A C K N O W L E D G E M E N T

The Central Planning Organization in its course of Work-study, records its appreciation and acknowledges with gratitude the cooperation and coordination rendered by Dy.CSTE/MFT, all the Supervisors and their staff in completion of the report.

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M E T H O D O L O G Y

The Work Study department has applied the following techniques for completion of the Work Study.

1. Collection of the details of workload at S&T Work Shop/MFT.
2. Interaction with the Officers and Staff.
3. Observation of the pattern of working.
4. Critical examination of the existing system of working.
5. Assessment of manpower requirement for the existing workload.

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S Y N O P S I S

- **SUBJECT**: Review of Staff Strength of S&T Workshop/Mettuguda.
- AUTHORITY: Annual programme of work studies for the year 2018-19.
- **STUDY No**: WSSCR-27/2018-19.
- **REFERENCE File No**: G.276/2/WSSCR-27/2018-19.
- **AREA OF ACTIVITY**: S&T Workshop/Mettuguda.
- With a view, to right size the organisation, the Central Planning cell of South Central Railway has taken up Work-study on the "Review of Staff Strength of S&T Workshop/Mettuguda".
- Railway Board's Lr. No. 2018/SP/MPS/1 of 09.05.2018-regarding Manpower Management strategy for Indian Railways, Annexure-I (A): Manpower costs-65% of IR's earnings:
- Manpower costs on IR have a direct implication on the future sustainability of the organization. In the FY 2016-17, staff costs at ₹ 65,779 crores, constituted 56.36% of IR's ordinary working expenses (OWE) and 39.8% of the Gross Traffic receipts (GTR. Along with the pension outgo of ₹ 40463 crores in 2016-17, the total staff cost including pension was ₹ 1, 06,242 crore at 64.28% of IR's Gross Traffic Receipts. With the annualized decadal growth in staff cost (without Pension) being 13.9% and pension outflow being 17.8% during the decade (2007-08 to 2018-19 (BE), there is a need to formulate a sustainable Manpower Strategy for IR.
- There is an increase in operating/working expenses year by year. The major portion of expenses being staff expenses. This has further escalated by implementation of 7th pay commission. It is therefore imperative to keep the working expenses with in financially viable limits by proper utilization of manpower. The Railways have to reduce the expenses from all corners. The major portion of expenses being staff expenses, all out efforts have to be made to contain the same.
- In the absence of yardsticks to measure the work load and manpower requirement for betterment of working class as well as to overcome the financial crunch of Railways, the work study team has taken ground realities into account, discussion with all the staff and arrived at the following conclusions.
- In order to assess the requirement of man power in S&T work shop/MFT, the Work study team visited all the sections and observed the working pattern. Work done in the various shops of S&T work shop/MFT are different in nature and time bound. The following parameters are taken into account to arrive the manpower requirement
  a) Targets of workload for the 3 years.
  b) Production done by the workshop for the last 2 years.
  c) Allowed time to do each item.
  d) Miscellaneous work done by the workshop.
  e) Outsourcing activities.
- **Summary of SAVE position as on 01.09.2018**:

S No	Category	San	Act	Vac
Ministerial, Supervisory and indirect staff				
1	Ministerial staff	22	18	4
2	Canteen	6	7	-1
3	Supervisors	35	27	8
4	Drawing	1	1	0
5	PCO	17	6	11
6	Helpers	43	21	22
	Sub Total	**0**	**0**	**0**
Technicians				
7	Machine shop	95	73	22
8	Fitting shop	88	79	9
9	Black smithy	46	31	15
10	Riveting	31	24	7
11	Welding	18	13	5
12	Tin smithy	4	2	2
13	Carpentry	2	2	0
14	Machinist wood	2	1	1

15	Electroplating	2	2	0
16	Painting	7	5	2
	Sub Total	**0**	**0**	**0**
	Grand Total	**419**	**312**	**107**

- **Production & Targets of S&T Workshop:**

S No	Description	Target 2016-17	Production	Target 2017-18	Production
1.	**Colour Light Signals**				
2.	Colour Light 2 aspect (C1)	240	305	0	45
3.	Colour Light 3 aspect (C1)	60	145	0	45
4.	Shunt Signal(Position light) (Fab)	600	550	240	110
5.	Ladder 3.5 M For CLS	300	225	200	250
6.	Ladder 4.5 M For CLS	350	50	100	100
7.	CLS2 Aspect (fab)	150	190	240	191
8.	CLS3Aspect (fab)	240	120	20	95
9.	CLS 4 Aspect (fab)	60	60	70	130
10.	CLS post 3.5/4.5 M	300	295	300	0
	Route Indicators				
11.	Route Indicator 1-way (Fab)	120	80	60	20
12.	Route Indicator 2-way (Fab)	120	116	40	28
13.	Route Indicator 3-way (Fab)	20	0	10	12
14.	Route Indicator 4-way (Fab)	20	0	30	32
	Apparatus cases				
15.	Apparatus cases GKP-HALF	650	579	600	660
16.	Apparatus case(single)	650	700	1000	810
17.	Fencing for Apparatus cases	600	440	960	430
18.	Point Roddings				
19.	Universal Point Rodding	480	530	480	60
20.	Elevated type Point Rodding	0	0	300	60
21.	Ground leverFrame-1 lever	120	0	0	0
	LC gates				
22.	Electrical Lifting Barrier Gate	480	190	180	297
23.	Operating Panel for EOLB	240	3	90	0
24.	EOLB spare Booms	480	0	180	0
25.	Booms 10m for Mech LB gate	240	195	0	0
26.	Sliding boom type Gate	120	85	30	0
27.	Track Feed Battery Charger	9000	6420	15000	3582
28.	FRP type Track Lead Jn. Box	24000	25100	9600	3650
29.	All Rail Switch Clamp	600	700	600	500
30.	LED road warning signal 24 v	0	20	0	0
31.	LED signal 110v Red & Yellow	1200	500	0	800
32.	Electric Key Transmitter	480	290	600	500
33.	Iron Skids	1200	1100	1000	0
34.	IPS	0	0	16	0
35.	FRP boards	0	900	300	0
36.	Station Panels	6	0	0	0
	POH				
37.	POH of BI	24	51	36	42
38.	POH of TRC	2	1	2	2
39.	DW rope wheel 225 mm	0	600	0	0
40.	GL Frame 01 L	0	195	0	40
41.	Wooden table	0	10	0	0

➢ **Comparison of man hours required to achieve the targets and actual man hours utilized:**

Year	Man Hours required to achieve the target	Man Hours utilised for production	% of man hours utilised
2016-17	564305	0	77.21%
2017-18	504321	0	54.54%

- From the above table it is observed that the targets for the years of 2016-17 and 2017-18 are not achieved and the man hours utilized for the production of these years are much less than the man hours required to achieve the target.

➢ **Requirement of manpower** (The sanctioned strength of S&T Work Shop is 419 with 312 on roll staff and 107 vacancies are existing. As the time specified for completion of work orders is relevant with the Technician category, the Planning has assessed the manpower requirement in Technician category only):

S No	Description	Man hours/men required
1	Total man hours required to achieve the target 2016-17	564305
	Total man hours required to achieve the target 2017-18	504321
	Total man hours required to achieve the target 2018-19	455857
	Total man hours required to achieve the target for the 3 years	1524483
2	Average man hours required to achieve the targets for last 3 years = 1524483/3	508161
	To the 3 years average man hours added 5% man hours for misc work orders = 508161x5%	25408
	Then total man hours required for yearly target and misc works orders	533569
3	Total man days available in the year per man=365-52(Sundays)-15(NH)	298
	*Total man hours available in a year per man	2339
4	Assessment of manpower based on the Yearly target and Misc. work orders	
	Men required = 533569/2339	228.12 say 228
	Leave reserve 12.5% for 228 men	28.5 say 29
	Men required (228+29) for Yearly target and Misc. work orders	257
5	Total sanctioned (Technicians) strength	295
6	Surplus manpower to be surrendered =295-257	**38**

***Working hours of S&T Workshop**

- Monday to Friday = 7.30-12.00 and12.45-17.00 hrs
  = 8hrs 45 min.
- Saturday = 7.30-11.15
  = 3 hrs 45 min.
- Sunday = weekly rest

Total man hours available in a week

- Monday to Friday = 8 hrs 45 min x 5 days
  = 43 hrs 45 min
- Saturday = 3 hrs 45 min x 1 day
  = 3 hrs 45 min
- Total man hours available in a week = 47 hrs 30 min
- Total man hours available in a year = 47 hrs 30 min x 52 weeks
  = 2470 hrs
- After deducting 15 National Holiday = 2470-131hrs 15min
  = 2338 hrs 45 min say **2339** hrs.

