

# **Railway Accidents and Safety Measures**

## **DEFINITION OF A RAILWAY ACCIDENT**

Any occurrence which does or may affect safety of the Railway, its engines, rolling stock, permanent way, works, passengers or staff or which affects the safety of others or which does or may cause delay to trains or loss to the Railway

## **CLASSIFICATION OF ACCIDENTS**

Railway accidents may be either '**Train accidents**' or '**Yard accidents**'.

# Train Accident-1

- A Train Accident has been defined as an accident involving a train,
- **when running under a particular number or a distinct name from**
- **a fixed point of departure to a fixed destination.**

Train Accidents have further been classified as

**‘consequential’**

or **‘indicative’**:

## Train Accident-2

- **‘Consequential Train Accidents’** include:
  - (i) Collisions, including side collisions,
  - (ii) Derailments,
  - (iii) Manned level crossing gate accidents,
  - (iv) Unmanned level crossing accidents,
  - (v) Fire in trains, and
  - (vi) Miscellaneous.
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## Train Accident-3

- **“Indicative Accidents”** include:
  - (i) Averted collisions,
  - (ii) Breach of block rules, and
  - (iii) Passing signal at danger.

## **Serious Accident:**

- Accident to a train carrying passengers which is attended with
- **loss of human life** or
- **grievous hurt** to passengers, or
- with serious **damage to railway property of over Rs. 25 lakhs**; or
- **any other accident which in the opinion of the Chief Commissioner or Railway Safety requires the holding of an inquiry by Commissioner of Railway**

# Accidents classified in categories 'A' to 'R' excluding 'I' and 'O' for purposes of reporting:

<b>Classification</b>	<b>Sub Class</b>	<b>Nature of accident</b>
• A	A1 to A5	Collisions.
• B	B1 to B7	Fire or Explosion.
• C	C1 to C9	Level Crossing Accidents.
• D	D1 to D6	Derailments.
• E	E1 to E2	Other train accidents,
• F	F1 to F4	Averted collisions.
• G	G1 to G4	Breach of block rules.
• H	H1 to H2	Passing signal at danger.
• J	J1 to J10	Engine/rolling stock failure.
• K	K1 to K7	Permanent Way failure.
• L	L1 to L4	Electrical failures.
• M	M1 to M7	Start wrecking.
• N	N1 to N3	Signal and Telecommunication
• P	P 1 to P3	Casualties.
• Q	Q 1 to Q6	Other incidents.
• R	R1to R5	Miscellaneous.

# Subclassifications

- A1 Collision involving passenger carrying train resulting in loss of life, grievous hurt, damage of more than RS. 25 lakhs, interruption for more than 24 hours
- A2 Collision involving freight train resulting in loss of life, grievous hurt, damage of more than Rs. 25 lakhs, interruption for more than 24 hours.
- A3 Collision involving passenger carrying train not falling under A-1 above
- A4 Collision involving freight train not falling under A-2 above.
- A5 Other collisions in yards etc. not involving a train.

# **REPORTING OF ACCIDENTS**

- **All concerned message**
- **Telephonic advice to Zonal Headquarters**
- **Telephonic advice to Railway Board**
- **Report to Commissioner of Railway Safety:**
- **Other non-railway officials to be advised:**



# RELIEF AND RESTORATION EQUIPMENT:

- (i) Accident Relief Medical Vans (ARMVs),
- (ii) Accident Relief Medical Equipment (ARME),
- (iii) Accident Relief Trains (ARTs),
- (iv) Break Down cranes (BDs),
- (v) First Aid Boxes,
- (vi) Fire Fighting Equipment.
- Location, composition and beats of ARMVs, ARMEs, ARTs and BDs are given in the Accident Manual of each Zonal Railway. The list of standard equipment for each of these is also given in the Accident Manual. Officers in charge for each of these ensure that these are always kept fully equipped and in good fettle.
- Mock drills are periodically organized to ensure their timely turning out and proper upkeep.

# **ACTION TO BE TAKEN FOR RELIEF & RESTORATION**

- Details of action to be taken by various officials in case of serious accidents are given in the Accident Manual. In case of a serious accident following actions are undertaken in order of priority:
  - (i) Saving life, rescue and immediate medical aid.
  - (ii) Quick relay of information to all concerned.
  - (iii) Transporting the injured to nearest hospital.
  - (iv) Supply of necessary materials to accident site.
  - (v) Protection of passengers' belongings, railway property,
  - (vi) Preservation of clues regarding cause of accident.

# **DUTIES in Serious Accident**

- **Duties of the Guard of the train:**
- **Duties of the Engine Crew:**
- **Duties of Officer – in – Charge site (OC site):**
- **Duties of Station Master of the nearest station:**
- **Duties of the Control Office:**

## **Duties of Officer –in- Charge site**

- In case some **railway officials are travelling by the accident** involved train, the **senior-most official** takes charge as **Officer – in – Charge site (OC site)**. He shall
- (i) Take charge of the situation and organize rescue and relief activities promptly and efficiently.
- (ii) Save lives and render first aid.
- (iii) Call for Doctors and seek their assistance.
- (iv) Seek assistance of railway staff and other volunteers on the train.
- (v) Arrange transportation of injured as hospital.
- (vi) Make quick assessment of assistance needed and advise Control Office or nearest Station Master.
- (vii) Arrange protection of passengers, belongings and railway property with the help of RPF, GRP.
- (viii) Preserve clues regarding probable causes of the accident.
- (ix) Ensure joint readings of track and rolling stock involved are taken as per rules.

