

दक्षिण पूर्व मध्य रेलवे  
SOUTH EAST CENTRAL RAILWAY

कार्यालय  
वरिष्ठ उपमहाप्रबंधक, बिलासपुर



Office of the  
Sr. Dy. General Manager, Bilaspur.  
Tel.No. 64006(Rly), 07752-414229

पत्र सं. No. WS/Engg/NGP /1399

दिनांक Dated: 27.06.2019

The Divisional Railway Manager,  
S.E.C. Railway,  
Nagpur.

Sub: Work study on "Review of existing cadre strength vis-a-vis workload of SSE (P. Way) Unit/Gwarighat of Engineering Department in Nagpur Division."

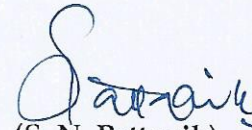
- Ref.: (i) This office letter no. WS/Engg./NGP/18-19/240 dated 13.02.2019.  
(ii) Sr. DEN(Co)/NGP's Office Letter No.-E/General/NGP/WS/GRG/2019 dated 21.02.2019,  
(iii) This office letter no. WS/Engg./NGP/18-19/332 dated 05.03.2019.

The work study of SSE(P-Way) Unit/Gwarighat of Engineering Department in Nagpur Division has been conducted to review the existing cadre strength in view of present work load, outsourcing of some works of P-way, track maintenance through Track Machines, higher Benchmarking, Konkan Railway system of track maintenance and need base requirement of manpower. Draft study report vide letter under reference was sent to DRM/NGP to furnish the remarks on the draft report. In response to this, remarks on the draft report from Sr. DEN(Co)/NGP has been received and a suitable reply has been sent to Sr. DEN(Co)/NGP vide letter under reference. Further, no reply has been received so far. Hence, the draft study report is finalised.

The work study report contains recommendation for surrender of 71 surplus vacant posts of Track Maintainer/Helper out of total sanctioned of 250 of SSE(P-Way) Unit/Gwarighat of Engineering Department. Besides this, some suggestions are also made to improve the efficiency.

Therefore in view of above, it is requested that suitable instructions may be given to concerned officers for implementation of the work Study report and copy of surrender memorandum may be sent to this office so that progress of implementation of work study can be advised to Railway Board accordingly.

This has the approval of SDGM.

  
(S. N. Pattnaik) 27/6/19

Asst. Work Study Officer  
For Sr. Deputy General Manager

Encl: 1 work study report.

Copy along with one copy of work study report is forwarded to:-

- ✓ 1) The Executive Director, E&R (ME), Railway Board for kind information.
- 2) Secretary/SECR for kind information of GM.
- 3) PCE/SECR/BSP for kind information and necessary action please.
- 4) Sr. DEN(Co)/NGP, Sr. DPO/NGP for kind information and necessary action.





# **SOUTH EAST CENTRAL RAILWAY**

WORK STUDY CELL

## **Work study report on**

**“Review of Existing Cadre Strength Vis-a-vis  
Workload of SSE(P. Way) Unit/Gwarighat of  
Engineering Department in Nagpur Division”**

OVER S.E.C. RAILWAY



**WORK STUDY CELL  
S. E C. RAILWAY  
BILASPUR**

**STUDY NO.  
SEC/04/2019-20**

# **SOUTH EAST CENTRAL RAILWAY**

## **Work study report on**

**“Review of Existing Cadre Strength Vis-a-vis Workload of  
SSE(P. Way) Unit/Gwarighat of  
Engineering Department in Nagpur Division”**

**OVER S.E.C. RAILWAY**

### **GUIDED BY**

**SRI AMIT KUMAR SINGH**

**SR.DY. GENERAL MANAGER**

### **LED BY**

**SRI S. N. PATTNAIK**

**ASST. WORK STUDY OFFICER**

### **CONDUCTED BY**

**SRI V. K. SINHA  
CH. WORK STUDY INSPECTOR**

**SRI SUNIL KUMAR MISHRA  
WORK STUDY INSPECTOR**

**WORK STUDY CELL  
S. E. C. RAILWAY BILASPUR**

**STUDY No.  
SEC/04/2019-20**

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## **SUMMARY OF RECOMMENDATIONS & SUGGESTIONS**

<b>Rec. No.</b>	<b>Description</b>	<b>Para Ref.</b>
<b><u>RECOMMENDATIONS:</u></b>		
1.	<p>Work Study team has adopted three methods for assessment of requirement of staff for SSE/P. Way/Gwarighat unit of Engineering department, Nagpur Division which are as under:</p> <p><b><u>First Method (In view of existing work load):</u></b> Considering the existing work load and as per details given in Para 3.2, the requirement of staff for SSE/P. Way/Gwarighat unit comes to 185 against sanction of 250 staff. Thus, 65 vacant posts of Track Maintainer /Helper are found surplus.</p> <p><b><u>Second Method (As per Benchmarking norms ):</u></b> Considering Benchmarking norms and as per details given in Para 3.3, the requirement of staff for SSE/P. Way/Gwarighat unit comes to 179 against sanction of 250. Thus, 71 vacant posts of Track Maintainer/Helper are found surplus.</p> <p><b><u>Third Method (As per Konkan Railway system of Track Maintenance):</u></b> After implementation of Konkan Railway Pattern of track maintenance and as per details given in Para 3.4, the requirement of staff for SSE/P. Way/Gwarighat unit comes to 165 against sanction of 250. Thus, 82 posts (72 vacant) of Track Maintainer/Helper are found surplus. <b>However, it is suggested that either of three methods as mentioned in the work study report may be adopted for assessment of requirement of staff as per feasibility.</b></p> <p><b><u>Conclusion:</u></b> Work study team has taken in Benchmarking norms for calculation of staff required for P. Way/GRG unit. Thus, <b>71 vacant posts</b> of Track Maintainer/Helper are found surplus from the existing sanctioned of 250 and same should be surrendered from Engineering Department (P. Way) of Nagpur Division.</p>	3.7.1
2.	The money value resulting after surrendering of vacant posts of Track Maintainer can be utilised for creation of posts required for Track Machine maintenance work as per need.	3.7.2
3.	The balance vacant post of Track Maintainer & Artisan category should be filled up for better monitoring of contractual and departmental civil engineering works.	3.7.3
4.	Some activities of P- Way like deweeding of track & cleaning of drain, painting of Boards/Rails, overhauling of LC Gate and tree cutting for visibility may be outsourced up to 80% and rest 20% through departmental.	3.7.4
<b><u>Suggestions:</u></b>		
1.	Mobile Maintenance Gang may be set up to cater the emergency work as per need.	3.7.5
2.	It is found that two staff are deployed at Shikara/Katunga Rest House as Caretaker which is a non-core activity. Hence, maintenance of Katunga Rest House may be carried out through contractual staff in order to savings in manpower cost.	3.7.6
3.	To Minimize the absenteeism, all efforts such as motivation, interaction with the staff may be made.	3.7.7

# **CHAPTER – I**

## **INTRODUCTION**

### **1.0 Background:**

The study of SSE (P-Way) Unit/Gwarighat of Engineering Department in Nagpur Division has been undertaken to review the existing workload vis-à-vis cadre strength in view of outsourcing of some works of P-way, track maintenance through Track Machines, higher Benchmarking, Konkan Railway system of track maintenance and need base requirement of manpower.

SSE (P. Way)/Gwarighat is a field unit of Civil Engineering Department of Nagpur Division to look after the maintenance of track and other allied works in the jurisdiction of Kachpura – Ghansore section. Earlier, this unit was known as SSE/P. Way/Howbagh.

Due to innovation and introduction of new technology, track maintenance by Track Machines, Gauge conversion, outsourcing activities and redundant activities, rightsizing of manpower is necessary.

### **1.1 Role of Permanent Way/Engg. Deptt.:**

Permanent way is the rail-road on which trains run. It basically consists of two parallel rails having a specified distance in between and fastened to sleepers, which are embedded in a layer or ballast of specific thickness spread over the formation.

Permanent Way is the major activity of the Engineering branch, which is entrusted with the periodical maintenance of track, bridges, level crossing gates and other related assets. A well maintained track is very essential for speedy, safety and efficient operation of trains. Continuous monitoring and inspection on daily basis is warranted in ensuring a reliable permanent way. The modern technologies have taken the track maintenance techniques from the era of axe and shovel to the era of modern mechanized track maintenance. The interconnection with S&T branch and TRD branch is a new development to be considered during the track maintenance. The equipments for testing the track have become sophisticated so as to not only trace the failures but also detect the failures that are likely to occur. The use of ultrasonic flow detector (USFD) equipment detects the minute hair line crack and blow holes in the rail which might develop into a rail crack and end up in train derailments. Many of the maintenance activities as of now are outsourced and there are wide scope for outsourcing the other activities which have no bearing on safety. So it has become imperative to have a hard look at the man power requirement considering the recent development that had taken place.

### **1.2 Administrative structure of P. Way Organisation at Division level:**

The P. Way organization is a part of Civil Engineering department at divisional level, functions under the administrative control of Sr. DEN (Co). Officers having entrusted with a particular section comprising of sectional CPWIs/PWIs(SSE) are in-charge of P. Way Units/depots and responsible for up-keeping of track. The track is maintained with the help of Trackman, Mate, Keyman & Artisan staff. The maintenance of track is a vital activity in the working of train in relation to safety & punctuality and it is duty of engineering department to keep up the standard of track using engineering parameters for the safe running of trains. In this way Engineering Department is the backbone of Railway system.

Permanent way maintenance is largely done by gangs consisting of Gangman/Trackman under the supervision of a Gang-mate. The gang goes down its assigned section (gang beat), inspecting track and performing normal routine maintenance. A patrolman may be separately deputed to perform visual inspections along the length of a section of track by

walking alongside it.

The schedule and track sections to be monitored by Gangman and Patrolmen are specified in a Patrol Charts prepared by the Divisional Engineer. These charts also indicates when and where the drivers of trains running to schedule may expect to meet Gangman/Patrolmen and gangs carry Patrol Books in which they record the status of the track and any maintenance they perform on it.

The gang is equipped to deal with minor problems such as fixing small deviations in gauge or elevation of the rails, rearranging ballast, etc. If problems are discovered with the permanent way that cannot readily be fixed by the gang, the details are reported to the station master of one of the adjacent block stations, and temporary engineering speed restrictions are put in place for the track. Trains going through that section are then subject to caution orders issued by the stations at either end.

The Permanent Way Inspector (PWI) of a section has ultimate responsibility for the maintenance of the permanent way under his jurisdiction. The PWI and his staff undertake separate regular inspection tours of the various lines, often in a trolley. In the past manually pushed trolleys were used quite often, but their use is declining now.

### **1.3 Present Scenario:**

Track maintenance in Indian railway has undergone a rapid change during the past 20 years due to continuous developments in various track components viz sleepers, Rails and fastenings. The use of the machines both for mechanized track maintenance as well as track laying has increased substantially in recent past with the introduction of heavy track structures to meet the challenges of growing traffic and changed socio-economic conditions. Simultaneously, with the help of mechanisation higher quality standard can be achieved.

### **1.4 Benchmarking:**

As per Railway Board's instructions, the manpower is to be brought down at the level of IRABM. As per latest Benchmarking of Manpower Productivity Ratios Report of September'2018 issued by the Director (E&R)/ Railway Board, the IR Average Benchmark of P. Way Department is 1.30 Men per ETKM whereas Benchmark of P. Way Department of Nagpur Division is 1.49 which is higher than IR Average Benchmark. The current IR Average Benchmark of Engineering Gatemen as per Benchmarking report, Sep'2018 issued by Railway Board is 2.30 Men per Gate whereas Benchmarking of Gateman of Nagpur Division is 2.72 Men per Gate which is above than IRABM.