➢ **OUTSOURCING ACTIVTIES AT S&T WORK SHOP**:

a) Hiring of 9 ton Vehicle for transporting for Railway Materials to Foreign railways from S&T Workshop/MFT for a period of 12 months.

b) Hiring of 4 ton vehicle for transporting railway materials within SC Railway for a period of 12 months.
c) Cleaning and maintenance of Toilets, Urinals, Staff canteen, Roads/Path ways e.t.c. in S&T workshop on Quotation basis for a period of 3 months. Proposal for one year through E-tendering is under process.

➢ **Remarks of the work study team:**

- S S&T Work Shop/MFT is manufacturing and supplying the S&T related items required for SCR and other Railways also.
- Due to the development in technology and the availability of the items at cheaper rate in the open market, the work orders are reducing in the last few years..
- Some of the sections such as Electro Plating, Machinist Wood and Carpentry were already closed and staff are deployed in other sections.
- It is observed that the targets are not achieved during the years 2016-17 and 2017-18 and the man hours utilized for the production of these years are less than the man hours required to achieve the target.
- Though the man hours utilized is much less than the men required in achieving the targets, the Work Study Team has taken the man hours required to achieve the target to arrive the requirement of manpower.
- There are 63 vacant posts in the Technician category, whereas indent was placed for 4 Technician posts only.
- As per the work load (Para No.3.11), the requirement of Technician category is **257** posts.
- It is observed that the work load of Black smithy, Riveting and Machine shop is reduced drastically during the last few years.
- In view of the above, it is recommended to surrender 38 vacant posts which are excess to the requirement.

Recommendation: **It is recommended to surrender 38 vacant posts which are excess to the requirement.**

** ** **

CHAPTER – 1

1.0 I N T R O D U C T I O N:

RAILWAY'S ROLE: Indian Railways is a premier transport service provider to the nation and is vested with the responsibility of carrying bulk of freight and passenger traffic across the country at economical rates. The Indian Railways operates through 17 Zones with 68 Divisions to serve the above objective

It is evident that the operating /working expenses are increasing year after year and with the implementation of 7th pay commission recommendations, the working expenses have shoot up further. It is therefore imperative that to keep the working expenses within financially viable limits, the Railways have no alternative but to reduce the expenses from all the corners. The major portion of expenses being staff expenses, all our efforts have to be made to contain it.

Railway is an organization with social obligation to the nation. The organization is also to be viewed as financially viable, one to make the best use of its machinery and manpower to achieve maximum utility. Manpower is the biggest component of the expenditure of Indian Railways. Rightsizing of manpower to reduce unit cost is an effective way to increase efficiency of Indian Railways.

As per the directives of the SDGM, the Central Planning Cell conducted a Work-study on "***Review of staff strength of S&T Work Shop/Mettuguda***".

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CHAPTER – 2

2.0 EXISTING SCENARIO:

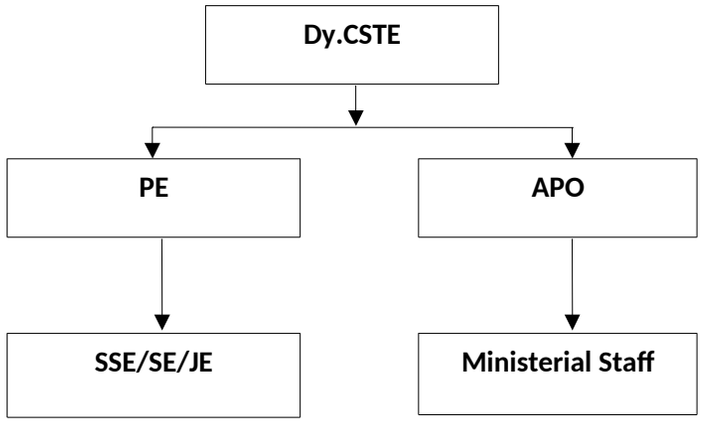
2.1 The signal & Telecommunication Workshop Mettuguda, Secunderabad, South central Railway was initially set up in 1951 under Engineering Department with annual turnover of Rs.5 lakhs. After its switch over to Signal & Telecommunication Department in 1956, requisite direction has been bestowed to manufacture the mechanical and electrical signaling items. The annual production has gone up by 250 times over a period of 5 decades.

2.2 Growth and Evolution:

1951	Founded by Robert Ottman under Engineering Department
1956	Taken over by S&T Department
1957-58	Expansion of Work shop (cost Rs.27 lakhs)
1960-61	Mr.Manne Terelius (Seeden) Report on Electrical Signalling Products.
1964-65	Mr.Toshio Watanable (Japan)'s in-house consultancy.
1966-67	Development of Track Recording car.
1969-70 to 1974-75	1) Manufacture of RE Telecom & ACSR items. 2) Annual turnover of Rs.100lakhs
1981-82	Export of Lifting Barrier gates to Nigeria.
1987-88	Development of Neal's ball token block instrument
2002-03	1) Development of Filment Switching unit. 2) Development of Track Feed Battery Charger.
2003-04	1) Development of Double line Block Instrument.

2.3 ORGANISATION: S&T Work shop is under the administrative control of Dy.CSTE and assisted by PE, In turn, DY.CSTE and PE are assisted by SSE/SEs/JEs .

2.4 ORGANISATION CHART:



SNo	Category	Grade	Grade pay	Sanction	Actual	Vacancy
Ministerial staff						
1	Ch. OS	9300-34800	4600	4	3	1
2	OS	9300-34800	4200	10	10	0
3	Senior Clerk	5200-20200	2800	1	0	1
4	Junior Clerk	5200-20200	1900	2	0	2
5	ChS&WI	9300-34800	4200	1	0	1
6	Hindi Asst	9300-34800	4200	1	0	1
7	Sr.Steno	9300-34800	4200	1	1	0
8	Duftry	5200-20200	1800	1	1	0
9	Peon including B/Peon	5200-20200	1800	1	3	-2
	Sub Total			**0**	**0**	**0**
	Canteen					
10	Manager II	5200-20200	2000	1	1	0
11	Sr.Cook	5200-20200	2400	1	1	0
12	Vendor I	5200-20200	1800	4	5	-1
	Sub Total			**0**	**0**	**0**
	Supervisory					
13	SSE	9300-34800	4600	20	20	0
14	SSE(Sig)	9300-34800	4600	2	1	1
15	SSE(PCO)	9300-34800	4600	2	2	0
16	JE	9300-34800	4200	9	3	6
17	JE (PCO)	9300-34800	4200	2	1	1
	Sub Total			**0**	**0**	**0**
	Drawing					
18	JEII	9300-34800	4200	1	1	0
	Sub Total			**1**	**1**	**0**
	Machine					
19	Sr.Tech	9300-34800	4200	31	27	4
20	Tech.I	5200-20200	2800	50	26	24
21	Tech.II	5200-20200	2400	9	3	6
22	Tech.III	5200-20200	1900	5	17	-12
	Sub Total			**0**	**0**	**0**
	Fitting					
23	Sr.Tech	9300-34800	4200	24	24	0
24	Tech.I	5200-20200	2800	48	41	7
25	Tech.II	5200-20200	2400	7	3	4
26	Tech.III	5200-20200	1900	9	11	-2
	Sub Total			**0**	**0**	**0**
	Blacksmith					
27	Sr.Tech	9300-34800	4200	15	14	1
28	Tech.I	5200-20200	2800	24	9	15
29	Tech.II	5200-20200	2400	5	3	2
30	Tech.III	5200-20200	1900	2	5	-3
	Sub Total			**0**	**0**	**0**

