EASTERN RAILWAY

WORK STUDY REPORT
ON

REVIEW OF MANPOWER VIS-A-VIS WORKLOAD OF BWN DIESEL SHED BASED ON BENCH MARKING CONCEPT

STUDY NO. WSER - 13/18-19

(Submitted on 22.11.2018)

Study conducted by: Sri A. K. Chatterjee, WSI

Study guided by: Sri S. Chandra, AEO

By
GM's Efficiency Cell
Eastern Railway
Kolkata

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ACKNOWLEDGEMENT

The study team expresses its deep gratitude to Sr. DME (DSL) / HWH & DME/ BWN for their valuable guidance to conduct the subject study successfully. The study team is thankful to all officers & Senior Supervisors of Bardhaman Diesel Shed for their heartiest co-operation to complete the study in time.

AUTHORITY

The subject study has been undertaken by the GM's Efficiency Cell of E. Rly. as per programme of work study fixed up by the competent authority during the year 2018-2019.

TERMS OF REFERENCE

1) Need based assessment of manpower at BWN DSL Shed based on Bench Marking Data.

2) To arrest the scope of reduction of workload due to modernized method of working.

3) To identify the scope of surplus of manpower, if any, due to outsourcing of cleaning activities in BWN DSL Shed.

METHODOLOGY ADOPTED

While conducting the subject study, a special attention has been given to revise the present method of working, if found feasible & viable, in order to improve the productivity of BWN DSL Shed as a whole. While thinking over the revision of methods, the present working procedures in BWN DSL Shed have critically been observed to arrest the scope of revision of methods, if any, for better out-turn. It is also explored to arrest the pockets of avoidable idleness and ineffectiveness of the staff engaged in the different fields of work in BWN DSL Shed.

An analysis of statistical data in connection with manpower to workload ratio (i.e.MPR) has been done to assess the revised requirement of manpower in BWN DSL Shed. The scope of outsourcing of any activities has also been taken in to consideration to assess actual requirement of manpower in BWN Diesel Shed. In addition, the concept of adoption of new method has been taken into consideration to improve the overall productivity of BWN Diesel Shed, if found feasible.

EXECUTIVE SUMMARY

Study Name & No:	**WORKSTUDY REPORT ON REVIEW OF MANPOWER VIS-A-VIS WORKLOAD OF BWN DIESEL SHED BASED ON B.M. CONCEPT.** **(STUDY NO : - WSER -13/18-19)**
Year of conducting the study:	2018-19
Terms of reference:	i) To assess the revised requirement of manpower consequent upon the Bench marking data.
Methodology adopted:	i) Thorough discussion with the concerned officials regarding workload & latest infrastructural set up. ii) Collection of work study related data. iii) Systematic observation of working of the deployed staff. iv) Analysis of Bench marking data.
Existing Sanctioned Strength:	536
On roll strength:	446
Vacant post:	90
Proposed Surrender:	90
Justification	Actual requirement of staff is assessed on the basis of B.M. data i.e. IR Avg. MPR of Diesel Sheds.

SUMMARY OF RECOMMENDATION

It is recommended that the revised sanctioned strength of BWN Diesel Shed will be 446 in total as against the present total sanctioned strength of 536 posts which will result in surrender of 90 posts from BWN diesel shed.

CHAPTER-1

INTRODUCTION

The main motto of conducting the subject work study is to assess the actual requirement of manpower based on the existing workload. As for requirement of manpower, staff of different categories having different designations either directly or indirectly involved in the field of maintenance & ancillary activities as well as ministerial, canteen & other miscellaneous activities in order to maintain the targeted out turn of BWN Diesel Shed as a routine measure, have been taken into consideration as MOR (Men-on-roll). So far workload of BWN Diesel Shed is concerned, the entire workload in terms of no of Locomotives maintained as per norms at BWN DSL Shed, has been taken into consideration during assessment of actual requirement of manpower. It is pertinent to mention here that the maintenance workload of each locomotive varies from Loco to Loco due to involvement of variable quantum of maintenance workload related to non-schedule activities. In addition to it, maintenance of different types of locos involves different magnitude of workload connected to both schedule & non-schedule activities which are observed during study period. Therefore, it may be said that the equated workload of BWN Shed is assessed on the basis of number of locos maintained by the Shed. For the sake of calculation of revised requirement of manpower, the equated workload has here been considered in terms of total numbers of DSL locos maintained by the Shed in order to fulfill the stiff target of work study for the current year with in a stipulated period of time. The main motto of conducting the subject study is to assess manpower of DSL Shed based on Benchmarking concept.

