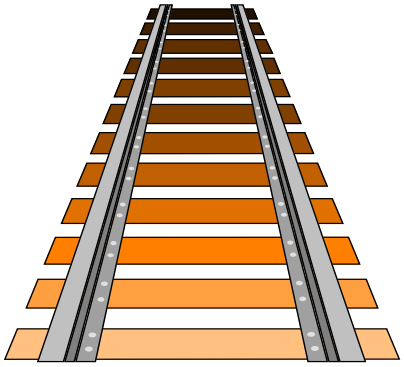


WORK STUDY TO REVIEW THE STAFF STRENGTH AT SSE/P.WAY/PTJ (E) SALEM DIVISION

SOUTHERN RAILWAY

PLANNING BRANCH

G.275/WSSR- 491920/2019-20

WORK STUDY TO REVIEW
THE STAFF STRENGTH
AT
SSE/P.WAY/PTJ (E)
SALEM DIVISION

STUDIED BY

WORK STUDY TEAM
OF
PLANNING BRANCH

FEBRUARY 2020

(i)

I N D E X

(i)

ACKNOWLEDGEMENT

The work study team sincerely acknowledges the valuable guidance and co-operation extended by ADRM/SA, Sr DEN (CO-ORD)/SA, ADEN/PTJ & SSE/P.WAY/PTJ (E) and staff in completing the study in time.

(ii)

AUTHORITY

Annual study programme approved by SDGM for the year 2019-20.

(iii)

TERMS OF REFERENCE

Work study to review the staff strength at SSE/P.Way/PTJ (E) Section of SA Division.

(iv)

METHODOLOGY

The work study team has applied the following techniques in conducting the work study.

(1) Collection and compilation of Data.

(2) Observation of present system of working.

(3) Interaction with ADEN/PTJ & SSE/P.Way/PTJ (E)

(4) Analyzing the data collected and assessed the manpower requirement based on the TRMS formula of MCNTM and on need basis.

SUMMARY OF RECOMMENDATIONS

Recommendations (REVISED):

1. Seventeen posts of T.M-IV, in GP Rs 1800 is found excess to the requirement and the same may be surrendered and credited to the vacancy bank.

(TOTAL 17 POSTS)

SUGGESTIONS

DREAM PROJECT OF INDIAN RAILWAYS ON GROWTH PATH

Indian Railways is the main contributory factor for the growth of Industries, employment opportunities and as a whole the Growth of the Nation. Indian Railways operates Goods and Passenger Trains and the transportation is to be there for many more years to come.

The train operation mainly depends on High quality well laid track, Rolling stock, Traction and Superior quality Computer based Signaling system etc. These above factors have to be well built and lasting for longer period without much preventive day-today maintenance activities. In order to have a system like this, it is necessary to do major changes in the above aspects.

How to make the system free from day-today preventive maintenance activities:

1. Rolling stock is the only factor causing damages to the other systems such as track, traction and signal. Therefore, Rolling stock has to be well built and maintained properly. If this is done, damage to the other factors will be very less.

2. Track has to be laid with Concrete runway so as to avoid frequent maintenance.

3. It is necessary to have high quality Rolling stock and Electrification so as to avoid day to-day maintenance activities.

4. The existing signaling system needs to be improved to avoid day to-day preventive checks and maintenance.

5. By achieving these milestones, the day to day maintenance cost on the above aspects will be saved in large scale. Apart from savings accidents, derailments and disruptions to train services will also be avoided.

CHAPTER - I

1.0 INTRODUCTION

SALEM DIVISION

1.1 The SSE/P.Way/PTJ (E) is a field unit of Civil Engineering department of Southern Railway to look after the maintenance of track and other auxiliary works.

1.2 Permanent Way is the major activity of the Engineering branch which is entrusted with the periodical maintenance of tracks, bridges, LC gates and other assets. A well maintained track is very essential for speedy, safety and efficient operation of trains. Continuous monitoring and Inspection is warranted daily in ensuring a reliable permanent way.

1.3 The modern technologies led the track maintenance techniques from the era of pick axe & shovel to the era of modern mechanized Track maintenance. The interconnection with S&T and TRD branches is a new development in the team work. The equipments for testing the track have become sophisticated not only in detecting the failures but also in preventive check. It will be worth mentioning the use of Ultrasonic Flaw Detector (USFD) equipment which detects even the minute air crack and blowholes in the rail which might develop into a rail crack leading to derailments.

1.4 The magnitude of outsource in maintenance activities paved way for a meticulous calculation to arrive at the manpower requirement in commensurate with the major developments taken place in the field of track maintenance.

1.5 The manpower requirements of SSE/PWI/PTJ (E) is arrived based on the TRMS formula of CMCNTM, approved by Railway Board vide letter No.95/CE-1/CWS/2/ Vol.II/ Pt.II dt. 06.03.2006 which recommends incorporating the effects of Modernization once in 5 years such as introduction of more number of shoulder ballast cleaners, improving rail-weld technology, better design of SEJs, maintenance free level crossing track structure.

1.6 Substantial investments on Track machines over the years to improve the quality of Track structure and curtailment in the need of its annual maintenance led to the reduction in the number of staff deployed on the track maintenance activities.

