

## **ACKNOWLEDGEMENT**

The Central Planning organization takes this opportunity to express hearty thanks to the Officials and staff of Electrical Department of Vijayawada Division for their valuable guidance and co-operation in compilation of the report.

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## **METHODOLOGY**

The Work Study department has applied the following techniques for completion of the Work Study.

1. Collection of the details of workload particulars.
2. Interaction with all the Staff and Officers on the Division.
3. Critical examination of the existing system of working and
4. Assessment of manpower requirement for existing workload.

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### **పాఠశాల SYNOPSIS**

- Subject: Review of Staff Strength of Electrical General Services over Vijayawada Division.
- Authority: Railway Board's Annual Programme of Work studies 2018-19.
- Study No: WSSCR-11/2018-19
- Reference File No: G.276/2/WSSCR-11/2018-19.

- Area of Activity: Vijayawada Division.
- The Central Planning cell of South Central Railway has taken up the Work study on the "Review of staff strength of Electrical General Services over BZA Division" in order to study the available manpower in comparison with the current IR Average and to thus identify if any excess staff is available, with a view to right size the manpower.
- The primary responsibility of General Electrical branch is multi dimensional ranging from maintenance of electric power supply to various railway establishments, air-conditioning of various assets to primary and secondary maintenance of trains.
- The job of General Electrical Service branch is divided into two major wings i.e. (a) Power maintenance and (b) Air Conditioning & Train lighting.
- **Summary of SAVE position of General Electrical Service Staff:**

Sl. No.	Sanction	Actual	Vacant
1	831	685	146

- It is observed from the scale check of Electrical General Services staff of Vijayawada Division, there are 831 sanctioned staff (including office staff), 685 staff on roll with 146 vacancies existing in different grades.
- It is seen that the technological development in Electrical department of the Railway is going in leaps and bounds and day by day modernized equipment are pressed into service which are not only having technologically improved features and also requires least or no maintenance or at the most maintenance consisting of replacing of a unit/module completely.
- It may be pertinent to mention that the maintenance activities wherein high sophisticated professionalism is involved have been outsourced; hence IR Average Benchmarking is taken into consideration.
- The activities which are outsourced /covered under AMC of electrical power maintenance and TL&AC is as follows:
  1. Lifts Maintenance
  2. Escalators Maintenance
  3. Operation Contracts(Lifts)
  4. Operation Contracts(Escalators)
  5. Booster Pump Maintenance& operation
  6. Hiring Contracts
  7. DG sets Maintenance
  8. AC and Water coolers Maintenance
  9. Maintenance of non-core activities of Batteries, Lights, Fans and their cleaning in TL coaches.
  - 10.ELUs Maintenance
  11. power car Maintenance
  - 12.RMPUs Maintenance
- March -2018 IR average and Bench Marking is as follows:

S No	Department	IR Average	IRBM
1	Power Maintenance	0.18	0.08
2	TL&AC	0.45	0.16

- Application of Benchmarking Norms: Benchmarking is based on dynamic and comparative analysis and is a very useful tool to manage efficient deployment of staff and monitor effects of improvement in working practices,

use of new technologies and level of outsourcing. Board also insisted all units to achieve Indian Railway Average Benchmarking.

- Keeping the above in view, the Work-study team made an analysis on the requirement of staff based on the following references:

a) Lr.No.2011/E&R/2800/Rly.imp.vol VI/(Corr) dated 09.06.2016 wherein it is stated to bring down the manpower ratios for activities which are above the IR Average at least to the current IR Average.

b) No. of activities under outsourcing/AMC.

- **Requirement of Staff as per IR Average.**

**a) Power Maintenance:**

Work load of Power maintenance is measured in terms units of power consumed and the following are the details of power consumed and requirement of staff:

A	Electrical Power consumption for 12 months (April 2017-March18)	25070914
B	Average Electrical power consumption per month	2089243
C	Solar power consumed for 12 months (April 2017-March18)	20959
D	Average Solar power consumption per month	1746.58
E	Average power consumption (Electrical+solar) per month=B+D	2090989.58
F	IR average for the month of March-2018	0.18
G	Staff required as per IR average (0.18 per 1000 units) = $E \times F$ ( 2090.99x0.18)	376.37 <b>377 Men</b>

- **Train Lighting and Air Conditioning:**

- **Coach holding of the Division:**

S No	Type of coaches	No.of coaches
1	Train Lighting	629
2	AC coaches	140
3	Power cars	04
5	Break down coaches	04
	<b>Total</b>	<b>777</b>

- Staff required to attend TL/AC failures and turn round attention at nominated way side stations as follows:

S No	Station	Required staff (per day)
1	Vishakhapatnam	(2 in each shift)6
2	Tuni	(2 in each shift)6
3	Rajahmundry	(2 in each shift)6
4	Eluru	(2 in each shift)6
5	Bhimavaram	(2 in each shift)6
6	Tenali	(2 in each shift)6
7	Ongole	(2 in each shift)6
8	Bitragunta	(2 in each shift)6



portion of expenses being staff expenses, all out efforts have to be made to contain the same.