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. The main purpose of the benchmarking is basically to establish more practical goals following the footsteps of the leader in the industry. In Indian Railways being a labor intensive organization needs to handle the personnel related information in an effective manner for efficient utilization of its Human resources.

At the outset, it is felt justified by the study team to assess the actual requirement of manpower at BWN DSL Shed based on Benchmarking data, a scientific means of calculation formulated by the Railway Board. Though the B.M data reflects a scope of surplus of manpower from the present MOR, the study team does not feel any justification to declare a single post as surplus from MOR due to tackling of additional non-schedule workload apart from the schedule workload as per norms written in the manual of schedule maintenance of diesel loco.

CHAPTER-2

Existing scenario & critical analysis

2.0 Review of manpower vis-a-vis workload of BWN Diesel Shed based on B.M data.

2.1 While conducting the subject work study, the Section-wise entire activities in connection with schedule maintenance of Diesel Locomotives as per extent norms, have physically been observed by the study team. The Section-wise present deployment of staff (both Gr. 'C' & Gr. 'D') to cater the daily sectional workload has also been noted to know the total men-on-roll position at BWN DSL Shed in order to maintain the regular flow of out-turn smoothly & perfectly.

2.2 While conducting the study, the category-wise existing sanctioned strength vis-a-vis Men-on-roll position as on 31/7/2018 has been collected from DME(DSL) / HWH for BWN Diesel Shed which may be seen from the following table. The breakup of staff strength of BWN Diesel shed furnished by DME/DSL/HWH is enclosed in the report as Annexure-'A'.

TABLE-'A'

Sl. No.	Category/Designation	Existing Sanctioned strength	Existing Men-on-roll	Vacancy
1	Supervisor (SSE & JE)	56	39	17
2	Ministerial staff (GR-C)	31	19	12
3	Peon(erstwhile GR-D ministerial staff)	05	04	01
4	Inspector	02	01	01
5	Laboratory	16	9	07
6	Direct maintenance staff. Artisan Gr.C (Diesel Mechl & Elect.)	287	226	61
7	Direct maintenance staff. Artisan Gr.D (Diesel Mechl & Elect.)	69	123	-54
8	Ancillary Staff. Artisan Gr.C	47	20	27
9	Ancillary Staff. Artisan Gr.D	18	15	03
10	Staff for handling fuel, Lubricants & Stores	05	00	05
	TOTAL	**536**	**456**	**80**

2.2.1 The category wise sanctioned strength vis-à-vis Men-on-Roll position of BWN Diesel shed duly signed by DME/DSL/HWH, is furnished below in a summarized form (Table-'B') This position of staff strength of BWN DSL Shed as on 31-07-2018 has been furnished by DME/DSL/HWH which is enclosed as Annexure-'A'.

TABLE-'B'

Sl. No.	Description	Gr-C		Gr-D		TOTAL	
		S/S	MOR	S/S	MOR	S/S	MOR
1	Direct Maintenance Staff	343	265	69	123	412	388
2	Ancillary Staff	47	20	18	15	65	35
3	Supporting Staff	59	33	-	-	59	33
	Grand Total	**449**	**318**	**87**	**138**	**536**	**456**

The above table reveals that the present MOR as on 31.07.2018 is 456 as against the present sanctioned strength of 536 posts in total.

2.3 During study period, the existing deployment of staff in BWN Diesel Shed has also been collected from the authority of Diesel shed by the study team as evident from annexure-B which reflects a total MOR of 446 staff as on 23.08.2018. The total MOR shown in annexure-A is 456 as shown in table – A and B above, whereas the total MOR shown in annexure-B is 446 which is furnished below in table –C. This variation of MOR is mainly due to retirement during the month of July, 2018.