2.5 SAVE Position as on 01.09.2018

	Riveting					
31	Sr.Tech	9300-34800	4200	9	9	0
32	Tech.I	5200-20200	2800	17	7	10
33	Tech.II	5200-20200	2400	3	1	2
34	Tech.III	5200-20200	1900	2	7	-5
	Sub Total			**0**	**0**	**0**
	Welding					
35	Sr.Tech	9300-34800	4200	5	5	0
36	Tech.I	5200-20200	2800	9	6	3
37	Tech.II	5200-20200	2400	1	1	0
38	Tech.III	5200-20200	1900	3	1	2
	Sub Total			**0**	**0**	**0**
	Tinsmithy					
39	Sr.Tech	9300-34800	4200	1	0	1
40	Tech.I	5200-20200	2800	2	1	1
41	Tech.II	5200-20200	2400	0	1	-1
42	Tech.III	5200-20200	1900	1	0	1
	Sub Total			**0**	**0**	**0**
	Carpentry					
43	Sr.Tech	9300-34800	4200	2	1	1
44	Tech.I	5200-20200	2800	0	0	0
45	Tech.II	5200-20200	2400	0	0	0
46	Tech.III	5200-20200	1900	0	0	0
	Sub Total			**2**	**1**	**1**
	Machinist wood					
47	Sr.Tech	9300-34800	4200	2	1	1
48	Tech.I	5200-20200	2800	0	0	0
49	Tech.II	5200-20200	2400	0	0	0
50	Tech.III	5200-20200	1900	0	0	0
	Sub Total			**2**	**1**	**1**
	Electroplating					
51	Sr.Tech	9300-34800	4200	2	2	0
52	Tech.I	5200-20200	2800	0	0	0
53	Tech.II	5200-20200	2400	0	0	0
54	Tech.III	5200-20200	1900	0	0	0
	Sub Total			**2**	**2**	**0**
	Painting					
55	Sr.Tech	9300-34800	4200	2	1	1
56	Tech.I	5200-20200	2800	3	1	2
57	Tech.II	5200-20200	2400	1	1	0
58	Tech.III	5200-20200	1900	1	2	-1
	Sub Total			**0**	**0**	**0**
	PCO					
59	Tech.I	5200-20200	2800	8	6	2
60	Tech.II	5200-20200	2400	9	0	9
61	Tech.III	5200-20200	1900	0	0	0
	Sub Total			**0**	**0**	**0**
62	Helper II	5200-20200	1800	**43**	**21**	**22**
	Grand Total			**419**	**312**	**107**

2.6 ITEMS S MANUFACTURED:

1) S&T Workshop, Mettuguda is a sole manufacturer of major mechanical signaling items like Lifting barriers for LC gates, Foundation Piers, Ground lever frames, Cranks, Compensators, Location boxes, CLS Units, CLS Ladders 3.5m & 4.5m. Universal Ground connections and cable markers.
2) This Workshop also manufactures and supplies Electrical Signal Machines, Electrical Reversers and Electrical detectors.
3) As a part of production diversification , efforts have been made to manufacture and supply of Lamp Switching Units, Track feed Battery chargers has also been started during the year 2002-03. Development of electrical lifting barriers and SGE Block instruments was achieved by the end of June 2004 and programmed to develop EKTs.

2.7 Shop Wise Activities:

1) **Production Control Organisation:** Planning of raw materials, Preparation of AAC, Drawl of materials from Dy.CMM/MFT, Inter movement of materials, Registration of work orders, Allotment of product to consignees, Process study and Time Study, Issue of job cards, Preparation of Production schedules, Disposal of D S 8 items, Certification of job cards and Conducting of Production meetings.

2) **Inspection:** Inspection of components manufactured in the shops, quality and quantity. Inspection of materials procured through local purchase by Dy.CMM/MFT and COS/SC, Preparation of P-16. Preparation of movement slips, sending samples to CMT/LGD for chemical analysis and certification of job cards.

3) **Receipt and Dispatch:** Collection of raw material, Dispatch of signaling items to consignees, Loading and Unloading of wagons, Maintenance of record of material received and dispatched, Loading of VPH and VPU, Dispatch of shop scrap, Preparation of monthly statement of material dispatched, Maintenance of cleanliness in work shop, Placing of requisition for allotment of VPU/VPH and wagon and Accountal of signaling items and Delivery notes.

4) **Machine Shop:** Cutting of round basis, Marking as per drawing, Turning, Threading and Boring of components, Milling, Teeth cutting, Keyway etc., Pouring, Shaping, and slotting of components and Drilling of components.

5) **Fitting Shop:** Drilling, Tapering, grinding and Filing of components, Assemble of Mechanical signaling items.

6) **Black Smithy:** Cutting, Bending, Swaging, Upsetting, Pre-forging, Stamping and Thread chasing of signaling components. Forge welding of roding for point machine.

7) **Riveting Shop (Weld and T/Smith):** Gas cutting of Billets, Flats and Angles, Cutting of various rounds, Angles and Sheets on Shearing machine. Bending, Slitting of Sheets. Brazing of components, Profile gas cutting of components with Templates, Arc welding of App. Cases of GKP type Punching of Washer key holes and Blanking, Manufacturing of App. Case GKP boxes marking and Drilling.

8) **Painting Section**: Cleaning, Washing, Applying knife paste, Papering, Primary coating and Spray painting, painting red oxide and letter writing of all mechanical components.

9) **Electrical Shop**: Marking, Drilling, Turning, Threading and taping of components. Manufacturing of Electric Lifting barrier.

10) **B.I and TFBC**: POH of Block Instruments, EKT, Track Feed Battery chargers, station Panels and LC gate panels.

11) **Tool Room**: Manufacturing of dies, swages, Test gauges, Punches, Templates, Jigs and Fixtures, Shearing M/C cutters. Gear Hobbing, Jig boring of components, Reconditioning of cutters & tools. Manufacturing of machine parts

12) **Millwright**: Maintenance of all machines of workshop, vehicles, Leister trucks, Forklifts and Compressors

13) **Track recording car**: POH of Track Recording cars of RDSO/LKO and manufacturing of spare parts.

2.8 OFFICE BUILDINGS AT S&T WORK SHOP:

No	Section/Shop	S No	Section/Shop
1	Administrative building	17	Electrical Shop
2	Elec. Maintenance Section	18	Painting Shop
3	S&T Dispensary Building	19	Block Instrument Section
4	Old Block Instrument Section	20	IPS&SSBPAC Section
5	Lifting Barrier Section	21	Electro Plating Section
6	Proposed Electrical Shop	22	TRC Section
7	Proposed Millwright	23	Tool Room
8	Powder Coating Machine Shed	24	Electrical Sub-Station
9	Scrap Yard	25	Mill Wright
10	Carpentry Shop	26	RPF
11	Machine Shop	27	SCRMU Office
12	Inspection Section	28	SCRES Office
13	Fitting Section	29	SC&ST Welfare Office
14	R&D Section	30	Canteen
15	Black smithy Shop	31	OBC Office
16	Fabrication Shop	32	Parking Shed

2.9 Machineries available in the S&T Workshop:

1) Block Instrument section:

S No	Description of Machine	Make	Year of Procurement	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1.	Centre Lathe	HMT	1988	BI	2003	29	Double Line Block Instrument Parts	Working
2.	Bench Drilling Machine	Rockwell	1970	BI	1985	47	Electrical, DLBI Works	Working
3.	Accumax Pillar Drilling Machine	Accumax	1989	BI	2004	28	FRP Socket Works	Working
4.	Pedestal Grinder	Ground Tools India Ltd	1988	BI	2003	29	Double Line Block Instrument works	Working

2) Black smithy section:

S No	Description of Machine	Make	Year of Procurement	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1.	Accumax Pillar Drilling Machine	Accumax	1988	B/Smithy	2003	29	Drilling Works of Ladder Components	Working

