

ABOUT CRWS



About CRWS

Coach Rehabilitation Workshop, a unit of West Central Railway, is located in Bhopal, which is the political capital of the State of Madhya Pradesh. Bhopal is known as the City of Lakes for its various natural as well as artificial lakes and is also one of the greenest cities in India. Bhopal, with its central location is very well connected to all the corners of the country. With the expanded planning area of 463 square kilometres, Bhopal stands among 15 largest cities of India. The workshop is situated around 2 Km from the Bhopal Railway station.

The earlier codal life of steel bodied ICF conventional coaches was 25 years. It was observed that as these coaches complete the service life of 10-12 years, their condition become very bad i.e. a lot of damage takes place in their body due to corrosion and significant deterioration in internal furnishing. To overcome this problem and to make coach fit for next 12-13 years service, Indian Railways decided to start Mid-Life Rehabilitation (MLR) of all Indian Railways Coaches in 80's. CRWS, Bhopal workshop was the first workshop, which was founded to start the **"MID-LIFE REHABILITATION OF ICF COACHES"** in the year 1989.

LHB coaches were introduced in Indian Railways w.e.f. year 2000. They are far superior to ICF conventional coaches in terms of their design, reliability, ride comfort and maintenance. Indian Railways decided to stop the production of conventional ICF coaches and to completely switch over to LHB coaches. Indian Railways decided to reduce the service life of ICF coaches to 20 years and to discontinue the MLR of ICF conventional coaches w.e.f. 01.04.2020. CRWS, Bhopal switched over to POH of ICF coaches and SS-II of LHB coaches after the stoppage of MLR work. CRWS has also planned to upgrade its infrastructure for carrying out SS-III of LHB coaches, which is expected from Financial Year 2023-24.

The CRWS campus is spread over a total area of 400 acres including 190 acres of workshop area. CRWS Staff colony has 688 quarters. The workshop functions out of budget provision from Railway Board in the form of WMS, Revenue Grants and Rolling Stock Program. The WMS Budget of CRWS is approx. 312 Crores for Financial Year 2023-24.

Current average expenditure for POH of ICF/Non-AC coach is Rs 14.70 Lakh, POH of ICF/AC coach is Rs 22.80 Lakh, SS-II of LHB/NAC is Rs 19.60 Lakh and for SS-II of LHB/AC is Rs 23.00 Lakh.

The CRWS has the target of 103 coach outturn/month including MEMU and NMG POH for FY 2023-24. CRWS has achieved 94 coach outturn up to Apr-2023 (working days in Apr-23 is only 21).

2. Major Milestones & Important Events

- ♦ **05th Feb 1987** : Foundation Stone CRWS laid
- ♦ **30th Jul 1989** : Workshop was dedicated to the Nation
- ♦ **29th Sep 1989** : First Coach ER 8815/GS turned out after MLR
- ♦ **14th Nov 1994** : Introduce MLR of AC Coaches
- ♦ **22nd Apr 1999** : Inception of Technical Training Centre
- ♦ **12th Jun 2001** : First Indian Railway Workshop Certified for ISO 9001, 2000 series
- ♦ **25th Jun 2004** : First Indian Railway workshop certified for OHSAS:18001
- ♦ **01st Oct 2004** : Introduction of Group Incentive Scheme
- ♦ **06th Jan 2007** : Inception of Regional Railway Welding Institute
- ♦ **17th Jan 2011** : Certified for Integrated Management System
- ♦ **22nd Jan 2016** : First rake of Mahamana Express (Model Rake) turned out
- ♦ **21st Jan 2019** : Shop Schedule-I of LHB coach bogies started
- ♦ **04th Jul 2019** : Green Co. Certificate (Silver) awarded by CII
- ♦ **13th Jan 2020** : CMT Lab got Certificate of Accreditation from NABL
- ♦ **01st Feb 2020** : NMG coach conversion started
- ♦ **01st Apr 2020** : Workshop Switchover from MLR work to POH work
- ♦ **01st Jun 2020** : Camping coach conversion work started
- ♦ **22nd Jul 2020** : Shop Schedule-II of LHB coaches started
- ♦ **31st Aug 2021**: First Rake of High Speed NMGH coach turned out.
- ♦ **15th Sep 2022**: Green Co. Certificate (Gold) awarded by CII
- ♦ **29th Dec 2022**: First rake of NMGHS coach turned out by CRWS
- ♦ **Jan-2023**: POH of MEMU coaches started

4. Activities Undertaken in Different Shops

The current average POH/SS-II cycle time and average man hours consumed for different type of coaches at CRWS are as follows :

SN	Type of Coach	Average Cycle Days	Average Man hours
1.	POH ICF AC	12.53	3283
2.	POH ICF Non-AC	13.26	2630
3.	SS-II LHB AC	15.40	2655
4.	SS-II LHB Non AC	9.50	2514

The work carried out in major shops are described as follows in order of sequence of repair:

Coach Washing Shop :

- ◆ Inside and outside washing of all coaches are done in this coach washing shop.