1.7 VARIOUS TYPES OF TRACK MACHINES:

UNIMAT - Used for tamping all plain track including points and crossings.

BCM - Used for deep screening of the ballast in the track.

CSM - Used for tamping all plain track excerpt points and crossing.

TRT - Used to replace the complete track with new rails and sleepers.

BRM - Used to regulate the ballast available n the track.

T-28 - Used to replace the existing points and crossing portion with new assembled points and crossings.

UTV - Used to pick up the released sleeper & rails lying side of the Track and unload the same for further disposal.

DGS - Used to consolidate the track.

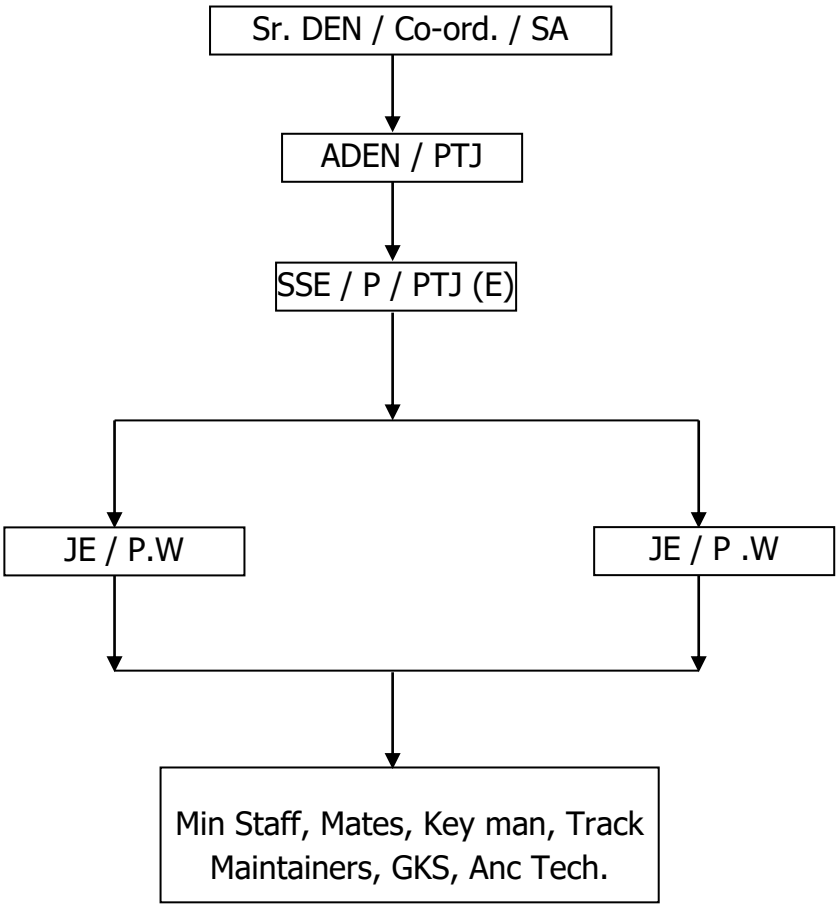
SBCM - Used to clean the ballast in the shoulder area.

CHAPTER – II

2.0 PRESENT SCENARIO

2.1 Organization:

The Engineering department of SA division is under the control of Sr.DEN/ Co-ord/ SA. The Permanent Way section of PTJ (E) which is managed by SSE/PWAY/PTJ (E) is under the direct & general control of ADEN/PTJ.



The duties of Supervisors and Technical staff in P. Way section are:

i. Duties of SSE/P.way [prescribed in para118 -135 of Part-B of IRPWM]

- Responsible for maintenance and inspection of track and safe condition for traffic.
- Execution of all works incidental to track maintenance including track relaying works.
- Accountal and periodical verification of stores and tools.

- Maintenance of land boundary between stations and at unimportant stations.
- Co-ordination with the works, Bridge, Signaling and Electrical staff.
- Accompanying on Inspection with higher officials.
- Testing of running qualities of track.
- Inspection of Gangs, Level Crossings, points and X-ings, curve inspection
- Foot plate inspection, Rear vehicle inspection, Foot inspection.
- Accompanying OMS/TRC (RDSO) Inspection.
- Check on patrolling
- Maintenance of station yards.
- Witnessing payment to staff
- Maintenance of Records
- Custodian of stores etc.
- Apart from above P.Way maintenance activities Staff Welfare viz. promotion, claiming of salary, supply of equipment and uniform, procurement of materials, issuing of materials scrap delivery (DS8)

ii. Duties of JE/P.way: [prescribed in para136 -145 of Part-B of IRPWM]

- Inspection and maintenance of track in a safe and satisfactory condition for traffic, including execution of all works, incidental to track maintenance.
- Execution of special works, such as a) Renewal, Directed Track maintenance curve re-alignment, deep screening etc.
- To assist the SSE/P.way.
- Co-ordination with Works, Bridge and staff of other departments.
- Inspection of Gangs, Level crossings, Points and crossings, Curves, foot plate inspection, rear vehicle inspection and foot inspection.

iii. P.Way Mistry /Track mate: [prescribed in para136-166 of Part- B of IRPWM]

