भारत सरकार रेल मंत्रालय

Presentation on Railway Accident Prevention, Safety Measures & Management guidelines

By

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ACCIDENT

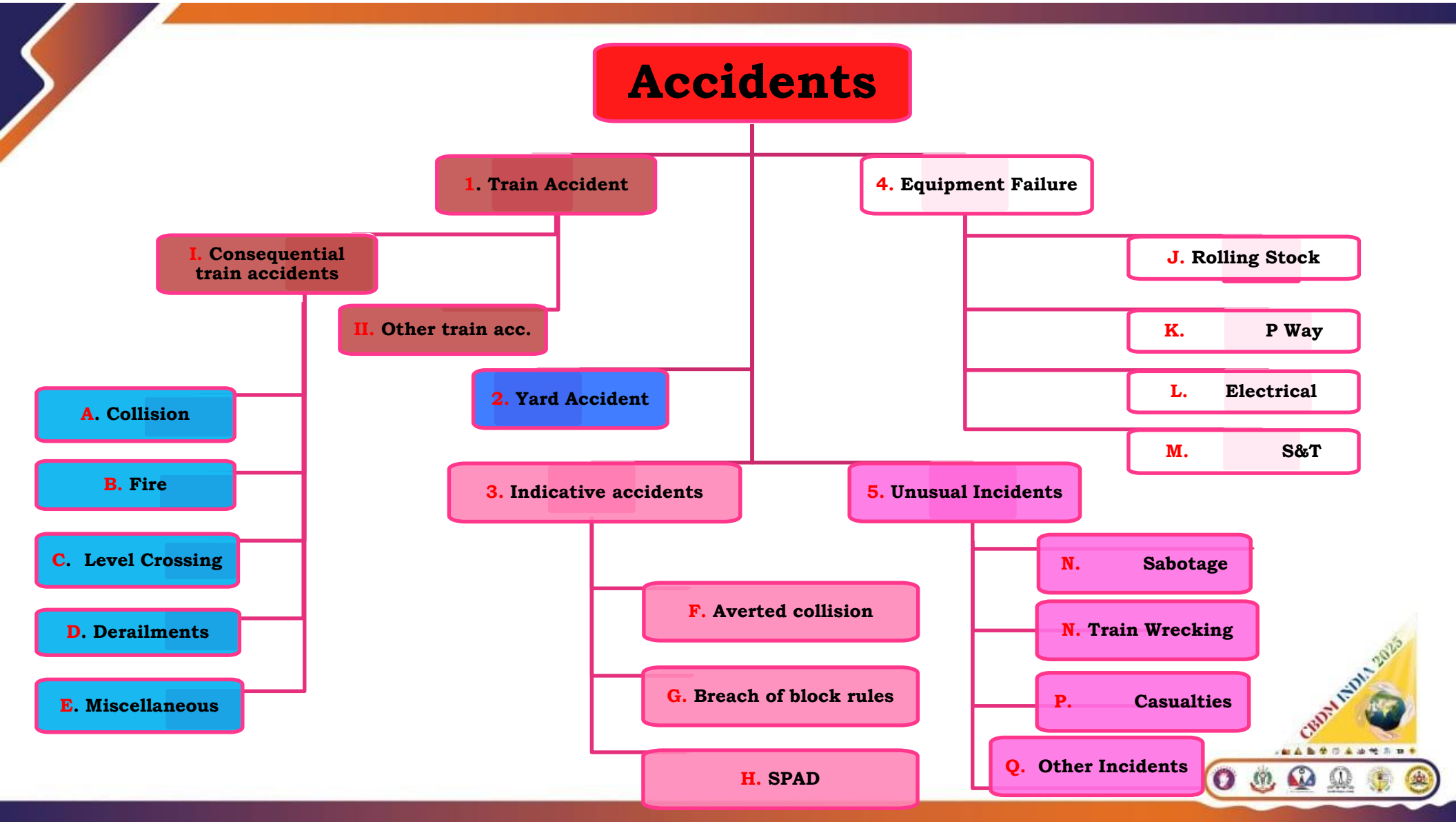
- Accident is an occurrence in the course of working of railway which does or may affect the safety of the railway, its engines, rolling stock, permanent way and works, fixed installations, passengers or railway servants or which affects the safety of others or which does or may cause delay to trains or loss to the railway.
- For statistical purposes, accidents have been classified in categories from "A" to "R" excluding "I" and “O”.

