इरिसेट IRISET

G9

DISASTER MANAGEMENT

Indian Railways Institute of
Signal Engineering and Telecommunications
SECUNDERABAD - 500 017

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INDIAN RAILWAYS INSTITUTE OF SIGNAL ENGINEERING & TELECOMMUNICATIONS, SECUNDERABAD - 500 017

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DISASTER MANAGEMENT

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CHAPTER - 1

DISASTER & ACCIDENTS

1.1 WHAT IS DISASTER?

Disaster is a sudden, calamitous event bringing great damage, loss, destruction and devastation to life and property. The damage caused by disasters is immeasurable and varies with the geographical location, climate and the type of the earth surface/degree of vulnerability. This influences the mental, socio-economic, political and cultural state of the affected area.

Generally, disaster has the following effects in the concerned areas,

1. It completely disrupts the normal day to day life
2. It negatively influences the emergency systems
3. Normal needs and processes like food, shelter, health etc. are affected and deteriorate depending on the intensity and severity of the disaster.

It may also be termed as **"a serious disruption of the functioning of society, causing widespread human, material or environmental losses which exceed the ability of the affected society to cope using its own resources."**

Thus, a disaster may have the following main features:-

- Unpredictability
- Unfamiliarity
- Speed
- Urgency
- Uncertainty
- Threat

Thus, in simple terms we can define disaster as a hazard causing heavy loss to life, property and livelihood. e.g. a cyclone killing 10,000 lives and a crop loss of one crore can be termed as disaster.

DEFINITION:

Disaster may be defined as an unusual occurrence characterized by :-

(i) Sudden calamitous event, having great material damage, loss and distress.

(ii) A complete definition of disaster may be 'an event, concentrated in time and space, which threatens a society or a relatively self sufficient sub division of a society with major unwanted consequence as a result of the collapse of precaution which had hitherto been culturally accepted as adequate.

Distinguishing between an emergency and a disaster situation

An emergency and a disaster are two different situations:

- An ***emergency*** is a situation in which the community is capable of coping. It is a situation generated by the real or imminent occurrence of an event that requires immediate attention and that requires immediate attention of emergency resources.

- A ***disaster*** is a situation in which the community is incapable of coping. It is a natural or human-caused event which causes intense negative impacts on people, goods, services and/or the environment, exceeding the affected community's capability to respond; therefore the community seeks the assistance of government and international agencies.

1.2 TYPES OF DISASTER

1.2.1 TYPES OF DISASTER IN GENERAL

There two types of disasters

1. Natural
2. Manmade

Further these disasters can be classified as

a. Major
b. Minor

Types of disasters	
Major Natural	**Major Manmade**
1. Flood 2. Landslide 3. Cyclone 4. Drought 5. Earth Quake	1. Setting of Fires 2. Epidemic 3. Deforestation 4. Chemical Pollution 5. Wars
Minor Natural	**Minor Manmade**
1. Cold wave 2. Thunderstrom 3. Heat waves 4. Mud slides 5. Storm	1. Rail/Road Accidents 2. Riots 3. Food Poisoning 4. Industrial disaster /crisis 5. Environmental Pollution

1.2.2 TYPES OF DISASTER CAUSING INTERRUPTION TO TRAIN SERVICES AS PER RAILWAYS PERSPECTIVE

Human/Equipment failure:

The following disasters/ accidents may be caused by human/equipment failure, which may affect normal movement of train services with loss of life or property or both.

- Collisions.
- Derailments.
- Level crossing accidents at Manned/Unmanned Level Crossings.
- Fire on Train.

Natural Calamities:

Natural calamities may also cause serious disruption of traffic with loss of life/property.

- Landslide.
- Earth quakes.
- Floods.
- Storm/Cyclones/Tornadoes.

Sabotage:

Sabotage causing deliberate loss of life and / or damage to property.

- Setting fire to train/railway installations and railway property.
- Bomb blasts.
- Placing of obstructions on track to cause disruption to traffic.
- Tampering with railway fittings to cause accidents.

Disaster in Railway parlance :

In Railways, disaster is defined as a major train accident leading to heavy causalities and disruption to traffic for a long period.

Train accidents

Train accident is an accident that involves a train. Train accidents are further classified as:

- Consequential train accidents.
- Indicative train accidents.

Consequential train accidents

These include train accidents having serious repercussion in terms of either one or many or all of the following: -

(i) Loss of human life.
(ii) Human injury.
(iii) Loss of Railway property.
(iv) Interruption to Rail traffic.

Train accident under following classification will be termed as consequential train accidents: -

Types of Consequential train accidents

1. Collision (Class A)
2. Fire or explosions (Class B)
3. Level crossing accidents (Class C)
4. Derailments (Class D)
5. Miscellaneous (Class E)

Collision

Collisions are worst kind of accidents and are of three types viz.

- Head on collision,
- Follow on collision,
- Side collision.

Fire or explosion in trains

This shall include all cases of physical fire or smoke emission resulting in death or injury or damage to property amounting to Rs. 5000/- and above.

Level crossing accidents

Applies to accidents at Level Crossings, i.e. at the intersection of the roads with railway track at the same level.

Derailment

Means off loading of wheel or wheels causing detention or damage to rolling stock/ permanent way.

Miscellaneous

All other train accidents that are not covered under the earlier categories are to be treated as miscellaneous accidents.

Indicative train accidents

These include:

- Averted Collisions (Class F)
- Breach of Block Rules (Class G)
- Train passing signal at danger (Class H)

Detailed Classification of Accidents

The detailed classification of accidents is as under:

CONSEQUENTIAL TRAIN ACCIDENTS

Class 'A' – Collisions

A-1 Collision involving a train carrying passengers, resulting in

(i) loss of human life and/or grievous hurt and/or
(ii) damage to Railway property of the value exceeding Rs.25,00,000 and/or
(iii) interruption of any important through line of communication for at least 24 hours.

A-2 Collision involving a train **NOT** carrying passengers resulting in

(i) loss of human life/grievous hurt and/or
(ii) damage to Railway property of the value exceeding Rs.25,00,000 and/or
(iii) interruption of any important through line of communication for at least 24 hours.

A-3 Collision involving a train carrying passengers, not falling under A-1 above.

A-4 Collision involving a train **NOT** carrying passengers not falling under A-2 above.

Class 'B' - Fire or Explosion in trains

B-1 Fire or Explosion in a train carrying passengers resulting in

(i) loss of human life and/or grievous hurt and/or
(ii) damage to Railway property of the value exceeding Rs.25,00,000 and/or
(iii) interruption of any important through line of communication for at least 24 hours.

B-2 Fire or Explosion in a train **NOT** carrying passengers resulting in

(i) loss of human life and/or grievous hurt and/or
(ii) damage to Railway property of the value exceeding Rs.25,00,000 and/or
(iii) interruption of any important through line of communication for at least 24 hours.

B-3 Fire or Explosion in a train carrying passengers not falling under B-1 above but loss to Railway property and/or interruption to traffic is more than the threshold value and/or resulting into detachment of rolling stock/stocks from the train and/or requiring relief engine/s.

B-4 Fire or Explosion in a train **NOT** carrying passengers not falling under B-2 above but loss to Railway property and/or interruption to traffic is more than the threshold value and/or resulting into detachment of rolling stock/stocks from the train and/or refining relief engines.

NOTE:- *In case of inquiry by a committee into a fire accident in Railway Premises or in a train leading to damage to Railway property and/or booked consignments a representative of the Railway Protection Force should also be included as a member of the Committee.*

Class 'C'- Trains running into road traffic and/or traffic running into trains at level crossings.

C-1 Trains carrying passengers running into road traffic and/or road traffic running into such trains at manned level crossings resulting into loss of human life and/or grievous hurt and/or damage to Railway property and/or interruption to traffic is more than the threshold value.

C-2 Trains **NOT** carrying passengers running into road traffic and/or road traffic running into such trains at manned level crossings resulting into loss of human life and/or grievous hurt and/or damage to Railway property and/or interruption to traffic is more than the threshold value.

C-3 Trains carrying passengers running into road traffic and/or road traffic running into such trains at unmanned level crossings resulting into loss of human life and/or grievous hurt and/or damage to Railway property and/or interruption to traffic is more than the threshold value

C-4 Trains **NOT** carrying passengers running into road traffic and/or road traffic running into such trains at unmanned level crossings resulting into loss of human life and/or grievous hurt and/or damage to Railway property or/and interruption to traffic is more than the threshold value.

NOTE :- *If a road vehicle is not capable of being physically cleared off the track promptly by single person operating it, it should be termed as road traffic for the purposes of classifying such an accident as a train accident, irrespective of its mode of traction.*

Class 'D' - Derailments

D-1 Derailment of a train carrying passengers resulting in loss of human life and/or grievous hurt and/or damage to Railway property of the value exceeding Rs.25,00,000 and/or interruption of any important through line of communication for at least 24 hours.

D-2 Derailment of a train **NOT** carrying passengers resulting in loss of human life and/or damage to Railway property of the value exceeding Rs.25,00,000 and/or interruption of any important through line of communication for at least 24 hours.

D-3 Derailment of a train carrying passengers, not falling under D-1 above.

D-4 Derailment of a train **NOT** carrying passengers not falling under D-2 above but loss to Railway property and or interruption to traffic is more than the threshold value.

Class 'E'-Other Train Accident

E-1 Train running over or against any obstruction including fixed structure other than included under class "C" resulting into loss of human life and/or grievous hurt and/or damage to Railway property and/or interruption to traffic is more than the threshold value.

E-2 Trains running into any obstruction including fixed structure but not covered under Class 'C' or 'E-1'.

INDICATIVE ACCIDENTS

Class 'F' - Averted Collisions

F-1 Averted collision between trains at least one of which is carrying passengers.
F-2 Averted collision between a train carrying passengers and an obstruction.
F-3 Averted collision between trains NOT carrying passengers.
F-4 Averted collision between trains NOT carrying passengers and an obstruction.

Class 'G' - Breach of Block Rules

G-1 Train carrying passengers, entering a block section without any authority or without a proper 'Authority to Proceed'.
G-2 Train Not carrying passengers entering a block section without any authority or without proper 'Authority to Proceed'.
G-3 Train received on a blocked line, not constituting an averted collision.
G-4 Train received on or entering a wrong line at a station or catch or Slip Siding or Sand Hump etc.

Class 'H' - Train passing signal at danger.

H-1 Train carrying passengers running past a 'Stop' signal at danger without proper authority.
H-2 Train/NOT carrying passengers running past a 'Stop' signal at danger, without proper authority.

1.2.4. LEVEL OF DISATER CAUSING INTERRUPTION TO TRAIN SERVICES:

Railway accidents can be categorized into different levels:

- Accidents of a magnitude which can be managed by the concerned divisional authorities;
- Accidents of a magnitude which may require assistance from neighboring divisions but can be managed by the Zonal Railway: and Disasters of a magnitude in terms of their severity or scale of casualties that require
- active involvement of multiple agencies of the Central Govt. (Ministry of Railways & other Ministries).

1.2.5. CLASSIFICATION OF A RAILWAY ACCIDENT AS A DISASTER:

Disaster in the railway context is defined as a major train accident leading to serious causalities and long duration of interruption to traffic. This compendium of instructions has been prepared for dealing with such disasters, and not normal train accidents. In case of a serious accident the

Administration would take a conscious decision whether the situation is to be classified as a Disaster or not.

1.2.6. CONCEPT OF DISASTER ON RAILWAYS

Disaster Risks in India :

India is vulnerable, in varying degrees, to a large number of natural as well as man-made disasters. 58.6% of the landmass is prone to earthquakes of moderate to very high intensity; over 40 million hectares (12% of land) is prone to floods and river erosion; of the 7516 km long coastline, close to 5700 km is prone to cyclones and tsunamis; 68% of the cultivable area is vulnerable to drought and hilly areas are at risk from landslides and avalanches. Vulnerability to disasters/emergencies of Chemical, Biological, Radiological and Nuclear (CBRN) origin also exists. Heightened vulnerabilities to disaster risks can be related to expanding population, urbanization and industrialization, development within high-risk zones, environmental degradation and climate change. It can also be related to increase in terrorism around the Globe.

1.2.6.1. Disaster defined in Railways' context :

The concept of a Disaster was, till the year 2005, not adequately and comprehensively defined on Indian Railways. It was accepted that a Disaster situation implies, on the railways, to cover only cases of serious rail/train accidents. It was, perhaps, due to this anamoly as late as the year 2008, even CAG's report on DM on Indian Railways has broadly adopted this fact in the concept of disaster and has gone to examine the relief/rescue/mitigation and preparedness of Indian Railways based on the earlier concepts and has reviewed the facilities for handling disasters available with the Railways only on the report/recommendations of the HLC on DM of Mr. S. Dhasarathy.

The definition of DM as given by the Government of India was legislated for the first time in the Disaster Management Act, 2005. The broad principles of disaster for any department of the government changed to the concept of any incident which could not be handled with alone by that department i.e. if it was beyond the coping capacity of a particular department, the incident could be termed as a disaster. With this came the concept of the departments of Government of India as also the State governments required to join hands to extend whatever facilities were available with them to provide relief/rescue and mitigation on the occurrence of a disaster.

In the DM plan of Indian Railways, this concept of disaster, which has now evolved, has been adopted. The zonal railways have to ensure that, down the line, this definition is understood.

While this Disaster Management Plan is a comprehensive Document, more detailed guidelines where required will be laid down on specific topics under the overall philosophy of Disaster Management laid down in this document. For instance, this has been done in the Guidelines on Chemical Disasters and the Hospital Disaster Management Plan.

1.2.6.2. Definition of a Disaster on Railways:

Based on the definition of the Disaster Management Act 2005, Ministry of Railways has adopted the following definition of Railway Disaster:

"Railway Disaster is a serious train accident or an untoward event of grave nature, either on railway premises or arising out of railway activity, due to natural or man-made causes, that may lead to loss of many lives and/or grievous injuries to a large number of people, and/or severe disruption of traffic etc, necessitating large scale help from other Government/Non-government and Private Organizations."

1.2.6.3. Strengths of the Railways to handle a Disaster :-

In handling disasters, Indian Railways is in a unique position as it has a number of strengths not available with many other departments of Government of India. These include:

- Railways' own Communication Network.
- Operating Control on each Division linked with each Station.
- Territorial Army Units.
- Uniformed force of RPF/RPSF
- Railways' own Medical Infrastructure
- Civil Defence Organization
- An army of Gang men spread out all over the Indian Railways.
- Scouts and Guides (they can at best provide background support).
- Dedicated Rescue/Restoration and Medical Equipment on Rails.

Each of the above can be made use of to handle adversities depending upon requirement to handle the disaster.

1.2.6.4. Railway's shortcomings to handle Disaster:

There are, however, a few inadequacies in the Railways own resources which are very essential for handling a specific type of Disaster as under:

- *Absence of Tunnel rescue equipment – in case of collapse of or mishap in a rail Tunnel, expertise and related equipment on this aspect is lacking.*
- *Non-availability of trained divers for extrication of passengers and/or casualties (dead bodies and drowning/drowned passengers) from rolling stock fallen down in sea/river/lake etc. Limited help of sports persons (Swimmers) can be taken for this; the time of their mobilization is a factor to be kept in view.*
- *Non-availability of cranes operated from a ship/barge for lifting of the coaches/bogies from a water body.*

- *Ability to handle a **C**hemical **B**iological **R**adiological and **N**uclear Disaster and major fire.*
- *Limited resources to handle a terrorist attack on a train and/or a station, **other railway premises etc.***

1.2.6.5. Types of Disasters

Disaster in the Railway context was traditionally a serious train accident, caused by human/equipment failure, which may affect normal movement of train services with loss of human life or property or both. This is now extended to include natural and other man made disasters.

Different types of disasters are described along with a few examples, below :

(a) *Natural Disaster* :- Earthquakes, Floods, Cyclones, Land Slides, Tsunami etc.

(b) *Train Accident related Disaster :-* Collisions (with a huge number of casualties), Train marooned (flash floods), derailments at a bridge over a river and coaches falling down; train washed away in cyclone, derailment of a train carrying explosives or highly inflammable material, tunnel collapse on a train, fire or explosion in trains, other miscellaneous cases etc.

(c) *Man made Disasters :-* Acts of Terrorism and Sabotage, i.e. causing deliberate loss of life and/or damage to property, which includes :- Setting fire to a Train, Railway installations etc., bomb blast at Railway Station/Train, Chemical (Terrorism) Disaster, Biological and Nuclear Disaster.

1.2.6.6. Changed Philosophy of Disaster Management in the Railways

With the enactment of the Disaster Management Act, 2005 and other developments on the national level, DM philosophy has also changed to adopt the latest concepts.

NEW PHILOSOPHY

- Serious train accidents, not the only events termed as disasters.
- Other events, e.g. Internal security related events like terrorist attack at station/train, marooning of train due to flash flood, disruption to traffic due to natural factors like earth-quake, cyclone, floods etc.
- No more Relief and Rescue Centric.
- Holistic Approach adopted to incorporate :-
    - Prevention
    - Mitigation
    - Preparedness
    - Rescue, Relief
    - Rehabilitation

New Philosophy gives more Emphasis on Prevention and Mitigation as under:

- Prevent and mitigate disasters
- Audit Existing Systems for Disaster Resistance, Disaster Prevention and Mitigation on the basis of NDMA's and self prepared guidelines
- Disaster Management in Developmental Planning – New activities should be disaster resistant
- Preparedness, Rescue, Relief and Rehabilitation - Dimensions of DM
- Expertise based response from all stake holders
- Pooling of resources of all agencies, e.g. local administration, community, defence, hospitals and other Govt. organizations.