- Knowledge of Rules and Signal
- Safety of the Track
- Equipments at site of work
- Muster and Gang Charts/Diary Books
- Observance of sleepers packing during passage of train.
- Precaution when view is obstructed
- Tidiness of section and Safe custody of tools
- Action when line is unsafe or in the event of accident
- Patrolling during abnormal Rainfall
- Commencing work affecting safety of train
- Weekly inspection of Gang length by mate.
- Preventing Tress pass and theft of P.way fittings
- Relief arrangements in emergencies
- Assistance to P&T staff
- Assistance in protection of train and Assistance in placing fog signals
- Responsibilities of the mate in LWR track

iv. **Duties of Key-man:** [prescribed in para167 -170 of Part-B of IRPWM]

- Key-man's daily inspection
- Equipment of key-man
- Rectifying the defects whichever possible by him.
- Reporting to Mate and PWI about the defects which require assistance for attending.
- In case of serious defects protection of Track & informing as per rules.
- Work at unmanned level crossings.
- Assisting mate after completing his routine inspection.
- Any materials found fallen safe custody and disposal.
- Apart from daily inspection, he should ensure tightness of fittings in Systematic manner.

Track Maintenance Methods:

The para 228 of IRPWM prescribes the system of maintenance for concrete sleeper track as given below. The following 3-tier system of track maintenance shall be adopted on sections nominated for mechanized maintenance.

They are -

1. On track machines (OMU)
2. Mobile Maintenance unit (MMU)
3. Sectional gangs

The mobile maintenance units shall comprise of two groups:-

MMU-1:- One for each PWI section

MMU-2:- One for each Sub-division

MMU-1 shall be a Rail cum road vehicle with a PWI in-charge with a jurisdiction of 40-50Km. double line and 90-100 Km for single line for various works including need based spot tamping and rail welding.

MMU-2 shall be a road vehicle based unit with each sub-division for reconditioning of turnout and minor repairs to the equipments of MMU.

Existing Maintenance Practices on IR

As on date, the practice of maintenance can be briefly summarized as follows;

(a) In sections where relaying with PSC sleepers has been done,
   i. Tamping with machines as and when machines are available, plus
   ii. Conventional system of maintenance

(b) In sections where relaying has not been done,
   Only conventional system of maintenance is being used.

Annual programmed regular track maintenance is as follow:

Sl. No.	Period	Work
1.	Post monsoon attention for about six months	Attention to run down stretches, one round of through packing
2.	Pre-monsoon attention for about two months	Clearing of drains
3.	Attention during monsoon for about four months.	Attention to track as required.

The role of open line organization of Engineering Department in IR mainly meant for maintenance/ strengthening/ modification of existing infrastructure i.e. track for permitting higher speeds and heavier Loads.

The manual maintenance of the track has given way to highly mechanized maintenance practices that has become inevitable for the following reasons.

- The high safety standards that can be achieved
- The capability for higher axle load, speed etc.,
- The overall economy in cost of maintenance
- The accuracy in testing, checking and inspections that can be achieved through mechanization.
- The necessity to avoid harsh physical work under inclement weather and isolated locations.
- The speed of maintenance
- The need to carry out the maintenance works within the constraints of time for line block etc.,

The provisions of "Small Track Machines Manual":-

The para1.3.2 says that the "Requirement of Manpower doesn't include Leave reserve". Further, the para1.3.3 stipulates that the Creation of posts for operation and maintenance of small track machines should be done by

surrender of equivalent money value of live revenue charged posts of Gang man /other category involved in the track maintenance. The component of unskilled staff being created should be barest minimum. The proportion of skilled personnel should form at least 75% of the total posts to be created.

2.2 **The brief outline of regular activities at P.Way /PTJ (E) is as under**

- Casual renewal of rails and distressing and welding of joints.
- Casual renewal of broken sleepers, SEJ sleepers, Points and Crossing sleepers, Bridge approach sleepers and LC sleepers.
- Pre-tamping and post tamping works for machine packing.
- Switch and stock rail renewal.
- Crossing renewal.
- LC opening and Examination, LC tar pointing and road repair works.
- Attention SEJ`s Bridge approaches, Points and crossing packing.
- Attention to Officer`s inspection notes.
- Attention to Joint inspection of points with S&T track notes.
- Oiling and greasing of fish plated joins.
- Weeding of track, boxing of ballast, and Anti-corrosive painting of rails.
- Attention to lifting barrier gates and installations.
- Attention to frequent trespass locations.
- Attention to cutting of trees likely to affect track.
- Attention to side drain clearing in cuttings.
- Attention to weld failure and rail failure.
- Security patrolling, Monsoon patrolling, patrolling of vulnerable location.
- Shallow screening of track.
- ERC greasing.
- Attention to TRC notes and OMS notes.