2.	Accumax Pillar Drilling Machine	Accumax	1989	B/Smithy	2004	28	Drilling Works of Ladder Components	Working
3.	Accumax Pillar Drilling Machine	Accumax	1995	B/Smithy	2010	22	Drilling Works of Roddings Spares	Working
4.	Pneumatic Power Hammer	NSE	1982	B/Smithy	1997	35	Bending works of All Rail clamps, Iron Studs, Ladder Components	Working
5.	Pneumatic Power Hammer	NSE	1983	B/Smithy	1998	34	Forging Solid Joints, Bending of Roddings	Working
6.	Pneumatic Power Hammer	NSE	1988	B/Smithy	2003	29	Forging of Roddings, Ground Lever	Working
7.	Pneumatic Power Hammer	NSE	1991	B/Smithy	2006	26	Bending of Hedeles of GKP & Ladder components	Working
8.	Cold Cutting Circular Saw	M/s Hans Kalton Bach M/c	1989	B/Smithy	2004	28	Cutting Works of Billets	Working
9.	Combined Shearing Machine	M/s Muhr & Bendemi	1990	B/Smithy	2005	27	Cutting Works of Ladder Components, Roddings,CLS, GKP	Working
10.	Welding Transformer	Berko	2009	B/Smithy	2024	8	Welding Works of Iron Skid, Ladder	Working
11.	Oil Cooled Welding Transformer	Berko	2012	B/Smithy	2027	5	LB Booms, Sliding, Stake, Booms & Fencing Works	Working
12.	Oil Cooled Welding Transformer	Berko	2012	B/Smithy	2027	5	LB Booms, Sliding, Stake, Booms & Fencing Works	Working
13.	Rough Grinder	….	1930	B/Smithy	1945	87	Grinding works of Solid Joints	Working
14.	Rough Grinder	England	1956	B/Smithy	1971	61	Grinding works of Solid Joints	Working
15.	Oil fired Furnace	Wesman	1961	B/Smithy	1976	56	Various types of rodding, Solid jaw and general works	Working
16.	Oil fired Furnace	Wesman	1961	B/Smithy	1976	56	Various types of rodding, Solid jaw and general works	Working
17.	Oil fired Furnace	Wesman	1968	B/Smithy	1983	49	Various types of rodding,	Working

							Solid jaw and general works	
18.	Blower	…	1968	B/Smithy	1983	49	Supporting works for Furnaces	Working
19.	NSE Universal Screwing M/c	NSE	1971	B/Smithy	1986	46	Threading of GLF CLS Rodding	Working
20.	Fan Blower		1982	B/Smithy	1997	35	For the use of Smithy works	Working
21.	Radial Drilling Machine	Batliboi	1961	B/Smithy	1976	56	Spares of L.B.Boom, Fencing works	Working
22.	Blower	Jayson Engg	1987	B/Smithy	2002	30	Supporting of Furnaces of B/ Smithy	Working
23.	Pipe & Bolt Threading M/c	…	1983	B/Smithy	1998	34	Proposed For DS-8	Proposed For Ds-8
24.	Blower	…	2005	B/Smithy	2020	12	Supporting of B/Smithy Furnaces	Working
25.	Blower	…	2005	B/Smithy	2020	12	Supporting of B/Smithy Furnaces	Working
26.	Power Hacksaw Machine	…	2011	B/Smithy	2026	6	Cutting works of L.B.Boom Pipes	Working

3) Carpentry section:

S No	Description of Machine	Make	Year of Procure ment	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1.	Lathe Machine for wood work	HMT	1913	Carpentry	1928	104	Wood Desinging works of Table Legs	Working
2.	Hollow Chisel marking Machine	Robbinson	1951	Carpentry	1966	66	Slotting & Drilling of Woods (Carpentry)	Working
3.	General Joiner Wood		1909	Carpentry	1924	108	Proposed For DS-8	Proposed For Ds-8
4.	Emery Grinder		1947	Carpentry	1962	70	Sharpening of Tools	Working
5.	Wood Planing Machine		1947	Carpentry	1962	70	Proposed For DS-8	Proposed For Ds-8
6.	Robindson Circular Saw	Robinson	1954	Carpentry	1969	63	Medium sizes of wood cutting	Working
7.	Saw		1955	Carpentry	1970	62	Sharpening of	Working

	Sharpner						Circular Saw	
8.	Circular Saw Wood		1951	Carpentry	1966	66	Heavy wood cutting works	Working
9.	Circular Saw Wood	Sonex	1982	Carpentry	1997	35	Small wood cutting	Working
10.	Air Compressor for Spray Paint		2012	Carpentry	2027	5	Spray works of S&T Components	Working

4) Electrical section:

S No	Description of Machine	Make	Year of Procurement	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1.	Precision Lathe	OKLA	1968	Electrical	1983	49	EOLB Spares	Working
2.	Capstan Latyh	Herberd India	1980	Electrical	1995	37	Proposed for DS-8	Proposed for DS-8
3.	Vertical Drilling	Accumax	1958	Electrical	1973	59	Drilling Operations of EOLB Spares	Working
4.	Praga Bench Drilling Machine	Praga	1963	Electrical	1978	54	EOLB Spares (Small)	Working
5.	Accumax Pillar Drilling Machine	Accumax	1988	Electrical	2003	29	EOLB Spares	Working
6.	Accumax Pillar Drilling Machine	Accumax	1989	Electrical	2004	28	EOLB Boom Roller, Motor Base	Working
7.	Coil winding	Berko	2009	Electrical	2024	8	Winding works of Electrical items	Working
8.	Welding Transformer	Berko	2009	Electrical	2024	8	Sent for DS-8	DS-8 Sent
9.	Welding Transformer	Berko	2013	Electrical	2028	4	All Gear Works	Working
10.	Grinding Machine	Praga	1965	Electrical	1980	52	Grinding of EOLB Works	Working
11.	Tool Grinder	Praga	1947	Electrical	1962	70	All types of Tool grinding works	Working
12.	Coil Winding machine	Praga	1964	Electrical	1979	53	Proposed For DS-8	Proposed For Ds-8

5) Electroplating section:

S No	Description of Machine	Make	Year of Procurement	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1.	H.P.Buffing Machine	Nagina Industries	2014	Electro plating	2029	3	Policing of Spares	Working
2.	Buffing & Polishing M/c	Indian	1955	Electropla ting	1970	62	Double Line BI components and TRC Spare parts	Working
3.	Polishing Barrel	Indian	1963	Electropla ting	1978	54	Nickle coati8ng for Brass & Cadmium	Working

6) Fitting section:

S No	Description of Machine	Make	Year of Procurement	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1.	Radial Drilling Machine	HMT	1976	Fitting	1991	41	CLS Bodies	Working
2.	Radial Drilling Machine	Batliboi	1988	Fitting	2003	29	Shunt Signal Parts, GLF & CLS Body Works	Working
3.	Radial Drilling Machine	Batliboi	2016	Fitting	2031	1	Drilling Works of GKP Spares	Working
4.	Energy Radial Drilling Machine	Energy Machine Tools	2016	Fitting	2031	1	GLF & CLS Works	Working
5.	Energy Radial Drilling Machine	Energy Machine Tools	2016	Fitting	2031	1	Shunt Signal Parts, GLF & CLS Body Works	Working
6.	Bench Drilling Machine	Praga	1963	Fitting	1978	54	Unit Frames, CLS backgound, Lence Ring	Working
7.	Eifco Pillar Drilling Machine	Efico	1982	Fitting	1997	35	CLS Units	Working
8.	Accumax Pillar Drilling Machine	Accumax	1988	Fitting	2003	29	CLS Parts, Unit Frames	Working
9.	Welding transformer	Berko	1993	Fitting	2008	24	Welding Works of CLS **Units**, Shunt Signal Parts	Working

10.	Welding Transformer	Berko	2009	Fitting	2024	8	CLS Shunt Signal, GLF Parts	Working
11.	Welding Transformer	Span	2009	Fitting	2024	8	CLS Shunt Signal, GLF Parts	Working
12.	Rough Grinder		1969	Fitting	1984	48	Grinding of spare parts of CLS, Shunt Signal units	Working

7) IPS development section

S No	Description of Machine	Make	Year of Procurement	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1	7.5 KVA Generator with Battery		2016	Development Section for IPS Works	2031	1	For IPS works	Working

8) Machine shop section:

