GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

LOK SABHA
UNSTARRED QUESTION NO. 4534
TO BE ANSWERED ON 20.08.2025

USE OF AI/ML-BASED TECHNOLOGIES IN RAILWAYS

4534. SHRI G M HARISH BALAYOGI:

Will the Minister of RAILWAYS be pleased to state:

(a)   whether the Government is leveraging Artificial Intelligence (AI) and Machine Learning (ML) technologies to enhance railway safety and operational efficiency;

(b)   if so, the key applications/systems where such technologies are being deployed/piloted including their objectives and scope;

(c)   whether Machine Vision based Inspection System (MVIS) is among the AI/ML-based initiatives being implemented to detect faults/defects in rolling stock and if so, the details thereof;

(d)   the number of MVIS units/similar systems proposed to be installed and the zones /corridors identified for their deployment;

(e)   whether the said systems have been tested for reliability and accuracy and the outcomes observed so far in terms of accident prevention, inspection efficiency/reduction in service disruptions and if so, the details thereof; and

(f) whether the Government has a roadmap for the phased expansion of AI/ML-enabled safety technologies across all railway zones and divisions and if so, details thereof and the reasons therefor?

ANSWER

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

(SHRI ASHWINI VAISHNAW)

(a) to (f): Technological improvements in Indian Railways (IR) are a continuous process. Artificial Intelligence/Machine Learning (AI/ML) based applications are a developing area. Some of the initiatives taken by IR in the area of AI/ML are as follows:

i. IR has adopted advanced/improved technologies like Online Monitoring of Rolling Stock System (OMRS), Wheel Impact Load Detector (WILD) for predictive maintenance of rolling stock.

ii. A Memorandum of Understanding has been signed between IR and Dedicated Freight Corridor Corporation of India Limited (DFCCIL) in July 2025 for induction of 4 numbers of wayside Machine Vision based Inspection System (MVIS). This is an AI/ML driven system for detecting hanging parts or missing components in moving trains. The locations identified for installation of these 4 systems are as follows:

   a. Near Tughlakabad over Delhi Division of Northern Railway

   b. Near Mauda over Nagpur Division of South East Central Railway

    c. In Vishakhapatnam – Vizianagaram section over Waltair Division of East Coast Railway

    d. Near Toranagallu over Hubballi Division of South Western Railway

These systems are being provided as pilot projects and will undergo technical proving out before they are considered for phased expansion over Indian Railways.

iii. A Memorandum of Understanding has been signed between IR and Delhi Metro Rail Corporation to induct 4 numbers of Automatic Wheel Profile Measurement System (AWPMS). The AWPMS allows for automatic non-contact measurement of train wheel profile ensuring real-time measurement of wheel geometry and wear. The locations identified for installation of these 4 systems are as follows:

    a. Lokmanya Tilak Terminus Coaching Depot over Mumbai Division of Central Railway

    b. Anand Vihar Terminal Coaching Depot over Delhi Division of Northern Railway

    c. Near Tughlakabad Wagon Depot over Delhi Division of Northern Railway

    d. Near Pandit Deen Dayal Upadhyay Wagon Depot over Pandit Deen Dayal Upadhyay Division of East Central Railway

iv. For improving operational efficiency, AI/ML models have been implemented in the areas of passenger services (Rail Madad and

Passenger Reservation System), freight operations (prediction of estimated time of arrival of freight trains), and prediction of unloading/loading time.

v. Centre for Railway Information Systems has signed a Memorandum of Understanding with Digital India Bhashini Division for auto language translation for handling of user complaints in any of the 13 scheduled languages.

vi. Centre for Railway Information Systems has signed a Memorandum of Understanding with Indian Institute of Technology Delhi for enhancing efficiencies in the area of train operations.

vii. Centre for Railway Information Systems has signed a Memorandum of Understanding with Indian Institute of Technology Mumbai for adoption of generative AI in transportation and related sectors.

viii. Artificial Intelligence (AI) enabled Intrusion Detection System (IDS) using Distributed Acoustic System (DAS) is implemented in 141 RKms section of Northeast Frontier Railway for detecting presence of elephants on Railway tracks. The system is designed to generate alerts for loco pilots, station masters and Control Room about the movement of elephants in proximity of railway tracks, for taking preventive action timely.

ix. Pilot initiatives involving AI-driven predictive maintenance of signaling are being undertaken over the Indian Railways.

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