### **1.5 KRCL Pattern of Track Maintenance:**

As per IRPWM Correction Slip No. 145 dated 23.07.2018, modified 3-tier system of track maintenance on the pattern of Konkan Railway may be adopted on single line sections with low traffic density (generally less than 10 GMT per annum) with the approval of PCE. The SSE/P-Way/Gwarighat unit comes under Single Line BG section (JBP-NIR). Earlier, it was NG line section. The length of this P. Way unit is 80 KM from Kachpura to Ghunsore station. The average number of trains run per day in this section is 08-10. The annual traffic density of this section is less than 01 GMT. During course of work study, it is known that KRCL system of track maintenance will be adopted for SSE/P. Way/GRG & SSE/P-Way/NIR jurisdiction as traffic density on these sections is less.

### **1.6 Terms of Reference:**

The following terms of reference were adopted for conducting the study:-

- I. Review of staff strength vis-à-vis existing workload.
- II. Outsourcing activities.
- III. Identifying redundant/unproductive activities to eliminate wastages.

- IV. Suggesting ways and means to improve the working system economically in view of modernization and system improvement.
- V. Benchmarking.
- VI. Konkan Railway (KRCL) pattern of track maintenance of new line sections.

#### 1.7 **Details of SSE/P. Way Unit/ Gwarighat in Nagpur Division:**

The Engineering (P. Way) Department /NGP Division is divided into seventeen SSE (P. way) units and these Units are further sub-divided in to various no. of sectional Gang to execute the related works.

The jurisdictions along with the no. of Gangs existing under SSE/P. Way/GRG Unit are given as under:

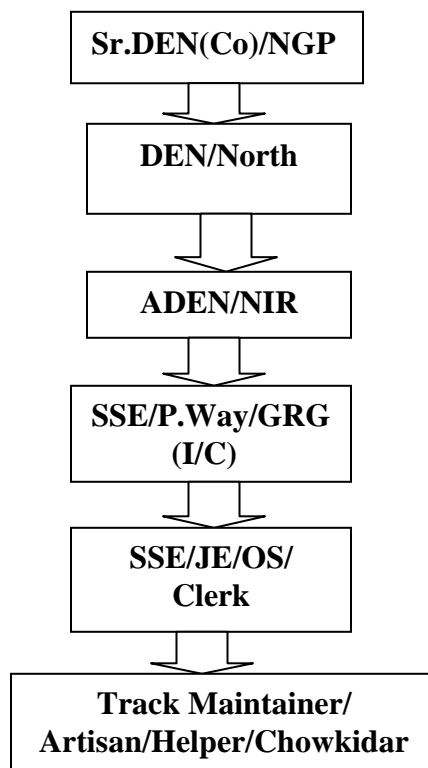
S#	Item	Particulars
1.	Section	Single Line (BG section)
2.	Jurisdiction	Kachpura –Ghunsore section [1132/2 -1232/2 KM-old jurisdiction] [1152/6-1232/2 – New jurisdiction].
3.	Length (KM)	80 KM
4.	Total No. of Sectional Gang under the P- Way Unit	13 Gangs (As per cadre position, there are 16 Gangs under SSE/PW/GRG. But 13 Gangs are working under SSE/PW/GRG and 03 Gangs working under SSE/PW/NIR.)
5.	Jurisdiction of one Gang	6-7 Km
6.	No. of Engineering LC Gates	02
7.	No. of Trains	Average 8-10 per day

#### 1.8 **DTM/Gang:**

Sometimes two Gangs are clubbed in one DTM gang and work jointly for better output at working site

One Gang No. 03 existing in Gwarighat has been taken up for sample study from this unit.

#### 1.9 **Organizational structure:**





### **1.10 Methodology:**

The following methodology has been adopted for conducting the study:

- (i) Unit visit
- (ii) Collection of relevant field data,
- (iii) Examination of records,
- (iv) Direct observations regarding working of staff,
- (v) Interaction with Supervisors and staff,
- (vi) Critical Analysis.
- (vii) Assessment of Need based requirement of staff.

## **CHAPTER-II**

### **2.0 OBSERVATIONS :**

#### **2.1 Staff strength:**

The cadre strength of SSE (P. Way) Unit/Gwarighat of Nagpur Division as furnished vide Sr. DPO Office/NGP P/NGP/CDR/2018/08 dated 19.11.2018 and as per data collected is given below:

S#	Category/ Design.	GP/Level	Sanc.	Actual	Vacancy
1	SSE (P. Way)	4600/L-7	03	04	-01
2	JE (P. Way)	4200/L-6	02	02	00
3	Ch. OS	4600/L-7	00	00	00
4	OS	4200/L-6	02	02	00
5	Sr. Clerk	2800/L-5	00	00	00
<b>Sub Total</b>			<b>07</b>	<b>08</b>	<b>-01</b>
1	Technician MCM (EBS)	4200/L-6	00	00	00
2	Technician MCM(HM)	4200/L-6	00	00	00
3	Technician MCM	4200/L-6	00	00	00
4	Technician MCM	4200/L-6	00	00	00
5	Technician Gr.-I (EBS)	2800/L-5	01	01	00
6	Technician Gr.-I (H/Man)	2800/L-5	00	00	00
7	Technician Gr.-I (Painter)	2800/L-5	01	01	00
8	Technician Gr.-I (E.C.R)	2800/L-5	00	00	00
9	Technician Gr.-I (Welder)	2800/L-5	00	00	00
10	Technician Gr.-II (EBS)	2400/L-4	00	00	00
11	Technician Gr.-II (H/Man)	2400/L-4	00	00	00
12	Technician Gr.-II (Painter)	2400/L-4	00	00	00
13	Technician Gr.-II (Welder)	2400/L-4	00	00	00
14	Technician Gr.-III (EBS)	1900/L-3	00	00	00
15	Technician Gr.-III (H/Man)	1900/L-4	00	00	00
16	Technician Gr.-III (ECR)	1900/L-2	00	01	-01
17	Technician Gr.-III (Painter)	1900/L-2	00	00	00
18	Technician Gr.-III (Welder)	1900/L-2	03	02	01
19	Track Maintainer-I	1800/L-1	14	10	04
20	Track Maintainer-II	1800/L-1	30	03	27
21	Track Maintainer-III	1800/L-1	54	27	27
22	Track Maintainer-IV	1800/L-1	134	124	10
23	Helper	1800/L-1	03	00	03
24	Chowkidar	1800/L-1	03	01	02
<b>Sub Total</b>			<b>243</b>	<b>170</b>	<b>73</b>
<b>Grand Total</b>			<b>250</b>	<b>178</b>	<b>72</b>

#### **2.2 Comparative Staff strength of SSE (P- Way)/GRG (HBG) unit:**

The comparative staff strength of SSE(P. Way)/GRG unit of last 02 years as per data collected is given below:

S#	Year	Sanction	Actual	Vacancy
1	01.04.2015	258	183	75
2	01.01.2019	250	178	72

### 2.3 Duties of P. Way staff:

The duties of P. Way staff category-wise are as under:

(i) **SSE/JE (P. Way):-**

SSE/JE( P. Way) perform their duties in office as well as in field units which are broadly mentioned as follows:

Inspections and maintenance of track in his jurisdiction in a safe condition for traffic. Inspections and maintenance of Engg. L/C Gate in his jurisdiction. Accountal, procurement and periodical verification of stores & tools required for regular maintenance. Execution of new/sanctioned works including zonal works. Measurements and bills pertaining to p. way works including correspondence, if any. Periodical inspection of new works and inspections as specified in Engineering Manual.

(ii) **PWS(upgraded to JE post)-**

They supervise the works carried out by Gang Mate.

(iii) **Mate:-**

He is assigned for the work that the prescribed system of track maintenance is adhered to and the task allotted to him either verbally or through gang chart/diary are carried out efficiently, ensure the tools & equipment as prescribed available at site of work, ensure his length of line is kept safe for the passage of trains and any unsafe condition is reported immediately, inspect the whole gang length once a week for on the spot supervision regarding track condition.

(iv) **Keyman:-**

The keyman inspects by foot his entire beat once a day, both the tracks and bridges for lookout of defects like loose spikes, keys, chairs, fish bolts, fittings on grinder bridges/culverts, broken/burnt sleepers, broken plates/tie bars etc. and attend them as necessary and report it to Mate/PWS/JE.

(v) **Trackman:-**

They are assigned the work of track maintenance like packing, casual renewal of rail/sleeper, lubrication of rail joints, attention to point & crossing, drain cleaning, vegetation cleaning, loading/unloading of materials, patrolling, protecting line in emergency, Gatekeeper, painting of board etc.

(vi) **Trolley man:-**

These staff are engaged for operation of Trolley available with SSE/JE and assist Supervisor.

(vii) **Black Smith:-**

These staff are engaged for smithy related activities.

(viii) **ECR:-**

These staff are engaged for carpentry related activities as and when required. However, at present the work of Carpenter has been reduced in view of no wooden sleeper.

(ix) **Welder:-**

Welder are utilized for welding work

(x) **Luter:-**

Luter are utilized for luting during welding work.

(xi) **Chowkidar:-**

Chowkidar staff are utilized in EI roster as care taker in the offices, stores etc.

### 2.4 Working Hours of Trackman:

March-June: 6.30-11.30 & 15.00-18.00

July-October : 07.30-12.30 & 14.00-17.00

November-February : 07.00-12.00 & 14.00-17.00

## 2.5 **Classification of Track Maintenance Activities as per MCNTM report:**

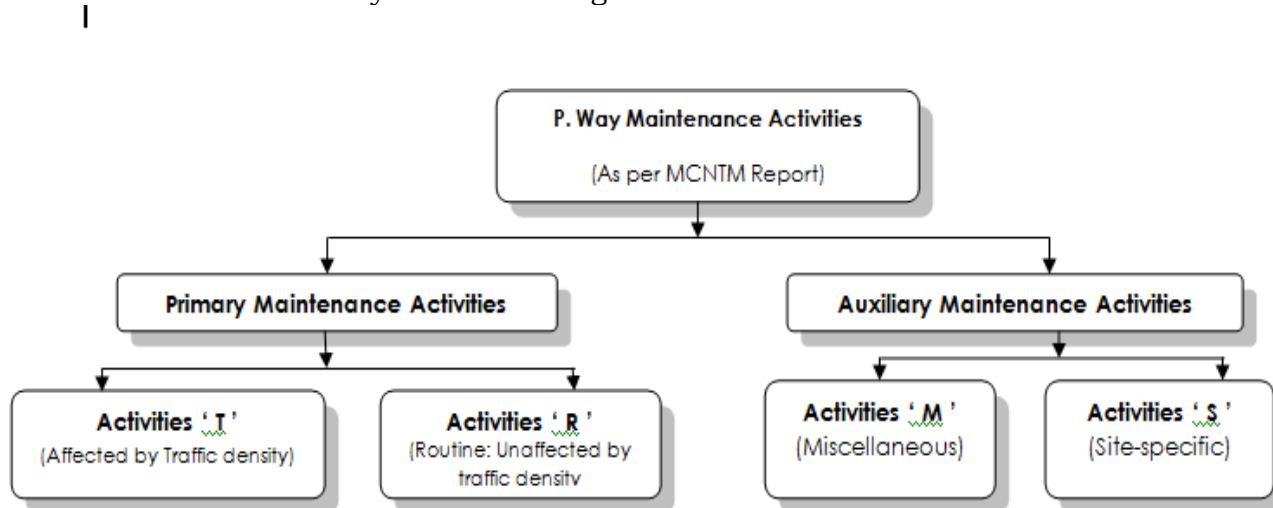
### **The Rational Formulae (MCNTM):**

These formulae were developed because the Special Committee Formula was felt inadequate to account for differing manpower availability (skill sets, age distribution) in different regions or zones, increasing use of casual labour and private contractors for certain track maintenance activities etc. In 1996, another committee was constituted by the Railway Board to look into this matter and to recommend changes to the Special Committee Formula.

