WEST CENTRAL RAILWAY

WORK STUDY REPORT

ON

"Review of staff strength of Small Track Machine Depot staff of JBP division"

Guided by
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EXECUTIVE SUMMARY

Name of work study	Review of staff strength of Small Track Machine Depot staff of JBP division

Sanctioned strength position of STMD staff of JBP division is as under:-

Category	Grade Pay	SS	MOR	Vac.
Technician III	1900	112	29	83
TTM Helper	1800	100	61	39
Total		212	90	122

It may be seen from the above table, 212 posts have sanctioned, 90 posts are MOR and 122 posts are vacant.

Advantages of Mobile Maintenance Gang System: (Para-2.7)

1	Maintenance of track in case of emergency
2	Faster due to availability of RMVs (Rail Maintenance Van)
3	Transportation of small track machine by RMV
4	Quick transportation of p-way material
5	In-situ repair welds quicker as cut rail and welding material with Gang Unloaded at site.
6	Saving in the establishment cost due to out-sourcing

Manpower required for Mobile Maintenance Gang system is 0.8 Trackman per km as compared to 1.3 Trackman per km of existing system on IR. Track Maintenance cost by Mobile Maintenance Gang will be Rs. 9 to 10 Lakhs per km as compared to Rs. 14 to 15 Lakhs per km of existing system on IR.

Critical Analysis:

As per RB letter no. E(MPP)2016/1/59 dtd 10.01.2017, Multi-skilling can be planned from the initial stage itself in new activities in Depot. The new activities even in the older establishments can be encouraged by calling for suggestion from employees and employee Unions. This will lead to huge reduction in costs and increased productivity. Multi skilling should be encouraged for artisans' category. To avoid delays for want of other skilled man, it is necessary that multi skilling for Artisans should be introduced.

On the base of above fact, small track maintenance Technicians are multi skilling and competent for maintenance and operation of machine. They work for blacksmith. At present, there are no blacksmiths at depot nor required.

For mobile maintenance gang, **need to develop approach road parallel to track** which will save a lot of money and manpower of railways. In all railways, many works have being done by outsourced activities. The qualities of service of private labours are much better than government's labour as welders/ blacksmiths.

Numbers of trains are increasing day by day. It is not possible to maintain manually and maintain safety.

For save manpower, to be implemented Mobile Maintenance Gang for Track Maintenance (Para-2.7) in the similar way of KRC. Railway Board has directed Zonal Railways to introduce KRCL system of track maintenance having less than 10 GMT with effect from 01.04.2018.

Manpower required for Mobile Maintenance Gang system is 0.8 Trackman per km as compared to 1.3 Trackman per km of existing system on IR. Track Maintenance cost by Mobile Maintenance Gang will be Rs. 9 to 10 Lakhs per km as compared to Rs. 14 to 15 Lakhs per km of existing system on IR.

The posts involved with small track machine, mostly posts are vacant; now vacant posts of Helper due to so many outsourcing in the department i.e. 39 posts should be surrendered.

Conclusion:

Modification of engineering depot is required as like as other. Also benchmarking figure is higher side.

Recommendation:

After outsourcing activities and track maintenance work to be done by small track machine, 39 vacant posts of Helper (small track machine depot) should be surrendered immediately.

Suggestion:

Need to develop approach road parallel to track which will save a lot of money and manpower of railways.

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SYNOPSIS

Indian Railway is one of the biggest transportation organizations among all other transport organizations in the country. In fact, Railway is backbone of the country's transport systems. In the recent time, Railway is facing tremendous competition from road and air. In the time of competition transport system should not only the agile, prompt and amenable but also financially viable. In order to bring economy in expenditure the optimum utilization of man, machine and material will have to be ensured.

In Railways, the process of absorption of modernization has been started and still in progress in every sphere of the system. As a result of which certain activities have become fully redundant/ obsolete from existing system. These technological up gradations have shown the considerable improvement in the efficiency and manpower productivity in Railways.

