

GOVERNMENT OF INDIA  
MINISTRY OF RAILWAYS

**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 2995**  
**ANSWERED ON 20.12.2024**

**OUTCOME OF KAVACH 4.0**

2995 SHRI YERRAM VENKATA SUBBA REDDY:

Will the Minister of RAILWAYS be pleased to state:

- (a) the outcome of Kavach 4.0 experiments undertaken by the Railways;
- (b) whether it is a fact that the Railways has called for tenders to install Kavach 4.0 in all zones and 3,000 route kms under South Central Railway (SCR) selected for this purpose;
- (c) if so, the details thereof; and
- (d) the reasons as to why Government cannot sell the technology to other countries to earn money and the same money can be used to expand Kavach on all tracks?

**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:
  - (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 Nov' 2024 is as under: -

SN.	Items	Progress
i	Laying of Optical Fibre Cable	5133 Km
ii	Installation of Telecom Towers	540 Nos.
iii	Provision of Kavach at Stations	523 Nos.
iv	Provision of Kavach in Loco	707 Locos
v	Installation of Track side equipment	3434 Rkm

10. Next phase of Kavach implementation is planned as under:-
  - (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 to impart training to all concerned officials. By now more than 9000 technicians, operators and engineers have been trained on Kavach technology. Courses have been designed in collaboration with IRISSET.