These new Rational Formulae are much more involved, and account for a wide variety of factors in terms of the nature of the maintenance work, the type of track and traffic carried on it, the distribution of casual and contracted labour for permanent way operations, etc. The Rational Formulae are actually many different formulae, for each kind of maintenance operation, and they also specify the equivalence of different kinds of work for the purposes of computing wages and so on. The latest set of Rational Formulae was adopted in 2006 on the basis of recommendation of “The Committee on Manpower and Cost Norms for Track Maintenance” (MCNTM Committee).

In order to cover certain gang activities left out which affect track maintenance effort and to take into account the effect of machine packing and track modernization, the Committee on Manpower and Cost Norms for Track Maintenance (MCNTM) found it more logical and rational to adopt zero based approach. The Committee recommended that the Railway may sanction Casual/Seasonal labour for all these works as and when required on the basis of volume of work.

As per MCNTM report the track maintenance activities are categorized as Primary maintenance and Auxiliary maintenance given as under:



### **PRIMARY MAINTENANCE ACTIVITIES:**

These activities are directly related to P. Way maintenance, needing manpower based on continuous length of track, further classified as follows:

#### **Activities T (Affected by Traffic density):**

These are aimed at achieving safety and acceptable running quality, commensurate with the loads and speeds carried.

#### **Activities R (Routine: Unaffected by traffic density):**

These are for maintaining track, formation and other integrated assets, which are of routine nature, but quite important for train operation and for achieving reliability and long life of assets.

### **AUXILIARY MAINTENANCE ACTIVITIES :**

These are related to upkeep of P. Way section as a whole, needing manpower based on

localized problems, special features and geographical nature of P. Way section, further classified as follows:

### Activities M (Miscellaneous):

For these activities, the quantum of work arising in the P. Way section can be assessed on a universally adoptable basis and the yardstick relating mandays requirement to output is rationally stipulated for each sub-activity.

### Activities S (Site-specific):

For these activities, the quantum of work arising varies from location to location depending on site-specific features of the P. Way section and the yardstick is stipulated generally based on past experience.

- 2.6** The details of activities and sub-activities mentioned in MCNTM report under T, R M, & S categories are given as under:

<b>List of activities &amp; sub-activities under T,R,M &amp;S as per MCNTM Report</b>			
<b>PRIMARY MAINTENANCE ACTIVITIES</b>		<b>AUXILIARY ACTIVITIES</b>	<b>MAINTENANCE</b>
<b>Activities 'T'</b> (Affected by Traffic density):	<b>Activities 'R'</b> (Routine: Unaffected by traffic density)	<b>Activities 'M'</b> (Miscellaneous)	<b>Activities 'S'</b> (Site specific)
<b>Machine packed track (non-suburban):</b>  <b>T1. Slack attention to</b> a. Bad spots b. Low joints, (FP or welded), Glued joints c. SEJ (1 No. per km.) d. Minor curve realignment <b>T2. For tie tamper working</b> a. Pre-tamping operations b. Along with tamper c. Post tamping operations <b>T3. Casual Renewal of</b> a. Rails b. Sleepers c. Fasteners (along with re-gauging) <b>T4. Repair Welding</b>  <b>ii. Manually packed track (non-suburban):</b>  <b>T1. Through packing</b> <b>T2. Slack attention to</b> a. Bad spots b. Low joints, insulated joints c. Minor curve realignment <b>T3. Casual renewal of</b> a. Rails b. Sleepers c. Fasteners (includes attention) <b>T4. Creep pulling</b>  <b>iii. Machine packed track (high density suburban):</b>  <b>T1. Slack attention to</b> a. Bad spots b. Low Joints c. SEJs d. Minor Curve attention <b>T2. For Tie tamper</b>	<b>Machine packed track (non-suburban):</b>  <b>R1.</b> Lubrication of ERCs <b>R2.</b> Shallow Screening (1/5 length) <b>R3.</b> Loading, leading, unloading <b>R4.</b> Overhauling of level crossing <b>R5.</b> Watching caution spots & Miscellaneous <b>R6.</b> Tree cutting for visibility <b>R7.</b> Lubrication of rails in curves <b>R8.</b> Accident relief and carcass removal in run-over cases <b>R9.</b> Bridge sleeper attention & renewal <b>R10.</b> Pre monsoon attention, such as clearing of drains and waterways, cess repairs, de-weeding of track and attention to cuttings and trolley refuges. <b>R11.</b> Creep pulling (approaches of bridge, turnout) <b>R12.</b> Rectifying damage to L/C posts and gates  <b>ii. Manually packed track (non-suburban):</b>  <b>R1.</b> Lubrication of rail joints <b>R2.</b> Shallow screening (1/5 length) <b>R3.</b> Loading, leading, unloading <b>R4.</b> Overhauling of level crossings <b>R5.</b> Watching caution spots & miscellaneous <b>R6.</b> Tree cutting for visibility <b>R7.</b> Lubrication of rails in curves <b>R8.</b> Accident relief and carcass removal in run-over cases <b>R9.</b> Bridge sleeper attention & renewal <b>R10.</b> Pre-monsoon attention such as clearing of drains and waterways, cess repairs, de-weeding of track and attention to cuttings and trolley refuges <b>R11.</b> Rectifying damage to LC posts and gates  <b>iii. Machine packed track (high density suburban):</b>  <b>R1.</b> Through packing <b>R2.</b> Shallow screening(1/5 length)	<b>Sub-activities:</b>  <b>M1.</b> Monsoon patrolling  <b>M2.</b> Hot weather patrolling for LWR track  <b>M3.</b> Cold weather patrolling for LWR track  <b>M4.</b> Watching of vulnerable locations  <b>M5.</b> Gate keeping at Engineering level crossings  <b>M6.</b> Rest giving for keymen  <b>M7.</b> Waterman duty (to serve the gang)  <b>M8.</b> Store watchman duty (at isolated locations of P. Way material store)	<b>Sub-activities:</b>  <b>S1.</b> Tunnel maintenance  <b>S2.</b> Bridge substructure maintenance  <b>S3.</b> Long girder bridge maintenance  <b>S4.</b> Extra workload due to very sharp curves, deep cuttings and steep gradients.  <b>S5.</b> Maintenance of track on extremely bad formation.  <b>S6.</b> Look-out man duty (for the safety of gang)  <b>S7.</b> Fog signal man duty (to assist Traffic Department)  <b>S8.</b> Filth removal from track (within city limits)  <b>S9.</b> Security patrolling  <b>S10.</b> Watching of water level in suburban section (mostly in Mumbai area) during monsoon and stopping of trains as soon as found necessary.



<b>working</b> a. Pre-tamping attention b. Along with tamper c. Post tamping attention <b>T3. Casual renewal of</b> a. Rails b. Sleepers c. Fastenings <b>T4. Repair welding</b>	<b>R3.</b> Loading, leading & unloading <b>R4.</b> Lubrication of ERCs(Jts.) <b>R5.</b> Overhauling of level crossings <b>R6.</b> Watching caution spots and look out men <b>R7.</b> Tree cutting <b>R8.</b> Lubrication of rails in curves <b>R9.</b> Bridge sleeper attention & renewal <b>R10.</b> Accident relief and carcass removal <b>R11.</b> Pre-monsoon attention <b>R12.</b> Creep pulling <b>R13.</b> Rectifying damage to LCs <b>R14.</b> Painting of weld colla <b>R15.</b> Emergency attention <b>R16.</b> Extra assistance to Keymen &B/Smith <b>R17.</b> Extra work in night blocks <b>R18.</b> Extra assistance for S&T items		
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**2.7** As per MCNTM report, the following track maintenance works can be earmarked for execution **through contracts**:

**Table –A: List of activities that can be executed through contract system**

S#	Activities
1	Formation treatment works
2	Collection of ballast, training out of ballast by material train, leading ballast stack to track, insertion of ballast in track and profiling.
3	Deep- screening of ballast in track, carrying out manually or by deploying BCM in which case manpower support is provided by contractor.
4	Introduction of sub ballast and ballast layer.
5	Heavy repairs to track including lifting.
6	Complete realignment of curved track.
7	Through renewal of rails, sleepers and fasteners.
8	Complete renewals of points & crossing, SEJs, traps, etc.
9	Resurfacing of machines and switch rails.
10	Loading and unloading of P. Way materials in bulk.
11	Lorrying of P. Way materials for other than casual renewal.
12	Security of materials in a depot which is closed and locked.
13	Painting of rails and weld collars.
14	Painting of bridge girders.
15	Heavy repairs (measurable) to formation, cutting, side drains and catch water drains.
16	Heavy repairs (measurable) to bridges, bridge protection works, river training works and tunnels.
17	Providing/repairing road surface at level crossings, including speed breakers.
18	Removal of major sand breaches.
19	Works arising due to restoration, following breach or accident.
20	Clearing of rank vegetation in platforms and in the vicinity of tracks in coaching and goods yards, repairs depots and workshops of Engineering, Mechanical, Electrical and S&T departments.

**Table –B: List of activities for machine packed track to be maintained **departmentally****

Activities under ‘T’ (Affected by traffic density):	
T.1	Slack attention to; a) Bad spot b) Low joints (FP or welded) & Glued joints c) SEJ d) Minor curve alignment.
T.2	For tie tamper working; a) Pre-tamping operations b) Along with tamper c) Post tamping operations.
T.3	Casual renewal of; a) Rails b) Sleepers c) Fasteners along with re-gauging.
T.4	Repair welding.

<b>Activities under 'R' (Unaffected by traffic density):</b>	
R. 1	Lubrication of ERCs.
R.2	Shallow Screening (1/5 length)
R.3	Loading, leading, unloading
R.4	Overhauling of level crossing
R.5	Watching caution spots & Miscellaneous
R.6	Tree cutting for visibility
R.7	Lubrication of rails in curves
R.8	Accident relief and carcass removal in run over cases
R.9	Bridge sleeper attention & renewal.
R.10	Pre monsoon attention, such as clearing of drains and water ways, cess repairs, de-weeding of track and attention to cuttings and trolly refuges.
R.11	Creep pulling (Bridge approaches/Turn-out)
R.12	Rectifying damage to L/C posts and gates.
<b>Activities under 'M':</b>	
M.1	Monsoon patrolling.
M.2	Hot weather patrolling of LWR track
M.3	Cold weather patrolling of LWR track
M.4	Watching vulnerable locations.
M.5	Gate keeping at level crossings
M.6	Rest giving for Key man
M.7	Waterman duty
M.8	Store-watchman duty at isolated location of P.way material store.
<b>Activities under 'S' (Site specific):</b>	
S.1	Tunnel maintenance(Subject to works/bridge staff not being available for this work)
S.2	Bridge sub-structure maintenance (Subject to works/bridge staff not being available)
S.3	Long girder bridge maintenance (No. of bridges each having more than 150m lineal waterway)
S.4	Extra workload due to very sharp curve, deep cuttings and steep gradients.
S.5	Maintenance of track on extremely bad formation. (No. of locations where track needs more than 12 attentions in a year)
S.6	Look-out man duty (for the safety of gang)
S.7	Fog signal man duty to assist Traffic Deptt(Man days utilized in past 3 years for this)
S.8	Filth removal from track (within city limits)
S.9	Security patrolling(Mandays utilized in past 3 years for this duty)
S.10	Watching of water level in suburban section (mostly in Mumbai area)

## **2.8 Revised List of Activities to be Outsourced in Konkan Railway System of Track Maintenance-**

1. Slack attention to bad spots
2. Attention to lo joints, SJ's, Glued joints etc
3. Flash Butt and isolated Thermit Welding done in emergency repairs
4. Loading, leading and unloading of P.Way material for routine works
5. Isolated curves realignment
6. Pre post and during taping operations
7. casual renewal of sleepers, fastening, Rails,
8. Lubrications of ERC
  
9. Lubrication of gauge face of rails in curves,
10. Tree cutting/trimming
11. Overhauling of LCs
12. Shallow screening
13. Bridge attention
14. Pre- monsoon drains clearing, tunnel maintenance, attention to bad formations
15. Distressing of L.W R
16. Distressing and boxing of ballast including deweeding.
17. Training out and leading ballast from rail DMT
18. Painting. Of various Boards
19. Painting of rails and welds collars
20. Removal of vegetation on Track
21. Creep attention
22. Companion of Patrolmen
23. Additional manpower for departmental USFD team
24. Re-conditioning of points and crossings SEJs
25. Any other activity on account vacancies in gangs for equivalent money available.