2.3 The actual staff strength of SSE/PWI/PTJ (E) is 156 including SSE, JEs, Artisans, Ministerial staff & Track men's as against the sanctioned strength of 192. The Sanction, Actual, Vacancy, Excess statement is placed as **Annexure I.** The entire section is maintained by 12 gangs and the distribution of staff is enclosed as **Annexure.**

Summary of Staff Strength (Actual):

Track Maintainers	139
Supervisors	4
OS/PB -1, OS/WB-1	1
Artisans	6
Tech-II&III STM	5
SWM	1
Total	156

2.4 **The stations coming under this Jurisdiction is detailed below** :

- IRUGUR
- SULUR
- VANJIPALAYAM
- PODHANUR
- TIRUPPUR (OUTER)
- SOMANUR

2.5 The present Sanction and actual staff of SSE/P.Way/PTJ (E) including supervisors ministerial staff & track men categories are as under:- (as per Division/Section)

Sl. No.	Designation	Sanction	Actual (Division)	Actual (Section)
1	Sr. Section Engineer	1	4	4
2	Junior Engineer	6	0	0
3	OS/works	1	0	0
4	Ch OS/WB	0	1	1
5	B T Checker-III	1	0	0

6	Blacksmith -I	1	0	0
7	Blacksmith-II	1	0	0
8	Blacksmith-III	0	2	2
9	Blacksmith Helper	1	0	0
10	Tech-I Painter	1	0	0
11	Painter –II	0	1	1
12	Tech-III- MT Driver Fitter	0	1	1
13	Welder-Sr Tech	1	0	0
14	Welder- III	0	1	1
15	Welder-Helper	1	0	0
16	Carpenter- Sr Tech	0	1	1
17	Carpenter-I	1	0	0
18	Tech-II- MT Driver Fitter	1	0	0
19	Track Maintainer- GR. I	12	8	7
20	Track Maintainer- GR. II	24	19	19
21	Track Maintainer- GR. III	44	21	21
22	Track Maintainer-GR.IV	95	85	89
23	STM-Tech-III	0	4	4
24	STM-Tech-II	0	1	1
25	SWM	0	1	1
26	Trainee Track Maintainer-IV	0	0	3
	Total	192	150	156

2.6 **Level crossing gates:**

There are 12 manned level crossing gates under the jurisdiction of SSE/P.WAY/PTJ (E), out of which 11 are Engineering LC gates, and 1 is traffic gate. There is no unmanned level crossing Gate.

Roster followed by Engineering LC's manned gates is here under :

Out of 11 engineering LC gates, 3 special class, 2 B class and 6 C class gates are there.

Number of Level Crossing Gates:

Sl.No	LC. No	Type of LC	Class of LC	TVU	Census
1	135	Engineering	SPECIAL	50688	Nov-18
2	136	Engineering	C	9207	Nov-18
3	137	Engineering	B2	31878	Nov-18
4	140	Engineering	C	59058	Dec-18
5	141	Engineering	SPECIAL	35343	Nov-18
6	142	Engineering	SPECIAL	88332	Dec-18
7	147	Engineering	C	4522	Jan-19
8	144	Engineering	C	4020	Mar-19
9	152	Engineering	C	9606	Mar-19
10	159	Engineering	B	26076	Mar-19
11	160	Engineering	C	5244	Mar-19
12	162	Traffic	SPL	26442	Mar-19

BRIDGES:

There are 155 Bridges available in the section. (9 Major & 146 Minor Bridges).

No of ROB: 15 No of RORB: 1 No of FOB: 3 No of RUB/LUS: 7.

No Of Curves:

Out of 54 curves, Down-16, UP-15, Single line (IGU-PTJ)-7 & Single line (CNV-PTJ)- 16.

Various track machines and their periodicity of working is Detailed below:-

Sl. No.	Name of the Machine	Work done	Frequency
1.	BCM-Ballast Cleaning Machine	Deep screening of track	Once in10 years
2.	DUOMAT/CSM – Continuous Action Tamper	Tie Tamping LWR work	Once in 2 years
3.	DGS - Dynamic Track stabilizer	For consolidating track after works affects core stability	Once in 10 years along with BCM
4.	UNIMAT/MPT	1.Tamping Points & crossing	Once in 2 years
5.	BRM - Ballast Regulating Machine	Boxing of track	
6.	UTV - Utility Track Vehicle	Leading and stacking materials	As per need
7.	T-28 - T28 cranes – One job crane (PRC laying Machine)	For re-laying of Points & crossing	As per requirement
8.	PQRS	For re-laying track	-do-
9.	TRT	For CTR of track	-do-

2.7.1 **List of Rail/Weld failures during the last three years is as follows**.

Year	NO. OF FAILURES	
	RAIL FAILURES	WELD FAILURES
2016-17	3	--
2017-18	3	4
2018-19	5	7
TOTAL	11	11
AV/Year	3.67	3.67

2.8 Units/Gangs Jurisdiction & distribution of PWI/PTJ (E):

Gang No	Jurisdiction		TM-I	TM-II	TM-III	TM-IV	Total
	From	To	(Actual)				
DTM/1/ TUP	443.350 443.150	449.820 449.820	1	2	0	5	8
DTM/2/ VNJ	449.820 449.820	455.520 455.520	0	2	1	18	21
DTM/3/ SNO	455.520 455.520	461.000 461.000	1	2	0	11	14
DTM/4/ SNO	461.000 461.000	467.000 467.000	0	2	0	18	20
DTM/5/ SUU	467	473	1	2	0	7	10
DTM/6/ IGU	473.000 473.000 0.000 0.000	479.000 475.680 0.600 0.600	1	2	2	4	9
DTM/7/ PTJ	484.990 484.510 22.230	468.480 486.480 23.700	1	2	3	2	8
Gang. No1/ NJD	479	485.92	1	1	2	4	8
Gang No 4/PTJ	486.480 486.480 22.230	487.200 487.200 23.700	1	1	2	2	6

Gang No 10/CNV	143.500	149.220	0	1	0	3	4
Gang No 11/CIM	149.220	154.940	0	1	1	3	5
Gang No 12/PTJ	154.940	160.660	1	1	3	7	12
13	TROLLEY MAN		0	0	7	5	12
14	STORE WATCHMAN		0	0	0	1	1
TOTAL STRENGTH			8	19	21	90	138

Duty Hours:

The normal working hours of the Ministerial and Artisans & Gang staff is given below.