Lifting Shop :

- ◆ Coaches are lifted to remove bogies for repairs, and dummy bogies are provided for internal movement within the workshop.
- ◆ Examination and repair of under-frame parts like center pivot and side bearers, is done in lifting shop.

Carpentry Shop :

- ◆ Internal components, wall panels, flooring and fittings are stripped off as per the condition and requirement.
- ◆ All internal mechanical fittings and furnishing items, including berths, seats and water tanks, body side door, shutters, lavatory doors are stripped off and repaired.

Electrical Train Lighting Shop :

- ◆ All electrical fittings (fans, lights, modular switches etc.) of coach including RMPU are overhauled and tested prior to re-fitment.
- ◆ RMPU loading work is done in Air Brake shop.

Body Repair Shop :

- ◆ Coaches are inspected thoroughly and pockets in body side panels and end panels are cut for facilitating inspection of the corroded portions.
- ◆ The entire coach body including structural members are subjected to inspection and replacement of corroded members giving necessary anti-corrosive treatment to the components is carried out.
- ◆ The body conversion work of NMGHS/Camping coaches is carried out in this



4. Activities Undertaken in Different Shops

Paint Shop :

- ♦ The coach shell is given a new look with PU painting in a paint booth after removing exterior paint.
- ♦ Lettering work on exterior as well as in coach interior is done by stenciling printing process.



Furnishing Shop :

- ♦ All coach components like seat & berth, window shutter, lavatory fittings repaired/overhauled by Carpentry shop are fitted in this shop.
- ♦ All passenger amenities fittings and internal components in the coach are replaced/refitted.
- ♦ Laying of PVC flooring, replacement of ceiling panels, replacement of wall panels and plumbing in lavatories are carried out in this shop.
- ♦ Repaired/overhauled electrical equipment's like fan & lights are replaced or refitted in this shop.
- ♦ Bio-tank cleaning and re-fitment are done by this shop.



Air Brake Shop :

- ♦ Carried out repairing & maintenance work of Air brake system.
- ♦ Overhauling and testing of DV and Brake cylinder etc.

Bogie Shop :

- ♦ All bogie components are stripped off. They are cleaned, inspected, replaced/repared as per requirement. All must change items are replaced with new one. Necessary testing of components as per ICF/LHB manual/ RDSO instructions are carried out before their refitment.
- ♦ Necessary painting of components is carried out. CRWS has separate work center for LHB and ICF bogie repair.



Wheel & RB Shop :

- ♦ **ICF Wheel:** During IOH/POH of ICF Wheel, Roller bearing overhauling and necessary attention given to wheel & axle.
- ♦ **LHB Wheel:** During SS-I/SS-II/SS-III of LHB wheel, CTRB are sent to OEM for necessary overhauling and after overhauling refitted on the wheel. ECA testing of each LHB wheel is carried out in this shop. **"LHB Wheel Maintenance"** is a "Centre of Excellence at CRWS."
- ♦ **Wagon Wheel :** Re-turning of tyre, CTRB change and/or Reaxling/Re-discing of wagon wheel set are done as per the requirement.
- ♦ Wheel shop carry out various testing's like DPT, ECA, UST, Magna flux,



4. Activities Undertaken in Different Shops

Final Inspection Shop

- ♦ The coach body is lowered on overhauled bogies.
- ♦ Final adjustments and tests/inspection of out-going coaches including NTXR examination is undertaken in the final shop, which has pit inspection facility.



Ancillary Shops:

- ♦ **Millwright shop:** Attention to all machinery and plant, lifting equipment's such as crane and traverser.
- ♦ **Electrical Repair shop:** All electrical repairs of machines, plants and equipment's is given by electrical repair shop.
- ♦ **Transport shop:** Coordination of vehicle for material handling such as fork lift, battery operated platform truck (lister) etc. inside the workshop and from other IR workshop. Maintenance of all workshop vehicles.
- ♦ **Shell Component Shop:** It is a feeder shop for the body repair shop. Components required for fitment in the coach shell are being manufactured from raw material (mainly corrosion resistant steel).

