CHAPTER-I

INTRODUCTION

1.1 Work Study on "Review of TRD staff of Bhopal division" has been taken as a 'Crash Work Study' for the year 2018-19.

1.2 Electrical department plays a vital role in train movement. In India, 18% trains run by electricity. It is the target of Indian railway that all trains will move with electric engine instead of diesel engine in future.

1.3 The electric department functions in different wing, which are as follows:

1. Electric General Services
2. Traction Rolling Distribution (TRD)
3. Traction Rolling System (TRS)
4. Traction Rolling Operation (TRO)
5. Construction

1. Electric General Services – Supply of electricity to Service and residential buildings, train lighting, pump houses etc.

2. Traction Rolling Distribution (TRD)- To supply electricity to wire for sub station from which distribute to line.

3. Traction Rolling System (TRS)- To maintain electric loco and electric loco sheds.

4. Traction Rolling Operation (TRO)- The main work of TRO is to control Drivers, Train Operation and loco movements.

5. Construction- construction work is different of electric department.

1.3.1 TRD :

TRD responsible for manning and maintenance of-

1. Over Head Equipment
2. Power Supply Installation

3. Remote control

1.3.2 I. Activities of OHE:

(A) Tower and checking

1. AOH of Cantiliver
2. POH of Cantiliver
3. Insulator cleaning
4. Height of contact and catenary's wire
5. Contact wire measurement
6. Curved collection, location, attend
7. Jumpers, splice, staggers etc.
8. X-over and Turnout

(B) ACD (Auto Tensioning Device):

1. POH of ACD
2. AOH of ACD
3. Wire cutting

(C) Bonding work:

1. Earthing of Mast
2. Earthing to rail to rail (Rail Bond)
3. Earthing of Track (Station area Bonding work)
   {with the co-ordination of Engg. & Signal deptt.}

(D) Tree cutting and other deptt.

1. IOW
2. BRI
3. Insulator maintenance

1.33 II. Activities of PSI:

(A) Feeding Post:

1. Transformer POH
2. Transformer AOH
3. Quarterly maintenance
4. Monthly maintenance

(B) Switching station:

1. SSP
2. SP

(C) Auxiliary Transformer:

1. LC gate
2. Station
3. Signal & Supply

1.3.4 III. Remote Control:

1. Batteries maintenance to all faculties {for example – SSP,SP,FP}
2. Vehicle Battery

There are four kinds of traction in Indian Railway:

1. 25 KV
2. 2 X 25 KV
3. 1500 V DC
4. 4000V

1.4 DUTIES OF TRD OFFICERS & SUPERVISORS AS PER ACT:

1.4.1 Duties of Traction Distribution (TrD) Officers :

1	The officer in immediate charge of the Traction Distribution section in a Division, responsible for all technical and organizational matters connected with the efficient maintenance and operation of the power supply installations, OHE and RC equipment.
2	He should be intimately acquainted with the technical details, performance rating and operating and maintenance problems of the installations under his charge.
3	His chief duties will be as under :- a) General planning and supervision to ensure efficient and safe maintenance and operation of the installations under his charge in accordance with prescribed schedules and regulations;
	b) Study of the day-to-day technical and organizational problems of operation and maintenance and initiation of appropriate measures to deal with these;
	c) Man-power planning for effective maintenance at minimum cost;
	d) Careful statistical analysis and compilation of details of all defects and failures occurring and initiation of appropriate remedial steps if these are attributable to inadequate or improper operation or maintenance or mis-management by staff. Where defects are attributable to improper design or manufacture, or where modifications or proposed remedial

	measures require CEE's approval, prompt submission of detailed analysis together with recommendations, seeking such approval;

1.4.2 Duties of Chief Traction Power Controller:

1	Study of all failure reports of OHE, switching stations etc. daily especially in so far. as they affect the operation of trains and submit connected periodical reports to AEE (TrD). He shall maintain complete statistical data relating to operation of RC equipment and ensure that the schedules of maintenance are carried out regularly;
2	Maintenance of close contact with the Chief, Deputy and Section Controllers, TPC and ATPC, TLC Sr DEE (TrD) and AEE (TrD) and study of all problems relating to train operations, as far as the Traction Distribution Branch is concerned, to seek solutions;
3	Scrutinize the Log Book and the Shift Duty Register once a day and ensure that they are properly maintained and action as necessary is taken;
4	In an emergency or disorganization be in direct touch with the Traffic Control Office and help in every way to restore and maintain the train services and take over operation of power control himself, if required;