**2.9 Average %-Break-Up of present Track Maintenance work executed by Departmentally & Through Contract : This is based on the data provided by SSE/PW/GRG.**  
**(Percentage Break-UP)**

S#	Activities	carried out by (in %-age)	
		Departmental	Contractual
1	Attention to bad spots	20	80
2	Attention to low joints	80	20
3	Attention to SEJ	60	40
4	Attention to minor curve realignment	20	80
5	Pretamping operations	20	80
6	Along with tamper	60	40
7	Post tamping operations	100	-
8	Casual renewal of rails	100	00
9	Casual renewal of sleepers	-	-
10	Renewal of fasteners (along with regauging)	-	-
11	Repair Welding	100	-
12	Lubrication of ERC	10	90
13	Shallow screening	00	100
14	Loading, leading, unloading	00	100
15	Overhauling of level crossing	100	00
16	Watching caution spots and misc.	100	00
17	Tree cutting for visibility	100	00
18	Lubrication of rails in curves	100	00
19	Accident relief and carcass removal in run over case	100	00
20	Bridge sleeper attention and renewal	100	00
21	Premonsoon attention such as cleaning of drains and water ways, cess repair, deweeding of track and attention to cuttings and trolley refuges	20	80
22	Creep pulling (approaches of bridge and turnout)	-	-
23	Rectifying damage to LC posts and gates	100	00
24	Monsoon patrolling	100	00
25	Hot weather Patrolling	100	00
26	Cold weather Patrolling	100	00
27	Vulnerable location	100	00
28	Waterman duty	100	00
29	Site store chowkidar	100	00
30	Gate Keeping at Level crossing	100	00
31	Tunnel maintenance	-	-
32	Bridge structure maintenance	-	-
33	Long girder maintenance	-	-
34	Extra for very sharp curve	-	-
35	Extra for very bad formation	-	-
36	Look outman duty	100	00
37	Fog signalman duty	100	00
38	Filth removal	100	00
39	Security Patrolling	100	00
40	Painting & Writing work	100	30

**2.10 Field Observation of 01 Gang of SSE (P. Pay) Unit/Gwarighat of Nagpur Division:**

During field observation and discussion held with Supervisor/staff, it is found that two Gang are clubbed in one DTM gang and working jointly for better output.

**2.10.1 Sectional data of sample gang:**

Sectional data of 01 sample gang of SSE(P. Way) unit as provided by SSE are summarized as under:

Item	Gang No.-03 (SSE/P. Way/GRG)
Division	Nagpur
Track Maintenance	Mechanised
Jurisdiction	1213/4-1219/5
Gang length	6.4+GRG yard
TKM (M/L)	-
RYL	800 m
GMT	Less than 01 GMT
Poor visibility	-
LWR length	2.5 Km+1.6 Km
No. of curves	4
Degree of curve	1.75-3.15
Length of curve	4710 m
Girder bridge	-
Length of G/Bridges	-
Station yard	GRG yard
L/C Gate	01
Distressing Temp.	41
Rail Temperature	2-54
Stationary Patrolling	-

**2.10.2 Cadre Position & Jurisdiction of Gangs under SSE(P. Way)/GWARIGHAT (As on Jan'2019):**

Gang No.	Section/ Jurisdiction	Sanction			Actual			Vacancy		
		Mate	Key man	Track man	Mate	Key man	Track man	Mate	Key man	Track man
1	1232/3-1225/9	01	01	14	00	01	09	01	00	05
2	1225/9-1219/5	01	01	12	00	01	08	01	00	04
<b>3</b>	<b>1219/5-1213/1</b>	<b>01</b>	<b>01</b>	<b>14</b>	<b>01</b>	<b>01</b>	<b>12</b>	<b>00</b>	<b>00</b>	<b>02</b>
4	1213/1-1206/7	01	01	12	00	01	09	01	00	03
5	1206/7-1200/3	01	01	12	00	01	08	01	00	04
6	1200/3-1193/9	01	01	14	01	01	10	00	00	04
7	1193/9-1187/5	01	01	14	00	01	05	01	00	09
8	1187/5-1181/1	01	01	12	00	01	05	01	00	07
9	1181/1-1174/9	01	01	14	00	01	07	01	00	07
10	1174/9-1168/8	01	01	12	00	01	06	01	00	06
11	1168/8-1162/8	01	01	14	00	00	08	01	01	06
12	1162/8-1156/8	01	01	12	00	01	07	01	00	05
13	1156/8-1150/8	01	01	14	01	01	07	00	00	07
GateKeeper-		00	00	06	00	00	06	00	00	00
Trolleyman-		00	00	15	00	00	15	00	00	00
<b>Total</b>		<b>13</b>	<b>13</b>	<b>191</b>	<b>03</b>	<b>12</b>	<b>122</b>	<b>10</b>	<b>01</b>	<b>69</b>
		<b>217</b>			<b>137</b>			<b>80</b>		

**NOTE: 03 Gangs namely Gang No. 14,15 & 16 are working under SSE/P.Way/NIR.**



#### **2.10.4 Site observation of 01 sample Gang under SSE(P. Way)/GWARIGHAT:**

The position of 01 sample gang of SSE(P. Way)/GRG unit during field observation on 04.01.2019 is summarized as under:

##### **Gang No. -03/SSE/P. Way/GRG:**

- I. As per cadre position available with Mate, it is found that actual 14 staff including Mate/Keyman were available against sanctioned cadre of 16 of Gang No.-03. Out of 14 Track maintainers, 04 were working with Gang for track maintenance activities(white washing of sleeper & SEJ), 01 working as Mate, 01 working as Keyman, 02 staff engaged for chowkidar duty at SSE/PW/GRG, 01 staff deployed at Katunga Rest House as Caretaker, 04 staff deployed for patrolling duty and 01 staff on leave.
- II. Avg. 12-13 Track maintainer are present out of on roll as per Attendance Register available with Gang Mate. Average Trackman on Rest/leave/sick/absent per day is 02.
- III. Average Trackman being utilized as Mate/Key man per Gang per day is 02.
- IV. Average No. of Trackman found engaged with track maintenance activities per day is 05-06.
- V. Lubrication of rail joints/ curves is a regular activity, and 01 Trackman per day is being utilized for this activity.

#### **2.11 Daily Work Progress of 01 Sample Gang beat under SSE (P. Pay) Unit/Gwarighat of last one year (01.12.2017 – 30.11.2018):**

The daily work progress of 01 sample Gang of SSE(P. Way) unit/Gwarighat of last one year (December'17- November'18)as provided by SSE are given below:

##### **Daily Work Progress of Gang No. 03/GRG of last one year (Dec'2017 to Nov'2018:**

**DECEMBER-2017**

Date	Work performed	Manpower available		
		Mate	Key Man	TM
01.12.2017	Slack Packing KM No.-1996/7-8 at Line no.-3	01	01	08
02.12.2017	Slack Packing .. KM No.-1215/9 ½ -10 at Line no.-3	01	01	06
03.12.2017	Slack Packing .. KM No.-1216/5 -6	01	01	10
04.12.2017	Rest	00	01	00
05.12.2017	Slack Packing KM No.-1211/5 -6	01	07	02
06.12.2017	Slack Packing , KM No.-1211/9 -2 ½	01	01	06
07.12.2017	Slack Packing .. KM No.-1214/9-9 ½	01	01	09
08.12.2017	Slack Packing .. KM No.-1214/9 ½ -15 /0	01	01	09
09.12.2017	Slack Packing .. KM No.-1215/0-1/2	01	01	08
10.12.2017	Slack Packing .. KM No.-1215/6 ½-1	01	01	10
11.12.2017	Rest	00	02	00
12.12.2017	Jungle cutting near Engg. Gate .. KM No.-1215/4-6	01	01	06
13.12.2017	Jungle cutting near .. KM No.-1215/6-8	01	01	06
14.12.2017	Jungle cutting near .. KM No.-1215/8-1216/1	01	01	07
15.12.2017	Slack Packing .. KM No.-1215/1-1 ¼	01	01	09
16.12.2017	Slack Packing .. KM No.-1215/1 ½ -2	01	01	07
17.12.2017	Slack Packing .. KM No.-1215/1 ½ -2	01	01	08
18.12.2017	Rest	01	01	00
19.12.2017	Ballast Cleaning .. KM No.-1216/4 ½ -5 ½	01	00	06
20.12.2017	Packing work .. KM No.-1215/1½ -2	01	01	08
21.12.2017	SEJ work .. KM No.-1217/4-5	01	01	09
22.12.2017	SEJ work .. KM No.-1217/2-3	00	01	08
23.12.2017	Jungle cutting near .. KM No.-1218/8-1219/6 ½	00	01	05
24.12.2017	Ballast segregation work .. KM No 1218/6-7	00	01	06
25.12.2017	Rest	00	01	00
26.12.2017	Jungle cutting near .. KM No.-1219/01-2	01	01	02
27.12.2017	Jungle cutting near .. KM No.-1219/01-4	01	01	04
28.12.2017	Jungle cutting near .. KM No.-1215/01-14/3	00	00	06
29.12.2017	Packing work .. KM No.-1215/1½ -2	01	02	05
30.12.2017	Jungle cutting near .. KM No.-1214/8-6	01	01	04
31.12.2017	Slack Packing .. KM No.-1217/6 ½ -7	01	00	05
<b>Total</b>				<b>179</b>

<b>JANUARY-2018</b>				
<b>Date</b>	<b>Work performed</b>	<b>Manpower available</b>		
		<b>Mate</b>	<b>Key Man</b>	<b>TM</b>
01.01.2018	Rest	00	01	00
02.01.2018	Material Carrying work from Haubag to Gwarighat	01	01	07
03.01.2018	Material Carrying work from Haubag to Gwarighat	01	01	05
04.01.2018	Track Packing & Greasing work	01	01	07
05.01.2018	Track Packing & Greasing work	01	01	07
06.01.2018	Material Carrying work	01	01	05
07.01.2018	Rest	00	01	00
08.01.2018	Material Carrying work	01	01	05
09.01.2018	Material Carrying work	01	00	04
10.01.2018	Material Carrying work	01	01	04
11.01.2018	Material Carrying work	01	01	05
12.01.2018	Material Carrying work	01	01	04
13.01.2018	Material Carrying work	01	01	04
14.01.2018	L-C Gate maintenance work	01	01	07
15.01.2018	Rest	00	01	00
16.01.2018	Slack Packing .. KM No.-1219/4 ½ -5 ½	00	01	06
17.01.2018	Slack Packing .. KM No.-1213/8 ½ -8 ½	00	01	07
18.01.2018	Pendrol Greasing work .. KM No.-1212/9-8	00	01	06
19.01.2018	Pendrol Greasing work .. KM No.-1212/8-7 ½	00	01	08
20.01.2018	Pendrol Greasing work .. KM No.-1212/7 ½ -6 ½	01	01	08
21.01.2018	Pendrol Greasing work .. KM No.-1213/6 ½ -4	01	01	07
22.01.2018	Rest	00	01	00
23.01.2018	Pendrol Greasing work .. KM No.-1213/4-4 ½	01	00	05
24.01.2018	Pendrol Greasing work .. KM No.-1213/4 ½ -5	01	01	05
25.01.2018	Slack Packing .. KM No.-1209/0-1/2	01	01	08
26.01.2018	Slack Packing .. KM No.-1209/1/2-1	01	01	07
27.01.2018	Track Packing	01	01	08
28.01.2018	Checking of Gauge Level	01	01	07
29.01.2018	Checking of Gauge Level	01	01	06
30.01.2018	Rest	00	01	01
31.01.2018	Rack Packing	01	00	08
<b>Total</b>				<b>161</b>

