

EASTERN RAILWAY

WORK STUDY REPORT

ON

**COMPARATIVE ANALYSIS BETWEEN MPRs' OF GRC/HQ & CKP DIVISION
UNDER ENGINEERING WORKS UNITS AS PER BENCHMARKING DATA**

(STUDY NO.WSER-08/18-19)

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CENTRAL PLANNING ORGANISATION

GM'S EFFICIENCY CELL

EASTERN RAILWAY

KOLKATA

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TERMS OF REFERENCE

A comparative work study of activity centres having highest and lowest benchmark MPR proposed vide Railway Board letter's No. 2017/ E&R / 2 (1) /1 dt 10.05.2018 for Engineering Buildings wing of GRC/HQ and CKP Division of South Eastern Railway.

METHODOLOGY

The study team adopted the following methodology for conducting the study.

- i) Collection of data regarding existing sanctioned strength and MOR of Works wing of GRC/HQ and CKP division.
- ii) Work load in terms of ITKM of Works wing under GRCHQ and CKP division.
- iii) Activities Outsourced and % of reduction of work load due to outsourcing.
- iv) Discussed with Controlling Officers and in charge of different Works wing of GRC/HQ and CKP Division.
- v) Critical analysis has been made based on variation in MPR and summary of suggestion has been drawn for improving MPR.

CHAPTER-I

1.0 INTRODUCTION:

- 1.1 Indian Railway is facing tremendous financial crunch after implementation of 7th Pay Commission. Operating ratio is gradually increasing. Though Indian Railway is not a business organization but to survive, it is always essential to make the organization in profit i.e. operating ratio should be less than 100. In Performance Efficiency Index shown in the corporate plan booklet published by the Eastern Railway, the “Operating Ratios” from 2012-13 to 2017-18 are given below –

2012-2013	178.86%
2013-2014	173.32%
2014-2015	177.27%
2015-2016	180.75%
2016-2017	165.25%
2017-2018	178.76% (Proposed)

In view of the above, Rly Board issued nos. of circulars, orders, etc to minimize Expenses and increase Earnings to Zonal railways to achieve better Operating Ratio. The Zonal Railways also implement various measures for financial discipline. Benchmarking is one of the process/measures to achieve the said goal. Manpower planning and benchmarking are thus complementing each other in enabling the railways to progressively achieve higher transportation output with the reduced compliment of staff.

- 1.2 Benchmarking, as an approach for determining operational and productivity goals based on the best practices in a given industry is one of the most promising tool in the field of quality management today. Among the various quality and productivity management tools available to the organizations benchmarking is the one that can be used without much prior preparation and the costs. As the technique helps the staff to learn as they work out their way in discovering and implementing the best practices in the industry. It fills them with self esteem and with a sense of achievement that they are capable of improving upon even the best in their industry.
- 1.3 The Indian Railways initiated the process of benchmarking in August 2000 when Efficiency & Research Directorate of Railways Board undertook a study which culminated in its first report on the Subject titled “Rightsizing of Indian Railways through Benchmarking” in April 2001. There are various areas where there is ample evidence of the staff getting redundant on slight change in the existing pattern of working/procedure or as a result of progressive introduction of computerization. These actions may point towards the potential for staff reduction in the coming years.

- 1.4 At this juncture, the Railway Board has advised Eastern railway to conduct a work study on Works wing of engineering department in GRC/HQ where the MPR is the highest with respect to MPR of CKP division having more than 750 ITKM. Railway Board has decided to carry out a comparative work study on Works units of engineering department between GRC/HQ and CKP division to study the reasons for wide variation of MPR where the MPR of CKP division is the lowest with respect GRC/HQ having more than 750 ITKM. The subject work-study has been undertaken by GM's Efficiency Cell/E.Rly during the current financial year 2018-2019 to improve the man power ratios of poor performing units.