- 1.3 With a view to right size the manpower, Railway Board have chosen a few select areas and are monitoring the manpower available in those activities on all divisions of Indian Railways. This includes the study of "*Electrical General Services*".
- 1.4 It is seen that the technological development in Electrical department of the Railway is going in leaps and bounds and day by day modernized equipment are pressed into service which are not only having technologically improved features but requires least or no maintenance or at the most maintenance consisting of replacing of a unit/module completely. In fact with modern equipment nothing more can be done, except replacement of a defective unit/module, thus considerably lessening the onerous task of repairing each and every portion of any circuit.
- 1.5 In view of the above, the Central Planning Organization conducted Work study of Electrical General Services (Power) of Vijayawada Division over South Central Railway.
- 1.6 Vijayawada division is one of the important Divisions in which Electrical Department plays an important role in smooth running of trains and providing services. Its jurisdiction includes the following B.G Section with various Industrial sidings etc.
  - KI-BZA-GDR
  - BZA-DVD
  - BZA-GDV-MTM
  - GDV-BVRM-NS
  - BVRT-NDD

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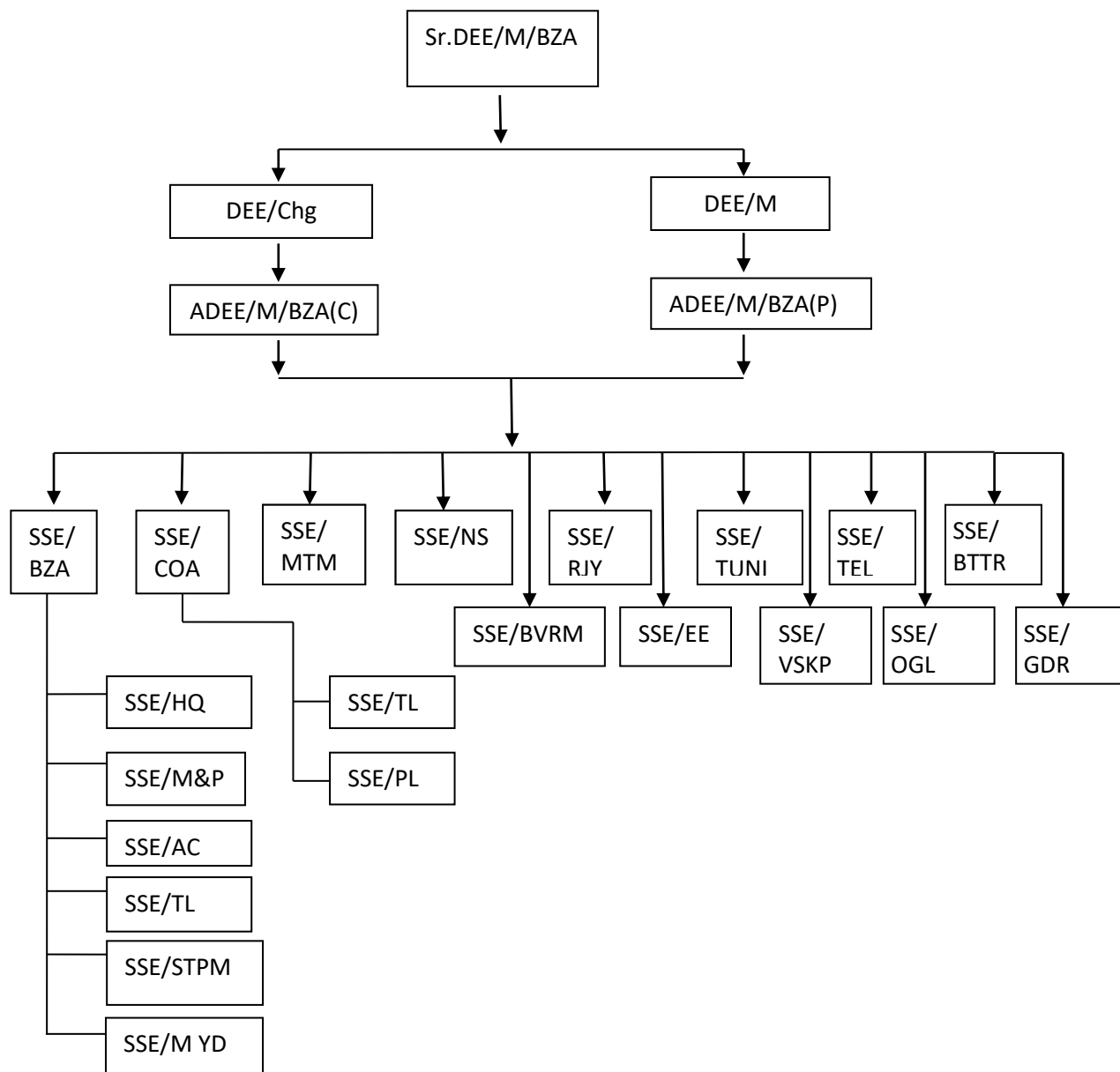
## ಇರಿಸುವಿಕೆ-2 **CHAPTER - 2**

### **2.0 EXISTING SCENARIO:**

**2.1 ORGANISATION:** An Electrical Engineer in Junior Administrative scale i.e. Senior Divisional Electrical Engineer is in-charge of all the Electrical assets on the Division and works under the administrative control of Divisional Railway Manager

**2.2** The Electrical Engineer in-charge of the Division is responsible to the Chief Electrical Engineer for the efficient maintenance and upkeep of installations

and maintains all Electrical assets on the Division. He is assisted by DEE/Chg, DEE/M, ADEE-I, ADEE-II and further assisted by supervisory officials as follows:



**2.3 Jurisdiction:** On Vijayawada Division under the General Services of Electrical Department there are 13 Units/ Depots, headed by respective SSEs/SEs. The extent of their jurisdiction with the contingents of staff and material for maintenance is detailed below:

1. SSE/M/BZA: six number of individual SSEs are deployed for HQRS,M&P,AC coaches, TL coaches, AC Maintenance, STPM and M-Yard. In-charge of units in the Division handles procurement and distribution of Stores and attends major repairs to AC units, pumps and D.G. Sets and other associated electrical equipments, EM& PRS.
2. SSE/M/COA: Two number of SSEs are deployed for Power Lighting(PL) and Train Lighting(TL).