6. Management Certification

There were three different certifications of CRWS for three different International standards ISO 9001:2015, ISO14001:2015 & ISO 45001:2018 with associated sets of documentation, audits etc. Certificate to three standards required lot of duplication in paper work & increase in demand for time & resources. The system has been streamlined after detailed review and all management system have now been unified under heading **Integrated Management System (IMS)**. This has now been fully established, and certified under IMS since April-2011. Further from Jan-2022, ISO 50001:2018 is also incorporated with IMS Certificate.

Apart from IMS, this workshop is also certified for

- ♦ **5s Certification:** since Aug-2017.
- ♦ **ISO 3834 for Welders:** For Welder Certifications and Quality Welding since Dec-2017.
- ♦ **Green Co Certification from CII:** On 4th July 2019, CRWS got Green co certification by CII in Silver Category and now workshop upgraded from Silver to **Gold** in Sep-2022.
- ♦ **NABL Accreditation Certification** - On 13th January 2020 CMT Lab got Certificate of Accreditation from NABL for "General Requirement for the Competence of Testing & Calibration Laboratories"

Quality Improvement Measures :

Quality Audits: Regular quality audits are conducted in different areas of the workshop by Internal and External Auditors to check the procedures being followed by the shop against IMS Procedure and Works Instructions. Recently following measures are taken for improvement of work quality –

- ♦ Adoption of ISO procedure for shop sweeping and scrap disposal, resulting in increase in house- keeping standards.
- ♦ Specifications of various PPE's are framed and issued as controlled document to enhance working safety.
- ♦ Computerization of Inspection shop feedback for taking corrective measures.
- ♦ Quality Plans have been introduced in each contract.

7. Central C&M Lab

The Central Chemical & Metallurgical Laboratory of WCR is established in CRWS, Bhopal and it started functioning in the year 2008. The laboratory is involved in quality control by testing of Store materials & detailed failure investigation analysis of failed components. Non-destructive testing (NDT) of components used in the maintenance of rolling stocks in CRWS is also carried out by the laboratory. The laboratory also provides technical opinions/support to all C&M Lab established in various units of WCR.

Major infrastructure of the laboratory :

- ♦ Computer controlled Optical emission spectrometer (OES) for chemical analysis of metal & alloy (Ferrous & Non-ferrous both)
- ♦ Ultrasonic flaw detector (USFD), MPI Machine for Non-destructive testing.
- ♦ Computerized Microscope with Polisher, Abrasive cutting machine, Surface leveler, Power hacksaw etc for detailed failure analysis.
- ♦ Brinell hardness machine, Rockwell hardness machine, Vicker's hardness tester, Computerized tensiometer to measure mechanical properties of the materials.
- ♦ Equipment's like Gloss meter, Alcolmeter, Ford cup, Salt spray cabinet, Humidity cabinet, Hagman gauge, Flexibility & Scratch hardness tester etc. for detailed paint testing.
- ♦ Shore 'A' & Shore 'D' hardness tester, Demattia (Flex tester), Cross breaking machine etc. for testing of Rubber and Rexine.
- ♦ pH meter, TDS meter, BOD Incubator & COD digester for analysis of effluent water of ETP.

Lab Salient Activities :

- ♦ Ultrasonic Testing of Axle, Wheel disc.
- ♦ Estimation of carbon percent of wheel disc.
- ♦ Surface defect detection of LHB wheel disc by ECA (Eddy Current Array) technique.
- ♦ MPI of Bare Axles, Helical Springs, Bolster Hanger, Brake beam hanger.
- ♦ DPT of Roller bearing, Knuckles, Center Pivot, Bogie Frame (Control Arm Flange), Lower Spring Beam.
- ♦ Metallurgical Failure investigation of Rail, CBC Coupler, Knuckles, Loco Liners, Helical springs, Bogies etc.
- ♦ Chemical Analysis of Ferrous & Non-Ferrous store materials.
- ♦ Testing of Rubber, FRP, PVC flooring sheet & Rexene, Paint (PU & Enamel), Putty, Thinner, All types of Brushes.
- ♦ Painter qualification test panels.
- ♦ Environmental parameters monitoring & obtaining consent filling returns, Hazardous waste disposal of CRWS/BPL as per MPPCB guidelines.
- ♦ ISO 3834 welder qualification Test.
- ♦ NABL Accreditation for Lab was granted on 13.01.2020. Currently valid up to Jan-2025

8. Regional Railway Welding Institute (RRWI)

The RRWI is a “**CENTRE OF EXCELLENCE IN WELDING TRAINING**”. RRWI is authorized to provide the training to welders of Five zones namely WCR, CR, NCR, WR and NWR. However, training to other zonal staff also provided.

