

**GOVERNMENT OF INDIA
RAILWAYS
LOK SABHA**

UNSTARRED QUESTION NO:1109

ANSWERED ON:16.08.2012

TECHNOLOGY FOR RAIL SAFETY

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Will the Minister of RAILWAYS be pleased to state:

- (a) whether the Railways are considering to adopt new technology such as anti-collision devices etc. to make train travel accident-free;
- (b) if so, the details thereof inter alia indicating the type of technology adopted with the current status of its implementation and the funds allocated to each such technology during the current financial year;
- (c) whether the Railways have fixed any time-frame for the implementation of each such technology throughout the country;
- (d) if so, the details thereof; and
- (e) the other steps taken/being taken by the Railways to make the train travel accident free?

Answer

MINISTER OF STATE IN THE MINISTRY OF RAILWAYS (SHRI K.H. MUNIYAPPA)

(a) to (e) A Statement is laid on the Table of the House.

STATEMENT REFERRED TO IN THE REPLY TO PARTS (a) TO (e) OF UNSTARRED QUESTION NO. 1109 BY SHRI ADHIR CHOWDHURY, SHRIMATI JYOTI DHURVE, SHRI RADHA MOHAN SINGH, SHRI N. CHALUVARAYA SWAMY AND SHRI KACHHADIA NARANBHAI TO BE ANSWERED IN LOK SABHA ON 16.08.2012 REGARDING TECHNOLOGY FOR RAIL SAFETY.

(a): Yes, Madam. Railways are considering to adopt various new technologies such as Anti Collision Device (ACD), Train Protection and Warning System (TPWS), Train Collision Avoidance System (TCAS), Vigilance Control Device (VCD) and Fog Safe Device (FSD) etc.

(b) to (d): Anti Collision Device (ACD): Anti Collision Device is a Global Positioning System (GPS) based device provided in the locomotive which continuously transmits position of loco to other locomotives in the vicinity and applies brakes in a collision like situation. ACD has been provided as pilot project since July 2006 covering 1736 route Kms and 548 Locomotives on Northeast Frontier Railway (NFR) where it has been in service trial since 2006. Based on the experience of the NFR, the specifications and design configuration were revised and the system as evolved was tried on the electrified multiple lines, automatic signalling section of the Southern Railway in 2010-2011. A large number of operational and technical problems have been experienced in Southern Railway (SR) trials which are being looked into. Anti Collision Device provided by Konkan Railway Corporation Limited and on trials in Northeast Frontier Railway also has operational problems and technical issues which are yet to be resolved. It will be possible to proliferate this system on complicated and High Density Routes (HDN) on other railways only after these issues are resolved comprehensively.

Train Protection & Warning System (TPWS) eliminates the accidents caused by human error like signal passing at danger and over speeding. Pilot project of Train Protection & Warning System (TPWS) has been commissioned on suburban section (50 RKms) of Southern Railway in May'2008 and is operational. The commercial trials of pilot project on Delhi-Agra section (200 RKms) on North Central Railway is in progress. Based on the experience gained, low cost TPWS version has been sanctioned for deployment on High Density Network (HDN)/Automatic Signaling Sections covering 3397 route kilometers over 8 zonal railways i.e. Central, Eastern, Northern, South Central, North Central, Southern, South Eastern and Western.

Train Collision Avoidance System (TCAS): Based upon experience gained from ACD & TPWS systems, Indian Railways has now taken up development of TCAS. TCAS shall be a fusion of functionalities of TPWS & ACD and shall prevent Signal Passing at Danger as well as Collisions. It is an indigenous research and development effort, work on which is progressing. Vigilance Control Device (VCD): The Vigilance Control Devices are being provided on electric as well as diesel locomotives to ensure safety. VCD is a device which takes intermittent inputs through positive actions from the driver like sounding of horn, operation of master controller, application of brakes and pressing of button to judge his alertness every 60 seconds and applies brakes if found lacking to stop train thereby ensuring safety. All diesel locos and 76% of electric locomotives have been provided with VCDs. Rs. 5.8 Cr. have been allocated in Budget 2012-13 for provision of VCDs on the remaining electric locomotives during 2012-13 and the work is progress.

Fog Safe Device (FSD) is a Global Positioning System (GPS) based device provided on locomotives working on high density, fog prone sections on Indian Railways on trial basis. This device displays the name of approaching signals and other critical landmarks even during poor visibility condition. However, it does not indicate the aspect of the signal. Extended trials are in progress. The results of these are being analysed to determine if the equipment have worked reliably. Moreover, adequate good quality vendors are not yet available for the equipment, which is still under development. Any proliferation of Fog safe devices will therefore have to wait till sufficient data is available to establish their reliability, crew-friendliness and ruggedness of the equipment. It may also be added that this device is not a safety system, but an aid to loco pilot to reduce stress during running of trains especial in foggy weather. Fog safe device is being provided under Revenue expenditure and no separate fund allotment is being made.

(e): Indian Railways are continuously modernizing its safety equipments/systems to prevent all types of accidents. Some notable items are as under:-

- i. Provision of complete Track Circuiting in signaling system to detect presence of a vehicle on a track.
- ii. Electrical/Electronic Interlocking Signalling System with centralized operation of points and signals to eliminate human failure and to replace old outdated mechanical systems.
- iii. Axle Counters for Automatic Clearance of Block Section to enable detention of any left-over vehicle(s) in the block section and ensure that this does not cause any unsafe situation.
- iv. Provision of Mobile Train Radio Communication (MTRC) for safe and secure communication between Loco Pilot, Guard, Station Masters, Controllers and maintenance teams working along the track.
- v. Progressive fitment of tight lock Centre Buffer Couplers (CBC) in lieu of screw coupling to prevent the coaches from climbing over each other in the unfortunate event of an accident.
- vi. Increased production of superior crashworthy coaches of LHB design.
- vii. Trials of Wheel Impact Load Detectors (WILD) to monitor the impact of load on tracks when a train passes over the track to ensure that no damage is done to the track.
- viii. Use of fire retardant material in coaches as per international norms.
- ix. Trial of fire and smoke detection system in coaches.
- x. Provision of superior air brake system in place of vacuum brake system in freight trains which facilitates better control of the train.
- xi. Increased use of superior Flash Butt Welding technology in place of Thermit Welding of rails to reduce weld failures.
- xii. Introduction of 60 Kg rails instead of 52 Kg rails for better track strength and progressive use of thick web switches in points and crossings.
- xiii. Use of Track Recording Cars and Portable Oscillation Monitoring Systems to detect track geometry defects for planning maintenance and adoption of mechanized track maintenance.
- xiv. Use of improved Ultrasonic Flaw Detector (USFD) equipments to identify weak spots/metallurgical defects in the rails not visible to naked eye.
- xv. Twin beam headlights for improving the visibility of the drivers during night time.
- xvi. Flasher lights which get automatically switched on in case of train parting due to derailment or otherwise.
- xvii. Air dryers for improving reliability of the braking system.
- xviii. Energy-cum-speed monitoring system (ESMON) having digital memory.