



Indian Railways Deploys Advance AI & Machine Learning Devices to Enhance Safety and its Operational Efficiency by Adopting Smart Monitoring

TRI-Netra System Being Developed by RDSO to Assist Loco Pilots with Enhanced Vision During Foggy and Adverse Weather Conditions

24 Wheel Impact Load Detector (WILD) Systems and 25 Online Monitoring of Rolling Stock (OMRS) Systems Installed for Real-time Monitoring of Wheel and Bearing Health

Machine Vision Inspection System (MVIS) Deployed on Pilot Basis; 3 Systems in Northeast Frontier Railway, 2 in DFCCIL and 1 in South East Central Railway

3 Integrated Track Monitoring Systems (ITMS) Deployed for AI-based Inspection and Monitoring of Track Components

Drone-based Thermal Monitoring of Overhead Equipment Piloted in Raipur Division; AI-enabled Aerial Inspection Under Development with IIT Madras

Rail Tech Policy and Portal to Fast-Track AI-Driven, Scalable Innovations

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Technological improvement in Indian Railways (IR) is a continuous process. Some major technologies deployed/piloted over IR are as follows:

- **Machine Vision Inspection System (MVIS):** MVIS is an Artificial Intelligence (AI)/ Machine Learning (ML) based system which generates alerts on detecting any hanging, loose or missing components of moving trains. Three (03) MVIS have been installed in Northeast Frontier Railway, two (02) in Dedicated Freight Corridor Corporation of India Limited (DFCCIL) and one (01) in South East Central Railway on pilot basis for freight stock. Further, a MoU has been signed between

IR and DFCCIL to induct four (04) MVIS over IR network for freight stock. Also, Research Designs and Standards Organisation (RDSO) has taken up development of MVIS for rolling stock in collaboration with industry through an Expression of Interest (EoI).

- Wheel Impact Load Detector (WILD): WILD is a way-side inspection system that measures the impact of wheel on track to identify the defective wheel in Rolling Stock. 24 such systems are installed over IR.
- Online Monitoring of Rolling Stock (OMRS): OMRS is a way-side inspection system which monitors the health of bearing & wheel of Rolling Stock. 25 such systems are installed over IR out of which one (01) OMRS is installed at Sirpur Kaghaz nagar /Secunderabad Division in South Central Railway.
- Integrated Track Monitoring Systems (ITMS): ITMS are deployed for comprehensive inspection and monitoring of Railway tracks. The ITMS utilizes machine learning and image processing to monitor and detect defects in railway track components such as rails, sleepers, and fastenings. The data from ITMS is analysed for urgent and planned maintenance of track. Presently three (03) ITMS are deployed for track recording and monitoring of IR track. It helps in better track maintenance planning, enhanced safety, improved reliability of track assets and operational efficiency.
- Drone based monitoring of Overhead Equipment: Drone based monitoring with thermal imaging of Overhead Equipment (OHE) has been taken up in Raipur division on pilot basis. Further, IR in association with IIT Madras, has taken up development of a Drone based aerial inspection of Overhead Equipment (OHE) which will also analyse the captured data using AI/ML.
- TRI-Netra: RDSO has taken up development of TRI-Netra (Terrain Imaging for Locomotive Drivers - Infra-Red, Enhanced Optical & Ranging Device Assisted) for assisting the Loco pilots during foggy, rainy and inclement weather. This system comprises of optical cameras, infra-red camera and ranging devices (e.g. Radar/Lidar) & AI to create a real-time, enhanced vision system for assisting Loco pilots.

Rail Tech Policy: Further, to support the development of cost-effective, implementable and scalable solutions, including those based on AI and data-driven technologies, a new policy called the Rail Tech Policy has been adopted on 26.02.2026 by IR and a portal (<https://railtech.indianrailways.gov.in>) has been launched to facilitate participation of innovators and startups.

The proposed Rail Tech Policy incorporates the following key features:

- Single-stage detailed submission of proposals by the Innovator.
- Provision for submission of proposals for self-initiated challenges by the Innovator on the Rail Tech Portal.
- Provision for funding on 50:50 cost-sharing basis between Indian Railways and the Innovator, with the maximum grant for prototype development and trials.
- Grant offered for extended trials or scale-up

The above proposed Policy will facilitate early adoption of new technologies in Indian Railways.

This information was provided by the Union Minister for Railways, Information & Broadcasting and Electronics & Information Technology, Shri Ashwini Vaishnaw, in a reply to questions in Lok Sabha.

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