1.4.3 Duties of the TPC/ATPC are as under :

1	When taking over shift duty, he should acquaint himself with the prevailing position of the entire section including working of the RC equipment, condition of all transformers, circuit breakers, interrupters and isolators, sections under power block, any special instructions to be carried out, movements or important officials connected with the traction distribution system, position of the OHE Inspection Cars and breakdown vehicles etc.;
2	Maintain continuous contact with the Power Supply Authorities;
3	Maintain continuous contact with the Traffic Section Controllers in regard to power supply affecting train movements, imposition of power blocks etc.;
4	In the event of power supply interruptions or other failures, take prompt action in accordance with prescribed rules and local instructions for restoration of supply;
5	Imposition of and removal of power blocks as required, following the prescribed procedure and safety rules.
6	In the event of power supply failures, OHE break-downs, accidents etc. in the electrified section, advise promptly the concerned

	Foreman, AEE, DEE/Sr. DEE (and other officials in accordance with local instructions), and keep them posted with ail important developments;
7	Record in the Log Book, on prescribed proforma, full details of all switching operations carried out, power blocks imposed or refused (or delayed) and other occurrences in the distribution system;
8	Maintain the following registers and records in the proforma prescribed :- (i) Shift Duty Register indicating points of importance including messages, movements of ODC involving power blocks and other details to be noted by following shifts. (ii) Record of standing instructions. (iii) Register of temporary instructions. (iv) Register of Staff Movements; (v) Emergency Telephone Testing Register. (vi) Register of train delays due to failures of signal supply. (vii) Weather forecast register.

1.4.4 Duties of Senior Section Engineer, Power Supply Installations (PSI):

1	He is the senior supervisor working under the control of DEE/AEE (TrD) and directly responsible for the safe and efficient operation and maintenance of traction power supply installations including sub-stations (when owned by the railway),
2	Switching stations, booster transformers and auxiliary transformers in his jurisdiction. He shall be thoroughly conversant with all technical details of the equipment under his charge including their rating, trend of power demand as also correct methods of their operation and maintenance.
3	In particular, he shall a. supervise the maintenance of installations under his charge in accordance with the prescribed schedules to keep them fully serviceable at all times and in a state of good repair;
	b. maintain proper co-ordination with the Traction Power Controller. Chief Traction Foreman (OHE). Supply Authorities and render assistance when required to ensure reliability of power supply;
	c.Keep his organisation in constant readiness to deal promptly with any breakdowns and failures of equipment;
	d. ensure that the programme of testing and maintenance of protective relays is adhered to and ensure that other safety equipment including bonding and earthing are functioning effectively;
	e. instruct, train and supervise staff under his control and ensure

	that they do operate and maintain the equipment properly and in particular do actually observe all rules and regulations and safety precautions laid down;

1.4.5 Duties of Senior Section Engineer, Overhead Equipments (OHE):

1	He is the senior supervisor working under the control of Sr. DEE/DEE (TrD) and directly responsible for the proper maintenance of OHE including the 25 KV feeders and return feeders from the traction sub-stations to the feeding posts.
2	He should be fully conversant with the lay-out and sectioning of OHE in his jurisdiction as also the rules and procedures laid down for efficient maintenance of OHE and safe working on OHE.

1.4.6 Duties of Field Supervisors:

The field supervisors' in-charge of OHE (ATFO, chargeman, Inspector etc.) will be under the CTFO (OHE) and each supervisor will be responsible for the following:

1	Maintenance of the OHE and allied installations in his jurisdiction in accordance with the prescribed schedules;
2	Submission of the requirements of power blocks for OHE maintenance, in coordination with permanent way maintenance as far as possible, so as to take maximum advantage of traffic blocks;
3	Scrutiny of daily foot-patrol and other reports of defects and take prompt action to remedy the defects brought out;
4	Close supervision of the maintenance gang under his control to ensure a high standard of work and compliance with prescribed schedules-.
5	Keeping the organization under his control in readiness to deal with break-downs;
6	Guidance to the maintenance staff for the proper execution of work in accordance with standing instructions.
7	Ensuring that tools and equipment under his charge are properly cared for and maintained in proper condition.