S No	Description of Machine	Make	Year of Procurement	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1.	HMT Lathe Machine	HMT	1961	Machine	1976	56	EOLB Boss	Working
2.	Planing Machine	Italy Make	1966	Machine	1981	51		Working
3.	Bombay Lathe	Kirloskar	1972	Machine	1987	45	Winch Gears	Working
4.	Centre Lathe	HMT	1972	Machine	1987	45	Winch Gears	Working
5.	High Speed Lathe	HMT	1973	Machine	1988	44	M-20,M-24 Washers Repair	Working
6.	High Speed Lathe	HMT	1973	Machine	1988	44	Studs	Working
7.	Lathe Machine	Leading Engg Works	1989	Machine	2004	28	Alluminum frame for Colour Lights	Working
8.	Kirloskar Lathe	Kirloskar	1986	Machine	2001	31	M-20, M24 Washer	Proposed for DS-8
9.	Vikram Lathe Machine	Gujarat Machine Tools Corp.	1987	Machine	2002	30	Shafts for EOLB	Proposed for DS-8
10.	Vikram Lathe	Gujarat Machine	1987	Machine	2002	30	MS Stud for GLF	Working

	Machine	Tools Corp.						
11.	Lathe Kirlosker	Kirloskar	1988	Machine	2003	29	Alluminum frame works	Working
12.	HMT Lathe Machine	HMT	1989	Machine	2004	28	Tie Rods, Ladder Pins	Working
13.	HMT Lathe Machine	HMT	1989	Machine	2004	28	M-20 & Tirupathi Workshop Works	Working
14.	HMT Lathe Machine	HMT	1989	Machine	2004	28	Stud & Spaces for Wheel Drums	Working
15.	Bombay lathe	Kirloskar	1987	Machine	2002	30	Winch Gears	Working
16.	Lathe Machine	HMT	2014	Machine	2029	3	Trolley Roller, Stud, Tie Rod	Working
17.	HMT Lathe Machine	HMT	2016	Machine	2031	1	Channel Roller Big & Small & TPTY WS Works	Working
18.	HMT Lathe Machine	HMT	2016	Machine	2031	1	MS Stud, Drum Wheel, Base, Stud	Working
19.	Universal milling Machine	Italian	1957	Machine	1972	60	Hasp for CLS	Working
20.	Vertical Milling Machine	BFW	1970	Machine	1985	47	MS Flat for Fleer Blade of TRC	Working
21.	Vertical Milling Machine	HMT	1972	Machine	1987	45	TPTY Works	Working
22.	Horizontal Milling Machine	HMT	1973	Machine	1988	44	Feeler Blades, MS Flat works	Under Repair
23.	Horizontal Milling Machine	BFW	1977	Machine	1992	40	All Gear Works	Working
24.	Horizontal Milling Machine	HMT	1978	Machine	1993	39	All Gear Works	Proposed for DS-8
25.	Milling Machine	HMT	1988	Machine	2003	29	Drum Wheel	Working
26.	Vertical Milling	HMT	1989	Machine	2004	28	Standard	Working

	Machine							
27.	Vertical Milling Machine	HMT	1989	Machine	2004	28	TPTY Works	Working
28.	Horizontal Milling Machine	HMT	1990	Machine	2005	27	MS.Flat & TPTY Works	Under Repair
29.	Vertical Milling Machine	HMT	1993	Machine	2008	24	MS.Flat & TPTY Works	Under Repair
30.	Vertical Milling Machine	HMT	1989	Machine	2004	28	CLS Box Terminal	Working
31.	Universal milling Machine	Royal Machine Tools	2014	Machine	2029	3	TRC Works	Working
32.	Shaping Machine	Cooper	1962	Machine	1977	55	CLS-2 Aspect	Working
33.	Shaping Machine	Cooper	1963	Machine	1978	54	CLS-3 Aspect	Working
34.	Shaping Machine	Cooper	1963	Machine	1978	54	CLS-2 Aspect	Working
35.	Radial Drilling Machine	Batliboi	1982	Machine	1997	35	Not Working	Proposed for DS-8
36.	Radial Drilling Machine	Batliboi	1988	Machine	2003	29	Mounting Socket	Working
37.	Radial Drilling Machine	Batliboi	1989	Machine	2004	28	General Drilling Works	Working
38.	Radial Drilling Machine	HMT	2008	Machine	2023	9	Route Indicator	Working
39.	Energy Radial Drilling Machine	HMT	2016	Machine	2031	1	TPTY Works	Working
40.	Slotting Machine	Cooper	1973	Machine	1988	44	EOLB Boss	Working
41.	Slotting Machine	RK M/c Tools	1976	Machine	1991	41	EOLB Boss	Working
42.	Arc Welding transformwer	Berko	1994	Machine	2009	23	Route Indicator Works	Working
43.	Welding Transformer	Berko	2013	Machine	2028	4	Fencing Works	Working
44.	Welding Transformer	Berko	2015	Machine	2030	2	Fencing Works	Working
45.	Power Hacksaw Machine	Cooper	1958	Machine	1973	59	Proposed for DS-8	Proposed for DS-8
46.	Zip Crane	Simpson	1956	Machine	1971	61	Lifting the S&T WS Materials	Working
47.	Combined Tool Grinder	Simpson	1961	Machine	1976	56	Tool Grinding, various types of tools	Working

48.	Planing Machine	Italy Make	1966	Machine	1981	51	TRC Rail works	Working
49.	Tool Grinder	RK M/c Tools	1974	Machine	1989	43	Various types of Lathe Tools Grinding	Working
50.	Power Hacksaw Machine	Bharat Bijlee	1984	Machine	1999	33	Various types of rod cutting	Working
51.	Double Head Tool Grinder	R.K.Machine	2011	Machine	2026	6	Various types of tool grinding	Working

9) Millwright section:

S No	Description of Machine	Make	Year of Procurement	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1.	HMT Lathe Machine	HMT	1989	Mill wright	2004	28	Spares of Break down works of all machines of S&T WS	Working
2.	Accumax Pillar Drilling Machine	Accumax	1983	Mill wright	1998	34	Break down works, Al types of Drills	Working
3.	Disel Fork Lift	Voltas	2003	M/Wright	2018	14	Lifting the S&T WS Materials	Working
4.	Disel Fork Lift	Godrej	2008	M/Wright	2023	9	Lifting the S&T WS Materials	Under Repair
5.	Jumbo Disel Truck	Lectronics	2013	M/Wright	2028	4	Bringing the PCO Materials	Working
6.	Hacksaw machine	E Ruch 'D' Engg	1978	MW	1993	39	All shops cutting works of breakdown jobs	Working
7.	Bench Grinder	National Electrical	1978	MW	1993	39	Tool Grinding works	Working
8.	Air Compressor	HULMAN	1980	MW	1995	37	Proposed for DS-8	Proposed for DS-8
9.	Pedestal Grinder	Grand Tools India	1988	MW	2003	29	Breakdown jobs of all shops works	Working
10.	Air Compressor		1994	MW	2009	23	Supporting of Bending Machine	Working
11.	Air Compressor	CEC	2011	MW	2026	6	Supporting of Shearing	Working

	(CEC)						Machine	
12.	Jumbo Diesel Truck	Manches war Inds.	2013	MW	2028	4	Drawal of S&T/WS material from Dy.CMM/G&S/MFT	Working
13.	Air Compressor (CEC)	CEC	2015	MW	2030	2	Supporting of Shearing Machine	Working

10) Painting section:

S No	Description of Machine	Make	Year of Procurement	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1	Powder Spray Electrostatcic	Sharada	2014	Painting	2029	3	Painting the S&T Components	Working

11) PCO section:

S No	Description of Machine	Make	Year of Procurement	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1	EMBOSSING	Bradma	1977	SSE/PCO		40	Proposed For DS-8	Proposed For Ds-8
2	BRADMA Electric Printing & Embossing M/c	Bradma	1967	SSE/PCO		50	Printing of Route & Incentive Cards	Working

12) R&D section:

S No	Description of Machine	Make	Year of Procurement	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1	Overhead and operated Crane (R&D)	….	1913	R&D	1928	104	Heavy Machine Jobs	Working

13) Riveting section:

S No	Description of Machine	Make	Year of Procurement	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1.	Radial Drilling Machine	Batliboi	1959	Rivetting	1974	58	Drilling Works	Working
2.	Radial Drilling Machine	Batliboi	1988	Rivetting	2003	29	Drilling Works of GKP Spares	Working