1.2.6.7. Nodal department for Policy Formulation on DM on Indian Railways:

The preparation of the Disaster Management Plans on Indian Railways and on the Zonal Railways in co-ordination with the different Departments of the Railway, other Central/State Govt. agencies, NGOs, Private agencies, etc. has to be done by the Safety department in the Railway Board, on the Zonal Railways and Divisions.

The Hospital DM plans and the Security arrangements (drills etc) shall be prepared coordinated by the Medical and the Security deptt. respectively. The Management of Floods, Cyclones, Earthquakes, Landslides etc, and preventive action to be taken for mitigation shall be coordinated by the Civil Engg Deptt.

The Rescue and Restoration DM Plans including preparing plans and procurement of specialized equipment and rescue centric training of personnel has to be coordinated by the Mechanical Department.

1.2.6.8. Authority to declare a Disaster on Railways :

Railway Board has also approved to nominate GMs, AGMs or CSOs (when GM/AGM are not available) for declaring an untoward incident as Railway Disaster. With the adoption of the above definition of railway disaster, it needs to be appreciated that not only a serious train accident may turn into a railway disaster, if not handled and managed properly, there may be many more railway related events which may not even involve human lives but may turn into disasters for which necessary prevention and mitigation measures are to be taken by the railways beforehand. Zonal Railways will ensure that prevention, mitigation, preparedness, rescue and relief related issues covering all types of disasters affecting railway system are addressed and their details are also appropriately incorporated in their Disaster Management plans.

1.3. DISASTER PREPAREDNESS

1.3.1. AVALABILITY OF RESOURCES

Railways are generally self-reliant in carrying out rescue and relief operations as a result of having a well organized set up including **A**ccident **R**elief **M**edical **V**ans and **A**ccident **R**elief **T**rains. However, major accidents, involving heavy casualties in remote areas or in difficult terrain or under adverse weather conditions are possible to be managed efficiently only by mobilizing non-railway resources.

Disaster Management mechanism in Railways can be maintained at a high level of preparedness and efficiency by keeping all resources readily available and in good fettle. Resources imply both railway and non-railway men and material including medical personnel, transport, volunteers, police and fire services.

Resources available in case of a major accident may be grouped into 4 different units, depending on the time frame within which these can be made available after an accident.

These are as follows:

1. Resource Unit I - Railway and non-railway resources available on the train, and at nearby surroundings.
2. Resource Unit II - Railway resources available at ARMV/ART depots and elsewhere within the division.
3. Resource Unit III - Railway resources available at ARMV/ART depots and elsewhere on adjoining Zones and Divisions.
4. Resource Unit IV - Non-railway resources available within or outside the division.

1.3.1.1. Resource Unit – I

(a) Resources available on trains carrying Passengers

(i) First Aid Box available with the Guard.
(ii) First Aid Box available with Train Superintendent and in the Pantry Car.
(iii) Portable Telephones, Fire Extinguishers in Brake Van.
(iv) Portable Telephones in Locomotives.
(v) Walkie-Talkie with Guard and Driver.
(vi) CellPhones/Mobile communications with Passengers.
(vii) Information collected by Train Superintendent/Travelling Ticket Examiner about Medical Practioners traveling on the train.
(viii) Information collected by TS/TTE about Railway Officers travelling on the train.
(ix) Railway staff travelling on the train-either on duty or on leave as passengers.
(x) Passengers travelling on the train who volunteer their help for rescue and relief work.

(b) Non-railway resources available nearby:

(i) Volunteers from nearby villages and town.
(ii) Transport facilities available at site or passing through nearby LC Gates.
(iii) Tractors with trolleys from nearby villages both for transport purposes and for lighting up the accident site.
(iv) Station staff and local railway administration should requisition help from non-railway sources before railway own rescue team arrives.
(v) Such local networks are most effective in rushing assistance immediately, especially with regard to :
   - medical succour,
   - additional manpower,
   - rescue equipment,
   - lighting arrangements,
   - transport services,
   - fire fighting tools etc.

(c) Railway resources available nearby:

(i) Engineering gangs.
(ii) OHE staff and Signal staff available.
(iii) Other resources such as medical facilities, communication facilites

(d) At adjoining Stations:

(i) Staff available at adjoining or nearby stations.
(ii) Railway resources as given in respective Divisional DM Plans.
(iii) Non-railway resources as given in respective Divisional DM Plans.
(iv) Resources should be mobilized to send medical team at short notice as given in the respective Divisional DM Plans

1.3.1.2. Resource Unit - II

(i) AMRVs, ARTs with 140 T crane are stabled at nominated stations.
(ii) Railway medical and departmental resources.

1.3.1.3. Resource Unit - III

(i) Location of AMRVs, ARTs with 140 T crane based on adjoining Zones/Divisions.
(ii) Section wise chart of which ARMVs/ARTS are to be requisitioned from adjoining Zones/Divisions is given in Divisional/zonal DM Plans.
(iii) Resources of men and material available on adjoining Zones/Divisions are given in their data bank and included in the Zonal/Divisional DM Plans of respective Zones/Divisions.
(iv) Copies of DM Plans of adjoining divisions should be available with the divisional control offices.

1.3.1.4. Resource Unit – IV :

(i) Non-railway resources available within the division-as given in the data bank and included in the Divisional DM Plan.

1.4 . USE OF ON BOARD RESOURCES

(A) PORTABLE TELEPHONE:

1. Types of Portable Telephones:

   (i) Portable Telephones are available in Brake van of Passenger carrying Trains.
   (ii) Telephones presently in use are of the 4-wire/2-wire type of portable phones which can be used in RE area as well as in overhead communication territory.
   (iii) There are two types of Portable Telephones
      - Land line type (Overhead Telephone line transmission)
      - Socket Type (Underground cable transmission)
   (iv) In overhead territory additional poles are to be carried by Guards for connecting phones to the overhead lines.

2. How to use Portable Telephones:

(a) Overhead type:

(i) Fix “Y” bracket on the poles.
(ii) Use required number of poles available.
(iii) Connect the two wires to phone terminals.
(iv) Circuit on Red colour bracket side connects the section controller telephone line.
(v) Circuit on the Green colour bracket side connects the Deputy Chief Controller telephone line.
(vi) Link “Y” bracket on the circuit and rub it for clear communication.

(b) Underground cable type :

(i) Look at Receiver Arrow sign for socket location on Over Head Equipment mast/ location post and move towards the Arrow pointing direction.
(ii) On reaching EMC Socket location, open the socket by using the key kept in the phone box where required.
(iii) Plug in the phone terminal properly for communication.
(iv) In electrified section this phone connects the Traction power controller and then link to section controller.

(B) WALKIE – TALKIE SETS:

(i) Ensure that the set is charged.
(ii) Check that the proper channel is selected for communication.
(iii) Do not intervene when the channel is engaged.
(iv) Never press “SOS” button provided in walkie-talkie unless it is a real emergency. In case of emergency if “SOS” button is provided on the mobile, it should be used to override an on going conversation.

(C) USE OF BSNL/CELL PHONE/MOBILE PHONES:

(i) BSNL phone numbers with STD code for Railway Station in a Division are given in (Working Time Table).
(ii) WTT is available with Guard, Driver, and Assistant Guard.
(iii) Refer WTT for nearest Station contact number.
(iv) BSNL phone numbers of important Stations are also available in Public Time Table.

(D) EMERGENCY TRAIN LIGHTING BOX:

1. How to use ETL BOX:

(i) This box is available in the Brake Van of Passenger carrying trains.
(ii) Open the box by removing the seal.
(iii) Fix the crocodile clip of hand Torch to the coach power supply terminal and use it for searching/surveying.
(iv) Fix the flood light to the Tripod Stand and connect its crocodile clip to the power supply terminal.

Many serious train accidents are also disasters and hence, every Railway staff should be in position to identify the characteristics of different disaster situations.

Indian Railways came into existence with the running of the first train from Kurla to Thane in 1853. Ever since then handling train accidents has been a priority area for the railways. With the main reason for building up of the rail network by the British Empire being the transportation of the military requirements through the Indian Railways, the railway organization worked hand in hand with the army authorities. Sharing of the Indian Railways' and Army Cranes as also their Medical Vans in times of a train accident was an accepted system for handling disasters (rail accidents).

With the gradual growth of Indian Railways and its transition to transportation of passengers and other goods including raw material for industries etc the railway gradually built up its own infrastructure of Cranes, Accident Relief Trains (ARTs), Accident Relief Medical Equipments (ARMEs). *Till the beginning of the year 2005, a disaster on the railway in effect meant a serious train accident*; other items of disaster viz. Floods, Earthquakes etc were handled in an uncoordinated manner. Disaster preparedness of the Railways, mainly pertaining to handling train accidents, had been gone into by a High Level Committee (HLC) in the year 2002/03 whose recommendations, where relevant, have been kept in view in the preparation of Railways' Disaster Management Plan.

The situation has now changed with the promulgation of the Disaster Management (DM) Act in 2005. A disaster no longer means only a train accident, but its scope has become much wider to include other incidents, terrorism related activity and natural calamities etc. The Indian Railways Disaster Management Plan has to be prepared on the principles now incorporated in the Act of sharing resources of all Government Departments along with Railways own resources available to handle serious train accidents, other mishaps, terrorism related crisis and natural calamities etc.

OBJECTIVE:

1. Rail/Road accident is a _____ disaster.
2. Setting fire to train/railway installations and railway property is a _____.
3. Head on collision is a Indicative accident. (True/False)
4. Derailments can be classified into _____ categories.
5. We wish that any accidents should not take place, but we should not be prepared to meet any situation if any unfortunate accident occurs or disaster takes place. (True/False)

SUBJECTIVE:

1. What is a disaster ?
2. What are the types of disaster causing interruption to train services ?
3. Enumerate different types of accidents and give their classification ?
4. Define disaster as per Railways?
5. What are the strengths and shortcoming of the Railways to handle a Disaster ?
6. How do you use a Portable Telephone?

CHAPTER – 2

MANAGEMENT FOR DISASTER

2.1 DISASTER MANAGEMENT CYCLE

Disaster management is a cyclical process; the end of one phase is the beginning of another (see diagram below), although one phase of the cycle does not necessarily have to be completed in order for the next to take place. Often several phases are taking place concurrently. Timely decision making during each phase results in greater preparedness, better warnings, reduced vulnerability and/or the prevention of future disasters.

The complete disaster management cycle includes the shaping of public policies and plans that either addresses the causes of disasters or mitigates their effects on people, property and infrastructure.

The mitigation and preparedness phases occur as improvements are made in anticipation of an event. By embracing development, a community's ability to mitigate against and prepare for a disaster is improved. As the event unfolds, disaster managers become involved in the immediate response and long-term recovery phases. The diagram below shows the Disaster Management Cycle.

Disaster Management Cycle

Mitigation: Measures put in place to minimize the results from a disaster. Examples: building codes and zoning; vulnerability analyses; public education.

Preparedness: Planning how to respond. Examples: preparedness plans; emergency exercises/training; warning systems.

Response: Initial actions taken as the event takes place. It involves efforts to minimize the hazards created by a disaster. Examples: evacuation; search and rescue; emergency relief.

Recovery: Returning the community to normal. Ideally, the affected area should be put in a condition equal to or better than it was before the disaster took place. Examples: temporary housing; grants; medical care.

2.2 DISASTER MANAGEMENT IN RAILWAYS

In India, the Railways are the most preferred mode of transport both for the movement of people and goods consignments in bulk. Indian Railways is spread over a vast geographical area over **63000** route kilometers. Unlike in other countries where the role of Railways, in the event of a disaster, is restricted to clearing and restoring the traffic, in our country Indian Railways handles the rescue and relief operations. The **'Citizen Charter'** of the Indian Railways also spells out the railways' commitment to providing safe and dependable train services to passengers.

The Indian Railways was managing disasters relating to train accidents in accordance with the rules and procedures contained in the Accident Manual 1992. Increasing traffic density, longer length of trains with a large number of passengers on board, higher operational speeds of trains, emerging technologies etc. called for a paradigm shift from the existing level of preparedness and readiness to combat any disastrous situation to a much higher level of an effective **'Disaster Management System'**. Consequently, Ministry of Railways constituted (September 2002) a High Level Committee (HLC) to review the disaster management system over the Indian Railways related to train accidents and natural calamities and to identify additional technological and managerial inputs required to quicken the pace of rescue, relief and restoration of operations. The Committee recommended additional inputs to be in place within a period ranging from three to 36 months and all of its 111 recommendations were accepted (April 2003) by the Railway Board.

Since the HLC did not address disasters such as earthquakes, floods, cyclones, fires, industrial accidents, accidents involving trains carrying explosives/inflammable/ hazardous material, Ministry of Railways constituted (January 2004) another committee to address these disasters. This committee is yet to finalize its recommendations. The Ministry of Railways also formulated (August 2003) a Corporate Safety Plan as a means to realize the vision of an accident free and casualty free Indian Railway system. Apart from addressing the safety concerns, in its Corporate Safety Plan, Ministry of Railways reiterated its focus on modernization of Disaster Management. While the Corporate Safety Plan addressed the causes that lead to disasters and was preventive in nature, HLC's focus was on effective management of disasters.

Further, the Central Government promulgated (December 2005) a Disaster Management Act 2005. Prior to formal promulgation of the Act, Ministry of Railways had nominated (January 2003) Additional Member (Mechanical) as a member of the National Disaster Management Authority (NDMA) to represent Ministry of Railways. Since the HLC was already constituted to review and upgrade the disaster management system in Indian Railways, Ministry of Railways issued instructions from time to time to zonal railways to ensure compliance on specific issues.

2.2.1 Major recommendations of HLC

- Detailed disaster management plans should be devised at the zonal and divisional levels.
- Relief trains and medical vans should be adequately provided, strategically located, upgraded to operate at higher speed and equipped with modern equipments.
- Rescue ambulances and other infrastructure should be provided including facilities in hospitals. Communication facilities should be upgraded.
- MOUs should be entered into with State Governments, public/private agencies, Armed forces etc to improve the response time during disasters.
- Crack rescue teams should be formulated. Specialized training in rescue, extrication, relief and restoration techniques should be provided to staff.

2.3 DISASTER MANAGEMENT PLAN AND ACT 2005

Disaster Management on Indian Railways deals with the following elements:-

1. Prevention and Mitigation.
2. Preparedness for Quick relief.
3. Rescue and restoration.

The Indian Railway Corporate Safety Plan, Zonal Safety Action Plan and Divisional Safety Action Plan envisage Disaster Prevention and Mitigation directed towards continuous reduction in risk level to its customers.

The following measures have been suggested to reduce the number of various types of accidents on Indian Railway.

- Construction of ROB's/RUB's at level crossing gates.
- Manning of unmanned level crossings gates.
- Interlocking of level crossing gates.
- Use of Train Actuated Warning Device (TAWD) and Anti-Collision Device(ACD).
- Upgradation of safety features in locomotives.
- Upgradation/replacement of overaged tracks, bridges, S&T gears and rolling stock.
- Reduction in thermit weld joints.
- Continuous Track Circuiting.
- Use of SPURT (**S**elf **P**ropelled **U**ltrasonic **R**ail **T**esting) car for rail flaw detection.
- Use of fire detector, smoke detectors and fire retardant material in rolling stock, work centres.
- Use of crash worthy coaches and tight lock couplers with anti climbing features.
- Up-gradation of ART/ARMV's and improving the skill of ART/ARMV's staff with regular training of the latest techniques and up-gradation of equipment to ensure preparedness for providing quick relief.

2.3.1 Disaster Management Act 2005.

The Parliament of India enacted the National Disaster Management Act on 23rd December 2005, and published under item no. 53 in the Gazette of India of 2005. This ACT brings about a paradigm shift in India's approach to Disaster Management. The centre of gravity stands visibly shifted to preparedness, prevention and planning from the earlier response and relief centric approach. The proposed legislation is in the concurrent list of constitution and thus has the advantage that it will permit the states also to enact their own legislation on disaster management.

The new ACT provides that:-

- There shall be a National Disaster Management Authority of which the Prime Minister of India will be the Chairperson, helped by a Vice Chairperson.
- The National Authority shall have the responsibility of laying down the policies, plans and guidelines for disaster management.
- There shall be created State Disaster Management Authorities, expected to be chaired by the Chief Minister of the state.
- There shall be created District Disaster Management Authorities co-chaired by the District Collector and President of the elected body of the district.
- The Central Government shall constitute the National Institute of Disaster Management. State Authorities to meet the immediate needs of providing rescue and relief to the victims of Disasters.
- Disaster Management plan to be prepared and reviewed every year.

The Government of India has also constituted a Cabinet Committee on Management of Natural Calamities and Cabinet Committee on Security. Besides above there is a High Level Cabinet Committee and Inter Ministerial Group in place.

Ministry of Home Affairs is the nodal Ministry of all National Disasters except Drought. Eight Battalions of Para-military forces has been trained to serve as the National Disaster Management Response Force (NDRF) with two Battalions each from Central Reserve Protection Force (CRPF), Central Industrial Security Forces (CISF), Indo Tibet Border Police (ITBP) and Border Security Force (BSF). Out of these 8 battalions, four battalion will deal with Nuclear Biological & Chemical (NBC) Disasters and rest four battalions will deal with Non-NBC disasters. Each Battalion has six companies comprising of three teams. Each team comprises of 45 men out of which, 24 are for search and rescue and balance 21 for support functions.

