GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

RAJYA SABHA
UNSTARRED QUESTION NO. 1330
ANSWERED ON 02.08.2024

TRAIN DERAILMENTS

1330 SHRI SANJAY RAUT:

Will the Minister of RAILWAYS be pleased to state:

(a) the major reasons for derailments of trains during the last three years;
(b) the new safety measures and protocols that are being introduced to support loco pilots and prevent such incidents in light of recent derailments and accidents; and
(c) the manner in which Government is planning to enhance training and support systems for loco pilots to handle emergency situations more effectively?

ANSWER

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

(SHRI ASHWINI VAISHNAW)

(a) to (c) : A Statement is laid on the Table of the House.

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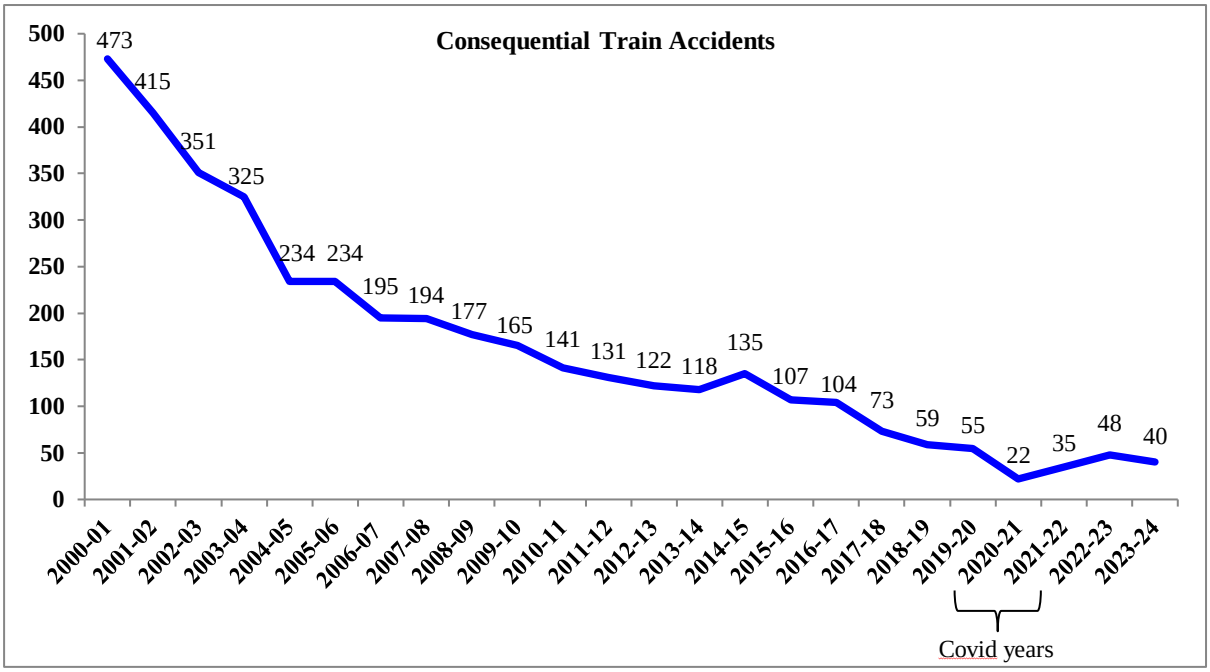
STATEMENT REFERRED TO IN REPLY TO PARTS (a) TO (c) OF UNSTARRED QUESTION NO. 1330 BY SHRI SANJAY RAUT ANSWERED IN RAJYA SABHA ON 02.08.2024 REGARDING TRAIN DERAILMENTS

(a) to (c): As a consequence of various safety measures taken over the years, there has been a steep decline in the number of accidents. Consequential Train Accidents, which include derailments also, have reduced from 473 in 2000-01 to 40 in 2023-24 as shown in the graph below. The causes of these accidents broadly include track defects, Loco/Coach defects, equipment failures, human errors etc. An accident might cause damage to the Railway property that includes track, rolling stock, OHE equipment, signaling gears etc.