**FEBRUARY-2018**

Date	Work performed	Manpower available		
		Mate	Key Man	TM
01.02.2018	Slack Packing	01	01	06
02.02.2018	Slack Packing & Greasing work .. KM No.-1209/3-3 ½	01	01	04
03.02.2018	Slack Packing .. KM No.-1219/4 -4 ½	01	01	01
04.02.2018	Slack Packing .. KM No.-1229/3-4	01	01	05
05.02.2018	Rest	00	01	00
06.02.2018	Ballast Filling work	01	00	03
07.02.2018	Slack Packing .. KM No.-1218/8-1219/4	01	01	04
08.02.2018	Ballast Filling work	01	01	04
09.02.2018	Greasing Work .. KM No.-1215/1-1218/1	00	01	04
10.02.2018	Material Carrying work	00	01	04
11.02.2018	Level alignment work .. KM No.-1213/1-1214/2	01	01	04
12.02.2018	Rest	00	01	00
13.02.2018	Level alignment work .. KM No.-1213/7-1217 5 ½	01	00	04
14.02.2018	Slack Packing .. KM No.-1216/1217/0-1/2	01	01	07
15.02.2018	Slack Packing .. KM No.-1216/1217/0-1/2	01	01	08
16.02.2018	Slack Packing .. KM No.-1219/3 ½ -4	01	01	08
17.02.2018	Slack Packing .. KM No.-1223/1 ½ -2	01	01	08
18.02.2018	Slack Packing .. KM No.-1223/1-1 ½	01	01	09
19.02.2018	Rest	00	01	01
20.02.2018	Ballast Filling work .. KM No.-1218/6-6 ½	01	01	04
21.02.2018	Ballast Filling work .. KM No.-1218/5-6	01	01	08
22.02.2018	Ballast Filling work .. KM No.-1214/2-3	01	01	09
23.02.2018	Ballast Filling work .. KM No.-1214/8-1216/5	01	01	09
24.02.2018	Slack Packing .. KM No.-1209/8-9	01	01	09
25.02.2018	Slack Packing .. KM No.-1213/0-1	01	01	10
26.02.2018	Rest	00	01	00
27.02.2018	Sleeper Carrying work	01	01	02
28.02.2018	Slack Packing .. KM No.-1211/8-9	01	00	03
<b>Total</b>				<b>138</b>

**MARCH-2018**

Date	Work performed	Manpower available		
		Mate	Key Man	TM
01.03.2018	Slack Packing .. KM No.-1211/9 ½ - 1212/01	01	01	04
02.03.2018	NH	00	01	00
03.03.2018	Greasing work .. KM No.-1218/5-4	01	01	06
04.03.2018	Greasing work .. KM No.-1214/7 ½ -1216/2	01	01	06
05.03.2018	Rest	00	01	00
06.03.2018	Greasing Work .. KM No.-1218/2-3	01	01	04
07.03.2018	Pt. 41 B packing work	01	01	05
08.03.2018	Pt. Crossing maintenance work .. KM No.-1218/5-3	01	01	05
09.03.2018	Ballast Cleaning work .. KM No.-1214/5-6	01	01	05
10.03.2018	Ballast Cleaning work .. KM No.-1218/8 ½ -9 ½	01	01	05
11.03.2018	Ballast Cleaning work .. KM No.-1215/9-1216/10	01	01	06
12.03.2018	Rest	00	01	00
13.03.2018	Attended Safety Seminar	01	01	06
14.03.2018	Greasing work	01	01	07
15.03.2018	Ballast Filling & Earth work .. KM No.-1217/2-1	01	01	05
16.03.2018	SEJ work .. KM No.-1217/2 ½ -3	01	01	10
17.03.2018	Ballast Filling & Earth work .. KM No.-1217/1/2-1	01	01	09
18.03.2018	Ballast Filling & Earth work .. KM No.-1217/10-9	01	01	08
19.03.2018	Rest	00	01	00
20.03.2018	Ballast Filling & Earth work .. KM No.-1215/8-8 ½	00	01	06
21.03.2018	Ballast Filling & Earth work .. KM No.-1216/0-1	00	01	06
22.03.2018	Ballast Filling & Earth work .. KM No.-1216/0-2	01	01	07
23.03.2018	Ballast Filling & Earth work .. KM No.-1216/1-2	01	01	07
24.03.2018	Ballast Filling & Earth work .. KM No.-1216/8-9	01	01	05
25.03.2018	Gauge levelling work	01	01	05
26.03.2018	Gauge levelling work	01	01	05
27.03.2018	Gauge levelling work	01	00	08
28.03.2018	Ballast Filling & Earth work .. KM No.-1216/8-8 ½	01	00	06
29.03.2018	Rail maintenance work at Bridge	01	00	08
30.03.2018	Rail Pulling Work	01	00	05
31.03.2018	Rail Girdur replacement work	01	00	08
<b>Total</b>				<b>167</b>



**APRIL-2018**

Date	Work performed	Manpower available		
		Mate	Key Man	TM
01.04.2018	Rail Carrying Work .. KM No.-1225/8-9	01	00	08
02.04.2018	Rest	00	01	00
03.04.2018	Deweeding work	01	00	03
04.04.2018	Gate maintenance work .. KM No.-1225/8-9	00	01	06
05.04.2018	Gate maintenance work .. KM No.-1225/8-9	00	01	06
06.04.2018	Rail pulling work .. KM No.-1212/7 ½ -4	01	04	04
07.04.2018	Maintenance of Crossover .. KM No.-1218/4-5	01	01	04
08.04.2018	LC Gate Overhauling work	01	01	04
09.04.2018	LC Gate approach Road repairing work	01	01	05
10.04.2018	Ballast Carrying work .. KM No.-1227/2-1226/6	01	00	02
11.04.2018	Maintenance of Guard Rail	01	01	07
12.04.2018	Rest	00	01	00
13.04.2018	SEJ check rail fitting work .. KM No.-1212/1-1212/5	01	01	07
14.04.2018	Earth work near LC Gate .. KM No.-1216/8-9	01	01	06
15.04.2018	Stocking of Ballasts .. KM No.-1218/0-1	01	00	08
16.04.2018	Rest	00	01	00
17.04.2018	Maintenance of Guard Rail at Bridge .. KM No.-1219/4 ½ -5 ½	00	01	04
18.04.2018	Maintenance work of Bridge .. KM No.-1219/4-5	01	01	05
19.04.2018	Earth work near LC Gate .. KM No.-1219/4 ½ -2	00	01	03
20.04.2018	Packing work near Axle Counter	00	01	04
21.04.2018	Packing work	00	01	07
22.04.2018	Packing work	00	01	05
23.04.2018	Rest	00	01	00
24.04.2018	Ballast filling work .. KM No.-1218/3-4	01	00	06
25.04.2018	Fixing of Cross Bond .. KM No.-1214/48-9	01	01	06
26.04.2018	Welding work .. KM No.-1217/1-9	01	01	08
27.04.2018	Ballast filling work .. KM No.-1218/4-4 ½	01	01	08
28.04.2018	Loading/Unloading of Store Materials	01	01	08
29.04.2018	Ballast filling work .. KM No.-1218/6-6 ½	01	01	04
30.04.2018	Rest	00	01	02
<b>Total</b>				<b>140</b>

**MAY-2018**

<b>Date</b>	<b>Work performed</b>	<b>Manpower available</b>		
		<b>Mate</b>	<b>Key Man</b>	<b>TM</b>
01.05.2018	Ballast filling work .. KM No.-1218/6-5 ½	01	00	05
02.05.2018	Ballast filling work .. KM No.-1218/4 ½ -5 ½	01	01	05
03.05.2018	Rail carrying Work .. KM No.-1215/4 -5	00	01	06
04.05.2018	Rail carrying Work near Gwarighat Stn.	00	01	06
05.05.2018	Miscellaneous work near Gwarighat Workshop	00	01	08
06.05.2018	Rest	00	00	04
07.05.2018	Rail welding Work near Siding	00	01	06
08.05.2018	Dressing work .. KM No.-1218/5 ½ -6	00	01	06
09.05.2018	Fixing of Bolts in Guard Rail .. KM No.-1219/4 ½ -5 ½	00	01	06
10.05.2018	Miscellaneous work in Office Workshop	00	01	06
11.05.2018	Dressing work .. KM No.-1223/1-2	00	01	06
12.05.2018	Maintenance work on Bridge .. KM No.-1219/4-5 1/2	00	01	07
13.05.2018	Rest	00	01	03
14.05.2018	Greasing of Curved Rail near KM No. 1214/1T	00	00	05
15.05.2018	Point Crossing Maintenance work	00	01	07
16.05.2018	Nose Rail Maintenance work on Bridge .. KM No.-1214/8-9	00	01	05
17.05.2018	Rail Cutting work near 1218/06	00	01	06
18.05.2018	Stocking of Rails .. KM No.-1226/4-5	00	01	04
19.05.2018	Ballast Filling work .. KM No.-1218/6-2	01	00	07
20.05.2018	Ballast Filling work .. KM No.-1218/6-6 ½	01	01	06
21.05.2018	Rest	00	01	03
22.05.2018	Crossing Maintenance work at Pt. 31A .. KM No.-1211/3-4	01	00	06
23.05.2018	Segregation of Store Materials at Gwarighat	01	01	05
24.05.2018	Stocking of Rails .. KM No.-1227/4-3	01	01	07
25.05.2018	Ballast Filling work .. KM No.-1218/6 ½-7	01	01	07
26.05.2018	Ballast Filling work .. KM No.-1218/7-7 ½	01	01	06
27.05.2018	Rest	00	01	03
28.05.2018	Miscellaneous work in Office Premises at Gwarighat	01	00	06
29.05.2018	Jungle cutting Drive between 1227/3-1226/4	01	01	04
30.05.2018	Loading of Sanders in N-BOX.. KM No.-1227/5-6	01	01	04
31.05.2018	Loading of Sanders in N-BOX .. KM No.-1218/5-6	01	01	04
<b>Total</b>				<b>169</b>

**JUNE-2018**

Date	Work performed	Manpower available		
		Mate	Key Man	TM
01.06.2018	Loading work of Sander in N-Box .. KM No.-1227/5-6	01	01	04
02.06.2018	Loading work of Sander in N-Box .. KM No.-1227/5-6	01	01	04
03.06.2018	Rest	00	01	04
04.06.2018	Loading work of Sander in N-Box .. KM No.-1227/5-6	01	00	04
05.06.2018	Attended Monsoon Seminar at Shikara	01	00	04
06.06.2018	Loading work of Sander in N-Box .. KM No.-1227/5-6	01	01	03
07.06.2018	Ballast Cleaning work .. KM No.-1216/5-1213/3	01	01	06
08.06.2018	Ballast Cleaning work .. KM No.1213/5-6	01	01	07
09.06.2018	Earth work .. KM No.1217/4 ½ -1218/7 ½	01	01	07
10.06.2018	Ballast Cleaning & Earth work .. KM No.1213/5-6	01	01	04
11.06.2018	Rest	00	01	01
12.06.2018	Rail Carrying work	01	00	04
13.06.2018	Material transportation work	01	00	04
14.06.2018	Material transportation work near Rampur Gate	01	01	04
15.06.2018	Gutka fixing work	01	00	07
16.06.2018	Ballast Cleaning & Earth work .. KM No.1213/9 ½ -10	01	01	06
17.06.2018	Ballast Cleaning & Earth work .. KM No.1213/9 ½ -10	01	01	06
18.06.2018	Rest	00	01	01
19.06.2018	Deweeding work .. KM No.1215/5-7	01	01	06
20.06.2018	Deweeding work .. KM No.1215/5-7	00	01	05
21.06.2018	Rail carrying work near Garah	00	01	03
22.06.2018	Deweeding work .. KM No.1214/7 ½ -7	00	01	05
23.06.2018	Miscellaneous work in Workshop	00	01	03
24.06.2018	Deweeding work .. KM No.1217/8-9	00	01	04
25.06.2018	Rest	00	01	00
26.06.2018	Deweeding work .. KM No.1214/7-6 ½	01	00	05
27.06.2018	Levelling & alignment work	01	00	05
28.06.2018	Slack Packing work .. KM No.1218/8 ½ -9	01	01	05
29.06.2018	Engg. Board Fixing Work .. KM No.1216/2-3	01	01	05
30.06.2018	Guage levelling work .. KM No.1214/2-4	01	01	06
<b>Total</b>				<b>132</b>