It is proposed to establish four training centers in different parts of the country by respective paramilitary forces. A National Disaster Mitigation Fund and a National Disaster Response Fund are proposed to be created. Disaster Management Act 2005 legislates a holistic approach to Disaster Management from mere responding to disasters to greater attention to prevention and mitigation, capacity building and preparedness.

2.3.2 Disaster Management Plan

Railway Board 's Safety Directorate vide their letter no. 2003/Safety-I/6/2 dated 29.09.2003, High level Committee recommendation item no. 15 and Indian Disaster Management Act 2005 section 36, have laid down the requirement of a Zonal Railway Disaster Management Plan. All the aspects of disaster management and guidelines have been covered in this Zonal Disaster Management Plan A Disaster Management Plan should not be something **"done a few years ago"**, gathering dust on the shelf. There is the need for constantly revisiting plans to see how good they have been when implemented. This process of review, rehearsal and training should be continuous, so that the oral tradition is every bit as strong as the written word in the manual.

All Divisions and Zonal Railway headquarters. (Including Metro Kolkata & Delhi Metro Railway Corporation) must devise their disaster management plan, if not already done taking into consideration the resources available with them, their neighboring divisions/Zonal Railways, civil authorities, industrial units and Armed Force bases located in their territory. This would enable the Divisions/Zonal Railways to muster the entire local resources in case of a major disaster/natural calamity. Zonal Railways Disaster Management plan should integrate all divisions and also to take into consideration adjacent railway's framework.

Preparation of Disaster Management Plan : The Disaster Management Plan must inter-alia include *'**who is responsible for what activities in detail**'.*

- Preparation and implementation of disaster management plan is the responsibility of concerned **General Manager/Divisional Railway Manager**.
- Authority to order ART/ARMV/Break Down crane-Chief Mechanical Engineer/Chief Motive Power Engineer (Running & Loco)/Sr. Divisional Mechanical Engineer/Divisional Mechanical Engineer, etc.
- Senior most railway officer at the site of the accident shall be the designated **Site Manager.**
- Management of rescue operations- Primarily it is responsibility of **Mechanical** and **Medical Departments**. Assistance to be provided by all **Railway men** (*irrespective of their department*)as needed.
- Relief operations including care for the dead-**Commercial, Medical & RPF Departments.**
- Communication network- **Signal & Telecom Department**.
- Crowd control and law & order at site – **RPF**.
- State police clearance for restoration – **RPF**.
- Restoration operations-Rolling stock- **Mechanical Department**.
- Fixed infrastructure like Track, Over Head Equipment, Signaling system, etc.- **Departments concerned**.
- Maintenance of SPART/ART & ARMV Rolling Stock/Break Down cranes including rail- cum-road and road mobile emergency vehicle etc. – **Mechanical Department**.

- Maintenance of equipment kept in SPART/ART/ARMV for rescue and restoration operations – **departments concerned**.
- Media Management at site-

  (a) **Site Manage**r shall be the chief spokesman at site and can be assisted by the branch officers concerned, if needed.
  (b) **Public Relations/Commercial** Department to look after the media needs at site.

- Checklist for the officers & supervisors must be issued in the form of a pocket booklet indicating Dos and Don'ts for the benefit of:

  a) First official reaching the site of accident.
  b) Senior most officer at the site.
  c) Divisional/HQ control organization.
  d) Station Manager/Station Master.

The Disaster Management Plans must be reviewed and updated in the month of January every year.

2.3.3 Various phases of Disaster Management

Disaster Response in the face of Railway Accidents constitutes of five phases. These five phases are determined both by the time factor, as also by the extent of specialized assistance available. Firstly it begins with the spontaneous reaction of front line staff and men available on the train at the time of accident.

Second phase continues with contributions made in rescue and relief work by men and materials available locally in nearby areas of the accident site.There also covers the arrival of crack team.

Third to fifth and longest phase consists of meticulously planned action by the trained disaster management team who arrive at the accident site to carry out rescue and relief operations.

It is necessary to take firm and quick decisions to save lives and property. To achieve all these objectives Railways have a well-defined action plan that is successfully executed by the co-ordinated efforts of different disciplines, all of whom function as a team.

The three groups which are active during the all five phases of Disaster Response may be classified as follow:

1. Instant Action Team or Front line Staff (IAT)
2. First Responders (FR)
3. Disaster Management Team (DMT)

2.3.3.1. Phase-I (Golden Hour)

The first phase, which is of shortest duration, lasts for about an hour. It is an amateurish, poorly equipped effort; but is nevertheless the most important phase. Inmost cases, this is the only help available for a major part of the **"GOLDEN HOUR".**

1. In the period immediately after the accident where grievous injuries to passengers, loss of property etc. takes place, action has to be taken on war footing by Railway Officials/ officers-on-board to render definite medical care which gives relief to affected persons and also helps them to overcome the trauma.
2. If a critical trauma patient is not given definite medical care within one hour from the time of accident, chances of his ultimate recovery reduces drastically, even with the best of Medical attention thereafter.

This first one hour period is known as the Golden Hour FOR A CRITICAL TRAUMA PATIENT:-

During this Golden Hour period, following efforts should be made:

i) Guard, Driver, Conductor and TTEs. etc. must pass on the information quickly to the nearest station or to control, about the accident. Being trained in first-aid, they should simultaneously render every possible medical aid to the injured.
ii) Senior-most officer traveling by the affected train, whether on duty or on leave, shall take charge as Site Manager.
iii) All Railway officers and staff available on train must report to the Guard and work as per the directions of the Site Manager.
iv) SMs of the adjoining stations must inform Control about the happenings and the nature of assistance required.
v) Render definite medical care to the extent possible preferably by qualified medical practitioners.
vi) Stop bleeding and restore Blood Pressure.
vii) Persons under shock should be relieved of shock immediately.
viii) Transport causalities to the nearest hospital so as to reach within this Golden Hour period.

2.3.3.2. Phase-II (Arrival of Crack Team)

The second phase which is of 2-3 hours duration is comparatively less amateuricsh and much better equipped. Their contribution is vital since the **"GOLDEN HOUR"** period comes to an end during the working of this group.How many critically injured passangers can be saved depends solely on the efficiency of this group. Quick and effective use of local resources in vital in this phase.

CRACK TEAM OF RAIL RESCUE EXPERTS:-

This Crack Team will consist of Rail Rescue Experts from Mechanical and Medical Departments. This crack team will be based at Headquarters who can be rushed to any site of accident by air/rail/road and route at short notice. This group will continuously be exposed to the latest rescue, extrication techniques and medical relief. This group will support the accident rescue and relief arrangements made by Divisions at the site of accident.

CRACK TEAMS:- These will be Specialized Disaster Response Units :

- One complete set of sophisticated equipment/gadgets required for rescue and relief must be available with one specialized disaster response unit at each Zonal headquarter.
- Each unit will be provided with state of the art equipment for extraction and rescue from the accident involved coaches and will be kept at the disposal of Ganeral Manager
- This specialized disaster response unit (comprising of both men and material) available at Zonal Headquarter must be moved by Helicopter or with GM's special train as needed.

They would serve as an additional aid.

- The Specialized response unit should maintain its elite character. It must not be sentto sites of smaller accidents and should only be rushed to sites of major disasters.

Functioning of crack team - As soon as alarm hooters are sounded, the nominated team shall proceed to the site of accident by first available train or by road. The crack team will carry prescribed tool kits consisting of –

i) S&T kit,
ii) Lightening kit,
iii) First Aid kit,
iv) Rescue kit etc.

On reaching at accident site, the crack team shall perform following activities: -

1. Extrication/removal of injured passengers from the coach.
2. First Aid to the injured.
3. Provide succour and help to the passengers at site.
4. Relieve panic and create re-assurance among passengers.

Disaster Syndrome:

A victim's initial response following a Disaster is in three stages, viz. Shock stage, Suggestible stage and Recovery stage. These initial responses are called Disaster Syndromes:-

(a) **Shock Stage:** In which victims are stunned, dazed and apathetic.
(b) **Suggestible stage:** In which victims tend to be passive but open to suggestions and willing to take directions from rescue workers and others.
(c) **Recovery stage:** In which the individual may be tense and apprehensive and may show generalized anxiety.

First Aid in Emergency :

(a) Order of priority for dealing with and helping injured passengers should be as follows:-

(i) Unconscious,
(ii) Bleeding excessively
(iii) Having breathing problems,
(iv) Grievously injured,
(v) In a state of shock,
(vi) Having fractures,
(vii) Simple injured.

(b) For assessing and handling injuries, acronym DR ABC is to be followed:-.

(i) **D-DANGER:-** Look out for danger. Make sure that no further danger exists either for the patient or for the First Aider.

(ii) **R-RESPONSE:-** Check for consciousness. Call by his/her name, slap, pinch and shake plenty. If there is no response, then it means that the patient is unconscious.

(iii) **A-AIRWAY:-** Clear the airway (Trachea). If patient is unconscious, then the airway may be narrowed or blocked making breathing impossible. This occurs due to several reasons. Mass food particles or foreign body in the air passage or the tongue may have sagged back and blocked the air passage. To open the airway lift the chin forward with the fingers of one hand while pressing the forehead backwards with the other hand, now the tongue comes forward and the airway is cleared. To clear the other objects in the mouth press the Jaw, open the mouth put your fingers or a clean cloth in the mouth and clear the obstruction. Now the air passage is clear.

(iv) **B-BREATHING:-** Check for Breathing. Keep the back of your fingers near the nose ofthe patient. You can feel the warm air (or) keep your ear near the nose and look for the movement of chest, listen to the sound from the throat and feel the warm airfrom the nose.

(v) **C-CIRCULATION:-** Check the pulse. Normally we check the pulse at the wrist; however, sometimes it is not felt because of severe bleeding. So, it is better to check the pulse at neck. (Carotid Pulse).

After checking DRABC, there may be two possibilities:

(i) If patient is breathing, has circulation but is unconscious, immediately turn him to recovery position and transport to hospital.

(ii) If the patient has failure of breathing and circulation, then immediately start CPR (CARDIOPULMONARY RESUSCITATION), the important life saving technique in First Aid.

Special Disaster management team of RPF: Special disaster management team of RPF has to be set up at Jabalpur, Bhopal & Kota for providing support to relief and restoration at the site of accident. They shall also reach to the accident site by first available means.

2.3.3.3. Phase-III (Arrival of Relief Train)

Disaster Response by Railway Disaster Management team continues and comes to an end not only the restoration of traffic but also with the departure of most relatives and next of kin from the accident site and disposal of all bodies. Few of the grievously injured who continue to be hospitalized for comparatively longer spells are then the sole responsibility of railway's medical department. Phase - III begins with the arrival of relief train ART/ARME. The senior-most officer who reaches the site first becomes the Site Manager. All staff and officers should work as per the directions of the Site Manager.

Site organization:

- Medical relief camp
- Security of luggage
- Clue preservation
- Relief rescue and restoration
- Coordination with civil and press
- Liaison with control
- Communication- STD phones, Walkie-talkies, mobiles, PA System etc.
- Lighting arrangements
- Commercial-information booth, Arrangement of Tea, Food and Water.
- Evacuation of passengers, payment of ex-gratia etc.

The medical team reaching the spot must comprise adequate number of doctors and staff. The senior-most doctor and Site Manager should have all details abou t dead/injured and hospitals where they have been sent.

Special Task Teams

i) Medical Medical Relief and transportation of injured to hospitals.
ii) Commercial Catering- food, tea and drinking water, Payment of ex-gratia, Information Booth, liaison with Civil administration and Press.
iii) Commercial and RPF Security of luggage, parcels and Railway property
iv) Operating Liaison with control and arranging logistics including shunting.
v) S & T Establishment of communication and free telephone booths.
vi) Mechanical Rescue and Relief operations including re-railment and preservation of clues.
vii) Electrical Lighting arrangement
viii) Civil Provision of tents, accommodation etc.
ix) Safety Preservation of clues, measurement of track, wagon, photography, videography, statement of witnesses. Breath analyzer test of staff involved in accident.
x) Personal Passenger Care
xi) Public Relation Press and Electronic Media Management

Arm Bands

Rescue team members must wear armbands and jackets. Armbands for doctors should bear a red cross.

Cold cutting

Extreme care must be exercised while tackling damaged coaches. Cold cutting equipments should be used on coaches containing passengers so as to avoid burns to passengers by use of flame cutting.

Handling of dead/injured

- Dead bodies should be handled with care and respect.
- Cover dead bodies with white shrouds, which should be available in ARME.
- Expeditious issue of death certificates.
- List of dead and injured must be passed on to control and disaster management cell at HQ's from time to time.
- A photographer should take coloured photographs of the dead and injured.

Free food, drinking water, tea, etc.

Food and clean drinking water must be rushed from the nearest source. Free food and beverages must be supplied.

Correct picture to media

Press and other media should be given correct picture timely.

ACTION TO BE TAKEN AT DIVISIONAL LEVEL

i) Opening up of special enquiry booths at originating, terminating and major stations en-route.
ii) Furnishing update d position of dead, injured and evacuated passengers to all concerned.
iii) Help line Phone Number should be relayed through TV, Radio and press.
iv) Arrangement for issue of free Railway passes for relatives/dependents of dead & injured.
v) Make arrangements for transportation of evacuated passengers to be sent to destinations. Transport vehicles can be hired.
vi) In case of major disaster, DRM can requisition helicopter/Aeroplane.
vii) Press should be briefed properly and quickly.
viii) HQq/Board should be advised quickly.

2.3.3.4. Phase-IV (Handling injured passengers)

Phase-IV mainly refers to dealing with injured passengers. Following action must be planned:

- Relief train for clearing injured or stranded passengers must get overriding priority.
- Road vehicles can also be arranged for stranded passengers.
- List of injured, hospital-wise, should be conveyed to all concerned and displayed at prominent locations.
- Ex-gratia payment should be arranged.
- Restoration operation should be planned and acted upon without affecting the relief operations. Restoration of passenger services gives a sense of normalcy. Providing means to relatives/dependents of victims to visit them and attend to them.

2.3.3.5. Phase-V (Restoration of Traffic) Concept of Controlling Station

The Station Master of nominated Controlling Station should immediately, on receiving information of an accident, reach the site with sufficient staff drawn from all departments at his station, and take all the necessary steps for Rescue & Relief. It should be made clear to everybody that staff of all departments must follow the directions of the Station Master of the controlling station and render all help and assistance necessary for tackling the disaster.

Clearance by State Police

1. Clearance by the state police in case of Railway Accident, where Sabotage is suspected is necessary for commencing restoration works at the site of accident.
2. Such clearance by the State Police or permission of the State Govt. is not required for launching Rescue Operations" for the purpose of saving human lives which inter-alia may also involve handling, shifting the rolling stocks (wagons, locomotives & coaches) for extricating the trapped passengers.
3. Ministry of Home affairs/Govt. of India vide their letter No. VI-24022/11/2002-PM-1 dated 24-12-2002 has directed the Home Secretraries of all states to issue suitable instructions to all concerned authorities for taking prompt action and to expedite clearance certificate in the event of a rail accident when sabotage is suspected. (vide Rly. Bd's letter No. 2002/Sec (Cr.)/45/47; 27th March, 2003).

2.3.4 DISASTER RESPONSE

2.3.4.1. FIRST RESPONDERS

(A) Duties of First Responders – Local people :

1. At Accident site :

(i) Tractors which arrive should be lined up in a row facing the track with their headlights switched ON for illuminating the accident site.

(ii) Tractors should be so spaced out that they illuminate the entire length of the accident site. Such spacing would also depend on number of tractors that have arrived.

(iii) Rescue and relief work should now be mounted under the available light.

(iv) Villagers arriving for rescue and relief work should be formed into separate groups for handling individual coaches.

(v) Group leaders of IAT who were earlier conducting rescue and relief work should co-ordinate with the local people and guide them.

(vi) Grievously injured passengers extricated from coaches should be sent to the nearest hospitals in tractor trolleys.

(vii) Passengers who have suffered Trivial injuries and uninjured passengers should stay back at accident site and wait for arrival of railways DM team who would take charge of them.

(viii) As a thumb rule, any injury requiring hospitalization of more than 48 hrs. is grievous, hospitalization of less than 48 hrs. is simple, and any injury not requiring hospitalization at all is trivial.

(ix) The following priority should be adhered to while sending such grievously injured passengers :
- unconscious,
- bleeding excessively,
- having breathing problems,
- grievously injured,
- in a state of shock,
- having fractures,
- simple injured.

(x) Dead bodies, if extricated should be kept alongside the coach but away from the track for proper tagging etc. before being dispatched for preservation.

(xi) Bodies should be kept in separate lots, coach-wise, so that they do not get mixed up.

(xii) Tagging of dead bodies should indicate the coach number and also the cabin number, if possible. (For example ECR 98127, cabin number containing berths 9-16)

2. In villages/towns :

(i) A big building, preferably a school building should be got vacated and made ready for keeping of dead bodies and unclaimed luggage of passengers.

(ii) They should be asked to bring the following to the accident site for train passengers:
- tea and refreshments,
- warm clothing, if required.

(iii) Look after injured passengers who have been taken to the village.