3. SSE/M/MTM: TL& AC Maintenance is done at Machilipatnam. Power maintenance Jurisdiction comprises of Staff quarters at GDV, MTM, KVM. In addition to the staff quarters and station/office buildings in the section MTM-GDV-NDM.
4. SSE/M/NS: TL& AC Maintenance is done at Narasapur.
5. SSE/M/BVRM: Jurisdiction comprises of Staff quarters at BVRM Jn, NS, PKO, PAGM, BVRT, AKVD, KCLR and TNKU. In addition to the staff quarters, station/office buildings in the section KLDI-BVRT-OTR, BVRT-BVRMJn-NS
6. SSE/M/RJY: Jurisdiction comprises of Staff quarters at RJY, GVN, KVR, DWP, LN Puram. In addition to the staff quarters, station/office buildings in the section NDD-MPU.
7. SSE/M/EE: Jurisdiction comprises of Staff quarters at NDD, TDD, EE, VAT&NZA. In addition to the staff quarters and station/office buildings in the section MBD-NDD.
8. SSE/M/TUNI: Power maintenance Jurisdiction comprises of Staff quarters at TUI, NRP, AKP, ANV, YLM. In addition to the staff quarters, station/office buildings in the section DGDG-THY.
9. SSE/M/VSKP: Loco Running Room, TTE's Rest Room, RPF baraks, Officer's Rest House is maintained by PL staff. TL staff attends TL failure and maintenance.
10. SSE/M/TEL: Jurisdiction comprises of Staff quarters at BPP& TEL. In addition to the staff quarters and station/office buildings in the section BPP-PVD.
11. SSE/M/UGL: Jurisdiction comprises of Staff quarters at UPD, SKM, TNR, UGL. In addition to the staff quarters and station/office buildings in the section UPD-SPF.
12. SSE/M/BTTR: Jurisdiction comprises of Staff quarters at PGU, BTTR and KVZ. In addition to the staff quarters, station/office buildings in the section PGU-TTU.
13. SSE/M/GDR: Jurisdiction comprises of Staff quarters at GDR, VKT and NLR. In addition to the staff quarters, station/office buildings in the section GDR-NLR.

## 2.4 SAVE position of Electrical General Services is furnished below:

S.No	Category	Grade Pay	San	Act	Vacancy
SSE/SE					
1.	SSE/SE	4600	28	23	05
2.	JE.I&II	4200	11	11	0
	Sub total		<b>39</b>	<b>34</b>	<b>5</b>
Administrative/Ministerial					
3.	Ch.OS	4600	06	05	01
4.	OS	4200	17	15	02



5.	Sr.Clerk	2800	04	0	04
6.	Jr.Clerk	2400	0	05	-05
7.	Sr.Steno	4600	01	01	00
8.	SSE/Drg	4800	02	03	-01
9.	JE/Drg	4200	02	01	01
10.	Vehicle Driver	2400	03	01	02
11.	Jr.RS	1800	01	00	01
12.	Peons	1800	02	02	00
	Sub total		<b>38</b>	<b>33</b>	<b>05</b>
Train Lighting					
13.	Sr.Tech	4200	41	41	00
14.	Tech-I	2800	81	62	19
15.	Tech-II	2400	13	03	10
16.	Tech-III	1900	12	31	-19
17.	Khalasi Helper	1800	101	34	67
	Sub total		<b>248</b>	<b>171</b>	<b>77</b>
Air Conditioning					
18.	MCM	4200	13	13	0
19.	Tech-I	2800	26	21	5
20.	Tech-II	2400	04	01	03
21.	Tech-III	1900	14	17	-03
22.	ACCA	1800	02	02	00
23.	Khalasi Helper	1800	18	19	-01
24.	Khalasi HelperII	1800	32	138	-106
	Sub total		<b>109</b>	<b>211</b>	<b>-102</b>
Power Maintenance					
25.	Sr.Tech	4200	75	73	02
26.	Tech-I	2800	146	78	68
27.	Tech-II	2400	23	04	19
28.	Tech-III	1900	20	61	-41
29.	Khalasi Helper	1800	133	20	113
	Sub total		<b>397</b>	<b>236</b>	<b>161</b>
	<b>Grand Total</b>		<b>831</b>	<b>685</b>	<b>146</b>

**2.5 ACTIVITIES:** The main activities of Electrical Branch General Services (Power) are as follows:

- Power supply installations – HT/LT lines and maintenance of lighting in residential buildings, service buildings, welfare buildings etc.
- Power supply and maintenance of water pumping sets.
- Maintenance of standby Diesel Generating sets.
- Maintenance of Air conditioning equipments.
- Maintenance of fans, water coolers, air coolers, streetlights, decorative lights and any other electrical equipment in divisional and other offices & quarters.
- Conservation of Energy.

**2.5.1 General Services covers the maintenance of the following:**

**(a) Maintenance of Staff Quarters:**

Cleaning of fittings once in a month, replacement of fused bulbs, attending to emergency failure and repairs to wiring and fittings. Taking Meter reading once in six months, and keeping track of the occupation and vacation of Railway Quarters.

**(b) Maintenance of Pumps:**

The Maintainer has to pay attention to the following -

1. Replacement of glands, bearings, foot valves, non-return valves, Carbon Bushes and general repairs.
2. Slip ring cleaning and bowring the Motor.
3. Attending to leaks/ replacement of leather to the foot valves oiling.
4. Greasing of motor pumps, replacement of bearings, checking of bushes, slip rings, checking of single-phase protector.
5. Replacement of water seals, transformer oil and dashpot oil and replacement of Gland Packings for pumps and valves.
6. Maintenance of the electrical panel board/switch gears in the pump house"

**(c) Maintenance of Fans and Plug points:**

This includes "Checking of the fans, sending them for periodic overhauling, Plug points have to be replaced with new ones.

**(d) Maintenance of Sub-Stations:**

The staff is required for maintenance of transformers such as cleaning, checking oil levels and safety devices like bus bars, circuit breakers and records the reading shown in the voltmeter and ammeter for every hour, where the supply should be step down to the domestic purpose/ step up to the AC plant and pump house. Whenever power supply is shutting down, generator set has to be switched on for continuous power supply. To oil and lubricate fittings and charge batteries on a regular basis, while attending minor repairs.