**JULY-2018**

<b>Date</b>	<b>Work performed</b>	<b>Manpower available</b>		
		<b>Mate</b>	<b>Key Man</b>	<b>TM</b>
01.07.2018	Rest	00	00	02
02.07.2018	Welding work .. KM No.1218/8-9	01	00	05
03.07.2018	Deweeding work .. KM No.1214/9 ½ -1215/ ½	01	00	07
04.07.2018	Slack Packing	01	01	02
05.07.2018	Slack Packing	01	01	08
06.07.2018	SEJ Packing	01	01	08
07.07.2018	SEJ Packing	01	01	07
08.07.2018	SEJ Packing	01	01	07
09.07.2018	Rest	00	01	05
10.07.2018	SEJ Packing work	01	00	07
11.07.2018	Track Packing work	01	01	09
12.07.2018	SEJ packing work	01	01	07
13.07.2018	Track packing work	01	01	06
14.07.2018	Slack Packing	01	01	08
15.07.2018	Track Pacing work	01	01	05
16.07.2018	Ballas Filling Work	01	01	05
17.07.2018	Ballast f filling work	01	01	00
18.07.2018	Rest	00	01	01
19.07.2018	Packing work	01	01	09
20.07.2018	Packing work	01	01	08
21.07.2018	Deweeding Work	01	01	05
22.07.2018	Ballast filling work	01	01	07
23.07.2018	Deweeding work	01	01	06
24.07.2018	Miscellaneous work	01	01	07
25.07.2018	Levelling & alignment work	01	01	06
26.07.2018	Rest	00	01	00
27.07.2018	Rail carrying work	01	01	08
28.07.2018	Levelling & alignment work	01	01	06
29.07.2018	Deweeding work	01	01	05
30.07.2018	Track Packing work	01	01	05
31.07.2018	Deweeding Work	01	01	06
				<b>177</b>

<b>AUGUST-2018</b>				
<b>Date</b>	<b>Work performed</b>	<b>Manpower available</b>		
		<b>Mate</b>	<b>Key Man</b>	<b>TM</b>
01.08.2018	Packing work	01	01	05
02.08.2018	SEJ Packing work	01	01	04
03.08.2018	Deweeding work	01	01	04
04.08.2018	Slack Packing work	01	01	04
05.08.2018	Slack packing work	01	01	05
06.08.2018	Rest	00	01	00
07.08.2018	Jungle Cutting work	01	01	04
08.08.2018	Slack Packing work	01	01	05
09.08.2018	Packing work	01	01	05
10.08.2018	Deweeding work	01	01	03
11.08.2018	Deweeding work	01	01	04
12.08.2018	Jungle Cutting work	01	01	04
13.08.2018	Rest	00	01	00
14.08.2018	Packing work	01	01	05
15.08.2018	Jungle cutting work	01	01	04
16.08.2018	Deweeding work	01	01	05
17.08.2018	Rust cleaning & Greasing work	01	01	05
18.08.2018	Rust cleaning & Greasing work	01	01	03
19.08.2018	Rust cleaning & Greasing work	01	01	05
20.08.2018	Rest	00	01	00
21.08.2018	SEJ Packing work	01	00	03
22.08.2018	Holiday	00	01	00
23.08.2018	Packing work	00	01	05
24.08.2018	Packing work	00	01	04
25.08.2018	Packing work	00	01	05
26.08.2018	Packing work	00	01	05
27.08.2018	Rest	00	01	00
28.08.2018	Deweeding work	01	00	02
29.08.2018	Rust cleaning & Greasing work	01	00	02
30.08.2018	Packing work	01	01	02
31.08.2018	Packing work	01	01	02
<b>Total</b>				<b>104</b>



SEPTEMBER-2018				
Date	Work performed	Manpower available		
		Mate	Key Man	TM
01.09.2018	Ballast Filling work .. KM No.-1218/6 ½ -7	01	01	04
02.09.2018	Ballast Filling work .. KM No.-1218/7-7 ½	01	01	03
03.09.2018	Rest	00	01	00
04.09.2018	Greasing work .. KM No.-1218/7-7 ½	01	00	04
05.09.2018	Slack Packing .. KM No.-1217/0-1/2	01	01	04
06.09.2018	Slack Packing .. KM No.-1217/1/2 -1	01	01	03
07.09.2018	Dressing Work .. KM No.-1218/7 ½-8	01	01	05
08.09.2018	Slack Packing .. KM No.-1219/0-1/5	01	01	05
09.09.2018	Dressing Work .. KM No.-1218/8-8 ½	01	01	03
10.09.2018	Rest	00	01	00
11.09.2018	Packing Work .. KM No.-1226/4-4 ½	01	00	05
12.09.2018	Packing & Greasing Work	01	01	05
13.09.2018	Removal of Boards & Plantation work	01	01	05
14.09.2018	Slack Packing work	01	00	02
15.09.2018	Carrying of Tongue Rail	01	00	04
16.09.2018	Greasing work	01	00	02
17.09.2018	Rest	00	01	00
18.09.2018	Plantation work .. KM No.-1211/8-1212/1	01	00	06
19.09.2018	Dressing work & Ballast filling work	01	01	06
20.09.2018	Slack Packing work .. KM No.-.. 1216/2-2 ½	01	01	06
21.09.2018	Dressing & Ballast Filling work .. 1218/9 ½-10	00	01	06
22.09.2018	Dressing & Ballast Filling work.. 1219/0-1/2	00	01	06
23.09.2018	Dressing & Ballast Filling work .. 1219/1/2 -1	00	01	06
24.09.2018	Rest	00	01	00
25.09.2018	Dressing & Ballast Filling work .. 1219/1-1/2	00	01	06
26.09.2018	Dressing & Ballast Filling work .. 1219/2 ½ -3	00	01	06
27.09.2018	Dressing & Ballast Filling work .. 1217/1-2	00	01	04
28.09.2018	Painting work .. 1222/6-6 1/2	01	01	04
29.09.2018	Packing work .. 1222/6-6 1/2	00	01	00
30.09.2018	Packing work .. 1222/6 ½-7	00	01	01
Total				111

<b>OCTOBER-2018</b>				
<b>Date</b>	<b>Work performed</b>	<b>Manpower available</b>		
		<b>Mate</b>	<b>Key Man</b>	<b>TM</b>
01.10.2018	Rest	00	01	00
02.10.2018	Holiday	00	01	00
03.10.2018	Maintenance of Fish Plate .. 1214/9-1216/5	01	00	05
04.10.2018	Painting work .. 1212/3-7	01	00	03
05.10.2018	Painting work .. 1212/3-9	01	01	05
06.10.2018	Painting work .. 1212/7-9	01	01	05
07.10.2018	Painting work .. 1214/7-9	01	01	04
08.10.2018	Rest	01	00	00
09.10.2018	Miscellaneous maintenance work .. 1213/1-1219/0	01	00	04
10.10.2018	Plate Greasing work .. 1215/5-1217/3	01	01	04
11.10.2018	Plate Greasing work .. 1217/3-1219/4	01	01	04
12.10.2018	Plate Greasing work .. 1217/4-1218/3	01	01	04
13.10.2018	Plate Greasing work .. 1213/1-1217/5	01	01	04
14.10.2018	Plate Greasing work .. 1217/5-1219/5	01	01	05
15.10.2018	Rest	00	01	00
16.10.2018	Pedrol Greasing work .. 1217/5-1219/5	01	00	04
17.10.2018	Packing work .. 1230/5	01	00	04
18.10.2018	Height Gauge maintenance work	01	00	03
19.10.2018	Loading of Ballast .. 1218/0-1	01	01	06
20.10.2018	Packing work .. 1230/8-8 ½	00	01	04
21.10.2018	Packing work .. 1230/7 ½ -8	01	01	06
22.10.2018	Rest	00	01	00
23.10.2018	Packing work .. 1220/6-6½	01	00	05
24.10.2018	Packing work .. 1220/6½-7	01	01	03
25.10.2018	Packing work .. 1222/0-1/2	01	01	05
26.10.2018	Packing work .. 1220/1/2--1	01	01	03
27.10.2018	Greasing on Curve Area .. 1218/2-1217/5	01	01	04
28.10.2018	Checking & Inspection work	01	00	03
29.10.2018	Maintenance of Pandrol Clip work	01	00	04
30.10.2018	Rest	01	00	04
31.10.2018	Maintenance of Pandrol Clip work	01	01	04
<b>Total</b>				<b>109</b>

<b>NOVEMBER-2018</b>				
<b>Date</b>	<b>Work performed</b>	<b>Manpower available</b>		
		<b>Mate</b>	<b>Key Man</b>	<b>TM</b>
01.11.2018	Ballast segregation work .. 1218/4-5	01	01	03
02.11.2018	Ballast segregation work .. 1218/4-5	01	01	05
03.11.2018	Greasing of Pendrol Clips	01	01	04
04.11.2018	Greasing of Pendrol Clips	01	01	03
05.11.2018	Welding work & Patrolling	00	01	04
06.11.2018	Welding work & Patrolling	00	01	03
07.11.2018	Holiday	00	01	00
08.11.2018	Greasing Work	00	01	04
09.11.2018	Greasing Work	00	01	04
10.11.2018	Greasing Work	01	01	04
11.11.2018	Greasing Work	01	01	04
12.11.2018	Rest	01	01	00
13.11.2018	Greasing of Curved Rails	01	00	04
14.11.2018	Greasing of Curved Rails	01	01	03
15.11.2018	Greasing of Curved Rails	01	01	05
16.11.2018	Ballast filling work	01	01	04
17.11.2018	Marking of Rail Lines	01	01	04
18.11.2018	Greasing work	00	01	03
19.11.2018	Rest	00	01	00
20.11.2018	Deweeding work	01	00	03
21.11.2018	Miscellaneous work in P. way Office	01	01	04
22.11.2018	Greasing work in curved Rail	00	01	03
23.11.2018	Dressing Work	01	01	04
24.11.2018	Dressing Work .. 1218/5-5 1/2	01	01	04
25.11.2018	Dressing Work .. 1218/5 ½-6	01	00	04
26.11.2018	Rest	01	01	02
27.11.2018	Pendrol Greasing work	01	01	04
28.11.2018	Dressing work .. 1215/6 ½-7	01	01	05
29.11.2018	Dressing Work .. 1215/5-4	01	01	04
30.11.2018	Dressing work .. 1215/4-5	01	01	04
31.11.2018	Dressing Work .. 121/4-3	01	01	04
<b>Total</b>				<b>106</b>

**2.12    Position of LC Gate under SSE/P. Way/Gwarighat unit/NGP Div.:**

<b>S#</b>	<b>L C Gate No.</b>	<b>KM</b>	<b>Classification</b>	<b>No. of Shift</b>
1	GJ 134	1193/9-1194/0	Class-C	02 Shift (12 Hrs.)
2	GJ 149	1216/8-9	Class-C	02 Shift (12 Hrs.)