It may noted that the consequential train accidents during the period 2004-14 was 1711 (average 171 per annum), which has declined to 678 during the period 2014-24 (average 68 per annum).

Another important index showing improved safety in train operations is Accidents Per Million Train Kilometer (APMTKM) which has reduced from 0.65 in 2000-01 to 0.03 in 2023-24, indicating an improvement of more than 95% during the said period.



Safety is accorded the highest priority on Indian Railways. The various safety measures taken to enhance safety in train operations are as under:-

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1. On Indian Railways, the expenditure on Safety related works has increased over the years as under:

(₹ in Crores)

	2022-23 (Act)	**2023-24(Act)**	**BE 2024-25**
Maintenance of Permanent Way & Works	18115	20322	21386
Maintenance of Motive Power and Rolling Stock	27086	30864	31494
Maintenance of Machines	9828	10772	11864
Road Safety LCs and ROBs/ RUBs	5347	6662	9980
Track Renewals	16326	17850	17652
Bridge Works	1050	1907	2137
Signal & Telecom Works	2456	3751	4647
Workshops Incl. PUs and Misc. expenditure on Safety	7128	9534	9634
Total	**87336**	**101662**	**108795**

2. Electrical/Electronic Interlocking Systems with centralized operation of points and signals have been provided at 6,589 stations up to 30.06.2024 to eliminate accident due to human failure.
3. Interlocking of Level Crossing (LC) Gates has been provided at 11,048 level Crossing Gates up to 30.06.2024 for enhancing safety at LC gates.
4. Complete Track Circuiting of stations to enhance safety by verification of track occupancy by electrical means has been provided at 6,609 stations up to 30.06.2024.
5. Kavach is a highly technology intensive system, which requires safety certification of highest order. Kavach was adopted as a National ATP system in July 2020. Kavach has so far been deployed on 1465 Route km and 144 locomotives (including Electric Multiple Unit rakes) on South Central Railway. Kavach is provided progressively in phased manner.
6. Axle counters for Automatic clearance of Block Section, BPAC (Block Proving Axle Counter) are provided to ensure complete arrival of train without manual intervention before granting line clear to receive next train and to reduce human element. These systems have been provided on 6079 Block Sections upto 30.06.2024.

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7. A project for provision of Long Term Evolution (LTE) based Mobile Train Radio Communication system has been approved for 34,803 Rkms over Indian Railways.
8. The project for provision of Tunnel Communication has been taken up in various zonal Railways.
9. Emergency talk-back system and Emergency Alarm Systems have been provided in Vande Bharat Train sets.
10. CCTVs have been provided in all Vande Bharat Express coaches. Till date more than 9572 coaches are equipped with CCTV.
11. Detailed instructions on issues related with safety of Signalling e.g. mandatory correspondence check, alteration work protocol, preparation of completion drawing, etc. have been issued.
12. System of disconnection and reconnection for S&T equipment as per protocol has been re-emphasized.
13. All locomotives are equipped with Vigilance Control Devices (VCD) to improve alertness of Loco Pilots.
14. Retro-reflective sigma boards are provided on the mast which is located two OHE masts prior to the signals in electrified territories to alert the crew about the signal ahead when visibility is low due to foggy weather.
15. A GPS based Fog Safety Device (FSD) is provided to loco pilots in fog affected areas which enables loco pilots to know the distance of the approaching landmarks like signals, level crossing gates etc.
16. Modern track structure consisting of 60kg, 90 Ultimate Tensile Strength (UTS) rails, Pre-stressed Concrete Sleeper (PSC) Normal/Wide base sleepers with elastic fastening, fan-shaped layout turnout on PSC sleepers, Steel Channel/H-beam Sleepers on girder bridges is used while carrying out primary track renewals.
17. Mechanisation of track laying activity through use of track machines like PQRS, TRT, T-28 etc to reduce human errors.
18. Maximizing supply of 130m/260m long rail panels for increasing progress of rail renewal and avoiding welding of joints, thereby improving safety.
19. Ultrasonic Flaw Detection (USFD) testing of rails to detect flaws and timely removal of defective rails.
20. Laying of longer rails, minimizing the use of Alumino Thermic Welding and adoption of better welding technology for rails i.e. Flash Butt Welding.

