GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

DISASTER MANAGEMENT PLAN

November, 2019

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No.2018/Safety(DM)/6/14 **New Delhi, dated: 13.11.2019**

Addressed to:

As per list attached.

Sub: Disaster Management Plan- 2019 for the Ministry of Railways.

Updated Disaster Management Plan-2019 of the Ministry of Railways is enclosed for information and necessary action.

13/11/2019

(Dimpy Garg)
Executive Director/Safety(M)
Railway Board

List of Addresses:

S.No.	Name of the Official
1.	Chairman, Railway Board
2.	Financial Commissioner, Railway Board
3.	Member Traffic, Railway Board
4.	Member Rolling Stock, Railway Board
5.	Member Engineering, Railway Board
6.	Member Traction, Railway Board
7.	Member Staff, Railway Board
8.	Member Material Management, Railway Board
9.	Member Signal & Telecommunication, Railway Board
10.	DG(RHS)
11.	DG(RPF)
12.	AM(C)
13.	AM(Traffic)
14.	AM(Mech)
15.	AM(Electrical)
16.	AM(CE)
17.	AM(Finance)
18.	AM(Tele)
19.	AM(Signal)
20.	AM(Staff)
21.	PED/TT(M)
22.	PED/Bridges
23.	PED/L&A
24.	PED/Safety
25.	EDTT(S)
26.	Secretary(Security), Cabinet Secretariat
27.	Secretary, NDMA, Govt of India, NDMA Bhawan, A 1 Safdarjung Enclave, New Delhi
28.	Executive Director, NIDM
29.	Chief Secretary, All states and Union Territories of India
30.	Secretary, Central Water Commission, 313(S), Sewa Bhawan, R.K.Puram, New Delhi
31.	Director General, India Meteorological Department, Mausam Bhawan, New Delhi
32.	Director General, Geological Survey of India, 27, Jawaharlal Nehru Road, Kolkata – 700016.
33.	Secretary, Ministry of Earth Sciences, Anusandhan Bhavan, 2, Rafi Marg, New Delhi.
34.	Secretary, Ministry of Water Resources, Shram Shakti Bhawan, Rafi Marg, New Delhi.
35.	Secretary, Ministry of Health & Family Welfare, Nirman Bhawan, New Delhi.
36.	Secretary, Ministry of Environment & Forests, Paryavaran Bhawan, New Delhi.
37.	Secretary, Ministry of Shipping, Road Transport & Highways, 1, Sansad Marg, New Delhi.
38.	Secretary, Ministry of Power, Shram Shakti Bhawan, New Delhi
39.	Secretary, Ministry of Information Technology, 6, CGO Complex, New Delhi
40.	Secretary, Ministry of Home Affairs, North Block, Central Secretariat, New Delhi
41.	Secretary, Ministry of Defence, South Block, New Delhi.
42.	Secretary, Ministry of Communication, Sanchar Bhawan, 20, Ashok Road, New Delhi.
43.	DG/NDRF
44.	Railway Board Safety Control Room
45.	All Zonal Railways (5 copies each)

DISASTER MANAGEMENT PLAN – 2019

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Abbreviations:

AC	Air Conditioned
AGM	Additional General Manager
ARME	Accident Relief Medical Equipment
ARMV	Accident Relief Medical Van
ART	Accident Relief Train
BIS	Bureau of Indian Standards
BLS	Basic Life Support
BRO	Border Roads Organization
BSF	Border Security Force
BT	Bio-Terrorism
BW	Biological-Warfare
CAG	Comptroller & Auditor General
CBO	Community Based Organization
CBRN	Chemical, Biological, Radiological, Nuclear
CCS	Cabinet Committee on Security
CCTV	Close Circuit Television
CDM	Cyclone Disaster Management
CE	Chief Engineer
CISF	Central Industrial Security Force
CMD	Chief Medical Director
CMG	Crisis Management Group
CMP	Crisis management Plan
CMS	Chief Medical Superintendent
CPMF	Central Para Military Force
CRB	Chairman Railway Board
CRPF	Central Reserve Police Force
CSO	Chief Safety Officer
CTD	Chemical (Terrorism) Disaster
CWC	Central Water Commission
DDMA	District Disaster Management Authority
DG	Director General
DOD	Department of Ocean Development
DM	District Magistrate
DRM	Divisional Railway Manager
EMS	Electronic Messaging System
EMR	Emergency Medical Response
ERC	Emergency Response Centre
ESF	Emergency Support Function
ESIC	Employees State Insurance Corporation
EWS	Early Warning System
FC	Financial Commissioner
FF	Flood Forecasting
FM	Flood Management
FOIS	Freight Operation Information System

GAIL	Gas Authority of India Ltd.
GIS	Geographic Information System
GM	General Manager
GRP	Government Railway Police
GSI	Geological Survey of India
Hazchem	Hazardous Chemical
HFL	Highest Flood Level
HLC	High Level Committee on Disaster Management
HM	Home Minister
HQ	Headquarter
HS	Home Secretary
HSD	High Speed Diesel
IAN	Integrated Ambulance Network
IDSP	Integrated Disease Surveillance Programme
IMD	India Meteorological Department
IOC	Indian Oil Corporation
IOC	Integrated Operation Centre
INCOIS	Indian National Centre for Oceanic Information Services
IRITM	Indian Railways Institute of Transport Management
IRS	Incident Response System
IRT	Incident Response Team
IS	Internal Security
ITBP	Indo Tibetan Border Police
ITWC	Interim Tsunami Warning Centre
MCE	Mass Casualty Evacuation
MCM	Mass Casualty Management
ME	Member Engineering
MFR	Medical First Responder
MHA	Ministry of Home Affairs
MoD	Ministry of Defence
MoES	Ministry of Earth Sciences
MoH&FW	Ministry of Health and Family Welfare
MoR	Ministry of Railways
MoS	Minister of State
MoSRTH	Ministry of Shipping, Road Transport and Highways
MoWR	Ministry of Water Resources
MPMCM	Medical Preparedness and Mass Casualty Management
MRS	Member Rolling Stock
MTR	Member Traction
NAHI	National Association of Home Inspectors
NBC	Nuclear, Biological & Chemical
NAIR	National Academy of Indian Railways
NCMC	National Crisis Management Committee
NCRMP	National Cyclone Risk Mitigation Project
NDM	National Disaster Management
NDMA	National Disaster Management Authority
NDRF	National Disaster Response Force

NEC	National Executive Committee
NFMI	National Flood Management Institute
NGO	Non-Governmental Organization
NIDM	National Institute of Disaster Management
NIO	North Indian Ocean
NIOT	National Institute of Ocean Technology
NSG	National Security Guard
OFC	Optic Fiber Cable
PMO	Prime Minister Office
POMKA	Portable Medical Kit for Accidents
PPE	Personal Protective Equipment
PTWC	Pacific Tsunami Warning Centre
QRT	Quick Reaction Teams
R&D	Research & Development
RAT	Remote Administration Tool
RAW	Research and Analysis Wing
RDSO	Research, Design and Standards Organization
RMC	Regional Meteorological Centers
ROB	Road Over Bridge
RPF	Railway Protection Force
RPSF	Railway Protection Special Force
RUB	Road Under Bridge
S&T	Signal & Telecommunication
SDMA	State Disaster Management Authority
SDRF	State Disaster Response Force
SEC	State Executive Committee
SOP	Standard Operating Procedure
SPARMV	Self-Propelled Accident Relief Medical Van
SPART	Self-Propelled Accident Relief Train
STC	Supervisor Training Centre
STS	System Technical School
TA	Territorial Army
TC	Tropical Cyclones
TMS	Terminal Management System
TS	Train Superintendent
TTE	Train Ticket Examiner
UNISDR	United Nations International Strategy for Disaster Reduction
UNDP	United Nations Developmental Programme
UT	Union Territory
ZRTI	Zonal Railway Training Institute

Executive Summary

The Disaster Management Act, 2005 (DM Act 2005) lays down institutional and coordination mechanism for effective Disaster Management (DM) at the national, state, district and local levels. As mandated by this Act, the Government of India (Gol) created a multi-tiered institutional system consisting of the National disaster Management Authority (NDMA) headed by the Prime Minister, the State Disaster Management Authorities (SDMAs) headed by the respective Chief Ministers and the District Disaster Management Authorities (DDMAs) headed by the District Collectors and co-chaired by Chairpersons of the local bodies. These bodies have been set up to facilitate a paradigm shift from the hitherto relief-centric approach to a more proactive, holistic and integrated approach of strengthening disaster preparedness, mitigation, and emergency response.

The National Disaster Management Plan (NDMP) provides a framework and direction to the government agencies for all phases of disaster management cycle. The NDMP recognises the need to minimize, if not eliminate, any ambiguity in the responsibility framework. It, therefore, specifies who is responsible for what at different stages of managing disasters. The NDMP is envisaged as ready for activation at all times in response to an emergency in any part of the country. It is designed in such a way that it can be implemented as needed on a flexible and scalable manner in all phases of disaster management: a) mitigation (prevention and risk reduction), b) preparedness, c) response and d) recovery.

The NDMP is consistent with the approaches promoted globally by the United Nations, in particular the Sendai Framework for disaster Risk Reduction 2015-2030. It is a non-binding agreement, which the Signatory nations will attempt to comply with on a voluntary basis. India will make all efforts to contribute to the realization of the global target by improving the entire disaster management cycle in India by following the recommendations in the Sendai Framework and by adopting globally accepted best practices. The four priorities for action under the Sendai Framework are:

1. Understanding disaster risk
2. Strengthening disaster risk governance to manage disaster risk
3. Investing in disaster risk reduction for resilience
4. Enhancing disaster preparedness for effective response and to " Build Bach Better" in recovery, rehabilitation and reconstruction

The NDMP incorporates substantively the approach enunciated in the Sendai Framework and will help the country to meet the goals set in the framework. By 2030, the Sendai Framework aims to achieve substantial reduction of disaster risk and losses in lives, livelihoods, and health and in the economic, physical, social, cultural, and environmental assets of persons, businesses, communities, and countries.

Vision of NDMP

Make India disaster resilient, achieve substantial disaster risk reduction, and significantly decrease the losses of life, livelihoods, and assets – economic, physical, social, cultural, and environmental – by maximizing the ability to cope with disasters at all levels of administration as well as among communities.

Multi-Hazard Vulnerability

India, due to its, physiographic and climatic conditions is one of the most disaster prone areas of the world. Vulnerability to disasters/emergencies of Chemical, Biological, Radiological and Nuclear (CBRN) origin also exists. Heightened vulnerabilities to disaster risks can be related to increasing population, urbanization, industrialization, development within high-risk zones, environment degradation, and climate change. Hazard vulnerability maps for India are annexed to NDMP.

Reducing Risk; Enhancing Resilience

In the domains of DM planning, preparedness, and capacity building, the central agencies will constantly work to upgrade Indian DM systems and practices as per global trends. The planning framework has arranged the actions envisaged for risk reduction under five thematic areas for action with one of the four priorities for action of Sendai Framework as its dominant feature.

For each hazard, the approach used in national plan incorporates the four priorities enunciated in the Sendai Framework the planning framework for Disaster Risk Reduction under the five Thematic Areas for Action:

1. Understanding Risk
2. Inter-Agency Coordination
3. Investing in DRR – Structural Measures
4. Investing In DRR - Non- Structural Measures
5. Capacity Development

For each thematic area for action, the NDMP has identified a set of major themes for undertaking actions within the broad planning framework. For each hazard, themes for action are presented in a separate responsibility matrix assigning roles of centre and state for each of the thematic areas for action.

Response

Response measures are those taken immediately after receiving early warning, anticipating an impending disaster, or post-disaster in cases where an event occurs without warning. The primary goal of response to a disaster is saving lives, protecting property, environment, and meeting basic needs of human and other living beings after the disaster. The immediate focus will be on search and rescue of those affected and to evacuate those likely to be affected by the disaster or secondary disaster that is likely to happen.

At the national level, the central government has assigned nodal responsibilities to specific ministries for coordinating disaster-specific response. The NDMA will be coordinating with relevant nodal ministry.

Different central ministries and departments will provide emergency support to the response effort as per request from the State Government. It may be noted that the SDMA, Department of Revenue of Commissioner of Relief (as applicable) is the nodal agency for coordination of disaster response. The various agencies whose responsibilities are defined in detailed DM plans for the state and district will be responsible specific response measures. The DDMA is the nodal agency for coordination of response at district level supported by other district level agencies. The department wise specific activities at central ministries and state government are summarized in matrix providing clarity to the roles and responsibilities of various agencies.

Structure of Disaster Management plan of Ministry of Railways

Based on the National Disaster Management Plan, context specific changes were made in the DM plan of Ministry of Railways duly indicating the role and responsibilities at Board, Zonal Head Quarters and Divisional level. Zonal Railway and Divisional Disaster Management plans need to be developed on similar lines.

Disaster management plan also contains detailed guidelines relating to cases of breach/floods, earthquakes, cyclones, manmade disasters like terrorism etc. DM plan at divisional level must include management of rescue and relief operations including care for dead, communication network, restoration operations, maintenance of ART/ARMV & their equipment, media management, check list for officers and supervisors etc. DM plan should also include details of local resources as indicated in chapter no.6.

Accident Manual contains definitions, classification of accidents, reporting of accidents and other unusual occurrences, duties of officials, relief measures, investigation and inquiries, disposal of inquiry reports etc. in case of a train accident. It is a compendium of all instructions, rules, procedures and guidelines issued from time to time on Railway accidents and for safe working of trains in general. These details are not required to be included in DM plans. Accident Manual of Railways may be referred for details related to train accidents.

Division shall identify vulnerable locations and risks associated with natural disasters and incorporate them in the Divisional DM plan. Information flow chart for communicating alerts issued by early warning agencies to the filed officials shall be clearly specified in the DM plan duly indicating preparedness and response to deal with them.

NDMA has issued guidelines on “Managing Crowd at Events and Venues of Mass Gathering”. Guidelines on crowd management and role of RPF in crowd control is included in the chapter no. 9 and 15. In events of mass gathering, based on NDMA guidelines, event specific Disaster Management plan for the stations where the crowd is expected needs to be prepared and implemented.

Guidelines issued by NDMA regarding chemical disaster are included in chapter no.14. Rules for carrying Hazardous chemicals is legislated in Railway Red Tariff Rules, 2000. In Red Tariff, general rules governing acceptance, handling, carriage, storage, delivery and the list of commodities along with the DOs and Don’ts in case of leakage of hazardous chemicals is included. Carriage of commodities other than those specified in Red Tariff, shall not be accepted for transport by rail unless specially authorised by the Railway administration. Dos and Don’ts issued by MHA regarding CBRN disasters is also included in the plan.

Capacity development covers strengthening of institutions, mechanisms, and capacities of all stakeholders at all levels. Chapter no. 14 indicates disaster management training methodology and schedule at all levels.

Chapter 1

INTRODUCTION

1.1 Background

Indian Railways is the life-line of nation and the fourth largest Railway network in the world by size, with a route length of over 72,038 kilometers and total track length of 1,23,236 kilometers. Indian Railway runs more than 13,452 passenger trains and 9,141 Goods trains daily, from 7,318 stations across India.

As a national common carrier transporting passenger and goods over its vast network, Indian Railways has always played a key role in India's social and economic development. It is a cheap and affordable means of transportation for millions of passengers. As a carrier of bulk freight viz. ores and minerals, iron and steel, cement, mineral oils, food grains and fertilizers, containerized cargo etc., the importance of Indian Railways for agriculture, industry and the common man is well recognized. Indian Railways carried 23.12 million passengers and 3.35 million tonnes of freight each day during 2018-19.

Indian Railways, functioning as Ministry of Railways, is headed by the Minister for Railways. The apex body entrusted with the management of this mega enterprise is led by the Chairman, Railway Board (CRB). Members of the Railway Board include Financial Commissioner, Member Traffic, Member Engineering, Member Rolling Stock, Member Traction, Member S&T, Member Material Management and Member Staff who represent their respective functional domains. Further for administrative convenience, Indian Railways is divided into 17 Zones, each headed by a General Manager (GM). The Zonal Railways are further divided into 68 divisions, each under a Divisional Railway Manager (DRM) where teams of officers, supervisors and staff are directly looking after day to day operational works of the Railways and interacting with rail users. In addition, there are a number of Production Units, Training Establishments, Public Sector Enterprises and other offices working under the control of Railway Board.

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 Equipment Van (ARMVs). 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. Indian Railways Disaster Management Plan has been prepared based on the

principles incorporated in the Disaster Management Act, National Disaster Management Plan and also Guidelines issued by NDMA. The basic philosophy to be followed is of sharing resources of all Government Departments along with Railways own resources to handle serious train accidents, other mishaps, terrorism related crisis, natural calamities etc.

1.2 Concept of Disaster on Railways:

1.2.1 Disaster Risks in India:

India is vulnerable, in varying degrees, to a large number of natural as well as man-made disasters. 59% 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 7500 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.

1.2.2 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.

Definition of Disaster 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 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 by Railway Board 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 Management of Chemical Disasters and the Hospital DM Plan.

1.2.3 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 gangmen spread out all over the Indian Railways.
- Scouts and Guides
- Dedicated Rescue/Restoration and Medical Equipment on Rails.

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

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

(b) Train Accident related Disaster:-
Collisions (with a large number of casualties), Train marooned (flash floods), derailments on 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, and 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 a Train on fire, Railway installations etc., bomb blast at Railway Station/Train, Chemical (Terrorism) Disaster, Biological, Radiological and Nuclear Disaster.

1.2.5 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. are termed as Disasters.
- No more Relief and Rescue Centric.
- Holistic Approach adopted to incorporate :-
    - Prevention
    - Mitigation
    - Preparedness
    - Rescue and 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 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*."

1.2.7 Nodal department for Policy Formulation on DM on Indian Railways:

Disaster Management plan of Ministry of Railways, Zonal and Divisional plans has to be prepared by the safety department in coordination with the concerned departments of the railways and all other stake holders.

The Hospital DM plans and the Security arrangements (drills etc) shall be prepared and coordinated by the Medical and the Security department respectively.

The Management of Floods, Cyclones, Earthquakes, Landslides, etc, and preventive action/ mitigation shall be coordinated by the Civil Engineering Department.

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

1.2.8 Authority to declare a Disaster on Railways:

Railway Board has nominated GM, AGM or CSO (when GM/AGM are not available) of a Zonal Railway for declaring an untoward incident as Railway Disaster. With the adoption of the above definition of Railway disaster as envisaged in para 1.2.6, 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.

1.2.9 Sendai Framework

The NDMP is consistent with the approaches promoted globally by the United Nations, in particular the Sendai Framework for Disaster Risk Reduction 2015-2030 (hereafter "Sendai Framework") adopted at the Third UN World Conference in Sendai, Japan, on March 18, 2015 (UNISDR 2015a) as the successor instrument to the Hyogo Framework for Action 2005-2015. It is a non-binding agreement, which the signatory nations, including India, will attempt to comply with on a voluntary basis. However, India will make all efforts to contribute to the realization of the global targets by improving the entire disaster management cycle in India by following the recommendations in the Sendai Framework and by adopting globally accepted best practices.

The Sendai Framework was the first international agreement adopted within the context of the post-2015 development agenda. Two other major international agreements followed it in the same year: the Sustainable Development Goals 2015 – 2030 in September, and the UNCOP21 Climate Change agreement to combat human-induced climate change in December. DRR is a common theme in these three global agreements. The Paris Agreement on global climate change points to the importance of averting, minimizing, and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events, and the role of sustainable development in reducing the risk of loss and damage. These three agreements recognize the desired outcomes in DRR as a product of complex and interconnected social and economic processes, which overlap across the agendas of the three agreements. Intrinsic to sustainable development is DRR and the building of resilience to disasters. Further, effective disaster risk management contributes to sustainable development.

In the domain of disaster management, the Sendai Framework provides the way forward for the period ending in 2030. There are some major departures in the Sendai Framework:

- For the first time the goals are defined in terms of outcome-based targets instead of focusing on sets of activities and actions.
- It places governments at the centre of disaster risk reduction with the framework emphasizing the need to strengthen the disaster risk governance.
- There is significant shift from earlier emphasis on disaster management to addressing disaster risk management itself by focusing on the underlying drivers of risk.
- It places almost equal importance on all kinds of disasters and not only on those arising from natural hazards.
- In addition to social vulnerability, it pays considerable attention to environmental aspects through a strong recognition that the implementation of integrated environmental and natural resource management approaches is needed for disaster reduction
- Disaster risk reduction, more than before, is seen as a policy concern that cuts across many sectors, including health and education

As per the Sendai Framework, in order to reduce disaster risk, there is a need to address existing challenges and prepare for future ones by focusing on monitoring, assessing, and understanding disaster risk and sharing such information. The Sendai Framework notes that it is "urgent and critical to anticipate, plan for and reduce disaster risk" to cope with disaster. It requires the strengthening of disaster risk governance and coordination across various institutions and sectors. It requires the full and meaningful

participation of relevant stakeholders at different levels. It is necessary to invest in the economic, social, health, cultural and educational resilience at all levels. It requires investments in research and the use of technology to enhance multi-hazard Early Warning Systems (EWS), preparedness, response, recovery, rehabilitation, and reconstruction.

The four priorities for action under the Sendai Framework are:

1. Understanding disaster risk
2. Strengthening disaster risk governance to manage disaster risk
3. Investing in disaster risk reduction for resilience
4. Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction

India is a signatory to the Sendai Framework for a 15-year, voluntary, non-binding agreement which recognizes that the State has the primary role to reduce disaster risk but that responsibility should be shared with other stakeholders including local government, the private sector and other stakeholders. It aims for the "substantial reduction of disaster risk and losses in lives, livelihoods, and health and in the economic, physical, social, cultural, and environmental assets of persons, businesses, communities, and countries." India will make its contribution in achieving **the seven global targets set by the Sendai Framework:**

1) Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005– 2015;
2) Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005-2015;
3) Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030;
4) Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030;
5) Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020;
6) Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of the present Framework by 2030;
7) Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030.

The four priorities for action under the Sendai Framework have been incorporated into the DM plan of Railways is summarised below for quick reference:

Sendai Framework for DRR (2015-2030) Priority	**Chapters with the priority as its dominant theme**
1. Understanding disaster risk	Chapters 3, 12,13, 14, 16
2. Strengthening disaster risk governance to manage disaster risk	Chapters 3, 4, 5,6
3. Investing in disaster risk reduction for resilience	Chapters 3, 4, 5, 6, 7, 8, 9, 15
4. Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction	Chapters 4, 7, 15, 16,17,18

Chapter 2

INSTITUTIONAL FRAMEWORK FOR DISASTER MANAGEMENT

2.0 National Level

The overall coordination of disaster management vests with the Ministry of Home Affairs (MHA). The Cabinet Committee on Security (CCS) and the National Crisis Management Committee (NCMC) are the key committees involved in the top-level decision-making with regard to disaster management. The NDMA is the lead agency responsible for the preparation DM plans and the execution of DM functions at the national level. Figure 2-1 provides a schematic view of the basic institutional structure for DM at national level. The figure represents merely the institutional pathways for coordination, decision-making and communication for disaster management and does not imply any chain of command.

In most cases, state governments will be carrying out disaster management with the central government playing a supporting role. The central agencies will participate only on the request from the state government. Within each state, there is a separate institutional framework for disaster management at the state-level. The DM Act of 2005 provides for the setting up of NDMA at national level, and, the SDMA at the state level. The role, composition and the role of the key decision making bodies for disaster management at national-level are briefly described in the Table 2-1.

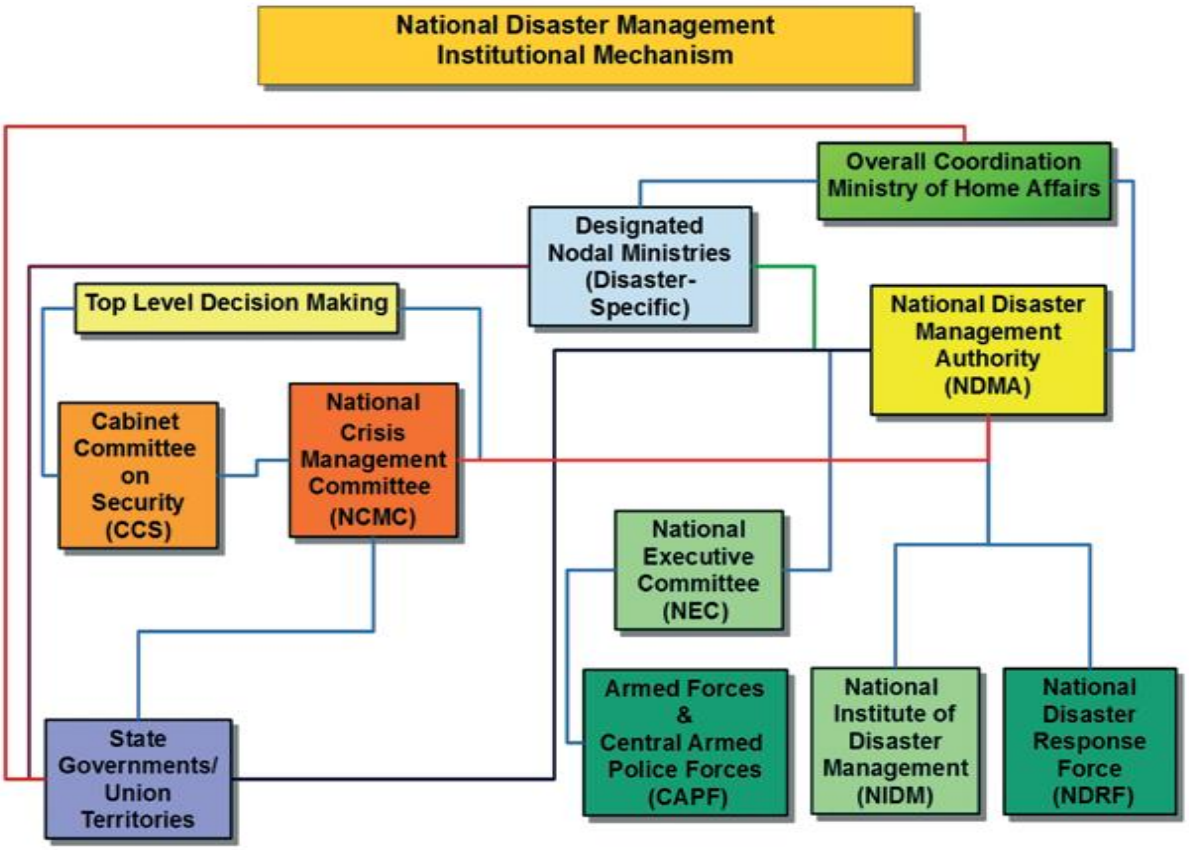

Figure 2-1: National-level disaster management - basic institutional framework

Table 2-1: Key national-level decision-making bodies for disaster management

	Name	Composition	Vital Role
1.	**Cabinet Committee on Security (CCS)**	Prime Minister, Minister of Defence, Minister of Finance, Minister of Home Affairs, and Minister of External Affairs	• Evaluation from a national security perspective, if an incident has potentially security implications • Oversee all aspects of preparedness, mitigation and management of Chemical, Biological, Radiological and Nuclear (CBRN) emergencies and of disasters with security implications • Review risks of CBRN emergencies from time to time, giving directions for measures considered necessary for disaster prevention, mitigation, preparedness and effective response
2.	**National Crisis Management Committee (NCMC)**	Cabinet Secretary (Chairperson) • Secretaries of Ministries/ Departments and agencies with specific DM responsibilities	• Oversee the Command, Control and Coordination of the disaster response • Give direction to the Crisis Management Group as deemed necessary • Give direction for specific actions to face crisis situations
3.	**National Disaster Management Authority (NDMA)**	• Prime Minister (Chairperson) • Members (not exceeding nine, nominated by the Chairperson)	• Lay down policies, plans and guidelines for disaster management • Coordinate their enforcement and implementation throughout the country • Approve the NDMP and the DM plans of the respective Ministries and Departments of Government of India • Lay down guidelines for disaster management to be followed by the different Central Ministries, Departments and the State Governments
4.	National Executive Committee (NEC)	Union Home Secretary (Chairperson) • Secretaries to the GOI in the Ministries/ Departments of Agriculture, Atomic Energy, Defence, Drinking Water and sanitation, Environment, Forests and Climate Change Finance (Expenditure), Health and Family Welfare, Power, Rural Development, Science and Technology, Space, Telecommunications, Urban Development, Water	• To assist the NDMA in the discharge of its functions • Preparation of the National Plan • Coordinate and monitor the implementation of the National Policy • Monitor the implementation of the National Plan and the plans prepared by the Ministries or Departments of the Government of India • Direct any department or agency of the Govt. to make available to the NDMA or SDMAs such men, material or resources as are available with it for the purpose of emergency

		Resources, River Development and Ganga Rejuvenation, The Chief of the Integrated Defence Staff of the Chiefs of Staff Committee, ex officio as members. • Secretaries in the Ministry of External Affairs, Earth Sciences, Human Resource Development, Mines, Shipping, Road Transport and Highways and Secretary, NDMA are special invitees to the meetings of the NEC.	response, rescue and relief • Ensure compliance of the directions issued by the Central Government • Coordinate response in the event of any threatening disaster situation or disaster • Direct the relevant ministries/ Departments of the GoI, the State Governments and the SDMAs regarding measures to be taken in response to any specific threatening disaster situation or disaster. • Coordinate with relevant Central Ministries/Departments/Agencies which are expected to provide assistance to the affected State as per standard Operating Procedures (SOPs) Coordinate with the Armed Forces, Central Armed Police Forces6 (CAPF), the National Disaster Response Force (NDRF) and other uniformed services which comprise the GoI's response to aid the State authorities • Coordinate with India Meteorological Department (IMD) and a number of other specialised scientific institutions which constitute key early warning and monitoring agencies • Coordinate with Civil Defence volunteers, home guards and fire services, through the relevant administrative departments of the State Governments
5.	**National Disaster Response Force (NDRF)**	Specially trained force headed by a Director General Structured like para military forces for rapid deployment	Provide assistance to the relevant State Government/District Administration in the event of an imminent hazard event or in its aftermath
6.	**National Institute of Disaster Management (NIDM)**	Union Home Minister; Vice Chairman, NDMA; Members including Secretaries of various nodal Ministries and Departments of Government of India and State Governments and heads of national levels scientific, research and technical organizations, besides eminent scholars, scientists and practitioners.	• Human resource development and capacity building for disaster management within the broad policies and guidelines laid down by the NDMA • Design, develop and implement training programmes • Undertake research • Formulate and implement a comprehensive human resource development plan

			• Provide assistance in national policy formulation, assist other research and training institutes, state governments and other organizations for successfully discharging their responsibilities • Develop educational materials for dissemination • Promote awareness generation

From time to time, the central government notifies hazard-specific nodal ministries to function as the lead agency in managing particular types of disasters (see Table 2-2 for current list of disasters specific nodal ministries notified by GoI).