Keeping in view, all these constraints, Work Study Cell is assigned to conduct work study of *'Review of staff strength of Small Track Machine Depot staff of JBP division'* with a view to assess the staff requirement as per the existing workload after technological upgradation. To arrive at the actual requirement of staff, the team held discussions with officers and supervisors of this division.

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CHAPTER-I

1. INTRODUCTION

Work study on "Review of staff strength of Small Track Machine Depot staff of JBP division" has been taken as a "Crash Work Study" for the year 2018-19.

The maintenance of track is responsibility of Engineering department. The maintenance of track is a vital activity in the train operation in relation to safety & punctuality. It is the duty of engineering department to up keep the standard of track using engineering parameters for the safe running of trains.

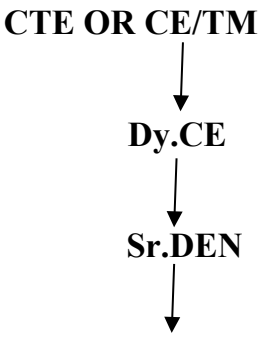
1.1 Due to growing traffic and introduction of heavier track structure, faster and more efficient methods of maintenance are needed to be evolved. In the changed socio-economic scenario, role of types of small machines have been developed for various activities on track.

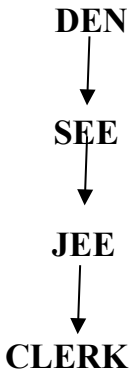
Different types of small machines have been developed for various activities on track. These small track machines are to be used for day-to-day maintenance, laying and construction of track.

1.2 Organisational setup:

The organization shall be under the overall charge of CTE or CE/TM of the railway. CTE/CE(TM) shall be assisted by one Dy. Chief Engineer/ Sr. Engineer for small track machines as convenient.

At divisional level, each Sr. DEN/DEN shall guide AENs for smooth functioning of small track machines, section engineer wise is given additional requirement of small track machines wherever required shall be worked out by the Division.





1.3 Types of Small Track Machines:

1.	Abrasive Rail Cutter
2.	Rail Cutting Machine
3.	Chamfering Kit
4.	Hydraulic Rail Tensor (non- infringing type), 70 T capacity
5.	Rail Creep adjuster
6.	Hydraulic sleeper spacer
7.	Concrete Sleeper Drilling Machine
8.	Portable DC Welding Generator
9.	Rail Profile Weld Grinder
10.	Toe Load Measuring Device
11.	Mechanical Track Jack
12.	Hydraulic Track Jack
13.	Portable track lifting & slewing device
14.	Self Propelled light weight Trolley
15.	Powered Material Trolley
16.	Light weight Rail (Mono) cum Road Trolley
17.	Jib Crane Attachable to BFR-BRH for handling concrete sleeper
18.	Attachment for Rail Dolly for PRC
19.	Powered Rail Hauling System
20.	Portable Ballast Cleaner (Semi Mechanized)
21.	Portable shoulder Ballast compactor

1.4 Maintenance Schedule:

1. Daily check

2. Monthly check

3. Quarterly check

4. Yearly check

1.5 Inspection:

AENs shall carry out inspection of all the Small Track Machines once in 06 months, while the Section Engineer shall inspect all his machines/tools once in a fortnight.

Sr.DEN/DENs/AEN shall pay special attention to repairs, maintenance and effective use of Small Track Machine during their regular inspection of Section Engineer's offices and stores. They shall also scrutinize the small Track Machines Register.

1.6 Training:

Sr.DEN(Cord.) shall organize of staff for operation and maintenance of small track machines/tools through the machines/Tools manufactures.

It shall also be ensured that adequate training facilities are made available in Divisional Training School at divisional level and Zonal training Schools at Zonal Level.

1.7 Benchmarking:

Benchmarking is a continuous process of comparing different units and identifying which one is the best in the business and then learning how this excellence was achieved and the setting out to improve the efficiency of those units, which were behind.

If this concept is implemented it, will result large reduction in the cost and make significant contribution in improving the efficiency of various divisions of the Railways, but Jabalpur Division has not infrastructure developed than other Division of Indian railway.

