA/ER for his co-operation, Dy.CME/C/KPA/ER, Dy.CPO/KPA/ER for their valuable suggestions and guidance in steering the work-study and framing the report towards a distinct direction.

The study team is also thankful to Sr. SEs of Shop No. 20(I/C)), & other associated SSEs for active co-operation, furnishing relevant data, facts & figures pertaining to Workload vis-a-vis Manpower of Tool Room Section along with the other sections of Shop No. 20 /KPA.

Thus, the relevant personnel extended their assistance and co-operation to conduct the subject Work Study & thereby formulate the study report.

TERMS OF REFERENCE

i) To assess the quantum of Workload of Tool Room Section of Roller Bearing & Wheel Shop No. 20 / C&W /KPA.

ii) To examine the particulars of staff deployment at Tool Room Section of Shop No. 20 / C&W / KPA who are involved to cater the allied workload.

SUMMARY OF RECOMMENDATION

Sl. No.	*Recommendation*	*Para ref.*
1	*It is recommended that '12 posts' of The Tool Room of Wheel Shop No. 20 / C&W / KPA to be declared as 'Surplus Posts' and surrender the same right away from the respective Book of sanction of KPA Workshop.*	2.18.0

EXECUTIVE SUMMARY

Study Name & No.	"Review of Workload vis-a-vis Staff Strength of Tool Room Section of Wheel Shop at Kanchrapara Workshop". (Study No. WSER - 16/ 20-21)
Year of conducting the study	2020 -21
Terms of reference:	1. To assess the quantum of Workload of Tool Room Section of Shop No. 20 / C&W /Kanchrapara. 2. To examine the particulars of staff deployment in Tool Room Section of Shop No. 20 / C&W /Kanchrapara., for compliance of the associated workload.
Methodology:	1. Collection of relevant data / documents pertaining to Sanctioned Staff Strength, Men-On-Roll (MOR), Output as well as present workload in Tool Room Section of Shop No. 20 / C&W / Kanchrapara. 2. Comprehensive Discussion with Dy.CME/C/KPA/ER, along with other relevant personnel in connection with Staff matters & existing Work load, etc. of Tool Room Section of Shop No. 20 / C&W / Kanchrapara. 3. Critical analysis of available facts, figures & data, pertaining to Workload of Tool Room Section of Shop No. 20 / C&W /Kanchrapara vis-à-vis Staff deployment thereon.
Existing Sanctioned Strength	32
Existing Men on Roll	13
Vacant Posts	19
Evaluated Surplus Posts	12
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CHAPTER- I

1.0.0. INTRODUCTION:

1.1.0. On 1862, the Sealdaha - Kusthia Broad Gauge Railway Line started functioning. In the next year i.e., on 1863, one Railway locomotive workshop (having area 1,32,000 m²) and one Railway Station (on the northernmost tip of Bizpur Mouza of erstwhile 24-Paragana District), were operational by the then Assam Bengal Railway (later Bengal Assam Railway). Subsequently, Eastern Bengal Railway Company acquired the above Railway Workshop and founded a combined Locomotive and C&W (Carriage & Wagon) Shops. On 1st July, 1884, during the period of East India Company, management was taken over by the State itself.

1.2.0. On October 12 of 1914, C&W Shops were shifted to the present site and started functioning separately as an independent unit. The workshop has the distinction of serving the defence department for repairs of Air craft and manufacture of armoured cars and grenade shells during World War II.

The second 5-year plan brought about drastic changes with diesel and electric traction. Electrification on the Railway system in the eastern region necessitated major repair and overhaul facilities for Electric Loco, EMU Rolling Stock from early 60's. Kanchrapara Workshop was selected to take part the key role in these spheres. In 1962, a decision was taken for re-modelling Kanchrapara Workshop in order to make it a base workshop for maintenance of Electric Locos, Electrical Multiple Unit (EMU) stock of Eastern and South Eastern Railways.

1.3.0. Indian Railway is now the largest public sector undertaking of Govt. of India with staff strength of about 11.53 lakhs employees. The Railways in India are not only a mere transport agency, but also have deep social obligations to serve efficiently and fully the increasing needs of the countrymen.

1.1.0. Railway Board issued a nos. of circulars, orders, etc. to minimize Railway Expenses and increase Earnings. The Zonal Railways also implement various measures for imposing financial discipline.

1.2.0. At this juncture, the role of Railway Efficiency & Research Directorate is also very important in connection with 'Benchmarking', 'Rationalizing of Man-Power', etc. without hampering normal progress and activities in Indian Railway.

