

**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS**

**LOK SABHA
UNSTARRED QUESTION NO. 2544
TO BE ANSWERED ON 11.12.2024**

AUTOMATIC TRAIN PROTECTION SYSTEM – KAVACH 4.0

2544. SMT. POONAMBEN HEMATBHAI MAADAM:

SHRI MOHITE PATIL DHAIRYASHEEL RAJSINH:

SMT. SUPRIYA SULE:

SHRI SANJAY DINA PATIL:

SHRI AMAR SHARADRAO KALE:

PROF. VARSHA EKNATH GAIKWAD:

SHRI BHASKAR MURLIDHAR BHAGARE:

SHRI SHAFI PARAMBIL:

SHRI MANISH JAISWAL:

DR. AMOL RAMSING KOLHE:

SHRI BAJRANG MANOHAR SONWANE:

SHRI NILESH DNYANDEV LANKE:

Will the Minister of RAILWAYS be pleased to state:

- (a) whether the Government has developed an Automatic Train Protection System called Kavach and if so, the current status of Kavach 4.0 across the Railways alongwith timeline for its implementation on high-density and high-speed routes;**
- (b) the details of railway lines in the country particularly in Maharashtra where Kavach 4.0 has been deployed, route-wise;**
- (c) the number of trains operating in Maharashtra currently equipped with Kavach 4.0;**
- (d) the reasons for the delay in rolling out the Kavach system in all stations;**
- (e) the specific technological advancements in Kavach 4.0 compared to its earlier versions;**

- (f) whether any foreign technology partnerships were involved in its development;**
- (g) the measures being taken to continuously upgrade the system to meet global safety standards;**
- (h) the number of train accidents or near-misses prevented by Kavach 4.0 since its deployment;**
- (i) anticipated reduction in accidents and delays due to the system;**
- (j) the Government has conducted any cost-benefit analysis for Kavach 4.0 implementation, if so, the details thereof;**
- (k) whether the deployment of Kavach 4.0 has improved punctuality and safety in train operations;**
- (l) if so, the details of its impact, with specific reference to zones where it is operational; and**
- (m) the details of fund allocated for installation of Kavach system for Maharashtra and Jharkhand?**

ANSWER

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

(SHRI ASHWINI VAISHNAW)

- (a) to (m): 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 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 Oct' 2024 is as under: -

SN	Items	Progress
I	Laying of Optical Fibre Cable	5116 Km
ii	Installation of Telecom Towers	538 Nos.
iii	Provision of Kavach at Stations	521 Nos.
iv	Provision of Kavach in Loco	687 Locos
v	Installation of Track side equipment	3413 Rkm

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

a. Project for equipping 10,000 Locomotives has been finalized.

b. 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. The sections mentioned above also pass through states of Maharashtra and Jharkhand.

12. 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.

- 13. 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.**

- 14. The funds utilized on Kavach works so far is Rs. 1547 Crores. The allocation of funds during the year 2024-25 is Rs. 1112.57 Crores. Requisite funds are made available as per the progress of works.**