(iv) Take injured passengers to the nearest hospital by means of any transport available. For this purpose, apart from tractor trolleys, even trucks passing on the highway can be utilized.

(B) Duties of First Responders– Railway Staff :

1. Gang Staff:

(i) On double/multiple line section stop any other train approaching the accident area by showing hand danger signal.

(ii) Ensure that track alignments or lines are not disturbed.

(iii) Report to OC Site and assist in rescue and relief work.

(iv) Assist in extricating injured passengers from coaches.

(v) Assist in transporting them to nearest hospitals.

2. Gate men:

(i) Keep gate closed if the train has not cleared the gate.

(ii) On double/multiple line section stop any other train approaching the accident area by showing hand danger signal.

(iii) Arrange to inform SM immediately.

(iv) Don’t meddle with Interlocking.

(v) Avail services of road vehicles waiting or passing through LC Gate.
(vi) Send message to nearby village, informing them regarding the accident.
(vii) Collect men and material available nearby and direct them to site.

3. Station Master at adjoining station:

A. Conveying of information:

(i) Arrange protection of traffic by keeping all signals at ON position.
(ii) Report the accident to Station Master at the other end. He should be asked to call all off duty staff at his station and send them to the accident site.
(iii) Report the accident to Section Controller.
(iv) Control to be advised regarding –
- Time and nature of accident.
- Brief description of accident.
- Adjacent lines clear or not.
- Damage to rolling stock.
- Damage to track in terms of telegraph posts.
- OHE masts damaged or not, and extent of damage.
- Approximate number of dead and injured (grievous, simple) to be obtained from the TS/TTEs.

(v) Following functionaries should be advised regarding the accident :
- All off duty railway staff posted at that station.
- SS of Junction stations at either end.
- TI, CMI.
- P Way Supervisors – SSE/JE etc.
- TRD Supervisors – SSE/JE etc.
- C&W Supervisors – SSE/JE etc.
- S&T Supervisors – SSE/JE etc.
- SI/RPF, SHO/GRP.
- Nearest Fire Station.

(vi) Inform civil authorities, village/town/city representatives and volunteers for possible relief assistance.
(vii) Supervisory Station Manager of the nearest Jn. station shall proceed to accident site.

B. Medical assistance:

(i) Call for assistance from local Doctors, SJAB, Civil and Army Hospitals.
(ii) Arrange adequate number of First Aid boxes and stretchers.
(iii) Mobilize local medical team and send it to site to render First Aid to the injured.
(iv) Quickly transport ARME Scale – II equipment to the site of the accident.

C. Passenger assistance:

(i) Arrange drinking water, beverages and refreshments, either from Refreshment Room or local sources.
(ii) Supply beverages and refreshments free of cost to stranded passengers.
(iii) Open an emergency counter and display necessary information.
(iv) Obtain reservation charts and display it.
(v) Collect information on dead/injured and convey it whenever asked for.
(vi) Make frequent announcements about diversion, cancellation, regulation of train services.
(vii) Arrange for refund of fares as per extant rules.

D. Transport assistance:

(i) Arrange for transport from local resources, if available, for transporting injured passengers to nearest hospitals by fastest possible means.
(ii) For this purpose, apart from tractor trolleys, even trucks passing on the highway can be utilized.
(iii) Stranded passengers to be transported from the accident spot by arranging transshipment either by train or by hiring road vehicles.

E. Security assistance

(i) Advise RPF/GRP/State Police to provide security to passengers, their belongings and railway property.
(ii) They should also be asked to assist in rescue and relief work.

F. Communication Assistance :

(i) Direct passengers to PCO booths available nearby.
(ii) Make available STD phone to relatives of dead/injured.

G. Sending manpower for site :

(i) Proceed to site of the accident by quickest means with trolleys, coolies, lamps, vendors and any other equipment that is considered necessary
(ii) Till relieved by a Traffic Inspector or Divisional Officers be in charge of site and carryout rescue/relief operations.

H. Preservation of clues and evidences :

(i) TI/SM first reaching the site shall take action to preserve clues and evidences.
(ii) Secure records related to accident in the Station/Cabin.
(iii) Seal slides, levers, knobs and Relay room, if accident takes place within the Station limit.

4. Duties of TI/PWI/SI/CWI/LI :

(a) Rushing to accident site with men and material :

(i) Before leaving for the site of accident organize maximum number of men to go to the accident site along with their equipment.

(ii) Reach the site of accident by quickest available means.

(b) Rescue and relief :

(i) Ensure that the obstructed line is protected.
(ii) Direct all staff working under them to assist in rescue and relief work.
(iii) (iii)All of them should work as per directions of OC Site.
(iv) Assess casualties and arrange to render First Aid.
(v) Shift injured to nearest hospital.

(c) Joint measurements and preservation of clues and evidences :

(i) Collect and record all evidences relating to the accident such as:

- Condition of track, with special reference to alignment, gauge, cross levels, super elevation, points of mount and drop and any sign of sabotage etc.
- Condition of Rolling stock with reference to Brake Power and braking gear.
- All marks on sleepers, rails, locomotives and vehicles etc. especially for preservation of clues.
- Position of derailed vehicles.
- Prima facie cause of accident.

(ii) Seize and seal the Train Signal Register, Log book, Private Number Book, Line Admission Book, Speed Recorder Chart and other relevant records.

(iii) Note down the position of panel switches, indication, block instrument, condition of relay room, status of data logger, etc.

(iv) Condition of switches, ground connections, point locking, occupancy of track circuit, details of damage to outdoor signal/point gears should be noted down.

(v) Seize and seal the Speed Recording Graph and all other registers and repair log book of the locomotive.

(vi) Record details of Brake Power and other aspects of Rolling stock as per Performa.

(vii) Joint measurements of rolling stock should be taken.

Note down observations, measurements of Loco etc. at site. If it is not possible arrange for taking the reading at shed.

(viii) These can also be recorded on a video or digital camera subject to availability.

(ix) Details of all readings taken and position of all equipment noted should be jointly signed by supervisors of all 5 departments at accident site.

(x) Obtain statement of staff involved in the accident.

(xi) CWI shall prepare a sketch showing position of Rolling stock.

(xii) PWI shall prepare a final sketch indicating the position of track, with respect to alignment, point of mount, point of drop, OHE mast, point number etc.

(xiii) Survey the situation, assess assistance required and issue message to Divisional Control Office.

(xiv) Take charge of the situation pertaining to your own department and remain till Divisional officers arrive at the site.

2.3.5 OFFICERS AT DIVISION & HEADQUARTERS

(A) GENERAL:

1. Intimation of Accident- Divisional Control Office:

(i) In the Divisional Control Office, information regarding an accident is generally received either by the Sectional Controller or the TPC.

(ii) In most cases, the First Information Report also intimates the approximate number of coaches involved and a rough estimate of the likely number of casualties (such as 'heavy casualties expected').

(iii) Accidents involving a passenger carrying train where the first information says that heavy casualties are expected, should prima facie be treated as a Disaster.

(iv) The moment information regarding an accident involving a passenger carrying train is received in the divisional control office; the accident bell in the control room should be sounded for alerting all on-duty functionaries.

(v) After all on-duty functionaries gather around the section control board they will be briefly informed about the accident.

(vi) Each functionary will thereafter resume his position and take steps to set in motion activities required of him.

(vii) TPC will switch off OHE in case it has not tripped. OHE will not be restored even on adjacent line unless confirmation has been received from site that adjacent line is not obstructed and OHE is alright.

(viii) PRC will undertake the following action in the given order of priority:

(a) Give orders to Loco Foreman for sounding the siren for ARMVs and ARTs.

(b) PRC will also order movement of ARMV and ART (With 140 T crane) from adjoining divisions for approaching the accident site from the other end

(c) Thereafter he will inform his departmental officers and supervisors.

(ix) Dy. CHC (Chg.) will first inform Hospital Casualty. Thereafter he will inform officers and supervisors as given below.

(x) Each departmental functionary will inform divisional officers and supervisors of his department about the accident as detailed below:

Functionary	Officers and Supervisors
Dy. CHC (Op)	Operating & Safety
Dy. CHC (Chg.)	Hospital Casualty, DRM,ADRM, Medical
TPC	Electrical
PRC	Mechanical
Engineering. Control	Engineering , Personnel, Accounts
Test Room	S&T, Stores
Commercial Control	Commercial, Public Relations
Security Control	RPF

(xi) For this purpose, all functionaries working in the divisional control office will have a ready list of telephone numbers (Railway, BSNL and Mobile) of all officers and supervisors of their departments.

(xii) After Dy. CHC (Chg.) has informed Hospital Casualty, DRM, ADRM and Medical Doctors, he will then inform Dy. CHC (Chg.) or Dy. CHC (Op) in Hdqrts. Emergency Control regarding the accident.

2. Intimation of Accident-Railway Doctors:

Dy. CHC (Chg.) will inform the Hospital Emergency of Railway Hospital regarding details of the accident. Railway doctor on emergency duty shall undertake the following:

(i) Note down time of receiving message.

(ii) Inform CMS, MS, other Doctors & para medical staff and instruct them to reach the ARMV immediately.

(iii) Collect necessary Medical team in the hospital.

(iv) Inform CMD about movement of ARMV.

(v) Alert blood donors, SJAB.

(vi) Bare minimum medical team should remain in the hospital; rest of the doctors should be rushed to the accident site.

(vii) Arrange to move Emergency boxes from ARME Scale-II locations to the accident site.

3. Intimation of Accident-Hdqrts, Central Control Office:

(i) In Hdqrts. Central Control Office also, the accident bell in control room should be sounded for alerting all on-duty functionaries.

(ii) After they gather around the Dy. CHC they will be briefly informed about the accident.

(iii) Each functionary will thereafter resume his position and take steps to set in motion activities required of him.

(iv) Each departmental functionary will inform headquarters Officers of his department about the accident as detailed below:

- Dy. CHC (Op) : Operating & Safety
- Dy. CHC (Chg.) : GM, Medical
- TPC : Electrical
- PRC : Mechanical
- Engg Control : Engineering, Personnel, Accounts
- Test Room : S&T, Stores
- Commercial Control : Commercial, Public Relations
- Security Control : RPF

(v) For this purpose, all functionaries working in the Central control office will have a ready list of telephone numbers (Railway, BSNL and Mobile) of all officers and supervisors of their departments.

(vi) After Dy. CHC (Chg.) has informed GM and Medical Doctors, he will thereafter inform Safety Directorate's Emergency Cell in Railway Board.

(vii) GM will inform CRB regarding the above accident.

(viii) PHODs will inform their respective Board Members. In case PHOD is not available in headquarters., then the next senior most officer of that department will inform his Board Members.

(ix) CSO/Dy. CSO will inform CRS.

(x) In case of major accident, headquarters special train carrying GM & other PHOD's are required to move immediately. As soon as the information of major accident received by CPTM, he will arrange special train from nearest location of accident or as directed by GM.

(xi) Functionaries of different departments will also inform their respective departmental officers regarding timing of 1st Special train carrying GM and other headquarters Officers to the accident site.

(xii) In case, the accident side is far away and going by air would be faster, then the helicopter or special Air force Plane may be arranged by Secretary to GM.

4. Informing Non-Railway Officials:

(i) DM, SP and CMS of the district within which the accident site falls should be informed regarding the accident by the CHC.

(ii) ADRM will inform the following regarding the accident:
- IG/GRP,
- ADG/GRP,
- Divisional Commissioner,
- Home Secretary

(iii) In case POL rake is involved, then IOC/BPC/HPC officials should also be informed.

(iv) In case Mail bags of RMS are involved, then Postal officials should also be informed.

(v) Telephone numbers of all DMs, SPs, CMSs and Divisional Commissioners are available in Divisional DM Plans.

(vi) Telephone numbers of IOC, BPC and HPC officials are also available in the Divisional DM Plans.

5. Divisional Officers required to go to site:
   (i) All divisional officers required to go to the accident site should proceed by the ARMV.
   (ii) Road vehicles should be sent to accident site separately. Maximum number of road vehicles should be sent to accident site from Divisional headquarters.
   (iii) ARMV shall be dispatched within 15" by day and within 25" by night after sounding of siren.
   (iv) DRM will proceed to the accident site. ADRM shall stay back at divisional headquarters for co-ordination work.
   (v) All Branch Officers should proceed to the accident site. For this purpose, officers heading different branches within the same department are referred to as Branch Officers. For example, in Electrical department, TRD and 'General' will be considered to be separate branches and both will be required to go to site.
   (vi) The second senior most officer of each branch should stay back at divisional headquarters.
   (vii) Of the remaining officers from each branch, a majority of both Senior and junior scale officers should also proceed to the accident site.
   (viii) Once it has become clear that the accident is a Disaster, then the 80/20 rule should be followed:
      (a) 80% of all officers should go to the accident site, and only 20% should stay back at headquarters.
      (b) Similarly, 80% of all supervisory staff should go to the accident site, and only 20% should stay back at headquarters.
   (ix) The complement of officers available in each department varies from division to division. Hence, Divisional DM Plans should specifically spell out, department wise, designations of officers who will be required to go to site, and those who will be required to stay back in headquarters.
   (x) Divisional DM plans should also spell out the same thing for Supervisors of each department.
   (xi) Arrangements of Road Vehicles to proceed to accident site, indicating alternative vehicles as well, shall be indicated in Divisional DM Plans.
   (xii) Arrangements of vehicle drivers including spare drivers shall also be notified.

6. Supervisors required going to Accident Site:
   (i) At the divisional level 80% of all supervisors available in divisional headquarters should proceed to the accident site.
   (ii) All other supervisors available in the field at other stations should also proceed to the accident site.
   (iii) Divisional Control Office should issue a recorded control message from DRM to all Supervisors for proceeding to the accident site immediately by fastest possible means.

7. Headquarters Officers required to go to site:
   (i) All hdqrts. Officers required to go to the accident site should proceed by the 1st special train which will be carrying GM and other officers from headquarters.

(ii) This special train shall be arranged by Divisional Control Office, in consultation with headquarters Central Control. Scheduled departure time will be informed to headquarters officers by their departmental functionaries in headquarters Central Control.

(iii) GM will proceed to the accident site. COM shall stay back at zonal headquarters for co-ordination work.

Department wise, designations of officers who are required to go to site, and those who will be required to stay back in headquarters is given below:

Department	Site	Headquarters.
Medical	CMD	Dy. CMD
Commercial	CCM,CCM(G), CCM(M&R),*	Dy. CCM(Claims),Dy CCM (G)
Mechanical	CME,CMPE(Dsl), CRSE,**	CWE, I JA Grade,
Civil	PCE,CTE,CBE, 3 JAG	2 JA grade
Electrical	CEE, CELE , 2 JAG	2 JAG
S&T	CSTE,CSE, Dy. CSTE (Tele)	CSTE(Con)
Operating	*	COM, CFTM, Dy.COM/Chg.
Safety	CSO**	STM(Safety)/Dy.CSTE (Safety)
Security	CSC, Dy.CSC	SO to CSC
Personnel	CPO,*	Dy. CPO
Accounts	FA&CAO, Dy.FA(Traffic)	Dy. FA&CAO
Stores	COS, Dy. CMM(G)	CMM

** All other JA Grade, Senior and Junior Scale officers.

* All other Senior and Junior Scale officers.

(v) PHODs should issue local instructions based on the above regarding supervisors who will be required to go to the accident site.

(vi) Only 3 supervisors of each department should stay back in headquarters. All others should go to the accident site.

OBJECTIVE

1. Divisional officers are not required to go to site during a disaster. (True/False)
2. Preparation and implementation of disaster management plan is the responsibility of concerned _____/_____.
3. Provision of Communication network is the responsibility of _____ department.
4. Guard/Drivers of the trains are provided with _____ and _____ for communicating with Controllers and SMs.

SUBJECTIVE:

1. What are the different phases of Disaster Management Cycle, explain with diagram?
2. What are the major recommendation of High Level committee?
3. What does the disaster management deal with in Indian Railways?
4. What are the measures suggested to reduce the number and safety of various types of accidents on Indian Railway?
5. What is the main theme of Disaster Management Plan of Railways?
6. Name the different phases of Disaster Management?
7. What is Golden Hour and its importance?
8. What are the actions to be taken at divisional level in case of a disaster?

CHAPTER – 3

ACCIDENT RELIEF MEDICAL VAN & ACCIDENT RELIEF TRAINS

1. ACCIDENT RELIEF MEDICAL VAN (ARMV)

ARME Scale-I –Equipment stored in Spl. Medical Relief Vans stabled in separate sidings.

i. One key of the Van is available with the Loco forman or Station Master in a glass fronted case.
ii. Other key is with the doctor in charge of the ARMV.
iii. Medicines and equipments are provided as per Rly. Board norms.
iv. Keys of all locks inside the ARMV are also in duplicate. One set of keys is kept with the medical officer in charge of ARMV and the other set of keys are kept in a glass fronted case inside the ARMV.
v. The target time for turning out of ARMV is 15 minutes in day and 25 minutes in the night from the time of sounding of Hooter.