Table 2-2: Nodal Ministry for Management / Mitigation of Different Disasters

	Disaster	**Nodal Ministry/ Department**
1.	Biological	Min. of Health and Family Welfare (MoHFW)
2.	Chemical and Industrial	Min. of Environment, Forest sand Climate Change (MoEFCC)
3.	Civil Aviation Accidents	Min. of Civil Aviation (MoCA)
4.	Cyclone/Tornado	Min. of Earth Sciences (MoES)
5.	Tsunami	Min. of Earth Sciences (MoES)
6.	Drought/Hailstorm/Cold Wave and Frost/Pest Attack	Min. of Agriculture and Farmers Welfare (MoAFW)
7.	Earthquake	Min. of Earth Sciences (MoES)
8.	Flood	Min. of Water Resources (MoWR)
9.	Forest Fire	Min. of Environment, Forests, and Climate Change (MoEFCC)
10.	Landslides	Min. of Mines (MoM)
11.	Avalanche	Min. of Defence (MoD)
12.	Nuclear and Radiological Emergencies	Dept. of Atomic Energy (DAE)
13.	Rail Accidents	Min. of Railways (MoR)
14.	Road Accidents	Min. of Road Transport and Highways (MoRTH)
15.	Urban Floods	Min. of Urban Development (MoUD)

2.1 National Disaster Management Authority (NDMA)

The Government of India established the NDMA in 2005, headed by the Prime Minister. Under the DM Act 2005, the NDMA, as the apex body for disaster management, shall have the responsibility for laying down the policies, plans, and guidelines for disaster management for ensuring timely and effective response to disaster. The guidelines of NDMA will assist the Central Ministries, Departments, and States to formulate their respective DM plans. It will approve the National Disaster Management Plans and DM plans of the Central Ministries / Departments. It will take such other measures, as it may consider necessary, for the prevention of disasters, or mitigation, or preparedness and capacity building, for dealing with a threatening disaster situation or disaster. Central Ministries / Departments and State Governments will extend necessary cooperation and assistance to NDMA for carrying out its

mandate. It will oversee the provision and application of funds for mitigation and preparedness measures.

NDMA has the power to authorise the Departments or authorities concerned, to make emergency procurement of provisions or materials for rescue and relief in a threatening disaster situation or disaster. The general superintendence, direction, and control of the National Disaster Response Force (NDRF) is vested in and will be exercised by the NDMA. The National Institute of Disaster Management (NIDM) works within the framework of broad policies and guidelines laid down by the NDMA. The NDMA has the mandate to deal with all types of disasters – natural or human-induced. However, other emergencies such as terrorism (counter-insurgency), law and order situations, hijacking, air accidents, CBRN weapon systems, which require the close involvement of the security forces and/or intelligence agencies, and other incidents such as mine disasters, port and harbour emergencies, forest fires, oilfield fires and oil spills will be handled by the National Crisis Management Committee (NCMC). Nevertheless, NDMA may formulate guidelines and facilitate training and preparedness activities in respect of CBRN emergencies.

2.2 National Institute of Disaster Management (NIDM)

As per the provisions of the Chapter-VII of the DM Act, Government of India constituted the National Institute of Disaster Management (NIDM) under an Act of Parliament with the goal of being the premier institute for capacity development for disaster management in India and the region. The vision of NIDM is to create a Disaster Resilient India by building the capacity at all levels for disaster prevention and preparedness. NIDM has been assigned nodal responsibilities for human resource development, capacity building, training, research, documentation, and policy advocacy in the field of disaster management. The NIDM has built strategic partnerships with various ministries and departments of the central, state, and local governments, academic, research and technical organizations in India and abroad and other bi-lateral and multi-lateral international agencies. It provides technical support to the state governments through the Disaster Management Centres (DMCs) in the Administrative Training Institutes (ATIs) of the States and Union Territories. Presently it is supporting as many as 30 such centres. Six of them are being developed as Centres of Excellence in the specialised areas of risk management – flood, earthquake, cyclone, drought, landslides, and industrial disasters.

2.3 National Disaster Response Force (NDRF)

The NDRF has been constituted as per the Chapter-VIII of the DM Act 2005 as a specialist response force that can be deployed in a threatening disaster situation or disaster. As per the DM Act, the general superintendence, direction and control of the NDRF shall be vested and exercised by the NDMA. The command and supervision of the NDRF shall vest with the Director General appointed by the Government of India. The NDRF will position its battalions at different locations as required for effective response. NDRF units will maintain close liaison with the designated State Governments and will be available to them in the event of any serious threatening disaster situation. The NDRF is equipped and trained to respond to situations arising out of natural disasters and CBRN emergencies. The NDRF units will also impart basic training to all the stakeholders identified by the State Governments in their respective locations. Further, a National Academy will be set up to provide training for trainers in disaster management and to meet related National and International commitments.

Experience in major disasters has clearly shown the need for pre-positioning of some response forces to augment the resources at the State level at crucial locations including some in high altitude regions.

2.3.1 General – First and Key Responders:

The role and importance of community, under the leadership of the local authorities, Panchayati Raj Institutions (PRIs) and Urban Local Bodies (ULBs), being the bedrock of the process of disaster response, is well recognized. For their immediate support, there are other important first responders like the police, State Disaster Response Force (SDRFs), Fire and Medical Services. The NDRF will provide specialist response training whenever required. In serious situations, the resources of all NDRF battalions, on an as required basis, will be concentrated in the shortest possible time in the disaster affected areas. Other important responders will be the Civil Defence, Home Guards and youth organizations such as NCC, NSS and NYKS. The deployment of the armed forces will also be organized on as required basis.

2.3.2 Location, Constitution and Functions

These have been formed under the Disaster Management Act at 12 selected locations in the country for dealing with relief and rescue operations related to all types of disasters. The NDRF consists of battalions of Central paramilitary forces drawn from the Border Security Force(BSF), Indo-Tibetan Border Police(ITBP), Central Industrial Security Force (CISF)and Central Reserve Police Force (CRPF) for the purpose of specialist response in disaster situations. Each Battalion has 6 Companies comprising of 3 teams each. Team comprises of 45 men out of which 24 are for Search & Rescue and balance 21 for support functions. Short-listed & trained staff are on deputation in NDRF.

Details of NDRF organization and 12 battalions are as under:

S.No.	Name of Officers/Designation and Location of Deployment	STD Code	Tele(O)	Unit Control Room no.	Fax Nos.
Hd. Qrs.	DG/NDRF, 6th floor, NDCC-II Building, Jai Singh Road, New Delhi - 110001	011	23438020 23438119	_	23438091
1.	Commandant, Ist Bn NDRF Patgoan PO Azara, Distt. Kamrup Metro, Guwahati-781017.	0361	2840027	2840284 09401048790 09435117246	2849080
2.	Commandant, 2nd BN NDRF, Near RRI Camp. Haringhata, Mohanpur, Nadia, West Bengal Pin - 741246	033	25875032	25875032 09474061104 09474116775	25875032
3.	Commandant 3rd BN NDRF PO-Mundali,Cuttack, Odisha Pin - 754013	0671	2879710	2879711 09437581614	2879711
4.	Commandant 4th BN NDRF PO-Suraksha Campus Arrakonam,Distt. Vellore, Tamilnadu - 631152	04177	246269	246594 09442140269	246594

5.	Commandant 5th Bn NDRF, SudumbareTaluka, Distt – Maval Pune (Maharashtra) Pin. 412109	02114	247010	247000 09422315628	247008
6.	Commandant,6thBn NDRF Chilora Road, Gandhinagar Pin - 382042	079	23202540	23201551 09723632166	23201551
7.	Commandant 7th Bn NDRF Bibiwala Road, Bhatinda (Punjab) Pin - 151001	0164	2246193	2246193 2246570	2246570
8.	Commandant 8thBn NDRF Kamla Nehru Nagar, Ghaziabad, (UP) Pin - 201002	0120	2766013	2766618 09412221035	2766012
9.	Commandant 9thBn NDRF, Bihata Patna, Bihar, Pin - 801103	06115	253942	253939 08544415050 09525752125	253939
10.	Commandant 10thBn NDRF ANU campus, Nagarjuna Nagar, Distt- Vijaywada(AP) Pin - 522510	0863	2293178	2293050 08333068559	2293050
11.	Commandant 11th Bn NDRF, Gautam Budh Bhawan, Maqboolalam Road,Varanasi, U.P. Pin - 221002	0542	2501201	2501101 08004931410	2501101
12.	Commandant 12th Bn NDRF, Doimukh, Distt- Papum Pare, Itanagar, Arunachal Pradesh. Pin - 791112.	0360	2277109	2277106 2277104 09485235464	2277106

Locations of Regional Response Centres (RRC) of NDRF:

NDRF HQ	**Teams/Coys Relocations Places**	**Telephone No.**
1st NDRF Bn Guwahati (Assam)	1. Aizwal (Mizoram)	09862266296
	2. Agartala (Tripura)	09435117479
2nd NDRF Bn Kolkata(West Bengal)	3. Pakyong, Gangtok (Sikkim)	09474055715
	4. Siliguri (West Bengal)	0353-2005415, 09474051303
	5. Kolkata (West Bengal)	09474054898
3rd NDRF Bn Mundali (Odisha)	6. Balasore (Odisha)	09437964575
4th NDRF Bn Arakkonam (Tamilnadu)	7. Port Blair (Andaman & Nicobar)	03192-289066, 09442112269
	8. Chennai (Tamil Nadu)	044-24420269, 09442112269
	9. Thrissur (Kerala)	09442105069
5th NDRF Bn Pune (Maharashtra)	10. Mumbai (Maharashtra)	09423578447, 09422316997
6th NDRF Bn Vadodara (Gujarat)	11. Gandhinagar (Gujarat)	079- 23202540, 09723632166
	12. Nareli (Rajasthan)	09660822599
7th NDRF Bn Bhatinda (Punjab)	13. Srinagar (J&K)	0164- 2246193
	14. Nurpur, Kangra (Himachal Pradesh)	0164- 2246193
	15. Panchkula (Haryana)	09465884337, 09472599096

8th NDRF Bn Ghaziabad (UP)	16. Dwarka (Delhi)	09412221058
	17. R K Puram (Delhi)	09412221049
	18. Noida (Uttar Pradesh)	
	19. Jhajra, Dehradun (Uttrakhand)	09412221057
9th NDRF Bn Bihta, Patna (Bihar)	20. Supaul (Bihar)	08544415042
	21. Ranchi (Jharkhand)	08544415055
10th NDRF Bn Vijayawada (AP)	22. Bangalore (Karnataka)	09482978719, 09482978715, 080-28531005
	23. Hyderabad (Telangana)	040-23565666, 08333068536, 08333068547
	24. Vishakhapatnam (Andhra Pradesh)	083330685665, 08333068560
11th NDRF Bn Varanasi (UP)	25. Lucknow (UP)	08004931459
	26. Gorakhpur (UP)	08004931457
	27. Bhopal (Madhya Pradesh)	08004931412
12th NDRF Bn Doimukh, Arunachal Pradesh	28. Kohima (Nagaland)	09485235472

As per the Disaster Management Act, various ministries and departments under Government of India should join hands for mutual assistance in case of a disaster. Assistance from local government and non-government agencies is invariably required by the railway administration for prompt relief and rescue operation in case of disasters affecting railways and, therefore, assistance of NDRF could be of great help to the railways. The rail infrastructure is not in an island away from the civil areas (of the Districts/States). In most cases of a disaster, other than a train accident, the State Governments as well as the Zonal Railways would, therefore, requisition the NDRF simultaneously (for the same disaster). Coordination amongst the affected agencies (many departments of the Central Government and the States) is very important before the help of NDRF is required.

2.3.3 Coordination with NDRF

Zonal Railways should get in touch with NDRF offices at the nearby locations to have the first-hand knowledge of the resources available with them and also to familiarize them with railway related disaster situations and expose them to the issues relevant to the rescue and relief of passengers during railway accident. It has also been advised to associate NDRF in full scale exercise that is held once every year. There are no charges for availing the services of NDRF except the rail transportation which railways may provide at railways cost for attending to rail disasters. Railways may also have to provide rail transportation logistics for transporting NDRF team even in case of non-railway exigencies.

The Railway Board has empowered DRMs/CSOs to directly requisition the relevant NDRF battalion for relief and rescue operations depending on the gravity of situation so that their services could be made available expeditiously without any loss of time. NDRF Head quarter office, New Delhi will draw an annual calendar for zone/division-wise meeting between NDRF Battalion Commandants and Railway Safety officials for better coordination and management during disasters/major train accidents. NDRF battalion should carry out at least one or two mock exercises/coordination meeting with each zonal Railway in a year, for which an annual calendar will be issued by Board in consultation with NDRF HQs office.

2.4 State Level

As per the DM Act of 2005, each state in India shall have its own institutional framework for disaster management. Among other things, the DM Act, mandates that each State Government shall take necessary steps for the preparation of state DM plans, integration of measures for prevention of disasters or mitigation into state development plans, allocation of funds, and establish EWS. Depending on specific situations and needs, the State Government shall also assist the Central Government and central agencies in various aspects of DM. Each state shall prepare its own State Disaster Management Plan.

The DM Act mandates the setting of a State Disaster Management Authority with the Chief Minister as the *ex officio* Chairperson. Similar system will function in each Union Territory with Lieutenant Governor as the Chairperson. At the district level, District Disaster Management Authority (DDMA), the District Collector or District Magistrate or the Deputy Commissioner, as applicable, will be responsible for overall coordination of the disaster management efforts and planning. Figure- 2-2 provides schematic view of the typical state-level institutional framework does not imply any chain of command.

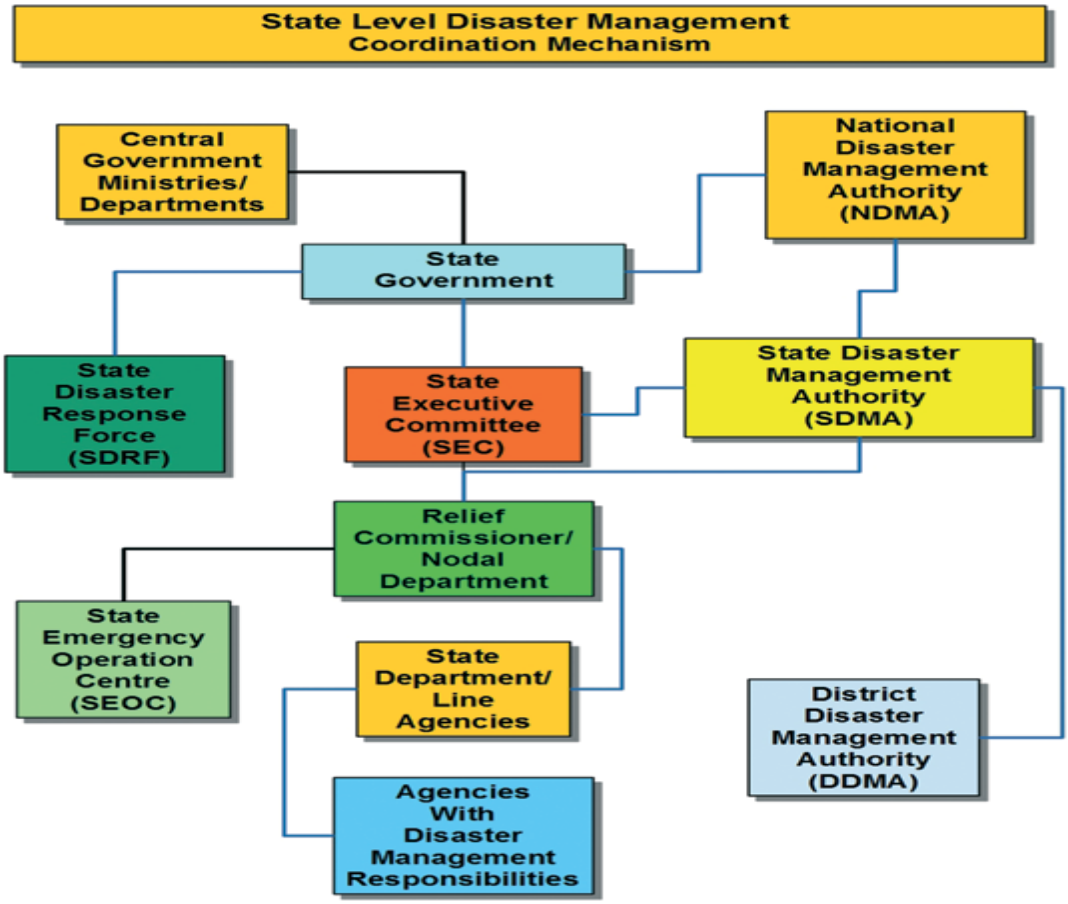

Figure 2.2 : State level Disaster Management – Basic Institutional framework

2.5 State Disaster Management Authority (SDMA)

As per provisions in Chapter-III of the DM Act, each State Government shall establish a State Disaster Management Authority (SDMA) or its equivalent under a different name with the Chief Minister as the Chairperson. In case of other UTs, the Lieutenant Governor or the Administrator shall be the Chairperson of that Authority. For the UT of Delhi, the Lieutenant

Governor and the Chief Minister shall be the Chairperson and Vice-Chairperson respectively of the State Authority. In the case of a UT having Legislative Assembly, except the UT of Delhi, the Chief Minister shall be the Chairperson of the Authority established under this section. The SDMA will lay down policies and plans for DM in the State. It will, inter alia approve the State Plan in accordance with the guidelines laid down by the NDMA, coordinate the implementation of the State Plan, recommend provision of funds for mitigation and preparedness measures and review the developmental plans of the different Departments of the State to ensure the integration of prevention, preparedness and mitigation measures. The State Government shall constitute a State Executive Committee (SEC) to assist the SDMA in the performance of its functions. The SEC will be headed by the Chief Secretary to the State Government. The SEC will coordinate and monitor the implementation of the National Policy, the National Plan, and the State Plan. The SEC will also provide information to the NDMA relating to different aspects of DM.

2.6 District Disaster Management Authority (DDMA)

As per provisions in Chapter-IV of the DM Act, each State Government shall establish a District Disaster Management Authority for every district in the State with such name as may be specified in that notification. The DDMA will be headed by the District Collector, Deputy Commissioner, or District Magistrate as the case may be, with the elected representative of the local authority as the Co-Chairperson. The State Government shall appoint an officer not below the rank of Additional Collector or Additional District Magistrate or Additional Deputy Commissioner, as the case may be, of the district to be the Chief Executive Officer of the District Authority. The DDMA will act as the planning, coordinating and implementing body for DM at the District level and take all necessary measures for the purposes of DM in accordance with the guidelines laid down by the NDMA and SDMA. It will, inter alia, prepare the DM plan for the District and monitor the implementation of the all relevant national, state, and district policies and plans. The DDMA will also ensure that the guidelines for prevention, mitigation, preparedness, and response measures laid down by the NDMA and the SDMA are followed by all the district-level offices of the various departments of the State Government.

2.7 Plan Implementation

The DM Act 2005 enjoins central and state governments to make provisions for the implementation of the disaster management plans. In this respect, the sections of the DM Act 2005 applicable for national, state, and district DM plans are 11, 23, and 31. The Chapters V and VI of the DM Act spell out the responsibilities of the central, state, and local governments with respect to disaster management. The DM Act states that every Ministry or Department of the Government of India shall make provisions, in its annual budget, for funds for the purposes of carrying out the activities and programmes set out in its disaster management plan. The Act mandates that every Ministry and Department of the Government of India and every state must prepare a DMP in accordance with the NDMP. Annually, respective DM authorities must review and update their DM plans. Central ministries and state governments will integrate DRR into their development policy, planning and programming at all levels. They must adopt a holistic approach and build multi-stakeholder partnerships at all levels, as appropriate, for the implementation of the DM plans. Depending on its nature, different components of the NDMP will be implemented within a span of five, ten, or fifteen years. The plan is highly ambitious and the complete implementation of all elements across the country may take a very long time. Nevertheless, both central and state governments have already made considerable progress and they are expected to make sincere efforts for the implementation of the DM plans.

Chapter 3

REDUCING RISK AND ENHANCING RESILIENCE

3.1 Background

The Disaster Management Act, 2005 and the National Policy, 2009 marks the institutionalization of paradigm shift in disaster management in India, from a relief-centric approach to one of proactive prevention, mitigation and preparedness. The Policy notes that while it is not possible to avoid natural hazards, adequate mitigation and disaster risk reduction measures can prevent the hazards becoming major disasters. Disaster risk arises when hazards interact with physical, social, economic and environmental vulnerabilities. The National Policy suggests a multi-pronged approach for disaster risk reduction and mitigation consisting of the following:

- Integrating risk reduction measures into all development projects
- Initiating mitigation projects in identified high priority areas through joint efforts of the Central and State Governments
- Encouraging and assisting State level mitigation projects
- Paying attention to indigenous knowledge on disaster and coping mechanisms
- Giving due weightage to the protection of heritage structures

In the terminology adopted by the UNISDR, the concept and practice of reducing disaster risks involve systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events. While both the terms “Disaster Reduction” and “Disaster Risk Reduction” are widely used, the latter provides a better recognition of the ongoing nature of disaster risks and the ongoing potential to reduce these risks. Mitigation consists of various measures required for lessening or limiting the adverse impacts of hazards and related disasters.

The disaster risk reduction and mitigation plan integrates the global targets into the national efforts and seeks to strengthen significantly India’s reliance to both natural and human-induced disasters. The DM Act 2005 defines "Mitigation" as measures aimed at reducing the risk, impact, or effects of a disaster or threatening disaster situation. ”Goal of mitigation is to minimize risks from multiple hazards and the threats from individual hazards need not always occur in isolation. At times, a hazardous event can trigger secondary events. For example, an earthquake can produce a tsunami or may create flooding or landslides. Similarly, cyclones often lead to flooding and various other cascaded events spread over an area wider than the primary event. In addition, demographics, nature of human settlements, and effects of global climate change can magnify the vulnerability of the communities at risk. The DM Plan, therefore, focuses on enhancing the mitigation capabilities for multiple hazards, their likely cascading effects.

Guiding principle of Sendai Framework states that disaster risk reduction requires responsibilities to be shared by different divisions of governments and various agencies. The effectiveness in disaster risk reduction will depend on coordination mechanisms within and across sectors and with relevant stakeholders at all levels. For each hazard, the approach used in national plan incorporates the four priorities enunciated in the Sendai Framework into the planning framework for Disaster Risk Reduction under the five thematic areas for action.

1. Understanding Risk
2. Inter-Agency Coordination
3. Investing in DRR – Structural Measures
4. Investing in DRR – Non-Structural Measures
5. Capacity Development

For each of these thematic areas for action, a set of major themes have been identified for inclusion in the planning framework.

3.1.1 Understanding Risk

This thematic area for action focuses on understanding disaster risk, the Priority-1 in the Sendai Framework integrates into it numerous actions needed for strengthening disaster resilience. The major themes for action are: a) Observation Networks, Information Systems, Research, Forecasting, b) Zoning / Mapping, c) Monitoring and Warning Systems, d) Hazard Risk and Vulnerability Assessment (HRVA), and e) Dissemination of Warnings, Data, and Information. Having adequate systems to provide warnings, disseminate information, and carry out meaningful monitoring of hazards are crucial to disaster risk reduction, and improving resilience. They are also an integral part of improving the understanding of risk.

3.1.2 Inter-Agency Coordination

Inter-agency coordination is a key component of strengthening the disaster risk governance - Priority-2 of the Sendai Framework. The major themes for action required for improving the top level interagency coordination are a) Overall disaster governance b) Response c) Providing warnings, information, and data and d) Non-structural measures. The central ministries and agencies mentioned are those vested with hazard-specific responsibilities by the Govt. of India or those expected to play major roles in the thematic areas given in the matrix.

3.1.3 Investing in DRR – Structural Measures

Undertaking necessary structural measures is one of the major thematic areas for action for disaster risk reduction and enhancing resilience. These consist of various physical infrastructure and facilities required to help communities cope with disasters. The implementation of these measures is essential to enhance disaster preparedness, a component of Priority-4 of the Sendai Framework. It is also an important component of investing in disaster risk reduction for resilience, which is Priority-3 of Sendai Framework.

3.1.4 Investing in DRR – Non-Structural Measures

Sets of appropriate laws, mechanisms, and techno-legal regimes are crucial components in strengthening the disaster risk governance to manage disaster risk, which is Priority-2 of the Sendai Framework. These non-structural measures comprising of laws, norms, rules, guidelines, and techno-legal regime (e.g., building codes) framework and empowers the authorities to mainstream disaster risk reduction and disaster resilience into development activities. The central and state governments will have to set up necessary institutional support for enforcement, monitoring, and compliance.

3.1.5 Capacity Development

Capacity development is a theme in all the thematic areas for action. The Sendai Priority-2 (Strengthening DRR governance to manage DR) and Priority-3 (Investing in DRR for resilience) are central to capacity development. The capacity development includes training programs, curriculum development, large-scale awareness creation efforts, and carrying out regular mock drills and disaster response exercises. The capability to implement, enforce, and monitor various disaster mitigation measures has to be improved at all levels from the local to the higher levels of governance. It is also strengthening the DRR governance at all levels to better manage risk and to make the governance systems more responsive.