**(e) Special Activities:**

In addition to the above, staff are deployed for:

- 1 Modification of Officers chambers.
- 2 Provision of computer terminals in the offices.
- 4 Various railway functions at Vijayawada Divisional office.
- 5 Provision of additional supply points to Air Coolers.
- 6 Provision of sensors for AC Plants in Officers chambers.
- 7 Maintenance of PRS, UTS & installation including satellite unit centers etc.

**2.6 STAFF DUTIES:** The duties of staff of Electrical Power Maintenance are furnished below:

**2.6.1 Duties and responsibilities of SSE/SE:**

**I. Technical duties:**

- a) Management of men, material and regular work concerning the depot maintenance.
- b) Steps for Energy Conservation.
- c) Assisting ADEE and Sr.DEE in all matters relating to smooth function of depot/ dept. and improvements in installation.
- d) Execution/supervision of contractual works, if any in the section/ jurisdiction.

- e) Exercising supervision over the maintenance or work done by the Electrical Maintainers (Technicians) and staff in accordance with the instruction of the officers.
- f) Testing, overhauling and carrying out of alteration to the existing electrical installations.
- g) Submit an annual return of all apparatus in service on his section to the Sr.DEE. Maintain liaison with APSEB for proper supply of Power.
- h) SSE(E)/HT/BZA looks after maintenance of HT Substations in Vijayawada Division and maintenance of HT/LT lines like HT Meter reading, transformer maintenance and trimming of tree branches in the entire Vijayawada Division.

**ii) General duties:**

- a) Stores matters.
- b) Staff matters.
- c) Enquires & Inspection.
- d) Unscheduled works like attending to Break down, major failures and accidents, accompanying Officers for examinations etc.

**2.6.2 Duties of Electrical Maintainers (Technicians):**

- a) Efficient maintenance and testing of all Electrical equipment under his charge, so as to keep them in proper working condition, in accordance with instructions stipulated or as may be issued from time to time.
- b) Carrying out works and alterations to the existing installations under the instructions of the SSE/SE/JE (Electrical).
- c) Ensuring that the safety appliances are in good condition and are always made use of , in order to ensure his safety and the safety of staff working under him.
- d) Deploying men for look out duties as and when necessary.
- e) Electrical Maintainers shall attend to all failures in his section promptly by the first available means on receipt of information.
- f) On receipt of advice about any accident in his jurisdiction, the Maintainer shall proceed to the site of accident by first available means. He shall not interfere with any equipment on his own but shall act upon the orders given by the senior most officials at the site of accident.
- g) Maintenance and coordination with State Electricity Board in case of failures.
- h) Maintenance of Staff Quarters: Cleaning of fittings once in a month, replacement of fused bulbs, attending to emergency failure and repairs to wiring and fittings. Taking Meter Reading, keeping track of Occupation and Vacation of Railway Quarters.
- i) Collection of Electricity Bills from State Authorities and submission of the same to Headquarters for payment.
- j) Checking of earthing in all stations and vital locations

**2.6.3 Duties of other Artisan staff:**

Artisan staff performs their duties with relevance to their respective trade/designation. They attend to all types of failures, carrying out maintenance schedules as directed by the supervisor. They also carry out developmental works entrusted to them, if any, by the supervisor

**2.6.4 Duties of Group "D" Staff:**

Group "D" Staff basically assist the technical staff in the various maintenance activities

## **2.7 WORK LOAD:**

### **2.7.1 Energy consumption for the last 12 months of the year 2017-18**

Sl.No	Month	No. of Units
1	April	2352095
2	May	2448805
3	June	2280374
4	July	2217172
5	August	2182770
6	September	2189608
7	October	2151549
8	November	2004481
9	December	1840323
10	January	1712063
11	February	1694078
12	March	1997596
Total		25070914
Avg. units per month (=25070914/12)		2089242.83units

- The Total Consumption is 25070914 per annum (during April 2017 to March 2018). Therefore the average consumption per month is 2089242.83units.

### **2.7.2 Solar generated units in the Division for last 12 months in the year 2017-18:**

AKP (15KWP)	RJY (2KWP)	ETTC /BZA	KI (10KWP)	Total
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			(15 KWP)		
Apr	2036	98	NIL	NIL	2134
May	1905	93	NIL	NIL	1998
June	1474	86	NIL	NIL	1560
Jul	1206	61	NIL	NIL	1267
Aug	1722	66	NIL	NIL	1788
Sep	1450	69	NIL	NIL	1519
Oct	1509	72	NIL	NIL	1581
Nov	1360	69	NIL	NIL	1429
Dec	1678	45	NIL	NIL	1723
Jan	1400	26	337	NIL	1763
Feb	1427	43	328	NIL	1798
Mar	1213	126	672	388	2399
Total	18380	854	1337	388	20959

## **2.8 STAFF DUTIES:** The duties of staff of AC&TL are furnished below:

### **2.8.1 Duties and responsibilities of SSE/SE:**

#### **I) Technical duties**

- a. Management of men, material and regular work concerning the coach Maintenance.
- b. Assisting ADEE and Sr.DEE in all matters relating to smooth function of depot/dept.
- c. Execution/supervision of contractual works, if any in the section/ jurisdiction.
- d. Exercising supervision over the maintenance or work done by the Technicians and staff in accordance with schedule of maintenance.
- e. Providing assistance to the Technicians to attend works, which are normally beyond the scope of the maintenance staff.
- f. Submit an annual return of all apparatus in service on his section to the Sr.DEE.

#### **II) General duties**

- a. Stores matters
- b. Staff matters
- c. Enquires & Inspection

### **2.8.2 Duties of Technicians:**

- a. Efficient maintenance and testing of all Electrical equipment fitted in the coach, so as to keep them in good working condition, in accordance with the schedule of maintenance.
- b. Bringing to the notice of the SSE/SE/JE (Electrical) any emergency and situation that may be beyond his competence.
- c. Ensuring that the safety appliances are in good condition and are always made use of in order to ensure his safety and the safety of staff working under him.
- d. Deploying men for look out duties as and when necessary.

