

Research Design And Standards Organisation-An Overview

Historic Background

The first railways in India were built in 1853 and their subsequent continent-wide development saw the appearance of various private railway companies and state-owned railway systems. To enforce standardization and coordination between these sometimes-disparate systems, the Central Standard Office (CSO) was established in 1930 to prepare designs, standards and specifications. However, before Indian independence in 1947, most of the design and manufacturing of rolling stock and infrastructure was entrusted to foreign consultants. With the subsequent phenomenal increase in the nation's industrial and economic activity and rising demand for railway transport, a new organization called the Railway Testing and Research Centre (RTRC) was set up in 1952 at Lucknow to test and conduct applied research for development of railway rolling stock, permanent way etc. In 1957, the CSO and RTRC were integrated as the Research Design and Standards Organisation (RDSO) under the Ministry of Railways at Lucknow.

Functions

RDSO is the sole R&D organization of Indian Railways and functions as the technical advisor and consultant to the Indian Railway Board, regional railways and rolling stock works. Basically, its activities involve:

▪	Development of new and improved designs
▪	Development and adoption of new technologies for use on Indian Railways
▪	Development of standards for materials and products especially needed by Indian Railways
▪	Technical investigation, statutory clearance, testing and provision of consulting services
▪	Inspection of critical and safety items for rolling stock, locomotives, signals, telecommunications equipment, and track

RDSO also offers international consultancy services on design, testing and inspection of railway equipment as well as surveys for construction of new lines. Consultancy services have been provided to various countries such as Iraq, Sri Lanka, South Korea, Zambia, Egypt, Nigeria, Saudi Arabia, etc.

Identification of Research Areas

RDSO derives its policy direction from a governing council comprised of a chairman and board, director general, and board members of Indian Railways representing the civil, mechanical and electrical engineering, finance, personnel, traffic and planning wings.

The governing council identifies and approves R&D projects for Indian Railways. It reviews the progress of projects and determines the amount of direct funding.

To keep abreast with the latest technological developments, close liaison is maintained with industry and academic institutions through the Central Board of Railway Research (CBRR), consisting of well-known scientists, technologists, engineers and executives of other research

organizations, universities and industrial units related to railways and materials. The CBBR considers, recommends and reviews research while also ensuring coordination and assistance from non-railway laboratories.

Collaboration with Research and Academic Institutions

RDSO recognizes the imperative to generate basic knowledge through advanced academic research to enable a truly self-reliant technology improvement programme for the nation's railways. As a result, strong links have been forged with other institutions and organizations, such as the Indian Institutes of Technology (IIT) at Kanpur, Roorkee, New Delhi and Chennai, the Defense Research and Development Organisation (DRDO) in New Delhi, and the Central Scientific Research Organisation (CSIR).

IIT Kanpur has a Railway Technology Cell to handle projects related to development of a detector for wheel flats, finite element method (FEM) analysis of wheels and geo-technical problems such as field validation of design methodologies for rehabilitation of unstable structures and strengthening of existing structures for heavier axle loads.

Two professorial chairs have been established at IIT Roorkee in the fields of bridge engineering and the dynamics of rail-vehicle systems. The research covers revision of fatigue provisions in codes for steel bridges, formulation of design guidelines for rational assessment of temperature gradient in PRC box girders, reduction of scour around bridge piers, optimization of rail-wheel profiles for longer life, and representation of track irregularities by photo-spectral density. IIT Chennai also has a project on development of knowledge-based expert systems for integrated design of bridges.

IIT Delhi has projects on reduction of diesel engine noise and analysis of rail stress by FEM. RDSO also has a joint project with CSIO Chandigarh to develop an oscillation monitoring system based on microprocessor technology.

International Union of Railways (UIC) Projects

RDSO is active in global research projects through its participation in the following two UIC joint research projects.

UIC Project on Rail Defect Management (JRP-1)

RDSO was entrusted with laboratory testing under simulated load conditions of various rail samples received from railways in Japan, America, South Africa and India. A test rig was built in the RDSO Track Laboratory and the tests were completed in December 2002. A report on the growth of flaws in rails has been submitted to UIC for future discussions.

UIC Project on Rail -Wheel Interaction (JRP-2)

RDSO has been assigned the work of defining/describing/cataloguing the Rail -Wheel interaction phenomenon and mechanisms with respect to vertical and lateral discontinuities at welded rail joints.