GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

RAJYA SABHA
UNSTARRED QUESTION NO. 1542
ANSWERED ON 01.08.2025

USE OF KAVACH TO AVERT ACCIDENTS

1542. SHRI C. VE. SHANMUGAM:

Will the Minister of RAILWAYS be pleased to state:

(a) whether it is a fact that the Railways use Kavach technology to avert accidents;

(b) if so, the details thereof including the number of railway lines and networks covered and being covered by the Kavach technology in the country, division-wise;

(c) the status of the completion of the Kavach lines in other networks;

(d) the total amount sanctioned so far for the implementation of the Kavach technology; and

(e) whether there is any similar technology in use in rail networks in other countries, if so, the details thereof?

ANSWER

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

(SHRI ASHWINI VAISHNAW)

(a) to (e): 1. Kavach is an indigenously designed, developed, and manufactured 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 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.

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.

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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 on 1465 RKm on south central Railway, a 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 yards, 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. After extensive and elaborate trials in 324 kms of Mathura-Kota section for advance version of Kavach 4.0, this section is approved by Independent Safety Assessor (ISA). This is also the first section to be approved by ISA. Kavach Version 4.0 has been commissioned over Kota–Mathura section covering 324 Route Kilometers on 30.07.2025.

10. Progress of Key items comprising Kavach system on Indian Railways upto 14.07.25 is as under:-

SN	Items	Progress
i.	Laying of Optical Fibre Cable	5856 Km
ii.	Installation of Telecom Towers	619 Nos.
iii.	Provision of Kavach at Stations	708 Nos.
iv.	Provision of Kavach in Loco	1107 Locos
v.	Installation of Track side equipment	4001 Rkm

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

12. 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 14847 RKm have been awarded.

13. Specialized training programmes on Kavach are being conducted at centralized training institutes of Indian Railways to impart training to all concerned officials. By now more than 30,000 technicians, operators and engineers have been trained on Kavach technology. Courses have been designed in collaboration with IRISET.

14. The cost for provision of Track Side including Station equipment of Kavach is approximately Rs. 50 Lakhs/Km and cost for provision of Kavach equipment on locomotives is approximately Rs. 80 Lakh/Loco.

15. The funds utilized on Kavach works so far up to June'25 is Rs. 2015 Crores. The allocation of funds during the year 2025-26 is Rs. 1673.19 Crores. Requisite funds are made available as per the progress of works.

16. Automatic Train Protection (ATP) Systems are also used in rail networks in other countries such as European Train Control System (ETCS) in European Countries, Digital Automatic Train Control (D-ATC) system in Japan etc.

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