CHAPTER-II

2.0 EXISTING SCENARIO

- 2.1 There are four divisions viz Adra, Chakradharpur, Kharagpur and Ranchi in South Eastern Railway. GRC is a head quarter of South Eastern Railway. All Engineering works units at GRC and CKP are under the overall control of Sr.DEN/Co-ord/KGP and Sr.DEN/Co-ord/CKP respectively. The Engineering works units at GRC are under direct control of Sr.DEN/GRC & the Engineering works units at CKP are under DEN/CKP & AEN/ CKP. Each works unit is functioning directly under the supervision of SSE/Works in regard to maintenance of Railway assets and to look after the passenger amenities as well as staff welfare.
- 2.2 The main functioning of Works units is to upkeep the building, sewages and water supply system. Of course there are other works such as maintenance of road, pipeline, rest houses, and plantation etc. But those three are considered as the main functions. Regarding repairing and other maintenance works of building, sewage etc, it is enough to say that major repairing works are carried on by the contractual agencies at present. Works units are responsible for the patch works or any small repairing works. In addition to petty work, the staff also attends to emergency calls & complaints received from the officers and Railway staff over phone.
- 2.3 Presently major works under Works units at GRC/HQ and CKP division have already been given to private agency. Now this contractual work has been processed through special work and yearly contract basis i.e. zonal work. The store function under each Works units has also been decreased due to contractual work. Existing staff are deployed to cater the small repairing works based on the complaints registered by staff/officers. The following items of works connected to petty repair works based on complaint received on daily measure, are generally maintained by departmental staff.
- i) Building (Service/Residential)
 - ii) Major/Minor Bridge (Inliner water way)
 - iii) FOB/ROB/RUB
 - iv) Water treatment plant
 - v) Surface drainage
 - vi) Underground drainage
 - vii) Road area
 - viii) PF(covered/uncovered)
 - ix) Pipeline
 - x) Pumping installation

2.4 Major complaints faced by the Works units of GRC at HQ and CKP division in connection with the maintenance of Railway assets are of common nature. Accordingly departmental staff is booked to comply the same on urgent basis.

The following major complaints are as under:

- i) Life of staff quarter/service building is very old and roof of the building is jack arch with lime concrete terracing. Almost main complaint received from occupants of staff quarter due to water leakage from the ceiling of residential building as well as service building. This type of building roof will need immediate demolition and converted into RCC roof.
- ii) Some Railway station platform is very low due to insertion of PSC concrete sleeper. Hence these stations will keep raising of platform for the safety of passenger.
- iii) There is no latrine/bathroom in some of the L/C gate under CKP division. On duty gateman lodges the complaints regularly for provision of bathroom
- iv) Repair of damaged doors & windows of staff quarters/service buildings
- v) Repair of damage pipeline, replacement of corroded distribution pipeline including fittings
- vi) Repair of drainage system
- vii) Repair of floor, wall, ceiling etc.
- ix) Recently complains regarding repairing of pipe line, masonry and carpentry work lodged through CMS.

2.5 There are two (2) Works units at GRC/ HQ under Sr.DEN/GRC which is under the overall control of Sr.DEN (Co-ord) under KGP division. The workload in terms of ITKM of each works unit at GRC/HQ as in Feb-18 & July-18 is found unchanged which is appended below:

UNITS	ITKM
SSE/North/GRC	238.59
SSE/South/GRC	79.83
TOTAL	318.42

2.5.1 There are 13 nos. of Works unit at CKP division under Sr.DEN/Co-ord/CKP. The total workload in terms of **ITKM** of CKP division was **8925** and the corresponding **MPR** was **0.08 as in Feb'18**. The work load i.e.ITKM of each works unit has been revised as under as on date.