2. ACCIDENT RELIEF TRAIN:

i. ART Special formation is stabled complete on a separate siding having double entry for faster exit in both directions.
ii. Rescue/Restoration equipment are kept as per Railway Board's instructions.
iii. BD Special keys are with the following officials:
   - Engineering Tool Van SSE/SE/JE/Permanent Way.
   - Mechanical Tool Van SSE/SE/JE/Mechanical.
   - Over Head Equipment Tool Van SSE/SE/JE/OHE/TRD.
iv. Crane Supervisor will ensure availability of adequate fuel and water in the crane at all times.
v. On getting emergency call, the Crane Supervisor shall check and ensure:
   - Correct marshalling of Crane according to site requirement.
   - Alert the stand by Crane Operator of 140T Crane.
vi. In case road approach is faster, re-railing equipment may be moved by road as required.
vii. The target time for turning out of ART is 30" by day and 45" by night from the time of sounding of siren.

3. Authority to order movement of ARMVs & ARTs to site:

i. On receipt of information about serious accident involving casualties, ARMVs and ARTs shall be ordered immediately.
ii. This decision would be taken by the Dy. CHC (Chg.) on duty and nobody's authorization would be required for ordering the same.
iii. After sounding of siren the ARMV and ART should be run out within the stipulated target time.

GENERAL GUIDELINES FOR MAINTENANCE OF ARTs

ARTs are provided with equipment as detailed in section D. The equipments are to be periodically tested to ensure their satisfactory working at all times. Testing / Inspections shall be carried out as under

Complete testing by ART nominated staff: once in 15 days.
Inspection by ASTE/DSTE: once in 3 months.
Inspection by Sr.DSTE/DSTE: once every year.

1. A register is to be maintained in the ART for making entries for testing of equipment.
2. Whenever the ART returns from accident spot, equipments are to be immediately checked for their proper working.
3. Any short fall / missing equipment should be replaced with good working equipment at the earliest.
4. All equipments having shelf life, viz. jointing kits, torch cells etc., shall be replaced in due time.
5. The list of minimum essential equipments to be provided in ART shall be as under:

A. GENERAL (Common for RE as well as non-RE areas)

Sl. No.	Item Description	Qty
1.	Inspection Book	1 No.
2.(a)	Magneto Telephone	4 Nos.
2.(b)	Dry cells large 6-I, 1.5 volts each for magneto phones	12 Nos.
3.	PVC insulated, PVC sheathed twin core cable	500 Mtrs.
4.	Microphone for cordless PA system	2 Nos.
5.	Loud speaker horn type 5/10 watts	2 Nos.
6.(a)	Amplifier of minimum 20 watts power output (having interface for cordless microphones) and operating voltage of 12 V DC	2 Nos.
6.(b)	12V storage battery for 6(a) along with appropriate battery charger	2 Sets
7.	Megaphones Transistorized (minimum 10 watts each)	3 Nos.
8.	Portable stand for loud speaker with adjustable height from 1.5M to 3M.	2 Nos.
9.	Field service telephone cable PVC insulated (D-8)	4 drums of 500 M
10.	Push button auto telephone with tone/pulse switching facility	4 Nos.
11. (a)	Walkie-talkie sets (2/5watts-VHF) with 100% spare batteries	30 Nos.
11. (b)	Battery chargers for 12(a) (two position charger with rapid charging)	100%
12.	Multimeter	1 No.

Sl. No.	Item Description	Qty
13.	Extension Boards for power supply (Mains)	4 Nos.
14.	Hand held torch of 3 cells complete with dry cells	4 Nos.
15.	Jointing kit & material for cables and over head wires – this is required to be decided by the Railways themselves according to their local needs for different ARTs.	
16.	Tool Box containing: a) soldering iron – 10W/12, 10 W/220V & 65 W/220V b) Long nose pliers – 200mm c) Cutter diagonal 200mm d) Box spanner 6, 5.5 & 5mm e) Hammer Steel 750 grams f) Hammer wooden g) Adjustable spanner 300 mm h) Screw Driver – 200mm i) Screw Driver – 250 mm j) Mains tester (230 volts) k) Electrical insulation tape 12mm x 15 meters l) Resin core	 1 No. each 1 No. 1 No. 1 No. each 1 No. 1 No. 1 No. 1 No. 1 No. 1 No. 1 No. 1No. 500 gms.
17.	Tape recorder (cassette type)	2 Nos.
18.	Control way station equipment DTMF type 2 wire & 4 wire with amplispeaker telephone and suitable Ni-Cd cells	2 Nos.
19.	Cellular Phones/Fixed communication terminals	5 Nos.
20.	Satellite phone (SAT phone – miniature type)	1 No.
21.	FAX Machine (Plain paper)	1 No.
22.	Auto dialing system from emergency socket (only way station emergency control telephone)	1 No.
23.	Map showing sections of track where communication through cellular phone is possible	1 Set.
24.	WLL mobile exchange with 30 handsets	1 Set.

B. Specific Equipments required for ARTs having beats in non-RE area

Sl. No.	Item Description	Qty
1.	2 wire portable control phone in a suitable box with dry cells	2 sets
2.	Telescopic pole of minimum 6 meters height with its bracket opening space at least 350mm	2 Nos.
3.	Overhead control alignment charts	1 Set

C. Specific Equipments required for ARTs having beats in RE Area:

Sl. No.	Item Description	Qty
1.	4 wire Emergency portable control telephone in a suitable box with dry cells	2 Sets
2.	Tapping transformers (1120 : 1120)	2 Nos.
3.	Terminating transformers (1120:470)	2 Nos.

6. Adequate space shall be provided in the ART for housing all the equipments.
7. The telecom equipment shall be properly housed to avoid the equipment rolling off during the movement of ART.
8. Adequate packing shall be provided for sophisticated equipments like satellite phones, walkie-talkie sets, FAX machines, PA equipment etc.
9. Sophisticated equipments shall not be stacked one above the other, unless packed in proper protective boxes and arrangements are provided to secure them properly.
10. Arrangements shall be made for extending power supply for charging batteries for PA system, VHF batteries etc. For satisfactory charging of batteries, regular power supply shall be made available near to the Art location, where it is normally stationed.

SIREN AND THEIR CODES

Circumstances	Code
For accidents in Loco sheds/Traffic Yards at home station requiring only breakdown train.	Two long blasts each of 45 seconds duration with 5 seconds break in between.
For accidents outside the home station requiring only breakdown train.	Three long blasts each of 45 seconds duration with 5 seconds break in between.
For accidents at home station requiring both medical van & breakdown train.	Four long blasts each of 45 seconds Duration with 5 seconds break in between.
For accidents outside the home station requiring both medical van and breakdown train.	Five long blasts each of 45 seconds Duration & with 5 seconds break in between.
For cancellation of medical van and breakdown train.	One long blast of 90 seconds duration.

STAFF FOR ART

1. Every ART shall have nominated telecom staff. The incharge shall generally be SE/JE and shall be assisted by 2 Telecom Maintainers and 3 Khalasi Helpers / Khalasis.
2. The nominated staff shall test the ART equipment as per schedule and ensure satisfactory working of all equipments.
3. The nominated staff shall respond immediately whenever an accident takes place and proceed by ART to the site of accident.
4. The nominated staff shall be responsible for establishing communication , immediately on reaching the site of accident.

INSTRUCTIONS FOR TESTING OF ART EQUIPMENT

1. All active devices shall be tested for their satisfactory operation.
2. Charging of batteries shall be carried out as per requirement. The requirement may vary depending on the battery and the self-discharge characteristics of the battery.
3. Wherever feasible, batteries shall be separated from the equipment and protected properly to minimize the self-discharge.
4. Primary cells viz., torch cells shall be replaced as soon as deterioration in performance is observed. In any case, the cells shall be replaced at interval not exceeding one year. Leak proof cells only shall be used.
5. Detailed guidelines are given below:

   While inspecting the telecom equipments in ART, the following guidelines related to the equipments shown against them may be observed

   i. Portable Telephone Set:
      a) Check for any physical damage to the phone, wires, cords and the plug. (Pole and connecting bracket in the case of 2W PT set).
      b) Condition of dry cells; change if due.
      c) Quality of speech both way.

   ii. Magneto Phones:
      a) Check for any physical damage to the phones & wires.
      b) Condition of dry cells; change if due.
      c) Quality of speech both way.
      d) Ring Test.
      e) Check FS cable's continuity & insulation.

   iii. Megaphones:
      a) Condition of dry cells; change if due.
      b) Quality of speech and condition of volume control.
      c) Working of the Siren.

   iv. P.A. System:
      a) Functional Test.
      b) Quality of reproduction of the amplifier.
      c) Condition of mike cords.
      d) Condition of Loud Speaker wires.
      e) Functional test in the case of cordless mike.
      f) Condition of standby battery 12V.

   v. Walkie – Talkie sets:
      a) Functional test.
      b) Quality of speech.
      c) Condition of battery.
      d) Battery swapping after charge.

vi. 25W VHF set:

a) Physical check of set, antenna, feeder, mike and battery cord
b) Functional test.
c) Condition of 12V storage battery.

vii. Way Station Control Equipment:

a) Functional test (Ring & Speech).

viii. Auto Dialler:

a) Functional test.

ix. Fax Machine:

a) Physical check.
b) Functional test.

x. Cassette Tape Recorder:

a) Functional test.
b) Condition of dry cells; change if due.

xi. Checking of Records:

a) Availability of all material as per check list.
b) Inspection book for record of inspections.
c) Record of charging of storage batteries & walkie-talkie batteries.
d) Record of replacement of dry cells.

ARRANGEMENTS AT DISASTER MANAGEMENT CONTROL ROOMS AT HEADQUARTERS / DIVISIONS

The following facilities shall be available in the disaster management control rooms at headquarters and divisions:

a) BSNL Phones – 2 Nos with ISD facility.
b) Railway Telephones – 3 Nos with STD facility.
c) Fax Machines – 1 No. connected to BSNL line and 1 No. connected to railway line.
d) Facility to extend section control to the disaster management control. The concerned section control in whose jurisdiction the accident takes place, shall be connected.
e) Hot line between Headquarters and divisional disaster management control rooms shall be provided.
f) Important telephone numbers of hospitals/doctors/officials of state and district administration and other important functionaries be kept ready.

SIGNAL & TELECOMMUNICATION DEPARTMENT:

(i) Sr. DSTE as well as ASTEs should proceed to site of accident. DSTE will be available in Divisional Control Office for providing backup support.
(ii) Similarly, CSTE along with HODs and other JA grade officers from hdqrts. Will proceed to accident site.

(iii) Main responsibility of S&T Department will be for providing effective and adequate means of communication.

1. Rushing of men and material to site:

   i. Sr. DSTE along with ASTE will carry the following to the accident site:
      - Satellite phone.
      - FAX cum printer,
      - two 25 W VHF sets along with antenna and battery
      - 10 numbers 5 W walkie-talkie sets.

   ii. He will be accompanied with at least two TCI and two TCM.

   iii. As per requirement TCI/TCM, SIs of the section and maximum number of telecom staff should be sent for installation and operation of telecom equipment. They should go to the site of accident either by ART or latest by 2nd and 3rd Special trains carrying backup logistic support to the accident site, from each end.

   iv. Satellite phones of HQ and one FAX machine will be carried in GM special by at least two TCI and two TCM.

   v. All mobile phones available with the Division should also be rushed to site for emergency use.

   vi. Sufficient number of spare batteries and battery chargers for these mobiles should also be taken to accident site.

2. Arranging communication at site:

   i. DSTE in the division will immediately come to divisional control office and ensure setting up of all communication arrangements as required.

   ii. DSTE will keep a record of the numbers of Railway telephones, BSNL telephones, IMMERSAT phones provided at site and telephones provided at Helpline Enquiry Booths. This information shall be passed on to the Divisional Emergency Cell.

   iii. He should liaison with BSNL officials in the area for immediate provision of additional BSNL telephone/hot lines at the accident spot, nearest station and at Helpline Enquiry Booths duly utilizing assets under his disposal where required.

   iv. Should hire sufficient number of cell phones and send them to accident site.

   v. Obtain E-Mail addresses of Emergency Cells set up on other Divisional and Zonal headquarters.

3. Communication at headquarters and Divisional Emergency Cells:

   (i) Communication arrangements are required to be provided at ECR headquarters Emergency Cell immediately.

   (ii) 2 BSNL Telephones, one having STD facility are already available in the headquarters Central Control. Dynamic locking code of the telephone is available with CHC/Emergency. FAX machine is also provided on one BSNL telephone in the Emergency control.

(iii) Apart from this telephone, 4 other BSNL telephone numbers (2 with STD facilities) should be made available in headquarters Emergency Cell for use by Chief Emergency Officer. These should be temporarily transferred from officer's chambers.

(iv) One FAX machine shall be provided on one BSNL telephone.

(v) 2 Railway telephone numbers with STD facilities should also be made available.

(vi) 2 Mobile telephones should also be made available in headquarters Emergency Cell.

(vii) Similar Communication arrangements should also be provided in the Divisional Emergency Cell.

4. Communication at Helpline Enquiry Booths:

(i) Helpline Enquiry Booths are to be opened at all important stations en-route of the affected train.

(ii) Location of these Helpline Enquiry Booths will be on Platform No. 1 of their respective stations.

(iii) 2 BSNL phones should be identified and kept pre-wired to the Helpline Enquiry Booths so that these can be energized at short notice.

(iv) Similarly, 2 Railway phones should be identified and kept prewired to the Helpline Enquiry Booths so that these can be energized at short notice.

(v) One FAX machine, Photocopier and PC with internet connection and printer should also be provided at Helpline Enquiry Booths. These should also be kept pre-wired so that these can be energized at short notice.

(vi) Stations at which such arrangements are to be made and telephones which are to be utilized should be identified by Sr. DSTE with approval of DRM.

OBJECTIVE:

1. The target time for turning out of ART is _____ minutes by day and _____ minutes by night from the time of sounding of siren.
2. Inspection of ART by Sr.DSTE/DSTE once in _____.
3. Important telephone numbers of hospitals / doctors /officials of state and district administration and other important functionaries should not be kept ready. (True/False)
4. For accidents outside the home station requiring both medical van and breakdown train the siren code is One long blast of 90 seconds duration.
   (True/False)

SUBJECTIVE:

1. What are the general guidelines for the maintenance of Accident Relief Trains?
2. Who is authorized to order movement of ARMVs & ARTs to site ?
3. List minimum 10 (telecom) essential equipments to be provided in the ART as per the Railway Board's guidelines?
4. Enumerate the Siren and their codes?
5. How do you test a megaphone and PA system in the ART?
6. What are the arrangements to be made at disaster management control rooms at headquarters / divisions?
7. What are the duties of S&T department staff during an accidents?

CHAPTER – 4

COMMUNICATIONS ARRANGEMENT DURING DISASTER (Disaster Communication System)

4.1 Communication on Railways for Disaster Management

A comprehensive Communication System on the Railways to encompass all requirements of the Railways Disaster Management is required to be set up. Railways have their own extensive communication systems which would be used for Disaster Management too. However, we need to have back-ups especially to ensure 100% communication availability in case of any type of manmade or natural disasters. Sharing of OFC network, where required with others may be ensured by tie ups in advance. This will be also inter-linked with the communication system with outside agencies of the concerned Central and State Governments, IMD etc.

Preparatory work may be done for quick installation of communication system (satellite system) between Railway control set up for flood and affected locations locations/station. This can even be on make shift raft, boat etc. Similar arrangements can also be made in earthquake affected areas.

There should be a provision for Telecommunication with Relief Camps as and when and where these are set up.

4.2 Communication between stake holders

Under the Head of the item of Infrastructural Development (Item 3.3.2) under the Sub-Head “Networking and Communication” NDMA’s Guidelines on Chemical (Terrorism Disaster provide) in item (iii) and in (iii) (c) page 30 that “Effective Communication and Networking (Human and Functional) between various stake-holders and sensitive organizations is currently inadequate and needs to be established with the Security Agencies (CISF, Police etc.) manning sensitive locations like Railway stations.”

In item iii (e) page 30, it is further laid down that dedicated communication system is to be established for Rail Transportation to monitor movement of Toxic Chemical Agents. A mechanism is to be developed like a Geographic Information system (GIS) for continuous monitoring of such Transport Vehicles along their route. This may require to be dove-tailed with the FOIS network of the Railways, once the TMS/FOIS is extended for booking (preparation of RRs) and movement of chemical items in wagons to be included in FOIS.

4.3 Back up Communication on Railways:

To handle any disaster by the Railways and to utilize its resources efficiently, Communication is an essential requirement. Where required, back up (alternatives) should be adequately available.

In chapter 2 of the DM Plan of the Railways (in item 2.2) one of the strengths of the Railways to handle a disaster is its own communication network. In handling a crises or a disaster, reliability of communication has to be cent per cent.

At the Divisional level, the control rooms have to communicate with the stations, the telephone exchange have to function and the OFC and Quad cable network has to have reliable backups to be able to be effective. The reach of reliable communication network has to be extended to cover even the Meter and Narrow gauge sections.

Where there is no back up of the Railways owned OFC network, an arrangement of sharing with Government/Non Government organization and other service providers has to be planned in advance. Or else, the alternative of satellite communication be resorted to. However, the speed of reconnecting a failed communication by which ever means is of essence.

Further to provide better communication facilities during disaster, it is necessary that either the Railnet a intranet network of IR is extended to every railway station of Indian Railways. Alternatively other means of communication is provided on all the stations. This will ensure quick setup of voice, video and data transmission facility at stations during any eventuality since IR's own V-Sat Hub is now established at Thomson Road, New Delhi, voice/data/video communication facilities from this centre to different railways and divisions need to be planned and catered to.