Ministerial staff:

07.00 to 17.30 hours from Monday to Saturday

Lunch break 30 minutes.

Artisans and Units staff:

Morning: 07.00 to 12.00 hours

Evening: 14.30 to 17.30 hours

Sunday is rest.

2.9 As per executive summary of the said MCNTM report para 0.13, 12.5 % LR is allowed for all non-supervisory and non-secretarial category staff. The Rational formula covers all activities as per para 0.14 of the report.

As per para 0.20 Annual Review of gang strength is to be conducted on every 1st of April continuously. IRICEN will be custodian of software for calculating man power.

EMKM (Equated Man power Kilometer) will replace ETKM (Equated Track Kilometer) as performance unit.

Equated Cost Kilometer (ECKM) can be evolved as performance unit in future.

EMKM is defined as numerically equal to 0.6 times of the number of track men required for the section for all the activities T, R, M & S as per rational formula.

2.10 TRACK MAINTENANCE ACTIVITIES

The whole activities connected to Track Maintenance are clubbed under four main categories under CMCNTM studies. They are:

a) Activity 'T' – Affected by Traffic Density
b) Activity 'R' – Not affected by Traffic Density
} Primary activities

c) Activity 'M' – Miscellaneous
d) Activity 'S' – Site specific
} Auxiliary activities

2.11 ACTIVITY 'T' – AFFECTED BY TRAFFIC DENSITY

T_1	-	Slack attention to	a) Bad spots
			b) Low joints (FP, welded, glued joints)
			c) SEJ (1 No. / Km)
			d) Minor curve alignment
T_2	-	For Tie tamper	a) Pre tamping operations
		Working	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	

2.12 ACTIVITY 'R' – Not affected by Traffic Density

R_1 - Lubrication of ERCs
R_2 - Shallow screening
R_3 - Loading, Leading, Unloading

R_4 - Overhauling of LC gates

R_5 - Watching of caution spots & misc.

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 waterways, Cess repair, de-weeding of track and attention to cuttings Trolley refuges.

R_{11} - Creep pulling approaches to bridges, turnout

R_{12} - Rectifying damage to LC posts and gates.

2.13 **ACTIVITY 'M'** – Miscellaneous

M_1 - Monsoon patrolling

M_2 - Hot weather patrolling

M_3 - Cold weather patrolling

M_4 - Watching vulnerable locations

M_5 - Gate keeping of LC gates

M_6 - Rest giving for key man

M_7 - Water man duty

M_8 - Store watch man duty

2.14 **ACTIVITY 'S'** – Miscellaneous

S_1 - Tunnel Maintenance

S_2 - Bridge substructure maintenance

S_3 - Long girder maintenance

S_4 - Extra maintenance due to very steep curves, deep cutting, steep gradient

S_5 - Maintenance of track on extremely bad formation

S_6 - Look out man duty

S_7 - Fog signal man duty

S_8 - Filth removal from track

S_9 - Security patrolling

S_{10} - Watching of water level in suburban section

(T.R.M.S details are enclosed as Annexure – III)

CHAPTER – III

3.0 CRITICAL ANALYSIS

3.1 The laying and maintenance of P.Way is a laborious task right from survey, sanction of funds, acquisition of land, construction through undulated and difficult terrains of mountains, rivers, ravines etc. Bridges, tunnels cuttings, gradients, curves, draining of water etc., pose big challenges not only for construction but also for maintenance.

3.2 Engineering Branch in Indian Railways has progressed by leaps and bounds from the time of Clark and Robert Stephenson. Bridges and tunnels running to a length of even 7 kilometers and 350m height, underground track running for long stretches etc., has become the order of the day. The gruesome manual maintenance of the track has given way to highly mechanized maintenance practices.

3.3 Such mechanization has become inevitable for the following reasons.

- The high safety standards that can be achieved.
- The capability for higher axle load, speed etc.,
- The overall economy in cost of maintenance
- The accuracy in testing, checking and inspections that can be achieved through mechanization.
- The necessity to avoid harsh physical work under inclement weather and isolated locations.
- The speed of maintenance
- The need to carry out the maintenance works within the constraints of time for line block etc.,

3.4 **TROLLEY MOVEMENTS:**

The details of Trolley inspections conducted during the last one year are 72 and in an average 6 inspections conducted every month.

Details of Trolleys Available:

Motor Trolley BG- 2, Motor Trolley MG-1 & Push Trolleys -6

3.5 SOME REFERENCES FROM MCNTM REPORT 2000

(a) The MCNTM Committee recommends that the effort to improved rail welds should receive adequate thought and that a review should made after 5 years from now, so as to avoid reduction factors to be applied for the yard stick of man power requirement for SWR/LWR track (Para 0.4).