Regional Railway Welding Institute was established in the year – 2007 at Coach Rehabilitation Workshop. It imparts training in mainly the welding areas namely SMAW, GMAW, GTAW, Plasma cutting & gas cutting. Broadly, the institute conducts various training programmes for welders and supervisors/engineers to improve their skill and knowledge in welding processes.

Rail Kausal Vikas training program:

Program has been started for welder trade entry level training from October 2021 for local youth as per the guide line of Railway Board and till April 2023 total 115 candidates are trained in 17 courses under this scheme.

Training Infrastructure:

- ♦ Modern welding workshop, 16 Nos. fully equipped all position booth, Inverter based power sources, Centralized fume extraction systems and 02 Class Rooms equipped with multimedia LCD projector.
- ♦ All lectures are bilingual on power point presentation.
- ♦ **Auditorium** - Modern hall with digital podium, promoting the advancement of welding and associated technologies through regular seminar & lectures.
- ♦ **Model Room** - safety equipment, hand tools, joints, position, charts, modern welding & cutting, torch & torch assembly, Welding defects etc are displayed.
- ♦ **Use of Weld Gauges** - for demonstration of use of weld gauges in the field to ensure design strength in weld joint.
- ♦ **RRWI Mobile App** - Inhouse, a Mobile App has been developed and published on Google play for trainees. This App contains various welding training materials like welding process and gauges. This App also have Quiz section, by which a trainee can evaluate his/her knowledge on welding processes.
- ♦ **Welding Simulator-** One welding simulator room has been developed in RRWI. In this room, a welding simulator has been successfully installed and commissioned to train initial welders without use of welding consumables.

8. Technical Training Centre (TTC)

This training center was established as Basic Training Center (BTC) in 1994 and recognized as TTC by Railway Board in the year 2005, with a purpose to enhance the potential of the newly recruited employees and to meet the immediate training need. Currently, Technical Training Centre is imparting training to CRWS employees and special courses to all zonal railways as per their requirements. Technical Training Centre is established within CRWS campus itself in its natural lush green and peaceful environment.

The center has qualified trainers, workshop, teaching-aid equipment's, different types of models, simulators for imparting effective training. The center has also organized special courses as per the requirements of workshop.

Training Infrastructure:

- ♦ Well furnished 02 Class room with multimedia LCD projector
- ♦ Well furnished 02 Class room with Green glass board
- ♦ Two nos. of simulators of LHB Coach braking system and LHB Coach Braking Fault trainer
- ♦ The library consists of approx. 1200 books on Hindi, Mechanical, Electrical and Establishment matters
- ♦ Models & Workshop
 - ♦ Model of under-frame of ICF Coach
 - ♦ Model of LHB Coaches
 - ♦ Working Model of Bio-toilet
 - ♦ Working model of bogie mounted air brake system
 - ♦ Cut section model of Air Brake Component
 - ♦ Display of LHB FIAT Bogie (Flex board)
- ♦ An auditorium having seating capacity for 50 persons. equipped with CCTV camera.
- ♦ Hostel for accommodation for trainees with capacity of 60 persons.

Details of Special Course for all ZR staff:

- ♦ **LHB Disc Brake System** : To develop knowledge & skill of the staff to meet the challenges in smooth operation & maintenance of air brake and disc brake.
- ♦ **Maintenance of EOT Crane** : To develop knowledge & skill of the staff to meet the challenges in smooth operation & maintenance of EOT Crane.

Coach Rehabilitation Workshop, Bhopal



Contact Address

Chief Workshop Manager, Coach Rehabilitation Workshop

West Central Railway, Nishatpura, Bhopal (MP) – 462010

Telephone: 0755-2742785, Fax: 0755-2743863, 2743643

E-mail: crwsbpl@gmail.com, Website:

www.wcr.indianrailways.gov.in