1.3.0. The subject work-study has been undertaken by GM's Efficiency Cell/E. Rly. to improve the productivity index of Eastern Railway. As per terms of reference, the study team has thoroughly observed the activities of Tool Room Section of Shop No. 20 / C&W /Kanchrapara and critically analysed the involvement of staff in different activities to ascertain their optimum utilization and thus to find out the need-based requirement of work force.

CHAPTER-II

2.0.0. EXISTING SCENARIO & CRITICAL ANALYSIS:

2.1.0. The Roller Bearing & Wheel Shop No. 20 / C&W / Kanchrapara Workshop presently has the under- mentioned functional areas, viz.-

1. Wheel Section

   A) Light Repair Section: Entrusted in making Wheel profile as per RDSO sketch by Surface Wheel Lathe.

   B) Heavy Repair Section: Re-Axling, Re-Discing of flawed Wheel sets, Formation of new Wheel sets against replacement of flawed one.

   C) Crane Section: Operation of 06 nos. existing cranes at three bays of wheel section.

2. Roller Bearing Section

   A) Bearing cleaning & checking Section: All bearings which are released from incoming wheel sets are cleaned in Roller Bearing Cleaning Plant. Inspection of the same if carried out to separate good and condemned bearings.

   B) Axle Box & Roller Bearing Assembly components cleaning & checking Section: Axle Box & other components of Roller Bearing cleaning is done in this section

   C) Bearing Fitment Section: Bearings and other components are fitted on wheel.

3. Air Brake Section
   A) Collection of components after dismantling of Bogies.
   B) POH of Air-Brake components
   C) Fitments of all components in Bogies
   D) Testing

4. Tool Room Section
   A) Collection of all materials required for POH from KPA & HLR Store Depot.
   B) Issue of materials to different section.
   C) Material procurement through Non-Stock Procurement system.
   D) Re-Sharpening of all drills, Milling cutters, etc.

5. Mill Wright Section

   A) Mechanical maintenance / repair of all machines in Shop 20 (Excluding the machines within the purview of Annual maintenance Contract).

   B) Keeping all the records and bills raised which are associated with Annual maintenance Contract.

6. Machine & Drill Section

   A) Machining of different components including Suspension Bearings (Brass Made).
   B) Record keeping of Brass Bearings.

7. Welding, Oxy-Cutting & Fitting Section

   A) Bogie Rectification and modification.

   B) Manufacturing of Head Stock

   C) Fabrication of other components required for POH of coach, as per demand of different shops.

8. Shearing Section.

   A) Shearing and bending of plates as per the demand of different shops

2.2.0. As per the 'Terms of Reference' of subject Work study, Review of Workload vis-a-vis staff Strength of only 'Tool Room Section' of Roller Bearing & Wheel Shop No. 20 is being conducted.

2.3.0. At this juncture, study team briefly explains the significance of 'Tool' & 'Tool Room' in any Workshop.

2.3.1. A tool is any instrument or simple piece of equipment that can be used to do a particular kind of work. For example, spades, hammers, and knives are all tools. Any particular type of tool can be used for a particular purpose. Tools are the most important items that the ancient humans used to climb to the top of the food chain; by inventing tools, they were able to accomplish tasks that human bodies could not, such as using a spear or bow and arrow to kill prey, since their teeth were not sharp enough to pierce many animals' skins.

2.3.2. In modern civilization, Tools are particularly important in construction work. They are primarily used to put things together (e.g., hammers and nail guns) or to take them apart (e.g., jackhammers and saws). Moreover, Tools and equipment means all hand tools, implements, camp equipment, drawing office and survey instruments, medical and surgical instruments and all articles of similar nature, whether or not they are of an expendable nature, Tools are often classified as hand tools and power tools. Hand tools include all non-powered tools, such as hammers and pliers.

2.3.3. Tool room is the room where the tools are kept for storage, prepare, repairing and machining. It consisting the big racks, shelves, cupboards and workbench to store and repair the tools. Thus it can have the facilities to design, manufacture and repair the custom requirements.

2.3.4. The facilities of the Tool Rooms allow for the design and manufacture of sophisticated medium and small-size tools. These comprise of the manufacture of press tools, moulds, jigs, fixtures, gauges, die casting dies, manufacture of standard parts and components, and carry out precision job work.

2.3.5. Tool Rooms play crucial roles in supporting the daily production of many machine shops; the role of a singular Tool Room becomes both conspicuous and remarkable. Because they serve primarily in backup roles, Tool Room can become almost invisible features in many shops. For this reason, the Tool Room's inherent capabilities are usually taken for granted. These capabilities include substantial versatility that derives chiefly from the increasingly rare talents of skilled, conventional machinists.

