GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

LOK SABHA
UNSTARRED QUESTION NO. 3113
TO BE ANSWERED ON 11.03.2026

DEPLOYMENT OF TECHNOLOGY IN SOUTH CENTRAL RAILWAY DIVISION

3113. SHRI B K PARTHASARATHI:

Will the Minister of RAILWAYS be pleased to state:

(a) whether Artificial Intelligence (AI), Machine Learning (ML) and Machine Vision–based systems such as the Machine Vision Inspection System (MVIS), Online Monitoring of Rolling Stock System (OMRS) or Wheel Impact Load Detector (WILD) are being deployed/piloted in the South Central Railway (SCR) Division;

(b) if so, the details of such technologies, their objectives and the locations identified for pilot or installation;

(c) whether any collaborations have been undertaken with research institutions or private entities for these pilots and if so, the details thereof; and

(d) the details of the outcomes observed so far in improving safety, predictive maintenance and operational efficiency?

ANSWER

MINISTER OF RAILWAYS, INFORMATION & BROADCASTING AND ELECTRONICS & INFORMATION TECHNOLOGY

(SHRI ASHWINI VAISHNAW)

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

1. **Machine Vision Inspection System (MVIS): MVIS is an Artificial Intelligence (AI)/ Machine Learning (ML) based system which generates alert on detecting any hanging, loose or missing components of moving trains.**

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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).

2. **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.**

3. **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.**

4. **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.**

5. **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.**

6. **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 camera, infra-red camera and ranging devices (e.g. Radar/Lidar) & AI to create a real-time, enhanced vision system for assisting Loco pilots.

7. Kavach:

i) Kavach is an indigenously developed Automatic Train Protection (ATP) system. Kavach is a highly technology intensive system, which requires safety certification of highest order (SIL-4).

ii) Kavach aids the Loco Pilot in running of trains within specified speed limits by automatic application of brakes in case Loco Pilot fails to do so and also helps the trains to run safely during inclement weather.

iii) Based on deployment of Kavach version 3.2 on 1465 Route Km on South Central Railway and experience gained, further improvements were made. Finally, Kavach specification version 4.0 was approved by RDSO on 16.07.2024.

iv) Major improvement in Version 4.0 includes increased location accuracy, improved information of signal aspects in bigger yards, Station to Station Kavach interface on OFC and Direct Interface to existing Electronic Interlocking System.

v) After extensive and elaborate trials, Kavach Version 4.0 has been successfully commissioned on 1452 Route Kilometres, covering the high density Delhi- Mumbai and Delhi-Howrah routes as below:

SN	Section	Progress (Route Km)
(1)	Delhi-Mumbai route:	
i	Junction cabin – Palwal – Mathura – Nagda section	667
ii	Vadodara - Ahmedabad section	96
ii	Vadodara - Virar section	336
(2)	Delhi – Howrah route:	
i	Gaya Sarmatanr section	93
ii	Chota Ambana - Bardhaman – Howrah section	260

vi) **Further, track side Kavach implementation work has been taken up on 24,427 Route Kilometres covering all GQ, GD, HDN and identified sections of Indian Railways. Progress of key items of Kavach as on 28.02.26 is as under:**

SN	Item	Progress
i	Laying of Optical Fibre Cable	8570 Km
ii	Installation of Telecom Towers	1100 nos.
iii	Station Data Centre	767 stations
iv	Installation of Track side equipment	6776 RKm
v	Provision of Kavach in Loco	4154 nos.

vii) **In addition, work for installation of Kavach in 8979 Locomotives and 1200 EMU/MEMU has been taken up.**

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 up to ₹ 3 Cr for prototype development and trials.**
- **Grant offered for extended trials or scale-up shall be upto five times the initial grant subject to a maximum of ₹ 10 crore.**

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

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