3.1.6 Hazard-wise Responsibility Matrices for Disaster Risk Mitigation

For the DM plans to succeed, it is necessary to identify various stakeholders/agencies and clearly specify their roles and responsibilities. At all levels - from local to the centre - the relevant authorities must institutionalise programmes and activities at the ministry/department levels, and increase inter-ministerial and inter-agency coordination and networking. They must also rationalise and augment the existing regulatory framework and infrastructure. For each hazard, in the subsections that follow, themes for action are presented in a separate responsibility matrix for each of the five thematic areas for action. It must be noted that the role of the central agencies is to support the disaster-affected State or the UT in response to requests for assistance. However, the central agencies will play a pro-active role in disaster situations. In the domains of DM planning, preparedness, and capacity building, the central agencies will constantly work to upgrade Indian DM systems and practices as per global trends. This section covers the hazards relevant to Indian Railways listed below:

1) Train Accidents
2) Cyclone and Wind
3) Floods
4) Seismic
5) Tsunami
6) Landslides and Snow Avalanches

3.2 Train Accidents

Train Accidents		**Understanding Disaster Risk, Investing, capacity development and Mitigation**					
S. No.	**Major Theme**	**Railway Board/Zonal/Divisional Agencies and their Responsibilities**					
		Railway Board	**Responsibility-Board**	**Zonal Railway**	**Responsibility- Zone**	**Division**	**Responsibility- Division**
1.	Collision of trains	S&T	Policies on development and maintenance of reliable signaling systems over IR. Developing reliable train protection system over IR.	S&T	Implementation of RB policies and guidelines for reliable signalling system. Proliferation of ATP and its maintenance	S&T	Implementation of RB policies and guidelines for reliable signalling system. Proliferation of ATP and its maintenance.
		Traction	Policy guidelines on maintenance of locomotives. Developing Training Modules and policies regarding monitoring of crew. Developing of technology to assist and monitor crew.	Mechanical and Electrical.	Implementation of Board guidelines for reliable maintenance of locomotives. Training and monitoring of crew.	Mechanical and Electrical.	Implementation of Board guidelines for reliable maintenance of locomotives. Training and monitoring of crew.
		Establishment	Developing training modules and policy regarding training/refresher courses for running staff.	Personnel	Implementation of Board Policies and monitoring performances of the training centres.	Personnel	Implementation of Board Policies and monitoring performances of the divisional training centres.
		Safety	Preparing general rules and procedures for safe train operations.	Safety	Monitoring and auditing safety systems.	Safety	Monitoring and auditing safety systems.
		Traffic Transportation	Policy guidelines on working of station staff and guards.	Operating	Preparing subsidiary rules and effective implementation of GR & SR during train operations.	Operating	Effective implementation of GR & SR during train operations.

Train Accidents		Understanding Disaster Risk, Investing, capacity development and Mitigation					
S. No.	**Major Theme**	**Railway Board/Zonal/Divisional Agencies and their Responsibilities**					
		Railway Board	**Responsibility-Board**	**Zonal Railway**	**Responsibility- Zone**	**Division**	**Responsibility- Division**
		Engineering (Track Machines)	Developing Training Modules and policies regarding monitoring of track machine operators. Developing of technology to assist and monitor track machine operators. Policy guidelines on maintenance of track machines.	Engineering	Training and monitoring of track machine operators. Proper maintenance of track machines		
		Traction	Policy guidelines on maintenance of tower wagons. Developing Training Modules and policies regarding monitoring of tower wagon operators. Developing of technology to assist and monitor tower wagon operators.	Electrical (TRD)	Implementation of Board guidelines for reliable maintenance of tower wagons. Training and monitoring of tower wagon operators.	Mechanical and Electrical (TRD).	Implementation of Board guidelines for reliable maintenance of tower wagons. Training and monitoring of tower wagon operators.
		Rolling Stock	Policy guidelines on maintenance of coaches/wagons/EMU/DEMU/ train sets. Development of new technology to assist and monitor performance of above rolling stock.	Mechanical and Electrical (TL)	Implementation of Board guidelines for reliable maintenance of coaches/wagons/ EMUs/DEMUs/train sets.	Mechanical and Electrical (TL)	Implementation of Board guidelines for reliable maintenance of coaches/wagons/ EMUs/DEMUs/train sets.
		Security	Policy guidelines on security and Co-ordination with State Police, CAPFs and Central state Intelligence agencies.	Security	Implementation of Board guidelines	Security	Implementation of Board guidelines

Train Accidents		**Understanding Disaster Risk, Investing, capacity development and Mitigation**					
S. No.	**Major Theme**	**Railway Board/Zonal/Divisional Agencies and their Responsibilities**					
		Railway Board	**Responsibility-Board**	**Zonal Railway**	**Responsibility- Zone**	**Division**	**Responsibility- Division**
2.	Derailments	S&T	Policy on development and maintenance of reliable signaling systems over IR.	S&T	Implementation of RB policies and guidelines for reliable signalling system.	S&T	Implementation of RB policies and guidelines for reliable signalling system.
		Traction including TRD	Policy guidelines on maintenance of locomotives and tower wagons. Developing Training Modules and policies regarding monitoring of crew. Developing of technology to assist and monitor crew.	Mechanical and Electrical.	Implementation of Board guidelines for reliable maintenance of locomotives and tower wagons. Training and monitoring of crew.	Mechanical and Electrical.	Implementation of Board guidelines for reliable maintenance of locomotives and tower wagons. Training and monitoring of crew.
		Establishment	Developing training modules and policy regarding training/refresher courses for safety category staff.	Personnel	Implementation of Board Policies and monitoring performances of the training centres.	Personnel	Implementation of Board Policies and monitoring performances of the training centres.
		Safety	Preparing general rules and procedures for safe train operations. Monitoring and auditing of safety systems.	Safety	Monitoring and auditing of safety systems.	Safety	Monitoring and auditing of safety systems.
		Traffic	Policy guidelines on working of station staff & guards and commercial matters.	Operating	Preparing subsidiary rules and effective implementation of GR & SR during train operations.	Operating	Effective implementation of GR & SR during train operations.
				Commercial	Implementation of Board guidelines regarding loading of commodities.	Commercial	Implementation of Board guidelines regarding loading of commodities.

Train Accidents		Understanding Disaster Risk, Investing, capacity development and Mitigation					
S. No.	**Major Theme**	**Railway Board/Zonal/Divisional Agencies and their Responsibilities**					
		Railway Board	**Responsibility-Board**	**Zonal Railway**	**Responsibility- Zone**	**Division**	**Responsibility- Division**
		Engineering including Track Machines	Policy guidelines and maintenance of track/bridges/ buildings /tunnel / FOB/ ROB/ RUB/Track machines. Developing Training Modules and policies regarding monitoring of engineering staff. Developing of technology to assist and monitor maintenance of engineering assets.	Engineering	Implementation of RB policies and guidelines for reliable engineering assets.	Engineering	Implementation of RB policies and guidelines for reliable engineering assets.
		Rolling stock	Policy guidelines on maintenance of coaches/ wagons/EMUs/DEMUs/train sets. Development of new technology to assist and monitor performance of above rolling stock.	Mechanical and Electrical (TL)	Implementation of Board guidelines for reliable maintenance of coaches/wagons/ EMUs/DEMUs/train sets.	Mechanical and Electrical (TL)	Implementation of Board guidelines for reliable maintenance of coaches/wagons/ EMUs/DEMUs/train sets.
		Security	Policy guidelines on security and coordination with State Police, CAPFs and central intelligence agencies.	Security	Implementation of Board guidelines.	Security	Implementation of Board guidelines.
3.	**Fire**	Traction including TRD	Policy guidelines on maintenance of locomotives and tower wagons. Developing Training Modules and policies regarding monitoring of crew. Developing of technology to minimize fire risk in	Mechanical and Electrical.	Implementation of Board guidelines for reliable maintenance of locomotives and tower wagons.	Mechanical and Electrical.	Implementation of Board guidelines for reliable maintenance of locomotives and tower wagons.

Train Accidents		Understanding Disaster Risk, Investing, capacity development and Mitigation					
S. No.	**Major Theme**	**Railway Board/Zonal/Divisional Agencies and their Responsibilities**					
		Railway Board	**Responsibility-Board**	**Zonal Railway**	**Responsibility- Zone**	**Division**	**Responsibility- Division**
			locomotive/tower wagons.				
		Establishment	Developing training modules and policy regarding training/refresher courses for safety category staff.	Personnel	Implementation of Board policies and monitoring performances of the training centres.	Personnel	Implementation of Board Policies and monitoring performances of the training centres.
		Safety	Monitoring and auditing of safety systems.	Safety	Monitoring and auditing of safety systems.	Safety	Monitoring and auditing of safety systems.
		Traffic Commercial	Policy guidelines on commercial matters.	Commercial	Implementation of Board guidelines regarding loading of commodities.	Commercial	Implementation of Board guidelines regarding loading of commodities.
		Engineering (Track Machines)	Policy guidelines and maintenance of track machines.	Engineering	Implementation of RB policies and guidelines for reliable engineering assets.		
		Rolling stock	Policy guidelines on maintenance of coaches /wagons /EMUs /DEMUs/ train sets to minimize fire hazards. Policy guidelines on development of new technology to minimize fire hazards. Requirements of Fire prevention and fire fighting infrastructure and equipments, their provision as well as procurement, installation and maintenance.	Mechanical and Electrical (TL)	Implementation of Board guidelines for reliable maintenance of coaches/wagons/ EMUs/DEMUs/train sets to minimize fire hazards. Requirements of Fire prevention and fire fighting infrastructure and equipments, their provision as well as procurement, installation and maintenance.	Mechanical and Electrical (TL)	Implementation of Board guidelines for reliable maintenance of coaches/wagons/ EMUs/DEMUs/train sets to minimize fire hazards. Requirements of Fire prevention and fire fighting infrastructure and equipments, their provision as well as procurement, installation and maintenance.
		Security	Policy guidelines on security at stations and access control.	Security	Implementation of Board guidelines.	Security	Implementation of Board guidelines.

Train Accidents		**Understanding Disaster Risk, Investing, capacity development and Mitigation**					
S. No.	**Major Theme**	**Railway Board/Zonal/Divisional Agencies and their Responsibilities**					
		Railway Board	**Responsibility-Board**	**Zonal Railway**	**Responsibility- Zone**	**Division**	**Responsibility- Division**
4.	**Manned and unmanned level crossings**	S&T	Policies on development and maintenance of reliable signaling systems at interlocked LCs.	S&T	Implementation of RB policies and guidelines for reliable signalling system at interlocked LCs.	S&T	Implementation of RB policies and guidelines for reliable signalling system at interlocked LCs.
		Traction	Policy on monitoring and counseling of crew.	Mechanical and Electrical.	Implementation of Board guidelines of monitoring of crew.	Mechanical and Electrical.	Implementation of Board guidelines of monitoring of crew.
		Establishment	Developing training modules and policy regarding training/refresher courses for safety category staff.	Personnel	Implementation of Board Policies and monitoring performances of the training centres.	Personnel	Implementation of Board Policies and monitoring performances of the training centres.
		Safety	Preparing general rules and procedures for safe train operations. Monitoring and auditing of safety systems.	Safety	Monitoring and auditing of safety systems.	Safety	Monitoring and auditing of safety systems.
		Traffic	Policy guidelines on working of station staff including traffic gatemen.	Operating	Preparing subsidiary rules and effective implementation of GR & SR during train operations.	Operating	Preparing subsidiary rules and effective implementation of GR & SR during train operations.
		Engineering	Policy guidelines and maintenance of manned and unmanned gates. Developing of technology to assist and monitor maintenance of LCs. Counseling and awareness campaign at manned and unmanned level crossing gates. Joint prosecution drive at unmanned level crossing gates	Engineering	Implementation of RB policies and guidelines for maintenance of LCs.	Engineering	Implementation of RB policies and guidelines for maintenance of LCs.

3.3 Cyclone and Wind Risk Mitigation
3.3.1 Understanding Risk

Cyclone and Wind						**Understanding Risk**		
SNo.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	Observation Networks, Information Systems, Research Forecasting.	IMD, MoES	• Modernization of Observation Network, equipment, • systems, technology. • Land-and Ocean-based observation systems • Cyclone database and forecasting • Research and studies to improve forecasts	State/UT, SDMA, CoR, Revenue Dept., State-level research and technical institutions.	Support and coordination	CE Directorate - (Bridge) Support and coordination	Engineering Department – Support and coordination	Engineering Department – Support and coordination
		DoS, IMD	Space and sea based observations.					
		MoES,IMR, NRSC, ISRO	Aircraft based and Unmanned Aerial Vehicle					
		IMD, DoS	Satellite-based Communication Systems.					
		MoES,DoS IMD, MoST, CSIR,DST	Promote research and studies – both in-house and extramural by providing research grants to researchers and institutions.					
2.	Zoning/ Mapping	DoS, MoEFCC, NRSC,SAC ISRO, MoST	Support the preparation of detailed maps to delineate coastal wetlands, mangroves and shelterbelts and tracts for coastal bio-shields using best tools, field studies, and satellite data	State/UT, State-level research and technical institutions	Carry out the mapping and related studies	CE Directorate - Support and coordination	Engineering Department – Preparation of detailed maps indicating vulnerable locations	Engineering Department – Preparation of detailed maps indicating vulnerable locations

Cyclone and Wind						**Understanding Risk**		
SNo.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
3.	Hazard Risk Vulnerability Assessment	NDMA, NIDM, MoST, DST, CSIR	• Promote studies, provide guidelines. • Studies on vulnerability covering social, economic, ecological, gender, and equity aspects. • Change in vulnerability and risk under climate change scenarios.	State/UT, SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Undertake HRVA as part of preparing and periodic revision of DM plans, and for development planning.	CE Directorate - (Bridge) Support and coordination	Engineering Department – Preparation of detailed maps indicating vulnerable locations	Engineering Department – Preparation of detailed maps indicating vulnerable locations
4.	Dissemination of warnings, data, and information	IMD	Quick, clear, effective dissemination among central and state agencies	State/UT, SDMA, CoR, Revenue Dept.,DDMA, Panchayats,ULBs	Dissemination of warnings to all (including fishermen), down to the last mile – remote, rural or urban; Regular updates to people in areas at risk	CE Directorate – (Bridge) Co-ordination with the concerned Ministries and Railway Zones.	Engineering Department – To coordinate with state Authorities and to disseminate early warning signals to Divisional Authorities.	Engineering Department – To Coordinate with Local Authorities and to disseminate early warning signals/ Information to last mile.
		MoIB, MoES	• Deployment of communication equipment. • Warnings using all types of options, types of technologies and media.	State/UT, SDMA, CoR , Revenue Dept., Information Dept., DDMA, Panchayats, ULBs	• Deployment of communication equipment. • Warnings using all types of options, types of technologies, and media			

Cyclone and Wind								Understanding Risk
SNo.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
		DST, Deity, DoT, MoCIT, MoIB	Facilitating last-mile connectivity and access to disaster risk information	State/UT,SDMA, CoR, Revenue Dept.,DDMA, Panchayats, ULBs	Ensure facilities and infrastructure for the implementation of adequate access of information to communities at risk			
			State Wide Area Networks (SWAN)	State/UT, Dept. of Science and Technology	Establishing seamless interface between national and state networks			
		IMD	Providing weather information online and offline and interface with mobile network service providers for warnings on radio, TV, and cell phones.	State/UT, SDMA, CoR, Revenue Dept., Information Dept.	Monitoring compliance by various network operators and service providers			

3.3.2 Inter-Agency Coordination

Cyclone and Wind						**Inter-Agency Coordination**		
S No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	**Overall Disaster governance**	MoES	Nodal ministry – providing coordination, technical inputs, and support	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Preparation and Implementation of DM plans and ensure the functioning of agencies with DM tasks	CE Directorate – (Bridge) Co-ordination with the concerned Ministries and Railway Zones.	Engineering Department – Implementation of DM plans	Engineering Department – Implementation of DM plans
2.	**Response**	MHA	Nodal ministry for central assistance	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Organising the immediate response and seeking assistance of central agencies	CE Directorate-(Bridge) Co-ordination with the concerned Ministries and Railway Zones	Engineering Department – Implementation of DM plans	Engineering Department – Implementation of DM plans
3.	**Warnings, Information, Data**	IMD, Cyclone Warning Centre, NDMA	Quick, clear, effective dissemination among central and state agencies	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Dissemination of warnings to all, down to the last mile – remote, rural or urban; Regular updates to people in areas at risk	CE Directorate – (Bridge) Co-ordination with the concerned Ministries and Railway Zones.	Engineering Department – To Coordinate with state Authorities and to disseminate early warning signals to Divisional Authorities.	Engineering Department – To Coordinate with Local Authorities and to disseminate early warning signals/ Information to last mile.
4.	**Non-structural measures**	MHA, NDMA, BIS	• Revised/Updated rules, norms, and codes • New/Updated standards • Review and improve laws, regulations and policies	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Adapting the norms/ codes as per State's requirement, enforcement, monitoring	CE Directorate-(Bridge) Co-ordination with the concerned Ministries and Railway Zones	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

3.3.3 Investing in DRR-Structural Measures

Cyclone and Wind								**Structural Measures**
SNo.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	**Hazard resistant construction, strengthening, and retrofitting of all lifeline structures and critical infrastructure**	NDMA, NBCC, BMTPC, CBRI, SERC, IE(I), all relevant Ministries/ Departments	Guidance and implementation	State/UT, SDMA, DDMA, Panchayats, ULBs, all relevant Departments/ Agencies	Collaboration with technical agencies and implementation	CE Directorate (Bridge) and Traction (TRD) – Policy guidelines, norms and codes.	Engineering Department – Adapting the norms/ codes Electrical department – Adapting the norms/ codes for TRD	Engineering Department – Adapting the norms/ codes Electrical department – Adapting the norms/ codes for TRD

3.3.4 Investing in DRR-Non-Structural Measures

Cyclone and Wind						**Structural Measures**		
SNo.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	**Laws Regulations Enforcement Mechanisms Techno-Legal regimes Institutional Arrangements Codes for disaster risk reduction Compliance monitoring**	MoES; MoEFCC, DoS, BIS	• Evolving codes • Guidance and Support • Oversight and monitoring of compliance with coastal zone laws	State/UT, CoR, Revenue Dept., Environment/ Forest Dept.	Take into account shoreline erosion, risk to structures, monitoring shoreline changes with regard to the preservation of natural barriers.	CE Directorate (Bridge) and Traction (TRD) – Policy guidelines, norms and codes.	Engineering Department – Adapting the norms/ codes Electrical department – Adapting the norms/ codes for TRD	Engineering Department – Adapting the norms/ codes Electrical department – Adapting the norms/ codes for TRD
		MoES; MoRD, MoEFCC	Coastal shelterbelts as a mandatory component under national afforestation programme	CADA, CZMA, DDMA, Panchayats, ULBs	All coastal states and UTs will complete the spread, preservation and restoration/regeneration of bio-shields			
		CWC	Formulating a regulatory framework for flood plain zoning and flood inundation management in cyclone-prone coastal areas.	State/UT, SDMA, CoR, Revenue Dept., DDMA, Irrigation Dept., Panchayats, ULBs	Constitute task teams jointly with central agencies for implementing land-use regulation as per zoning guidelines			

3.3.5 Capacity Development

Cyclone and Wind							Capacity Development	
SNo.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	Training	NIDM,LBSNA,NIRM, NDMA, NISA, NIC, and other training institutions for Indian Civil Services	Training and orientation programs for central govt. staff, and other direct stakeholders	State/UT, SDMA, CoR, Revenue Dept., SIDM, ATI, Engineering Training Institutes, SIRD, Police Training Academies	Training and orientation programs for state govt. staff, and other direct stakeholders such as: civil society, media-persons, elected representatives, professionals for veterinary care and support to disaster-affected animals	CE Directorate (Bridge) and Establishment directorates – Developing training curriculum and organising training.	Civil and Personnel departments – Training and orientation of all concerned staff.	Civil and Personnel departments – Training and orientation of all concerned staff.
2.	Mock Drills/ Exercises	NDMA, All Government Ministries/ Agencies, NDRF, Armed Forces, CAPF	Promoting the planning and execution of emergency drills by all ministries and in all States/UTs	State/UT, SDMA, CoR, Revenue Dept., DDMA, SDRF, Fire and Emergency Services, Civil Defence, Police	Joint planning and execution of emergency drills	CE Directorate (Bridge) and Security dte. in consultation with Safety dte. - For preparation of guidelines for Mock drill/ exercises.	Civil Engineering department and Security department in consultation with Safety department - For conducting Mock drills/ exercises.	Civil Engineering department and Security department in consultation with Safety department - For conducting Mock drills/ exercises.

3.4 Flood Risk Mitigation

3.4.1 Understanding Disaster Risk

Flood								
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	**Observation Networks, Information Systems, Monitoring, and Forecasting**	CWC, IMD, MoWR, MoAFW, NRSC	Modernization of Observation Network; Assessment, Monitoring and Scientific studies	Irrigation Dept., WRD, SDMA, DDMA, Panchayats, ULBs	• Support and cooperate with central agencies • Sponsor state-specific efforts; support local efforts	CE Directorate (Bridge) - Support and coordination	Engineering Department – Support and coordination	Engineering Department – Support and coordination
2.	**Zoning, mapping, and classification flood prone areas**	MoWR, NRSC, SoI	Preparation of large-scale hazard maps of flood prone areas of high vulnerability	Irrigation Dept., WRD, SDMA, DDMA, Panchayats, ULBs	• Support and cooperate with central agencies. • Sponsor state-specific efforts; support local efforts	CE Directorate (Bridge) - Support and coordination	Engineering Department – Preparation of detailed maps indicating vulnerable locations	Engineering Department – Preparation of detailed maps indicating vulnerable locations
3.	**Hazard Risk Vulnerability Assessment**	NDMA, NIDM, CWC, MoST, DST, CSIR	• Promote studies, provide guidelines • Studies on vulnerability covering social, economic, ecological, gender, and equity aspects • Change in vulnerability and risk due under climate change scenarios	SDMA, CoR, Revenue Dept., Irrigation Dept.	Undertake HRVA as part of preparing and periodic revision of DM plans.	CE Directorate (Bridge) - Support and coordination	Engineering Department – Preparation of detailed maps indicating vulnerable locations	Engineering Department – Preparation of detailed maps indicating vulnerable locations

Flood								
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
4.	**Monitoring, Forecasting and Warning Systems**	CWC,IMD, NRSC	• Specialized efforts for different types of floods and causes of flooding, including cloudburst. • Developing forecasting models for discharge from dams	SDMA, Irrigation Dept., WRD, relevant state level technical institutions	Support, cooperation for data collection and updates	CE Directorate (Bridge) - Support and coordination	Engineering Department – Support and coordination	Engineering Department – Support and coordination
5.	**Dissemination of warnings, data, and information**	IMD, CWC, MoWR	Quick, clear, effective dissemination among central and state agencies	SDMA, CoR, Revenue Dept., Irrigation Dept., WRD, Information Dept., DDMA, Panchayats, ULBs	• Inter-state data and information sharing where applicable • Coordination and cooperation with the central agencies. • Ensure facilities and infrastructure for the implementation of adequate access to communities at risk. • Dissemination of warnings to all,	CE Directorate (Bridge) - Co-ordination with the concerned Ministries and Railway Zones.	Engineering Department – To Coordinate with state Authorities and to disseminate early warning signals to Divisional Authorities.	Engineering Department – To Coordinate with Local Authorities and to disseminate early warning signals/ Information to last mile.
		DeitY, DoT, MoCIT, MoIB	Facilitate the distribution of necessary communication equipment, last-mile connectivity and access to disaster risk information					
		MoWR, MEA	International cooperation to share warnings about rivers flowing from neighbouring countries.					
		NDMA, MoWR, DeitY	Promoting reliable networking systems for data and information sharing among central and state					
		CWC, NRSC	Monitoring of landslides and blockages in rivers Warning systems					

Flood								
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
		MoWR, CWC, NDMA	• Providing information in all possible ways and using all types of media. • Interface with mobile network service providers for warnings		down to the last mile – remote, rural or urban; Regular updates to people in areas at risk. • Warnings using all types of options, types of technologies and media • Monitoring compliance by various network operators and service providers			

3.4.2 Inter – Agency Coordination

Flood								**Inter-Agency Coordination**
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	**Overall disaster governance**	MoWR	Nodal ministry – providing coordination, technical inputs, and support	SDMA, CoR, Revenue Dept., Irrigation Dept., DDMA, Panchayats, ULBs	Preparation and implementation of DM plans and ensure the functioning of agencies with DM tasks	CE Directorate (Bridge) - Co-ordination with the concerned Ministries and Railway Zones.	Engineering Department – Implementation of DM plans	Engineering Department – Implementation of DM plans
2.	**Response**	MHA	Nodal ministry for central assistance	SDMA, CoR, Revenue Dept., Irrigation Dept., DDMA, Panchayats, ULBs	Organising the immediate response and seeking assistance of central agencies	CE Directorate (Bridge) - Co-ordination with the concerned Ministries and Railway Zones.	Engineering Department – Implementation of DM plans	Engineering Department – Implementation of DM plans
3.	**Warnings, Information, Data**	CWC, IMD, NRSC, NDMA	Quick, clear, effective dissemination among central and state agencies	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Dissemination of warnings to all, down to the last mile – remote, rural or urban; Regular updates to people in areas at risk	CE Directorate (Bridge) - Co-ordination with the concerned Ministries and Railway Zones.	Engineering Department – To Coordinate with state Authorities and to disseminate early warning signals to Divisional Authorities.	Engineering Department – To Coordinate with Local Authorities and to disseminate early warning signals/ Information to last mile.

Flood								Inter-Agency Coordination
S.No.	Major Theme	Central/State Agencies and their Responsibilities						
		Centre	Responsibility-Centre	State	Responsibility-State	R.B.	Zonal HQ	Divisional HQ
4.	Non-structural measures	MHA, BIS,NDMA	• Revised/ Updated rules, norms, and codes • New/Updated standards • Review and improve laws, regulations and policies	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Adapting the norms/ codes as per State's requirement, enforcement, monitoring	CE Directorate (Bridge) - Co-ordination with the concerned Ministries and Railway Zones.	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

3.4.3 Investing in DRR – Structural Measures

Flood								Structural Measures
S.No.	Major Theme	Central/State Agencies and their Responsibilities						
		Centre	Responsibility-Centre	State	Responsibility-State	R.B.	Zonal HQ	Divisional HQ
1.	Flood control measures such as construction of embankments and levees	CWC, NDMA, NBCC, BMTPC, CBRI, SERC, IE(I)	Technical support and studies	State/UT, SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	• Identification safe buildings and sites to serve as temporary shelters for people Construction of multi-purpose shelters in Coastal villages/habitations prone to frequent cyclone • Proper maintenance of drainage systems and flood embankments	CE Directorate (Bridge)- Issue suitable guidelines, norms/codes.	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

Flood								Structural Measures
S.No.	Major Theme	Central/State Agencies and their Responsibilities						
		Centre	Responsibility-Centre	State	Responsibility-State	R.B.	Zonal HQ	Divisional HQ
2	Hazard resistant construction, strengthening, and retrofitting of all lifeline structures and critical infrastructure	NDMA, NBCC,BMTPC,CBRI, SERC, IE(I), all relevant Ministries/ Departments	Guidance and implementation	State/UT, SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs, all relevant Departments/ Agencies	Collaboration with technical agencies and implementation	CE Directorate (Bridge) - Issue suitable guidelines, norms/codes.	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

3.4.4 Investing in DRR – Non - Structural Measures

Flood								Non-Structural Measures
S.No.	Major Theme	Central/State Agencies and their Responsibilities						
		Centre	Responsibility-Centre	State	Responsibility-State	R.B.	Zonal HQ	Divisional HQ
1.	• Regulation and enforcement of laws, norms, regulations guidelines • Regulation of Reservoirs • Integrated Water	IMD, CWC,NRSC, MoWR, NWDA, NRSC	• Guidance and Support • Oversight and monitoring of compliance with coastal zone laws • Promote institutional mechanisms for sharing forecasts, warnings, data, and information • Regulatory framework for flood plain zoning and flood inundation	Irrigation Dept., WRD, SDMA, CoR, Revenue Dept.	• Implementing land-use regulation for low lying areas as per flood control norms • Regulation of inhabitation of low-lying areas along the rivers, nallas and drains • Implementing flood management action plan • Review and	CE Directorate (Bridge)- Issue suitable guidelines, norms/codes.	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

Flood							Non-Structural Measures	
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
	Resources Management (IWRM)		management • Implement IWRM in major river basins and their sub-basins • Scheme of incentives and disincentives with respect to the central assistance to encourage the states for implementing flood plain zoning regulations		modification of operation manuals for all major dams/ reservoirs • Support and cooperate with central agencies; Sponsor state-specific efforts; support local efforts; Cooperate with central efforts • Prevention and removal of encroachment into the waterways and natural drainage systems			
2.	Regulations to promote flood Resilient buildings & infrastructure	NDMA, MoWR, MoUD, CWC, BIS	Guidance and Support	State/UT, SDMA, CoR, Revenue Dept., Local bodies	Revise and implement the relevant rules in flood prone areas	CE Directorate (Bridge) - Issue suitable guidelines, norms/codes.	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

3.4.5 Capacity Development

Flood							**Capacity Development**	
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	**Training**	NIDM, LBSNAA, NIRM, NDMA, NISA, NIC and other training institutions for Indian Civil Services	Training and orientation programs for central govt. staff	SDMA, ATIs, Engineering Training Institutes, SIRD, Police Training Academies	Training and orientation programs for state govt. staff, professionals for veterinary care and support to disaster affected animals	CE Directorate (Bridge) and Establishment directorates – Developing training curriculum and organising training	Civil and Personnel departments – Training and orientation of all concerned staff.	Civil and Personnel departments – Training and orientation of all concerned staff.
		NDRF, CAPF, MoYAS, MoD	Incorporating disaster response, search and rescue in the training programs of youth such as NCC, NYKS, Scouts and Guides and NSS	SDMA,SIDM, ATI DDMA, Panchayats, ULBs	Incorporating disaster response, search and rescue in the training programs of youth such as village volunteers, and for protection of disaster-affected animals			
2.	**Mock Drills/ Exercises**	NDMA, NIDM, MoWR, Line Ministries, Govt. Agencies, NDRF, Armed Forces, CAPF	Promoting the planning and execution of emergency drills by all ministries and in all States/UTs		Joint planning and execution of emergency drills	CE Directorate (Bridge) and Security dte. in consultation with Safety dte. - For preparation of guidelines for Mock drill/ exercises.	Civil Engineering department and Security department in consultation with Safety department - For conducting Mock drill/ exercises.	Civil Engineering department and Security department in consultation with Safety department - For conducting Mock drill/ exercises.

