RDSO was setup by the merger of the Railway Testing and Research Centre, RTRC and the Central Standards Organization (CSO) in the year 1957. This is a premier research, design and standards organization set up with the view to evolve appropriate design of Railway equipments and systems for improved safety, reliability, and maintainability.

RDSO, being the central pillar for technology on Indian Railways, is fully involved in development, adoption and absorption of new technologies; development of new and improved designs of equipment and systems and setting standards for adoption on Indian Railways. RDSO is also involved in technical reviews, statutory clearances and testing, apart from giving technical guidance to Zonal Railways. Vendor development with approval and inspection of major items is also part of the mandate of RDSO, an ISO 9000:2008 organisation. RDSO also functions as international platform for interaction with bodies such as UIC and AAR.

Some of the important activities during the year are given as:-

**Safety**

**VHF Based Approaching Train Warning System for Track Maintainers (Rakshak):** The system works through VHF Transmitter & a Hand held VHF Receiver (HHR) available with maintenance staff. This unit will be normally installed in a Relay Room or Station Master’s Room.

**Advance Warning System for UMLC:** RDSO has developed GPS based “Advance Warning System (Radio & RFID Based) to Pre-Warn Road User about Approaching Trains at Unmanned Level Crossing Gate”.

**Development of Train Collision Avoidance System (TCAS):** Train Collision Avoidance System (TCAS) is an Automatic Train protection (ATP) System with cab-signalling, meant to provide protection by preventing trains to pass signal at Danger (Red), excessive speed over turnouts / Speed restrictions and to avoid the situation in which more than one train is on the same track. TCAS provides features of ACD & ETCS at much lower cost.

**Development of Train Protection & Warning System:** Train Protection & Warning System (TPWS) is a continuous supervision system that eliminates risks of Signal Passing at Danger (SPAD). The system has been
commissioned on 116 RKM on SR, 192 RKM on NCR/NR and 28 RKM on Kolkata Metro.

**Development of FIBA (Failure Indication cum Brake Application) Device:** FIBA Device has been developed on IR and introduced successfully in coaches of important trains having Hybrid, (LHB shell & ICF bogies), LHB and Double Decker coaches fitted with Air Suspension in secondary stage.

**Ultrasonic Broken Rail Detection System:** The UBRD system, designed to inspect rail status for continuity at frequent intervals through guided ultrasound waves between stations spaced at approximately one km interval, has been commissioned in NR and NCR (25 kms each) in April, 2016.

**Screening of Experienced Loco Pilots for Their Deployment as High Speed Train Drivers on Trains Having Speed > 110 kmph Including Rajdhani/Shatabdi:** It is being done on indigenously developed Computer Aided Drivers Aptitude Test equipment comprising of different tests for assessment of psycho-physical, cognitive and personality attributes, crucial for the job of high speed train driving.

**Development of Drawings for Derailing Switch for Throughput Enhancement:** RDSO has developed two drawings of derailing switch of 52 Kg rail section. These drawings have been issued to all Zones.

**Passenger Amenities**

**IR-DRDO Bio Toilets in IR BG Coaches:** To overcome the environmental degradation and maintain hygiene in railway premises, RDSO in association with DRDO (DRDE/Gwalior) has developed IR-DRDO Bio-toilets which is being fitted on existing & new coaches.

**Development of World Class Interior in Coaches:** First model rake of world class AC and Non AC coaches was flagged off by the Prime minister of India and is running between Varanasi and New Delhi in Mahamana Exp.

**Water Purification System in Indian Railway Passenger Coaches:** RDSO has developed and MCF/RBL has fitted Water Purification System in 22 numbers Antyodaya Coaches (LWS) for trial.

**First Indigenous Air-conditioned EMU:** First Indigenous Air-conditioned EMU for Mumbai sub-urban with 3-phase propulsion system has been developed and manufactured by ICF for operation in Western Railway.

**Air Conditioned Metro for Kolkata Metro:** Air conditioned metro with 3-phase electric and bolsterless bogie similar to other metro coaches has
been manufactured by ICF and one rake has been turned out in July, 2017.

**Operational Efficiency**

**Development of LHB Rake Fit to Run at 200 Kmph on Existing Track:** RDSO in association with RCF, Kapurthala has developed LHB rake fit to run at 200 kmph on existing track. This rake has been provided with automatic closing door, improved EP assist stainless steel brake system and sintered brake pad.

**Prototype Development of Newly Designed 25T Open Wagon:** RDSO has developed the next version of the BOXN25 designated as BOXNS incorporating indigenously developed Light Weight Low Height bogie. Final speed certificate of the wagon has been issued at 85 kmph (E)/65lmph (L).