CLASSIFICATION OF ACCIDENTS

Accidents are classified under following heads:

1. Train Accidents.
2. Yard Accidents
3. Indicative Accidents
4. Equipment Failures
5. Unusual Incidents

CLASSIFICATION OF ACCIDENTS



Various committees in Railways for Railway Accident and Safety

Classification	Railway Accident Committee Kunzru Committee (1962)	Railway Accident Inquiry Committee Wanchoo Committee (1968)	Railway Accidents Inquiry Sikri Committee (1978)	Railway Safety Review Committee Khanna Committee (1998)	High Level Safety Review Committee Kakodkar Committee (2011)
Recommendations	377	531	528	278	106
Accepted / Partially Accepted	354	440	450	236	68
Implemented	354	439	450	217	**
Not Implemented	-	1	–	5	**
Not Accepted	23	91	78	37	**
Under Implementation	–	–	–	19	68

Railway Accident Committee
Kunzru Committee (1962)

Background: Set up after Dumrao and other serious accidents
Chairman: Sh. H.N. Kunzru
Recommendations (377 total):

- Limit duty hours of goods drivers (not beyond 14 hours)
- Personalized training; introduction of Psycho-technical cells
- Standardized rules and procedures
- Mechanized track maintenance; census of LCs every 5 years
- Safety features: ATC, interlocking, ultrasonic axle testing
- Creation of Divisional Safety Officers and Safety Superintendent roles

Railway Accident Inquiry Committee
Wanchoo Committee (1968)

Chairman: Justice K.N. Wanchoo
Trigger: Yalvigi and Bharwari accidents in 1968
Recommendations (531 total):

- Full utilization of training facilities
- Limitations on staff duty hours; simplify recruitment
- Amend Indian Railways Act for accident prosecution process
- Use of concrete sleepers and improved time tables
- Census of LCs, stronger scrutiny on tenders
- Promote refresher training and safety organizations

Railway Accidents Inquiry
Sikri Committee (1978)

Chairman: Justice S.M. Sikri
Trigger: Naini collision (Oct 1977) and Ajarka-Bawal derailment (Nov 1977)
Recommendations (528 total):

- Vigilance Control Devices in locos; no 24-hour duty for gatemen
- Speedometer repositioning; cab signaling; AWS use
- Guard rails and walkways on bridges; rationalize gang strength
- Strengthen S&T inspections; apply uniform staffing yardsticks

Railway Safety Review Committee
Khanna Committee (1998)

Chairman: Justice Khanna

Focus: Reviewed implementation of prior committees' suggestions

Recommendations (278 total):

- Formulate a Corporate Safety Plan
- Replace overaged assets: wagons, coaches, bridges, signaling
- Define safety policy, timeframes, and investment needs
- Recommend a one-time government grant to modernize infrastructure

High Level Safety Review Committee
Kakodkar Committee (2011)

Chairman: Dr. Anil Kakodkar

Mandate: High-Level Safety Review covering technical & human factors

Recommendations (106 total):

- Eliminate all Level Crossings in 5 years (Rs. 50,000 crore)
- Advance Signaling System (Rs. 20,000 crore)
- All new coaches to be LHB design (Rs. 10,000 crore)
- Create a statutory Railway Safety Authority
- Strengthen RDSO and create Railway Research & Development Council
- Empower DRMs and GMs with enhanced financial powers
- Fill all safety category vacancies within 6 months
- Establish Core Safety Groups at divisional and HQ levels

Railway Safety Review Committee (RSRC)

- Railway Safety Review Committee (Khanna Committee) was set up in 1998 under the Chairmanship of Justice H.R. Khanna, a retired Supreme Court Judge. The Committee, interalia, reviewed the recommendations of earlier Committees and suggested measures for further improvement in the safe running of trains. The Committee submitted its report in two parts. Part-I was submitted in August, 1999 while its part II was submitted in February, 2001,

- The Committee made a total of 278 recommendations in its Report (150 in Part-I and 128 in Part-II)

Railway Safety Review Committee (RSRC)

1. **RSRC**: The RSRC, established in 1998, focused on enhancing safety within the Indian Railways. Its report in 1999 highlighted the urgent need for safety enhancements, particularly concerning infrastructure and equipment.

2. **Recommendations**: The committee's key recommendation was for a one-time grant from the Central Government to cover the backlog in essential renewals. This aimed to revitalize the railway infrastructure and equipment, including track, bridges, rolling stock, and signaling systems.

3. **Special Railway Safety Fund (SRSF)**:To address the backlog, the RSRC suggested the creation of a Special Railway Safety Fund (SRSF) to ensure dedicated funding for these improvements.
4. **Impact:** The recommendations, including the establishment of the SRSF, were adopted and implemented, demonstrating the government's commitment to improving railway safety and infrastructure
5. **Other Recommendations:** The RSRC also made recommendations regarding the creation of a Railway Safety Authority, restructuring of the Research Design and Standards Organization (RDSO), and establishing a Railway Research and Development Council (RRDC). They also suggested adopting an Advanced Signaling System and eliminating level crossings.