3.5 Seismic Risk Mitigation

3.5.1 Understanding Disaster Risk

Seismic								**Understanding Disaster Risk**
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	• Earthquake Monitoring Services • National Seismological Network • Real Time Seismic Monitoring Network (RTSMN)	IMD	• Estimate the earthquake parameters quickly after detection • Disseminate information • Share information relating to under-sea earthquakes capable of generating tsunamis in the Indian coastal regions with INCOIS to issue tsunami related messages and warnings • Share seismic activity data with national and international scientific, academic and R&D institutions	State/UT, SDMA, CoR, Revenue Dept.	Share information widely	CE Directorate (Bridge)- coordination	Engineering Department – coordination	Engineering Department – coordination
2.	Earthquake Hazard and Risk Assessment (EHRA)	IMD	• Seismic hazard assessment • Seismic zoning • Seismic micro-zoning			CE Directorate (Bridge)-coordination	Engineering Department – coordination	Engineering Department – coordination
3.	Scientific Seismic Zonation	MoES, IMD, EREC, BIS,GSI, various national institutes,	Inter-Agency Coordination and Collaboration for publishing the guidelines	State/UT, SDMA, CoR, Revenue Dept., UDD, PWD,ULB, DDMA	Ensuring implementation, enforcement, compliance and monitoring; awareness creation	CE Directorate (Bridge)-coordination	Engineering Department – coordination	Engineering Department – coordination

Seismic								Understanding Disaster Risk
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
		professional institutions, MoST, DST, CSIR						
4.	Seismic Microzonation	EREC, Research Institutes	Develop a status paper based on a consensus among the professionals on the methodologies for micro-zonation studies	State/UT, SDMA, CoR, Revenue Dept., Technical organizations/ agencies	Carry out needs assessment from endusers, conduct micro-zonation studies, prioritize important urban areas for micro-zonation, do professional review before adoption	CE Directorate (Bridge)- coordination	Engineering Department – coordination	Engineering Department – coordination
5.	Hazard Risk Vulnerability Assessment	NDMA, NIDM, MoST, DST, CSIR	• Promote studies, provide guidelines • Studies on vulnerability covering social, economic, ecological, gender, and equity aspects • Change in vulnerability and risk due under climate change scenarios	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Undertake HRVA as part of preparing and periodic revision of DM plans	CE Directorate (Bridge)- Support and coordination	Engineering Department – Preparation of detailed maps indicating vulnerable locations	Engineering Department – Preparation of detailed maps indicating vulnerable locations

3.5.2 Inter Agency Coordination

Seismic		**Inter-Agency Coordination**						
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1	Overall disaster governance	MoES	Nodal ministry – providing coordination, technical inputs, and support	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Preparation and implementation of DM plans and ensure the functioning of agencies with DM tasks	CE Directorate (Bridge)- coordination	Engineering Department – coordination	Engineering Department – coordination
2	Response	MHA	Nodal ministry for central assistance	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Organising the immediate response and seeking assistance of central agencies	CE Directorate (Bridge)- coordination	Engineering Department – coordination	Engineering Department – coordination
3	Non-structural measures	MHA, BIS, NDMA	• Revised/ Updated rules, norms, and codes • New/Updated standards • Review and improve laws, regulations and policies	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Adapting the norms/ codes as per State's requirement, enforcement, monitoring	CE Directorate (Bridge)- Issue policy guidelines/Norms/Codes	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

3.5.3 Investing in DRR-Structural Measures

Seismic								**Structural Measures**
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	Hazard resistant construction, strengthening and retrofitting of all lifeline structures and critical infrastructure	NDMA, NBCC, BMTPC, CBRI, SERC, IE(I), all relevant Ministries/ Departments	Guidance and implementation	State/UT, SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs, PWD, all relevant Departments/ Agencies	Collaboration with technical agencies and implementation	CE (Bridge) and L&A Directorates - Issue policy guidelines/Norms/Codes	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

3.5.4 Investing in DRR-Non-Structural Measures

Seismic								**Non-Structural Measures**
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	Regulations and model codes for town planning, civil works and public infrastructure	IRC,MoRTH, RDSO, MoR, AERB, DAE, BIS, MoRD, MoUD	• Periodic update of codes, rules, regulations • Work with all central ministries, agencies, and state governments to implement techno-legal regime by modifying/ developing necessary rules	State/UT, SDMA, CoR , Revenue Dept., UDD, DRD, PWD, All other relevant departments, DDMA, Panchayats, ULBs	• Adopt suitable byelaws for rural and urban areas, put model codes into practice and ensure proper compliance • Ensure strict compliance	CE (Bridge) and L&A Directorates - Issue policy guidelines/Norms/Codes	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

Seismic		Non-Structural Measures						
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
					with code implementation through relevant Departments and agencies			
2.	Structural safety audit of lifeline structures and buildings Prioritization of lifeline structures and buildings for strengthening and seismic retrofitting	MoES,NDMA,IE(I), CIDC, CFI, NAC,relevant Ministries/ Departments	• Formulate standard procedures and guidelines • Periodically provide clarifications in line with the relevant national standards	SDMA, CoR, Revenue Dept.,UDD,PWD,DDMA, Panchayats, ULBs	• Carry out safety audit of lifeline buildings and critical infrastructure • Ensure implementation, monitoring, enforcement and proper compliance.	CE (Bridge) and L&A Directorates - Issue policy guidelines/ Norms/Codes	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

3.5.5 Capacity Development

Seismic		Capacity Development						
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	Training	NDMA, MoES, MoHRD, AICTE, CA, IE(I), NITTTR, NICMAR,CFI, BAI, and other professional institutions	Contribute to the national effort to build the requisite number of trained personnel to handle seismic safety in India.	SDMA, CoR, Revenue Dept., Education Dept., ATIs	Contribute to the national effort to build the requisite number of trained personnel to handle seismic safety in India Trainings in search and rescue	CE (Bridge), L&A and Establishment directorates – Developing training curriculum and organising training	Civil and Personnel departments – Training and orientation of all concerned staff.	Civil and Personnel departments – Training and orientation of all concerned staff.
2.	Mock Drills/Exercises	NDMA, All Government Ministries, NDRF, Armed Forces, CAPF	Promoting the planning and execution of emergency drills by all ministries and in all States/UTs		Joint planning and execution of emergency drills	CE Directorate (Bridge) and Security dte. in consultation with Safety dte. - For preparation of guidelines for Mock drill/ exercises.	Civil Engineering department and Security department in consultation with Safety department - For conducting Mock drill/ exercises.	Civil Engineering department and Security department in consultation with Safety department - For conducting Mock drill/ exercises.

3.6 Tsunami Risk Mitigation

3.6.1 Understanding Disaster Risk

Tsunami						**Capacity Development**		
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	**Research and Development Efforts**	MoES, INCOIS, MoST, DST, CSIR	Encourage development of standardized methods for tsunami risk assessment and scenario development, support studies to collect the data and compile knowledge Develop suitable large-scale digital maps indicating the tsunami hazard on the basis of past tsunami disasters	State/ UT, SDMA, CoR, Revenue Dept.	Develop detailed computerized maps and databases of vulnerable areas along the coast for planning and coordination of DM activities	CE (Bridge) Directorate - coordination	Engineering Department – coordination	Engineering Department – coordination
2.	**Zoning/Mapping**	MoES, in co-operation with Other relevant Ministries and Departments and other specialized agencies	Database of Tsunami Risk and Vulnerability in the coastal areas with information on trends of storm surge, high tides, local bathymetry, etc.	State/ UT, SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Ensure support to the Central Government agencies in zoning/ mapping and carry out at their level	CE (Bridge) Directorate - coordination	Engineering Department – coordination	Engineering Department – coordination
3.	**Warning System Components and Instruments**	MoES	Assess the status of existing important installations in coastal areas to withstand tsunami	State/UT, SDMA, CoR, Revenue Dept., State level research and technical institutions	Support, cooperation for data collection and updates	CE (Bridge) Directorate - coordination	Engineering Department – coordination	Engineering Department – coordination

Tsunami								Capacity Development
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
		NRSC, Indian Air Force, Indian collection and updates Navy, Coast Guard	Securing critical instrumentation to ensure fail-safe functioning of these critical instruments and their protection					
4.	**Dissemination of warnings, data and information**	INCOIS, IMD, MHA	Monitoring earthquake, provide warning based on seismic models and issue periodic bulletins	State/UT, SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Dissemination of warnings to all, down to the last mile – remote, rural or urban; Regular updates to people in areas at risk	CE (Bridge) Directorate - Co-ordination with the concerned Ministries and Railway Zones.	Engineering Department – To Coordinate with state Authorities and to disseminate early warning signals to	Engineering Department – To Coordinate with Local Authorities and to disseminate early warning signals/ Information to
5.	**Hazard Risk Vulnerability Assessment**	MoES, NDMA, NIDM, MoST, DST, CSIR	• Promote studies, provide guidelines • Studies on vulnerability covering social, economic, ecological, gender, and equity aspects • Change in vulnerability and risk due under climate change scenarios	State/UT, SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Undertake HRVA as part of preparing and periodic revision of DM plans	CE (Bridge) Directorate - Support and coordination	Engineering Department – Preparation of detailed maps indicating vulnerable locations	Engineering Department – Preparation of detailed maps indicating vulnerable locations

3.6.2 Inter-Agency Coordination

Tsunami		Inter-Agency Coordination						
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	**Overall disaster Governance**	MOES	Nodal ministry – providing coordination, technical inputs, and support	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Preparation and implementation of DM plans and ensure the functioning of agencies with DM tasks	CE (Bridge) Directorate - Co-ordination with the concerned Ministries and Railway Zones..	Engineering Department – Implementation of DM plans	Engineering Department – Implementation of DM plans
2.	**Response**	MHA	Nodal ministry for central assistance	SDMA, CoR, DDMA, Panchayats, ULBs	Organising the immediate response	CE (Bridge) Directorate - Co-ordination with the concerned Ministries and Railway Zones.	Engineering Department – Implementation of DM plans	Engineering Department – Implementation of DM plans
3.	**Warnings, Information, Data**	INCOIS, MoES, NDMA	Quick, clear, effective dissemination among central and state agencies	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Dissemination of warnings to all, down to the last mile – remote, rural or urban; Regular updates to people in areas at risk	CE (Bridge) Directorate - Co-ordination with the concerned Ministries and Railway Zones.	Engineering Department – To coordinate with state Authorities and to disseminate early warning signals to Divisional Authorities.	Engineering Department – To Coordinate with Local Authorities and to disseminate early warning signals/ Information to last mile.
4.	**Non-structural measures**	MHA, BIS, NDMA	• Revised/ Updated rules, norms, and codes • New/Updated standards • Review and improve laws, regulations and policies	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Adapting the norms/ codes as per State's requirement, enforcement, monitoring	CE (Bridge) Directorate - Co-ordination with the concerned Ministries and Railway Zones.	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

3.6.3 Investing in DRR-Structural Measures

Tsunami		**Structural Measures**						
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	**Strengthening of lifeline structures and high priority buildings**	Relevant Central Government Ministries	Implementation as per recommendations of safety audit where applicable	State/UTs, SDMA, CoR, Revenue Dept., PWD, all relevant line departments, DDMA, Panchayats, ULBs	Implementation as per Recommendations of safety audit	CE Directorate (Bridge) - Issue suitable guidelines, norms/codes.	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes
2.	**Hazard resistant construction, strengthening, and retrofitting of all lifeline structures and critical infrastructure**	NDMA, NBCC, BMTPC, CBRI, SERC, IE(I), BIS, all relevant Ministries/ Departments	Guidance and implementation	State/UT, SDMA, CoR, Revenue Dept., PWD, DDMA, Panchayats, ULBs, all relevant Departments/ Agencies	Collaboration with technical agencies and implementation	CE Directorate (Bridge)- Issue suitable guidelines, norms/codes.	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

3.6.4 Investing in DRR–Non-Structural Measures

Tsunami						**Non- Structural Measures**		
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility -State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	Mainstreaming DM into Development Planning	MoF, NDMA, NitiAyog	Include DM concerns in plan schemes and non-plan proposals by various ministries as per norms	State/UT, SDMA, CoR, Revenue Dept., Finance Dept., DDMA, Panchayats, ULBs	Include DM concerns in plan schemes and non-plan proposals by various ministries as per norms	CE Directorate (Bridge) - Issue suitable guidelines, norms/codes.	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes
2.	Regulation and enforcement of relevant laws	MoES/DoS	• Guidance and Support • Oversight and monitoring of compliance with coastal zone laws	State/ UT, SDMA, CoR, Revenue Dept., Forest/ Environment Dept., DDMA, Panchayats, ULBs	• Ecologically sound land-use zonation • Regulating aquaculture, and groundwater extraction	CE Directorate (Bridge) - Issue suitable guidelines, norms/codes.	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes
3.	Safety audits and evaluation of all lifeline structures and important facilities	NDMA, NBCC, BMTPC, CBRI, SERC, IE(I), all Ministries/ Departments	Guidance and Support	State/UT, SDMA, CoR, Revenue Dept., all relevant line departments, DDMA, Panchayats, ULBs	Detailed assessment of tsunami hazard to the structure and foundation and the benefits of strengthening	CE Directorate (Bridge) - Issue suitable guidelines, norms/codes.	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

3.6.5 Capacity Development

Tsunami						**Non- Structural Measures**		
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	Training and Capacity Development of Professionals	NIDM	Technical capabilities in safety audit Conduct training programmes for State and Local Administration personnel including Fire and Rescue and Police personnel in disaster management	SDMA, CoR, Revenue Dept., State ATI	Training and orientation programs for State Govt. staff/ emergency response officials and other volunteer groups	CE (Bridge) and Establishment directorates – Developing training curriculum and organising training	Civil and Personnel departments – Training and orientation of all concerned staff.	Civil and Personnel departments – Training and orientation of all concerned staff.
		NIDM	Evolve an action plan to offer a comprehensive curriculum related to tsunami management in the form of training modules for the various target groups	State ATIs, State Governments with the help of other research organisations	Training of the Trainers to impart knowledge related to tsunami mitigation measures to various target groups			
2.	Mock Drills/ Exercises	NDMA, All Government Ministries/ Agencies, NDRF, Armed Forces, CAPF	Joint planning and execution of emergency drills	State/ UT, SDMA, CoR, Revenue Dept., DDMA, SDRF, Fire and Emergency Services, Civil Defence, Police	Joint planning and execution of emergency drills	CE Directorate (Bridge) and Security dte. in consultation with Safety dte. - For preparation of guidelines for Mock drill/ exercises.	Civil Engineering department and Security department in consultation with Safety department - For conducting Mock drill/ exercises.	Civil Engineering department and Security department in consultation with Safety department - For conducting Mock drill/ exercises.

3.7 Landslides and Snow Avalanches Risk Mitigation

3.7.1 Understanding Disaster Risk

Landslides and Snow Avalanches Understanding Disaster Risk								
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	Hazard Zoning, mapping, geological, and geotechnical Investigations in regions prone to landslides and snow avalanches	GSI/MoM, Wadia Inst. of Himalayan Geology, NIDM, NRSC,BRO, SASE	• Preparation of comprehensive and user-friendly inventory of landslides and avalanche prone areas and its updation as per widely accepted standards • Studies and monitoring of risk prone areas on site and using satellites • Studies to classify vulnerable areas as per likelihood of hazard	State/UT, SDMA, CoR, Revenue Dept., State DGM, SRSC	Support to and cooperation with central agencies	CE Directorate (Bridge) - Support and coordination	Engineering Department – Preparation of detailed maps indicating vulnerable locations	Engineering Department – Preparation of detailed maps indicating vulnerable locations
2.	Dissemination of warnings	CWC, NRSC, IMD, BRO	Quick, clear, effective dissemination among central and state agencies	State/UT, CoR, Revenue Dept., SDMA, PWD, DDMA, Panchayats, ULBs	• Ensure facilities and infrastructure for the implementation of adequate access to communities at risk. • Dissemination of warnings to all, down to the last mile– remote, rural or urban; Regular updates to people in areas at risk.	CE Directorate (Bridge) - Co-ordination with the Ministries and Railway Zones.	Engineering Department – To Coordinate with state Authorities and to disseminate early warning signals to Divisional Authorities.	Engineering Department – To Coordinate with Local Authorities and to disseminate early warning signals/ Information to last mile.

3.7.2 Inter-Agency Coordination

Landslides and Snow Avalanches Understanding Disaster Risk								
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	Overall disaster governance	MoM, MoD	Nodal ministry – providing coordination, technical inputs, and support	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Preparation and implementation of DM plans and ensure the functioning of agencies with DM tasks	CE Directorate (Bridge) - Co-ordination with the Ministries and Railway Zones.	Engineering Department – Implementation of DM plans	Engineering Department – Implementation of DM plans
2.	Response	MHA	Nodal ministry for central assistance	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Organising the immediate response and seeking assistance of central agencies	CE Directorate (Bridge) - Co-ordination with the Ministries and Railway Zones.	Engineering Department – Implementation of DM plans	Engineering Department – Implementation of DM plans
3.	Warnings, Information, Data	GSI, SASE, IMD, MoM, BRO, NDMA	Quick, clear, effective dissemination among central and state agencies	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Dissemination of warnings to all, down to the last mile – remote, rural or urban; Regular updates to people in areas at risk	CE Directorate (Bridge) - Co-ordination with the Ministries and Railway Zones.	Engineering Department – To Coordinate with state Authorities and to disseminate early warning signals to Divisional Authorities.	Engineering Department – To Coordinate with Local Authorities and to disseminate early warning signals/ Information to last mile.
4.	Non-structural measures	MHA, BIS, MoD, BRO, NDMA	• Revised/ Updated rules, norms, and codes • New/Updated standards • Review and improve laws, regulations and policies	SDMA, CoR, Revenue Dept., DDMA, Panchayats, ULBs	Adapting the norms/ codes as per State's requirement, enforcement, monitoring	CE (Bridge) Directorate - Issue suitable guidelines, norms/codes.	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

3.7.3 Investing in DRR–Non-Structural Measures

Landslides and Snow Avalanches Non-Structural Measures								
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	**Regulations and building codes**	MoM, BIS, NIDM	Codes and guidelines related to landslides published by BIS to be critically examined and reviewed by peers. BIS will revise/revalidate every five years or earlier, if necessary	State/UT, SDMA, UDD, DDMA, Local Authorities	Ensure implementation and adherence to codes and guidelines	CE (Bridge) Directorate - Issue suitable guidelines, norms/codes.	Engineering Department – Adapting the norms/ codes	Engineering Department – Adapting the norms/ codes

3.7.4 Capacity Development

Landslides and Snow Avalanches Capacity Development								
S.No.	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	**Training**	NIDM, MoM, CDMM, CoA	Train professionals on how to handle slope failures and their remediation and landslide emergencies by promoting observational method of design and construction with training on the development of contingency plans	State/UT, State DGM, SRSC, ATIs, SIDM	• Support and collaboration to national agencies • Training and skill upgrades for search and rescue • Conduct regular training programs for professionals including those for care and protection	CE (Bridge) and Establishment directorates – Developing training curriculum and organising training	Civil and Personnel departments – Training and orientation of all concerned staff.	Civil and Personnel departments – Training and orientation of all concerned staff.
2.	**Mock Drills/ Exercises**	NDMA, All Government Ministries/ Agencies, NDRF, Armed Forces, CAPF	Promoting the planning and execution of emergency drills by all ministries and in all States/UTs	State/UT, SDMA,SDRF, Fire and Emergency Services, Civil defence, Police, DDMA, Panchayats, ULBs	Joint planning and execution of emergency drills	CE Directorate (Bridge) and Security dte. In consultation with Safety dte. For preparation of guidelines for Mock drill/ exercises.	Civil Engineering department and Security department In consultation with Safety department For conducting Mock drill/ exercises.	Civil Engineering department and Security department In consultation with Safety department For conducting Mock drill/ exercises.

Chapter 4

PREPAREDNESS AND RESPONSE

4.1 Background

Response measures are those taken immediately after receiving early warning from the relevant authority or in anticipation of an impending disaster, or immediately after the occurrence of an event without any warning. The primary goal of response to a disaster is saving lives, protecting property, environment, and meeting basic needs of human and other living beings after the disaster. Its focus is on rescuing those affected and those likely to be affected by the disaster. The UNISDR defines response as "the provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected."

Preparedness, as defined by UNISDR, consist of "the knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions." Based on the preparedness, the response process begins as soon as it becomes apparent that a disastrous event is imminent and lasts until the disaster is declared to be over. It is conducted during periods of high stress in highly time-constrained situations with limited information and resources. It is considered as the most visible phase amongst various phases of disaster management. Response includes not only those activities that directly address the immediate needs, such as search and rescue, first aid and temporary shelters, but also rapid mobilization of various systems necessary to coordinate and support the efforts. For effective response, all the stakeholders need to have a clear vision about hazards, its consequences, clarity on plans of action and must be well versed with their roles and responsibilities.

Any emergency requires a quick response to save lives, contain the damage and prevent any secondary disasters. In most cases, first responders such as members of Incident Response Teams (IRT) of district, block, or other agencies (medical fire, police, civil supplies, municipalities) manage emergencies immediately at the local level. If an emergency escalates beyond their capabilities, the local administration must seek assistance from the district administration or the State Government. If State Government considers it necessary, it can seek central assistance.

CCS deals with issues related to defence of the country, law and order, and internal security, policy matters concerning foreign affairs that have internal or external security implications, and economic and political issues impinging on national security. CCS will be involved in the decision making if the disaster has serious security implications. The NEC will coordinate response in the event of any threatening disaster situation or disaster where central assistance is needed. The NEC may give directions to the relevant Ministries/Departments of the GoI, the State Governments, and the State Authorities regarding measures to be taken by them in response to any specific threatening disaster situation or disaster as per needs of the State.

The NDMA is mandated to deal with all types of disasters; natural or human-induced. The general superintendence, direction and control of the National Disaster Response Force

(NDRF) is vested in and will be exercised by the NDMA. The NCMC will deal with major crises that have serious or national ramifications. These include incidents such as those requiring close involvement of the security forces and/or intelligence agencies such as terrorism (counter-insurgency), law and order situations, serial bomb blasts, hijacking, air accidents, CBRN, weapon systems, mine disasters, port and harbour emergencies, forest fires, oilfield fires, and oil spills.

The immediate response in the event of a disaster lies with the local authorities with the support of the State Government. The Union Government supplements their efforts through providing logistic and financial support, deploying NDRF, Armed Forces, CAPF, and other specialized agencies like in case of CBRN disaster. It will depute experts to assist the State Government in planning and its implementation, during severe natural or human-induced disasters as requested by the State Government.

4.2 Institutional Framework

Chapter-2 provided an overview of the institutional arrangements covering all aspects of disaster management. There are specific tasks, roles and responsibilities in the domain of response, which as mentioned before, is the most critical and time-sensitive aspect of disaster management. This section summarizes the function and responsibilities of Ministries and agencies that have a key role to play in disaster response as per current guidelines. The plan will be updated periodically to reflect any changes in the key roles envisaged to particular ministries or agencies.

No single agency or department can handle a disaster situation of any scale alone. Different departments have to work together to manage the disaster with an objective to reduce its impact. Section 37(a) of the DM Act, 2005 mandates that Departments / Ministries of Central Government prepare disaster management plans keeping mitigation, preparedness and response elements into consideration. Sections 22(2), 24, 30 and 34 of the DM Act, 2005 have clearly laid down various duties relating to DM to be performed by various agencies.

The institutional arrangements for the response system consist of the following elements:

a) Nodal Central Ministries with disaster-specific responsibilities for national-level coordination of the response and mobilization of all the necessary resources.
b) Central agencies with disaster-specific responsibilities for Early Warning Systems and alerts
c) National Disaster Response Force (NDRF)
d) State Disaster Response Force (SDRF)

There will be National Emergency Operations Centre (NEOC) known as NEOC-1 under the MHA and NEOC-2 under the National Disaster Management Authority (NDMA). It will be connected to the following control rooms:

- All agencies designated to provide early warning information about hazard events
- State Emergency Operations Centre (SEOC)
- District Emergency Operations Centre (DEOC)
- NDRF
- Integrated Defence Staff (IDS)
- MEA
- CAPFs

4.3 National Early Warning System

4.3.1 Central Agencies Designated for Natural Hazard-Specific Early Warnings

The GoI has designated specific agencies (Table 4-1) to monitor the onset of different natural disasters, set up adequate Early Warning Systems (EWS), and disseminate necessary warnings/ alerts regarding any impending hazard, for all those hazards where early warning and monitoring is possible with the currently available technologies and methods. These agencies provide inputs to the MHA, which will issue alerts and warnings through various communication channels. The agencies responsible for EWS will maintain equipment in proper functioning order and conduct simulation drills to test their efficacy.

Table 4-1: Central Agencies Designated for Natural Hazard-Specific Early Warnings:

	Hazard	**Agencies**
1	Avalanches	Snow and Avalanche Study Establishment (SASE)
2	Cyclone	India Meteorological Department (IMD)
3	Drought	Ministry of Agriculture and Farmers Welfare (MoAFW)
4	Earthquake	India Meteorological Department (IMD)
5	Epidemics	Ministry of Health and Family Welfare (MoHFW)
6	Floods	Central Water Commission (CWC)
7	Landslides	Geological Survey of India (GSI)
8	Tsunami	India National Centre for Oceanic Information Services (INCOIS)

On their part, the relevant State Government and district administration shall disseminate such alerts and warnings on the ground through all possible methods of communications and public announcements.

4.3.2 Role of Central Agencies/ Departments

The National Emergency Operations Centre (NEOC) will act as the communication and coordination hub during this phase and it will maintain constant touch with early warning agencies for updated inputs. It will inform State Emergency Operations Centre (SEOC) and District Emergency Operations Centre (DEOC) through all the available communication channels and mechanisms. The DM Division of the MHA will communicate and coordinate with designated early warning agencies, various nodal Ministries, and State Governments. It will mobilise reinforcements from the NDRF, Armed Forces and the CAPFs and put together transportation plans for moving resources. The NDMA will support the overall coordination of response as per needs of MHA. The NDMA will be providing general guidance, and take decisions for the deployment of the NDRF. The NDRF will be deployed as required depending on the request from State Government. They will keep the force in operational readiness at all times.

4.4 Coordination of Response at National Level

At the national level, the Central Government has assigned nodal responsibilities to specific Ministries for coordinating disaster-specific responses (Table 4-2). As described in Chapter-1, the NEC will coordinate response in the event of any threatening disaster situation or disaster. The State Government will activate the IRTs at State, District, or block level and ensure coordination with the SEOC. The SDMA will provide the technical support needed to strengthen the response system.

It is essential that the first responders and relief reach the affected areas in the shortest possible time. Often, there are inordinate delays due to real constraints imposed by the location, nature of disaster and, most regrettably, due to inadequate preparedness. In many situations, even a delay of six to twelve hours will prove to be too late or unacceptable. To make matters worse, relief tends to arrive in a highly fragmented or uncoordinated form with multiple organisations acting independently of each other without a cohesive plan, without mechanisms to avoid overlaps and without proper prioritization of different aspects of relief such as shelter, clothing, food, or medicine. From an operational perspective, the challenges are similar across most hazards. The NDMA has formulated IRS Guidelines for the effective, efficient, and comprehensive management of disasters. The implementation of NDMA's IRS Guidelines by the States will help in standardisation of operations, bring clarity to the roles of various departments and other agencies, which are common to most disaster response situations.