# **Role of Commercial department: at site**

- (j) Taking the injured to hospitals.
- (ii) Arranging for photographs of dead/injured.
- (iii) Safe custody of passengers' belongings.
- (iv) Tran-shipment of remaining passengers.
- (v) Payment of Ex-gratia
- (vi) Arranging for food and water at site.
- (vii) Taking care of perishables in VPU.
- (viii) Taking care of relatives of passengers.
- (ix) Manning of the Command Post.

# Site management:

- Commercial staff who reach the accident site collect the current reservation chart from TTEs who were on duty in the affected train and cross check names against the list.
- The list of injured passengers admitted to various hospitals includes following details:
  - (i) S.No.
  - (ii) Name.
  - (iii) Time/Date
  - (iv) Train No./Coach No./Berth No./Ticket No.
  - (v) Address.
  - (vi) Status.
  - (vii) Hospital.
  - (viii) Ex-gratia paid.
  - (ix) Persons accompanying.
  - (x) Name of next of kin.
- . Each special train carrying unaffected passengers is accompanied by a commercial supervisor. Free food is provided enroute.

# Photographs and Ex-Gratia:

- Arrangements are made for taking photographs of dead bodies, preferably in colour and from different angles. If possible, Video filming is done. Before photography or video filming each body is properly labeled with a unique serial no. prominently displayed in the photograph Ex– Gratia payments are made as follows to the injured passengers and the next kin of the dead.
  - (i) Dead Rs. 15000/-
  - (ii) Grievous injury Rs. 5000/-
  - (iii) Simple injury Rs. 500/-

# Arrangement for food and drinking water

- for following categories of people:
- (i) Injured passengers admitted in hospitals.
- (ii) Unaffected passengers of the ill fated train.
- (iii) Relatives of dead or injured passengers.
- (iv) Railway Staff working at site.
- (v) Off duty railway staff.
- (vi) Staff of other govt. organizations or local volunteers who may be helping out.



# ACCIDENT INQUIRIES

- **Objective of holding an accident inquiry:**
- All failures are examined even if they have not affected a running train to see how they can be prevented in future. The aim is to ensure that railways reach a stage of no failures. The objective of an accident inquiry is to find out the cause of an accident so that:
  - (i) Those responsible for negligence or breach of rules may be punished,
  - (ii) If there is any inherent defect in the system of working, steps may be taken to effect necessary improvements.

# **Types of Inquiries:**

- **(i) Judicial Commission of inquiry.**
- **(ii) Commissioner of Railway Safety's inquiry.**
- **(iii) Officers joint inquiry.**
- **(iv) Senior Subordinates joint inquiry.**
- **(v) Departmental inquiry.**

## **Time schedule for completion of inquiries by committees**

- (i) D - Date of accident.
- (ii) D+3 - Commencement of inquiry.
- (iii) D+7 - Completion of inquiry & Submission of report to DRM.
- (iv) D+10 - Submission of report to GM.
- (v) D+27 - Submission of report to CRS.
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# Functions of the Commission of Railway Safety

- (i) Inspection of new railway lines prior to authorization for passenger traffic.
- (ii) Periodical inspection of open lines.
- (iii) Approval of new works and renewals affecting passenger carrying lines.
- (iv) Investigation into accidents.
- (v) General advice on matters concerning safety

# The cause-wise position during last few years

		04-05	05-06	06-07	07-08	08-09
•	1. Human Failure					
•	(i) Failure of Railway Staff	119	120	85	86	75
•	(ii) Failure of persons other than Railway Staff	78	86	84	81	75
•	2. Equipment Failure					
•	(i) Rolling Stock	5	1	4	4	0
•	(ii) Track	7	6	5	3	0
•	(iii) Electrical	2	-	-	-	-
•	(iv) S&T	-	1	-	1	-
•	3. Sabotage	4	5	8	7	13
•	4. Combination of Factors	1	-	1	-	4
•	5. Incidental	16	11	7	8	4
•	6. Cause not established	2	3	-	2	4
•	7. Under Investigation	-	1	1	-	2
•	Total	234	234	195	193	177

# Comparative position of casualties and compensation

- **04-05 05-0606-0707-0808-09**

- 1. Passengers

- (i) Killed        50    168   38    09    52

- (ii) Injured     191   183   227   245   257

- 2. Compensation paid (In Lacs Rs.)

