

**GOVERNMENT OF INDIA  
MINISTRY OF RAILWAYS**

**LOK SABHA  
UNSTARRED QUESTION NO. 4516  
TO BE ANSWERED ON 30.03.2022**

**TECHNOLOGY IMPROVEMENT/DEVELOPMENT OF RAILWAYS**

**4516. SHRI MANOJ KOTAK:  
SHRIMATI RAKSHA NIKHIL KHADSE:**

**Will the Minister of RAILWAYS be pleased to state:**

- (a) whether the Government is working on technology improvement/development for modernization of Indian Railways;**
- (b) if so, the details thereof;**
- (c) whether the Government is making a policy to enable involvement of private sector for research and development in Railways; and**
- (d) if so, the details thereof?**

**ANSWER  
MINISTER OF RAILWAYS, COMMUNICATIONS AND  
ELECTRONICS & INFORMATION TECHNOLOGY  
(SHRI ASHWINI VAISHNAW)**

**(a) & (b): Yes, Sir. Technology improvement/development for modernization of Indian Railways is a continuous process. The various steps taken by Indian Railways in this regard are as under:**

**(1) Track: (i) Modern track structure consisting of Pre-stressed Concrete Sleeper (PSC) Normal/Wide base sleepers with elastic fastening, 60 kg, 90 or higher Ultimate Tensile Strength (UTS) rails, fan shaped layout turnout on PSC sleepers, Steel Channel Sleepers on girder bridges is used while carrying out primary track renewals.**

**(ii) Long rail panels of 260 M/130M length are being manufactured at the steel plant to minimize number of Alumino Thermit Joints in the track.**

- (iii) Provision of Thick Web Switches (TWS),**
- (iv) Weldable Cast Manganese Steel (CMS) crossings,**
- (v) Using of improved fittings,**
- (vi) Maintenance of track with the help of track machines,**
- (vii) Ultrasonic testing of rails to detect flaws, etc.**

**(2) Bridge: (i) Bridge Management System (BMS), a web based IT application has been developed to facilitate 24x7 availability of information such as bridge drawings/design details, inspection details, photographs, videos, etc. for meaningful analysis, assessment of progressive deterioration and capacity to carry increased loads.**

**(ii) New and Modern Technologies introduced to upgrade inspection techniques of Bridges such as continuous water level measurement and monitoring system; inspection of bridges using Drones, 3D scanning of riverbeds.**

**(iii) Trials of continuous scour monitoring system are in progress.**

**(iv) Trials for under water inspection by deploying Remote Operated Vehicles (ROV) are in progress.**

**(3) Rolling Stock: (i) Advanced/improved technologies like Online Monitoring of Rolling Stock System (OMRS) and Wheel Impact Load Detector (WILD) have been adopted for predictive maintenance of rolling stock.**

**(ii) Radio Frequency Identification (RFID) tags are being fitted on rolling stock to automatically track and trace the rolling asset moving over Indian Railways network.**

**(iii) In addition, other technological systems like Hot Box Detector (HBD) and Machine Vision Inspection System (MVIS) are also under development for implementation over Indian Railways.**

**(4) EMU/MEMU: (i) Newly manufactured Electric Multiple Unit (EMU) trains, Mainline Electrical Multiple Unit (MEMU) trains, Kolkata Metro and Electric Train sets have been introduced with common technical features such as**

**Introduction of IGBT based 3-Phase propulsion system with energy efficient regenerative braking features.**

**(ii) Microprocessor based Train Control and Management System (TCMS), Corrosion less Stainless car body,**

**(iii) Installation of GPS based Passenger Announcement cum Passenger Information System,**

**(iv) Touch-screen Driver's Display Unit provides live status of healthiness of major equipments of all basic units such as lights or fans, etc.**

**(v) To ensure security of passengers, Close Circuit Tele Vision Cameras in Coaches as well as in Driver's cabs have been provided which would be visible on Display in Driver's/Guard's cabs.**

**(vi) Front view CCTV Cameras to record Signal aspects and Rear view cameras on both sides of Drivers Cab for recording platform status.**

**(vii) Emergency Talk Back system/Panic Buttons, for passengers to communicate with Guard/Driver in case of emergency.**

**(viii) Aesthetic plush interiors for comfort of passengers, Aerodynamic Nose Cone and Ergonomically designed Driver's desk.**

**(ix) Energy efficient LED lights in coaches for better illumination.**

**(x) Under-slung Fully Air conditioned, Kolkata Metro rakes with Automatic doors, end to end vestibules, fitted with Train Protection and warning system and fully suspended Traction Motors.**

**(5) Main Line Trains: (i) In Main Line Trains, EOG trains have been converted into HOG trains to reduce noise and air pollution at stations and in trains. All LHB EOG trains have been converted into HOG compliant.**

**(ii) Energy efficient LED lights provided in coaches for better illumination.**

**(6) Signalling System: (i) Electronic Interlocking (EI) is being adopted on a large scale to derive benefits of digital technologies in train operation and to enhance safety,**

**(ii) In order to increase line capacity to run more trains on existing High Density Routes of Indian Railways, Automatic Block Signalling is being provided,**

**(iii) Automatic Train Protection (ATP System called Kavach, indigenously developed by Indian Railways, has been adopted in South Central Railway for enhancing safety of running trains.**

**(7) Coach: (i) With indigenous developed technology, Indian Railway has manufactured Vande-Bharat Trains (Train-18).**

**(ii) Indian Railway has already awarded contract for design, development, manufacture, supply, integration, testing and commissioning of IGBT based 3-Phase propulsion, control and other equipment (including Bogie assemblies) for manufacture of 44 Vande Bharat trains with improved suspension technology and energy efficiency.**

**(iii) Indian Railway also plans to acquire/manufacture 400 new generation energy efficient Vande Bharat trains with better energy efficiency and passenger riding experience.**

**(iv) Modern Coach Factory (MCF)/Rae Bareli has signed a Transfer of Technology (ToT) contract with M/s Dawonsys, South Korea for Design, Development, Manufacturing and Testing of Aluminium Body passenger coaches.**

**(c) & (d): Indian Railways is making efforts to leverage the expertise and technical knowledge available with various sectors, including private sector, in the country for improving operational efficiency of Indian Railways.**

**\*\*\*\*\***