Table 4-2: Central Ministries for Coordination of Response at National level

	Disaster	**Nodal Ministry/ Dept./ Agency**
1.	Biological Disasters	Min. of Health and Family Welfare (MoHFW)
2.	Chemical Disasters and Industrial Accidents	Min. of Environment, Forests and Climate Change (MoEFCC)
3.	Civil Aviation Accidents	Min. of Civil Aviation (MoCA)
4.	Cyclone, Tornado, and Tsunami	Min. of Home Affairs (MHA)
5.	Disasters in Mines	Min. of Coal; Min. of Mines (MoC, MoM)
6.	Drought, Hailstorm, Cold Wave and Frost, Pest Attack	Min. of Agriculture and Farmers Welfare (MoAFW)
7.	Earthquake	Min. of Home Affairs (MHA)
8.	Flood	Min. of Home Affairs (MHA)
9.	Forest Fire	Min. of Environment, Forests and Climate Change
10.	Landslides and Avalanche	Min. of Home Affairs (MHA)
11.	Nuclear and Radiological Emergencies	Dept. of Atomic Energy, Min. of Home Affairs (DAE, MHA)
12.	Oil Spills	Min. of Defence/Indian Coast Guard (MoD/ICG)
13.	Rail Accidents	Min. of Railways (MoR)
14.	Road Accidents	Min. of Road Transport and Highways (MoRTH)
15.	Urban Floods	Min. of Urban Development (MoUD)

The state and district administration shall identify sites for establishment of various facilities as mentioned in the IRS guidelines such as Incident Command Post, relief camp, base, staging area, camp, and helipad, for providing various services during the response. The state and local administration must widely disseminate and publicise information about these arrangements as mandated in the SDMP and DDMP. Since disaster response operations are multifaceted, time sensitive, extremely fast-moving, and mostly unpredictable, it requires rapid assessment, close coordination among several departments, quick decision-making, fast deployment of human resources and machinery as well as close monitoring. In order to prevent delays and to eliminate ambiguities with regard to chain of command, the SDMP and DDMP must clearly spell out the response organisation as per IRS. These plans must clearly identify the personnel to be deputed for various responsibilities in the IRT at various levels of administration along with proper responsibility and accountability framework. Provision for implementation of unified command in case of involvement of multiple agencies such as Army, NDRF, CAPF, and International Urban Teams Search and

Rescue must be spelt out in the SDMP. From time to time, the DM plan must be tested and rehearsed by carrying out mock exercises.

4.5 Fire and Emergency Services (FES)

The primary role of Fire and Emergency Service (FES) is of responding to fire incidents. However, besides fire-fighting, FES attends to other emergencies such as building collapse, road traffic accidents, human and animal rescue, and several other emergency calls. FES also takes part in medical emergencies. The role of FES has become multi-dimensional. The role of FES extends to the domain of prevention, especially in urban areas. FES is an integral part of the group of agencies responding to disaster situations. FES is one of the first responders during the Golden Hour after a disaster and plays a vital role in saving lives and property. Therefore, it is imperative to adequately equip and develop the capacities of FES. Further, continuous training should also be provided to the fire staff in using and maintaining the equipment.

FES is a key element in the emergency response system. It comes under the 12th schedule of the Constitution dealing with municipal functions. At present, States and UTs, and ULBs are managing the FES. The MHA and NDMA will render technical advice to the States, UTs, and Central Ministries on fire protection, prevention, and related legislation. While in several States, FES is under the jurisdiction of Municipal Corporations, in others it is under the respective Home Department. Only a few States have enacted their own Fire Act. As on today, there is no standardization with regard to the scaling of equipment, the type of equipment, or the training of their staff. In each State it has grown according to the initiatives taken by the States and the funds provided for the FES. Government of India has taken many initiatives to strengthen the techno-legal regime for fire safety. Apart from initiating major legal changes, Government is also reviewing many laws that have to be amended. Government of India has also taken steps for institutional reforms and organizational restructuring of FES. However, it is the responsibility of the State Governments to implement the major changes for the modernization of the FES to make them more effective.

4.6 Responding to Requests for Central Assistance from States

Catastrophic disasters like earthquakes, floods, cyclones and tsunami result in a large number of casualties and inflict tremendous damage on property and infrastructure. The Government of India has established a flexible response mechanism for a prompt and effective delivery of essential services as well as resources to assist a State Government or Union Territory severely hit by a disaster. Disaster management is considered as the responsibility of the State Governments, and hence the primary responsibility for undertaking rescue, relief and rehabilitation measures during a disaster lies with the State Governments. The Central Government supplements their efforts through logistic and financial support during severe disasters as requested by the State Governments. Responding to such emergencies stretches the resources of district and State administration to the utmost and they may require and seek the assistance of Central Ministries/Departments and agencies like the NDRF, Armed Forces, CAPF, and Specialized Ministries/ Agencies.

4.7 Management of Disasters impacting more than one State

At times, the impact of disasters occurring in one State may spread over to the areas of other States. Similarly, preventive measures in respect of certain disasters, such as floods,

etc. may be required to be taken in one State, as the impact of their occurrence may affect another. The administrative hierarchy of the Country is organized in to National, State and District level Administrations. This presents challenges in respect of disasters impacting more than one State. Management of such situations calls for a coordinated approach, which can respond to a range of issues quite different from those that normally present themselves – before, during and after the event. The NCMC will play a major role in handing such multi-state disasters. The NDMA will encourage identification of such situations and promote the establishment of mechanisms for coordinated strategies for dealing with them by the States and Central Ministries, departments and other relevant agencies.

4.8 Major Tasks and the Responsibilities: Centre and State

While there are disaster-specific aspects to the post-disaster response, the emergency functions are broadly common to all disasters and there are specific ministries, departments, or agencies that can provide that emergency response. Besides, very often, there are multiple hazards and secondary disasters that follow a major disaster. Hence, response intrinsically follows a multi-hazard approach. Therefore, all the response activities have been summarized in a single matrix applicable to all types of disasters. The response responsibility matrix specifies the major theme of response. It specifies the agencies from the Central and State Government responsible for the major theme of response. All agencies responsible for response should follow the NDMA's IRS guidelines, which will help in ensuring proper accountability and division of responsibilities. Different ministries and departments have to provide specialized emergency support to the response effort. Certain agencies of Central Government will play a lead role, while others will be in a supporting role. The SDMA, CoR , or the Dept. of Revenue is the nodal agency at the state level for coordination of response. The DDMA is the nodal agency for coordination of response at District level. Various central ministries, departments, agencies, and state governments have to prepare their own hazard specific response plans as per guidelines of the NDMA and in line with the NDMP. They need to ensure preparedness for response at all times and must carry out regular mock drills and conduct tests of readiness periodically, and the ministries/ departments must report the status to the NDMA. The major tasks of response given in the responsibility matrix are:

1. Early Warning, Maps, Satellite inputs, Information Dissemination
2. Evacuation of People and Animals
3. Search and Rescue of People and Animals
4. Medical care
5. Drinking Water / Dewatering Pumps / Sanitation Facilities / Public Health
6. Food & Essential Supplies
7. Communication
8. Housing and Temporary Shelters
9. Power
10. Fuel
11. Transportation
12. Relief Logistics and Supply Chain Management
13. Disposal of animal carcasses
14. Fodder for livestock in scarcity-hit areas
15. Rehabilitation and Ensuring Safety of Livestock and other Animals, Veterinary Care
16. Data Collection and Management
17. Relief Employment
18. Media Relations

4.9 Responsibility Matrix for Preparedness and Response

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
1.	**Early Warning, Maps, Satellite inputs, Information Dissemination**	**Lead Agencies:** IMD, CWC, INCOIS, SASE, GSI,BRO, MoIB, MoES, MoWR, MoAFW, **Support Agencies:** SoI, NRSC, DoT, MHA, NDMA, MoCIT, hazard specific nodal ministries	• Issue forecasts, alerts, warnings • Provide early warnings (where ever possible) to reduce loss of life and property. • Disseminating warnings and information to all Central Ministries/Departments/Agencies and State Government • Use of satellite imageries and other scientific methods for risk assessment and forecasting	State/UT, SDMA, Revenue Dept., CoR, SEOC, DDMA, all other relevant Department/ Agencies	• To disseminate early warning signals to the district administration, local authorities, and the public at large in the areas likely to be affected by a disaster so as to reduce loss of life and property • Dissemination of warnings and information up to the last mile • Ensure appropriate compilation/analysis of received data • Use of satellite imageries and other scientific methods for risk assessment and forecasting	CE Directorate - Co-ordination with the Ministries and Railway Zones.	Engineering Department – To Coordinate with state Authorities and to disseminate early warning signals to Divisional Authorities.	Engineering Department– To Coordinate with Local Authorities and to disseminate early warning signals/ Information to last mile.
2.	**Evacuation of People and Animals**	**Lead Agency:** MHA **Support**	• On request, support the affected state government in evacuation of people	State/UT, SDMA, Revenue Dept., CoR,	• Quick assessment of evacuation needs such as the number of people and	TT Directorate - Co-ordination	Operating Department –Coordinate with RB and	Operating Department – Coordinate with HQs and

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
		Agencies: MoD, CAPF, MoRTH, MoR, MoCA, ministries/ depts. with hazard-specific responsibilities, NDRF, Civil Defence	and animals from areas likely to be affected by major disaster <u>Special situations:</u> • Evacuation of large numbers of people from far flung areas and islands (e.g., Andaman and Nicobar Islands, Lakshadweep Islands,etc. in cases of cyclone) • Evacuation of visitors/ pilgrims stranded in remote Himalayan regions on account of inclement weather, landslides, flash floods and avalanches • Evacuation of fishermen from the high seas in case of a cyclone	SEOC, FES, DDMA, all other relevant Departments /Agencies, SDRF, Civil Defence	animals to be evacuated and mode of evacuation • Mobilize transport and resources for evacuation • Identify and prepare sites for temporary relocation of affected people and animals • Identify requirements of resources for evacuation such as helicopters, aircrafts, high speed boats and ships to be provided to the affected state government. • Request for central resources, if needed • Coordinate with central agencies to mobilise required resources • Monitor the situation • Earmark resources/ units/ battalions of	with the Ministries and Railway Zones	State Authorities	Local Authorities

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
					SDRF for quick deployment • Prepare handbook/manuals and SOP for evacuation of people and animals • Undertake review and revise DMPs and SOPs after each major incident • Prepare evacuation plan taking into account local conditions and periodically update it • Undertake mock/simulation drills • Prepare operational checklists • Prepare list of agencies/ organizations who could assist in evacuation • Web-based resource inventory and its regular updates			

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
3.	**Search and Rescue of People and Animals**	**Lead Agencies:** MHA, NDMA, NDRF **Support Agencies:** MoD, CAPF, MoHFW, MHA, MoRTH, MoCA, MoR, ministries/ departments with hazard-specific responsibilities, Civil Defence	• Fail safe communication between early warning agencies and EOC of Central and State/ District, Central Min. • Adequate NDRF support in a state of readiness to move at a short notice • MoU with suppliers for blankets, tarpaulins, tents, boats, inflatable lights, torches, ropes, etc. with a condition that they will be supplied at short notice (usually within 24hours) from the placement of order • SOPs for sending rescue/ relief material from other adjoining States to the affected state immediately	State/UT, SDMA, Revenue Dept., CoR, SEOC, SDRF, FES, DDMA, all other relevant Departments /Agencies, Civil Defence	• Various positions of IRTs (State, District, Sub-division and Tehsil) are trained and activated for response at their respective administrative jurisdiction • SDRF teams are trained, equipped and ready to move at a short notice to the affected areas • Strategic stationing of state of the art equipment for search, rescue and response with dedicated trained manpower • MoU is in place with suppliers for blankets, tarpaulins, tents, boats, inflatable lights, torches, ropes, etc. with a condition that they will be supplied	Safety Directorate - Coordination with NDRF/NDMA Mechanical directorate – Policy/ Planning of rescue centric equipment and training of staff. Establishment – Developing and conducting training modules.	Safety Department – Coordination with NDRF/SDRF Mechanical Department – Upgrading/ Maintenance of ARTs/ARMVs rescue equipment, training of ART/ARMV staff in rescue operations. Personnel Department – Organising and monitoring rescue centric	Safety Department – Coordination with NDRF/SDRF Mechanical Department – Rescue of passengers, Maintenance of ARTs/ARMVs rescue equipment and training of ART/ARMV staff in rescue operations. Personnel Department – Organising and monitoring rescue centric training to ART/ARMV staff.

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
			• Support of Armed Forces and CAPF as per requirement		quickly at short notice (usually within 24 hours) • Nodal officer selected for coordination is in regular touch with MHA/NDMA for additional requirements (including help from other Central Ministries)		training to ART/ARMV staff.	
4.	**Medical Care**	**Lead Agencies:** MoHFW **Support Agencies:** MoD, CAPF, MoR	• Medical assistance to the affected state in response to its request for post-disaster emergency medical care. • Mobile Field Hospitals similar to the military field units that has trauma-care for the disaster-affected and serve as a temporary substitute for the collapsed local	State/UT, SDMA, Revenue Dept., CoR, SEOC, SDRF, FES, DDMA, Health Dept., all other relevant departments, Civil Defence	• Health and Family Welfare Dept. works with the logistic section of the state level • IRT to provide effective services (Medical Unit) to the field level IRTs for response. • District wise repository of hospitals (both Government and Private), availability of beds, doctors,	**Health Directorate –** Policy/ Planning of medical equipment in ARMVs and Hospital for trauma care in disasters, Co ordination with MOHFW, Monitoring of hospital Disaster Management	Medical Department – Upkeep of Hospitals and ARMVs, Implementation of Hospital disaster Management plans and training of Doctors and paramedics. Personnel Department-	Medical Department – Rescue and relief of effected passengers, Upkeep of Hospitals and ARMVs, Preparation and Implementation of Hospital disaster Management plans and training of Doctors and

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
			general medical and surgical facilities in the disaster zone. • Gradual improvement of the field hospital to conform to global standards. • Mobile medical care units with OT facility, power sources, dedicated trained staff of doctors, and paramedics who could be immediately summoned at the time of emergency • Mobile medical support units stocked with medicines usually needed such as those for BP, diabetics, heart problems, common		paramedics and other trained staff available along with other infrastructure details and update it on a regular basis Include the hospital wise information in the DM Plans at local levels • Tie-up with the companies for easy availability of common medicines during the emergency situations • Hygienic conditions are prevalent at all times in various facilities established as well as hospitals to curb the spread of diseases • Establishment of sound protocols for coordination between state's health Dept. and the central agencies	plans and training of staff. Establishment Directorate – Establishment – Developing and organising training modules for Doctors and Paramedics in Trauma Care.	Organising training modules for Doctors and Paramedics in Trauma Care.	paramedics. Personnel Department - Organising training modules for Doctors and Paramedics in Trauma Care.

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
			ailments, etc. as well as provisions such as: bleaching powder, chlorine tablets; nutritional supplements catering to specialized groups such as lactating mothers, elders, and children below 6. • Timely technical support to the State Governments for restoration of damaged hospitals as well as infrastructure • Ensure strict compliance with minimum standards of relief as per Section 12 of DM Act 2005		• Ensure strict compliance with minimum standards of relief as per Section 12 of DM Act 2005.			

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
5.	**Food and essential supplies**	**Lead Agencies:** MoCAFPD, MoFPI **Supporting Agencies**: MoRTH, MoCA, MoR, MoSJE, MHA, FCI	• Ensure availability of adequate and appropriate food supplies to the disaster affected areas • Immediate availability of ready-to-eat/ precooked food/ meals • Deploying transport with essential supplies at strategic locations • MoU with suppliers to provide required quantities of family packs of essential food provisions • Special provisions to address the needs of infants/ small children (baby food) • FCI godowns are able to supply required food grains	State/UT, SDMA, Revenue Dept., CoR, SEOC, DDMA, Food and Civil. Supply Dept., all other relevant Departments, Civil Defence	• Dept. of Food and Civil Supply works with the logistic section of the state level IRT to provide effective services to the field level IRTs for response • Agreements/MoUs with organisations, trusts, and firms for setting up community kitchens in the affected areas • Depending upon the requirement, coordinate with the relevant Central Ministry to make sure that the supplies reach the site on time • Deploy a dedicated team at the local level to receive the supplies, maintain log (manual or	TC - Coordination with Zonal Railways and issue policy guidelines. TT Directorate - Co-ordination with the Ministries and Railway Zones for movement of supplies.	Commercial department – Coordinate with Divisional authorities. Operating Department – Coordinate with RB and State Authorities for movement of supplies.	Commercial department – Arrangement of food and water to the passengers. Operating Department – Coordinate with HQs and Local Authorities for movement of supplies.

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
			as per requirement of disaster affected areas.		computerized), and distribute them at required locations • Food godowns have sufficient food materials and not situated at vulnerable location			
6.	**Communication**	**Lead Agencies:** MoCIT, DoT **Support Agencies:** MoR, MoCA, MoD, Telecom Providers	• Detailed plans for fail safe communication with all the early warning agencies (such as IMD, CWC, etc.) and Control Rooms (Central/ State) for getting accurate information at regular intervals. • Restoration of emergency communication in disaster affected areas Emergency response teams to be in place with detailed technical plans to restore communication after	State/UT, SDMA, Revenue Dept., COR, SEOC, DDMA, Information Dept., all other relevant departments	• Failsafe communication plan is prepared with all early warning agencies • Logistic section of the state level IRT coordinates with central agencies to provide effective communication support to the field level IRTs for response. • State and district EOCs are equipped with satellite phones/ VHF/ HF as a backup to the landline	Telecommunication Directorate – Coordination with Zonal Railways and Policy guidelines effective communication at disaster site.	Signalling & Telecommunication department – coordination with division and implementation of RB policy guidelines.	Signalling & Telecommunication department – Provide effective communication, provide and maintain communication equipment in ARTs/ARMVs

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
			the occurrence of a disaster • Provide a dedicated radio frequency for disaster communications		• All communication equipment, especially the satellite phones are in good working condition 24 X 7 on all days through regular testing.			
7.	**Transportation**	**Lead Agencies:** MoRTH, MoR, MoCA **Support Agencies:** MHA, MoD, NHAI, IWAI, NDRF, MoHFW	• Adequately address the post-disaster transportation needs to ensure that the emergency response and recovery efforts are carried out in a timely manner; restore the public transport; resumption of the movement of essential goods. • Pool heavy duty earth moving machineries, tree cutters, fork lifters and other required equipment either at strategic locations or centralized. • Quick deployment of	State/UT, SDMA, Revenue Dept., CoR, SEOC, DDMA, Transport Dept., Forest/Environment Dept., PWD, Railways, Airport officer, all other relevant departments	• Requirement of transport for the sending the relief material, responders are arranged • Need of the transport of various activated section of the IRT as per Incident Action Plan is fulfilled • Indian Railway works with the logistic section of the state level IRT to provide effective services (Ground Support Unit) • Restoration of railway tracks and functioning of railway at the	TT Directorate - Co-ordination with Railway Zone for quick restoration of train services and planning for relief trains for stranded passengers.	Operating Department – Coordinate with RB for regulation/diversion and cancellation of trains, coordinate with division for quick restoration of train services and planning for relief trains for stranded passengers.	Operating Department – Movement of relief trains to Disaster site quickly, Coordinate with HQs for regulation/diversion and cancellation of trains.

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
			resources and equipment for quick repairs/restoration of rescue and relief teams with their supplies. • Operational plans are in place to transport heavy machinery (like dewatering pumps, boats, etc.) through road in close coordination with the relevant Ministries. • Operational plans are in place for quick restoration or train services, providing additional railway wagons, containers and passenger coaches for movement of relief supplies/rescue equipment and personnel and shifting affected population to safer places/shifting stranded passengers in consultation with State Government.		earliest • Coordinate with Central Govt. for transportation of relief materials • Within and near Airports: AAI works with the logistic section of the state level IRT to provide effective services (Ground Support Unit) and also provide Nodal Officer for coordination of the relief operations • Restoration of Airport at the earliest involving specialised response force of the central government • Coordination with state and district administration to provide air support • Cater to the needs of transporting affected people if required.			

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
			• Availability of diesel locomotives and drivers in disaster-affected areas where power is disrupted/shut as a preventive measure; maintain a live roster of such emergency support systems which can be mobilized at very short notice by periodic review of readiness. • Establishment of emergency services group within the railways with staff having experience of working in disaster situations. • Contingency plan is in place to deploy rail coaches as makeshift shelters if required. • Activation of railway hospitals/ mobile rail ambulances to shift/					

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
			treat injured patients in consultation with the Health Ministry. • Easy availability of heavy equipment available with the Railways for search and rescue. • Plan is in place for quick restoration of airport runway and restoration of air traffic for facilitation of transport or relief teams/supply/ equipment, stranded passengers, etc. • Control room gets activated for smooth coordination in receiving and dispatching resources and equipment in close coordination with the State Government. • Availability of trained manpower for making night landing during					

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
			emergencies. • Availability of Air Ambulances at strategic locations with trained manpower and equipment in close coordination with the Health Dept.					
8.	**Relief Logistics and Supply Chain Management**	**Lead Agencies:** MHA, ministries with hazard specific responsibilities, NDMA **Support Agencies:** MoD, MoR, MoRTH, MoCA, MoCAFPD, MoFPI, MoAFW	• Coordinate transportation (air, rail, road, water) for other Central ministries/ departments/ agencies • Locate, procure and issue resources to Central agencies involved in disaster response, and supply to the affected state	State/UT, SDMA, Revenue Dept., CoR, SEOC, DDMA, all other relevant department/ Agencies	• Establish a mobilization centre at the airport/railway station for the movement of relief supplies within the state • Deploy special transport mechanism for the movement of relief supplies within the state • Make arrangements to receive and distribute relief and emergency supplies received from different parts of the country • Coordinate	TT Directorate - Co-ordination with the Ministries and Railway Zones	Operating Department – Coordinate with RB and State Authorities	Operating Department – Coordinate with HQs and Local Authorities

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
					transportation (air, rail, road, water) with Central ministries/depts./ agencies • Arrange alternative means of transportation to send relief supplies to the affected locations if normal transport cannot reach.			
9.	**Rehabilitation and Ensuring Safety of Livestock and Other Animals, Veterinary Care**	Lead Agency: MoAFW, DoAHDF Support Agencies: MoRTH, MoR	• Support the setting up of livestock camps/ shelters for animals in distress due to disasters, including drought • Provide assistance for care of animals in the camps/ shelters • Assist State/UT in the proper management, and running of livestock camps/ shelters • Assist in proper rehabilitation of animals • Supplement the	State/UT, SDMA, Revenue Dept., CoR, SEOC, DDMA, Forest/ Environment Dept., Agriculture Dept., AHD, Animal Welfare Organizations	• Include provisions for evacuation, safety, and rehabilitation of animals in SDMP • Set up of livestock camps/ shelters for animals in distress due to disasters, including drought • Organize proper care of animals in the camps/ shelters • Ensure proper management and running of livestock camps/ shelters • Proper rehabilitation	TT Directorate - Co-ordination with other Ministries and Railway Zones.	Operating Department – Coordinate with RB and State Authorities	Operating Department – Coordinate with HQs and Local Authorities

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
			needs of State/UT to provide veterinary care to disaster-affected livestock, including drought-hit areas		of animals • Provide veterinary care to disaster affected livestock, including in drought areas			
10.	**Data Collection and Management**	**Lead Agencies:** MHA, NDMA **Support Agencies:** NIDM, MoIB, MoCIT, MoST, MoES, MoWR, MoEFCC, ministries/ departments with hazard-specific responsibilities	• Maintain proper records of all the essential services needed for rescue, response and relief phases, both by the State Governments and by the Central Ministries/ Departments • Establish a sound reporting mechanism to meet the information needs of both Central and State Governments about the disaster response	State/UT, Revenue Dept./ SEOC/ CoR, SDMA, DDMA, Bureau of Economics and Statistics, all other relevant Departments	• Representative of SDMA works with the planning section at state level for making of IAP and dissemination of information. • Creation of a cell at the District level (preferably as part of DEOC) and place dedicated resources to collect/ update data on all essential services (as per the template given in the IRS guidelines) which will help during the response phase for effective reporting and compilation.	Safety Directorate - Coordination with Mechanical and TT directorate – for maintaining record of Accidents and essential services needed for rescue, response and relief.	Safety Department – Coordination with Mechanical and operating Department – for maintaining record of Accidents and essential services needed for rescue, response and relief.	Safety Department – Coordination with Mechanical and operating Department– for maintaining record of Accidents and essential services needed for rescue, response and relief.

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
11.	**Media Relations**	**Lead Agencies:** MoIB, MHA, NDMA **Support Agencies:** MoCIT, MoST, MoES, MoWR, MoEFCC, ministries/ departments with hazard-specific responsibilities	• Collect, process and disseminate information about an actual or potential disaster situation to all stakeholders so as to facilitate response and relief operations; update information on disaster and disaster victims; maintain contacts with mass media; inform public regarding the impact of disaster and the measures taken for the welfare of the affected people • Ethical guidelines for disaster coverage by media as per accepted global standards respecting dignity and privacy of the affected communities and individuals and	State/UT, SDMA, Revenue Dept., CoR, SEOC, DDMA, Information Dept., all other relevant Departments	• Dept. of Information and Public Relations works with the Command staff as Information and media officer of the state level IRT to provide effective services • Ethical guidelines for coverage of disaster is prepared and shared with all media agencies • Plan is prepared for providing/ broadcasting warnings, do's and don'ts etc. to media and ensure its dissemination	Director Public Relations (DPR) and Director Information and publicity (DIP) - for information to the representative of media.	Chief Public Relation Officer (CPRO) - for information to the representative of media.	Public Relation Officer (PRO) - for information to the representative of media.

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
			work with media to adopt the guidelines through self-regulation as well as oversight by relevant regulatory institutions • Mechanisms for broadcasting warnings, do's and don'ts etc. to media and public before (if applicable), during and after the disasters • Proper schedule for media briefing (once/ twice/ thrice daily depending on the severity of the disaster) and designate a nodal officer for interacting with media on behalf of the Government					

Preparedness and Response								
S.No	**Major Theme**	**Central/State Agencies and their Responsibilities**						
		Centre	**Responsibility-Centre**	**State**	**Responsibility-State**	**R.B.**	**Zonal HQ**	**Divisional HQ**
12.	**Fodder for livestock in scarcity-hit areas**	**Lead Agency:** MoAFW, DoAHDF **Support Agencies:** MoRTH, MoR	• When required, mobilize fodder and cattle feed to meet shortages, as in drought or scarcity conditions • Transport fodder from storage facilities or distant areas to the scarcity-hit areas • Organize fodder resource and mobilization centres • Enlist PSUs and private agencies for	State/UT, SDMA, Revenue Dept., CoR, SEOC, DDMA, Forest/ Environment Dept., Agriculture Dept., AHD, Animal Welfare Organizations	• Mobilize fodder and cattle feed to meet shortages, as in drought or scarcity conditions • Transport fodder from storage facilities or collection centres to the scarcity-hit areas • Organize collection centres for fodder and cattle feed	Traffic Commercial dte - Coordination with Zonal Railways and issue policy guidelines. TT Directorate - Co-ordination with the Ministries and Railway Zones for movement of supplies.	Commercial department – Coordinate with Divisional authorities. Operating Department – Coordinate with RB and State Authorities for movement of supplies.	Commercial department – Arrangement of food and water to the passengers. Operating Department – Coordinate with HQs and Local Authorities for movement of supplies.

13.	**Fuel**	**Lead Agencies:** MoPNG **Support Agencies:** MoD, MoR, MoRTH, MoCA	• Petrol pumps are functional and adequate petrol, oil and diesel are available to Government for relief, rescue and general public • Adequate supply of petrol, diesel, kerosene and LPG Gas in the affected areas in close coordination with the State Government for general public as well as emergency responders/equipment • Quick mobilization of fuel in hilly areas to avoid delays caused by complex supply chain to such areas	State/UT, SDMA, Revenue Dept., CoR, SEOC, DDMA, Civil Supply Dept.,all other relevant Departments	• Logistic section of the state level IRT to coordinate with the relevant departments/ agencies to provide effective services (Ground Support Unit) to the field level IRTs for response • Assess and indicate clear requirement of fuel to the Central Ministry and coordinate the delivery of fuel through local arrangements. • Ensure sufficient availability of tankers/ other vehicles for local transportation through the relevant Dept. • Establish mechanism for stocking the fuel at strategic locations with relevant agencies.	Traffic Commercial dte - Coordination with Zonal Railways and issue policy guidelines. TT Directorate - Co-ordination with the Ministries and Railway Zones for movement of supplies.	Commercial department – Coordinate with Divisional authorities. Operating Department – Coordinate with RB and State Authorities for movement of supplies.	Commercial department – Arrangement of Fuel. Operating Department – Coordinate with HQs and Local Authorities for movement of supplies.