1. **Railway Accident Prevention.**
2. **Safety Measures.**
3. **Management Guidelines**

1. Railway Accident Prevention:

A. Infrastructure Improvements.

B. Technological Integration.

C. Human Factor Management.

A. Infrastructure Improvements.

1. **Track Maintenance:** Regular inspections and timely repairs of rails, joints, sleepers, and ballast.

Viz. Old Rail track with wooden sleepers upgraded by Rail Track with PCC (Pre-stressed Cement Concrete) Sleepers

A. Infrastructure Improvements.

2. Signal Systems: Upgradation to advanced signaling (like Automatic Train Control).

Viz. Old Semaphore signals and signaling system upgraded by Light signals and automatic block section signal systems

A. Infrastructure Improvements.

3. **Level Crossings:** Replace unmanned crossings with manned gates or over/underpasses.

   Viz. Unmanned level crossings eliminated and Manned level crossing used. Further Rail track underpass and Rail Over bridges for road constructed

A. Infrastructure Improvements.

4. **Bridges & Tunnels:** Periodic structural checks and reinforcement.

A. Infrastructure Improvements.

5. **Rolling Stock:** Upgradation of Passenger coaches, Freight wagons and Locomotives

Viz.

1. Old ICF Passenger Coaches upgraded by Stainless steel body LHB Coaches.

A. Infrastructure Improvements.

5. Rolling Stock: Upgradation of Passenger coaches, Freight wagons and Locomotives

Viz.

2. Old Wagons with UIC bogies upgraded by CASNUB bogies and stainless steel body wagons

A. Infrastructure Improvements.

5. Rolling Stock: Upgradation of Passenger coaches, Freight wagons and Locomotives

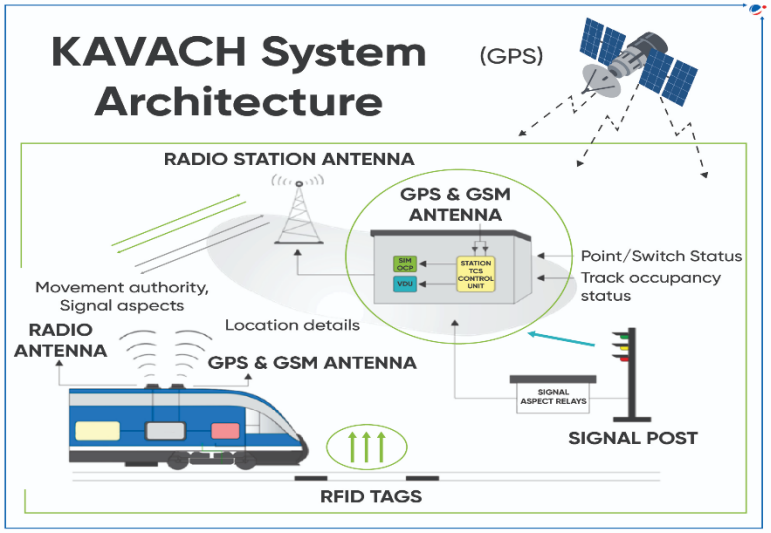
Viz.

3. Steam Locomotives upgraded by Diesel Locomotives and further by AC Locomotives

B. Technological Integration.

1. **GPS & Tracking:** Real-time train tracking systems to avoid collisions.
2. **Automatic Braking Systems:** Stops the train in case of signal violations.

Viz. Kavach



1. **AI & Sensors:** Predictive maintenance using data analytics and sensors.

C. Human Factor Management.

1. **Training:** Continuous training for loco pilots, station staff, and maintenance crews.

1. **Medical Checks:** Periodic health evaluations to ensure fitness for duty.

1. **Fatigue Management:** Sufficient rest periods between shifts.

2. Safety Measures:

A. On board Safety.

A. Passenger Awareness.

A. Freight Safety.

A. Station Safety.

A. On board Safety.

1. Emergency communication systems.

1. Fire extinguishers and smoke detectors.

1. Safety instructions and regular drills for staff and passengers.

B. Passenger Awareness.

1. Educate passengers via campaigns (TV, announcements, posters).

1. Prohibit traveling on rooftops or between coaches.

C. Freight Safety.

1. Proper securing and labeling of hazardous materials.

1. Routine inspection of cargo wagons.

D. Station Safety.

1. Clear signages and announcements.

1. Platform edge warning lines.

1. Crowd management during peak hours.

3. Management Guidelines:

A. Policy & Regulation.

A. Emergency Management.

A. Audit & Review.

A. Community Engagement.

A. Policy & Regulation.

1. Comply with national railway safety codes and international standards.
2. Establish a centralized safety regulatory authority.