**2.13    Position of Trolley under SSE/P. Way/Gwarighat unit/NGP Div.:**

<b>Nominated</b>	<b>No. of Trolley</b>	<b>Status</b>	<b>No. of T/man deployed</b>	<b>Avg. frequency of trolley movement in a month</b>
In-charge	01	Working	05	15
Sectional SSE	02	Working	10	20

## **CHAPTER-III**

### **3.0 CRITICAL ANALYSIS & RECOMMENDATIONS :-**

- 3.1** Railway Board has suggested to conduct work study of P. Way staff after introduction of small and other track machines. The actual staff strength of of SSE (P. Way) unit/Gwarighat in Nagpur Division is **178** against the sanctioned strength of **250** with vacancies of **72** as on 01.01.2019. The requirement of staff has been assessed based on the present workload (Daily work progress of last one year of one sample gang), in view of mechanization of track, utilization of Track Machines for track maintenance, provision of outsourcing of some activities of P. Way, direct observations and discussion held with SSE/JE/Mate(P. Way). As major works of P. Way are being carried out through contract and repair works like slack attention to bad spots, lubrication of rails, casual renewal of Rail/Sleeper, rail/weld failure, other duty/with Artisan/Site protection/USFD work/Track Machine, patrolling duty, LC Gate Duty, deweeding of track, attending accident relief/run over cases etc. are attended by P. Way staff. Thus, the workload of SSE(P. Way) units has reduced and as such the present review of workload has been undertaken. **It is observed that for the last three years the average actual staff strength of this P-Way unit is 180 and work is being managed.**

As per existing practice, Track maintenance activities in the field are maintained through either departmental resources or through contracts or a combination thereof, depending upon the situation. Activities which are intensive in nature and require more man days like; sleeper renewal, shallow screening, welding, loading/unloading, pre tamping, post tamping, LC overhauling, etc. are mostly executed through contracts/outsourcing. Activities like; slack packing, casual renewal, ballast dressing, jungle cleaning, drain cleaning, rail lubrication, bridge attention, patrolling, store watchman etc. are being maintained by Trackman. **A huge amount is expended every year for outsourcing activities of P-Way works, hence the number of staff should be reduced from the sanctioned strength accordingly.**

Moreover, while going through the daily work progress of sample Gang/DTMs, it is observed that, average 20 % of available man days are being utilized for De-weeding of Track, side drain cleaning, Filth removal, painting of board/rail, tree cutting for visibility which can be outsourced up to 80% to achieve better progress and economy.

In view of above facts, the assessment of need based requirement of staff for SSE(P. Way) unit/Gwarighat has been assessed.

### **3.2 Benchmarking norms:**

As per Railway Board's instructions, the manpower is to be bring down at the level of IRABM. The current IR Average Benchmark of Engineering (P-Way) Department as per Benchmarking report, Sep'2018 issued by Railway Board is 1.30 Men per ETKM (Divisions more than 2250 ETKM) whereas Benchmarking of P. Way of Nagpur Division is 1.49 Men per ETKM. The current IR Average Benchmark of Gatemen as per Benchmarking report, Sep'2018 issued by Railway Board is 2.30 Men per Gate whereas Benchmarking of Gateman of Nagpur Division is 2.72 Men per Gate. Thus, Benchmarking of P-Way of Nagpur Division is above the current IR Average.

In order to achieve the MPR of P-Way Branch of Nagpur Division at par with the IR Average Benchmarking, the work study team has assessed the requirement of P. Way staff based on direct observations, present workload, outsourcing activities and utilization of Track Machines.

### **3.3 Assessment of requirement of staff for SSE(P. Way) Unit/Gwarighat as per existing work load (Based on Daily Work Progress) :-**

The daily work progress of **01 sample Gang (Gang No. 03/GRG)** of SSE(P. Way) unit/GRG of last one year (December'17- November'18) as provided by SSE is critically analyzed for assessment of requirement of Trackman and are summarized as under:

**Table: A- Summary of Daily work progress of Gang No. 03 for last one year (01.12.17 to 30.11.18)**

	Year' 2017	Year' 2018 (Avg. Man days)											Total Man days
Gang No.	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	
03	179	161	138	167	140	169	132	177	104	111	109	106	<b>1693</b>

### Critical Analysis:-

During field observation it is revealed that-

- Out of 13 on roll Track Maintainer of 1 sample Gang, average 06-07 TM are available for track maintenance work per gang per day, 02 staff are not involved in gang activities and working outside the gang. It indicates that, after mechanization of track and provision of P. Way zonal contract, the role of Trackman has been reduced to certain extent
- Average Trackman on leave/sick/absent per day per Gang is 2.

### Sectional Gang :

As per existing work load of above 01 sample Gang, Avg. No. of Trackman utilized for track maintenance per year per Gang = 1693 man days

Number of working days per annum for P. Way Gang is 294 has been taken vide Rly. Board L. No. 95/CE-I/GNS/2 Vol.II-Pt.II, dated 06.03.2006.

Avg. No. of Trackman required per Gang per day for Track maintenance =  $1693 \text{ mandays} \div 294 \text{ wkg. days} = 5.76$ , Say **06** (excluding Mate/Keyman).

Avg. No. of Track Maintainer utilised for Mate/Keyman duty per Gang =  $01+01 = \mathbf{02}$ .

Beside the above Track maintenance activities, an average of **02** Trackman per day from per Gang are being utilized for patrolling duty, assisting Artisan staff/welding team etc.

Hence, Total Trackman utilised per day per Gang is  $06 + 02+02 = \mathbf{10}$ .

Net requirement of Track Maintainer per Gang (excluding Store gang) comes to  $10 + \text{LR @ } 12.5\% = 10 + 01 = \mathbf{11}$ .

The above calculation has been done as per actual work volume of Gang (Daily Work progress).

The total no. of Gangs working under SSE/P-Way/Gwarighat unit = 13.

(As per cadre position of SSE/PW/GRG, there are 16 Gangs but 13 Gangs are working under SSE/PW/GRG and 03 Gangs working under SSE/PW/NIR.)

After applying the same principle as a whole, the total requirement of Track Maintainer for 13 Gangs will be  $11 \times 13 = \mathbf{143}$ .

### Store/MP Gang:

At present 02 TM are deployed in unit store for material stacking/handling and 02 TM utilised in the office work & assist SSE/OS. The requirement of Trackman for Store/MP Gang (as per discussion held with SSEs) for dealing store/office related activities will be  $04 + 01 \text{ RG/LR} = \mathbf{05}$ .

### Engineering LC Gate (Gatekeeper):

Presently Trackman required for Engg. LC Gate Duty are utilised from Gang of SSE (P. Way)



units.

The requirement of Gatekeeper (Trackman) for each L/C Gate in continuous roster (03 shift) is  $03 + 01RG/LR = 04$ .

The requirement of Trackman for each L/C Gate in E.I. roster (02 shift) is  $02 + 01RG/LR = 03$ .

The total no. of Engg. Manned LC Gates under SSE/P-Way/GRG unit is 02 having two shift.

The net requirement of Trackman (Gatekeeper) for LC Gate =  $2 \times 3 = 06$ .

**Trolleyman:**

Requirement of Trackman for Trolleyman duty for this P-Way unit will be  $03 \times 04 = 12 + 02 LR = 14$ . (Normally, each P. Way Unit has 03 Trolleys and per trolley 04 Trolleyman required)

Thus, present deployment of 14 Trackman for Trolleyman duty is justified.

However, it is observed that average movement of a trolley in a month is 15-20 days. If the movement is planned nicely by duly coordinating with each other supervisor, it may be effectively carried out by two trolley gang. The remaining working days of Trolleyman may be utilized for other activities.

**Total Requirement of Track Maintainer:**

On being summarized of above calculation, the total requirement of Track Maintainer for Gang, Store Gang, LC Gate, Trolleyman duty for SSE (P. Way)/Itwari Unit will be  $143 + 05 + 06 + 14 = 168$ .

**The sanctioned cadre of Track Maintainer category in SSE (P. Way)/GRG unit is 232.**

**Hence, the total reduction in sanctioned cadre of Track Maintainer will be  $232 - 168 = 64$ .**

**Hence, it is recommended that 64 identified surplus vacant posts of Track Maintainer should be surrendered from Engineering Department of Nagpur Division.**

**Supervisor Category:** At present 06 Supervisors (04 SSE & 02 JE) are deployed which is not justified. Considering the existing work load of Supervisors, work study team proposed 01 SSE required for overall in-charge of office, periodical inspection, preparation of proposals/estimates, 02 SSE as sectional PWI for supervision of track maintenance work, periodical inspection of track, Gate & contractual works in their respective jurisdiction, 01 JE for supervising Mobile Maintenance Gang and 01 SSE as PWI (Spl.) for LR/ special works, supervision of casual work respectively. Thus, 05 Supervisors are justified.

**Ministerial staff:** At present 02 Ministerial staff (OS) are utilised for dealing establishment matters of staff like preparation of Muster Roll/TA bill, issue of pass/PTO, D&A cases, RTI cases, correspondence work and all works related with Stores like maintenance of DMTR/Ledger, preparation of requisition, collection/supply of material, disposal of scrap material which is found justified.

**Artisan staff (Carpenter/EBS/Painter/Hammerman/Welder):** At present 05 Artisan staff are utilised for smithy work, welding work, maintenance work as per requirement. A lot of track maintenance work are done on contractual basis. Work study team suggests multiskilling for Artisan staff by imparting necessary training so that they can be utilised as Multi-tasking staff for various activities as per requirement.

**Helper:** San-03, On Roll-00

At present 02-03 TM are utilised for loading/unloading of material in truck. Truck is utilised on contract basis. It is found that 03 post of Helper are lying vacant since long time. Hence, 03 vacant post of Helper are found surplus and should be surrendered.

**Chowkidar:** San-03 On Roll-01

At present 02 Trackman from Gang No.-3 are utilised for chowkidar work at SSE/PW/GRG store and 01 Chowkidar & 01 TM from Gang No.-10 utilised for caretaker duty at Shikara Rest

House. The requirement of Chowkidar for SSE(P-Way) office/Store will be 02 (01 in 12 hrs. shift x2) +01 RG/LR=03. The requirement of Chowkidar for Shikara Rest House will be 02 (01 in 12 hrs. shift x2) +01 RG/LR=03. The RG/LR Chowkidar may be arranged from Store/MP Gang since there is only 02 sanctioned post of Chowkidar for this P-Way unit.

**Thus, the requirement of staff (Supervisor/Ministerial staff/Track Maintainer/ Artisan staff/Helper/Chowkidar) for SSE (P-Way)/GRG unit comes to 185 against sanctioned of 250. Hence, 65 vacant posts of Track Maintainer/Helper are found surplus and should be surrendered.**

**Summary of Assessment based on existing workload:**

Activity	Staff required	Remarks
Supervisor (SSE/JE)	04	01 SSE as Overall In-charge, 02 SSE as sectional supervisor, 01 as SSE/PW/SPL & 01 JE for MMG.
Sectional Gang	143	Total Mandays engaged in 01 Gang as per Daily work progress= 1693 (approx) Requirement of TM per Gang =1693/294 = 5.75=06 Total requirement of Mate/Keyman & TM per Gang =06+02+02+01 LR =11 No. of Gangs=13
Artisan	05	For welding, smithy. painting work etc.
Store/MP Gang	05	
Gatekeeper	06	No. of Engg. Gate=02 (EI Roster) 02x02=04+02RG/LR=06
Trolleyman	14	No. of Trolley=03 03x04=12 +02 LR =14
Chowkidar for SSE/PW/GRG unit & Shikara Rest House	06	01x02+01 RG/LR=03+03=06
Office/Establishment & Store work	02	01 Ministerial staff for dealing with establishment work & 01 staff for store work.
<b>Total</b>	<b>185</b>	

**Sanctioned cadre of SSE/P. Way unit /Gwarighat = 250.**

**Staff requirement = 185**

**Identified Surplus Post = 250 – 185 = 65 (vacant)**

**3.3 Application of Benchmarking norms:-**

Railway Board vide letter no. 2011/E&R/2800/Rly./Imp. VolVI(corr.) dated 09.06.2016 has directed Zonal Railways to bring down Manpower Productivity Ratios (MPR) for activities which are above the IR average level to the current IR average level.