Chapter 5

STRENGTHENING DISASTER RISK GOVERNANCE

5.1 Background

Strengthening disaster risk governance is considered a cornerstone of the efforts to understand, reduce and manage risks in global practices (UNDP 2015). UNDP defines disaster risk governance as follows (UNDP 2013):

"The way in which public authorities, civil servants, media, private sector, and civil society at community, national and regional levels cooperate in order to manage and reduce disaster and climate related risks. This means ensuring that sufficient levels of capacity and resources are made available to prevent, prepare for, manage and recover from disasters. It also entails mechanisms, institutions and processes for citizens to articulate their interests, exercise their legal rights and obligations, and mediate their differences."

The concept has evolved over the last decade and the current thinking acknowledges that one cannot separate governance of disaster risk from the governance of other types of risks, including those associated with global climate change, environmental degradation, financial crises, and conflict situations(UNDP 2015). From the mid-2000s onwards, governance was commonly accepted as the crux of DRR, with comprehensive efforts underway to increase the DRR capacity of national and local institutions; to strengthen policy, legal and planning frameworks; to develop human and financial capacities; and to promote multi-stakeholder and multi-disciplinary approaches. There is now greater emphasis on accountability, transparency, responsiveness to the needs of those most at risk, and ensuring the rule of law/compliance with legal provisions. These are of crucial importance in disaster risk governance.

5.2 Sendai Framework and Strengthening Disaster Risk Governance

The Sendai Framework states that disaster risk governance at different levels is of great importance for an effective and efficient management of disaster risk. It also requires clear vision, plans, competence, guidance, and coordination within and across sectors, as well as participation of relevant stakeholders. Strengthening disaster risk governance is necessary to foster collaboration and partnerships for the implementation of disaster risk reduction and sustainable development. The Sendai Framework lays emphasis on the following to strengthen disaster risk governance:

a) Mainstream and integrate disaster risk reduction within and across all sectors and promote the coherence and development of relevant laws, regulations, and public policies. It must guide both the public and private sectors through the legal framework that clearly spells out the roles and responsibilities. It must address disaster risk in publically owned, managed, or regulated services and infrastructures. It must encourage actions by persons, households, communities, and businesses. It has to enhance relevant mechanisms and initiatives for disaster risk transparency. It must put in place coordination and organizational structures.
b) Adopt and implement disaster risk reduction strategies and plans, across different levels(local to national) and timescales, aimed at preventing the creation of risk, the reduction of existing risk and the strengthening resilience – economic, social, health and environmental.

c) Carry out assessment of the technical, financial and administrative disaster risk management capacity to deal with the identified risks at different levels.
d) Promote necessary mechanisms and incentives to ensure high levels of compliance with the safety-enhancing provisions of sectoral laws and regulations, including those addressing land use, urban planning, building codes, environment, resource management, health and safety standards, and update them, where needed, for better disaster risk management
e) Develop and strengthen mechanisms to periodically review and assess the progress on various DM plans as well as encourage institutional debates, including by parliamentarians and relevant officials, on DRR plans
f) Assign clear roles and tasks to community representatives within disaster risk management institutions and processes and decision-making through relevant legal frameworks, and undertake comprehensive public and community consultations during the development of such laws and regulations to support their implementation
g) Establish and strengthen government coordination forums composed of relevant stakeholders at the national and local levels, such as national and local platforms for disaster risk reduction.
h) Empower local authorities, as appropriate, through regulatory and financial mechanism to work and coordinate with civil society, communities and indigenous people and migrants in disaster risk management at the local level
i) Work with parliamentarians for disaster risk reduction by developing or amending relevant legislation and setting budget allocations
j) Promote the development of quality standards, such as certifications and awards for disaster risk management, with the participation of the private sector, civil society, professional associations, scientific organizations and the United Nations
k) Formulate relevant public policies and laws aimed at addressing issues of prevention or relocation, where possible, of human settlements in disaster risk-prone zones.

5.3 Initiatives taken by Ministry of Railways for strengthening Disaster Risk Governance:

Ministry of Railways has taken a number of initiatives for strengthening Disaster Risk Governance as per Sendai Framework for Disaster Risk Reduction. Some of the important initiatives taken to reduce the accidents and improve safety are as under:

5.3.1 Measures to Improve Safety :

- **Safety Focus** - to reduce accidents caused by human errors, a multi-pronged approach with focus on introduction of newer technologies, mechanization of maintenance, early detection of flaws, etc. to reduce human dependence in the first place, alongwith upgrading the skills of the human resources were the prime drivers for accident prevention.
- **Periodical Safety Audits** - Periodical Safety Audits of different Divisions by multi-disciplinary teams of Zonal Railways as well as Inter-Railway Safety Inspections were conducted on regular basis. During the year 2018, 83 Internal Safety Audits and 29 Inter-Railway Safety Inspections were carried out.
- **Training facilities** - Special emphasis is being laid on training of Railway Officials specially those looking after areas connected with safety. Training was imparted to 1,55,337 (Provisional) Non-Gazetted safety staff during 2018-19.

5.3.2 Infrastructural Inputs :

'Rashtriya Rail Sanraksha Kosh (RRSK)' has been introduced in 2017-18 for replacement/renewal/upgradation of critical safety assets, with a corpus of Rs.1 lakh crore over a period of five years, having annual outlay of Rs.20,000 crore. In the first year of its inception, expenditure of Rs.16091 crore was made out of the Fund for safety works. In 2018-19 also, a provision of Rs.20,000 crore was made, against which expenditure of approximately Rs.18,000 crore has been incurred.

The Funds under RRSK are utilised for safety works relating to Traffic Facilities, Rolling Stock, Level Crossings, Road Over/Under Bridges, Track Renewal, Bridge Works, Signal and Telecommunication Works, other Electrical Works, TRD Works, Machinery and Plant, Workshops, Training/HRD, Passenger Amenities and Other Specified Works.

Ministry of Finance has issued 'Guidelines for Operation of Rashtriya Rail Sanraksha Kosh (RRSK)', which inter alia, includes Monitoring Framework for RRSK. It stipulates setting up of Monitoring Committee headed by CEO/NITI Aayog to examine performance. It is also laid down that the progress will be reviewed annually by Cabinet Committee on Economic Affairs headed by Hon'ble Prime Minister.

5.3.3 Measures to avoid Collisions :

To increase efficiency and to enhance safety in train operations, **Advanced Signaling System** with Panel Interlocking/ Route Relay interlocking / Electronic Interlocking (PI/RRI/EI) along with Multi Aspect Colour Light Signals have been progressively provided at 5886 stations covering about 94 % of the interlocked Broad Gauge stations on Indian Railways, replacing the obsolete Multi Cabin Mechanical Signaling System, that involved a large amount of human intervention. **Route Relay Interlocking (RRI)** have been provided on every major yard of Indian Railways for efficient and safe movement of trains.

To avoid collisions technological aids are briefly enumerated below:-

- **Complete Track Circuiting at stations: -** Track Circuit is one of the most important safety aids provided at the stations, which has reduced collisions in station area. A major thrust has been given to track circuiting at stations.
- **Block Proving Axle Counter (BPAC):-** To enhance safety, automatic verification of complete arrival of train at a station, Block Proving by Axle Counter (BPAC) is being provided at stations having centralized operation of points and signals.
- **Automatic Block Signaling:-** For augmenting Line Capacity and reducing headway on existing High Density Routes on Indian Railways, Automatic Block Signaling is being provided. This results in track circuiting of large portion of the track which leads to enhanced safety.
- **Automatic Train Protection (ATP) System:** In order to enhance safety in Train operations, Indian Railways has decided to provide Automatic Train Protection (ATP) System using a mix of proven European Train Control System (ETCS) level 2 and an indigenously developed Train Collision Avoidance System (TCAS). The system will be an aid to Loco Pilot, which will help to eliminate accidents due to Signal Passing at Danger (SPAD) and over speeding, ensure visibility of signals in foggy weather in addition to increasing line capacity.
  - Four projects of **ETCS Level 2** of limited lengths on High Density Networks, have been taken up for extensive trials before going for large scale implementation.

- **Train Collision Avoidance System (TCAS):-** Indigenous TCAS is under trials and once developed, it will be provided on low density routes.

- **Centralized Traffic Control (CTC) in Indian Railways:-** Centralized Traffic Control is a computer based system which facilitates the control and management of multiple Signaling installations at various stations from a single location. It also provides a real time simulation of railway traffic in a section at a single location. Ghaziabad-Kanpur section has been chosen for provision of first CTC of Indian Railways. All signalling assets in this section, 413 Kilometers double line section having 47 stations can be controlled from a single location i.e. CTC Tundla.
  The CTC operator can directly see the train's locations on an electronic display panel and efficiently control the train's movements by operating signals and points centrally.
- **Train Management System (TMS):-** is another area of technology upgradation for Centralized Monitoring and Management of Train traffic already functional on Mumbai Suburban section of Western Railway and Central Railway, provides live train movements in the Control Centre.

5.3.4 Measures To Reduce Derailments :

- To improve safety, Indian Railways (IR) has been using Pre-stressed Concrete sleepers (PSC) which are economical and functionally best suited for high speed and heavy density traffic. PSC sleepers are being used for all renewals, new lines, doubling, gauge conversion, etc.
- A new design of wider sleeper has been developed and adopted. The new design is considered to be functionally better than the present design. The wider and heavier sleeper offers higher frame resistance, less stress on ballast and rail pad, improving reliability and maintainability of track.
- Upgradation of Track Structure consisting of pre-stressed Concrete (PSC) sleepers, 60 Kg high strength (90 Ultimate Tensile Strength) rails on concrete sleepers, fanshaped layout on PSC sleepers, Steel Channel Sleepers on girder bridges has been adopted on most of the routes.
- Standardization of track structure with 60 Kg Rails and PSC Sleepers: Track structure is being standardized with 60 kg rails and PSC sleepers on all the Broad Gauge routes, especially on high density routes to reduce fatigue of rails under higher axle-load traffic. New track construction and replacement of over-aged tracks is being done by PSC sleepers only.
- **Rail Fracture Detection System -** Rail/weld failures are potential safety hazards. Advanced Railway systems are using the systems, which alerts all concerned in case of failures and train operations are controlled to prevent consequential train accidents. No such system is available on IR. Suitable technology will be developed in association with advanced railway systems for use on IR. A trail of Broken rail detection system on NR & NCR on 25 Kms track length in each has been undertaken. After successful trial, this system will be progressively installed on other important routes.
- **In-motion Weighbridges -** The in-motion weighbridge helps detect overloading in wagons. This reduces fatigue of rail/welds and, therefore, reduces chances of fracture. Installation of in-motion weighbridges is done as and when required as per changes in traffic pattern and emergent requirements and is a continuous process.
- **Long welded rails:** For improving maintenance and better asset reliability, Railways are consistently eliminating fish plated joints on tracks by welding the joints to convert all single rails into long welded rails to the extent possible. During relaying/construction of new lines/gauge conversion also, long welded rails are laid on

concrete sleepers to the extent possible. Mobile Flash Butt welding is being done on priority in construction projects.

- **Flash Butt Welding** :
  - Flash Butt Welding of rails on IR is carried out by using Stationary plants and Mobile machines.
  - FBW is done using electrical current and enough heat is generated by using the resistance of rails. No external material is used and Welding takes place by fusion of parent rail metal.
  - Approval of Quality Assurance Plan and Welding Parameters are Standardized by RDSO for both Stationary and mobile plants before execution of Work.
  - FB Welding is carried out as per Indian Railways Manual for flash Butt Welding of Rails, 2012 (FBWM).

5.3.5 Measures Taken To Prevent Fire In Trains :

Instructions have been issued for provision of the following items in coaches during manufacturing at Production Units to improve the safety features of these coaches:

- Fire detection and suppression system in all newly manufactured Power Cars and Pantry Cars.
- Fire and Smoke detection system in all newly manufactured AC coaches.
- Double Acting AC compartment doors in all newly manufactured AC coaches.
- Fire extinguishers in all newly manufactured non-AC coaches.
- Automatic plug type doors in all newly manufactured Humsafar and Uday train coaches.

Apart from this, the existing AC coaches are being retro fitted with Fire and Smoke detection system and existing Power Cars & Pantry Cars are being provided with Fire detection and suppression system. In addition fire balls are being provided in all power cars to control the fires in case if any such incident happens.

Curbing Fire hazards in Pantry Car :

- With a view to curb fire hazards in pantry car, Board has issued guidelines for upkeep of pantry car equipment to ensure that all equipment and gadgets are in working order and in safe condition.
- Electrical gadgets in Pantry Cars should be operated only by the authorized electrical staff, nobody else.
- Zonal Railways have been advised to remove the card board cartons after loading the food articles and they are to be kept in containers made up of fire retardant materials such as insulated metallic boxes.
- Ticket checking staff should permit only those persons in Pantry Car & Power Car (Railway Staff and Pantry Car Staff) whose names are appearing in reservation chart of pantry car and Power Car and having valid travel authority.

Fire detection and suppression system at important installations :

Fire at vital installations paralyses the train movements. Fire detection system is being provided at vital installations. Fire fighting equipment are being provided at such installations. Staffs have been trained to use these equipments.

5.3.6 Measures to Curb Accidents at Level Crossings :

Various measures taken by Indian Railways to prevent accidents at level crossings, are as under:

(a) **Elimination of Level Crossing :** Level crossings are meant to facilitate the smooth running of traffic in regulated manner governed by specific rules & conditions. Indian Railway has decided to progressively eliminate the level crossings for the safety of Road users and train passengers. During the year 2018-19, 3479 Nos. of unmanned level crossings and 631 Nos. of manned level crossings have been eliminated. As of September 2019, all unmanned Level Crossings on Broad Gauge have been eliminated.

(b) **Provision of Road Over/Under Bridges :** To improve safety of train operations and reduce inconvenience to road users, level crossings are being replaced by Road Over/Under Bridges/Subways (ROBs/RUBs) in a phased manner based on the quantum of traffic.

During the year 2018-19, 172 ROBs and 1305 RUBs/Subways have been constructed under cost sharing, railway cost, Deposit/BOT term and by NHAI over Indian Railway. Works for construction of 1581 ROBs and 5751 RUBs/Subways have been sanctioned. These are at various stages of planning and execution.

(c) **Interlocking of Level Crossing Gates :** Indian Railways have provided interlocking with Signals at 11375 Level Crossing Gates as on 31.03.2019, to enhance the safety at Level Crossings.

(d) **Action Plan for Road Users' Safety :** To reduce accidents at manned and unmanned level crossing gates, IR will adopt following multi-pronged strategy :-

- Existing task force of the Ministry of Railways and State Governments for construction of ROBs/RUBs would be made more effective.
- Items to be resolved between the Ministry of Railways and Ministry of Road Transport and Highways.
- Speed breakers at level crossings, their standards and maintenance.
- Testing of driving license applicant with regard to thorough knowledge pertaining to level crossings.
- Widening of roads at selected high density locations to ease movement.
- Training and counselling of road users.
- Lifting barriers with retro-reflective markers in lieu of gate leaves shall be provided on double and multiple lines.
- On manned level crossings, with more than 500 road vehicles per day and where possible, the road width shall be widened in railway land.
- Signalling Systems like Interlocking arrangements and provision of telephones at LC gates enhances safety considerably.
- Of 21340 Manned Level Crossings, 11375 are already interlocked and provided with signals as on 31.03.2019.
- Inclusion of Dos and Don’ts near level crossings in primary school curriculum.
- Intensive social awareness campaigns to counter misadventure in front of approaching trains.
- Basic infrastructure on all unmanned level crossings will be ensured and it includes provision of adequate width, normal gradient, level surface for 5 m from centre of the nearest track, Whistle Boards in retro-reflective sheets, specified Road Warning Boards, road surface in good condition and speed breakers/rumble strips etc.
- All level crossings, as per revised criteria for manning, falling in the three specified categories, are proposed to be manned in next 5 years.
- Periodic census of level crossings will be carried out by multi-disciplinary teams.

- Compulsory whistling by train drivers by linking loco whistle to the Vigilance Control Device (VCD).
- On sections where there are a number of unmanned level crossings, at close proximity, RUBs may be constructed at a convenient location and the remaining level crossings closed.
- Checking visibility levels at all unmanned level crossings, and taking corrective action for their improvement.
- Appropriate approach road gradients within railway boundary to be ensured.

5.3.7 **Better and Safer Coaches** :

Design of lightweight, stainless steel passenger coaches has been procured through a Transfer of Technology (TOT) contract from M/s Linke Hofmann Busch (LHB) of Germany. The coach provides better ride index at higher speeds. The design provides a higher safety level as a result of modern technology in use in the design of high-speed bogies.

LHB coaches have better riding, aesthetics, higher passenger capacity and safety features as compared to conventional Integral Coaches Factory (ICF) coaches. The Production of LHB coaches in production Units has continuously increased over the years. Only LHB coaches are being manufactured from April 2018 onwards.

5.3.8 **Prevention of Accident Due to Fog :**

Zonal Railways should ensure that the staff be advised and counselled regarding provisions in the General & Subsidiary Rules (G&SRs). Every Crew to be imparted necessary training for upto two days about the system of working of trains during fog. With the use of fog devices in locomotives, the maximum permissible speed during foggy/inclement weather condition be enhanced from 60 KMPH to 75 KMPH subject to the judgement of the Loco Pilots. Zonal Railways should comply instructions issued from Railway Board on fog from time to time. As per latest instructions on foggy/inclement weather, major precautions to be taken by Zonal Railways for safe train operations are briefly described below:

- Provision of Fog Safe Device: Reliable Fog Safe Devices may be provided to the Loco Pilots in all locomotives running in fog affected areas during foggy weather. Placement of detonators under conditions as contained in Railway Board's letter No.98/Safety(A&R)/19/16 dated 23.10.2018 shall be dispensed with.
- Modified Automatic Signalling System as per G.R 9.01 (3) & (4) and G.R 9.03 (3) and (4) and G.R 5.18 to be followed strictly.
- Necessary works like adequate supply of detonators, fitting of LED flasher tail light, painting of Signal sighting Boards, fog signal posts, whistle boards etc. Should be completed before onset of winter/foggy season.
- Reduced movements in the coaching yards, approach to terminals nad at/near terminals etc has to be done to reduce pressure on congested areas.
- Fog affected Railways should review the crew changing location.
- Placement of Visibility Test Object (VTO).

Precautions to be taken by Loco Pilot during Fog:

- When Loco Pilot feels that visibility is restricted due to fog, the speed shall in any case not be more than 75 KMPH.
- LP to whistle frequently to warn gateman and road users at level crossings.

- In Automatic Block territory the speed will be subject to the judgement of the LP i.e. after passing Automatic Stop Signal in Green, Double yellow and at Yellow the speed not to exceed 75 Kmph, 30 Kmph and at a further restricted speed respectively.

5.3.9 Other Measures :

- **Constant Review of Safety Performance at Board's apex level** - Safety performance is invariably reviewed as a first item on Agenda of Board Meeting at the apex level. All accidents are analyzed in detail so that remedial measures can be initiated.
- **Safety Review meeting with Zonal Railways –** Chairman and Board members have conducted Safety Review Meetings with General Managers and PHODs of zonal railways during their visits as well as through video conference.
- **Intensive Footplate Night Inspections -** Intensive Footplate Inspections including night inspections have been conducted at the level of SAG, branch officers and supervisors in the field.
- **Regular Safety Drives & awareness campaigns –** Safety drives and awareness campaigns have been launched from time to time, covering the lessons learnt from learnt from recent train accidents so as to prevent similar accidents in future.
- **Bridge Inspection and Management System:** Modern Bridge Inspection techniques have been adopted, which includes testing by non-destructive testing equipments, under water inspections, monitoring the water level with the help of water level system etc.
- **Patrolling of Railway Tracks:** During adverse weather conditions patrolling of railway tracks including night patrolling is carried out at vulnerable locations regularly.
- **Vigilance Control Device -** All electric and Diesel locomotives are equipped with vigilance control devices (VCD) to ensure alertness of Loco Pilot.

Chapter 6

CAPACITY BUILDING TO HANDLE DISASTER

6. Capacity Development – An Overview

6.1 Background

Capacity development covers strengthening of institutions, mechanisms, and capacities at all levels of all stakeholders. The United Nations International Strategy for Disaster Reduction (UNISDR) defines 'Capacity Development' for DRR as follows:

"The process by which people, organisations and society systematically stimulate and develop their capability over time to achieve social and economic goals, including through improvement of knowledge, skills, systems, and institutions – within a wider social and cultural enabling environment." (UNISDR, 2009)

It is an important component of investing in disaster risk reduction. In the domain of disaster risk management, the Sendai Framework emphasizes the need for enhancing the technical, financial, and administrative capabilities of institutions, governments, and communities to deal with the identified risks at different levels. The framework calls for reinforcing the capacity to implement, and enforce risk reduction measures. Capacity development commonly refers to a process that is driven from the inside and starts from existing capacity assets. The framework underlines the need for capacity development of women in disaster management and building their ability to participate effectively in managing disaster risk.

Investing in capacity development for DRR will be a continuing process to enhance the capability of individuals, agencies, and communities to improve the performance of their DM functions. The process of capacity building will include elements of human resource development, i.e., individual training, organizational development such as improving the functioning of groups, and the strengthening of organizations, regulations, and institutions. Involving stakeholders through participatory approaches is essential to establish ownership and commitment. The sustainability of capacity development initiatives increases in direct relation to the level of participation and ownership of the internal partners. In order for capacity development for disaster risk reduction to be effective, it must be clear in its purpose.

As capacity development entails activities on various levels, i.e. legal and institutional frameworks, systems of organisations, organisation and human and material resources, it is necessary to address challenges on all of them by implementing a mix of activities, on short and long term. The reason for this is that changes at one level often require changes at other levels too, as the levels are interdependent. Therefore, the focus of many capacity development efforts for DRR must go beyond human resource development and pay enough attention to organisational and institutional issues. Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the resilience to disasters. Investing in capacity development is the cost-effective way to save lives, prevent or reduce losses and ensure effective recovery and rehabilitation.

The NPDM 2009 underlines the need for a strategic approach to capacity development and notes that the active and enthusiastic participation of various stakeholders is necessary for it to be effective. The national policy notes that capacity development must address the challenge of "putting in place appropriate institutional framework, management systems and allocation of resources for efficient prevention and handling of disasters."

6.2 Capacity Development Themes

The capacity development covers all aspects of disaster management. The key aspects and broad thematic areas for capacity development applicable to these dimensions of DM are summarized in Table 7-1. The hazard-specific capacity development needs for prevention and response are given in the plan matrix of the Chapter-3 and Chapter-4. The list is indicative, illustrative, and not exhaustive. Further, those chapters provide certain extent of detailing. Even those are indicative and in consonance with national, regional, and global practices, there will be changes, which will be incorporated in the periodic revisions of the plan and during its implementation. The effort will be to follow the emerging best practices.

Table 6-1: Summary of Broad Capacity Development Themes

	Capacity Development Themes
Key Aspect	**Thematic Areas**
Prevention or mitigation for disaster risk reduction	**Hazards, Risk, and Vulnerability Assessment** • Human resource development • Institutional strengthening • Launching demonstration projects • Safety education in educational institutions • Improve the awareness and preparedness of stakeholders at all levels Documenting lessons from previous disasters and ensuring their wide dissemination • Preparing DM plans, regular updating, and mock drills • Institutional arrangements, policies, legal support, and regulatory framework • Developing appropriate risk transfer instruments by collaborating with insurance companies and financial Institutions • Strengthening early warning systems • Mainstreaming of disaster risk assessment, mapping and management into development plans and programs • Revision of building codes and standards for rehabilitation reconstruction practices both for urban and rural areas • Retrofitting techniques • Rapid visual surveys for safety evaluation of buildings • Training and skill development for masons and other artisans. • Reinforce systems to implement, monitor, and enforce regulations for DRR to promote disaster-resistant built environment • Promoting community-based DM taking into account specific needs, regional diversities and multi-hazard vulnerabilities • Design and implement social safety-net mechanisms, including community-based systems • Disaster resilience of health care systems by integrating disaster risk management into primary, secondary and tertiary health care • Business resilience, and protection of livelihoods and productive assets throughout the supply chains, ensure continuity of services and • integrate disaster risk management into business models and practices Preparedness and response plans at all levels • Community-based DRR and DM

Effective preparedness and response	**Emergency response capabilities** – EOCs, infrastructure, equipment upgrades and adoption of best available technologies • Strengthening of the Fire and Emergency Service through revamping, institutional reforms, and modernization • Comprehensive revamping of Fire and Emergency Services with institutional reforms and modernization • Adoption and adaptation of emerging global good practices • Rigorous training and HRD of first responders • Early warnings, maps/ satellite data/ effective dissemination of information • Table-top exercises, simulations, and mock drills to improve operational readiness of the plans • Rescue equipment at all levels • Systems to provide basic services in emergencies • Housing and Temporary shelters • Medical care for casualties, health care and sanitation • Power and fuel supply management • Transportation systems and network • Logistics and supply chain management • Media relations • Managing the dead, disposal of animal carcasses, and debris • Collection and management of data • Legal services/ support
Recovery and Build Back Better	• Post-Disaster Needs Assessment systems and expertise • Credible damage assessment mechanisms and expertise • Planning capabilities to ensuring coherence of BBB with overall development efforts and goals • Studies and research for incorporating resilience into BBB models • Studies on past disasters and recovery to draw useful lessons

The NPDM 2009 envisages a pivotal role for the National Institute of Disaster Management (NIDM) in the area of capacity building. Similarly, the State Disaster Management Institutes and ATIs should play a lead role in the States/ UTs. The NPDM envisages capacity development in the domain of DM at all levels of government and across various autonomous institutions. It also stresses the importance of capacity development efforts to promote community-based DM efforts. The policy notes that to sustain DRR, it is necessary to undertake capacity development across the education sector covering schools to professional institutions. It recognizes that skill development in all sectors to incorporate multi-hazard resistant features along with strengthening of relevant licensing, certification, and standards.

6.3 National Institute of Disaster Management (NIDM) and other Institutions

The NIDM, in partnership with other research institutions has capacity development as one of its major responsibilities, along with training, research, documentation and development of a National level information base. It will network with other knowledge-based institutions and function within the broad policies and guidelines laid down by the NDMA. It will organise training for trainers, DM officials and other stakeholders. The NIDM will strive to emerge as a 'Centre of Excellence' in the field of Disaster Management. The NIDM will play an important role in developing and facilitating the implementation of a National training schedule for DM. It will also be the nodal institution for Regional and International cooperation for training. There are a number of renowned institutes in various States, which are imparting training in

DM. These will be strengthened with financial assistance and such efforts will be replicated by other States/UTs. Also, the DM cells in all Administrative Training Institutes, Police Academies, State Institutes of Rural Development, Training centres of five CAPFs from where NDRF is drawn up (BSF, CRPF, CISF, ITBP, and SSB) and the NDRF Academy, Nagpur will contribute most significantly in developing DM related skills. The capacity of existing institutes needs to be upgraded in accordance with regional and local requirements.

6.4 Indian Railway Institute of Disaster Management

Indian Railway Institute of Disaster Management (IRIDM), Hejalla, Bangaluru, has been set up to play a crucial role in Disaster Management in train-related accidents across the country. The Disaster Management Institute and Safety Village in Hejjala is the first such initiative by Indian Railways and is a unique Virtual Reality Centre, which will simulate real-life disasters. The institute will train railway staff in responding using the right techniques when dealing with a train accident. The Virtual Reality Centre, which will indicate the effect of each action taken by the disaster management staff which will to better respond to emergency situations is also being set up for training of officials in disaster management. An action plan to impart safety training IRIDM, Bangaluru to working officers has been approved by Railway Board. Each officer will undergo training at IRIDM before he/she is given higher responsibilities.

Senior officers of Railways are imparted special training on "Safety Management" through regular courses conducted by Indian Railways Institute of Transport Management (IRITM), Lucknow to enhance the safety skills and knowledge of the officers. IRITM is conducting this course regularly since January, 2018.

Apart from these, Indian Railways have many Central Training Institute (CTIs), Zonal Training Institute (ZRTIs), Supervisor Training Centres etc. where officers, supervisors and staff are imparted training on different safety aspects.