2.3.6. A toolmaker is responsible for making precision tools (such as jigs, moulds and dies), special guides and holding devices, which are then used in the manufacturing process to make products, using machinery such as lathes, presses, milling machines and grinders to cut and shape the tools.

2.3.7. <u>Roles / duties of different categories of personnel in Tool Room:</u>

Tool Room Engineer: The Tooling Engineer is responsible to design and develop composite moulds and assembly fixtures to support prototyping activities and to ensure the using of state of the art in tooling and fixturing designs.

Tool Room Supervisor : To lead and co-ordinate resources within the Tool room to ensure all tooling are produced efficiently, on time and in line with quality standards ensuring that Health, Safety and Environmental requirements are adhered to. Implement and maintain a production planning system.

Tool Room Production Worker:

A) Mechanical - Knowledge of machines and tools, including their designs, uses, repair, and maintenance.
B) Production and Processing - Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.
C) Analytical Thinking – Capability of analyzing information and using logic to address work-related issues and problems.
D) Innovation - Competencies in creativity and alternative thinking to develop new ideas for and answers to work-related problems.
E) Operate fork-lift, pallet jack and other heavy equipment when necessary.

Tool Room Clerk Responsibilities and Duties: Maintain and manage tool room clerical functions i.e.

A) Maintain and update records of tool room equipment, tools and kits.
B) Issue tools, kits and equipment to the concerned sections.
C) Ensure return of issued tools, kits and equipment back to the tool room after use.
D) Check for damages or unusable condition of tools, equipment and kits.
E) Keep abreast of advance technologies in tools and equipment designs.
F) Maintain tool room equipment manuals, processes and operational guidelines.
G) Tools are kept in the sequence used, or in places a worker can easily reach.
H) To organize tools and equipment on shelves and racks for easy access and keep workers moving efficiently. Having tools kept in hard-to-reach areas are placed in an illogical manner can keep workers from moving around the space efficiently. A significant amount of time and energy can be saved when tools and materials

2.4.0. In line with the above functional aspect, the 'Tool Room Section' of Roller Bearing & Wheel Shop No. 20 was designed earlier. All kinds of solid Tools were then formed as per the specified 'Tool Geometry' & Tool Inserts were brazed on Tool shank. Besides that Tool Room of Shop No. 20 were engaged to form different kinds of fixtures, templates, gauges, etc.

2.5.0. Presently, Tool Room of Shop No. 20 is engaged with the sharpening of drilling tools and rarely used HSS Tools only. All kinds of other Tools are procured from Trade and used directly.

2.6.0. In a nutshell, the present functions of Tool Room of Shop No. 20 is as follows -

A) Collection of all materials required for POH from KPA & HLR Store Depot.
B) Issue of materials to different section.
C) Material procurement through Non-Stock Procurement system.
D) Re-Sharpening of all drills, Milling cutters, etc.

2.7.0. Study team noted that since last 10 – 11 years, a part of Tool Room sectional staff are engaged only with upkeepment & record maintain of tools, templates, etc, as usual. They issue the same to machinist, inspection team and get it back after job done. Besides the above, major part of sectional staff is deputed to assist the regular work of Sub-store / Shop No. 20.

2.8.0. Thus, it is very clear that since last 10 – 11 years, deployed staff of Tool Room section is engaged with very little 'Tool Room' associated work.

2.9.0. The present Staff position of Roller Bearing & Wheel Shop No. 20 / C&W / Kanchrapara Workshop, as per Book of Sanction (BOS), vide Dy. CPO/W/ER/KPA's office letter nos. PB/ Misc./OS(P)/Pt. V, dated 10/02/2021 is tabulated below -

Shop No.	Trade	Sr. Tech.			Tech.- I			Tech.- II			Tech.- III			Helper (Asstt. Workshop)		
		S/S	MOR	Vac	S/S	MOR	Vac	S/S	MOR	Vac	S/S	MOR	Vac	S/S	MOR	Vac
S/20	Mech. Fitter	32	21	11	63	32	31	10	33	-23	12	02	10	55	30	25
	Machinist	30	32	-02	59	06	53	09	26	-17	10	13	-03			
	Welder	15	07	08	29	06	23	05	07	-02	06	03	03			
	Rigger- Cum - Gunner	04	08	-04	09	05	04	01	02	-01	02	0	02			
	Trimmer	01	01	0	01	03	-02	0	0	0	01	0	01			
	Carpenter	0	0	0	0	01	-01	0	0	0	0	0	0			
	Painter	0	0	0	0	04	-04	0	01	-01	0	0	0			
	Elect. Fitter	0	0	0	0	01	-01	0	0	0	0	0	0			
	TOTAL	**82**	**69**	**13**	**161**	**58**	**103**	**25**	**69**	**-44**	**31**	**18**	**13**	**55**	**30**	**25**

