

GOVERNMENT OF INDIA  
MINISTRY OF RAILWAYS

**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 595**  
**ANSWERED ON 07.02.2025**

**DEPLOYMENT OF KAVACH SERVICE**

595 SHRI PRAMOD TIWARI:

Will the Minister of RAILWAYS be pleased to state:

- (a) the key activities undertaken for implementation of Automatic Train Protection System (Kavach) and the progress made so far in deploying it;
- (b) the details of planned next phase of Kavach implementation;
- (c) the progress made so far with regard to installation of fog safety devices in railways;
- (d) whether it is a fact that a crucial element of Kavach's successful implementation is the training of railway personnel; and
- (e) if so, the specialized training programmes initiated at its training institutes and the personnel trained so far?

**ANSWER**

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

(SHRI ASHWINI VAISHNAW)

- (a) to (e): 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:
  - (i) Installation of Station Kavach at each and every station, block section.
  - (ii) Installation of RFID Tags throughout the track length.
  - (iii) Installation of telecom Towers throughout the section.
  - (iv) Laying of Optical Fibre Cable along the track.
  - (v) 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, 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 31<sup>st</sup> Jan 2025 is as under: -

SN	Items	Progress
i	Laying of Optical Fibre Cable	5229 Km
ii	Installation of Telecom Towers	540 Nos.
iii	Provision of Kavach at Stations	571 Nos.
iv	Provision of Kavach in Loco	762 Locos
v	Installation of Track side equipment	3677 Rkm

10. In the next phase of Kavach implementation:-
  - (i) Project for equipping 10,000 Locomotives has been finalized. 69 number of loco sheds have been prepared for equipping with Kavach.
  
  - (ii) Bids for track side Works of Kavach for approximately 15000 Rkm have been invited. It covers all GQ, GD, HDN and Identified sections of Indian Railways.
  
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 (IRISET) and Zonal training centre to impart training to all concerned officials. By now more than 17,000 technicians, operators and engineers have been trained on Kavach technology. Courses have been designed in collaboration with IRISET.
  
13. 'Fog Safe Device' (FSD) is being provided to Loco Pilots, which displays the information of critical landmarks such as approaching signal, level crossing gates, permanent speed restrictions etc. in advance during poor visibility condition like fog. So far 24,984 nos. of FSDs have been provided on IR upto Dec'2024. This device is used for safe train operation especially during winter season and to help reduce stress on Loco Pilots while running in poor visibility conditions.

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