(b) Rational formula can be amended easily by recasting the relevant tables. The Committee recommends that the Rational Formula can be reviewed once in five years and amended (Para 0.8 & 4.15)

(c) Possible man power savings by deploying on track tampers for machine packing on BG

(d) The Pilot study has given confidence that the implementation of Rationalized formula will only result in savings in manpower and expenditure, at the same time ensuring equitable distribution of manpower in accordance with workload (Para 9.5 to 9.7 of MCNTM).

(e) As and when modernization in various sub-activities progresses, some of the sub-activities may reduce in part or vanish, or these many require less man power (Para 4.13 of MCNTM).

(f) The Committee recommended the Railway Board may order review of the Rational formula once in 5 years to incorporate the effects of modernization , such as introduction of more number of shoulder ballast cleaners, improving Rail weld technology, maintenance free level crossing track structures etc. (para 4.15 of MCNTM).

(g) **Hot Weather patrolling**

In zones of less temperature variation and in the case of track structure with adequate lateral strength, hot weather patrolling can be dispersed with as decided by CTE (Para 6.2.2 of MCNTM)

(h) **Cold weather patrolling**

CTE should authorize the need for this activity (Para 6.2.3 of MCNTM).

(i) **Gate keepers**

Only RG need be given from Trackman (para 6.2.5 of MCNTM)

3.6 The MCNTM Committee had not differentiated the requirements for SWR and LWR due to the problems then experienced in SEJ (Switch Expansion Joints) on account of poor welding technology. But the situation has now improved, and a distinction is warranted now between SW & LW track.

3.7 **MCNTM & TRMS FORMULA**

The report of MCNTM & TRMS Formula will convince us the need for rightsizing the manpower for track maintenance. It should be kept in mind that the very TRMS formula was evolved by studying the conditions existed during 1996 – 2000 period ie., when the mechanization was only in the nascent or experimental stage and when a good portion of the lines were in MG. Though the report was accepted in 2006 only, the basic points in the report are drawn from the above period.

3.8 **INFERENCES :**

a) The TRMS formula was approved in 2006 and it should have been implemented everywhere now.

b) The TRMS formula itself is 16 years old and requires periodical review.

c) The CMCNTM REPORT itself calls for annual review of staff strength based on the progressive mechanization and new technologies.

d) The very discarding of basic unit of the ETKM (Equated Track Kilometer) and the replacement of the same by Equated Manpower Kilometer (EMKM) and suggestions to transform it on Equated Cost Kilometer (ECKM) underscores the stress on manpower economy and cost economy in this field. So the work study is supposed to exercise a review on the TRMS formulae itself.

e) The CMCNTM report had recommended many activities for outsourcing which is not implemented fully. In certain areas, the technology and

practices are developed beyond the MCNTM Report period. So the proposal for outsourcing has a great relevance in this study.

3.9 EXTERNAL FACTORS

Certain external factors have also got a bearing on the manpower requirements especially under T, R, M & S activities, they are –

a) The improvements in road transport and vehicles
b) The improved availability of water, residence etc.,
c) The substitution of manual checking / testing / Inspection due to the use of machines like USFD, WILD etc.,
d) The longevity ensured due to mechanized laying of track and construction / inspection methods.
e) The supervisory element of work in the contracts.

3.10 Observation during the field study:

The work study team conducted a field study at SSE/P.WAY/PTJ (E).

During the interaction with the ADEN/PTJ & SSE/P.WAY/PTJ (E), it was stated that about 43 Track Women are available in this unit and hence difficult to allocate the work to them. They could not be utilized as Key women or for patrolling or any Track repair works.

With regard to Track women in the division, it is suggested that Track women may be equally distributed to each section in the Division by the Sr DEN (co-ord) in consultation with the ADEN's & SSE's of the division.

Activities Recommended for Outsourcing by Rational Formula.

1. Formation of treatment Works:
2. Collection of ballast, training out ballast by material train leading ballast from stack to track, insertion of ballast in track
3. Deep screening of the ballast in track, carried out manually by deploying BCM in which case man power is provided by the contractor
4. Introduction of sub ballast and ballast layers
5. Heavy repairs to track, including lifting
6. Complete realignment of curved track

7. Through renewal of rails, Sleepers and fosterers
8. Complete renewal of points and crossings, SEJs, traps etc
9. Resurfacing of crossings and switch rails
10. Loading and unloading of P.Way materials is bulk
11. Loading out 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 bides drains and catch water
16. Heavy repairs (measurable) to bridges, bridge protection works, river training works and tunnels.
17. Removal of major sand breaches
18. Works arising due to restoration following breach or accident
19. Clearing of rank vegetation in platforms and in the insanity of tracks in coaching and goods yards, repair depots and workshops or Engineering/Mechanical/Electrical and S & T depts.