2.10.0. The summary of the above table pertaining to Staff position of Roller Bearing & Wheel Shop No. 20 is stated below –

Shop No.	Categories	Sanctioned Strength (S/S)	Men-On-Roll (MOR)	Vacancy	Remarks
S/20	Sr. Technician	82	69	13	-
	Technician-I	161	58	103	-
	Technician-II	25	69	-44	MOR is excess by 44 posts than S/S.
	Technician-III	31	18	13	-
	Helper	55	30	25	-
TOTAL		**354**	**244**	**110**	-

2.11.0. From the above tables, it is very clear that there is no pin-pointed sanctioned strength in ‘Book of Sanction’ for Tool Room of Shop No. 20. Rather, there is vetted sanction for ‘Roller Bearing & Wheel Shop No. 20’ as a whole.

2.12.0. To get a fair and rational idea about section-wise sanctioned strength break-up, study team considers the ratio of section-wise Incentive sanction and evaluate sectional sanctioned strength on pro-rata basis.

2.13.0. The section-wise Incentive sanction of Direct Worker (DW) & Essential Indirect Worker (EIW) is tabulated below –

Sl. No. (1)	Name of Sections of Shop No. 20 (2)	Direct Worker (DW) (3)	Essential Indirect Worker (EIW) (4)	Total (5) [(3)+(4)]	Section-wise Ratio (6) [(5)÷368]
1.	Fitting & Welding	24	2	26	0.07
2.	White Metal	8	2	10	0.03
3.	Axle Box	17	3	20	0.05
4.	Vaccum	3	2	5	0.01
5	Roller Bearing	39	15	54	0.15
6.	Wheel	45	47	92	0.25
7.	Mc. Oxy Cutting	47	15	62	0.17
8.	Fitting & Shearing	29	5	34	0.09
9.	**Tool Room**	0	32	32	**0.09**
10.	Mill Wright	0	33	33	0.09
Total		212	156	368	1.00

2.14.0. Evaluation of proportionate Sanctioned Strength of Tool Room / Shop No. 20.,) based on total present Sanctioned Strength of Shop No. 20 (As per BOS, the S/S is **354**) and Ratio of section-wise Incentive sanction (i.e. **0.09**), on pro-rata basis.

Proportionate Sanctioned Strength of Tool Room / Shop No. 20 / KPA WS
= 0.09 X 354 i.e. 31.86 ≈ 32 Posts.

2.15.0. Study team learnt from In-Charge of Shop No. 20/KPA that present deployment of Artisan & Ministerial Staff in Tool Room Section is 13 (Excluding Supervisor).

2.16.0. The under mentioned Table will show a clear picture of staff position pertaining to Tool Room Section of Shop No. 20–

Sl. No.	Name of Section of Shop No. 20.	S/S	MOR	Vacancy
1.	Tool Room	32	13	19

2.17.0. Study team considers present Workload vis-a-vis deployment of Tool Room staff, any kind of future work load to cater, etc. Based on the field observation and need based requirement, the well-thought-out bare requirement of Tool Room Section is 17 Posts.

Thus, Bare Requirement = 17 Posts.
Leave Reserve = 12.5% of 17 i.e. 2.125
Need Based evaluated Man power = (17+2.125) i.e.,19.125 ≈ 20 Posts.

Nos. of Surplus Posts = Present Sanc. Strength – Evaluated Man power
= 32 - 20 i.e., 12 Posts.

2.18.0. **RECOMMENDATION :**

It is recommended that '12 posts' of The Tool Room of Wheel Shop No. 20 / C&W / KPA to be declared as 'Surplus Posts' and surrender the same right away from the respective Book of sanction of KPA Workshop.

CHAPTER-III

3.0.0. FINANCIAL APPRAISAL:

3.1.0. According to recommendation made in para - 2.18.0., approximate financial savings achieved on account of surrendering of 12 Posts from *The Tool Room of Wheel Shop No. 20 / C&W / KPA* is calculated based on lower Grade pay.

Level	**GP**	**Mean pay**	**DA @ 17 %**	**Total Pay/staff/ month**	**Proposed surplus**	**Monthly savings**	**Annual savings**
1.	1,800.00	20,750.00	3,527.50	24,278.00	12 (Twelve)	2,91,336.00	34,96,032.00

3.2.0. Thus, consequent upon implementation of recommendation, **approx. annual savings would be Rs. *35 Lakh (Approx.)*.**