3.	Efico driiling Machine	Efico	1982	Rivetting	1997	35	Small Drilling Works	Working
4.	Accumax Pillar Drilling Machine	Accumax	1987	Rivetting	2002	30		Working
5.	Accumax Pillar Drilling Machine	Accumax	1988	Rivetting	2003	29	Drilling Items of GKP Boxes	Working
6.	Press for Rail	SAFL	1955	Rivetting	1970	62	Pressing of Rails	Working
7.	Press for Sheet metal	USSurthy	1958	Rivetting	1973	59	All Sheet Metal Bending Works	Working
8.	Hyderaulic press	USSurthy	1959	Rivetting	1974	58	Bending of Piper	Working
9.	Power Press	Kaushik	1982	Rivetting	1997	35	Proposed for DS-8	Propose d for DS-8
10.	Hyderaulic press	SAFL	1985	Rivetting	2000	32	Pressing of small works	Working
11.	Fly Press	Namday & Co	1985	Rivetting	2000	32	Pressing of small works	Working
12.	PowerPress	Kaushik	1990	Rivetting	2005	27	Pressing of Verlitter Type	Working
13.	Hydraulic press	Kaushik	1990	Rivetting	2005	27	Pressing of various types of GKP	Working
14.	Sheet Metal Machine	Bansal	2008	Rivetting	2023	9	Bending Works	Working
15.	Heavy Duty Hydraulic Sheet Bending Machine	Keshav	2014	Rivetting	2029	3	Sheet Cutting for GKP Boxes	Working
16.	Profile Gas Cutting Machine	Swetish	1958	Rivetting	1973	59	Proposed for DS-8	Propose d for DS-8
17.	Portable high presslr gass cutting	Swetish	1958	Rivetting	1973	59	Billet Cutting & Other Items	Working
18.	Universal gas cutting Machine	Russian	1970	Rivetting	1985	47	Cutting of Mechanical Items	Working
19.	Guillitone Shearing Machine	Star Prem Engg	1977	Rivetting	1992	40	GKP Box Component s	Working
20.	Combined Shearing	M/s Muhr &	1990	Rivetting	2005	27	Punching of Washers	Working

	Machine	Bendemi						
21.	Shearing Machine	M/s Bansal	2008	Rivetting	2023	9	Cutters Works	Working
22.	Welding Transformer	Berko	2000	Rivetting	2015	17	Welding Works of GKP Boxes	Working
23.	Welding Transformer	Berko	2000	Rivetting	2015	17	Welding Works of GKP Boxes	Working
24.	Welding Transformer	Memco Brand	2005	Rivetting	2020	12	Welding Works of GKP Boxes	Working
25.	Welding Transformer	Memco Brand	2005	Rivetting	2020	12	Welding Works of GKP Boxes	Working
26.	Welding Transformer	Memco Brand	2005	Rivetting	2020	12	Welding Works of GKP Boxes	Working
27.	Welding Transformer	Memco Brand	2005	Rivetting	2020	12	Welding Works of GKP Boxes	Working
28.	Welding Transformer	Berko	2008	Rivetting	2023	9	Route Indicator Works	Working
29.	Welding Transformer	Berko	2008	Rivetting	2023	9	Welding Works of Iron Skid, Ladder	Working
30.	Welding Transformer	Berko	2009	Rivetting	2024	8	Welding Works of GKP Boxes	Working
31.	Welding Transformer	Berko	2013	Rivetting	2028	4	Welding Works of GKP Boxes	Working
32.	Welding Transformer	Berko	2013	Rivetting	2028	4	Welding Works of GKP Boxes	Working
33.	Emery Grinder	…	1956	Rivetting	1971	61	Grinding of small items	Working
34.	Hand Plate Cutting M/c	…	1928	Rivetting	1943	89	Cutting works of small sheets	Working
35.	Liner Machine	…	1934	Rivetting	1949	83	Tightening of Liners	Working
36.	Folding Machine	…	1955	Rivetting	1970	62	Folding works of GKP Sheets	Working
37.	Metal Sawing Hacksaw M/c	…	1957	Rivetting	1972	60	Various types of cutting works (Boom pipes)	Under Repair
38.	Cutting Machine	German	1958	Rivetting	1973	59	Proposed For DS-8	Propose d For

								Ds-8
39.	Pedestal Grinder		1976	Rivetting	1991	41	Grinding of all components	Working
40.	Welding transformer	STERO	1982	Rivetting	1997	35	GKP Box Welding works	Working
41.	Welding transformer Oil Cooled	BERCO	1994	Rivetting	2009	23	GKP Box Welding works	Working

14) Tool Room section:

S No	Description of Machine	Make	Year of Procure ment	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1.	Kirloskar Lathe	Kirloskar	1987	Tool room	2002	30	Punches Top & Bottom for new machines	Working
2.	Milling Machine	Italian	1963	Tool room	1978	54	New Cutters as per requirement	Working
3.	Horizontal Milling Machine	BFW	1976	Tool room	1991	41	New Milling Cutters as per requirement	Working
4.	HMT Milling Machine	HMT	1986	Tool room	2001	31	Radius Milling & New Die Cutters	Working
5.	Shaping Machine	Cooper	1960	Tool room	1975	57	Shaping of DIE Works	Working
6.	Praga Pillar Drilling Machine	Praga	1963	Tool room	1978	54	Cutters Drilling	Working
7.	Drill Poibnt grinding Machine	Indian	1966	Tool room	1981	51	Drills, Cutters,Point Grinding	Working
8.	Pillar Drilling Machine	Accumax	1992	Tool room	2007	25	Drilling of Cutter Sides	Working
9.	Slotting Machine	RK M/c Tools	1963	Tool room	1978	54	Slotting of Key Way Works	Working
10.	Electric Furnace		1961	Tool room	1976	56	Sent for DS-8	Sent for DS-8
11.	GIB Crane		1956	Tool room	1971	61	Lifting of Dies	Working
12.	Engraving Machine		1963	Tool room	1978	54	For the use of GM, Division & Workshop Shields	Working
13.	Universal Tool & Cutter Grinder		1957	Tool room	1972	60	For Cutter and tool sharpening	Working
14.	Tool Grinder		1963	Tool room	1978	54	For Cutter and tool sharpening	Working
15.	Hydraulic Surface Grinder		1963	Tool room	1978	54	Cutting edges of Grinding cutters	Working
16.	Electric Furnace	Indian	1964	Tool room	1979	53	Sent for DS-8	Sent for DS-8

17.	Universal Hobbing M/c		1965	Tool room	1980	52	Manufacture of Gears	Under Repair
18.	Optical Jig Boring M/c	Italian	1969	Tool room	1984	48	Making Die, Jigs & Fixtures	Working
19.	Surface Grinding M/c	HMT	1973	Tool room	1988	44	Grinding cutters and edges	Working
20.	Slotting Machine	Sharada	2015	Tool room	2030	2	Slotting of Key ways, Pulley shafts	Working

15) Track Recording Car section:

S No	Description of Machine	Make	Year of Procurement	Shop/ Section	Completion year of Codal life (15 years)	Period of service in years	Items Produced	Status of the Machine
1.	Lathe Machine	HMT	1965	TRC	1980	52	Essentric Pin, Lug, Bearings,Pulley Shaft & TRC Spares	Working
2.	Shaping Machine	Cooper	1958	TRC	1973	59	Proposed for DS-8	
3.	Shaping Machine	Cooper	1989	TRC	2004	28	Long & Cross Bheem Holding Works	Working
4.	Drilling Machine	Indian	1957	TRC	1972	60	Feeler Blades, Bracket, Long Bheems of TRC	Working
5.	Slotting Machine	RK M/c Tools	1963	TRC	1978	54	Carbide Tip Holders, EOLB Pedestal Grooving	Working
6.	Heavy Duty Grinding M/c	Battli Boi	1969	TRC	1984	48	All types o TRC Spares grinding	Working
7.	Welding transformer Oil Cooled	BERCO	2013	TRC	2028	4	Welding of EOLB Pedestal	Working

3.1 CRITICAL ANALYSIS:

3.2 Railway Board's Lr. No. 2018/SP/MPS/1 of 09.05.2018-regarding Manpower Management strategy for Indian Railways***, Annexure-I (A):*** **Manpower costs-65% of IR's earnings:**

Manpower costs on IR have a direct implication on the future sustainability of the organization. In the FY 2016-17, staff costs at ₹ 65,779 crores, constituted 56.36% of IR's ordinary working expenses (OWE) and 39.8% of the Gross Traffic receipts (GTR. Along with the pension outgo of ₹ 40463 crores in 2016-17, the total staff cost including pension was ₹ 1,06,242 crores at 64.28% of IR's Gross Traffic Receipts. With the annualized decadal growth in staff cost (without Pension) being 13.9% and pension outflow being 17.8% during the decade (2007-08 to 2018-19 (BE), there is a need to formulate a sustainable Manpower Strategy for IR.