### **2.8.3 Duties of other Artisan staff:**

Artisan staff to perform their duties with relevance to their respective grade/designation. They attend to all types of failures, carrying out maintenance schedules as directed by the supervisor.

### **2.8.4 Duties of Group "D" Staff:**

Group "D" Staff basically assist the technical staff in the various maintenance activities

### **2.8.5 Duties of AC Escorting Staff Before Departure:**

#### **I) Duties of Ac Coach Attendant:**

- a) To be present one hour before the schedule departure of the train.
- b) To check that all internal electrical fittings in the coach provided for the comfort and safety of passengers are intact and in working order.
- c) To monitor electrical/ mechanical defects developing in the coach and call maintenance staff for attending whenever necessary.
- d) To assist the AC coach mechanic before Commencement of the journey and enroute to take readings
- e) To assist the AC coach mechanic in the rectification of minor faults in the AC coach equipment enroute.
- f) Keep doors closed during run & open at station when train is stopped.

## **II) Duties of Ac Coach Mechanic:**

- a) Should be available in the coach one hour before schedule departure of the train.
- b) Check logbook of the coach for any entry by the maintenance staff and act accordingly.
- c) Check the condition of V-belts in stable condition.
- d) Check OFF load battery voltage.
- e) Record all parameters of the equipment in the logbook.
- f) Check all the grills inside the coach. These should be in open condition.
- g) Check all lights, emergency lights, fans, night lamps, reading lamps & mobile charging sockets.
- h) Attend complaint of passengers, if any.
- i) Should do temporary connection in TL coach also, if required.

## **III) General Checks in Air Conditioned Coach:**

- a) Before placing the AC coach at starting station, this should be pre-cooled. The AC coach attendant should check the followings.
- b) Visually inspect, both upper and under frame and ensure all fittings are intact at their places.
- c) In under frame check alternator, axle pulley, 'V' belts of alternators, compressor & condensers (in case of under slung), battery etc. if any abnormality found rectify or inform the concerned supervisor/mechanic, for rectification.
- d) In upper frame check control & power panels, fan and light fittings etc.
- e) Check the battery voltage.

### **2.8.6 Trip Schedule (Primary & Secondary Maintenance):**

- a) Cleaning and testing of Lights, fans and Plug points
- b) Replace the equipment if found defective
- c) Check the Battery voltage in OFF LOAD & ON LOAD
- d) Replace battery if found defective
- e) Charge the batteries
- f) Check field fuse, replace if found blown, with approved makes Check the continuity of field and phase winding with the help of test lamp/ multi-meter to ensure that windings are not open circuited.
- g) Check that the regulator feedback loop is O.K, Check connections for tightness in alternator and rectifier regulator.
- h) Check up the condition of safety chain and availability of split pins in safety chain bolts.
- i) Check up alternator suspension bracket and tension gear for any damage and replace, if necessary.
- j) Check up and tighten loose bolts in terminals box covers. Check availability of split pin for alternator castle nut.
- k) Check the belt tension.

### **2.8.7 Fortnight schedule:**

- a) Check the all battery connections
- b) Check the condition of battery cells like specific gravity and voltage
- c) Check the voltage in off load and on load
- d) Change the battery cells if found defective
- e) Remove all the battery cells and clean them properly.

### 2.8.8 Monthly Schedule:

In addition to the works mentioned in Trip & Fortnightly Examination, carry out the following:

- Check for tightness of terminal connections of alternators and rectifier regulators.
- Thoroughly clean externally the alternator and regulator
- Open inspection cover of regulator. Blow dust with a portable blower. Secure covers tightly after inspection.
- Check locking of current setting of regulator, if disturbed it should be reset/locked as prescribed.
- Check the alternator pulley for proper fixture and the availability of castle nut and split pin.

### 2.8.4 IOH Schedule:

- IOH schedule involves unit changing.
- Check the connections of alternator.
- Put "V" belts and check the generation of power.
- Remove all lights and fan units and clean and refix.
- Remove all the batteries for cleaning and painting.

### 2.9 Coach holding in the Division:

S No	Type of coaches	No.of coaches
1	Train Lighting	629
2	AC coaches	140
3	Power cars	04
5	Break down coaches	04
	<b>Total</b>	<b>777</b>

### 2.10 Outsourcing Activities at AC and TL/BZA:

	TL Works						
1	Kakinada port: Annual maintenance Contract for daily, FNE & monthly maintenance and cleaning / replacement of fans, lights and batteries in TL coaches for a period of two years.	COA	19.09.16	17.09.18	Sr.DE E/M/ BZA	Sri M. R. Chalapathi, TPTY	Work in progress
2	BZA: Annual maintenance Contract for daily, FNE & monthly maintenance and cleaning / replacement of fans, lights and batteries in TL coaches for a period of two years.	BZA	01.12.16	30.11.18	Sr.DE E/M/ BZA	M/s. I.C.Electricals Company (P) Ltd., New Delhi	Work in progress
3	NS: Annual maintenance Contract for daily, FNE & monthly maintenance and cleaning / replacement of fans,	NS	01.09.16	31.08.18	Sr.DE E/M/ BZA	Sri M. R. Chalapathi, TPTY	Work in progress



	lights and batteries in TL coaches for a period of two years.						
4	MTM: Annual maintenance Contract for daily, FNE & monthly maintenance and cleaning / replacement of fans, lights and batteries in TL coaches for a period of two years.	MT M	01.09.16	31.08.18	Sr.DE E/M/ BZA	Sri L. Poleraiah, Vadlamudi	Work in progress
5	BZA: AMC for daily, FNE, monthly maintenance and cleaning/ replacement of fans, lights and batteries in LHB type coaches of Train No.17215/16 (BZA-DMM-BZA) for a period of 2 years.	BZA	01.03.17	28.02.19	Sr.DE E/M/ BZA	Sri J. Siva Kalyan Kumar, BZA	Work in progress