Benchmarking is a very useful tool to manage efficient deployment of staff and to monitor effects of improvement in working practices, use of new technologies and level of outsourcing. Benchmarking offers us a solution for reduction and redistribution of staff and it is a very handy tool for rightsizing the staff strength on Indian Railways. It 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 setting out to improve the efficiency of those units, which were left behind. If this concept is implemented it will definitely bring a large reduction in the cost hence making a significant contribution in improving the efficiency of various units of the Railways.

After introduction of Track machines, many of the manual activities have been reduced considerably.

As per latest Benchmarking of Manpower Productivity Ratios Report of Sep.-2018 issued by the Director (E&R) / Railway Board:-

**Current Benchmark:- Ratlam Division (RTM) of WR at 0.77 Men per ETKM.**

**Current IR Average Benchmark :- 1.30 Men per ETKM.**

**Benchmark of P. Way of Nagpur Div.: 1.49 Men per ETKM**

**As per ETKM/ITKM statement collected from Sr. DEN/NGP Office, ETKM of SSE/P. Way/HBG unit is 118.03 (jurisdiction from KM 1132/12-1229/4). But during course of work study, it is revealed that the jurisdiction of SSE/P.Way/GRG is changed. The new jurisdiction is KM 1152/6-1232/2 (i.e 80 Km). Thus, jurisdiction of SSE/P-Way/GRG has reduced, staff should be reduced accordingly. However, work study team has taken old ETKM for calculation of staff required for this unit as new ETKM as per new jurisdiction is not available.**

**As per Guidelines for calculation of MPR for P. Way activity, the total requirement of staff for SSE/P-Way unit/Gwarighat in NGP Div. on applying the latest Benchmark is worked out as under:**

**Requirement of P. Way Staff =**

**Current IR Average Benchmark X ETKM of P. Way unit =  $1.30 \times 118.03 = 153.44 = 154$  staff. (excluding Gateman)**

**Requirement of Gateman = IR Avg. Benchmark x No. of Engg. Gates =  $2.30 \times 02 = 4.6 = 05$  staff**

**As per IRABM as mentioned above, 159 staff are required for dealing with the present workload of P-Way unit/Gwarighat in Nagpur Division. However, keeping a lenient view, the Work Study team opine that 20 more Track Maintainer (12.5% @ LR) are proposed in view of Gauge conversion of NG into BG and future workload.**

**Sanctioned cadre of SSE/P. Way unit /Gwarighat = 250.**

**Actual staff = 178**

**Staff requirement = 179**

**Identified Surplus Post =  $250 - 179 = 71$ .**

**Hence, 71 vacant posts of Track Maintainer/Helper are found surplus and should be surrendered from Engineering Department of Nagpur Division.**

### **3.4 Application of Konkan Railway's System of Track Maintenance:-**

The SSE/P-Way/Gwarighat unit comes under Single Line BG section (JBP-NIR). Earlier, it was NG line section. The length of this P. Way unit is 80 KM from Kachhpura to Ghansor station. The average number of trains run per day in this section is 08-10. The annual traffic density of this section is less than 01 GMT. During course of work study, it is known that Konkan Railway's system of track maintenance will be adopted for

SSE/P. Way/GRG & SSE/P-Way/NIR jurisdiction as traffic density on these sections is less. As per IRPWM Correction Slip No. 145 dated 23.07.2018, modified 3-tier system of track maintenance on the pattern of Konkan Railway may be adopted on single line sections with low traffic density (generally less than 10 GMT per annum) with the approval of PCE. This system is financially savings in manpower cost.

The requirement of staff for SSE/P. Way/Gwarighat unit as per Konkan Railway System of Track Maintenance is assessed as under:

<b>Activity</b>	<b>Staff required</b>	<b>Remarks</b>
Supervisor (SSE/JE)	04	01 SSE as Overall In-charge, 01 JE for MMG, 02 SSE as sectional supervisor for GRG & SKY.
Mobile Maintenance Gang (MMG)	12	Multi-skilled Men-08 Trackman-04 One MMG will cover 70-80 KM jurisdiction.
Sectional Gang-1(at GRG) (JE Gang for jurisdiction of 30- 40 Km))	23	03 Mate ( one Mate for 02 Gang Beat i.e. 15-20 Km) 06 Keyman (one Keyman/TSM for 6-7 Km), 14 Trackman
Sectional Gang-2 (at SKY) (JE Gang for jurisdiction of 30- 40 Km))	23	03 Mate ( one Mate for 02 Gang Beat i.e. 15-20 Km), 06 Keyman (one Keyman/TSM for 6-7 Km), 14 Trackman
Patrolling duty	38	No. of present Gangs =13
<b>Sub Total</b>	<b>100</b>	
RG @16.7%	17	
LR (@12.5%)	15	
Gatekeeper	06	No. of Engg. Gate=02 (EI Roster) 02x02=04+02RG/LR=06
Trolleyman	14	No. of Trolley=03 03x04=12 +02 LR =14
Chowkidar	06	01x02+01 RG/LR=03 for SSE/PW/GRG office/store 01x02+01 RG/LR=03 for Shikara Rest House
Office/Establishment & Store work	02 (Min. staff)+ 05 Trackman/Helper	For dealing with establishment & store related work and other miscellaneous work.
<b>Sub Total</b>	<b>65</b>	
TR (@2%)	03	
<b>Total</b>	<b>168</b>	

**As per KRCL system of track maintenance as mentioned above, 168 staff are required for dealing with the present workload of P-Way unit/Gwarighat in Nagpur Division.**

**Sanctioned cadre of SSE/P. Way unit /Gwarighat = 250.**

**Actual staff = 178**

**Staff requirement = 168**

**Identified Surplus Post = 250 – 168 = 82.**

**Hence, 82 posts (72 vac) of Track Maintainer/Helper are found surplus and should be surrendered from Engineering Department of Nagpur Division.**

**3.5 Summary of calculation of requirement of staff for SSE/P. Way/GWARIGHAT Unit under Nagpur Division (As per Para No. 3.2, 3.3 & 3.4) :**

Work study team has assessed requirement of staff for SSE/P. Way/Gwarighat unit by adopting three methods i.e. existing workload, Benchmarking norms & KRCL pattern. A positive attitude has been applied in evolving the requirement of staff vis-à-vis quantum of work in total and followed a feasible solution to the administration as well as to the employees.

However, it is suggested that either of three methods may be adopted for assessing the requirement of staff to carryout the work of P. Way unit/GRG as per feasibility.

The average actual staff strength for the last three years in this unit is 180. The entire workload of this P.Way unit are being managed with this staff strength. Therefore, Work study team has taken Benchmarking norms for calculation of staff required for P. Way/GRG unit.

Sanctioned strength = 250

On Roll strength = 178

Vacancy = 72

Staff requirement = 179

**Thus, Identified Surplus Post = 250 – 179 = 71.**(As per Benchmarking norms)

**3.6 Summary of Sanction, Present & Proposed staff strength of SSE/P-Way/Gwarighat unit in Nagpur Division :**

S#	Category	Sanction strength	Existing on Roll strength	Proposed Strength	No. of Surplus post to be surrendered
1.	SSE	03	04	03	00
2.	JE	02	02	02	00
3.	OS	02	02	02	00
4.	Jr. Clerk	00	00	00	00
5.	EBS	01	01	01	00
6.	Painter	01	01	01	00
7.	Welder	03	02	03	00
8.	ECR	00	01	00	00
9.	Track Maintainer	232	164	164	68
10.	Helper	03	00	00	03
11.	Chowkidar	03	01	03	00
<b>Total</b>		<b>250</b>	<b>178</b>	<b>179</b>	<b>71</b>

### **3.7 RECOMMENDATIONS & SUGGESTIONS:**

On the basis of above observations and critical analysis, the following recommendations and suggestions are made:

#### **RECOMMENDATION:**

- 3.7.1** Work Study team has adopted three methods for assessment of requirement of staff for SSE/P. Way/Gwarighat unit of Engineering department, Nagpur Division which are as under:

##### **First Method (In view of existing work load):**

Considering the existing work load and as per details given in Para 3.2, the requirement of staff for SSE/P. Way/Gwarighat unit comes to 185 against sanction of 250 staff. Thus, 65 vacant posts of Track Maintainer /Helper are found surplus.

##### **Second Method (As per Benchmarking norms ):**

Considering Benchmarking norms and as per details given in Para 3.3, the requirement of staff for SSE/P. Way/Gwarighat unit comes to 179 against sanction of 250. Thus, 71 vacant posts of Track Maintainer/Helper are found surplus.

##### **Third Method (As per Konkan Railway system of Track Maintenance):**

After implementation of Konkan Railway Pattern of track maintenance and as per details given in Para 3.4, the requirement of staff for SSE/P. Way/Gwarighat unit comes to 165 against sanction of 250. Thus, 82 posts (72 vacant) of Track Maintainer/Helper are found surplus.

**However, it is suggested that either of three methods as mentioned in the work study report may be adopted for assessment of requirement of staff as per feasibility.**

##### **Conclusion:**

Work study team has taken in Benchmarking norms for calculation of staff required for P. Way/GRG unit. Thus, **71 vacant posts** of Track Maintainer/Helper are found surplus from the existing sanctioned of 250 and same should be surrendered from Engineering Department (P. Way) of Nagpur Division.

- 3.7.2** The money value resulting after surrendering of vacant posts of Track Maintainer can be utilised for creation of posts required for Track Machine maintenance work as per need.
- 3.7.3** The balance vacant post of Track Maintainer category should be filled up for better monitoring of contractual and departmental civil engineering works.
- 3.7.4** Some activities of P- Way like deweeding of track & cleaning of drain, painting of Boards/Rails, overhauling of LC Gate and tree cutting for visibility can be outsourced upto 80% and rest 20% through departmental.

#### **SUGGESTIONS:**

- 3.7.5** Mobile Maintenance Gang may be set up to cater the emergency work as per need.
- 3.7.6** It is found that two staff are deployed at Shikara/Katanga Rest House as Caretaker which is a non-core activity. Hence, maintenance of Katanga Rest House may be carried out through contractual staff in order to savings in manpower cost.
- 3.7.7** To Minimize the absenteeism cases, all efforts such as motivation, interaction with the staff may be made.

## **CHAPTER-IV**

### **4.0 FINANCIAL EVALUATION & RESULTS:-**

#### **Savings due to surrender of 71 identified surplus posts of Track Maintainer :-**

<b>Design.</b>	<b>Level (7<sup>th</sup> CPC)</b>	<b>G.P. (6<sup>th</sup> CPC)</b>	<b>Pay Structure (7<sup>th</sup> CPC)</b>	<b>No. of Post to be surrend ered</b>	<b>Mean pay of the level</b>	<b>Approx. Cost per Month per staff (Mean Basic pay+ D.A. @ 9%)</b>	<b>Total cost per month (in Rs.)</b>	<b>Total cost per year (in Rs.)</b>
Track Maintainer- IV/Helper	Level- 1	1800	18000- 56900	71	37450	40820	2898220	34778640
<b>TOTAL</b>				<b>71</b>				

Thus, total recurring savings to the tune of Rs. 34778640 say **Rs.348 Lakhs** can be achieved due to surrender of **71** posts of Track Maintainer/Helper from Engineering Department of Nagpur Division and surrender Memorandum may be issued by Sr. DPO/NGP/SECR.

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