4.4 Modernization of Communication on the Railways through Satellite:

Feasibility of satellite based updating of trains status as well as field imagery relating to the disaster site needs to be examined. Instead of relying on GPS/GSMR which support mobile telephony and which have uneven signal strength in various regions dependent on the revenue earning models followed by the Service Providers, a more reliable system based on up linking with ISRO 3C satellite may be examined.

We can have the train status to be fed directly into a central server for direct dissemination on station display systems. However, a better arrangement would be that this information is fed through the FOIS back bone to the divisional servers supporting COA, and should be sent to the stations only through the NTES after being verified and cross matched with the referential data stored therein, purely as a validation exercise. This will take care of the updating of status of trains being regulated on the affected route and adjacent routes.

As far as actual accident sites are concerned, it needs to be examined if we can have a standing arrangement with ISRO that they would deploy one of their own satellite or get into a hospitality arrangement with any of the satellite of any country with which ISRO are already having special arrangements, for continuous updating of imagery every 45 minutes or so, taking into account the orbit frequency of any such satellite.

4.5 Incident Command System (ICS):

The National Policy on Disaster Management lays down guidelines for a chain of command in a structured unit to handle various types of Disasters as under :-

A traditional command structure exists in the administrative hierarchy which manages disasters in India. It has been planned to strengthen and professionalize the same by drawing upon the principles of the ICS with suitable modifications. The ICS is essentially a management system to organize various emergency functions in a standardized manner while responding to any disaster. It will provide for specialist incident management teams with an incident commander and officers trained in different aspects of incident management, such as logistics, operations planning, safety, media management, etc. It also aims to put in place such teams in each district by imparting training in different facets of incident management to district level functionaries. The emphasis will be on the use of technologies and contemporary systems of planning and execution with connectivity to the joint operations room at all levels.

The Railways have their own ICS as they have had to deal with crises like situations and mini-disasters in the day to day operational working and especially with handling of train accidents. With the setting up of the Rescue Centric Training Institute at Bangalore, the ICS structure will get streamlined.

4.6 Coordination – Integrated Command System of Railways with Integrated Operations Centre of MHA :-

Traditionally the Control Room in each Division monitors on a “Real Time” basis the train operations. This Control Room is manned round the clock and has representatives of all the departments concerned with train operations as also with abnormalities which may affect train running. The “Command and Control” of the Divisions Control Room is with the operating department who plan, execute and monitor the running of trains (both freight and coaching trains).

The assistance of a number of departments, viz. Mechanical (Power), Electrical (Power and OHE Traction Distribution), Mechanical (Carriage and Wagon), Civil Engineering (track maintenance and monitoring), Commercial (passenger information interface), Signal and Telecom (through a ‘Test Room’), Security (RPF) etc is given round the clock in the Operations Control Room.

This control room of the affected divisions on the Railways will act as the “Incident Command System” (ICS) to monitor information of the Disaster and to coordinate the organization of various emergency functions, (rescue, relief, mitigation etc) in the disaster areas.

The ICS of the Divisions will coordinate with the “Zonal ICS” where a similar control room exists, called the Emergency Control in the Headquarters of each Zonal Railway. The “Zonal ICS” will establish liaison with the IOC of the MHA right from the stage of receipt and issue of “Orange or Red Alerts” and also for providing/requesting help in relief/rescue/mitigation to other departments (or State Government) or from them respectively. The Zonal ICS will constantly update the position periodically to Railway Board.

ACCIDENT COMMUNICATION

SECTION A: COMMUNICATION AT ACCIDENT SITE

- Communication from the site of accident is to be established as soon as an accident takes place. For this purpose, drivers of all trains shall be provided with portable control telephones. Portable control telephones shall be 2 wire type in overhead communication territory, 4 wire type in underground cable territory, and shall be of 2 wire / 4 wire type wherever a train passes through both overhead communication and underground cable territories or 2 wire / 4 wire type may be used over both type of territories. As soon as an accident occurs, driver/asst. driver shall establish communication with the portable control telephone by hooking on to the overhead lines/plugging into the emergency sockets, so as to establish communication with control office.

- In addition to drivers being provided with portable control telephones, guards of all passenger carrying trains are also provided with portable control phones of the types mentioned above. Guard of the passenger carrying train shall also establish communication with control office as soon as an accident occurs.

- In addition to portable control telephones, drivers and guards of all trains shall be provided with 5 watt walkie-talkie sets, and as soon as an accident occurs, information shall be given in the 5 watt walkie-talkie set to the adjacent station wherever possible. Apart from giving information through the walkie-talkie to the adjacent station, it is necessary that communication is established to the control office using portable control phones. In some sections arrangements are available to communicate with control office on walkie- talkie/ duplex VHF sets and this may be used where such arrangement exist.

- As and when, advanced means of communication like GSM-R are deployed on the Railways, the same shall also be used to establish communication with the control office.

- Additional means of communication shall be provided progressively within the shortest possible time as under:

    - Provision of Railway telephone / telephones.
    - Provision of BSNL telephone / telephones.
    - Mobile phones wherever network coverage exists.

- Accident Relief Trains (ART) are located at strategic locations of each division and are provided with telecommunication equipment for providing additional facilities as under:

    - PA system shall be established for making important announcements.
    - Megaphones shall be given as per need at site.
    - Walkie-talkie sets shall be distributed as per need.
    - Magneto communication as required at site.
    - Communication through satellite phone shall be established.
    - FAX, E-mail shall be established wherever communication media is available.

- It shall be possible to provide the communication using satellite technology / through Railways own OFC links, by extending bandwidth from the accident site to the adjacent station/using BSNL connections. Mobile telephone exchange (WLL) may be established, if available.
- Wherever cell phone coverage exists, cell phones available with officers and with ART shall be used.
- It is desirable to send pictures of accident spot to Railway Board/Zonal/Divisional Headquarters using e-mail for which extension of internet/railnet to site is required. It is desirable to send video coverage to Railway Board/Zonal/Divisional Headquarters, as and when the necessary equipment are provided in the ARTs.

SECTION B: ACCIDENT INFORMATION FOR PUBLIC

- As soon as information regarding an accident is received, accident information number shall be activated and manned. This number shall normally be at the zonal/divisional headquarters. Adequate personnel shall be posted by commercial branch to meet the demand depending on the seriousness of the accident. Number of lines for this number shall be suitably augmented depending on the demand.
- Close liaison shall be maintained with BSNL officials for monitoring the call rates and increasing the lines as necessary.
- The accident information number should be made wide publicity through audio, video and print media.

Objective:

1. Communication from the site of accident should not be established as soon as accident takes place.
   (True/False)
2. 4-wire type portable control telephone shall be used in _____ territory.
3. Drivers and guards of passenger carrying trains are provided with portable control phone.
   (True/False)
4. Drivers and guards of all trains shall be provided with _____ walkie-talkie sets.
5. Advanced means of communication like GSM-R are deployed on the Railways, the same shall not also be used to establish communication with the control office.
   (True/False)

Subjective:

1. List out various communication that can be used during accident ?
2. What are the additional means of communication that shall be provided progressively within the shortest possible time ?
3. In Accident Relief Trains (ART) which are located at strategic locations of each division list the telecommunication equipment for providing additional facilities ?
4. How is accident information for public conveyed ?

CHAPTER – 5

DO'S AND DON'TS

DO's

Divisional Control

- ✓ Stop movements of trains into the affected section.
- ✓ Arrange for dispatch of medical vans and accidents relief trains to the site. In case causalities are more than fifty, ARMEs of the adjoining divisions have to be called for. As a rough thumb rule, the scale of such assistance required would be one from a division for every additional 50 injuries.
- ✓ Inform divisional officers, central control and controlling SM, Civil Authorities concerned.
- ✓ Collect and record systematically all developments at the site of accident.
- ✓ Advise Civil, Military, public and private hospitals in the nearby areas to rush doctors, medical aid to the site.
- ✓ Arrange for rushing the required Relief & Rescue equipments to the site.
- ✓ Inform NGOs and solicit their help.
- ✓ Arrange for regulating traffic by diverting or canceling trains.
- ✓ Arrange for running duplicate /relief trains for clearing stranded passengers with overriding priority.
- ✓ Advise the stations about the changes in the train timings, train diversions etc. so that timely information is given to the public.
- ✓ Ensure that list of the injured and the dead is obtained as quickly as possible from the site and relayed to the Zonal Headquarters, concerned stations, officer in charge of publicity, etc.
- ✓ Liaison with Commercial department's emergency team and ensure the information counters are opened at the accident site and a t important stations enroute for giving up-to-date information to the public.
- ✓ Guide the station staff on the correct method of train working.

Guard

- ✓ Arrange to protect the adjacent line/lines and then the affected line.
- ✓ Send information through the quickest means to the Control/SMs on either side
- ✓ Take action to save lives/render first-aid.
- ✓ Call for doctors and volunteers on the train, seek their assistance.
- ✓ Seek assistance of Railway men on the train for attending to the injured and for other relief operations.
- ✓ Post a railway employee to man the field telephone to ensure regular flow of information to control.
- ✓ Make a quick assessment of the assistance needed and advice control or nearest Station Master.
- ✓ Arrange protection of belongings of the passengers and railway property through RPF, GRP and other railway staff.

Station Master

- ✓ Ensure that no other train enters the effected section and take other necessary measures for protecting the site.
- ✓ Advise the control about the dimensions of the accident, and type of Medical and other assistance required. Also advise the local Civil authorities.
- ✓ Call for assistance locally from nearby hospitals, dispensaries and medical practitioners.
- ✓ Call all the off-duty staff including Engineering and S&T staff available in nearby areas and allot them specific duties for relief and rescue.
- ✓ Inform to Railway Rescue Volunteers Registered at the Station giving preference
- ✓ To doctor and other medical staff. Also to make arrangement for the transportation to site of accident.
- ✓ Arrange to provide all sort of assistance to the affected passengers such as catering, drinking water and issue of complimentary passes, arranging free messages to relatives, etc.
- ✓ Arrange for protection of both belongings of the passengers and Railway Property.
- ✓ Open information counters and booths for giving information to the publish regarding names of the injured, dead etc. and about regulation, diversion of trai etc.
- ✓ Utilize STD booths located at stations for giving relevant information.

Don'ts

Divisional Control

- × Loose patience.
- × Ignore the safety aspects.
- × Manipulate the control charts
- × Argue with the station staff.

Guard

- × Forget to note down the time of accident.
- × Forget to preserve and safeguard all clues of possible cause of accident
- × Leave the site until permitted to do so by a competent authority

Station Master

- × Permit any train to enter in the affected section except ART/ARME
- × Destroy railway records and clues of possible cause of accident.
- × Loose patience.
- × Argue or misbehave with the victims and other passengers.
- × Give any statement to media and press.
- × Use shortcuts and unsafe methods in train operation.

Objective:

1. During accidents divisional controller shall stop movements of trains into the affected section (True/False)
2. Arrangement for regulating traffic by diverting or canceling trains is the job of _____.
3. Divisional controller shall guide the station staff on the correct method of train working. (True/False)
4. Guard will arrange to _____ the adjacent line/lines and then the affected line.
5. Guard will post a railway employee to man the field telephone to ensure regular flow of information to control. (True/False)
6. Station master will advise the _____ about the dimensions of the accident, and type of Medical and other assistance required.
7. Station master will permit any train to enter in the affected section except ART/ARME (True/False)
8. Divisional controller shall manipulate the control charts during accidents. (True/False)
9. Station master (in fact any railway employee) should not _____ or _____ with the victims and other passengers.
10. Guard shall arrange protection of belongings of the _____ and railway property through _____ and other railway staff.

CHAPTER – 6

IMPORTANT CIRCULARS

Following are some of Important Telecom Circulars

1) Provision of Communication Facilities.
RB Ltr No.87/W-3/Tele/TN/23, dt: 06.08.1999

2) List of Telecom Equipments to be kept in Accident Relief Trains (ARTs) – RDSO Report No.STT/ART(I) – 97.
RB Ltr No.99/Tele/AR/4, dt: 01.10.2002

3) Provision of communication facilities at accident sites.
RB Ltr No.99/Tele/TN/6, dt: 16.12.2002

4) Provision of ISD facility on BSNL/MTNL telephone in Control offices.
RB Ltr No.99/Tele/TN/6, dt: 01.05.2003

5) Hiring of Cellular phones for passenger train accidents.
RB Ltr No.2002/Tele/TN/1, dt: 12.05.2003

6) Provision of Walkie – Talkie & 25 W VHF sets in ARTs of Divisional Headquarters
RB Ltr No.2002/Tele/AR/7, dt: 12.05.2003

7) Provision of one PC along with High speed Satellite modem (for Internet Connectivity).
RB Ltr No.99/Tele/TN/6, dt: 14.10.2003

8) Provision of Wireless in Local Loop (WLL) Exchange having 50 – line capacity.
RB Ltr No.2002/Tele/AR/7, dt: 31.07.2003

9) Provision of P&T telephone at accident site.
RB Ltr No.86/W3/Tele/TN/26, dt: 14.01.1988

10) Recommendations of High level Committee on Disaster Management – Video conferencing facilities from the site of accident (item – 98)
RB Ltr No.94/Tele/TC/8/Vol.II Pt, dt: 21.07.2004

11) Recommendations of the High Level Committee on Disaster Management – Recommendation No.98 & 99.
RB Ltr No.2004/Tele/TN/2, dt: 18.09.2006

12) Recommendation on High Level Committee on Disaster Management Recommendation No. 97.
RB Ltr No.2004/Tele/TN/2, dt: 27.04.2007

13) Specific DOT Telephone Number for Railways Accident Information – High Level Committee Report on Disaster Management over Indian Railways – Recommendation No. 43 (c)
RB Ltr No.2002/Tele/AR/7, dt: 11.02.2004

14) Allotment of ‘4’ digit Emergency Service Numbers to Air, Train & Road Accidents. Dept. of Communication & I.T. Ltr No.14-3/2002-BSH, dt: 10.06.2003

The above circulars can be obtained at the following link www.indianrailways.gov.in

- Goto *About Indian Railways* (First tab)
- Select *Railway Board Directorates*
- Choose *Telecommunications*

CHAPTER – 7

MISCELLANEOUS

MANAGEMENT OF CYCLONES

Cyclone vulnerability in India

A long coastline of about 7,516 km of flat coastal terrain, shallow continental shelf, high population density, geographical location, and land physiological features of its coastal areas makes India, in the North Indian Ocean (NIO) Basin, extremely vulnerable to cyclones and its associated hazards like storm tide (the combined effects of storm surge and astronomical tide), high velocity wind and heavy rains.

Though the frequency of Tropical Cyclones (TCs) in the NIO covering the Bay of Bengal and he Arabian Sea is the least in the world (7% of the global total), their impact on the east coast of India as well as the Bangladesh coast is relatively more devastating. This is evident from the fact that in the last 270 years, 21 of the 23 major cyclones (with a loss of about 10,000 lives or more) worldwide occurred over the area surrounding the Indian subcontinent (India and Bangladesh). This is primarily due to the serious storm tide effect in the area.

Thirteen coastal states and Union Territories (UTs) in the country, encompassing 84 coastal districts, are affected by tropical cyclones. Four states (Tamil Nadu, Andhra Pradesh, Orissa and West Bengal) and one UT (Puducherry) on the east coast and one state (Gujarat) on the west coast are more vulnerable to hazards associated with cyclones.

About 8% of the area in the country is prone to cyclone-related disasters. Recurring cyclones account for large number of deaths, loss of livelihood opportunities, loss of public and private property and severe damage to rail infrastructure.

Coordination by Railways regarding Cyclones Risk Management, Advance Warnings and Mitigation :-

The Zonal Railways in the high risk zone of cyclones (four states – Tamil Nadu, Andhra Pradesh, Orissa and West Bengal), one UT (Puducherry) on the east coast; and one state on the west coast (Gujarat) have to be in close coordination with the respective Government departments for handling all phases of the cyclones. These include :-

- Cyclone risk mitigation investments on rail track, colonies in the vicinity of high risk area.
- Capacity building on rail tracks/bridges and important rail installations both for reducing devastation from a cyclone, and for relief, restoration etc.
- Advance warning of a cyclone. Action for regulation mainly of Passenger trains follows thereafter.

The Railway infrastructure is located in the vulnerable States in part either in a densely populated area or alternately where no significant population exists. While in the former case the resources of the District/State Government would also be concentrated for rescue/relief/mitigation, in the latter case the Railways would have to depend mostly on their own resources for restoration of railway track.

MANAGEMENT OF EARTHQUAKES

Earthquake Risk in India :

India's high earthquake risk and vulnerability is evident from the fact that about 59 percent of India's land area could face moderate to severe earthquakes. During the period 1990 to 2006, more than 23,000 lives were lost due to 6 major earthquakes in India, which also caused enormous damage to property and public infrastructure. The occurrence of several devastating earthquakes in areas hitherto considered safe from earthquakes indicates that the built environment in the country is extremely fragile and our ability to prepare ourselves and effectively respond to earthquakes is inadequate. India witnessed several earthquakes like the Uttarkashi earthquake of 1991, the Latur earthquake of 1993, the Jabalpur earthquake of 1997, and the Chamoli earthquake of 1999. These were followed by the Bhuj earthquake of 26 January 2001 and the Jammu & Kashmir earthquake of 8 October 2005.