	<b>AC WORKS</b>						
	<b>POWER CARS MAINTENANCE</b>						
1	BZA Division : Operation & Maintenance of Cummins make 500KVA 750V DG sets fitted in power cars of Tri-weekly AC Express train from CCT to SC and back for a period of Two years.	COA	10.06.16	09.06.18	Sr.DEE/M/BZA	M/s DPS sales and services, HYB	Work in progress
2	BZA DIVN: Operation and maintenance of Cummins make 450 to 500KVA, 750V DG Sets fitted in Power Cars of Train No.17215/16 express from BZA-DMM and back for a period of 2 years.	BZA	24.11.16	23.11.18	Sr.DEE/M/BZA	M/s. DPS Sales & Services (India), Hyderabad	Work in progress

	<b>RMPUs MAINTENANCE</b>						
1	BZA, GNT, GTL Divisions ; CRS/TPTY: Comprehensive Maintenance Contract of RMPUs fitted in AC Coaches including POH activity at Tirupathi shops for a period of 03(three) years	BZA,GNT,GT L & TPTY	18.09.17	17.09.20	Sr.DEE/M/BZA	M/s. Lloyd Electric & Engg., Ltd., Alwar	Work in progress

## 2.11 Activities under AMC in Electrical Maintenance Department/BZA Division:

1	CAMC by OEM M/s Johnson lifts Ltd/BZA for the lift provided in DRM Office/BZA for a period of 2 years.	BZA	19.07.16	18.07.18	Sr.DEE /M/BZA	M/s Johnson lifts PVT.Ltd, BZA	Work in progress
2	CAMC by OEM M/s Johnson lifts Ltd./BZA for the lifts provided at PF.No1A & 1&2 at CLX Rly.Station for a period of 2 years	CLX	21.09.16	20.09.18	Sr.DEE /M/BZA	M/s Johnson lifts pvt. Ltd., BZA	Work in progress
3	CAMC by OEM for Johnson Lift provided at PF No. 1 and PF no. 2 & 3 of CCT Railway station and PF No.4&5 of TEL Railway station for a period of Two (02) years.	CCT&TEL	07.02.17	06.02.19	Sr.DEE /M/BZA	M/s Johnson lifts pvt. Ltd./BZA	Work in progress
4	CAMC by OEM for Johnson Lift provided at PF No.1, 2&3 and 4 at NLR Railway Station; P.F.No.1 at TEL & and PF No.1 and 2 at BVRT Railway station for a period of 2 years.	NLR & BVRT	01.01.18	31.12.19	Sr.DEE /M/BZA	M/s Johnson lifts pvt. Ltd./BZA	Work in progress
5	CAMC by OEM for Johnson Lift provided at PF No.1, 2&3 at GDR; PF.No.1, 2&3 at SLO Railway Station for a period of 2 years.	GDR	05.01.18	04.01.20	Sr.DEE /M/BZA	M/s Johnson lifts pvt. Ltd./BZA	Work in progress.

6	CAMC for Lift on P.F.No.2&3 at Tenali Railway Station by OEM for a period of 2(two)Years.	TEL	23.06.16	22.06.18	Sr.DEE /M/BZ A	M/s. Johnson Lifts Pvt., Ltd./ Chennai.	Work in progress
7	CAMC for Lifts on P.F.No.1, 4&5, 6&7 and 10 and near Clock Tower - 5Lifts for a period of 2 years (EASSO LIFTS)	BZA	24.10.16	23.10.18	Sr.DEE /M/BZ A	M/s. Climate Control, BZA	Work in progress

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**3.0 iδâδδ÷÷μδδδδÃÙδ"î òâδââδ÷æδÃδ CRITICAL EXAMINATION:**

- 3.1 Electrical General Services Organization is mainly divided into two wings i.e. 1) Power maintenance and 2) Air Conditioning & Train Lighting.
- 3.2 Power maintenance wing basically performs the day-to-day Electrical Maintenance work of the Division. It also plays a proactive role by ensuring required power supply arrangements to various Railway establishments. Besides this it also looks after the operations and maintenance of various electrical installations including residential quarters (*maintenance + meter reading activity*), service buildings, PRS/UTS locations, stationary air conditioning units, pumps, lifts, LC gates, maintenance of high tension lines and underground cables for electrical distribution system etc.
- 3.3 It is observed that no special training is required especially for the General electrical maintenance except on safety aspects of working and this activity can be classified as non-core activity. Keeping in view of the high staff costs on maintenance activity, requirement of manpower in the Electrical General services Department over Vijayawada Division is critically reviewed with reference to the Indian Railway Average Benchmarking. This also fetches a lot of financial viability and professionalism to the Electrical organization.
- 3.4 It is seen that the technological development in Electrical department of the Railway is going in leaps and bounds and day by day modernized equipment are pressed into service which are not only having technologically improved features and also requires least or no maintenance or at the most maintenance consisting of replacing of a unit/module completely.
- 3.5 It may be pertinent to mention that the maintenance activities wherein high sophisticated professionalism is involved have been outsourced; hence IR Average Benchmarking is taken into consideration.
- 3.6 The activities which are outsourced /covered under AMC of electrical general service department are as follows:
1. Maintenance of DG sets.
  2. Maintenance of Chillers.
  3. Maintenance of AC and Water coolers.
  4. Maintenance of non-core activities of Batteries, Lights, Fans and their cleaning in TL coaches.
  5. Maintenance of Inverters of AC coaches.
  6. Repairing/Reconditioning of Emergency light Units and 100VA Inverter for Mobile/Laptop charger points & OVPs in TL& AC depots.
  7. Maintenance and operation of DG sets of 4 power cars.
  8. CMC for RMPUs provided in AC coaches
- 3.7 March-2018 IR average and Bench Marking of is as follows:

S No	Department	IR Average	IRBM
1	Power Maintenance	0.18	0.08
2	TL&AC	0.45	0.16

- 3.8 Application of Benchmarking Norms: Benchmarking is based on dynamic and comparative analysis and is a very useful tool to manage efficient deployment of staff and monitor effects of improvement in working practices, use of new technologies and level of outsourcing. Board also insisted all units to achieve Indian Railway Average Benchmarking.