UNITS	ITKM
SSE/East/TATA	465.20
SSE/West/TATA	622.65
SSE/East/CKP	858.19
SSE/West/CKP	262.79
SSE/LINE/CKP	474.88
SSE/BNDM(I)	171.10
SSE/BNDM(II)	551.80
SSE/SNY	999.99
SSE/JSG	933.88
SSE/ROU	470.39
SSE/BXF	448.20
SSE/CBSA	538.64
SSE/DPS	671.75
TOTAL	7469.46

2.6 The summarized position of Supervisor, Ministerial, Technical Gr.C and Gr.D (Erstwhile) staff and officers of Works units as in **Feb '18** under HQ at **GRC** is furnished below.

Cadre	Sanctioned strength	Men on roll	Vac.
Officer	03	03	-
Supervisor staff	15	12	03
Ministerial staff	12	18	-06
Technical Gr-C	62	38	24
Gr-D staff	189	185	04
TOTAL	281	256	25

- 2.6.1 The above summarized position of Works units at **GRC/ HQ** has been updated in **July '18** which is furnished below. The details staff position of Works units under Sr.DEN/Co-ord/GRC as on 06.07.18 is attached in **annexure – I.**

Cadre	Sanctioned strength	Men on roll	Vac.
Officer	03	03	-
Supervisor staff	15	10	05
Ministerial staff	12	18	-06
Technical Gr-C	62	38	24
Gr-D staff	189	185	04
TOTAL	281	254	27

- 2.7 The summarized position of Supervisor, Ministerial, Technical Gr.C and Gr.D staff of Works units as in **Feb '18** under **CKP division** is furnished below.

Cadre	Sanctioned strength	Men on roll	Vac.
Officer	–	–	–
Supervisor staff	63	59	04
Ministerial staff	21	16	05
Technical Gr-C staff	277	270	07
Gr-D staff	470	369	101
TOTAL	831	714	117

- 2.7.1 The above summarized position of Works units under **CKP division** has further been revised in **July '18** which is furnished below. The details staff position of Works wings under Sr.DEN/Co-ord/CKP as on 12.07.18 is attached in **annexure – II.**

Cadre	Sanctioned strength	Men on roll	Vac.
Officer	–	18	–
Supervisor staff	63	60	03
Ministerial staff	21	16	05
Technical Gr-C staff	277	270	07
Gr-D staff	470	369	101
TOTAL	831	733	116

- 2.8 The MPR is derived from the ratio of total men on roll (total manpower) in Works wing of Engineering department and total integrated track kilometers (ITKM)

$$\text{MPR} = \frac{\text{Total men on roll in Works wing of Engineering department}}{\text{Total integrated track kilometers (ITKM)}}$$

For calculation of total MOR of staff, Officers, Supervisors, Ministerial staff, Technical Gr-C and group D staff of Works wing of GRC/HQ & CKP division under Works wing of Engineering department have been taken in to consideration.

- 2.8.1 The MPR of GRC/HQ as in Feb'18 is 0.80 i.e. $256 / 318.42 = 0.80$ and similarly MPR at CKP division as in Feb'18 is 0.08 i.e. $714 / 8925 = 0.08$

- 2.9 The contractual work under Works units over CKP division & HQ at GRC is of three types viz. (i) special revenue work, (ii) sanctioned work & (iii) zonal work. These special revenue, sanctioned and zonal works are executed in connection with construction of new project and maintenance of existing Railway assets. The details fund of special revenue, sanctioned and zonal work against Works units of engineering department over GRC/HQ & CKP division as on 30.05.2018 has been shown in details in **Annexure – III**.

CHAPTER-III

3.0 CRITICAL ANALYSIS

3.1 On being observed the different stages of operation and activities involved in different IOW units in connection with the construction of new assets as well as maintenance of existing railway assets at GRC/HQ and CKP division of South eastern railway, the entire data have been scrutinized by the study team. Keeping the MPRs of Engineering works units between GRC/HQ & CKP division in mind, the comparative analysis regarding variation of MPR of GRC/HQ & CKP division has been done based on bench marking data of both wings.