B. Emergency Management.

1. **Accident Response Teams (ARTs):** Equipped for medical aid, rescue, and clearing.
2. **Mock Drills:** Regular drills involving local hospitals, police, and fire services.
3. **Crisis Communication:** Designated spokesperson and helpline systems.

C. Audit & Review.

1. Regular safety audits by independent agencies.
2. Root cause analysis after each incident.
3. Implement findings and monitor corrective actions.

D. Community Engagement.

1. Work with local communities near tracks for vigilance.
2. School safety programs for children living near railway zones.

High Level Committe recommendation for Disaster Management (HLCR) in 2003

Committee members

1. Member Mechanical, Railway Board : Convenor
2. Member Traffic, Railway Board : Member
3. Financial Commissioner, Railway Board* : Member
4. Director General/Railway Health Services : Member
5. Director General/ Railway Protection Force : Member

Description	HLCR items	Remarks	
Total Items in HLCR	111	01 to 49	I. Institutionalizing Golden Hour Drill
		50 to 52	II. Relief measures for injured and survivors
		53 to 55	III. Care for the dead
		56 to 99	IV. Technological Inputs in ARMVs/ARTs
		100 to 107	V. HRD Training
		108	VI. Media management
		109 to 111	VII. Recommendations for Implementation

Even After these safety management if accident occurs

Railways Disaster management Equipments are ordered for rescue and restoration of the accident site

1. Accident Relief Medical Vans – SPARTs/SPARMVs.
2. Accident Relief Trains (ART).

Critical Machinery in Disaster Management Equipment.

1. 140T DHBD Crane.
2. Hydraulic Rescue Device (HRD).
3. Hydraulic Re-railing Equipment (HRE).
4. Cutting Equipments
5. Road Machinery.

In case of passenger involved accident first ARMV/SPARMV/SPART is ordered for rescue
DM equipment of ARMV i.e. Hydraulic Rescue Device (HRD)
is the major rescue equipment of Accident Relief Medical Van (ARMV) /
Self Propelled Accident Relief Medical Van (SPARMV)
and Self Propelled Accident Relief Train (SPART)

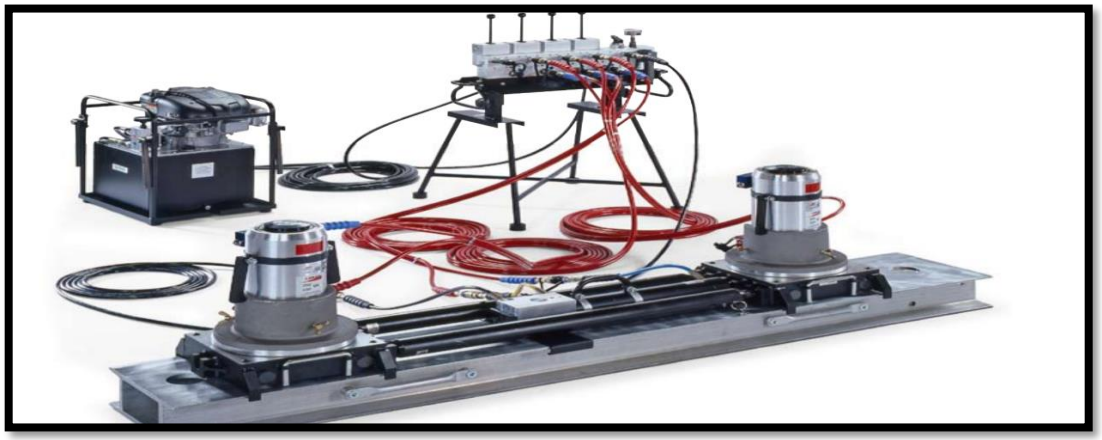
Accident Relief Train (ART) is ordered followed by ARMV in case of passenger involved accident
DM equipment of ART i.e. 140T DHBD Crane and Hydraulic Re-Riling Equipment (HRE)
is used for restoration of the Railway Track
either re-railing the derailed rolling stock or making it off-track

140T DHBD Cowans Sheldon Old Design Crane

ART

140T DHBD Gottwald New Design Crane

Hydraulic Re-railing Equipment (HRE)



Derailed rolling stock inside the tunnel and open line track is tackled by Hydraulic Re-railing Equipment (HRE)

Cutting Equipment

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Road Machinery

HYDRAULIC EXCAVATOR

Model	:	ZX370 LCH
Engine Rated Power	:	184 kW (250 PS)
Operating Weight	:	35400 - 35900kg
Backhoe Bucket	:	ISO Heaped : 1.3 - 2.5 m^3

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Road Machinery usage at accident site

Full Scale Mock Exercise involving NDRF, SDRF, Civil Defence & Rly D.M. Staff at IRIDM as nodal agency

THANK YOU