Therefore, the total MOR of BWN Diesel Shed has been considered as 446 instead of 456 inclusive of supporting staff. In course of conducting the study, the existing deployment of staff at BWN diesel shed has been collected by the study team which is shown in a summarized manner in the below mentioned table –C. This position has been given by SSE (I/C) /BWN diesel shed which is evident from annexure-B.

TABLE-'C'

B.U.NO.	DESCRIPTION	MOR		Total MOR
		Group-'C' Artisan	Group-'D' Helper	
600	Direct Maintenance Staff (Electrical)	88	33	121
60	Ancillary Staff (Electrical)	20	14	34
601	Direct Maintenance Staff and Ancillary Staff (Mechanical)	145	70	215
267	Laboratory Staff	5	3	8
268	Supervisor	38	0	38
268	Ministerial	19	4	23
573	Canteen Staff	01	6	7
	TOTAL	**316**	**130**	**446**

2.3.1 **T**he above stated table indicates that the present deployment of manpower at BWN Diesel Shed is 446 as a whole inclusive of rest giver & leave reserve and these staff are utilized for the day to day outturn of BWN diesel shed as a routine measure.

2.4 As the main object of conducting the subject study is to assess manpower of BWN DSL Shed based on Bench marking concept, the B.M. data of Diesel sheds as on 20/09/2018 have been tabulated below as per Annexure-'C'. Here, the shed wise workload in terms of number of loco and the corresponding MOR have been furnished below as per position given by **CMPE/ER on 20/09/2018 which is shown in Annexure-C.** :

TABLE-'D'

Sl. No.	DSL Sheds of E. Rly	DSL Loco holding	Total MOR	Actual holding of Locos at present	Shed-wise MPR of E. Rly	I.R. Avg MPR	IR Benchmark MPR
1	UDL	≥80 Locos	552	160	3.45	4.20	3.05
2	HWH	≤80 Locos	371	65	5.71	**5.03**	**1.96**
3	**BWN**	**Do**	**407**	**73**	**5.58**		
4	JMP	Do	349	57	6.12		
5	BGA	Do	132	27	4.89		

N.B.- It is realised during study period that the position of MOR as per Annex-'C' i.e. deployment of 407 staff has been calculated for the BWN diesel shed by excluding an engagement of 39 staff who are deployed in the field of ministerial activities, canteen's workload & for the training purpose.

2.4.1 The above table (table-D) indicates the shed wise position of MOR vis-a-vis holding of Diesel Locomotive.

In this regard, it may be stated that the total MOR position of 446 staff furnished by the authority of BWN diesel shed as per table-C includes a group of 39 staff comprising 23 ministerial staff, 07 canteen staff & 9 artisan staff (usually booked for training) . Hence, during adoption of benchmarking concept, the MOR of BWN diesel shed is considered as 446 inclusive of R.G.& L.R instead of 407 staff. Therefore, the study team has reviewed the necessity of retention of total manpower of 446 staff at BWN diesel shed, consequent upon the present scenario of BWN diesel shed.

2.4.2 Over and above, it may be said that the existing sanctioned strength of BWN diesel shed is 536 which is evident from the position given by DME/D/HWH (Enclosed as Annexure-'A') and the actual MOR is taken as 446 as per position given by the BWN diesel shed in charge (Enclosed as Annexure-'B'). During assessment of manpower, bench marking formula has been applied to review the necessity of retention of 446 staff at BWN diesel shed.

2.4.3 During the period of conducting the subject study, it is noticed that 446 staffs inclusive of R.G & L.R are presently deployed at BWN diesel shed for the daily outturn of loco as per schedule. These staffs comprise direct maintenance staff, ancillary staff, miscellaneous staff, laboratory staff, stores staff, canteen staff & ministerial staff deployed in BWN diesel shed. A major percentage of these staff is deployed in general shift (from 8-15 a.m. to 5-15 p.m. having an intermission

of 1 hour from 12-30 p.m. to 1-30 p.m.) and some staff are deployed in 3 shifts. in a skeleton structure which is shown in table-C based on Annexure-B. This deployment of 446 staff also includes distribution of 9 staff in stores, 8 staff in laboratory, 23 ministerial staff in office, 7 staff in canteen & 09 Artisan staff usually booked for training. Therefore, it is clear that 446 staffs are utilized to maintain 73 diesel locomotives at BWN diesel shed. The bench marking data given by CMPE /E.Rly is shown in annexure-'C' which indicates the MOR of 407 staff against a total holding of 73 diesel locomotives at BWN diesel shed excluding 39 staff comprising 23 ministerial staff, 7 canteen staff & 09 Artisan staff usually booked for training. However, the study team has considered a total MOR of 446 staff as per table-C, while B.M. concept is applied to assess revised manpower at BWN diesel shed.