3.9 Keeping the above in view, the Work-study team made an analysis on the requirement of staff based on the following references:

- a) Lr.No.2011/E&R/2800/Rly.imp.vol VI/(Corr) dated 09.06.2016 wherein it is stated to bring down the manpower ratios for activities which are above the IR Average at least to the current IR Average.
- b) No. of activities under outsourced/ AMC.

**3.10 Energy consumption for the last 12 months of the year 2017-18**

Sl.No	Month	No. of Units
1	April	2352095
2	May	2448805
3	June	2280374
4	July	2217172
5	August	2182770
6	September	2189608
7	October	2151549
8	November	2004481
9	December	1840323
10	January	1712063
11	February	1694078
12	March	1997596
Total		25070914
Avg. units per month (=25070914/12)		2089242.83units

- The Total Consumption is 25070914 per annum (during April 2017 to March 2018). Therefore the average consumption per month is 2089242.83units.

**3.11 Solar generated units in the Division for last 12 months in the year 2017-18:**

	<b>AKP (15KWP)</b>	<b>RJY (2KWP)</b>	<b>ETTC /BZA (15 KWP)</b>	<b>KI (10KWP)</b>	<b>Total</b>
Apr	2036	98	NIL	NIL	2134
May	1905	93	NIL	NIL	1998
June	1474	86	NIL	NIL	1560
Jul	1206	61	NIL	NIL	1267
Aug	1722	66	NIL	NIL	1788
Sep	1450	69	NIL	NIL	1519
Oct	1509	72	NIL	NIL	1581

Nov	1360	69	NIL	NIL	1429
Dec	1678	45	NIL	NIL	1723
Jan	1400	26	337	NIL	1763
Feb	1427	43	328	NIL	1798
Mar	1213	126	672	388	2399
Total	18380	854	1337	388	20959

### 3.12 Outsourcing Activities at AC and TL/SC:

	TL Works						
1	Kakinada port: Annual maintenance Contract for daily, FNE & monthly maintenance and cleaning / replacement of fans, lights and batteries in TL coaches for a period of two years.	COA	19.09.16	17.09.18	Sr.DE E/M/ BZA	Sri M. R. Chalapathi, TPTY	Work in progress
2	BZA: Annual maintenance Contract for daily, FNE & monthly maintenance and cleaning / replacement of fans, lights and batteries in TL coaches for a period of two years.	BZA	01.12.16	30.11.18	Sr.DE E/M/ BZA	M/s. I.C.Electricals Company (P) Ltd., New Delhi	Work in progress
3	NS: Annual maintenance Contract for daily, FNE & monthly maintenance and cleaning / replacement of fans, lights and batteries in TL coaches for a period of two years.	NS	01.09.16	31.08.18	Sr.DE E/M/ BZA	Sri M. R. Chalapathi, TPTY	Work in progress
4	MTM: Annual maintenance Contract for daily, FNE & monthly maintenance and cleaning / replacement of fans, lights and batteries in TL coaches for a period of two years.	MT M	01.09.16	31.08.18	Sr.DE E/M/ BZA	Sri L. Poleraiah, Vadlamudi	Work in progress

5	BZA: AMC for daily, FNE, monthly maintenance and cleaning/ replacement of fans, lights and batteries in LHB type coaches of Train No.17215/16 (BZA-DMM-BZA) for a period of 2 years.	BZA	01.03.17	28.02.19	Sr.DE E/M/ BZA	Sri J. Siva Kalyan Kumar, BZA	Work in progress
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	<b>AC WORKS</b>						
	<b>POWER CARS MAINTENANCE</b>						
1	BZA Division : Operation & Maintenance of Cummins make 500KVA 750V DG sets fitted in power cars of Tri- weekly AC Express train from CCT to SC and back for a period of Two years.	COA	10.06.1 6	09.06.1 8	Sr.DEE/M/BZ A	M/s DPS sales and services, HYB	Work in progress
2	BZA DIVN: Operation and maintenance of Cummins make 450 to 500KVA, 750V DG Sets fitted in Power Cars of Train No.17215/16 express from BZA-DMM and back for a period of 2 years.	BZA	24.11.1 6	23.11.1 8	Sr.DEE/M/BZ A	M/s. DPS Sales & Services (India), Hyderaba d	Work in progress
	<b>RMPUs MAINTENANCE</b>						
1	BZA, GNT, GTL Divisions ; CRS/TPTY: Comprehensive Maintenance Contract of RMPUs fitted in AC Coaches including POH activity at	BZA,GNT,GT L & TPTY	18.09.1 7	17.09.2 0	Sr.DEE/M/BZ A	M/s. Lloyd Electric & Engg., Ltd., Alwar	Work in progress

	Tirupathi shops for a period of 03(three) years						
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### 3.13 Activities under AMC in Electrical Maintenance Department/BZA Division:

1	CAMC by OEM M/s Johnson lifts Ltd/BZA for the lift provided in DRM Office/BZA for a period of 2 years.	BZA	19.07.16	18.07.18	Sr.DEE /M/BZ A	M/s Johnson lifts PVT.Ltd, BZA	Work in progress
2	CAMC by OEM M/s Johnson lifts Ltd./BZA for the lifts provided at PF.No1A & 1&2 at CLX Rly.Station for a period of 2 years	CLX	21.09.16	20.09.18	Sr.DEE /M/BZ A	M/s Johnson lifts pvt. Ltd., BZA	Work in progress
3	CAMC by OEM for Johnson Lift provided at PF No. 1 and PF no. 2 & 3 of CCT Railway station and PF No.4&5 of TEL Railway station for a period of Two (02) years.	CCT&T EL	07.02.17	06.02.19	Sr.DEE /M/BZ A	M/s Johnson lifts pvt. Ltd./BZA	Work in progress
4	CAMC by OEM for Johnson Lift provided at PF No.1, 2&3 and 4 at NLR Railway Station; P.F.No.1 at TEL & and PF No.1 and 2 at BVRT Railway station for a period of 2 years.	NLR & BVRT	01.01.18	31.12.19	Sr.DEE /M/BZ A	M/s Johnson lifts pvt. Ltd./BZA	Work in progress
5	CAMC by OEM for Johnson Lift provided at PF No.1, 2&3 at GDR; PF.No.1, 2&3 at SLO Railway Station for a period of 2 years.	GDR	05.01.18	04.01.20	Sr.DEE /M/BZ A	M/s Johnson lifts pvt. Ltd./BZA	Work in progress.
6	CAMC for Lift on P.F.No.2&3 at Tenali Railway Station by OEM for a period of 2(two)Years.	TEL	23.06.16	22.06.18	Sr.DEE /M/BZ A	M/s. Johnson Lifts Pvt., Ltd.,/ Chennai.	Work in progress
7	CAMC for Lifts on P.F.No.1, 4&5, 6&7 and 10 and near Clock Tower - 5Lifts for a period of 2 years (EASSO LIFTS)	BZA	24.10.16	23.10.18	Sr.DEE /M/BZ A	M/s. Climate Control, BZA	Work in progress



### 3.14 Requirement of Staff as per IR Average in Electrical General Services Department.

#### 3.14.1 Power Maintenance:

Work load of Power maintenance is measured in terms units of power consumed and the following are the details of power consumed and requirement of staff:

A	Electrical Power consumption for 12 months (April 2017-March18)	25070914
B	Average Electrical power consumption per month	2089243
C	Solar power consumed for 12 months (April 2017-March18)	20959
D	Average Solar power consumption per month	1746.58
E	Average power consumption (Electrical+solar) per month=B+D	2090989.58
F	Bench mark for the month of March-2018	0.08
G	Staff required as per IR average (0.18 per 1000 units) = $E \times F (2090.99 \times 0.18)$	376.37 <b>377 Men</b>

#### 3.14.2 Train Lighting and Air Conditioning:

- Coach holding of the Division:

S No	Type of coaches	No.of coaches
1	Train Lighting	629
2	AC coaches	140
3	Power cars	04
5	Break down coaches	04
	<b>Total</b>	<b>777</b>

- Staff required to attend TL/AC failures and turn round attention at nominated way side stations as follows:

S No	Station	Required staff (per day)
1	Vishakhapatnam	(2 in each shift)6
2	Tuni	(2 in each shift)6
3	Rajahmundry	(2 in each shift)6
4	Elure	(2 in each shift)6
5	Bhimavaram	(2 in each shift)6
6	Tenali	(2 in each shift)6
7	Ongole	(2 in each shift)6
8	Bitragunta	(2 in each shift)6
9	Gudur	(2 in each shift)6
	Bare requirement	54
	LR/RG (25%)	13.5
	<b>Total (54+13.5)</b>	<b>67.5 say 68</b>

Requirement of staff:

A	Total holding of coaches	777
B	IR average for the month of March-18	0.45
C	Manpower required as per IR average - $777 \times 0.45$	349.65 say 350
D	Men required at way side depots to attend turn round and pass through Trains	68
<b>E</b>	<b>Total men required for AC&amp;TL (C+D)=(350+68)</b>	<b>418</b>

➤ **Requirement of staff in Electrical General Services:**

A	Men required for Power maintenance	377
B	Men required for AC&TL	418
C	Total requirement of men in PM and TL&AC(A+B)=377+418	795
D	Total Sanctioned strength of Electrical General Service department	831
E	Staff excess to the requirement (D-C) =831-795	36

- The requirement of staff strength of Electrical General Services Department is 795 and found 36 staff are excess with reference to IR Average.
- In view of the above, the following recommendation is made.

**Recommendation:** It is recommended to surrender **36** posts from book of sanctions which are excess to the requirement.

\* \* \* \* \*

**4.0 ÿââδ÷÷µδÐδδÃÙδ"î òãðääð÷æðÃð FINANCIAL IMPLICATIONS:**

**4.1** If the recommendation is accepted, the recurring savings on surrender of the under mentioned posts in Electrical General Services over Vijayawada Division would be as follows:

Sl. No	Category	Scale		No. of posts	Mean Pay	DA @ 7%	Emoluments P.M (in Rs.)	Total Emoluments P.A (in Rs.)
		From	To					
1.	Group "D" staff	18000	56900	<b>36</b>	37450	2621.5	1442574	17310888

- On implementation of the recommendations brought out in the Work-study report an annual savings of **Rs. 173.10 lakhs** can be achieved.

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**çöüçÃðóóÃðó RECOMMENDATION**

<u>RECOMMENDATION</u>	Para No.
It is recommended to surrender <b>36</b> posts from book of sanctions which are excess to the requirement.	<b>3.14</b>

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**SOUTH CENTRAL RAILWAY**

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**WORK STUDY REPORT**  
ON  
**REVIEW OF STAFF STRENGTH**  
OF  
**ELECTRICAL GENERAL SERVICES**  
OVER  
**VIJAYAWADA DIVISION**

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**GUIDED BY**

एस जयचंद्र नायक

(S.JAYACHANDRA NAIK)

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**CENTRAL PLANNING ORGANISATION**  
**SECUNDERABAD**