6.5 Capacity Development of Local Bodies – Rural and Urban

The capacities of Panchayats and ULBs have to be developed in the sphere of disaster management. Without adequate capacity development, the local bodies cannot contribute effectively to disaster management or in ensuring the proper implementation of DM plans. Capacity development is also necessary for true empowerment of the bodies of local self-governance. The elected leaders and officials of Panchayats and ULBs should be trained to competently handle different types of crises, contribute to disaster preparedness, make proper use of available warnings, organize operations such as search, rescue, relief, medical assistance, and carry out damage assessment. They should also have sound understanding of the needs of proper post-disaster rehabilitation. The local leadership can play a big role in disaster management in all stages and in DM planning. Capacity development must aim at increasing the competence of local bodies in all aspects of disaster management, mainstreaming DRR, and in promoting a culture of disaster prevention and DRR. The capabilities of the local bodies have to be developed in financial, technical, and managerial spheres. The state level training institutes (ATI, SIDM, and others) will develop need-based training programs for the capacity development of rural and urban local bodies. The capacities of Panchayats and ULBs have to be developed in the sphere of disaster management. Without adequate capacity development, the local bodies cannot contribute effectively to disaster management or in ensuring the proper implementation of DM plans. Capacity development is also necessary for true empowerment of the bodies of local self-governance. The elected leaders and officials of Panchayats and ULBs should be trained to competently handle

different types of crises, contribute to disaster preparedness, make proper use of available warnings, organize operations such as search, rescue, relief, medical assistance, and carry out damage assessment. They should also have sound understanding of the needs of proper post-disaster rehabilitation. The local leadership can play a big role in disaster management in all stages and in DM planning. Capacity development must aim at increasing the competence of local bodies in all aspects of disaster management, mainstreaming DRR, and in promoting a culture of disaster prevention and DRR. The capabilities of the local bodies have to be developed in financial, technical, and managerial spheres. The state level training institutes (ATI, SIDM, and others) will develop need-based training programs for the capacity development of rural and urban local bodies.

6.6 Training Communities

Enhancing the capacity of communities, as they are the first responders to disasters, is a significant part of the capacity development process. The Sendai Framework notes the need to build the knowledge of civil society, communities, and volunteers on disaster risk reduction. Capacity building has to include awareness, sensitisation, orientation, and developing skills of communities and community leaders. Assistance from NDRF, Civil Defence, civil society organisations, local community-based organizations, and Self-Help Groups will be encouraged. The overall responsibility to give impetus to leadership and motivation will rest with local authorities, PRIs and ULBs under the overall guidance of State and District authorities.

6.7 National and State Disaster Resource Networks

India Disaster Resource Network (IDRN) is a portal providing nation-wide inventory of DM-related resources covering almost all the basic needs. It is a web based platform, for managing the inventory of equipment, skilled human resources and critical supplies for emergency response. Primary focus of IDRN portal is to enable the decision makers to find answers on availability of equipment and human resources required to combat any emergency situation. At the State-level, Government of India has encouraged each state to establish its own State Disaster Resource Network (SDRN) portal on the pattern of IDRN.

6.8 Capacity Development - Ministries and States

The Central Ministries, departments and agencies as well as the State Governments will take actions for capacity development of different stakeholders as shown in Table7-2 given below on the basis of proper capacity development needs assessment.

Table 6-2: Capacity development activities -

	Task	Central	Activities	Responsibility in Railways
1.	Deploying good resources, advanced technology and equipment	GoI, NDMA, MHA, All Nodal Min./ Dept.	• Identifying existing ones • Identification of gap between existing ones and those required on the basis of hazard risk and vulnerability and lessons learnt from recent past disasters. • Procurements of additional equipment with advanced	Respective Directorates to identify gaps and initiate action.

			technologies	
2.	Strengthening training institutes for disaster management.	NIDM, MoHRD, MHA, NDMA	• Research and extension support grants • Create/strengthen state level DM institutes.	Establishment directorate.

6.9 National Disaster Response and Mitigation Funds:

6.9.1 Disaster Management to be inbuilt in Developmental Plans:

The National Policy on Disaster Management provides for development of the Disaster Management handling capability by each Ministry/Department of the Central Government as also by the State Government. As per the policy, NDMA will ensure mainstreaming of disaster risk reduction in developmental agenda in all existing and new developmental programmes and projects shall incorporate disaster resilient specifications in the design and construction. The Planning Commission will give due weightage to these factors while allocating resources.

6.9.2 Responsibilities of the Central Ministries and Departments:

The National Policy on Disaster Management lays down that all Central Ministries and Departments will prepare their DM Plans and where funds are being asked for to improve Disaster Management capability including the financial projections to support these plans. The necessary budgetary allocations will be made as part of the Five Year and Annual Plans.

6.9.3 National Disaster Response and Mitigation Funds:

As per the National Policy on Disaster Management, a National Disaster Response Fund may be constituted as mandated in the Act. The National Response Fund will be applied by the National Executive Committee (NEC) towards meeting the expenses for emergency response, relief and rehabilitation, in accordance with the guidelines laid down by the Central Government in consultation with the NDMA. The proposal of merger of National Calamity Contingency Fund (NCCF) with the National Disaster Response Fund shall be as recommended by the Finance Commission from time to time. Similarly, as mandated by the Act, the National Disaster Mitigation Fund (NDMF) may be created for projects exclusively for the purpose of mitigation.

In the case of Ministry of Railways, all the maintenance activities related to rolling stock, track, civil infrastructure, signals and telecommunication, traction, operations as well as the capital expenditure incurred on these are for upkeep and improvement of safety of train operations. There is no specific allocation head for providing/capturing expenditure relating to disaster Management activities on Indian Railways. However, disasters do happen in form of train accidents, breaches, natural calamities, etc which affect operations on railways. The expenditure incurred as a result is, however, accounted for under safety related revenue and capital heads. Thus, the mitigation funds are part and parcel of the expenditure of Railways.

6.10 Modernization of Relief/Rescue during Disasters:

The National Policy on Disaster Management provides that all Central Ministries and Departments of the Central Government and of the States will build capacity to handle

different types of Disasters based on guidelines issued by the NDMA. Helicopter based relief rescue missions on par with similar arrangements existing in western world can also be used extensively for Mass Casualty Evacuation and for providing relief where required. For Railways own Disaster situation like a major train accident where the site is not approachable by rail or by other road vehicles this would be the only means of relief. All Zonal Railways may obtain details of Government and Private Helicopter service and the contact numbers of their operators to be contacted in advance. The Disaster Management Plan of the Zonal Railway and the Divisions should make a mention of the helicopter service providers. If these services are not available on one Zonal Railway, they may contact the nearest Zonal Railway where they are available to be called upon in a Disaster situation.

We have to have a total paradigm shift in the manner in which serious train accident relief is to be managed in the second decade of the 21st century. A much more radical approach would be gradually need to be introduced that what is existing on date.

Sensitive installations of Railways need to be identified. All Zonal Railways need to define sensitive installations and infrastructure. These should be ones which would cripple the Railways primary objective of transportation. For instance, Control Rooms; Microwave Towers; TF Exchanges; RRI of Jn Stations, Major Bridges, Tunnels of long lengths, Hospitals etc. are very sensitive/vulnerable locations.

6.11 Terrorist attacks on a freight train carrying inflammables :-

Railways have an excellent liaison with the Oil Companies due to the transport of their commodities viz. Motor Spirit, HSD, Naphtha etc. Traditionally we have always made use of their fire fighting equipment alongwith the expertise in fire control available with them. Gradually, Railways have to develop both the expertise through training in the Railways Rescue, Relief Training Institute being set up at Bangalore and also procure latest technology fire fighting equipment.

Chapter 7

MEDICAL PREPAREDNESS and HOSPITAL DISASTER MANAGEMENT PLAN

7.1 Network of Mobile Medical Infrastructure:

The Indian Railways has an established network system capable of handling train accidents along with emergency medical response and casualty evacuation. The system is based on an infrastructure consisting of 161Accident Relief medical Vans (ARMV) – Scale I (Unit of accident relief trains situated at an average distance of every 300kms on main lines and 400 km on branch lines), 320 Accident Relief Medical Equipment (ARME) – Scale II consisting of three sets of Portable Medical Kit for Accidents (POMKA). POMKAs are also available at all health units, sub-divisional and divisional/zonal hospitals. Trained manpower of medical and all other departments of the Indian Railways provide first aid, immediate and necessary emergency medical treatment to save the life and limbs of persons involved in train accidents and arrange rapid evacuation to the nearest government/private hospital by the first available means of transport. There is a well-rehearsed action plan to handle railway accidents.

The system is committed to the primary goal or meeting the needs of the Ministry of Railways, though this resource may be available in a limited manner for assistance of the district administration for mass casualty management.

7.2 Responsibility of Stake Holders:

Medical Response :

Medical Response has to be quick and effective. The execution of medical response plans and deployment of medical resources warrant special attention at the State and District level in most of the situations. The voluntary deployment of the nearest medical resources to the disaster site, irrespective of the administrative boundaries, will be emphasized. Mobile medical hospitals and other resources available with the centre will also be provided to the States/UTs in a proactive manner. Post-disaster management of health, sanitation and hygiene services is crucial to prevent an outbreak of epidemics. Therefore a constant monitoring of any such possibilities will be necessary.

The main stakeholders in the Medical Preparedness and Mass Casualty Management (MPMCM) are the Ministry of Health and Family Welfare, Ministry of Labour and Employment, Employees State Insurance Corporation, Ministry of Defence, Ministry of Railways, State Governments and Union Territories and private health care providers.

NDMA's guidelines on Mass Casualty Management (MCM) have been prepared to provide directions to the Central Ministries, Departments and State Authorities for the preparation of their detailed Medical Preparedness Plans. These guidelines call for a proactive, participatory, well-structured, fail-safe, multidisciplinary and multi-sectoral approach at various levels.

Each organization of the Government may be made aware of risks, vulnerabilities and effects of various natural and man-made disasters including peripheral emergencies in terms of mortality and morbidity; short and long-term health effects including the socio-economic problems faced by the community during, and in the aftermath of MCE. The need for creation of an institutional mechanism and system is essential. This would result in enhancing

capacities and capabilities of hospital and health care workers. So also is the need for strengthening existing procedures that allow emergent activities to meet the challenge of surge capacity because of mass casualty events. The different mass casualty events and other potential disasters including Chemical, Biological, Radiological and Nuclear (CBRN) emergencies which may lead to Mass Casualty Evacuation are to be made aware of to the Medical Management of the concerned departments which have their own medical establishments; Railways falls within the ambit of this item; this can be achieved only through specialized training initially to a few select Doctors in each Divisional Hospital (and the Zonal Hospitals).

A review of the existing health framework, preparedness of the Ministry of Health and Family Welfare, Ministry of Defence, Ministry of Railways and Ministry of Labour and Employment in relation to their capacity for handling casualties caused by various disasters is to be done so as to share each other's strengths and capabilities. Ministry of Health and Family Welfare is assigned with legislative capacity for a number of subjects including all matters relating to the medical, dental, nursing and pharmacy professions and education; mental health; standards for drugs; prevention of food adulteration; and prevention and control of epidemics.

Medical preparedness of Ministry of Defence, Ministry of Railways and ESIC have also been elaborated in the NDMA's guidelines. A brief outline of the arrangements with the state health departments is enumerated; there is also a bird's eye view of the health care infrastructure of the private sector, Indian Red Cross Society, certain Non-Governmental Organisations and various laboratories. Among the various International initiatives, the role of the recently operationalised International Health Regulations in limiting the spread of epidemics and other public health emergencies by the Member States has been highlighted in the guidelines.

Medical preparedness aims at preventive and mitigation measures. Preventive measures include upgrading public health laboratories and establishing an integrated Disease Surveillance Programme (IDSP). Preparedness for Emergency Medical Response (EMR) for the management of mass casualties at the incident site and, their quick and safe evacuation by ambulance services is an important step in this direction. Inadequacy and lack of appropriate capabilities and capacities in existing medical arrangements have to be appreciated. The need for hospital disaster preparedness plans alongwith the non-availability of medical logistics in critical care have been highlighted by NDMA in their guidelines which need to be followed up. The cold chain system in blood transfusion services needs to be established all across the country. The requirement of specialised facilities for CBRN management has also been highlighted by NDMA.

NDMA's guidelines are comprehensively given for a legislative and regulatory framework, preventive measures, preparedness, capacity development, hospital preparedness, specialised health care and laboratory facilities, role of alternative systems of medicine and identification of the dead, psychosocial care and mental health services and Research and Development for MPMCM. The roles and responsibilities of various stakeholders at the centre state and district levels are also described. The salient highlights in the guidelines include:

- Preventive measures like strengthening of epidemic control programmes, immunisation, HIV control etc., development of minimum standards of food and water; IDSP and its integration at all levels converged to develop an effective Early Warning System (EWS) operable at all levels.

- The Medical First Responders (MFRs) of mobile medical teams will be fully trained in triage and resuscitation; well-equipped and supported by all emergency services and material logistics.
- Emergency medical evacuation requires development of an Integrated Ambulance Network (IAN) including road, aerial and water ambulance networks integrated with special trains for MCE and not only self-propelled Accident Relief medical Vans (SP-ARMVs) of the railways as mentioned in the guidelines. As the evacuation of large number of casualties cannot be done by an ARME (or SP-ARMEs) the Railways have adopted the concept of mobilization of special train for MCE when required. It will work in conjunction with Emergency Response Centres (ERCs), ESIC medical services and related emergency functionaries with laid down Standard Operative Procedures (SOPs) for all stakeholders.
- Full-fledged containerised mobile hospitals will be acquired and attached with hospitals earmarked by states/districts.
- Capacity development will include training of all stakeholders including doctors, nurses, paramedics and other resource persons in triage and Basic Life Support (BLS), and development of specialists.
- Hospital preparedness should aim at planning the use of hospital resources in a well coordinated and simple way with defined roles for all medical personnel. Such activities will be drafted in the hospital DM plan which will be a part of the Zonal/Divisional DM plan. The plan will be rehearsed once a year using mock drills.

NDMA's guidelines include items related to response, rehabilitation and recovery, PPP, post-disaster documentation, media management and important medical management aspects which need to be integrated into the district DM plans. The major guideline include:-

- Mock drills will be based on the simulation of worst scenario in the identified vulnerable areas to check the preparedness level of the MFRs.

A specific reference in NDMA's guidelines include item for medical preparedness for handling CBRN emergencies besides the basic aspects of medical preparedness. It covers the following areas:-

- Specific education and skill based training of MFRs and necessary community awareness about various Dos and Don'ts to deal with CBRN incidences in a participative approach.
- SOPs for CBRN management at the incident site, triage, personal protection, decontamination, resuscitation, and casualty evacuation followed by management of victims at the hospital level.
- The necessary resource inventory in terms of Personal Protective Equipment (PPE), various detectors, decontamination and de-corporation agents, antidotes, essential medicines, specialised mobile laboratories and ambulances fitted with CBRN filters. Special CBRN stores and necessary laboratory facilities will be established at various levels.

Zonal Railways have to arrange special trains consisting of AC and/or non-AC coaches to run from the nearest coaching terminal to the site for evacuation especially for large scale casualties. Railway and non-Railway Medical Terms may be deployed in these special trains along with a portable kit of medicines, etc. (POMKA) to attend to the injured during the process of evacuation. In these special trains casualties even in hundreds can be evacuated; the medical attention, however, would be limited vis-à-vis what can be provided in the ARMVs.

Each different type of casualty requires a specialized training to handle it. The Railway Medical Department neither has the training nor can they digress from their principle function

of providing medical care to the railway men and their families including to retd. staff/families. During a Chemical Disaster, as the public areas are far away from station premises it may not be possible to run the ARME or a special train to the location close to the site. In some situations due to effect of Chemical Gases (as was the case in Bhopal Gas tragedy of Union Carbide) even the Loco Pilot/Guard and the Medical Teams may not find it possible to reach the site in the immediate period of post-Disaster.

Railways are not expected to be a main stake holder in the DM Plan of CBRN disasters. They can at best be involved in the evacuation of casualties by a special train (A/c and non A/c coaches) from the nearest station closer to site to a station serving Hospital, nearby. Skeleton First Aid facility can be extended by the Railways Medical Team in this special train. In any case it would take a maximum of 5/6 hours for the special train to evacuate the causalities once it reaches near the site to reach the station serving the Hospital.

The medical and para medical staff of Railways need to be imparted training for management of CBRN disasters, till the specialist force arrives at the disaster site. As an alternative zonal railways must cater in their own plans to arrange special trains consists of AC and non AC coaches for the purpose of evacuation of large number of casualties in a mass casualty event whenever the railways may be called upon to help the district and state authorities. Railways may not be the main stakeholder in disaster management for CBRN disasters but railways should also train their Para medics, Medical First Responders and Quick Medical Reaction Teams (QMRTS) and train them to provide pre hospital care in case of CBRN attack within the trains or platforms and should be able to respond till such time specialized trams of NDRF/SDRF mobilized to reach the site. Therefore, it is essential to provide personal protection equipment and other equipment, training to Para medics and Medical officers for the limited role for your own set up.

7.3 In the NDMA's Guidelines on Medical Preparedness and MCE, under the head of Medical Preparedness (Page 31) in Item 3.3.3 (i) a no. of duties are defined to be done by the Medical First Responder (MFR). It is specifically mentioned that adequate no. of Personnel, Protection Equipment (PPE) should be available with the mobile teams, various first responders and rescue services. Further, in item (ii) (b), it is mentioned for evacuation of CBRN victims the use of Rail Ambulances is currently non-existent.

As the different MFR's are neither defined nor separately listed in the NDMA's guidelines, it is clarified that the Railways are not to be treated as MFR. NDMA has clarified in a review meeting held with Railway Ministry representatives that the MFR would be NDRF and along with trained personnel of State Governments and District Administration. This may be specifically clarified in the Zonal and Divisional DM Plans as to who is considered as MFR.

7.4 Aim of Hospital Disaster Management Plan:

The aim of a Hospital Disaster Management Plan is to provide prompt and effective medical care to the maximum possible, in order to minimize morbidity and mortality resulting from any MCE.

7.5 Hospital DM Plan:

There shall be Hospital Disaster Management Plan for each Railway Hospital of Indian Railways which will be prepared by CMS/MD of the Divisional/ Zonal/ Workshop Hospital of the Zonal Railway. This shall be based on the NDMA Guidelines on Medical Preparedness and

Mass Casualty Management (Annex. I page 104 of NDMA Guidelines) referring to "Important Considerations for Developing the Hospital Disaster Management Plan".

The Hospital DM Plan should incorporate relevant items given in the DM Plan of the Railways. It should be clarified that:-

"The Hospital DM Plan comes into effect only if the competent authority so authorized declares on the Zonal Railways an incident as a disaster. It can also come into effect if any Central/ State Govt. agency declares a major incident a Disaster, and where the Medical facility of the Railways shall be required to give assistance."

7.6 Objective and Goals of a Hospital Disaster Management Plan:

The hospital disaster management plans should address not only mass causalities that has occurred away from the hospital, but should also address a situation where the hospital itself has been affected by a disaster – fire, explosion, flooding or earthquake, etc.

The role of the Railway Hospital will be of a general hospital only. After assessment of the hospital resources, treatment capacity and surgical capacity (refer Annex-1 of Chap 4, Page 105 of NDMA Guidelines on Medical Preparedness and Mass Casualty Management), its Hospital Disaster Management Plan should be available to the Divisional /Zonal Railway Administration and also to the district administration.

7.7 Disaster Drills:-

As a part of the emergency management plan, every hospital is required to have structure in place to respond to emergencies, this structure is routinely tested during drills.

Continuous revisions should be made in the hospital disaster management plan taking leads from the regular disaster drills in the hospitals. In these drills it should be tested if the Hospital is equipped to respond effectively to the disposal of a large no. of dead etci.e, role of mortuary services and forensic departments. Hospital Disaster Management Plan should be tested once a year by mock drills for up-dation.

7.8 Training of Health Care Personnel of Indian Railways:

It is desired by the National Plan that the Railways should train their Doctors in the treatment of specific injury from CBRN disasters as also keep medicines, the vaccines, equipments and disposables etc for the same in their hospitals. Railways may alternatively get the Training for Trainers of Medical department so that this could be proliferated to other Doctors and other Para Medical Personnel on all Indian Railways in nominated Railway Training Institute/s.

Chapter 8

ROLE OF SECURITY DEPARTMENT IN DISASTER MANAGEMENT

8.1 Security Setup Over Indian Railways

At present, a three tier security system of **District Police**, **Government Railway Police** (GRP) and **Railway Protection Force** (RPF) is prevailing over Indian Railways-

- **GRP:** GRP is a wing of the State Police responsible for prevention and detection of crime and maintenance of law and order in station premises, circulating area and trains. 50% of the cost on GRPs is shared by Railways with respective States.

- **District Police:** Security of tracks and bridges.

- **RPF:** Protection and security of railway property, passenger area, passengers and matters connected therewith. RPF functions under the Ministry of Railways.

8.2 Role of RPF In Disasters

In case of any disaster affecting Railways viz. serious train accidents, fire incidents, explosion in trains or on railway premises, terrorist acts, hijacking of train, etc., RPF will coordinate with other Departments of Railways, GRP/District Police and various Central and State authorities for speedier relief and rescue operations.

In cases of Chemical, Biological, Radiological & Nuclear (CBRN) Disasters or a natural calamity, RPF will provide support services in rescue, rehabilitation and mitigation efforts.

RPF will play an active role in crowd control along with GRP/District Police personnel and Commercial Department of Railways at disaster site.

The deployment of the RPF may be done on need basis to provide relief, rescue and rehabilitation consequent to any disaster situation over railways.

8.3 Current Preparedness

8.3.1 Coordination- Coordination with GRP, State Police and Civil authorities is ensured at the Divisional and Zonal level by concerned RPF officials.

An SOP on "Coordination and Flow of Information between RPF and State Agencies" has also been circulated to all zonal railways for information and necessary action [2014/Sec(Spl)/200/10, dated 10.09.2014].

State Level Security Committees for Railways (SLSCRs) have also been constituted in each State under Director General of Police of respective States with representatives of RPF, GRP, Intelligence & IB. Constitution of SLSCRs has been done with a view to have regular review of security over railways and to address railway related security issues at appropriate level.

Home Secretaries of all the States have been advised by the Min. of Home Affairs regarding initiation of action for expeditious clearance by the State Police in case of railway accident involving loss of human lives or injuries to the passengers, etc. [No.VI-24022/11/2002-PM-I, dated 24th December, 2002]. This letter of the Ministry of Home Affairs has also been circulated to all the General Managers for information and necessary action vide letter No.2002/Sec (Cr.)/45/47, dated March 27,2003.

8.3.2 Disaster management Teams- As per recommendations of the High Level Committee, a Disaster Management Team of 15 RPF personnel has been constituted in each Division with provision of necessary equipment viz. torches and other lighting arrangements, nylon ropes and poles for segregating the affected areas from unwanted visitors and spectators, loud-hailer, stretchers and first aid equipment, wireless sets for inter-communication, cameras for photography of scene of incident, luminous jackets, etc.

Guidelines also exist for ensuring availability of off duty RPF staff for dispatching them to place of occurrence in case of major disasters affecting Railways.

8.3.3 Crowd Control and Management- For effective crowd control, RPF, GRP and District Police have to act in a synchronized manner in coordination with civil authorities. Chapter 10 (Maintenance of Public Order and Tranquility) of the Code of Criminal Procedure Code (Cr.P.C.) Part-A deals with 'Unlawful Assemblies'. Legal procedures are outlined in Sections 129 to 132 of the Cr.P.C. for dealing with Unlawful Assemblies. Enabling provisions are also available under rule 243 of the RPF Rules 1987 empowering Superior officers of the Force to disburse unlawful assembly.

It is, however, essential that the District Magistrate (Dy Commissioner) or the Civil Police (Senior Superintendent of Police) provide advance information to the Railways (DRM) of the dates of expected rush; and also the volumes of rush (including some rough assessment of direction wise destination).

8.3.4 Close Circuit Television (CCTV) Cameras at stations and trains- 463 railway stations have been provided with CCTV cameras over Indian Railways. CCTV cameras have also been provided in few trains. Process has been further initiated to provide CCTV cameras to cover all the railway stations and coaches of trains to further strengthen surveillance mechanism over Railways.

Existing CCTV surveillance system at the railway stations need to be upgraded to incorporate intelligent video analytics to get timely information when heavy crowd builds up within station premises and plan follow-up action. Pictures stored on CCTV system will be of immense help in identifying miscreants and in initiating legal action against such elements. One of the intelligent video analytics envisaged for CCTV surveillance under the Integrated Security System is 'Crowd Management' to signal for crowd density within station premises when it exceeds the prescribed limit.

8.3.5 Upgradation of All India Security Help Line (182)- A 24x7 security helpline has been made functional through Security Control Rooms of RPF to provide round the clock security related assistance to passengers. This Helpline is functioning through a three digit no. 182. The helpline has already been upgraded by provision of ACD machines, call recording, automatic registration, feedback SMS after registration and after taking action alongwith a dashboard for monitoring.

8.4 Explosive Detection & Disposal

At present, Railways relies upon the States and Central Security Agencies for bomb detection/ disposal over railways.

Bomb detection system has been envisaged under Integrated Security System. It provides for development of detection capability in RPF. RPF personnel are being trained in phased manner in each Zonal Railways to develop capability in bomb detection.

Presently, 274 sniffer dogs are available with RPF for detection of explosives.

Preventive measures to be taken in such situations have been separately circulated vide Security Directorate Secret letter No. 2003/Sec(Spl)200/14 dated 16.01.2008.

8.5 Handling of Terrorist Acts & Hijacking of Trains

Procedures have been outlined in the Crisis Management Plans of the Government of India, of the Ministry of Home Affairs and of the Ministry of Railways to tackle such situations. Above mentioned secret documents are available with concerned Authorities and action has to be ensured in accordance with the provisions mentioned in the above mentioned plans.

Ministry of Home Affairs is the Central Nodal Ministry to tackle hostage or terrorist situations requiring specialized handling. National Security Guard (NSG) has to be requisitioned in such situations. Crisis Management Plan of the Ministry of Railways envisages management of such crisis by the National Crisis Management Committee (NCMC) and Crisis Management Group (CMG) at the Railway Board Level and by the zonal management group at the zonal level.

Coordinated efforts have to be ensured by all security agencies present at the spot. Senior most official available at the spot shall handle situations in accordance with conditions of the crisis at local level and instructions received from concerned Crisis Management Groups at Zonal and National levels.

Chapter 9

DISASTER COMMUNICATION SYSTEM

9.1 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 man-made 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.

9.2 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. 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.

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 Rail net 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.

9.3 Incident Response System (IRS):

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 Railway hierarchy which manages disasters in Indian Railways. It has been planned to strengthen and professionalize the same by drawing upon the principles of the IRS with suitable modifications. The IRS is essentially a management system to organize various emergency functions in a standardized manner while responding to any disaster. It will provide for specialised 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. This will facilitate optimum utilisation of resources.

The Railways have their own IRS 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.

9.4 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). Assistance of other 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 provided round the clock in the Operations Control Room.

This control room of the affected divisions on the Railways will monitor the activities post Disaster and coordinates with the various organizations (rescue, relief, mitigation etc) in the disaster areas.

The Divisional control will coordinate with the "Zonal Control" where a similar control room exists, called the Emergency Control in the Headquarters of each Zonal Railway. "Zonal Control will establish liaison with the Disaster Management Centre in the Railway Board which in turn coordinate 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 Control will constantly update the position to Railway Board.

Chapter 10

DISASTER INFORMATION FLOWS AND ALERTS OF DISASTER

10.1 Standard Operating Procedures (SOPs):

An Integrated Operation Centre (IOC) has been set up in the Ministry of Home Affairs (MHA), North Block, New Delhi, to handle disaster situations on a '24x7' basis. In the case of disasters such as cyclones, flood, avalanche, tsunami, etc, own early warning agencies would be able to render an advance warning, which would be followed by a 'watch' period. However, in the case of disasters like an earthquake or a rail accident, the event would be sudden and there will be no early warning or 'watch' period. To ensure that appropriate levels of the Government remain informed about impending or transpiring disaster events, as also to manage the response, the IOC has been made responsible for initiating 'Alert' messages using telephone(s), SMS, fax and e-mail messaging services to various senior level officers.
The aim of this SOP is to lay down standard guidelines and protocols to be followed for issuing Alert messages in disaster situations to senior officers at various levels of the Government.

10.2 Categorization of Alerts:

While there is a need to keep appropriate levels of the Government informed, there is also a requirement to prevent 'information overload' at apex levels, as also thwart undue alarm. Hence, for the purpose of keeping the Prime Minister's Office (PMO) / Cabinet Secretariat and/or senior officers of the MHA /NDMA /NDRF /ESF / Ministries /States /UTs informed, a uniform system of Alerts has been devised. This system envisages the Alerts being categorized into 'Yellow', 'Orange' and 'Red' depending on the magnitude, severity and/or effect of each type of disaster.

Thus, when informing the IOC (MHA) about a disaster event, the concerned agency will not only intimate the type and other details of the disaster, but will also indicate the corresponding category of the 'Alert' (Yellow / Orange / Red) depending on the gravity of the situation. The concerned agency will issue a revised 'Alert' level as and when the disaster-related circumstance change.