2.5 After summarizing the staff position of BWN diesel shed shown in Annexure-'A', 'B' & 'C and the corresponding tables ' A to D', a summarized statement in a tabular form is shown as under.

TABLE-'E'

Staff position given by Sr.DME/DSL/HWH as per Annex-'A' (Position as on 31/7/18)		**Staff position given by SSE/In charge/BWN DSL Shed as per Annex-'B' (Position as on 23/8/18)**	**Staff position given by CMPE /E.Rly in course of furnishing the B.M.Data as per Annex-'C' (Position as on 20/9/18)**
Total Sanctioned Strength of BWN DSL Shed.	**Total MOR of BWN DSL Shed.**	**Total MOR of BWN DSL Shed. (Position as on 23/8/18)**	**MOR of BWN DSLShed**
536	**456**	**446**	**407**

The above table reveals that, there is a difference in MOR position in each case. After reviewing the staff position of the shed, it is clear that the latest MOR of BWN DSL Shed is 446 in total and it is hereby concluded that the MOR position of BWN DSL Shed given by CMPE /ER is found to be 407 staff which excludes the position of 39 staff comprising ministerial staff, canteen staff and staff booked for training.

2.6 At the outset, it may be concluded that the MOR position of 446 staff as per B.M.Data (Table-D) has been considered during assessment of revised requirement of staff based on benchmarking concept.

2.7 So far out-turn of BWN DSL Shed is concerned, the shed has a total holding of 73 diesel locomotives with a following break-up as on 20-09-2018.

WDM2	-	02
WDM3A	-	67
WDG3A	-	04
Total	-	73

Average daily outage of locos as per shed's position	=	60
Loco in hand for maintenance	=	07
Locos sent for chassis re-building work	=	06
TOTAL	=	73 Locos

These locos require the following types of schedule maintenance as a routine measure.

1) Trip Schedule. It is done at an interval of every 20 days.
2) M4, M8, M16, M20, M28, M32, M40 & so on. This is 4 monthly maintenance schedules as per norms (also known as Qrly schedule).
3) M-12, M-36, M-60, M84 - Maintenance schedule (known as Half Yrly Schedule)
4) M24, M48, M72, -- Major maintenance schedule (known as Yearly Schedule)
5) On completion of every 8 years of schedule maintenance of Diesel Loco at diesel sheds, the diesel loco is sent to JMP workshop for POH after 8 yrs instead of doing 8th yearly Schedule at the shed.

2.7.1 During physical observation, it is noticed that the entire workload of each & every sections in different shifts inclusive of ministerial workload & canteen's workload is borne by these 446 staff (inclusive of RG & LR) very efficiently.
These following matters have been noticed by the study team.

1) Skillness of technicians is much better.
2) Idle-Hrs of technicians is very less i.e. Effectiveness is found much better.
3) Mechanized system of workings has reduced a reasonable Man-Hrs.

2.8 It is observed during field study that both Gr.'C' & Gr.'D' Artisan staff comprising direct maintenance staff , Ancillary staff & Other supporting staff have been divided & sub-divided into different sections in different shifts including General Shift based on the section-wise schedule & non-schedule maintenance workload including trip schedule work being worked out by the shed authority. This staff strength includes the provision of rest giver and Leave Reserve for the day to day outturn of the shed.

2.8.1 In order to arrive at the conclusion regarding revised requirement of manpower at BWN diesel shed, it is felt justified by the study team to adopt the concepts of Benchmarking.

Concept of Benchmarking:-

Benchmarking is a continuous process of measuring an organization's product, services, processes and practices against the most successful competitors which have established themselves as leaders in the field and then learning how the excellence was achieved by them, so that the system can be set and the processes put in place to match or even surpass them. In other words, benchmarking is the implementation of best practices.