**Design Development of 25T Container Flat Wagon:** RDSO has developed the design of container flat type wagons (BCSA & BCSB) fit for 25T axle load operations. Board has placed order for manufacture of 03 no. prototype wagons (02 ‘A’ car and 01 ‘B’ car) on GOC workshop.

**Prototype Development of New Design High Capacity Parcel Wagon:** RDSO has recently developed a parcel van, with increased volumetric capacity, designed to operate as dedicated freight vehicle/ freight trains.

**Development of Ballastless Track with Indigenous Fastening System (BLT-IFS):** Design for Ballastless track (BLT) design has been developed using indigenous fastening system (IFS) for full speed (110) for 25T axle load.

- New Initiatives in Design and Fabrication of Railway Bridges
  - Design of 91.44m span has been standardized.
  - Bow string girders for NHAI drawings of 42m span bow string ROBs have been issued for one way two lane.
  - Design of 60m Bow Arch Bridge for NHAI one way two lane is in progress.
  - Design of 72m Bow Arch girder has been completed.

**Indigenous Development**

**Development of Micro Processor Based Governor for HHP Diesel Electric Locomotives:** This would facilitate Import substitution and Indigenization of Governor.
Modelling and Validation of Interlocking for Railway Signalling Systems: An MoU has been signed between RDSO & IIT/ KGP for Modelling and Validation of Interlocking for Railway Signalling Systems.

OFC Based Backup Interlocked Signalling System: RDSO has developed a scheme which involves controlling outdoor signalling functions on OFC with a standby system for running trains operation in emergency from location box. Entire interlocking software is duplicated in an intelligent safety controller.

Inspection and Quality Audit

Quality Assurance/Civil Directorate is the inspection agency for GRSP/ CGRSP, GFN Liners, Dowels, CMS Crossings & AT Welding Portions. Now, total On-line system for product inspection has been adopted and inspection certificates are uploaded on website. During the year 2016-17, total value of product inspected was ₹ 406.64 crores.

QA/Civil Directorate is dealing with fresh approval, up-gradation, quality audit of approved vendors etc. In the year 2016-17 the directorate has done Quality Audit of 84 firms, up-gradation of 15 firms and fresh approval of 21 firms.

Consultancy

During the year 2016-17, eight consultancy/Inspection Reports have been issued to Zonal Railways for various track formation related problems at different locations.

Test and Trials

Lucknow Metro: Detailed Oscillation & EBD trials were conducted by RDSO for Lucknow Metro Rail Corporation Standard Gauge coaches.

Talgo Train: RDSO conducted following trials.

- Riding, Safety and Stability assessment trial of BG TALGO Aluminium Coaches fitted with integrated suspension on articulated wheel set upto maximum test speed of 180 kmph over Palwal-Mathura section of North Central Railway and upto maximum test speed of 115 kmph over Bareilly-Moradabad-Saharanpur section of Northern Railway
- Emergency Braking Distance (EBD) trial with speed of 160 and 150 kmph over Palwal-Mathura section of North Central Railway
- Train Timing trials up to maximum test speed of 150kmph over New Delhi – Mumbai section.
Export

Design & Development of Fabricated Bogie frame for MG Diesel Locomotive for Export to Myanmar Railways: Design of bogie frame has been developed and verified by simulating with existing load cases on FEA software.

Research and Collaboration

Strategic Technology & Holistic Advancement (SRESTHA): Setting up of a ‘Special Railway Establishment for Strategic Technology & Holistic Advancement’ (SRESTHA), a world class institution to undertake the various Research and Development projects in Indian Railways was announced in Budget 2016 with the following objectives:

- It shall engage itself in building new products for Indian Railways, based on available technology in the world and in newer areas, R&D shall be initiated in synergy with the needs of Indian Railways along with focus on applied research and development.

- It shall be design Centre for Railways as a ‘System of Systems’ along with being a Technology Incubation & Commercialization Centre and shall assist to build Design Centres at Production Units of Indian Railways and other Centres of Excellence in Academic Institutions.

- It aims to transform Indian Railways from a net technology Importer to its Exporter in ten years, and work towards a modal ‘Shift to Rail’ in India.

The Project Management Unit (PMU) for setting up SRESTHA has been set up.

InnoRail International Exhibition and Conference: 2nd InnoRail International Conference was organized by RDSO in association with CII for 3 days from 01.12.2016 to 03.12.2016 at RDSO, Lucknow.

Global Technology Conference: RDSO organized a two-day Global Technology Conference on 3rd & 4th May 2017 at Manekshaw Centre in New Delhi, Critical areas of Safety, Reliability, Capacity enhancement and Customer service were the focus of various discussion during the conference.