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CHAPTER-II

2. Staff Strength

2.1 JBP division spread over from ET–JBP, JBP-STA, STA-MKP, STA-REWA, KTE-SGRL and KTE-BINA section details of these sections is as following.

Section	KMs	Line
ET-JBP	245.155	Double Line
JBP-STA	188.990	Double Line
STA-MKP	77.449	Double Line
KTE-SGRL	260.052	Single Line
KTE-BINA	262.810	Double Line
STA-REWA	48.550	Single Line
JKE-KYCE	21.250	Single Line

To maintain the above length of track, following staff are deployed.

2.2 Sanctioned strength position of STMD staff of JBP division is as under:-

Category	Grade Pay	SS	MOR	Vac.
Technician III	1900	112	29	83
TTM Helper	1800	100	61	39
Total		212	90	122

It may be seen from the above table, 212 posts have sanctioned, 90 posts are MOR and 122 posts are vacant.

2.2 Work of STMD Technician regarding machines:

1.	Check the engine oil level for lubricant, add if required.
2.	Check the start grip and rope, Replace if found damaged.
3.	Check air cleaner for dirt in the air cleaner element, If it is dirty, clean air cleaner element.
4.	Change oil in air cleaner cup if found dirty.
5.	Check the oil level in gear box. To check the oil level, open the oil level plug and see if the oil oozes out of the hole. If not, add oil through this hole till the oil starts oozing out. Replace the plug in the hole.
6.	Check all nuts and bolts, tighten if found loose.
7.	Change engine oil
8.	Change oil in gear box

9.	Open drain plug
10.	Tightening the blade and tightening pins then replace if necessary.
11.	Clean air filter element
12.	Clean the cylinder head
13.	Inspect all the spares in gear box
14.	To replace blade if cutting not properly
15.	Check the main filter
16.	Check the tension of the drive belt
17.	Check the condition of the cutting wheel
18.	Check the starter and starter chord, clean the outside of the starter's air intake.
19.	Check that function of the stop switch.

2.3 Precautions in Operation of machine:

1.	The operator shall be fully conversant with use of the machine. The operator shall not be tired, under stress or under influence of any drug or alcoholic drink.
2.	The operator shall read and understand the safety precaution mentioned in the operation's manual and shall strictly follow the instructions.
3.	The operator shall wear safety clothing, shoes and goggles before starting the machine.
4.	No inflammable article shall be in vicinity of the cutting location. During cutting of rails in track circuit area care should be taken to avoid signal cable from burning.
5.	The machine shall be transported while the cutting disc is mounted on it. Fuel

2.4 There are so many small track machines which use in IR/JBP division as under:

SN	Types of Machines	Use	Manpower required
1	Abrasive Rail Cutter	It is quick cutting of all types of rail sections including wear resistant, head hardened rails up to 110 UTS.	3 per SE (Suburban) 1 per SE (Other than suburban) 1 per ART
2	Abrasive Rail Cutting Wheel	It is a disc used with abrasive rail cutting machine for cutting rails for various permanent way maintenance works of Indian Railways.	As required
3	Rail Cutting Machine	It is used for cutting of rails.	2 nos. per SE (other than Suburban)