3.3 There is an increase in operating/working expenses year by year. The major portion of expenses being staff costs. This has further escalated by implementation of 7th pay commission. It is therefore imperative to keep the working expenses with in financially viable limits by proper utilization of manpower. The Railways have to reduce the expenses from all corners. The major portion of expenses being staff expenses, all out efforts have to be made to contain the same.

3.4 In the absence of yardsticks to measure the work load and manpower requirement for betterment of working class as well as to overcome the financial crunch of Railways, the work study team has taken ground realities into account, discussion with all the staff and arrived at the following conclusions.

3.5 In order to assess the requirement of man power in S&T work shop/MFT, the Work study team visited all the sections and observed the working pattern. The work in the various shops of S&T work shop/MFT are different in nature and time bound. The following parameters are taken into account to arrive the manpower requirement

a) Targets of workload for 3 years.
b) Production done by the workshop for the last 2 years.
c) Allowed time to do each item.
d) Miscellaneous work done by the workshop.
e) Outsourcing activities

3.6 **Summary of SAVE position**:

S No	Category	San	Act	Vac
Ministerial, Supervisory and indirect staff				
1	Ministerial staff	22	18	4
2	Canteen	6	7	-1
3	Supervisors	35	27	8
4	Drawing	1	1	0
5	PCO	17	6	11
6	Helpers	43	21	22
	Sub Total	**0**	**0**	**0**
Technicians				
7	Machine shop	95	73	22
8	Fitting shop	88	79	9
9	Black smithy	46	31	15
10	Riveting	31	24	7
11	Welding	18	13	5
12	Tin smithy	4	2	2
13	Carpentry	2	2	0
14	Machinist wood	2	1	1

15	Electroplating	2	2	0
16	Painting	7	5	2
	Sub Total	**0**	**0**	**0**
	Sub Total	**0**	**0**	**0**
	Grand Total	**419**	**312**	**107**

3.7 OUTSOURCING ACTIVTIES AT S&T WORK SHOP:

1. Hiring of 9 ton Vehicle for transporting for Railway Materials to Foreign railways from S&T Workshop/MFT for a period of 12 months.
2. Hiring of 4 ton vehicle for transporting railway materials within SC Railway for a period of 12 months.
3. Cleaning and maintenance of Toilets, Urinals, Staff canteen, Roads/Path ways e.t.c. in S&T workshop on Quotation basis for a period of 3 months. Proposal for one year through E-tendering is under process.

3.8 Targets of S&T workshop for 3 years :

S No	Description	Allowed time per unit in Hrs	2016-17	Total time in Hrs	2017-18	Total time in Hrs	2018-19	Total time in Hrs
I.	**Colour Light Signals**							
1.	Colour Light 2 aspect (C1)	79.39	240	19053.06	-	-	-	0
2.	Colour Light 3 as pect (C1)	97.50	60	5850.09	-	-	-	0
3.	Shunt Signal(Position light) (Fab)	26.86	600	16114.92	240	6446	-	0
4.	Ladder 3.5 M For CLS	27.33	300	8199.60	200	5466	200	5466
5.	Ladder 4.5 M For CLS	30.78	350	10772.17	100	3076	200	6156
6.	CLS2 Aspect (fab)	67.76	150	10163.41	240	16262		0
7.	CLS3Aspect (fab)	96.80	240	23232.79	20	1936	50	4840
8.	CLS 4 Aspect (fab)	112.62	60	6757.33	70	7883	50	5631
9.	CLS post 3.5/4.5 M	1.68	300	504.99	300	504	300	504
II.	**Route Indicators**							
10.	Route Indicator 1-way (Fab)	129.13	120	15495.68	60	7748	-	0
11.	Route Indicator 2-way (Fab)	177.63	120	21315.66	40	7105	-	0
12.	Route Indicator 3-way (Fab)	219.66	20	4393.30	10	2197	-	0
13.	Route Indicator 4-way (Fab)	277.12	20	5542.32	30	8314	-	0
III.	**Apparatus cases**							
14.	Apparatus cases GKP-HALF	66.66	650	43330.66	600	39996	900	59994
15.	Apparatus case(single)	80.04	650	52025.91	1000	80040	1200	96048
16.	Fencing for Apparatus cases	40.50	600	24300	960	38880	1000	40500
IV.	**Point Roddings**							
17.	Universal Point Rodding	54.49	480	26155.20	480	26155	600	32694
18.	Elevated type Point Rodding	2.25	-	-	300	675	50	112.5
	Ground leverFrame-1 lever	48.05	120	5766	-	-	-	0

V.	**LC gates**							
19.	Electrical Lifting Barrier Gate	180.37	480	85578.56	180	32467	360	64933.2
20.	Operating Panel for EOLB	55.33	240	13279.20	90	4980	180	9959.4
21.	EOLB spare Booms	1.00	480	480	180	180	360	360
22.	Booms 10m for Mech LB gate	56.98	240	13675.20	-	-	-	0
23.	Sliding boom type Gate	149.80	120	17975.59	30	4494	-	0
VI.	Track Feed Battery Charger	10.75	9000	82620	15000	161250	10000	107500
VII.	FRP type Track Lead Jn. Box	0.76	24000	18280	9600	7296	-	0
VIII.	All Rail Switch Clamp	8.46	600	5076	600	5076	-	0
IX.	LED signal 110v Red & Yellow	5.16	1200	6192	-	-	-	0
X.	Electric Key Transmitter	8.08	480	3878.40	600	4848	1200	9696
XI.	Iron Skids	6.50	1200	7800	1000	6500	-	0
XII.	IPS	800	-	-	16	12800	-	0
XIII.	FRP boards	1.50	-	-	300	450	-	0
XIV.	Station Panels	88	6	528	-	-	-	0
XV.	POH							0
24.	POH of BI	193.81	24	4651.44	36	6977	48	9302.88
25.	POH of TRC	2159.97	2	4319.94	2	4320	1	2159.97
	TOTAL			**564305**		**504321**		**0 Say 455857**

3.9 Production & Targets of S&T Workshop:

S No	Description	Target 2016-17	Production	Target 2017-18	Production
	Colour Light Signals				
1.	Colour Light 2 aspect (C1)	240	305	0	45
2.	Colour Light 3 aspect (C1)	60	145	0	45
3.	Shunt Signal(Position light) (Fab)	600	550	240	110
4.	Ladder 3.5 M For CLS	300	225	200	250
5.	Ladder 4.5 M For CLS	350	50	100	100
6.	CLS2 Aspect (fab)	150	190	240	191
7.	CLS3Aspect (fab)	240	120	20	95
8.	CLS 4 Aspect (fab)	60	60	70	130
9.	CLS post 3.5/4.5 M	300	295	300	0
	Route Indicators				
10.	Route Indicator 1-way (Fab)	120	80	60	20
11.	Route Indicator 2-way (Fab)	120	116	40	28
12.	Route Indicator 3-way (Fab)	20	0	10	12
13.	Route Indicator 4-way (Fab)	20	0	30	32
	Apparatus cases				
14.	Apparatus cases GKP-HALF	650	579	600	660
15.	Apparatus case(single)	650	700	1000	810
16.	Fencing for Apparatus cases	600	440	960	430
	Point Roddings				
17.	Universal Point Rodding	480	530	480	60
18.	Elevated type Point Rodding	0	0	300	60
19.	Ground leverFrame-1 lever	120	0	0	0

