GOVERNMENT OF INDIA

MINISTRY OF RAILWAYS

RAJYA SABHA

UNSTARRED QUESTION NO. 3958

ANSWERED ON 04.04.2025

IMPLEMENTATION AND EXPANSION OF KAVACH TRAIN COLLISION AVOIDANCE SYSTEM

3958 SHRI MALLIKARJUN KHARGE**:**

Will the Minister of RAILWAYS be pleased to state:

(a) the details of total railway track length covered under the Kavach Train Collision Avoidance System (TCAS) as of date, zone-wise;
(b) the reasons for the slow rollout of Kavach despite successful trials and its certification for Safety Integrity Level (SIL)-4;
(c) the status of Kavach Version 4 deployment, including the key challenges identified during testing and implementation; and
(d) the roadmap and timeline for expanding Kavach coverage to key railway corridors across the country?

ANSWER

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

(SHRI ASHWINI VAISHNAW)

(a) to (d): 1. 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).

2. Kavach aids the Loco Pilot in running of train 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.

3. The first field trials on the passenger trains were started in February 2016. Based on the experience gained and Independent Safety Assessment of the system by Independent Safety Assessor (ISA), three firms were approved in 2018-19, for supply of Kavach Ver 3.2.

4. Kavach was adopted as National ATP system in July 2020.

5. Implementation of Kavach System involves following Key Activities:

   a. Installation of Station Kavach at each and every station, block section.
   b. Installation of RFID Tags throughout the track length.
   c. Installation of telecom Towers throughout the section.
   d. Laying of Optical Fibre Cable along the track.
   e. Provision of Loco Kavach on each and every Locomotive running on Indian Railways.

6. Based on deployment of Kavach version 3.2 on1465 RKm on south central Railway, lot of experience was gained. Using that further improvements were made. Finally, Kavach specification version 4.0 was approved by RDSO on 16.07.2024.

7. Kavach version 4.0 covers all the major features required for the diverse railway network. This is a significant milestone in safety for Indian Railways. Within a short period, IR has developed, tested and started deploying Automatic Train Protection System.

8. Major improvement in Version 4.0 includes increased Location Accuracy, Improved Information of Signal Aspects in bigger yard, Station to Station Kavach interface on OFC and Direct Interface to existing Electronic Interlocking System. With these improvements, Kavach Ver.4.0. is planned for large scale deployment over Indian Railways.

9. Progress of Key items comprising Kavach system on Indian Railways upto Feb' 2025 is as under: -

SN	Items	Progress
i	Laying of Optical Fibre Cable	5743 Km
ii	Installation of Telecom Towers	540 Nos.
iii	Provision of Kavach at Stations	664 Nos.
iv	Provision of Kavach in Loco	795 Locos
v	Installation of Track side equipment	3727 Rkm

10. Next phase of Kavach implementation is planned as under:-

    a. Project for equipping 10,000 Locomotives has been finalized. 69 number of loco sheds have been prepared for equipping with Kavach.

    b. Bids for track side Works of Kavach for approximately 15,000 RKm have been invited covering all GQ, GD, HDN and identified sections of Indian Railways, out of which works of 1865 RKm have been awarded.

11. Currently, 3 OEMs are approved for supply of Kavach System. To increase capacity and scale of implementation, trials and approval of more OEMs are at different stages.

12. Specialized training programme on Kavach are being conducted at centralized training institutes of Indian Railways to impart training to all concerned officials. By now more than 20,000 technicians, operators and engineers have been trained on Kavach technology. Courses have been designed in collaboration with IRISET.

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