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

Among the various quality and productivity management tools available to the organizations, benchmarking is one of the best tool that can be used without much prior preparation and the costs. This technique helps to work out the way in discovering and implementing the best practices in the industry with a sense

of achievement. The staffs would feel that, they are capable of improving upon even the best in their industry.

2.8.2 Objectives of Benchmarking:

The main purpose of the benchmarking is basically to establish more practical goals following the footsteps of the leader in the industry. It can be termed as a first step in a direction setting process & it is a means by which the practices needed to reach the new set of goals, are discovered and implemented.

From an organizational point of view, benchmarking seeks to legitimize goals and directions by passing them on external orientation. It is a good means to set targets based on extrapolation of past practices. Since benchmarking is a good tool to implement the best Practices as to enable the organization to continuously compare them with the best of the industry.

2.8.3 Benchmarking on Indian Railways:

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.

The main object of 'benchmarking' is to improve the productivity index by rightsizing the manpower of each and every activity centers. It is a continuous process to compare the manpower productivity ratio between the activity centers of similar nature. With the introduction of modernized system of working & upgraded infrastructure along with adoption of concept of outsourcing, the MPR values are found to be better day by day. That is why the scientific tool of benchmarking has been applied here which is more acceptable to assess the revised requirement of manpower based on MPR value.

2.8.4 Effects of Benchmarking:

A continuous improvement of productivity index is achieved by following the benchmarking concepts of all activity centers. A fresh look at old way of working and emphasis on innovative work practices result in diminishing resistance to change and improvement of work culture. There is a growing realization that unless the railways remain competitive by cutting unnecessary costs, the railways men can't think of a bright future for them. During the current year alone, Railways are reported to have saved a huge amount in expenditure through costs reduction measures.

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 which ultimately results in enhancement of staff productivity level. Improved staff productivity has not only enabled Indian Railways to pay better emoluments to its staff and make higher allocation towards other staff welfare activities but, it has also helped Railways to induct new technologies in all spheres of working.

2.9 As the main object of conducting the subject study is to assess manpower in BWN DSL Shed based on Bench marking concept, the study team has formulated the following table based on data collected during physical observation.

DSL Shed	DSL Loco holding	Total MOR	Actual holding of Locos at present	MPR	I.R. Avg MPR	IR Benchmark MPR
BWN	**≤80 Locos**	**446**	**73**	**6.11**	**5.03**	**1.96**

N.B.: The Bench marking calculation has been done based on the actual MOR position of 446 staff based on Annexure-B instead of considering 407 staff shown in Annexure--C against BWN diesel shed.

2.9.1 However, as per B.M. data, the BGA Diesel Shed has presently been benchmarked amongst all DSL Sheds over E. Rly which reflects the MPR of 4.89 i.e the. Best MPR amongst MPRs' of all Diesel Sheds over E.Rly having loco holding of less than 80 locos and it is better than IR-Avg. MPR of 5.03 which is shown in Annexure-D.

The above position reveals that the MPR value of BGA Diesel Shed may be benchmarked amongst all other DSL Sheds over Eastern Railway and its MPR value is almost nearer to the IR Average-MPR Benchmark value of 5.03.

Railway Board used to update the MPRs of all Diesel loco sheds based on figures supplied by Zonal Railways to compare MPRs' of similar activity centers over Indian Railway. It is observed that there is a wide variation in the MPRs' (manpower productivity ratio) among different sheds and Railways.

The Railway Board has advised time to time that every sections / activity centres of the organization should try to achieve the IR Avg. MPR of similar activities in the 1st phase and then try to achieve the Indian Railway benchmark of that activity. In calculation of IR avg. MPR of Diesel Loco Sheds, all types of locos and infrastructures available in Indian Railway are accounted in a systemic manner. Hence it is very much scientific to follow the IR avg. and the Railway Board is pressing hard to achieve the IR avg. in the 1st phase to those loco sheds that are above the avg. MPR. As per latest figure of Benchmarking data available with us (enclosed as Annexure-D), it is made clear that **the avg. MPR of Diesel loco shed in Indian Railway is 5.03.**It implies that modernized methods of doing work in diesel shed and also improvement of infrastructures in sheds resulted in improvement of MPR in Indian Railway. But, the MPR of BWN Diesel shed as on 20-09-2018 is found to be 6.11 which is higher as compared to **IR avg. MPR of 5.03**.