513.63        221.63        500.89        121.37

218.94

# Functions of the Safety Organization

- 
- (1) Framing of proper rules and regulations for train running.
- (2) Proper training of train passing and running staff.
- (3) Proper training of safety category staff of other departments.
- (4) Timely medical/night vision, psychological testing etc.
- (5) Provision of essential safety equipment.
- (6) Ensuring maintenance of assets in good fettle.
- (7) Installation of mechanical/electronic safety devices.
- (8) Technological upgradation and innovations.
- (9) Identifying unsafe practices in the system.
- (10) Monitoring, counseling and periodic screening of staff.
- (11) Conducting various types of inspections.
- (12) Conduction ambush checks, surprise night inspections.
- (13) Launching of periodic safety drives.
- (14) Preventing carriage of inflammable/explosive materials in trains.
- (15) Monitoring follow-up action on recommendations made
- (16) Statistical analyses of long-term trends of accidents.

# Authority to frame rules:

- Under the Indian Railway Board Act 1905, Railway Board is authorized to make General Rules for operation of Railways. Responsibility for safety in working and operation of railways rests solely with Railway Board and Zonal railway authorities.
- Important manuals and rule books pertaining to train running are as follows:
  - (a) General and Subsidiary Rules (G&SR).
  - (b) Operating Manual.
  - (c) Block Working Manual.
  - (d) Accident Manual.



# Role of the 3 – tier structure at Railway Board level

- Safety Directorate in Railway Board
- focuses attention, at highest level, on matters having a bearing on safety.
- It analyses long term trends of accidents, examines various suggestions and recommendations to promote safety,
- follows-up regarding implementation of recommendations of various committees.
- coordinates the efforts of zonal railways in the field of safety monitoring of problems that have inter – railway ramifications.
- coordinates efforts of various railways for use of mass-media for promotion of safety consciousness amongst staff and public.
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# At Zonal Headquarters

conducting on-the-spot checks to detect unsafe practices with a view to eliminate them,  
highlighting weak links in the system, taking remedial action,  
keeping a watch on refresher training,  
organizing safety campaigns, promoting safety consciousness amongst the staff,  
use of mass media for educating public about unsafe practices and safety hazards,  
compiling information relating to accidents, under taking analysis of various types of accidents,  
follow-up action taken on recommendations by various accident inquiry committees.

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# Divisional level

- At divisional level, main functions of safety organization are to carry out preventive and spot checks, safety counseling of staff, conducting of safety propaganda and education, putting up periodic reports to DRM on deficiencies and problems so that he can get executive officers to take action. Monitoring – quality of refresher courses of all staff connected with train operation, dealing with accident cases and arranging inquiries in connection therewith, ensuring implementation of various recommendations made by inquiry committees.
- Function of safety councilors is to make personalized contact with and educate staff in observance of safety rules. They give talks on safety matters and hold meetings with staff in their jurisdiction. In addition they also carry out inspections of an intensive nature from a safety point of view.

# **Training of train passing and running staff:**

- **(i) Zonal Training Center:**
- **(ii) Divisional Safety Schools:**
- **(iii) Safety Camps:**
- **(iv) Initial Induction Courses:**
- **(v) Refresher Courses:**
- **(vi) Promotional Courses:**
- **(vii) Use of Video films:**
- **(viii) Seminars and Workshops:**
- **(ix) Handbook of DOs and DONTs:**
- **(x) Safety circulars and bulletins:**
- **(xi) Safety posters:**

# **Periodic Medical Examination and Psychological testing:**

- **(i) Periodic Medical Examination:**
- **(ii) Breathalyzer Tests:**
- **(iii) Psychological testing of staff:**

# General Improvements

- **Provision of safety equipment staff:**
- **Ensuring maintenance of assets in good fettle:**
- **Installation of mechanical/electronic safety devices:**
- **Automatic switching ON of Loco flashers:**
- **Improved Locomotive headlight:**
- **Audio visual indicators on locomotives:**
- **Vigilance control device on locomotives**
- **Flasher Lights on the rear of SLRs:**

## **Technological up-gradations and innovations:**

- **(i) Flashing Tail Lamps:**
- **(ii) Flashing Hand Signal Lamps:**
- **(iii) Flashing Gate Signal Lamps for Level Crossing Gates:**

# **Identifying unsafe practices in the system:**

- **Vacancies in essential safety categories:**
- **Overtime working:**
- **Duty hours of running staff:**
- **Staff overdue refresher courses**
- **Condition of Running Rooms**
- **Running of trains without guards/brake vans:**
- **Time Tabling mistakes:**
- **Shortage of stores:**
- **Theft and vandalism:**
- **Financial Constraints:**



# MISC Measures for reducing Accidents

- **Monitoring, counseling and periodic screening of vulnerable staff:**
- **Monitoring of staff:**
- **Counseling of staff:**
- **Periodic screening of staff:**
- **Conducting various types of Inspections:**
- **Conducting surprise night inspection and ambush check:**
- **Safety drives:**
- **Preventing carriage of inflammable materials in trains:**
- **Monitoring follow-up action on recommendations made:**
- **Statistical analyses of long-term trend of accidents:**
- **Role of other departments in improving Safety**