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ANALYSIS**

TOPIC

**Indian Railways and Safety
Challenges**

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INDIAN RAILWAYS AND SAFETY CHALLENGES

Context

- The issue of Indian Railway safety is once again under scrutiny following a recent incident where a freight train collided with a passenger train near Siliguri in West Bengal. This incident, along with last year's tragic Balasore train accident, underscores the pressing **need for comprehensive reforms and enhanced safety protocols** to safeguard passengers and prevent such devastating accidents in the future.

Train Accidents in India

- It is an occurrence in the course of working of Railway which does or may affect the safety of the Railway, its engine, rolling stock, permanent way and works, fixed installations, passengers or servant or which affect the safety of others or which does or may cause delay to train or loss to the Railway.
- Despite advancements in technology and infrastructure, these incidents continue to impact passengers, infrastructure, and the overall economy.
- There has been an average of 44 consequential train accidents every year in the five-year period ending 2022-23 (FY23).

Types of Accidents

- **Derailments:** where a train goes off the tracks, are the most common. These can be caused by a variety of factors including track defects, equipment failure, human error, or even sabotage.
- **Collisions:** It occurs when two or more trains collide on the same track, often due to signal failures or errors in communication between railway personnel.
- **Level Crossing Accidents:** It involves collisions between trains and vehicles or pedestrians at rail crossings, highlighting the need for better safety mechanisms at these points.
- **Accident type in Indian Railways:** The accident type occurred in Indian Railways over the years following the trend: Derailment > Level crossing accidents > Collisions > Fire in trains > Miscellaneous accidents.

Impacts of Train Accidents

- **Casualties and hampers functioning:** The impact of train accidents extends beyond immediate casualties and injuries.
 - ♦ Each incident disrupts the smooth operation of the railway network, leading to delays, cancellations, and financial losses.
- **Trust related issues:** It erodes public trust in the safety of train travel, affecting passenger confidence and ridership.
- **Economic cost:** the cost of infrastructure damage, compensation payouts, and the investment required for safety upgrades are substantial.
 - ♦ These accidents also have broader implications for industries relying on efficient freight transport, impacting supply chains and logistics

Safety Challenges Faced by Indian Railways

- **Unmanned Level Crossings:** Closing unmanned level crossings remains a priority. These crossings pose a significant risk to both passengers and train crew. Focused measures to eliminate them have improved safety, but continued vigilance is essential.
- **Track Maintenance:** Emphasising track maintenance has led to a reduction in accidents. However, maintaining thousands of kilometres of tracks across diverse terrains remains a formidable task. Regular inspections, timely repairs, and modern technology are crucial.
- **Communication and Information Management:** Effective communication during emergencies is vital. The recent accident involving the GFCJ container train highlighted the need for accurate and timely information dissemination. Premature statements can create confusion and hinder investigations.
- **Overstaffing and Workload:** Indian Railways, like many government entities, is overstaffed. However, safety-critical roles, such as loco crew and station managers, require continuous attention. Addressing vacancies and reducing long working hours for locomotive pilots is essential.

- **Near Misses and Management Failure:** Investigating whether similar near misses are common in the affected section will reveal management effectiveness.
 - ♦ AI-enabled applications can enhance safety post mortems and provide actionable alerts by analysing digital data.

Safety Improvements

- **Digital Data Management and AI:** Extensive digital data from station data loggers and microprocessors on locomotives and trains can be effectively managed by AI, filtering out irregularities.
 - ♦ Implementing AI-driven predictive maintenance can help prevent accidents.
- **Track Maintenance:** Focused measures like closing unmanned level crossings have improved safety. Regular track maintenance remains essential to prevent derailments and accidents.
- **Traffic Demands vs. Safety: Balancing** increasing traffic demands with safety requirements is a challenge. Ensuring timely maintenance without compromising safety is vital.
- **Reducing Accidents:** Urgent steps are needed **to fill vacancies** and reduce long working hours for locomotive pilots.
 - ♦ Analysing accident patterns and implementing **targeted safety measures** can help.