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CHAPTER-II

2. TRD Department

2.1 Sanctioned strength, men on roll and vacancy position of staff is as under:-

Category	Pay Band	S.S.	M.O.R.	VAC.
SSE(TRD)	4600	50	42	08
JE(TRD)	4200	25	25	0
Total		**75**	**67**	**08**
Tower Wagon Driver	4200	12	10	02
Total		**12**	**10**	**02**
Sr.Tech./electrical	4200	16	14	02
Tech(OHE)-I	2800	44	40	04
Tech(OHE)-II	2400	20	14	06
Tech(OHE)-III	1900	31	25	06
Total		**111**	**93**	**18**
Tech(PSI)/FTR Elec.	4200	10	08	02
Tech(PSI)-I	2800	26	22	04
Tech(PSI)-II	2400	12	16	+4
Tech(PSI)-III	1900	17	12	05
Total		**65**	**58**	**07**
General Fitter Cum Diesel Mechanic Sr.Tech	4200	02	02	0
Tech(GF/DM)I	2800	05	04	01
Tech(GF/DM)I	2400	02	02	0
Tech(GF/DM)I	1900	01	01	0
Total		**10**	**09**	**01**
Tech.(Painter)-I	2800	01	01	0
TechI	2400	01	01	0
TechII	1900	01	02	+1
Total		**03**	**04**	**+1**
Tech.(welder) I	2800	01	02	+1
TechII	2400	01	0	1
TechIII	1900	01	01	0
Total		**03**	**03**	**0**
Tech (Black smith) I	2800	01	01	0

TechII	2400	01	0	01
TechIII	1900	0	0	0
Total		**02**	**01**	**01**
Tech (Carpenter)I	2800	10	04	06
TechII	2400	04	03	01
TechIII	1900	04	02	02
Total		**22**	**11**	**11**
T.W.Cum Vehicle Driver (other than Divisional Pool) MCM	4200	01	01	0
TechI	2800	04	03	01
TechII	2400	02	0	02
TechIII	1900	0	01	+1
Total		**07**	**05**	**02**
Helper	1800	266	221	45
Total		**266**	**221**	**45**
Peon	1800	05	05	0
Safaiwala	1800	0	03	+3
Total		**271**	**229**	**42**
Grand Total		**559**	**480**	**79**

It may be seen from the above that the 559 men are on roll against 480 sanctioned posts and 79 posts are lying vacant.

2.2 Workload:

The various types of work is done in TRD departments, some of them are as under:

13	Maintenance of vehicle
2	Working of Semi skilled/Un skilled staff in department
3	Traction maintenance
4	Look after of power supply
5	Arrangements of insulators
6	Arrangements of retro reflective number plate on OHE mast
7	Protection of mast and others from collision.
8	Adjustments of contact wires.

2.3 Outsourcing:

2.3.1 Advantages of Outsourcing Activities:

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

2.4 Scope of outsourcing :

1	Repairing of Tower Wagon & scheduled maintenance activities.
2	Outsourcing for water stagnation due to improper drainage facilities.
3	Workload diminished due to technical upgradation.
4	Hiring of vehicle
5	Out sourcing of Semi skilled/Un skilled staff for OHE maintenance work.
6	Out sourcing of non core activities for maintenance of batteries, lights, fans and their cleaning in TL coaches at Train lighting maintenance depot.
7	Material purchasing
8	Material supply
9	Vehicle maintenance
10	Corrosion resistant paint system for outdoor structure ot Traction Distribution.
11	Slewing or aterrations of track, involving adjustment of contact wire.

2.5 Benchmarking of TRD staff (Non- suburban) of Indian Railway is follows:

SN	**Division**	**Benchmarking Men per TKM**
1	GTL	0.19
2	BPL	0.36
3	IR	0.33

As per above, benchmarking of BPL division is less than IR average. Man powers at Bhopal division in use are more than the other mentioned division (as mentioned above).So, more manpower exist in Bhopal division.

2.6 Critical Analysis:

There are so many activities have been out sourced in other railways. Modifications and up gradation of machinery and methods of working has implemented in the shed, time to time.

Outsourcing of various activities saves a lot of valuable man hours which results to save the manpower.

As per para 2.2.2 benchmark of BPL is much higher than IR average and current Benchmark is of GTL division of SCR. It needs to be diminished.

Workload is also minimized due to technical up gradation in this department. There are so many works that can be outsourced as other railways.

Vacancies of 79 posts are lying in various cadre which may be filled up by giving promotion to the adjacent higher grade.

50% of 79 vacant posts= 40 which can be surrendered.

2.7 Recommendation:

There are so many categories are redundant for activities. So, 40 vacant posts of different categories are proposed for surrender immediately which is lying vacant from a long period.

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CHAPTER-III

3 FINANCIAL IMPLICATION

3.1 Anticipated financial implication on the surrender of 40 posts of various cadre of TRD department will be as under-

Particular	Amount
Mean of grade	37,450
DA@7%	2622
Transportation	1800
Salary Per Month	41,872
X 12 = Per annum	5,02,464
X No. of posts (40)	2,00,98,560
Say	2.00 Crore

On surrender of above 40 surplus posts, the anticipated saving works out to **Rs. 2.00 Crore per annum.**

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