	(Saw Type)		1 per ART
4	Hacksaw Blade for cutting Rails	It is used for cutting rails up to 90 UTS .	As required
5	Rail Drilling Machine	It is used for drilling of holes in rail web of all types of rails.	2 per SE (Suburban) 1 per SE (other than suburban) 1 per ART
6	Chamfering Kit	It is used to chamfer rail holes to eliminate chances of developing crack at the sharp edge of drilled holes in rail.	1 per SE
7	Hydraulic Rail Tensor (non-infringing type), 70 t capacity	It is used for de-stressing of LWR track and for maintaining specified gap at rail joints for A.T welding.	2 per SE
8	Hydraulic Rail Bender (Jim Crow), Heavy duty	It is used for bending/ de-kinking of all types flat bottom rails in horizontal plane .	1 per SE
9	Hydraulic Rail Joint Straightener	It is a manually operated hydraulic equipment for dehogging dipped welded / fish-plated joints for improving longitudinal profile of rail.	1 per Sub division
10	Rail Creep Adjuster	It is a hydraulic jacking device for creep adjustment of fish plated track.	1 per SE
11	Hydraulic Sleeper Spacer	is used for re-spacing/squaring of sleepers.	2 per SE
12	Concrete Sleeper Breaker with Angle Grinder	It is used primarily for breaking the concrete sleepers into pieces thereby facilitating quick removal of damaged concrete sleepers and restoration of railway track in case of accidents/derailments and other such emergent situations. It may also be used for breaking brick work, asphalt and rocks.	1 per ART
13	Concrete Sleeper Drilling Machine	It is used to drill hole (vertically) into concrete sleeper in-situ for fixing of guard rail and check rails on concrete sleeper track at specified location.	1 per Division
14	Portable DC Welding Generator	It is a portable generator for producing DC current for the operation of arc welding equipment for reconditioning of points and crossings at site. It also has an auxiliary AC unit for producing alternating current required for miscellaneous applications such as	1 per SE

		lighting at work-site, operation of electrically driven devices like rail profile grinder, rail drilling/cutting machine etc.	
15	Double Action Weld Trimmer for AT Welding (Power Pack Version)	This machine is used for trimming the extra weld metal from rail (top and sides) of AT welded rail joint after the welding operation.	1 per Welding-unit
16	Rail Profile Weld Grinder	It is used for grinding of A.T. welded joints after weld trimming operation is complete.	1 per Welding-unit
17	Heavy Duty Hydraulic Extractor for Jammed ERCs	It is used to remove jammed ERCs from concrete sleepers without any damage to the sleeper.	1 per SE 1 per ART
18	Toe Load Measuring Device (Mechanical)	It is used to determine the toe load of elastic rail clips during service in the field.	1 per SE
19	Electronic Toe Load Measuring Device	It is used to measure the toe load of elastic rail clips in service.	1 per SE
20	Mechanical Track Jack	It is used for lifting of track during track maintenance/construction work like spot attention, picking up slacks in isolated patches etc.	2 per gang/unit
21	Hydraulic Track Jack	It is used for lifting of track in track maintenance/construction work.	4 per gang/unit
22	Portable track lifting & slewing device (TRALIS)	It is a hydraulic device used for lifting and slewing of Railway track and turnouts for maintenance/ laying purpose.	2 per SE
23	Self Propelled light weight Trolley	It is used by Railway officials for track inspection and to reach accident/work site quickly.	1 per AEN
24	Powered Material Trolley	It is used by P.Way staff for carrying small track machines and tools for day to day track maintenance works.	1 per SE
25	Light Weight Rail (Mono) cum Road Trolley	It is a manually driven trolley to carry small track machines and can be moved on a single rail or on ground.	2 per gang 5
26	Jib Crane Attachable to BFR-BRH for handling concrete Sleeper	It is attached to BFR/BRH and used for loading/unloading of concrete sleepers from cess to BFR/BRH and vice-versa when the BFR/BRH is stationary.	As required
27	Attachment for Rail Dolly for	It is used with rail dolly for transportation of mono block concrete	4 per SE

	PRC sleeper	sleepers.	
28	Powered Rail Hauling System	It is used for : (i) Pairing and butting edges of long welded rails (10/20 rail panels), (ii) Stacking of long welded rails, (iii) Hauling heavy material, structures, equipment during construction, accidents, derailments etc. , (iv) Hauling vehicles, BFR, BRH and such equipment on track , (v) Hauling heavy cables for laying.	1 per PQRS site
29	Hand Held Off Track Tamper	It are used for tamping of track for slack picking in concrete sleeper track as a means of intermediate attention in between the runs of On – track tampers..	3 per SE
30	Portable Ballast Cleaner (Semi Mechanised)	It is used for cleaning the track ballast during track maintenance work like deep screening, overhauling etc.	1 per gang
31	Portable Shoulder Ballast Compactor	It is used for compaction of track ballast in crib and shoulder portion of track. It can also be used for soil compaction having a depth of 15 – 20 cm and for compaction of ballast bed before track laying.	1 per SE

All the above mentioned machines are under AMCs. In Jabalpur division, Hydraulic Rail Joint Straightener, Rail creep Adjuster, Toe Load Measuring Device (Mechanical), Concrete Sleeper Breaker with Angle Grinder, Jib Crane Attachable to BFR-BRH for handling concrete Sleeper, Portable Ballast Cleaner (Semi Mechanised) and Portable Shoulder Ballast Compactor machines are not available.

