

A FEEDBACK REPORT ON VISIT TO LOCO-SHADE, VADODARA

Date: 20/10/2016, Thursday Duration: 1 Day Venue: Zonal Electric Training Centre, Vadodara Yard, Electric Loco Shed, Vadodara, 390002 Department: Electrical Engineering Department No. of Students Present: 15 Faculty Guide: Mr Rakesh Bhadani



I. BACKGROUND INFORMATION

Vadodara has one of the largest electric loco sheds in the western railway zone. the shed houses more than 130 locomotives, which include wap-4, wap-5, wap-7, wam-4 and wag-5 locomotives. additionally, it had an AC electric trip shed to house locos coming from other sheds and an AC/DC dual loco trip shed which houses WCAM class locomotives from valsad shed and which allows locomotive changes at vadodara because the trains which were coming from new delhi mainline are ac locomotives and the trains going to mumbai need ac/dc loco. until 2011, mumbai was under dc supply from before borivali when the western railway in mumbai changed over to the AC system in february 2012, WCAM locos have been transferred to the kalyan shed.

It also has a memu car shed which houses the mainline electric multiple units which provides feeder services to ahmedabad, surat, dahod and godhra. Recently, it has been allocated with WAP-7 and WAG-9 locomotives.

Training section was divided under following sections:

- General Services
- TRD traction

II. PROGRAMME SCHEDULE

Visit to Loco Shed at Baroda on 19th & 20th of October 2016, during 10:00 AM - 12:00 PM.
 Whole visit was divided into two groups, Degree students and Diploma students, on 19th
 October Engineering students visited and on 20th October Diploma students visited. Loco Shed
 Baroda was divided into two main sections Training section and Maintenance Work.

III. TRAINING SECTIONS

GENERAL SERVICES:

A general service includes mainly system which generates power for coach and its accessories. In general service Fan, Tube light, Lamps, charging points, Air Conditioning System etc. included.

- For normal light fan 4.5 KW alternator used. Which is non AC.
- In AC coaches 2 Nos. Of 25KW alternator is used to power AC and Light fan both at the same time.
- In Morden AC coach all system works on 3ϕ , 440V.
- Talking about weight is $\frac{1}{3}$ to old AC which works on DC system.
- In DC system Air Conditioner is nearly 2700 kg. In weight which is too much heavy compare to Air Conditioner which works on AC system.
- DC compound generator used as compressor in Air Conditioner.
- In AC coach 1100 Ah of capacity batteries used.
- For non AC 120 Ah of capacity batteries used.
- Lead Acid Cell batteries used in AC coaches main advantage of this type of battery is they are maintenance free.
- In railway colony 20 HP motor is used as submersible motor to pump water which used to clean bogies and also other applications.

TRD:

In this section, main point was traction substation and traction system which used in Indian Railways.

Traction Substation:

- 132 KV supply is taken from national grid as input for traction substation.
- As input, only two phases taken from grid, at different location of substation varies phases taken like; R Y, Y B, B R so load can be balanced in national grid.
- 132 / 25 KV Transformer is used to step down voltage.

- Electrification of railways stared in 1925 in Indian railways and AC system started in 1957.
- 55% of all Indian railways network works on 25 KV.
- Our state Gujarat is included in "Western Region".
- Indian Railways buys electricity 4.5 Rs. /Unit, however price depends on location also; In Gujarat electricity is cheaper as compare to UP, Delhi other states because Gujarat supplies electricity to other states.

TRACTION SYSTEM:

- In railway tracks one rail is used as conductor for signal and other one is used as earth return conductor.
- Pantograph collector which is used to collect power is put on 7 Kg pressure on it. Even pantograph collector works on various systems like gravity push, gravity pull and air pull tec.
- Distance between overhead conductor and roof of coach is 5.60 meters.
- Centenary is 1.5 km long after that conductor is connected mechanically using mechanical joints.
- 2000 kg. Pressure produced at the end of overhead centenary wire.
- 19 standard gauge wires used as centenary wire which supports overhead conductor.
- Overhead conductor is 400-meter-long after that jumper is used to connect wires.
- 1667 mm distance kept between two rails that track is called Broad Gauge.
- Broad Gauge is also called "Indian Gauge" in foreign countries.



MAINTENANCE WORK UNDER SHED



LOCOMOTIVES UNDER SHED



ALTERNATOR AND DIFFERENT LOAD & AIR CONDITIONING SYSTEM
(ALL IN WORKING CONDITION)

IV. COMMENTS ON THE CONDUCT OF EVENTS

During the entire visit, the organization was found to be very cooperative in every walk of its administrative and managerial aspects. The students acquired knowledge of the different electrical & other products. The students asked several questions and all the experts were happy to satisfy their queries. This visit was full of excitement and enthusiasm.

SCHEMATIC CONNECTIONS OF PROTECTIVE RELAYS AT A.C. TRACTION SUB-STATION



SINGLE LINE DIAGRAM OF AC TRACTION SUBSTATION



MODEL OF COACH AND SUBSTATION



OVERHEAD CONDUCTOR, CENTENARY WIRE & INSULATOR



FACULTY WITH STUDENTS AT VISIT PLACE

V. BENEFITS AND RECOMMENDATIONS

The students found this industrial visit was very useful. This visit improved the students' knowledge of various equipment that being used in locomotive in India. Students were amazed at the speed at which the process occurred and how the automated systems could work according to the requirements. The students were expecting more visits like this one.