3.2 There are only 2 Works units under Sr. DEN/GRC/HQ and 13 Works units are under Sr.DEN/Co-ord/CKP. The details of Works units vis-à-vis work load in terms of ITKM under GRC/HQ of KGP division and CKP division is stated in para 2.5 & 2.5.1 and corresponding man power of Engineering works units of GRC/HQ & CKP division is also mentioned in para 2.6 & 2.7.

3.3 The existing maintenance workload and workload for the new assets have already been outsourced through special revenue as well as sanctioned works & Zonal works. A few petty repair works based on complaints lodged by occupants are presently undertaken by Works units by deploying their existing Artisan and Gr.D staff throughout the year. The major works viz. Building, Minor Bridge (FOB, ROB RUB) Water treatment plant, Surface drainage, Underground drainage, Road area PF (covered/uncovered), Pipeline and Pumping installation, staff is more utilized mainly for maintenance of building as well as pipeline.

The item-wise similar type of maintenance jobs of Works units under GRC/HQ and CKP division is described as under:

i) Building:

As stated in Para 2.3, 16% of works is carried out by the departmental staff and 84% of maintenance of works have already been off loaded to the contractual agencies. Leaky roof treatment, repairing of damaged doors/windows, walls, floors and sanitary works etc are the main repair jobs. Artisan staff along with Khalasi is booked on an average 18 days/month for the said work.

ii) Minor Bridge(FOB/ROB/RUB):

Mainly Major and Minor bridge are maintained by Bridge dept. Major work of 94% is done through contractual agency and rest 6% work is complied by departmental IOW staff. Jungle cutting of linear water way at the time of summer season and changing of broken wooden/concrete slab under FOB, ROB & RUB are the main maintenance work. Depending upon the volume of work, one artisan along with one and two Khalasi is booked on an average 2 days/month for the said maintenance work.

iii) Water treatment plant:

There are one water treatment plants at GRC/HQ and 19 water Filtration plants at CKP division. The maintenance of water treatment plant is purely under contractual at GRC/HQ and 100% departmental work is existing at CKP division.

Checking of:

- a. Chlorination of water
- b. Iron removal from water
- c. Water softening
- d. Physical list in every month and chemical test at an interval of 3 months are to be made in the outside laboratory by the help of department staff. In view of the above, one staff is deployed in day shift for the above work.

iv) Surface /Underground drainage:

The length of underground drainage is very minimum with respect of surface drainage. Maintenance of drainage system at service building/colonies is done by medical dept. of GRC/HQ and CKP division. On an average 20% of department work i.e. repairing of drain as well as cleaning of drain near L/C gate at the time of rainy season is carried out by departmental staff. One Artisan along with one Khalasi is required to deploy 6 days in a month only for monsoon season.

v) Road area:

Road repairing works of about 95% at GRC/HQ and 100% at CKP division have been off-loaded to contractual agency on yearly contract basis and rest emergency work is maintained by departmental Works staff. For which one Artisan with one Kh/helper is booked on an average 2 to 3 days/month.

vi) PF(covered/uncovered):

There is no maintenance work of GRC/HQ. The following maintenance works under PF (Covered /Uncovered) of about 5% at CKP are as under:

- a. Changing of one or two broken AC sheets
- b. Cleaning of pipeline attached with PF covered portion during rainy season
- c. Earth feeling with cementing near holes in PF uncovered portion
- d. Jungle cutting near PF fencing

In connection with the above work one Artisan staff along with one Khalasi is booked on an average one or two days/month for the said job.

vii) Pumping installation:

Installation and maintenance of pump is done by Electrical Department only operation of valves for supplying water is undertaken by valveman of GRC and CKP division.

One valveman in 12 hrs roster is required to deploy for operation all valves under the existing pumps of both the division.

The following items are to be changed in connection with maintenance of Hand tube well at CKP division and there is no existence of hand tube well at GRC division so maintenance work is nil.