To achieve the **IR avg.MPR of 5.03, the MOR strength of BWN Diesel shed should be 368 (73 locos x 5.03= 368) instead of present MOR of 446 staff (as per Annex-B). Hence, 78 posts (446-368=78) are found surplus against present MOR of BWN Diesel shed, if Indian Railway average MPR of Diesel Loco Sheds is considered.** The ministerial staff, canteen staff & staff booked for training have been included during adoption of Benchmarking concept.

2.9.2 During study period it is noticed that the shed authority often faces difficulties to cater to the daily outturn due to roster-wise more absence of staff beyond the norms of L.R. In order to avoid this crisis of manpower due to additional absence of staff without intimation, it is felt justified by the study team that a few staff may be provided in addition to the assessed manpower of 368 staff as per the concept of B.M. On scrutiny, it is also felt justified to deploy additional

manpower proportionately in Gr.-C (Tech.) & Gr.-D categories due to additional workload arisen out on daily measure for maintaining the over-aged locos & old locos apart from the schedule maintenance of DSL Locos as per maintenance schedule written in the Manual. In order to maintain qualitative vis-a-vis quantitative maintenance out-turn of DSL Locos as per schedule, the excess 78 posts of BWN Diesel Shed as envisaged by the study team as per B.M. concept, may presently be retained instead of surrender of the surplus posts.

Consequent upon the above stated analysis, the excess posts of 78 staff may be retained under the present situation. In this regard, it may be mentioned that the present staff strength (i.e MOR of 446 staff) deployed in different sections at BWN Diesel Shed does not leave any scope of surplus under the present situation. Hence, the present deployment of 446 staff shown in Annexure-B should continue.

2.9.2.1 Conclusion:- Consequent upon the analysis made in para 2.9.2, it is concluded that the present MOR of 446 staff (as per Annexure-B) should be retained under the present situation instead of surrender of 78 posts from the present MOR.

2.10 The revised sanctioned strength as against a total present sanctioned strength at BWN diesel shed has been assessed by the study team which is as under,

Staff position given by Sr.DME/DSL/HWH as per Annex-'A' (Position as on 31/7/18)	**Staff position given by SSE/In charge/BWN as per Annex-'B' (Position as on 23/8/18)**	**Actual Requirement of staff at BWN diesel shed as on 25/9/18 i.e. Revised MOR (including R.G & L.R)**
Total Sanctioned Strength of BWN DSL Shed.	**Total MOR of BWN DSL Shed. (Position as on 23/8/18)**	**Revised sanctioned strength of BWN DSL Shed in total**
536	**446**	**446**

2.11 The revised sanctioned inclusive of R.G & L.R as against the present S/S of BWN Diesel shed is shown as under.

Present S/S (As per Annex-A)	**Present MOR (As per Annex-B)**	**Revised S/S as assessed (Including all activities)**	**Surplus**	**Para Ref**
536	446	446	90	2.10

The above stated table reflects that the revised sanctioned strength, as proposed by the study team, will be 446posts in total as against a total present sanctioned strength of 536 posts which would result in surplus of 90 posts. On scrutiny, the study team is of the opinion that these 90 incumbent free surplus posts may be surrendered from the bottom most categories or from any categories whichever will be felt justified by the concerned department.

2.11.1. <u>Recommendation</u>

It is recommended that the revised sanctioned strength of BWN Diesel Shed will be 446 in total as against the present total sanctioned strength of 536 posts which will result in surrender of 90 posts from the BWN diesel shed.

CHAPTER-3

3.0 Financial Appraisal

Consequent upon the recommendation made in Para 2.11.1 of Chapter-2, the annual financial savings of recurring nature is worked out to Rs 4.5 Crores (approx.) due to surrender of 90 posts from BWN Diesel Shed in consideration with average basic pay at the lowest category of Gr. C posts.

Thus, the annual financial savings will be Rs.4.5 Crores (Approx), if the recommendation made in the subject work study report is fully implemented by the concerned department.