Preparedness by Railways :

The review of earthquake vulnerability and of structural audit of existing critical structures (operationally essential) is coordinated by CE Directorate in Railway Board. RDSO has been assigned the job of collection of data and prepare a plan for developing the specification etc for new buildings and identify existing ones which need retro-fitment. On the Zonal Railways and the Divisions the subject is to be coordinated by the PCE and Sr. DEN's.

Action to be taken by the Railways/PUs on these guidelines is briefly summarized in a tabular form to facilitate this review (Annexure at Page 61). Zonal Railways will review their new projects as well as the existing infrastructure to fall in line with NDMA guidelines. The Action Plan, including the prevention and post disaster response for cyclones, is very similar as for floods. Zonal railways should also keep the effect of cyclones and landslides in mind while reviewing preparedness on each item covered under NDMA guidelines. A multi-disciplinary team comprising of various departments such as Civil, S&T, Electrical, Mechanical, Medical, Security, Personnel and Finance will be constituted for this purpose by the respective zonal railways. Sr. ED/CE/RDSO has been nominated by the Board to monitor this work. CSOs will coordinate with PCEs and other concerned officers to see that necessary action is taken in a time bound manner which should be part of the disaster management plan of the railways both at the zonal and divisional levels.

ANNEXURE

Summary of NDMA Guidelines on Earthquakes and Floods

Railway Infrastructure	Earthquake Proneness Review	Flood Proneness Review
Railway Track Formation (incl. station Yards, bridges/culverts, ROBs/RUBs, etc. Buildings housing signaling gears like RRI, SSI etc. Buildings in open line maintenance work centers like loco sheds, Coaching depots etc. Station buildings Control room, other important office building, etc. High-rise residential buildings, other important residential buildings Railway hospitals	**New Construction** Must be earthquake resistant **Existing Infrastructure** - Identify existing railway infrastructure falling under various seismic zones. - Review for earthquake resistant adequacy based on age, foundation and other details. - Retrofit/rebuild to make it earthquake resistant. - **Training of Engineers (at various levels)** - associated with design and construction of railway infrastructure. - **Any other item that railway may like to add.**	New Construction: Railway Station building should be located in such a fashion that they are above the levels corresponding to a 100 year frequency or the maximum observed flood levels. Similarly they should also be above the levels corresponding to a 50 year rainfall and the likely subversion due to drainage congestion. Government offices buildings should be above a level corresponding to a 25 year flood or a 10 year rainfall with stipulation that all buildings in vulnerable zones should be constructed on columns or stilts. Railway track at levels well above the likely flood levels. **Existing Infrastructure:** Co-ordination with flood/rain forecasting agencies to get early warning so as to introduce patrolling. Speed restriction etc. as per the provisions in Railway's SR. Inspections of Railway Affecting Works – to be streamlined and timely ensured. Review of waterways for adequacy and alignment and measures to modify, if needed. Status Note on the lessons learnt from the previous flood situations in the past 5 years. Bye-laws for buildings in flood plains. Making existing and new buildings and infrastructure capable of withstanding fury of floods. **Any other item that railway may like to add.**

NDMA's Guidelines on Management of Earthquakes' alongwith on 'Management of Floods' (August 07) were sent to RDSO for coordinating implementation on Indian Railways, as decided by Board (ME, ML, MM, FC & CRB). Sr. ED(Civil)/RDSO is to submit Action Plan of all the Railways and Production Units to Railway Board. There is a need for RDSO to prepare the Action Plan early. Zonal Railway, may also keep the effect of Cyclones and Landslides in mind in such vulnerable areas while reviewing preparedness on each item covered in NDMA guidelines.

A detailed study will have to be done by RDSO to work out the actual requirements and investment planning, if any, that may be needed to fulfill the end objectives. For effective handling of the information and details of a railway, each division is to be taken as a unit.

MANAGEMENT OF FLOODS

Vulnerability to Floods

Floods have been a recurrent phenomenon in India and cause huge losses to lives, properties, livelihood systems, infrastructure and public utilities. India's high risk and vulnerability is highlighted by the fact that 40 million hectares out of a geographical area of 3290 lakh hectares is prone to floods. On an average every year, 75 lakh hectares of land is affected, 1600 lives are lost and the damage caused to crops, houses and public utilities is Rs. 1805 crores due to floods. Eighty percent of the precipitation takes place in the monsoon months from June to September.

The rivers bring heavy sediment load from the catchments. These, coupled with inadequate carrying capacity of the rivers are responsible for causing floods, drainage congestion and erosion of riverbanks.

Cyclones, cyclonic circulations and cloud bursts cause flash floods and lead to huge losses. The fact that some of the rivers causing damage in India originate in neighbouring countries, adds another complex dimension to the problem.

Institutional Framework

As per the constitutional provision, Flood Management (FM) is a state subject and as such the primary responsibility for flood management lies with the states. There is a need to set up a central organisation to lay down policy and implement FM measures in consultation with the states and other stakeholders as floods are not confined to one state and flooding in one state leads to flooding in adjoining states. Accordingly, it has been proposed to set up River Basin Organisations to deal with the management of water resources at river basin level.

It is also proposed to set up a National Flood Management Institute (NFMI) at an appropriate location in one of the flood prone states, to impart training to engineers, administrators, personnel of the police departments, Non-governmental Organisations (NGOs) and Community Based Organisations (CBOs) etc.

The Ministry of Water Resources along with other department is responsible for the technical aspects of FM besides others. The Ministries of Agriculture, Civil Aviation, Environment and Forests, Health, Space, Earth Sciences, Mines, Railways etc. also have important role in management of floods in their respective fields.

Activities for Minimizing Flood Risk and Losses

(a) By Central/State Governments :

These activities include identification and marking of flood prone areas on maps, preparation of close contour and flood vulnerability maps, formulating plans for expansion and modernization of flood forecasting and warning systems, identification of priority flood protection and drainage improvement works, identification of reservoirs for review and modification of operation manuals and rule curves and undertaking special studies on problems of river erosion.

(b) Increase in Water Ways :

Examining adequacy and if required, increasing the water ways of bridges/culverts under railway embankments (and roads) by the Ministry of Shipping, Road Transport and Highways (MOSRTH), Ministry of Railways, Ministry of Defence, National Highways Authority of India, Border Road Organisation and State governments.

Action Plan for Alignment, Location, Design and Provision of Waterway on Railways Embankments :-

Roads and Railway embankments cut across the drainage lines and may lead to increase in vulnerability of the area, through which they pass and to flooding and drainage congestion, if they are not properly aligned, located and designated. In-adequate waterway in the form of vents/culverts/bridges/ causeways is another cause of increase in vulnerability to floods. Further, breaches in them may result in huge loss of life and properties. Insufficient height of rail embankments may result in overtopping and breaches.

The Ministry of Shipping, Road Transport and Highways (MOSRTH), MOR, MOD, NAHI, BRO, State Governments/SDMAs will ensure that national highways, state highways, district and other roads are aligned, located and designed properly with respect to height and width and provided with adequate waterway in the form of vents, culverts, bridges and causeways so as to make them flood safe and not increase the vulnerability of the area to flooding and drainage congestion.

The safety of existing roads/railway embankments against floods will also be checked by the MOSRTH, MOR, MOD, NHAI, BRO and state governments/SDMAs/DDMAs and if found inadequate, measures by way of increasing height and width and augmenting water way by constructing additional bridges/culverts/causeways or by adding more spans to existing ones, will be taken up.

Flood Forecast :-

Forecasts (stage/inflow) are issued whenever the river stage at the Flash Flood site exceeds or is likely to exceed a specified level called warning level of the site which is fixed in consultation with the concerned state government. The warning level is generally 1 m below the danger level of the site, although there is no-common format designed for issuing flood forecasts by various fields divisions, as forecasts are issued according to the users convenience. In the forecast, the current date and time of issue of forecast, present water level/inflow and anticipated water level/inflow with corresponding date and time are normally included.

Dissemination of Flood Forecasts and Warnings

On reaching a critical point, the final flood forecasts are then communicated to the user agencies such as the concerned administrative and engineering authorities of the state/central governments including railways, defence and other agencies connected with flood protection and DM by special messenger/telegram/wireless/ telephone/fax/e-mail.

The Central Water Commission's Flood Forecasting Network in India :

The CWC's FF network covers most of the flood prone inter-state river basins in the country. The CWC is presently issuing flood forecasts for 175 stations of which 147 stations are for river stage forecast and 28 for inflow forecast.

Flood Preparedness :-

Based on NDMA's guidelines, a lot of data is to be collected by the Civil Engineering Directorate, Railway Board, so as to plan flood protection works and to reduce vulnerability. Board has asked RDSO to compile the Flood vulnerable areas in Formation, Cutting Bridges and Buildings etc.

Action Plan :-

The following Action Plan should be followed by the Zonal Railway :-

- ✓ Flood/weather forecasting in consultation with IMD and other agencies like CWC, State Government, local bodies etc.
- ✓ Development of system of collecting data using modern techniques, Monitoring of land slides, flood danger to bridges, bridge approaches causing interruption to traffic.
- ✓ Identification of flood prone areas, RAT, RAW and information prone to erosion/breaches and marking them on railways system map. Monitoring of behaviour of rivers which pose danger to railway embankment.
- ✓ Documentation of records of flood and breaches.
- ✓ Flood Insurance of Railway properties – A pilot project to be taken by each Railway through help of suitable consultants.
- ✓ Mechanism for coordination with State Government and other Central Agencies on flood control and erosion etc.
- ✓ Sanction and execution of Anti Erosion works of track, formations, bridges etc.
- ✓ Improvement to water ways of bridges in track formation (if necessary) including
- ✓ sanction and execution of works.
- ✓ Development of Flood Shelters for staff and passenger at suitable locations in the areas prone to repeated floods.
- ✓ Implementation of Bye-laws for buildings in flood prone areas including modifications of Works Manual.
- ✓ Training on Flood Management to officials in various Railway Training Schools and institutions by devising suitable syllabus.
- ✓ Emergency response team on floods.
- ✓ Study of silting pattern resulting in reduction in reservoir/Dam's water holding capacity over years to forecast and extrapolate future impact on track due to over flow and need of additional waterway.
- ✓ Study of changed water encatchment area due to construction of highways, Dams.
- ✓ Study of changed rainy season month on a particular region.

MANAGEMENT OF LANDSLIDES AND SNOW AVALANCHES

Landslide Risk

Landslides are one of the natural hazards that affect at least 15 percent of the land area of our country –an area which exceeds 0.49 million km. Landslides of different types are frequent in geodynamically active domains in the Himalayan and Arakan-Yome belt of the North-Eastern parts of the country as well as in the relatively stable domains of the Meghalaya Plateau, Western Ghats and Nilgiri Hills. In all, 22 states and parts of the Union Territory of Puducherry and Andaman and Nicobar Islands are affected by this hazard. The phenomenon of landslides is more pronounced during the monsoon period.

Nodal agency of Government of India :-

The Geological Survey of India was declared the nodal agency for landslides by the Government in January 2004. The responsibilities of the Ministry of Mines/Geological Survey of India as the nodal ministry/agency include coordinating all the activities related to landslide hazard mitigation, and monitoring the occurrence of landslide in the country.

As per the Disaster management Act, the responsibility to cope with natural disasters is essentially that of state governments and the role of the central government is a supportive one in terms of supplementing physical and financial resources.

Monitoring and Forecasting of Landslides

The monitoring and forecasting of landslides, which are two of the least developed fields of landslide management practice will be given special attention as a part of mitigating the risk arising from landslide hazard. Monitoring of landslides includes :

i) Surface measurements of landslide activity.
ii) Sub-surface measurements of landslide activity.

Management of Snow Avalanches :-

The recording of avalanche data and their clearance is carried out by the Border Roads Organisation. The forecasting and control of snow avalanches are generally dealt with by the Snow and Avalanche Studies Establishment. According to the management of this hazard will be a collaborative work of the National Disaster Management Authority, District Administration, Border Roads Organisation, Snow and Avalanche Studies Establishment, and academic institutions active in carrying out research in this field.

Till the Kashmir Project is fully completed the Railway infrastructure is not likely to be affected by this except at a few locations in Himachal Pradesh.

Organisations Associated with Landslide Hazard Management

The is a need to set up a central organisation that will deal exclusively with all the fields of landslide management in a comprehensive manner has been accepted by Government of India.

The central government through the Ministry of Mines will, therefore, set up a centre for landslide research, studies and management in one of the landslide prone states to ensure a wider view of landslides as a component of the environment and bring the existing pool of expertise in earth sciences (coastal stability, seismology and meteorology included) to bear upon this new initiative.

On the Railways, RDSO has still to undertake any study to identy vulnerable areas of rail infrastructure prone to landslide hazards. This work will be initiated by the CE Dte., Railway Board who will lay down guidelines for RDSO to undertake the study.

Action Plan: Although management of landslides requires coordinated and multi-faceted activities among many stakeholders in the total disaster management cycle, one important recommendation for follow up by Civil Engineering Dte., Railway Board is the landslide hazard zonation mapping in macro and meso scales after identification and prioritization of the areas in consultation with the Border Roads Organization, State Governments and local communities.

MANAGEMENT OF BIOLOGICAL DISASTERS

Causes of Biological Disasters : Biological disasters might be caused by epidemics, accidental release of virulent microorganism(s) or Bioterrorism (BT) with the use of biological agents such as anthrax, smallpox, etc. The existence of infectious diseases have been known among human communities and civilisations since the dawn of history.

In recent times travelling has become easier for which Railways have made a significant contribution. More and more people are travelling all over the world which exposes the whole world to epidemics. As our society is in a state of flux, novel pathogens emerge to pose challenges not only at the point of primary contact but in far removed locations. The Marburg virus illustrates this. The increased interaction between humans and animals has increased the possibilities of zoonotic diseases emerging in epidemic form.

Biological Warfare (BW) and Bio-Terrorism (BT) : The historical association between military action and outbreaks of infections suggest a strategic role for biological agents. The advances in bacteriology, virology and immunology in the late 19th century and early 20th century enabled nations to develop biological weapons. The Biological and Toxin Weapons Convention, however, resolved to eliminate these weapons of mass destruction. Despite considerable enthusiasm, the convention has been a non-starter.

Mitigation : The essential protection against natural and artificial outbreaks of disease (bio-terrorism) will include the development of mechanisms for prompt detection of incipient outbreaks, isolation of the infected persons and the people they have been in contact with and mobilisation of investigational and therapeutic countermeasures. In the case of deliberately generated outbreaks (bio-terrorism) the spectrum of possible pathogens is narrow, while natural outbreaks can have a wide range of organisms. The mechanism required however, to face both can be similar if the service providers are adequately sensitized.

Nodal Ministry and support of other Ministries : The response to these challenges will be coordinated by the nodal ministry-Ministry of Health and Family Welfare (MOH&FW) with inputs from the Ministry of Agriculture for agents affecting animals and crops. The support and input of other ministries like Ministry of Home Affairs, Ministry of Defence, Ministry of Railways and Ministry of Labour and Employment, who have their own medical care infrastructure with capability of casualty evacuation and treatment, have an important role to play. With a proper surveillance mechanism and response system in place, epidemics can be detected at the beginning stage of their outbreak and controlled.

Handling Chemical **B**iological **R**adiological and **N**uclear **Disaster – Training :**

For handling and to provide medical relief for all CBRN disaster which (include a Biological Disaster) and mitigation of BW and BT affected Railway staff, need to be incorporated in the Hospital DM Plan.

Training of a skeleton numbers of Medical Doctors in each Divisional Railway Hospital to manage CBRN casualties is to be planned.

MANAGEMENT OF CHEMICAL DISASTERS

Guidelines by NDMA :

National Disaster Management Authority (NDMA) has issued guidelines on the management of chemical disasters. These guidelines are directed more towards their prevention and mitigation of their effects, if these happen than on rescue and relief operations afterwards.

The main stakeholders in the management of chemical disasters are Ministry of Environment and Forests (MoEF; the nodal ministry); Ministry of Home Affairs (MHA); Ministry of Labour and Employment (MoLE); Ministry of Agriculture (MoA); Ministry of Shipping, Road Transport and Highways (MoSRT & H); Ministry of Defence (MoD); Ministry of Chemicals and Fertilizers (MoC&F); Ministry of Petroleuum and Natural Gas (MoP &NG). Department of Atomic Energy (DAE);

Salient features of NDMA Guidelines :

The growth of chemical industries has led to an increase in the risk of occurrence of incidents associated with hazardous chemicals (HAZCHEM). With their proliferation, the demands on its transportation by rail has gone up significantly. Common causes for chemical accidents are deficiencies in safety management systems and human errors, or they may occur as a consequence of natural calamities or sabotage activities. Chemical accidents result in fire, explosion and/or toxic release. The nature of chemical agents and their concentration during exposure ultimately decides the toxicity and damaging effects on living organism in the form of symptoms and signs like irreversible pain, suffering, and death. Meteorological conditions such as wind speed, wind direction, height of inversion layer, stability class etc. also play an important role by affecting the dispersion pattern on toxic gas clouds. The Bhopal Gas tragedy of 1984 – the worst chemical disaster in history, where over 2000 people died due to the accidental release of the toxic gas Methyl Isocyanate, is still fresh in our memories.

Genesis of NDMA's Guidelines on Chemical Disasters :

Effective Chemical Disaster Management (CDM) is possible by the adoption of preventive and mitigation strategies as most chemical disasters are preventable in comparison to natural disasters that are difficult to predict and prevent.