- i) Leather sheet valve
- ii) Leather bucket
- iii) Nuts and bolts
- iv) Plunger rod
- v) Handel.

Contractual agency is required to attend for installation of hand tubewell as well as failure of strainer. Due to lowering the water level during summer season i.e. attention regarding maintenance hand tubewell to be given more than the other months of a year. One artisan staff along with one khalasi is booked on an average 14 days/month for the above work

viii) Pipeline:

Average 73% maintenance work at GRC and CKP division have been off-loaded to contractual agency and rest 27% maintenance work of GRC and CKP division catered by the departmental staff is focused as under:

- i) Repairing and replacement of damaged pipeline including fittings
- ii) Cleaning and replacement of corroded pipeline
- iii) Cleaning of OH tank and roof tank in a particular time at colony and roof rank in a particular time at colony.

In view of the above, one Artisan along with one Kh/Helper is required to book on an average 18 days/months for the maintenance work.

3.4

Horticulture work is a part of engineering Works units of both GRC and CKP division. The plantation and maintenance of horticulture work are carried out by departmental staff and contractual agency. The details maintenance work of horticulture at GRC and CKP division is described as under:

- i) Preparation of plan and estimates for gardening, a forestation plantation etc.
- ii) Execution and measurement of landscaping work
- iii) Submission of Proposal for gardening a forestation plantation etc.
- iv) Floral decoration, potted plant decoration in connection with VIP movement, inauguration/ceremonial function under the jurisdiction of GRC and CKP division are to be undertaken by concern incharge of Horticulture.

- 3.5 Consequent upon the review of workings of engineering Works units of both GRC/HQ and CKP division, the comparative analysis regarding variation in MPR between GRC/HQ and CKP division have been done after scrutinizing the entire activities and workload which is stated as under.

Comparative analysis based on B.M.Data as in Feb-2018

Description of work/Activities	GRC/HQ Under KGP division	CKP division
ITKM	318.42	8925
MOR	256	714
MPR	0.80	0.08
Nos. of Works units	2 nos.	13 nos.
Nos. of contractual work	26 nos.	246 nos.
Pipe line Maintenance	79% workload is outsourced	68% workload is under departmental and rest 32% workload is outsourced.
Dealing of store materials	NIL	NIL
Maintenance of major, minor bridge (FOB/ROB/RUB)	No activities	94% workload is outsourced.
PF (covered/uncovered)	No activities	95%. workload is outsourced
Hand tube well	No activities	94% departmental work.
Nos. of complaints per unit / month	459 nos. (Avg) per unit	143 nos. (Avg) per unit
Maintenance of residential/service building.	90% workload is outsourced & 10% workload is done departmentally.	78% workload is outsourced & the rest 22% workload is done departmentally.
No. of water treatment plant/Filtration plants	01 no.	19 nos.
Maintenance of water treatment /Filtration plants	100%workload is outsourced	88% workload is done departmentally and rest 12% is outsourced.
Maintenance of road area	95% contractual work.	100% contractual work.
Surface/underground drainage	90% workload is done by medical department &10% workload is departmentally done.	68% workload is done by medical department &32% workload is departmentally done
Pumping installation	Operation of valves is done by Works unit and the entire maintenance Workload is tackled by Electrical department	Operation of valves is done by Works unit and the entire maintenance Workload is tackled by Electrical department.
Maintenance of total no. of Quarters	1237 nos done by 02 units under GRC/HQ	12889 nos done by 13 units under CKP division.

3.6 The work study team has drawn the following **observations** on the basis of analysis due to variation of MPR of engineering Works units of GRC/HQ and CKP division made in para 3.5.