3.11. **MANDAYS FOR T, R, M & S ACTIVITIES FOR TRACKMAINTAINER:**

Track Km of segment:

BG UP/1	35.28 Km
BG UP/2	0.91 Km
BG UP/3	0.65 Km
BG UP/4	1.72 Km
BG SL/1	13.77 km
BG SL/2	17.16 Km
BG DN/1	33.24 Km
BG DN/2	1.89 Km
BG DN/3	2.08 Km
Total	**106.7 Km**

In the interest of Rightsizing the manpower in P.Way maintenance, IRICEN/Pune has recommended more than 20 activities mentioned in the rational formula for outsourcing. Furthermore, as per the Railway Board instructions, CTE vide letter no. W.315/94/G-man Rational Formula/Vol.III DT. 17.01.2014, has directed the divisions to outsource the activities (T2, T3, T4; R4 and R10) to increase the efficiency.

As per TRMS formula, the following are Mandays worked out for T & R activities.

T Activity	-	17091.71 Man days *(Without shallow screening it is 14176.91)
R Activity	-	21864.80 Man days
Total	**-**	**38956.50 Man days**

***This includes Man days for Shallow screen activities.**

"T" Activity:

Under `T` activity, almost all the activities has already been carried out by the Track machines. Out of the total 11 activities under "T" the four activities (T_{2a}: Pre-tamping operations $_{3a:}$ Casual renewal of rails, T_{3b}: Casual renewal of sleepers &$T_{4:}$ Repair welding) are the major activities that require more man power comparing the other minor activities. These activities constitute more than 50% of the total work load under T activity. The other sub activities under T also do not arise often since the entire line is layed with a 60 kgs / 52 kgs rails.

Hence, a reduction of 50 % of the total man-days given in the TRMS Sheet can be taken into account.

"R" Activity: The following sub activities have been suggested for outsourcing;

1. R_1 - Greasing of ERCs
2. R_3 - Loading, Leading & Unloading
3. R_4 - Overhauling of LCs (suggested by CTE)
4. R_6 - Tree cutting for visibility (suggested by CTE)
5. R_7 - Lubrication of Rails in curves (suggested by CTE)
6. R_{10} - Pre-monsoon attention (suggested by CTE)
7. R_{11} - Creep pulling (suggested by Rly. Board).

Out of the total 12 activities under"R" these 7 activities listed above are the major ones that have the potential for outsourcing. . These activities constitute more than 60% of the total workload under "R" activity.

Hence, a reduction of 50% of the total man-days given in the TRMS Sheet can be taken into account.

M – Activity:

Monsoon patrolling	-	1830.00	Man days
Hot weather patrolling	-	2654.28	Man days
Cold weather patrolling	-	1061.71	Man days
Vulnerable locations	-	244.00	Man days
Gate keeping	-	-1682.00	Man days
RG for key men	-	1278.00	Man days
Waterman	-	3528.00	Man days
Store watchman	-	3285.00	Man days
Total Man days	**-**	**12198.99**	**Man days**

Less: Waterman Man days +SWM+ Hot weather patrolling

(3528+3285+2654.28) **9467.28 Man days**

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2731.71 Man days

** In the present changed scenario, waterman duty is no longer in existence anywhere in Southern Railway and as such there are 5 railway stations in this section with an inter distance of 4.5 Kms on an average, where sufficient water is available. Hence the man days allotted for waterman duty are found excess and the same has been deducted from the total man days.

** Man power for store watch man was given separately.

** As per section details, the hot weather patrolling was not performed in this section. Hence, the man days given in TRMS was not taken into account while calculating the requirement of man power.

S – Activity:

Bridge structure maintenance	-	157.80	Man days
Long Grider Maintenance	-	---	Man days
Extra for very sharp curves	-	478.93	Man days
Extreme bad condition	-	2400.00	Man days
Lookout man Man days	-	823.87	Man days
Filth removal	-	294.00	Man days
Security Patrolling	-	240.00	Man days
Fog signal man	-	330.00	Man days
Total		**4724.60**	**Man days**

3.12 Gang strength:

Total Route Km	-	97.900	Kms
Man days 'T'	-	7088.45	Man days
Man days 'R'	-	10932.40	Man days
Man days 'M'	-	2731.71	Man days
Man days 'S'	-	4724.60	Man days

Total T+R+M+S - 25477.16 Man days

3.13 CALCULATION OF REQUIREMENT OF TRACK MEN:

No. of working days	:	294
Total Man days required as T, R, and M & S for Performing Track maintenance duties	:	25477.16 Man days
No. of staff required as per T, R, M & S	:	25477.16 / 294

	:	86.65 Staff or say 86 staff
LR @ 12.5%	:	10.88 say 11 Staff
Total gang strength	:	86 + 11 = 97
RG @16.66%	:	16.26 say 16 staff

Total requirement of trackmen = 113 staff

Requirement of key men & key mate (15x2) = 30 staff

3.14 Requirement of Trolley men:

SSE/P WAY (in charge) – once in a month (CS No. 132 para 124 (a), Dt: 08.04.2013.)
SSE/JE (section in charge) – once in a fortnight (CS No. 132 para 139 Dt: 08.04.2012.)
The section supervisor normally took two days to inspect the section in trolleys in the fortnight period.
For the movements of a pushing trolley four persons are required in which, two will physically push the trolley and the other two is sitting and watching backside of the movement on safety view.

On need basis 3 sets of trolley men batch will be provided to meet the requirement.