In the NDMA's Guidelines comprehensive instructions for installations and storages (including isolated storages of HAZCHEM) that contain good engineering practices for safety, accident reporting, investigation and analysis cheklists and safety promotional activities as important tools for effective CDM, are provided.

In the guidelines are instructions related to chemical accidents during transportation of HAZCHEM. The areas covered include:

- Preparation of a highway DM plan.
- Modification of rules pertaining to transport emergencies.
- Specific roles and responsibilities of MAH units, transporters, drivers, authorities and aspects related to emergency communication systems and training of various stake holders.
- The need for the development of an efficient pipeline management system.

The approach to implementation of the NDMA's Guidelines are highlighted along with the key points for ensuring the implementation of the plans prepared by the central ministries, departments and states.

Guidelines on Chemical Disasters: Railway's guidelines/instructions relevant to the zonal railways have been issued separately in detail for taking necessary action and incorporating suitable provisions in their respective DM Plans. These guidelines will add to the existing safeguards listed in the Red Tariff on handling, storage and transportation of hazardous material.

Railways Red Tariff – Transport of Hazchem: Indian Railways have also been transporting chemicals and hazardous materials e.g. petroleum products (petrol, Naphtha, HSD, etc.), Caustic soda, Alcohol, compressed gases (LPG gas etc.) Chemical manures, Acids, Matches etc. These goods are carried either in the SLRs or in the Parcel Vans or in the goods wagons. Quantum and type of transportation of such hazardous material varies from railway to railway and different zonal railways need to prepare themselves based on the type and extent of hazardous material being handled and transported by them.

Indian Railway's Rules for carrying dangerous (hazardous goods) by rail have been legislated in the Railway Red Tariff Rule 2000 as per which dangerous goods have been classified into following 8 classes:

1. Explosives
2. Gases, Compressed, liquefied or dissolved under pressure
3. Petroleum & other inflammable liquids
4. Inflammable solids
5. Oxidizing substance
6. Poisonous (Toxic Substances)
7. Radio-active substances
8. Acids & other Corrosives.

Monitoring Movement of Hazchem :

Dedicated communication system is to be established for Rail Transportation to monitor movement of Toxic Chemical Agents. A mechanism is to be developed like a Geographic Information system (GIS) for continuous monitoring of such Transport Vehicles along their route.

This may require to be dove-tailed with the FOIS network of the Railways, once the TMS/FOIS is extended for booking (preparation of RRs) and movement of chemical items in wagons to be included in FOIS.

Rescue Relief and Restoration Operations:

Railway's expertise in dealing with the mis-happenings like spillage, catching fire etc. of these dangerous goods is very limited. It is therefore imperative that the respective zonal railways will develop and nurture coordination with those agencies and Organisations on their system that have expertise in dealing with the hazardous material being handled and transported on the respective zonal railways. Contact details e.g. Name, Designation, Telephone Nos., Mobile Nos. etc. of such agencies should be available in the Divisional and Zonal Railway Disaster Management Plan so that these agencies can be called for without any delay during any untoward incident. Nominated staff of ARMVs, ARTs and few of the staff maintaining the rolling stock which is used for transportation of hazardous material may be trained and equipped with the equipment used for dealing with such material.

Divisions located on the "Hazchem Rail Transportation Highways" have to be in close touch with specialized services available with IOC/GAIL and Pvt. Chemical Factories and NGOs to be able to call upon their men and fire fighting fire extinguishers etc at short notices. Vulnerability on this Highway needs to be reduced by the removal of Jhuggies from close to the track (say at least 15 m away).

MANAGEMENT OF CHEMICAL (TERRORISM) DISASTERS

Introduction :-

A terrorist attack involving chemical agents differs from a normal terrorist attack as it results in specific effects on health and can cause fatal injuries, create panic, and affect the morale of the community. The targets of terrorists include market places, densely populated areas, public functions, important dignitaries, water and electricity supplies, restaurants/food plazas, malls, places of entertainment, busy railway stations in metros and critical and sensitive military, civil and economic institutions.

Chemical terrorism is an act of violence to achieve professed aims using chemical agents. These chemical agents include poisonous gases, liquids or solids that have a deleterious effect on the biotic and non –biotic environment. Due to the relatively easy availability of hazardous chemicals in Major Accident Hazard units, storages and during transportation, terrorists can procure chemicals or even try to sabotage the facilities or transport vehicles as it offers them an easier and often more catastrophic method of anti-national activity. The mode of dispersal used for chemical agents would range from dissemination of aerosolised material to contamination of food and water.

NDMA's Guidelines :-

The possibility of a chemical terrorism attack can be minimized by spreading general awareness and building the capacity of the community, institutions, and governmental and non – governmental organisations.

The approach followed in the NDMA's Guidelines lays emphasis on :

i) Security and surveillance measures for installations manufacturing/using/storing chemicals.
ii) Strengthening intelligence regarding the movement of chemicals.
iii) Preparedness for counter-terrorism measures :
   (a) Issues regarding the safety of chemicals and risk reduction strategies etc.
   (b) Strengthening of response through rescue and emergency medical resources.
   (c) Preparedness of all emergency functionaries in terms of protection, detection, decontamination, decorporation, capacity building and infrastructure development.
   (d) Community-centric mechanism for the management of chemical (terrorism) disasters.

Comparative **T**oxic genomics **D**atabase **Preparedness Plan :-**

Implementation of the Guidelines at the national level shall begin with the preparation of a detailed action plan (involving programmes and activities) by the nodal ministry (MHA) that shall promote coherence among different CTD management practices and strengthen mass casualty management capacities at various levels. The concerned ministries like MoD, MoEF, Ministry of Railways (MoR), MoL&E (through Employees' State Insurance Corporation (ESIC), MoA etc., will also prepare their respective CTD preparedness plan as a part of all hazard DM Plans. The Railways has an important role in the management of mass casualties in the event of national calamities, they should also cater for developing additional capacities besides meeting their own requirements in their preparedness plan.

Railway Board has issued guidelines on precautions in handling, storage and transportation of chemicals. These are to supplement the guidelines laid down in the Red Tariff. The Commercial

Department may keep the RPF official updated on the Goods Sheds which handle Hazchem so that adequate security systems can be strengthened. This may be a part of the Divisional DM Plans.

Preparedness for Emergency Response :-

Preparedness for an emergency response at the incident site requires protection, detection, and decontamination. RPF and the Medical Department have a role to play in the relief and mitigation efforts. SOPs are required for all the emergency responders working under the overall supervision of the incident commander. This may be identified in the zonal DM Plan as the DRM of the respective division on the Railways where CTD has occurred. SOPs will be included for field decontamination. A well-orchestrated medical response to CTD will be possible only by having a command and control function at the divisional level by the Medical Department. The CMO/CMS will be the main coordinator for the management of CTD.

Training for the Responders :-

The Medical Department of the Railways has little or no expertise in the effects of different chemicals. This needs to gradually developed initially in a skeleton number (one or two) of Doctors and Para-medis in each Divisional Railway Hospital through training.

MANAGEMENT OF NUCLEAR AND RADIOLOGICAL EMERGENCY (DISASTER)

Nuclear/Radiological Emergency :

Any radiation incident resulting in or having a potential to result in exposure and/or contamination of the workers or the public in excess of the respective permissible limits can lead to a nuclear/radiological emergency.

After due consideration of the nature and consequences of the nature and consequences of all the possible scenarios, these radiological emergencies have been broadly classified into the following five categories :

i. An accident taking place in any nuclear facility of the nuclear fuel cycle including the nuclear reactor, or in a facility using radioactive sources, leading to a large-scale release of radioactivity in the environment.
ii. A ‘criticality’ accident in a nuclear fuel cycle facility where an uncontrolled nuclear chain reaction takes place inadvertently, leading to bursts of neutrons and gamma radiations.
iii. An accident during the transportation of radioactive material.
iv. The malevolent use of radioactive material as a Radiological Dispersal Device by terrorists for dispersing radioactive material in the environment.
v. A large-scale nuclear disaster, resulting from a nuclear weapon attack (as had happened at Hiroshima and Nagasaki) which would lead to mass casualties and destruction of large areas and property.

Normally, nuclear or radiological emergencies (referred to in points (i) to (iv) above)are within the coping capability of the plant/facility authorities. A nuclear emergency that can arise in nuclear fuel cycle facilities, including nuclear reactors, and the radiological emergency due to malevolent acts of using Radiological Dispersal Devices are the two scenarios that are of major concern. The impact of a nuclear disaster (scenario at (v)) will be well beyond the coping capability of the local authorities and it calls for handling at the national level.

Vulnerability of Nuclear Facilities :

Identification of a Rail network close to a nuclear facility needs to be done by the zonal Railways. As regards the vulnerability of various nuclear fuel cycle facilities to terrorists attacks, these facilities have elaborate physical protection arrangements in place to ensure their security. The structural design of these facilities ensures that even in the event of a physical attack, the structural barriers prevent the release of any radioactivity outside the plant area itself and hence the public are not likely to be exposed to radiation.

While their radioactive strength is in itself a deterrent to pilferage, the radioactive sources can still be stolen and used in a Radiological Dispersal Device or Improvised Nuclear Device. Essentially, a Radiological Dispersal Device is a conventional explosive devise in which the radioactive material has been so added that, on its being exploded, there would be dispersal of radioactivity in the environment.

A Radiological Dispersal Device is not a Weapon of Mass Destruction. Normally, the use of a Radiological Dispersal Device by itself would not result in fatalities due to radiation. The fatalities, if any, would primarily be due to the explosion. However, it may contaminate a reasonably large area, besides its main potential of causing panic and disruption.

Accidents during the transportation of radioactive materials are of low probability due to the special design features of the containers in which they are transported and special safety and security measures (to take care of all possible threats/eventualities, including the threat from misguided elements) which are laid down to be followed during actual transportation.

A network of 18 Emergency Response Centres has presently been established by the Bhabha Atomic Research Centre to cope with radiological emergencies in the public domain, like transport accidents, handling of orphan sources, explosion of Radiological Dispersal Devices etc. The task of these Emergency Response Centres is to monitor and detect radiation sources, train the stakeholders, maintain adequate inventory of monitoring instruments and protective gear, and provide technical advice to first responders and local authorities.

MANAGEMENT OF RAIL DISASTER IN TUNNELS/DEEP CUTTINGS OR IN A WATER BODY

Expertise To handle Rail Disasters in Tunnels etc. : The Railways have no expertise or infrastructure to handle a train disaster if it occurs in a tunnel or in a deep cutting not approachable by land. No machinery, or earth moving equipment is available on the Indian Railways which would be mobilized for this job. Help of other stake holders or of NDRF has to be taken for this.

Ventilation arrangements in Tunnels : Adequacy of ventilation arrangement and its efficient operation is always a matter of concern especially in very long tunnels. There are ventilation systems installed with alarms to warn the control rooms in case of a mishap.

In case a train stalls in long tunnel due to derailment/fire or any unusual condition, automatically alarm will be sounded in the control room to alert the Ventilation Operator/Controller or if Guard/Driver of a train or any other person gives such call on ‘Emergency’ Telephone the Ventilation Operator should control the ventilation in tunnel as per the procedure given.

Lighting Systems in Tunnels for use in emergency : Depending on length of a tunnel, emergency lighting arrangements may be provided to give immediate assistance in handling a disaster.

Rail Disasters in a Lake, River, Sea etc. : The Railways neither has the equipment (cranes operated from barges) nor trained manpower to extricate bodies from a train or coaches fallen down from a bridge on to a water body, viz lake, river or sea etc. Help of the NDRF has to be taken is such a situation.

DISASTER MANAGEMENT TRAINING

Disaster Management Training on the Railways

National Institute of Disaster Management (NIDM)

National Institute of Disaster Management (NIDM) has been envisaged as apex body on disaster Management training & research in the country under the Disaster Management Act, 2005.

NIDM runs several multi-disciplinary training programmes including the programmes on transportation related disasters in which railway officers have also been invited to attend. Services of NIDM may be made use of, if required, for training railway officials in Disaster Management at IRITM, Lucknow. Most of the States also have DM Training Institutes funded by the Centre.

DM Training on Zonal Railways and Divisions

With the enactment of the Disaster Management Act, Indian Railways have also taken several initiatives to revamp Disaster Management training. Presently, training on disaster management of various tiers of railway officials does not envisage newer concepts like integration of disaster management into developmental planning, leveraging on the strengths of other non-railway agencies etc. Till now any training on the subject of Disaster Management implied subjects connected with Train Accidents only. There was no training given for natural calamities or for terrorism related items. With the adoption of this concept the training requirements for Lower, Middle and Higher Management officials of the Railways needs to be re-oriented to cover these concepts. Hence the subjects of Disaster Management are more vast and varied. However, even today some of the Railway staff need are given training only on the older concept, i.e. on a limited syllabi of Management of a train accident. Amongst the staff which falls in this category are the frontline staff (and their superiors) either traveling on the train or available on line.

It has also not yet been possible to harness availability and strengths of railway on-board staff who are the first railway responders during a serious train Accident. With this in view, Board have decided to revamp the Training on Disaster Management being imparted to several tiers of railway officials through Railway Training Institutes as indicated below:

Sl. No.	Categories of Officials	New Training methodology and schedule	Frequency of Training:
1.	Top Level Management (GMs, PHODs, DRMs and other SAG Officers)	3-day Disaster Management Modules are to be delivered at IRITM/LKO @ once every 3 months.	Once every five years for SAG Officers and above.
2.	Middle Level management (SG & JAG officers)	Some of the latest and relevant topics are to be included in the AMP and MDP programmes being delivered at RSC/BRC IRITM/LKO will also deliver special module being developed by them @ one every month.	Every SG/JAG officer need to undergo the module once every five years either at RSC as regular MDP/AMP course or special DM module at IRITM.
3.	Lower Level Management (SS & JS officers including serving Group B officers).	Disaster management training to be imparted at IRITM/LKO @ one course every month	Once every five years.
4.	Probationers and Group B officers attending induction courses	Topics listed in **annexure 4** of detailed instructions are to be covered during the regular training programme at RSC/Vadodara.	As part of the course.
5.	Supervisors of all frontline departments (Mechanical, Electrical, Engg., S&T, Traffic Comml. & Optg.)	One-week course at ZRTIs @ one every month. **Passing this course is compulsory for promotion to SE and above.**	Once every five years.
6.	Railway Staff on board passenger carrying train (TS, Dy.TS, TTEs & catering staff of Commercial Department, Coach attendants and AC Mechanics from Electrical Departments, some of the selected coach cleaners of Mechanical Departments, some of the RPF escorting staff and catering staff of contractor wherever	Disaster Management being a multidisciplinary effort during field operations, training in groups of such on board staff is more desirable and efficient then training them category wise. Role of on board railway staff has been a matter of great criticism in most of the serious train accidents. On board staff are the first railway representatives to respond to any untoward incident and their empowerment will improve railways response in a big way. Such staff is to be trained in	Once every three years.

	outsourced).	appropriate multidisciplinary groups at such locations in the divisions where there is concentration of such staff to obviate the need for their hostel accommodation, non-availability for longer periods, etc. Such training can be imparted at the selected country-wide locations to cover maximum number of staff in short period of time. This training can also be imparted in the **Customer Care Institute**. Only few select staff of Mechanical, Electrical (AC), RPF is to undergo this training who are deputed to escort trains. This training will be made mandatory in a phased manner for any staff to go on-board a passenger train. The staff of catering contractor is also to be imparted this training in Phase 2 to leverage their physical presence.	
7.	Nominated ARMV and ART staff of Mechanical and Medical departments	Composite training of Mechanical and Medical Staff for relief and rescue operations is planned to be given at upcoming disaster management railway institute at Bangalore. Doctors and paramedics nominated for ARMVs and other rescue operations should be exclusively trained on trauma care management either at some nominated specialized institutions or in-house. IRITM is one of the Training Institutes under consideration.	Once every three years.
8.	Disaster management team of RPF staff & other RPF personnel associated with relief rescue operations.	As per recommendation no. 46 of HLC on disaster management there should be a disaster management team of RPF on each division comprising about 15	Once every three years for disaster management team of RPF.

		men in different ranks. Such teams should be trained in providing necessary support on relief rescue operations. The existing 5 day training module should be appropriately revised to make it suitable to achieve the above objective. Each of the above teams should be trained on this module at RPF Academy at Lucknow. In addition, training module may be appropriately developed separately for RPF Officers and staff and should be imparted at RPF Academy at Lucknow. The respective training modules should include role of RPF at the accident site, security at the railway premises like railway stations, trains etc.	Once every five years for other RPF officers and staff.
9.	RPF Officers	Disaster Management training for RPF officers may be also organized in IRITM till such time the capability in RPF academy is developed.	--

NOTE: Mechanical(Traction) is the Nodal Directorate in Railway Board for Train Accident Management which includes all aspects of Policy on ART/ARME/Cranes and rescue, extrication, firefighting equipment etc. A nodal Training Institute for specialized rescue/extrication etc. for officers and for subordinates is being set up in Bangalore; the work on this Institute is being coordinated by Mechanical (Traction) dte. Railway Board.

IRITM/Lucknow has been nominated as the nodal centre for training on general aspects of Disaster Management for the senior and middle level officers (including Senior Management Level Officers). Training modules are being set up at ZRTI at Udaipur and Bhuli for Disaster Management training of other railway officials.

Respective Training Institutions on each zonal railway will ensure that the modules prescribed above are institutionalized and officials are imparted training to build the capacity on disaster management on human resource front.