- 1) It is revealed from the above stated comparative analysis that MPR of engineering works unit at GRC/HQ is much higher with respect to MPR of CKP division. This is mainly due to deployment of excess manpower at the units under GRC/HQ. Here CKP division has been benchmarked as IR Benchmark whose MPR value is 0.08
- 2) GRC/HQ has two (2) Works units only. These 2 works units are actually under KGP division, whereas CKP division has 13 nos. of Works units.
- 3) It is to mention here that, GRC/HQ is not a division; rather it is the HQ of S.E.Railway. There is no workload of Major & minor bridges, Platforms and Hand tube-well etc at GRC/HQ. This kind of maintenance work is tackled by other works units under KGP Division (except GRC/HQ unit).
- 4) Most of the buildings and Quarters under GRC/HQ are of 70 years old which needs to be attended more. As a result, frequent maintenance of such buildings are done for which involvement of manpower is comparatively more..
- 5) Number of complaints attended by the staff of each Works unit under GRC/HQ in connection with the maintenance workload of old railway residential and service buildings is found to be 459 nos per month, whereas the number of complains attended by each Works unit of CKP division is 134 nos per month. This difference in numbers is mainly due to tackling of huge departmental workload of non-schedule nature in connection with maintenance & repairs of very old railway residential and service buildings by the staff of works units under GRC/HQ..

In view of above, it appears that the quantum of complaints is on higher side at GRC/HQ in comparison to the CKP division due to poor condition of buildings at GRC which attracts more maintenance. As a result, additional set of staff is required to be deployed for such additional workload arisen as a regular measure which is evident from the position of no of complaints recorded by the study team.

Moreover, a special attention is required to be given as the works units are located adjacent to Zonal HQ at GRC. As it is a zonal HQ, the expectation demands more for the better quality of work at HQ compared to the division.. However, it is felt necessary to explore the unit-wise day to day workings in a full fledged manner with a view to confirm the feasibility of reduction of manpower of works units under GRC/HQ either based on B.M. data or by means of scientific analysis of work study.

CHAPTER-IV

4.0 SUMMARY OF SUGGESTION

4.1 It is suggested that the following steps are required to be taken to improve the MPR of Engineering Works units under GRC/HQ.

1) It is observed during field study that 43 nos. of safaiwala of Works units under GRC /HQ are engaged to clean the different offices and toilets at zonal head quarters .This cleaning activity may be outsourced and as a result ,the MPR value of GRC/HQ will become better due to curtailment of the aforesaid departmental workload consequent upon outsourcing. This would obviously leave a scope of further study in order to plug the pockets of excess manpower under GRC/HQ.

2) It may be an opinion that thorough renovation of the buildings is required to be done to reduce the rate of frequent maintenance of buildings which is evident from the nos of complaints attended by the departmental staff. As a result of which, there will be a scope of reduction of manpower due to reduction of building maintenance workload. Ultimately, the excess manpower in proportionate to decrease in workload may be arrested to declare excess manpower, if any.

3) It is also noticed during field study that 12 staff are engaged to maintain the horticulture work at GRC/HQ, though the same work is partially tackled on contractual measure. In this connection, It is suggested that horticulture work may be outsourced fully which will result in curtailment of departmental staff against the said activity.

4.2 On scrutinizing all aspects, it may be said that the concept of comparison of MPR values between GRC/HQ & CKP division is not logically justified, because the MPR of the works units over CKP division (MPR= 0.08) is a divisional MPR, but in case of GRC/HQ'S MPR, it is the MPR of 02 units only located nearby HQ/S.E.RLY under the overall control of KGP division. It is known that the MPRs are firstly compared between the divisions of zonal railway and then MPR values are compared between divisions of Indian Railway. So the target of comparison of MPRs between CKP & GRC/HQ in the subject study does not justify the concept of application of B.M. data & MPR values and ultimately, it does not have the correct assessment of revised requirement of manpower at GRC/HQ as per its MPR value derived in consideration with 02 units only instead of assessment of whole divisional MPR considering all works units under KGP division inclusive of GRC/HQ. Inspite of giving different suggestions in Para 4.1, it is felt justified that an in- depth study in this regard, is required to be conducted to arrest the causes of variation of MPRs.