GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

RAJYA SABHA
UNSTARRED QUESTION NO. 2179
ANSWERED ON 13.12.2024

AUTOMATIC SIGNALING SYSTEM IN RAILWAYS

2179. SHRI YERRAM VENKATA SUBBA REDDY:

Will the Minister of RAILWAYS be pleased to state:

(a) whether Commissioner of Railway Safety (CRS) recommended to improve reliability and resilience of automatic signaling system in view of recent increase in number of accidents;

(b) the manner in which Government looks at CRS observation that there were 275 failures in automatic signaling section of Katihar divison between June, 2023 and June, 2024;

(c) whether there were 208 instances of signal passing at danger between April, 2019 and March, 2024, out of which 12 cases resulted in collision;

(d) whether the same imply that there is an urgent need to install Kavach; and

(e) the steps taken to standardize training programmes for loco pilots operating in automatic signaling areas?

ANSWER

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

(SHRI ASHWINI VAISHNAW)

(a) to (e) Chief Commissioner of Railway Safety (CCRS) has recommended steps to improve reliability of automatic signalling sections.

The major cause of signaling failures in Automatic Signaling Section of NFR are MSDAC failures caused due to Lightning & adverse weather condition during the long Monsoon season. In this connection, to improve reliability of the signaling system, (especially MSDAC in bad weather conditions of lightning etc.) following corrective actions have been taken:

1. Provision of additional SPDs inside track side equipment (Mushroom enclosure).
2. EMI/EMC filter Earthing.
3. Soldering of Quad cable shield with earth.

4. Testing of conventional Earth (Less than 10 ohms) and improvement wherever required.
5. Parameter measurement of Detection Points and settings wherever required.
6. Testing of Ring Earth. (Less than one ohm) and improvement wherever required.
7. Quad Cable Testing.
8. Bifurcation of System-1 and System-2 power supplies.
9. Checking for provision of A class Earth outside perimetric Ring Earth.
10. Data Logger Exception Report Generation for Auto Hut.
11. Provision of MSDAC NMS at Sig/CNL/KIR and ASTEA/NJP's Office.
12. Joint inspection of AT and their Earthing with TRD Department.

Safety is accorded the highest priority on Indian Railways. Various safety measures have been taken by IR to enhance safety in train operations; implementation of Automatic Train Protection System (Kavach) is one such measure. The present status of Automatic Train Protection System (Kavach) implementation over IR is as follow:

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 numbers 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 IRISET.

Railway employees including Loco Pilots and Assistant Loco Pilots are given structured training at various stages of their career. Detailed training modules as per prescribed periodicity are available for respective category at initial and promotional stages along with refresher courses and specialized training courses. For Loco Pilots and Assistant Loco Pilots, such training also includes hands-on training on simulators. The training modules created for initial and promotional as well as refresher courses for Loco Pilots and Assistant Loco Pilots, cover the functioning, safety features, and emergency protocols related to Automatic Signaling.

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