

GOVERNMENT OF INDIA  
MINISTRY OF RAILWAYS  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 2374**  
**ANSWERED ON 07.08.2026**

**DEVELOPMENT OF DOMESTIC MANUFACTURING CAPACITY FOR KAVACH**

2374# SHRI MANAN KUMAR MISHRA:

Will the Minister of RAILWAYS be pleased to state:

- (a) the steps taken by Government to develop domestic manufacturing capacity for Kavach-related equipment and its components;
- (b) the percentage of passenger trains and kilometre route currently equipped with the Kavach system and Government's plan to further expand its coverage;
- (c) the steps being taken to ensure the availability of trained personnel and maintenance capacity; and
- (d) whether Micro, Small and Medium Enterprises (MSMEs) and Indian electronics manufacturers are being integrated into the Kavach supply chain?

**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 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.
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 1,465 Rkm on South Central Railway and experience gained, 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, Kavach Version 4.0 has been successfully commissioned on 2,633 Route Kilometres as on 31.07.26, covering the high density Delhi- Mumbai and Delhi-Howrah routes as below:

| SN         | Section                                                                                     | Progress (Route Km) |
|------------|---------------------------------------------------------------------------------------------|---------------------|
| <b>(1)</b> | <b>Delhi-Mumbai route: 1,423 Rkm</b>                                                        |                     |
| i          | Tilak Bridge - Junction cabin – Palwal – Mathura – Kota-Nagda-Ratlam–Vadodara-Virar section | 1,327               |
| ii         | Vadodara – Ahmedabad section                                                                | 96                  |
| <b>(2)</b> | <b>Delhi – Howrah route: 1,210 Rkm</b>                                                      |                     |
| i.         | Chippyana - Tundla - Kanpur - Subedarganj section                                           | 563                 |
| ii.        | Kanpur – Lucknow section                                                                    | 71                  |
| iii.       | Mirzapur - DDU (Excluding) section                                                          | 64                  |
| iii.       | DDU(FOC)-Bhabua Road section                                                                | 50                  |
| iv.        | Sasaram - Phesar section                                                                    | 43                  |
| v.         | Gaya -Sarmatarn- Nimiaghat section                                                          | 159                 |
| vi.        | Chota Ambana - Bardhaman – Howrah section                                                   | 260                 |

10. In addition, track side Kavach implementation work has been taken up on 21,794 RKM covering all GQ,GD,HDN and identified sections of Indian Railways.

11. The total Progress of key items of Kavach on Indian Railway sections are as under:-

| SN  | Item                                 | Progress      |
|-----|--------------------------------------|---------------|
| i   | Laying of Optical Fibre Cable        | 11,547 Km     |
| ii  | Installation of Telecom Towers       | 1,721 Nos.    |
| iii | Station Data Centre                  | 1,009 station |
| iv  | Installation of Track side equipment | 7,726 RKm     |
| v   | Provision of Kavach in Loco          | 6,290 Nos.    |

12. In addition, work for installation of Kavach in 7,190 Locomotives and 1,200 EMU/MEMU has been taken up.

13. The funds utilized on Kavach works so far up to Jun'26 is Rs. 3,875 Crores. The allocation of funds during the year 2026-27 is Rs. 2,066 Crores. Kavach work is going at good pace in the entire country. Requisite funds are made available as per the progress of works.

14. Kavach is an indigenously developed Automatic Train Protection system. The main component of Kavach are Stationary Kavach, Remote Interface Units and Loco Kavach which comply with Make In India policy.

Since entire Kavach system is conceived, designed, and manufactured in India, all the vendors are Indian manufacturer. Three manufacturers are already approved and further two more are under process of approval. These vendors have to comply with stringent safety standards of SIL4 for components and products, and accordingly utilize the supply chain.

#### **Training/Skilling:**

1. Indian Railways have a comprehensive training ecosystem, which provides for different sets of training interventions at various stages of career to ensure skilling, re-skilling and up-skilling of Railway Employees. For this purpose, extensive training infrastructure has been created in the form of Centralised Training Institutes (CTIs), Multi-disciplinary Zonal Training Institutes (MDZTIS), Multi disciplinary Divisional Training Institutes (MDDTIs) and specialised training centres, which conduct induction, refresher, promotional and technical training programmes at different stages of service.
2. Detailed training modules including Kavach system as per prescribed periodicity are available for respective categories at initial and promotional stages along with refresher courses as well as specialized training courses, laying emphasis on practical aspects which help them in skill

upgradation and assimilation with related advanced technology. These modules are also updated keeping in view the technological changes in working practice.

3. Further, training modules on 'Kavach have been included in structured training of relevant categories of staff who are associated with the operation and maintenance of the system such as Loco Pilots, Assistant Loco Pilots, Chief Loco Inspectors, Station Managers, Assistant Station Managers, and staff belonging to Traffic and Signal & Telecommunication department, etc.
4. These training initiatives are aimed at building the required competency among Railway personnel for 'safe and efficient operation of the KAVACH system.
5. 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 94,000 technicians, operators and engineers have been trained on Kavach technology. This includes about 57,000 Loco Pilots & Assistant Loco Pilots. Courses have been designed in collaboration with IRISSET.

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