Steps Taken To Minimise Rail Accidents

- **Safety System Implementation:** The **adoption of Kavach**, an indigenous collision prevention system, has faced challenges in terms of efficacy and speed of implementation.
 - ♦ While Kavach matures, considering installing ETCS Level II in important sections could be a pragmatic approach.
 - ♦ **Priority Areas for Kavach:** The CRS report from the Vizianagaram train accident emphasised implementing Kavach in Automatic Signalling territories prone to collisions.
 - ♦ Prioritising trunk routes and Automatic Signalling territories for Kavach installation (at a rate of 4,000 to 5,000 km/year) is achievable.
- **Mission Zero Accident:** In the **Railway Budget 2016-17**, Mission Zero Accident was one of the Missions announced, comprising of the **two sub-missions:**
 - ♦ Elimination of **unmanned level crossings** over broad gauge in the next 3-4 years. Currently, all unmanned level crossings on Broad Gauge have already been eliminated in 2019.
 - ♦ **Train Collision Avoidance System (TCAS):** To prevent collisions and signal passing at danger by the Loco Pilot through developing an indigenous technology and also to increase throughput by increasing average sectional speed on Indian Railways (IR). It has been installed on Lingampalli – Vikarabad – Wadi and Vikarabad – Bidar sections (250 Route km) on South Central Railway. Further, the system is under implementation on 1199 Route Km on South Central Railway.
- **Rashtriya Rail Sanraksha Kosh Fund:** The fund has been created in 2017-18 with a corpus of 1 lakh crore, **as a non-lapsable fund**, over a period of five years for critical safety related works.
- **Refresher Course to Officers:** Over 300,000 non-gazetted officers across the country have been trained through a refresher course to address lapses by railway staff through skills enhancement.
- Safety category staff is also given training in Disaster Management with emphasis on **Relief, Rescue and Rehabilitation (3'R's)**, Threat Perception and Emergency Response, Fighting and use of fire Extinguishers and First Aid.
- **Fog PASS Device**, a Global Positioning System (GPS) based hand held portable device, is used. It serves as an aid for the crew during foggy weather through audio visual alarm, whenever any landmark comes within the geo-fence range.
- **Recommendations of the CAG Report:** Development of a strong monitoring mechanism to ensure timely implementation of maintenance activities by adopting fully mechanised methods of track maintenance and improved technologies.
 - ♦ Railway administration must follow the guiding principles for deployment of RRSK funds.
 - ♦ Indian Railway may prepare the Detailed Outcome Framework for each item of safety work.

Suggestions and Way Forward

- Continued investment in upgrading tracks, signalling systems, and rolling stock is crucial.
 - ◆ Modernising ageing infrastructure can significantly reduce the risk of accidents.
- Strengthening safety protocols through better training of railway staff, stricter adherence to operating procedures, and leveraging technology for real-time monitoring and response.
- Increasing public awareness about railway safety, including rules at level crossings and onboard safety measures, can prevent accidents involving pedestrians and vehicles.
- Improved coordination between different stakeholders—government agencies, railway authorities, and the public—ensures accountability and timely response to safety issues
- Encouraging research into innovative safety technologies and practices tailored to Indian conditions can lead to breakthroughs in accident prevention.
- As India continues to develop the demand for safe and reliable rail transport, it is imperative that safety measures evolve to protect passengers and ensure the continued viability of the railway system.

Brief about Indian Railways

- It plays a pivotal role in India's economic landscape. There are the following significances:
 - ◆ **National Unity and Accessibility:** The Indian railway system, hailed as the world's largest railway network, connects diverse regions across the country, spanning over 67,000 kilometres and connecting every corner of the country.
 - ◆ It enhances national unity by bridging geographical gaps and facilitating seamless travel for millions of passengers.
 - ◆ **Economic Growth and Trade:** The railways drive economic growth by boosting the Gross Domestic Product (GDP).
 - ◆ It facilitates the movement of goods, raw materials, and finished products, supporting trade and commerce.
 - ◆ Freight transport via railways is cost-effective and efficient, benefiting industries and businesses.
 - ◆ **Freight Traffic:** With strategic initiatives like the **New Logistics Policy and PM Gati Shakti**, enhancing multimodal connectivity infrastructure, rail freight is poised to transform the express delivery industry, offering a sustainable alternative to road transport.
 - ◆ It aims to catapult freight traffic from 1.1 billion tonnes in 2017 to 3.3 billion tonnes by 2030.
 - ◆ Indian railways' remarkable 7.5% increase in cargo transported in 2022, totalling 1,497 million tonnes, aligns with the **National Rail Plan Vision-2030's goal** to raise rail's freight share from 31% to 44% by 2051.
 - ◆ **Job Creation and Livelihoods:** Undoubtedly, the railways are a major contributor to employment.
 - ◆ From loco crew to station staff, it provides livelihoods to a vast workforce.
 - ◆ Investments in modernization can further enhance job opportunities.
 - ◆ **Mass Mobility and Accessibility:** The railways serve as a lifeline for millions of commuters, especially in densely populated areas.
 - ◆ Affordable and widespread rail connectivity ensures mobility for people across socio-economic backgrounds.
 - ◆ **Environmental Impact and Climate Change:** As concerns about climate change grow, public transport becomes crucial.
 - ◆ The Railways' shift toward renewable energy contributes positively to environmental sustainability.

Mains Practice Question

[Q] Discuss the role of Indian Railways in the socio-economic development of India. What are the key safety challenges faced by the railway system?

Source: TH