2.5 Track KM of JBP division is as under: (Unit wise)

SN	Unit name	Total Track KM
1	BGTA	75.58
2	SGP	76.00
3	GAR	75.60
4	NU	86.40
5	SRID	75.80
6	JBP(S)	82.40
7	JBP YD	0.00
8	JBP (N)	57.45
9	SHR	87.20
10	KTE S	82.30

11	KMZ	76.20
12	NKJ	36.81
13	KTE N	60.80
14	MYR	73.00
15	STA S	64.20
16	STA N	82.92
17	REWA	52.76
18	MKP	85.37
19	KYE	72.37
20	SGO W	74.40
21	SGO E	76.60
22	DMO W	75.40
23	DMO E	79.80
24	SYA	73.80
25	KHBJ	78.45
26	BEHR	90.80
27	SGAM	85.17
TOTAL		**1937.58**

2.6 Outsourcing:

2.6.1 Advantages of Outsourcing Activities:

1	Monetary Saving compared to present system
2	Availability of physically fit person for the job
3	No detention to trains due to absenteeism, absconding from duty, incapability of doing the job due to old age etc.
4	Administrative convenience
5	Less / no union activities therefore better work culture
6	Enforce conditions as per the requirement and benefits to Railways
7	Saving of valuable manpower

2.7 In KRC, all track works are mechanized and also work exists through Mobile Maintenance Gang.

2.7.1 Advantages of Mobile Maintenance Gang System:

1	Maintenance of track in case of emergency
2	Faster due to availability of RMVs (Rail Maintenance Van)
3	Transportation of small track machine by RMV
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2.8 Special Track Maintenance works Contracts are as under:

1	Manual Deep Screening (Tunnels & Ballasted Deck bridges)
2	Shallow screening
3	Destressing
4	Overhauling of Turnout
5	Overhauling of LC
6	USFD (75%)
7	Auxiliary works of BCM working
8	Ballasting (supply and run out)
9	Removal/making of cess.

2.9 Comparative figures of benchmarking of different P.Way depots of Indian Railways :

SN	Railways	Depot	Men per ETKM
1	IR	-	1.33
2	WCR	BPL	1.52
3	WCR	JBP	1.35
4	WCR	Kota	1.62
5	Benchmark	MB of NR	0.69

2.10 Critical Analysis:

As per RB letter no. E(MPP)2016/1/59 dtd 10.01.2017, Multi-skilling can be planned from the initial stage itself in new activities in Depot. The new activities even in the older establishments can be encouraged by calling for suggestion from employees and employee Unions. This will lead to huge

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The posts involved with small track machine, mostly posts are vacant; now vacant posts of Helper due to so many outsourcing in the department i.e. 39 posts should be surrendered.

2.11 Conclusion:

Modification of engineering depot is required as like as other. Also benchmarking figure is higher side.

2.12 Recommendation:

After outsourcing activities and track maintenance work to be done by small track machine, 39 vacant posts of Helper (small track machine depot) should be surrendered immediately.

2.13 Suggestion:

Need to develop approach road parallel to track which will save a lot of money and manpower of railways.

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CHAPTER-III

3 FINANCIAL IMPLICATION

3.1 Financial implication on surrender of 39 vacant posts of Engineering department of JBP division is as under-

Particular	Amount
Mean of grade	37,450
DA@7%	2622
Transportation	1800
Salary Per Month	41,872
X 12 = Per annum	5,02,464
X No. of posts (39)	1,95,96,096
Say	1.96 Crore

Say Rs. 1.96 Crores Per Annum

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