The total trolley men required (3x4) = 12

3.15 Requirement of Supervisors:

On need basis the requirement of supervisors as follows:

1. Over all in charge	:	1
2. Section supervisors	:	3
3. LR/Special works	:	2
Total requirement	**:**	**6**

3.16 Requirement of Ministerial Staff:

At present this section is having one ministerial staff to look after the personal matters and other allied works which is permitted to continue by the work study team.
On need base, the requirement of ministerial staff: 1

3.17 Requirement of store watch man:

Since, there is only one store in this section, 3 staff has been provided to look after the store duties on need basis.

The requirement of store watch men: 3

3.18 Requirement of other technicians:

S. No	Category	Requirement
1	Blacksmith	2+1 Helper
2	Welder	1+ 1 Helper
3	Painter	1
4	Carpenter	1
5	M V Driver Fitter-II	1
6	B T Checker	1
TOTAL		**9**

3.19 Analysis of T, R, M & S activities:

Requirement of Trackman on outsourcing:

Outsourcing of several sub activity under T, R, M, S, activities have been recommended and suggested by Railway Board vide his letter No. 2004/CE-1/GNS/1 of 04.03.2004, by CTE vide his letter No. W.315/94/G.Men/Rational formula / Vol.III dated 22.08.2011.

Summary of Requirement of Gang strength:

Requirement of Track maintainers as per T.R.M.S	=	113
Key men, key mate	=	30
Trolley men	=	12
Store watch man	=	3

Total trackmen required	=	158
Supervisors	=	6
Ministerial staff	=	1
Artisan staff	=	9

Total requirement of staff	=	174
		---

1. The lady track women in this section are 32 % (that is 43 staff) out of 133 trackmen.

2. Availing CCL by the lady staff 4 spells in a year in an average will affect the day to day activities and sometimes availing ML will also affect the routine works.

3. Sr DEN (co-ord)/SA , may take necessary steps to distribute the lady staff strength in equal distribution to all the sections in SA division.

SANCTION VS REQUIRMENT:

Sl. No.	Category	Sanction	Actual	Requirement	Surplus
1	Track maintainers	175	139	158	17
2	Artisans & M V Driver	9	6	9	0
3	SSE & JE	7	4	6	1
4	OS/W & PB	1	0	1	0
5	SWM*	0	1	0	0
7	STM- Tech-II&III	0	6	0	0
	Total	**192**	**156**	**174**	**18**

- Already provided separately in track maintainers account.

RECOMMENDATIONS:

1. One post of J E in GP Rs 4200 is found excess to the requirement and the same may be surrendered and credited to the vacancy bank.
2.. Seventeen posts of T.M-IV, in GP Rs 1800 is found excess to the requirement and the same may be surrendered and credited to the vacancy bank.

(TOTAL 18 Posts)

SUMMARY OF RECOMMENDATIONS:

S.No	Category	GP (Rs)	No Of Posts
1	Junior Engineer	4200	1
2	Track Maintainer-IV	1800	17
TOTAL			**18**

CHAPTER - IV

4.0 PLANNING BRANCH'S REMARKS ON CO-ORDINATING OFFICER'S VIEWS:

With reference to the draft work study report, the following views were offered by the coordinating officer vide letter No. ADEN/PTJ/G.1 dated 10.02.2020 addressed to Dy CPLO/HQ is reproduced below.

With reference to the work study report received on 10.02.2020 vide Dy CPLO letter No. G.275/WSSR-491920/2019-20 dated 07.02.2020, the following remarks were offered.

1. Agreed to surrendering of Seventeen posts of Track maintainers in PTJ(E) section as per the scale check of 30//11/2019 in the work study report.

Remarks of the Planning Branch: NOTED.

2. Surrendering of One JE post is not feasible, since the section is running with lot of special work and contract works which include safety work of Track renewals also. So, surrendering the JE post will affect the day to day working of the section and hence not agreed for surrendering.

Remarks of the Planning Branch: AGREED TO

This is for your kind information and necessary action please.

SANCTION VS REQUIRMENT (REVISED):

Sl. No.	Category	Sanction	Actual	Requirement	Surplus
1	Track maintainers	175	139	158	17
2	Artisans & M V Driver	9	6	9	0
3	SSE & JE	7	4	7	0
4	OS/W & PB	1	0	1	0
5	SWM*	0	1	0	0
7	STM- Tech-II&III	0	6	0	0
	Total	**192**	**156**	**175**	**17**

RECOMMENDATION (REVISED):

Seventeen posts of T.M-IV, in GP Rs 1800 is found excess to the requirement and the same may be surrendered and credited to the vacancy bank.

SUMMARY OF RECOMMENDATIONS (REVISED):

S.No	Category	GP (Rs)	No Of Posts
1	Track Maintainer-IV	1800	17
TOTAL			**17**

CHAPTER – V

5.0 FINANCIAL SAVINGS

5.1 If the recommendations made in the study report are implemented after outsourcing, the annual recurring financial savings will be as under:

Category	No. of posts	Grade Pay (Rs.)	Money Value (Rs.)	Annual Savings (Rs.)
Track maintainer-IV	17	1800	43817	89,38,668
Grand Total	**17**			89,38,668