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21. Monitoring of track geometry by OMS (Oscillation Monitoring System) and TRC (Track Recording Cars).
22. Patrolling of railway tracks to look out for weld/rail fractures.
23. The use of Thick Web Switches and Weldable CMS Crossing in turnout renewal works.
24. Inspections at regular intervals are carried out to monitor and educate staff for observance of safe practices.
25. Web based online monitoring system of track assets viz. Track database and decision support system has been adopted to decide rationalized maintenance requirement and optimize inputs.
26. Detailed instructions on issues related with safety of Track e.g. integrated block, corridor block, worksite safety, monsoon precautions etc. have been issued.
27. Preventive maintenance of railway assets (Coaches & Wagons) is undertaken to ensure safe train operations.
28. Replacement of conventional ICF design coaches with LHB design coaches is being done.
29. All unmanned level crossings (UMLCs) on Broad Gauge (BG) route have been eliminated by January 2019.
30. Safety of Railway Bridges is ensured through regular inspection of Bridges. The requirement of repair/rehabilitation of Bridges is taken up based upon the conditions assessed during these inspections.
31. Indian Railways has displayed Statutory “Fire Notices” for widespread passenger information in all coaches. Fire posters are provided in every coach so as to educate and alert passengers regarding various Do’s and Don’ts to prevent fire. These include messages regarding not carrying any inflammable material, explosives, prohibition of smoking inside the coaches, penalties etc.
32. Production Units are providing Fire detection and suppression system in newly manufactured Power Cars and Pantry Cars, Fire and Smoke detection system in newly manufactured coaches. Progressive fitment of the same in existing coaches is also underway by Zonal Railways in a phased manner.
33. Regular counselling and training of staff is undertaken.

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34. Concept of Rolling Block introduced in Indian Railways (Open Lines) General Rules vide Gazette notification dated 30.11.2023, wherein work of integrated maintenance/ repair/ replacement of assets is planned up to 52 weeks in advance on rolling basis and executed as per plan.

The details of Safety related works undertaken by Railways are tabulated below:-

SN	Item	2004-05 to 2013-14	2014-15 to 2023-24	2014-24 vs 2004-14
	Track Maintenance			
1.	Expenditure on Track Renewal (Rs. in Cr.)	47,018	1,09,659	2.33 times
2.	Rail Renewal Primary (Track Km)	32,260	43,335	1.34 times
3.	Use of high-quality rails (60 Kg) (Km)	57,450	1,23,717	2.15 times
4.	Longer Rail Panels (260m) (Km)	9,917	68,233	6.88 times
5.	USFD (Ultra Sonic Flaw detection) Testing of Rails (Track km)	20,19,630	26,52,291	1.31 times
6.	USFD (Ultra Sonic Flaw detection) Testing of Welds (Nos.)	79,43,940	1,73,06,046	2.17 times
7.	New Track KM added (Track km)	14,985	31,180	2.08 times
8.	Weld failures (Nos.)	In 2013-14: 3699	In 2023-24: 481	87% reduction
9.	Rail fractures (Nos.)	In 2013-14: 2548	In 2023-24: 383	85% reduction
10	Thick Web Switches (Nos.)	Nil	21,127	
11	Track Machines (Nos.)	As on 31.03.14 = 748	As on 31.03.24 = 1,661	122% increase
	Level Crossing Gate Elimination			
1.	Elimination of Unmanned Level Crossing Gates (Nos.)	As on 31.03.14: 8948	As on 31.03.24: Nil (All eliminated by 31.01.19)	100% reduction
2.	Elimination of Manned Level Crossing Gates (Nos.)	1,137	7,075	6.21 Times
3.	Road over Bridges (RoBs)/ Road under Bridges (RUBs) (Nos.)	4,148	11,945	2.88 Times
4.	Expenditure on LC Elimination	5,726	36,699	6.40 Times