	LC gates				
20.	Electrical Lifting Barrier Gate	480	190	180	297
21.	Operating Panel for EOLB	240	3	90	0
22.	EOLB spare Booms	480	0	180	0
23.	Booms 10m for Mech LB gate	240	195	0	0
24.	Sliding boom type Gate	120	85	30	0
25.	Track Feed Battery Charger	9000	6420	15000	3582
26.	FRP type Track Lead Jn. Box	24000	25100	9600	3650
27.	All Rail Switch Clamp	600	700	600	500
28.	LED road warning signal 24 v	0	20	0	0
29.	LED signal 110v Red & Yellow	1200	500	0	800
30.	Electric Key Transmitter	480	290	600	500
31.	Iron Skids	1200	1100	1000	
32.	IPS	0	0	16	0
33.	FRP boards	0	900	300	0
34.	Station Panels	6	0	0	0
	POH				
35.	POH of BI	24	51	36	42
36.	POH of TRC	2	1	2	2
37.	DW rope wheel 225 mm	0	600	0	0
38.	GL Frame 01 L	0	195	0	40
39.	Wooden table	0	10	0	

3.10 Man hours required for production:

S No	Description	Allowed time per unit in Hrs	Production 2016-17	Total time in Hrs	2017-18	Total time in Hrs
	Colour Light Signals					
1.	Colour Light 2 aspect (C1)	79.39	305	24213.95	45	3572.55
2.	Colour Light 3 as pect (C1)	97.50	145	14137.5	45	4387.5
3.	Shunt Signal(Position light) (Fab)	26.86	550	14773	110	2954.6
4.	Ladder 3.5 M For CLS	27.33	225	6149.25	250	6832.5
5.	Ladder 4.5 M For CLS	30.78	50	1539	100	3078
6.	CLS2 Aspect (fab)	67.76	190	12874.4	191	12942.16
7.	CLS3Aspect (fab)	96.80	120	11616	95	9196
8.	CLS 4 Aspect (fab)	112.62	60	6757.2		0
9.	CLS post 3.5/4.5 M	1.68	295	495.6		0
	Route Indicators					
10.	Route Indicator 1-way (Fab)	129.13	80	10394.4	20	2598.6
11.	Route Indicator 2-way (Fab)	177.63	116	13645.08	28	3293.64
12.	Route Indicator 3-way (Fab)	219.66	0	0	12	2635.92
13.	Route Indicator 4-way (Fab)	277.12	0	0	32	8867.84
	Apparatus cases					
14.	Apparatus cases GKP-HALF	66.66	579	38596.14	660	43995.6
15.	Apparatus case(single)	80.04	700	56028	810	64832.4
16.	Fencing for Apparatus cases	40.50	440	17820	430	17415
	Point Roddings					

17.	Universal Point Rodding	54.49	530	28879.7	60	3269.4
18.	Elevated type Point Rodding	2.25		0	60	135
19.	Ground leverFrame-1 lever	48.05		0		0
	LC gates					
20.	Electrical Lifting Barrier Gate	180.37	190	34270.3	297	53569.89
21.	Operating Panel for EOLB	55.33	3	165.99		0
22.	EOLB spare Booms	1.00		0		0
23.	Booms 10m for Mech LB gate	56.98	195	11111.1		0
24.	Sliding boom type Gate	149.80	85	12733		0
25.	Track Feed Battery Charger	10.75	6420	69015	358	3848.5
26.	FRP type Track Lead Jn. Box	0.76	25100	19076	3650	2774
27.	All Rail Switch Clamp	8.46	700	5922	500	4230
28.	LED signal 110v Red & Yellow	5.16	500	2580	800	4128
29.	Electric Key Transmitter	8.08	290	2343.2	500	4040
30.	Iron Skids	6.50	1100	7150		0
31.	IPS	800		0		0
32.	FRP boards	1.50	900	1350		0
33.	Station Panels	88		0		0
	POH					
34.	POH of BI	193.81	51	9884.31	42	8140.02
35.	POH of TRC	2159.97	1	2159.97	2	4319.94
	Total			**0**		**0**
	Miscellaneous					
36.	DW rope wheel 225 mm		600			
37.	Solid Joint		0			
38.	GL Frame 01 L		195		40	
39.	Wooden table		10			
40.	LED Road warning signal 24v		20			

3.11 Comparison of man hours required to achieve the targets and actual man hours utilized:

Year	Man Hours required to achieve the target	Man Hours utilised for production	% of man hours utilised
2016-17	564305	0	77.21%
2017-18	504321	0	54.54%

- From the above table it is observed that the targets are not achieved and the man hours utilized for the production of 2016-17 and 2017-18 years are less than the man hours required to achieve the target.

3.12 Requirement of manpower (The sanctioned strength of S&T Work Shop is 419 with 312 on roll staff and 107 vacancies are existing. As the time specified for completion of work orders is relevant with the Technician category, the Planning has assessed the manpower requirement in Technician category only):

S No	Description	Man hours/men required

1	Total man hours required to achieve the target 2016-17	564305
	Total man hours required to achieve the target 2017-18	504321
	Total man hours required to achieve the target 2018-19	455857
2	Average man hours required to achieve the targets for last 3 years = 1524483/3	508161
	To the 3 years average man hours added 5% man hours for misc work orders = 508161x5%	25408
	Then total man hours required for yearly target and misc works orders	533569
	Total man days available in the year per man=365-52(Sundays)-15(NH)	298
3	Total man days available in the year per man=365-52(Sundays)-15(NH)	298
	*Total man hours available in a year	2339
4	Assessment of manpower based on the Yearly target and Misc. work orders	
	Men required = 533569/2339	228.12 say 228
	Leave reserve 12.5% for 228 men	28.5 say 29
	Men required (228+29) for Yearly target and Misc. work orders	257
5	Total sanctioned (Technicians) strength	295
6	Surplus manpower to be surrendered =295-257	**38**

***Working hours of S&T Workshop**

- Monday to Friday = 7.30-12.00 and12.45-17.00 hrs
  = 8hrs 45 min.
- Saturday = 7.30-11.15
  = 3 hrs 45 min.
- Sunday = weekly rest

Total man hours available in a week

- Monday to Friday = 8 hrs 45 min x 5 days
  = 43 hrs 45 min
- Saturday = 3 hrs 45 min x 1 day
  = 3 hrs 45 min
- Total man hours available in a week = 47 hrs 30 min
- Total man hours available in a year = 47 hrs 30 min x 52 weeks
  = 2470 hrs
- After deducting 15 National Holiday = 2470-131hrs 15min
  = 2338 hrs 45 min say 2339 hrs

3.13 Observations of the work study team:

- S&T Work Shop/MFT is manufacturing and supplying the S&T related items required for SCR and other Railways also.
- Due to the development in technology and the availability of the items at cheaper rate in the open market, the work orders are reducing in the last few years..
- Some of the sections such as Electro Plating, Machinist Wood and Carpentry were already closed and staff are deployed in other sections.
- It is observed that the targets are not achieved during the years 2016-17 and 2017-18 and the man hours utilized for the production of these years are less than the man hours required to achieve the target.
- Though the man hours utilized is much less than the men required in achieving the targets, the Work Study Team has taken the man hours required to achieve the target to arrive the requirement of manpower.
- There are 63 vacant posts in the Technician category, whereas indent was placed for 4 Technician posts only.
- As per the work load (Para No3.11), the requirement of Technician category is 257 posts.
- It is observed that the work load of Black smithy, Riveting and Machine shop is reduced drastically during the last few years.
- In view of the above, it is recommended to surrender 38 vacant posts which are excess to the requirement.

3.14 **Recommendation: It is recommended to surrender 38 vacant posts which are excess to the requirement**.

3.15 On implementation of the above recommendation, the effective savings are Rs.2.06 Crores.

** ** **

CHAPTER –IV

4.0 FINANCIAL IMPLICATIONS:

Sl. No	Category	Scale		No. of posts	Mean Pay	DA 9%	Emoluments P.M (in Rs.)	Total Emoluments P.A (in Rs.)
		From	To					
1	Technician	19900	63200	**38**	41550	3740	1721020	20652240
TOTAL				**38**				**Rs. 20652240**

- On implementing the recommendations, the financial savings to the exchequer would be to the tune of **Rupees 2.06 Cr. Per annum**.

** ** **

CHAPTER –V

5.0 RECOMMENDATIONS

S No.	Recommendation	Para No.
1	**Recommendation**: It is recommended to surrender 38 vacant posts which are excess to the requirement. .	3.13

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