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	Bridge Rehabilitation			
1.	Expenditure on Bridge Rehabilitation (Rs. in Cr.)	3,919	8,008	2 Times
	Signaling Works			
1.	Electronic Interlocking (Stations)	837	2,964	3.52 times
2.	Automatic Block Signaling (Km)	1,486	2,497	1.67 times
3.	Fog Pass Safety Devices (Nos.)	As on 31.03.14: 90	As on 31.03.24: 19,742	219 times
	Rolling Stock			
1.	Manufacture of LHB Coaches (Nos.)	2,337	36,933	15.80 times
2.	Provision of Fire and Smoke Detection System in AC coaches (Nos. of Coaches)	0	19,271	
3.	Provision of Fire Detection and Suppression System in Pantry and Power Cars (Nos. of Coaches)	0	2,991	
4.	Provision of Fire Extinguishers in Non –AC coaches (Nos. of Coaches)	0	66,840	
	Budget allocation			
1	**Gross Budgetary Support for Railway Investment (Rs. in Cr.)**	**1,56,739**	**8,25,967**	**5.3 times**

Apart from above, the following safety measures are being taken to support loco pilots in particular and prevent accidents:

(i) Fitment of Vigilance Control Devices (VCD) as a technological aid to alert loco pilots in case of loss of alertness while driving. Since 2014, VCD has been provided in more than 12,000 (10,521 Electric +1,873 Diesel) locos.

(ii) GPS based Fog safe Device (FSD) is being provided to loco pilots as a technical aid for displaying and announcing the name and distance of approaching signals and important landmarks. Since 2014, 21,742 nos. FSDs have been provided in IR.

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(iii) Simulator based training (simulating field experience) is being imparted for improving the driving skills and the reaction time of Loco Pilots.

(iv) Retro-reflective sigma boards are provided on the mast which is located two OHE masts prior to the signals in electrified territories to alert the crew about the signal ahead when visibility is low due to foggy weather.

(v) Mobile Application named 'Chalak Dal' has been developed for the facilitation of crew. The app has been modified in 2023, to enable crew to access all his details related to running duties, sign on / sign off, loco trouble shooting directory and other documents required during train operation which otherwise were required to be carried in hard copy.

(vi) Various safety drives & special counseling programs are regularly organized for checking the alertness and safety awareness among loco pilots to boost their morale and confidence. Special safety seminars & meetings are also organized for interaction with family members of running staff for educating them on role of quality rest in ensuring safety.

(vii) The duty hours of Loco Pilots are meticulously monitored and are maintained.

To improve the working conditions of loco pilots following measures have been taken in respect of the Running rooms where loco pilots takes rest after performing their duties:

- All 558 running rooms have been air-conditioned.
- Running staff are provided with Yoga and meditation room, reading room with newspaper and magazines for relaxing in accordance with their requirements.
- Loco pilots have to keep a continuous watch on track and signals involving long hours of standing in loco while driving unlike airplanes and road vehicles. Therefore, foot massager etc. are made available in running rooms for giving proper rest to loco pilots.
- Provision of subsidized meals in running rooms.
- Availability of RO water filters in running rooms.

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- Ergonomic crew friendly design features like better seat and drivers' desks for better comfort of loco pilots has been provided in the locomotive cab. Since 2014, 7,286 three phase locos with these facilities have been manufactured as against only 719 locos prior to 2014.

- All new locos are provided with air-conditioned cabs since 2017-18. So far more than 7,000 locos have been provided with air conditioners.

As safe train operation is the top most priority of Indian Railways special emphasis is given to the training of safety category employees. All safety category railway employees including loco pilots are given structured training at various stages of their career. Detailed training modules as per prescribed periodicity are available for loco pilots at initial/promotional stages along with refresher courses and specialized training courses laying emphasis on practical aspects which helps them in assimilating technology transferred, skill upgradation and to handle emergency situation. In addition, combined umbrella work approved for ₹1200 crore which includes proposal for up gradation of training facilities.

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