Information Passage in Case of Other Contingencies: For any other unprecedented disaster-related event, 'Alert' messages to the PMO / Cabinet Secretariat will be sent only in consultation with, and after approval of the JS (DM) / AS (DM), MHA.

10.3 The 'Emergency Support Function' (ESF) Ministries / Department will be as follows:-

- Ministry of Communication.
- Ministry of Health & Family Welfare.
- Ministry of Defence.
- Ministry of Power.
- Ministry of Transport.
- Ministry of Urban Development.
- Department of Food & Public Distribution.
- Ministry of Drinking Water & Sanitation.
- Ministry of Information & Broadcasting.
- Atomic Energy Regulatory Board.
- Ministry of Petroleum & Natural Gas.

10.4 SOP and Protocol for Transmitting Alerts:

(a) AVALANCHES:

- **Early Warning / Forecasting agency:** Snow & Avalanche Study Establishment, Chandigarh.
- **Alert Categorization:**
  - Low/Medium danger - **Yellow.**
  - High - **Orange.**
  - All Round - **Red.**

Category	Description	Stage	Alerts transmitted to
Low	Partly unsafe conditions. Small size triggering is possible on few extreme slopes. Valley movements are generally safe. Movement on slopes with care.	Yellow	-
Medium	Unsafe conditions. Triggering is possible from the most avalanche prone slope and may reach the valley in medium size. Avoid movement on slopes. Routes should be selected with care. Valley movement with precaution. Evacuate from unprotected settlements on/near the avalanche paths.	Yellow	• JS (DM)/AS(DM)
High	Highly unsafe condition. Triggering is possible from all avalanche prone slopes and may reach the valley in large size. Suspend all movements. Airborne avalanches likely. Evacuate from all settlements on/near the avalanche paths.	Orange	• AS(DM) / JS (DM)/PS to HM/PS to MOS. • Nodal Officers of NDMA & NDRF. • Concerned State / UT Governments. • On instruction of JS (DM), be transmitted to HS.
All round	Extremely unsafe condition. Numerous large avalanches are likely from all possible avalanche slopes even on moderately steep terrain. Airborne avalanche likely and may follow unexpected paths. Evacuate from avalanche prone areas.	Red	• HS/AS, (DM)/JS (DM)/PS to HM/PS to MOS. • Nodal officers of NDMA & NDRF. • All designated officers in PMO/Cabinet Secretariat. • ESF Ministries/ Departments & concerned States / UTs

MHA Control Room will also communicate Avalanche warning to Border Security Force (BSF), Central Reserve Police Force (CRPF) and Indo-Tibet Border Police (ITBP).

(b) TSUNAMI - INCOIS

- **Early Warning / Forecasting Agency:** Indian Tsunami Early Warning Centre (ITEWC) (of the Earth System Science Organization – Indian National Centre for Ocean Information Services (INCOIS), Hyderabad).
- **Alert Categorization:**
  - Watch - **Yellow.**
  - Alert - **Orange.**
  - Warning - **Red.**

Category	Description	Stage	Alerts to be transmitted to:
Watch	When an undersea or near coast earthquake of greater than or equal to 6.5 is reported and a Tsunami Watch is received form ITWEC, INCOIS, Hyderabad.	Yellow	• JS (DM) & AS (DM). • Nodal Officers of NDMA & NDRF. • Concerned State/UT Governments, with instructions to further transmit the alerts to the concerned/Districts authorities. • On instruction of JS (DM), be transmitted to HS, MHA.
Alert	When an undersea or near coast earthquake of greater than or equal to 6.5 is reported and a Tsunami Alert is received form ITWEC, INCOIS, Hyderabad.	Orange	• HS/AS (DM)/JS (DM)/PS to HM/PS to MOS. • Nodal Officers of NDMA & NDRF. • Concerned State/UT Governments with instructions to further transmit alerts to the concerned/Districts authorities. • All designated officers in PMO/Cabinet Secretariat.
Warning	When an undersea or near coast earthquake of greater than or equal to 6.5 is reported and/or when a change in water level after an earthquake is reported. ITWEC would issue a Tsunami warning as per laid down channels.	Red	• HS/AS (DM)/JS (DM)/PS to HM/PS to MOS, Nodal officers of NDMA & NDRF. • All designated officers in PMO/Cabinet Secretariat. • ESF Ministries/Departments. • Concerned States/UTs with instructions to further transmit alerts to the concerned/Districts authorities.

- ✓ Tsunami alert will be sent to senior officers only when Tsunami is likely to affect India or neighbouring countries.
- ✓ All alerts messages will be followed by **Situation Reports (SITREP)** to be sent twice a day or more frequently depending on unfolding events.
- ✓ Alerts falling in **Orange stage** will be communicated with 03 hourly updates.
- ✓ Alerts falling in **Red Stage** will be communicated with hourly updates or at more frequent intervals as warranted by the situation.

(c) LANDSLIDES.

- **Early Warning / Forecasting Agency:** Geological Survey of India.
- **Alert Categorization:**
  - Category-III - **Yellow.**
  - Category-II - **Orange.**
  - Category-I - **Red.**

Category	Description	Stage	Alerts to be sent
III	Landslides (Slides/Falls/Flows) and Subsidence that occur in the vicinity of inhabited areas and/ or any infrastructure that can adversely affect either humans or properties or any infrastructure. Landslides (Slides/Falls/Flows) and Subsidence that block smaller natural drainages and posing insignificant to limited risk to lives and properties. It may pose some amount of threat for future damage.	Yellow	JS (DM).
II	Landslides (Slides/Falls/Flows) and Subsidence that occur and/or have damaging effects on inhabited areas, important and strategic infrastructures such as highways/roads, pilgrimage routes, rail routes and other civil installations like any appurtenant structures of any hydroelectric/irrigation/multipurpose projects and that result either loss of lives or damage to any property.	Orange	• JS (DM) & AS (DM) • On instruction of JS (DM), be transmitted to HS. • Nodal Officers of NDMA & NDRF • Concerned State/UT
I	Landslides (Slides/Falls/Flows) and Subsidence that occur and/or have effect on inhabited areas, important and strategic infrastructures such as highways/roads, pilgrimage routes, rail routes and other civil installations like any appurtenant structures which result in significant losses of lives and properties. The category also includes large landslides that causes damming and blocking of major rivers leading to the possibility of breaching of dam and flooding of downstream low-lying areas (outcome of **Landslide Lake Outburst Flow** – LLOF)	Red	• HS/AS (DM)/JS (DM)/PS to HM/PS to MOS, Nodal officers of NDMA & NDRF. • All designated officers in PMO/Cabinet Secretariat. • Concerned State/UT.

(d) CYCLONE.

- **Early Warning / Forecasting agency:** India Meteorological Department.
- **Alert Categorization:**
  - Cyclone Alert - **Yellow.**
  - Cyclone Warning - **Orange.**
  - Post Landfall Outlook - **Red.**

Category	Description	Stage	Alerts to be Transmitted to
Cyclone Alert	Issued 48 hours before the commencement of bad weather and/or when a cyclonic system is located about 500 km or more away from the coast.	**Yellow**	• JS (DM) & AS (DM). • Nodal Officers of NDMA & NDRF. • Concerned State/UT Governments, with instructions to further transmit the alerts to the concerned/Districts authorities. • On instruction of JS (DM),be transmitted to HS, MHA.
Cyclone Warning	Issued about 24 hours before commencement of bad weather and are of a **"serious nature".** The expected place & time of landfall and the districts along the coastal areas likely to be affected are clearly indicated in the warning messages. The location of the system at this stage may still be 300 km – 500 km away from the coast.	**Orange**	• HS/AS (DM)/JS (DM)/PS to HM/PS to MOS. • Nodal Officers of NDMA & NDRF. • Concerned State/UT Governments with instructions to further transmit alerts to the concerned/Districts authorities. • All designated officers in PMO/Cabinet Secretariat.
Post landfall outlook:	Issued about 12 hours before actual landfall, this stage of warning is of a "very serious nature". Includes details of the likely direction of movement of the cyclone after landfall and the areas expected to be affected.	**Red**	• HS/AS (DM)/JS (DM)/PS to HM/PS to MOS, Nodal Officers of NDMA & NDRF. • All designated officers in PMO/Cabinet Secretariat. • ESF Ministries/Departments. • Concerned States/UTs with instructions to further transmit alerts to the concerned/Districts authorities.

- ✓ All alerts messages will be followed by **Situation Reports (SITREP)** to be sent twice a day or more frequently depending on unfolding events.
- ✓ Alerts falling in **Orange stage** will be communicated with 03 hourly updates.
- ✓ Alerts falling in **Red stage** will be communicated with 1 hourly updates or at more frequent intervals as warranted by the situation.

(e) EARTHQUAKE (National Centre for Seismology)

- **Warning Agency:** National Centre for Seismology, Ministry of Earth Sciences, Hyderabad.
- **Alert Categorization:**
  - Slight & Moderate - **Yellow.**
  - Strong - **Orange.**
  - Major, Great & Giant - **Red.**

Category	Description	Stage	Alerts to be Transmitted to
Small Moderate	Less than 5.0 5.0 – 5.9	**Yellow**	• JS (DM) & AS (DM). • Nodal Officers of NDMA & NDRF. • Concerned State/UT Governments, with instructions to further transmit the alerts to the concerned/Districts authorities. • On instruction of JS (DM), be transmitted to HS, MHA.
Strong	6.0 – 6.9	**Orange**	• HS/AS (DM)/JS (DM)/PS to HM/PS to MOS. • Nodal Officers of NDMA & NDRF. • Concerned State/UT Governments with instructions to further transmit alerts to the concerned/Districts authorities. • All designated officers in PMO/Cabinet Secretariat.
Major Great Giant	7.0 – 7.9 8.0 – 8.9 9.0 and above	**Red**	• HS/AS (DM)/JS (DM)/PS to HM/PS to MOS, Nodal Officers of NDMA & NDRF. • All designated officers in PMO/Cabinet Secretariat. • ESF Ministries/Departments. • Concerned States/UTs with instructions to further transmit alerts to the concerned/Districts authorities.

✓ Alert messages will be followed by **Situation Reports (SITREP)** to be sent twice a day or more frequently depending on unfolding events.

(f) FLOOD (Central Water Commission)

- **Early Warning / Forecasting Department:** Central Water Commission
- **Alert Categorization:**
  - Above normal - **Yellow.**
  - Severe - **Orange.**
  - Extreme - **Red.**

Category	Description	Stage	Alerts to be transmitted to
Above normal	Water level between Warning Level and Danger Level	**Yellow**	• JS (DM) & AS (DM). • Nodal Officers of NDMA & NDRF. • On instruction of JS (DM), be transmitted to HS.

Severe	Water level between Danger Level to the HFL* attained at that location	**Orange**	• HS/AS (DM)/JS (DM)/PS to HM/PS to MOS. • Nodal Officers of NDMA & NDRF. • All designated officers in PMO/Cabinet Secretariat. • Concerned State/UT Governments.
Extreme	Water level higher than the HFL* attained at that location	**Red**	• HS/AS (DM)/JS (DM)/PS to HM/PS to MOS. • Nodal officers of NDMA & NDRF. • All designated officers in PMO/Cabinet Secretariat. • ESF Ministries/ Departments & concerned States / UTs

*****Highest Flood Level: - The highest flood level of the river ever recorded at the place.

- ✓ Alert messages will be followed by **Situation Reports (SITREP)** to be sent twice a day or more frequently depending on unfolding events.
- ✓ Alerts falling in **Orange stage** will be communicated with 03 hourly updates.
- ✓ Alerts falling in **Red stage** will be communicated with 1 hourly updates or at more frequent intervals as warranted by the situation.

(g) RAILWAYS (Ministry of Railways)

- **Warning Agency:** Ministry of Railways
- **Alert Categorization:**
  - Minor - **Yellow.**
  - Medium - **Orange.**
  - Major - **Red.**

Category	Description	Stage	Alerts transmitted to
Minor	Consequential Passenger Train Accident not resulting in a casualty.	Yellow	• JS (DM), AS (DM) &NDRF
Medium	1-25 casualties/deaths	Orange	• HS/AS (DM)/JS (DM)/PS to HM/PS to MOS. • Nodal Officers of NDMA & NDRF. • All designated officers in PMO/Cabinet Secretariat.
Major	26 or more deaths due to rail accident	Red	• HS/AS (DM)/JS (DM)/PS to HM/PS to MOS. • Nodal Officers of NDMA & NDRF. • All designated officers in PMO/Cabinet Secretariat.

- ✓ Alert messages will be followed by **Situation Reports (SITREP)** to be sent twice a day or more frequently depending on unfolding events.

(h) FOREST FIRE

- **Warning Agency:** Ministry of Environment, Forests & Climate Change
- **Alert Categorization:**
  - Ordinary Fire - **Yellow.**
  - Medium Fire - **Orange.**
  - Major Fire - **Red.**

Category	Description	Stage	Alerts to be transmitted to
Ordinary Fire	Localised fires which can be controlled by the concerned territorial Conservator of Forests.	**Yellow**	• JS (DM)
Medium Fire	Where large forest area is under fire, which can be controlled by the State Government and no Central intervention is sought by the State Government.	**Orange**	• HS/AS (DM)/JS (DM)/PS to HM/PS to MOS. • Nodal Officers of NDMA & NDRF.
Major Fire	Large fire, which may result in substantial loss of human lives, massive environmental degradation or loss of wildlife.	**Red**	• HS/AS (DM)/JS (DM)/PS to HM/PS to MOS. • Nodal Officers of NDMA & NDRF. • All designated officers in PMO/Cabinet Secretariat.

- ✓ Alert messages will be followed by **Situation Reports (SITREP)** to be sent twice a day or more frequently depending on unfolding events.
- ✓ Alerts falling in **Orange stage** will be communicated with 03 hourly updates.
- ✓ Alerts falling in **Red stage** will be communicated with 1 hourly updates or at more frequent intervals as warranted by the situation.

10.6 Action on Division/Zones on Orange/Red Alert:

On the issue of an Orange Alert (or of a higher level) the Responders have to be activated as required for relief etc. as under :-

- Mobilisation of Gangmen
- Hospitals to mobilize Doctors and Para-medical staff
- Civil Defence units to be activated
- RPF and RPSF deployment
- Scouts and Guides for colony care and passenger guidance
- Operation and manning of the disaster control room
- Coordination amongst various stake holders through advance warnings
- Communication system to be ensured and backups to be in readiness for immediate use when required.
- TA Units Deployment; In case the existing railway staff may not be able to maintain train services to be operational, the TA units have to mobilized. (It takes 2-3 days for the deployment of the TA unit after issue of their mobilization order; hence advance warning is of essence)

10.7 Monitoring/Reporting of Effects of Disaster :

On the declaration of an incident as a Disaster by a State Government or District Administrator or even by the GM/AGM of the Zonal Railway, the CSO would provide time to time updates to the Safety Control in Railway Board of the Situation. Assistance of other departments would be made available by the GM to the Safety Department on the zonal Railways.

10.8 Standard Operating Procedure (SOP) on Railways:

Natural Disasters:-

The Civil Engineering Department at the field level and on the Divisions gets information through advance warning sent by the respective Government Departments on the possibility of Floods, Cyclones, Earthquakes, Landslides etc. Depending on the gravity of the disaster/crises/calamity expected the information would be passed on to the Divisional officers through the Emergency Control which will act as the IRS. Where train operations have to be suspended or regulated the operating departments would be suitably advised. After making the train regulation plan the divisional control would advise the commercial and security departments for management of the welfare of passengers. Alerts to the passengers would be issued through the PR Department of the Railway in the Print and Electronic Media.

The DRMs on the divisions shall ensure coordination amongst the departments for ensuring running of train services (including relief special trains) as also relief arrangements for the passengers and for the Welfare of Railways own staff. Assistance of other Divisions and from the Zonal Railways would be taken through the Headquarter of the Zonal Railways (i.e. by involving the General Manager). Coordination with the IOC of MHA and NDMA/NDRF would be through the Emergency Control of each zonal Headquarter.

Man-Made Disasters:-

Different forms of terrorism fall under the ambit of these disasters. A major role has to played by the Security Department of the Railways who will coordinate with the State Governments and when required the Para-military and other forces. The Security Control of the division will act as the IRS. The Headquarter Security Control will coordinate with the IOC of MHA.

A similar system would be followed as above in organizing regulation of train services by the operating department at the divisional, zonal level and also in the Railway Board.

Chapter 11

MEDIA MANAGEMENT

(Extracts of Manual for Public Relation Department, First Edition-2007)

11.1 Authority To Deal With The Media

11.1.1 At the Railway Board level, only Ministers, Chairman, Members, Secretary Railway Board, Director Public Relations (DPR), Director Information & Publicity (DIP) or any other Officer(s) especially authorized by the Minister of Railways may give information or be accessible to the representatives of the media. Any other officer, if approached by the representatives of the media is to refer them to the DPR (***the official Spokesperson for the Ministry of Railways***) or in his absence to the Information Officer. The Chairman is to be kept informed of the press conferences, if any, being held by any Member of the Board.

11.1.2 At the Railway/PU Headquarters level, the General Managers and the CPROs are authorized to meet the media in a formal Press Conference or informally depending upon the importance of the nature of the information to be given. However, the General Managers may especially authorize the PHODs to give information or be accessible to the representatives of the media. Any other officer, if approached, by the media, is to refer them to the CPRO.

11.1.3 At the Divisional Level, Divisional Railway Mangers (DRMs) are permitted to meet the representatives of the media approaching them for factual information on specific subjects. They may also send news items concerning the working of the Railways (particularly in their Division and other matters of local interest) to the media directly or through the local office of Press Information Bureau (if available). DRMs may also hold press conferences **occasionally**. However, in respect of queries on wider policy matters concerning the Zonal Railway or the Indian Railways, the representatives of the media may politely be directed to GM/CPRO or DPR/Railway Board. In order to ensure that no unauthorized information/material is supplied to the press, the DRMs should **generally not** delegate this work to a Divisional Officer except to ADRMs. All such information/material should have **DRMs approval** before it is supplied to the press. Services of PROs (wherever positioned) may be utilized for the purpose.

11.1.4 It is made clear that **no unauthorized person should speak to or interact with the media,** as it may amount to un-becoming of a railway servant. In this connection, the provisions relating to official documents and responsibility of railway servants (*contained in **Rule-11** of Railway Servants (Conduct) Rules, 1966*) may also kept in view.

11.2 PUBLICITY DURING ACCIDENTS/OTHER UNUSUAL OCCURENCES

11.2.1 In the event of accidents, resulting in damage/causalities, the image of Railways invariably suffers because of adverse reactions in public and media. In such situations, Railways must **display greater responsibility** not only in relief and rescue operations but also in interacting with the media with correct and updated information.

11.2.2 Sometimes, newspapers publish **contrary versions** relating to any accidents attributing them to railway sources. It is, therefore, necessary that only the authorized officers (mentioned in **para 12.1.1 to 12.1.3**) interact with the media. Unauthorized person **should not** speak to the media (as mentioned in **para-12.1.4**).

11.2.3 It has **to be ensured that the media is kept informed** of the relief and rescue measures, passengers injured and dead, restorations of the traffic, etc. to avoid breeding of gossip, rumours and sensational reporting in the absence of authentic information. CPROs must depute an official to monitor and scan through all the print and major electronic media reports, analyze them and take appropriate action immediately to correct any adverse trend for any report aimed at mere sensationalizing the untoward incident.

11.2.4 The media persons must be **briefed** at the accident site and if necessary, **at least once every day** at the Divisional/Zonal Headquarters on regular basis. For this purpose, the executive departments should ensure that the PR Department is fed with the latest information and update at top priority.

11.2.5 Appropriate **rejoinders and contradictions** must be issued and copies thereof should be sent to DPR, Railway Board for briefing the media at the national level. During such emergencies, a **close contact should be established with DPR** Ministry of Railways. It is of prime importance that PR activities have a **common strategy and one voice.**

11.2.6 Sometimes, train services are disrupted badly because of other reasons such as **bandh calls, rail rook agitations, etc.** by political/pressure groups etc. for causes many a time not even remotely connected with railway operations.

11.2.7 In situations mentioned in **para-12.2.6**, where **advance information** of such agitations is available, zonal railways must publicize about the possibility of train services getting affected from the relevant date through suitable press notifications. These notifications must make it amply clear that the agitations and bandh calls are responsible for the cancellations/diversions of the train services, if any. Wherever necessary advertisements can also be brought out in the newspapers, TV and Radio in this regard. Apart from conveying information, such initiatives may also generate opinion against such bandh calls/agitations.

11.2.8 A similar action ***(as mentioned in* para-12.2.7)** may be taken for **publicizing disruption of traffic due to floods, fog etc.** regretting inconvenience caused to the passengers and stating clearly that the reasons for such disruptions are beyond the control of Railway Administrations.

Chapter 12

GUIDELINES FOR MANAGEMENT OF DISASTERS (NATURAL HAZARDS)

12.1 Background

India is the seventh-largest country by area, the second-most populous country with over 1.2 billion people and the most populous democracy in the World. Bounded by the Indian Ocean on the south, the Arabian Sea on the south-west, and the Bay of Bengal on the south-east, it shares land borders with Pakistan to the west; China, Nepal, and Bhutan to the north-east; and Burma and Bangladesh to the east. In the Indian Ocean, India's neighbours are Sri Lanka and Maldives. Andaman and Nicobar Islands share a maritime border with Thailand and Indonesia.

12.2 Disaster Risks in India:

India is vulnerable, in varying degrees, to a large number of natural as well as man-made disasters. 59% 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 7500 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.

12.3 Management of Cyclones:

12.3.1 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 the 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.

12.3.2 National Cyclone Risk Mitigation Project

The National Cyclone Risk Mitigation Project (NCRMP), to be implemented with financial assistance from the World Bank, is envisaged to have four major components:

- Component- A: Improvement of early warning dissemination system by strengthening the Last Mile Connectivity (LMC) of cyclone warnings and advisories. Railways need to obtain advance warnings from the systems developed.

- Component -B: Cyclone risk mitigation investments. On the Railways, along the high risk coastal rail infrastructure lengths, a similar protection needs to be planned where required.

- Component- C: Technical assistance for hazard risk management and capacity-building, where required on the railway infrastructure.

- Component- D: Project management and institutional support by advance coordination by the Sr. DEN/PCEs of the Divisions and Zonal Railways is essential to be able to obtain it at short notice.

Early warning to station masters and passengers is the key to informing concerned stake-holders in the DM Plan. Coastal afforestation, construction of protection walls, cyclone shelters near railway stations where required and strengthening of bridges and rail tracks are some of the mitigation measures which Indian Railways can play to undertake, in a phased manner, as per the mitigation plan. Zonal Railways should identify the affected places and put up mitigation projects for consideration and fund allocation. Not only floods, but management of all types of disasters is the basic responsibility of the States and Central Govt. role is restricted to that of support in terms of coordination, resource allocation and making available requisite funds.

12.3.3 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.

12.4 Management Of Floods:

12.4.1 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 river-banks. 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.

12.4.2 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.

The Ministry of Water Resources is responsible for the technical aspects of Flood Management. 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.

Not only floods, but management of all types of disasters is the basic responsibility of the States and Central Govt. role is restricted to that of support in terms of coordination, resource allocation and making available requisite funds.

12.4.3 India Meteorological Department

The IMD established in 1875, is responsible for the National Meteorological Services and the principal government agency in all matters relating to meteorology, seismology and allied subjects. The IMD is mandated as follows:-

To warn against severe weather phenomena like tropical cyclones, north-westerly dust storms, heavy rains and snow, cold and heat waves etc., which cause destruction of life and property.

For the convenience of administrative and technical control, there are six Regional Meteorological Centres (RMCs) located at Mumbai, Chennai, New Delhi, Kolkata, Nagpur and Guwahati. Under each RMC, there are different types of operational units such as meteorological centres at state capitals, forecasting offices, agro-meteorological advisory service centres, flood meteorological offices (FMOs) and area cyclone warning centres.

12.4.4 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 roads railway embankments 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.

12.4.4 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.

12.4.6 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.

12.4.7 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.

12.4.8 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.

Role of CWC to be given out in detail as their warnings are more relevant for flood forecast and effecting evacuation. For Railways, early warnings are important for smooth movement of trains.

12.4.9 Flood Preparedness of Ministry of Railways:-

Board has advised RDSO to compile the Flood vulnerable areas in Formation, Cutting, Bridges and Buildings etc. along with a questionnaire.

Ministry of Railways has asked RDSO to coordinate IR activities for implementation of National Disaster Management Authority's guidelines on 'Management of floods (Jan.08) by zonal railways and production units. NDMA Guidelines have been made available to all zonal railway and production units.

12.4.10 Action Plan of Ministry of Railways:-

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 catchment area due to construction of highways, Dams.
- Study of changed rainy season month on a particular region.
- Installation of Flood water level monitoring system.

13.5 Management of Earthquakes:

12.5.1 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.

12.5.2 Nodal Ministry:-

The Ministry of Earth Sciences (MoES), as the nodal ministry will prepare the Earthquake Management Plan covering all aspects like earthquake preparedness, mitigation, public awareness, capacity building, training, education, Research and Development (R&D), documentation earthquake response, rehabilitation and recovery.

12.5.3 Monitoring Seismic Activity and Safety Codes:-

The Indian Meteorological Department (IMD) will be the nodal agency for the monitoring of seismic activity. The Bureau of Indian Standards (BIS) will be the nodal agency for preparing earthquake-resistant building codes and other safety codes. All such key stakeholders, including central ministries, departments and State Governments/SDMAs will develop detailed DM plans, recognising the seismic risk in their respective jurisdictions based on the Guidelines of NDMA.

Given the high seismic risk the earthquake vulnerability in India, the NDMA Guidelines require the Railways alongwith all other stakeholders to ensure that, hereafter, all new structures are built in compliance of earthquake-resistant building codes and town planning bye-laws. This will be taken up as a national resolve.

12.5.4 Structural Safety Audit and Strengthening:-

The NDMA Guidelines emphasize the need for carrying out the structural safety audit of existing lifeline structures and other critical structures in earthquake-prone areas and carrying out selective seismic strengthening and retrofitting.

The critical factors responsible for the high seismic risk in India and consequently the prioritised six sets of critical interventions have been presented as the six pillars of earthquake management. They will help to:-

1. Ensure the incorporation of earthquake-resistant design features for the construction of new structures.
2. Facilitate selective strengthening and seismic retrofitting of existing priority and lifeline structures in earthquake-prone areas.
3. Improve the compliance regime through appropriate regulations and enforcement.
4. Improve the awareness and preparedness of all stakeholders.
5. Introduce appropriate capacity development interventions for effective earthquake management (including education, training, R&D, and documentation).
6. Strengthen the emergency response capability in earthquake-prone areas.

12.5.5 Institutionalization Earthquake-Resistant Design and Construction:-

The Railways alongwith all central ministries and departments and State Governments will facilitate the implementation and enforcement of relevant standards for seismically safe design and construction of buildings, bridges, flyovers, ports and harbours, and other lifeline and operationally important structures including track infrastructure etc. falling within their administrative control.

12.5.6 Need for Seismic Strengthening of Existing Structures:-

There are approximately 12 crores buildings in the country in seismic Zones III, IV and V. A review of the vulnerable buildings on the Railways needs to be similarly done. Out of these how many are critical to Railways operational needs have to be separately identified. As it is not practically feasible or financially viable to retrofit all the existing buildings, these Guidelines recommend the structural safety audit and retrofitting of select critical lifeline structures and high priority buildings. Such selection will be based on considerations such as the degree of risk, the potential loss of life and the estimated financial implications for each structure, especially in high-risk areas, i.e. in seismic Zones III, IV and V, where structures have to conform to IS-1893 specifications. All the Railway buildings and bridges are designed as per relevant latest seismic provisions.

12.5.7 Preparedness by Railways:-

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.

Outline/gist of RDSO action plan should be included in the DM Plan, for implementing by Zonal Railways, in a given time frame.

RDSO has issued detailed guidelines on seismic design of Railway bridges in January 2015. Action to be taken by the field staff post-earthquake with regard to train operations and inspection of track/bridges is indicated in these guidelines. Gist of these guidelines have to be incorporated in DM plan of Zonal railways/ Divisions.

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.

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.	**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.

12.6 Management of Landslides and Snow Avalanches:

12.6.1 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 geo-dynamically 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.

12.6.2 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.

12.6.3 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.

12.6.4 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. The Nilgiri Hills and Western Ghats are additional likely areas which may be affected by landslides and should be included in the DM Plan as vulnerable areas.

12.6.5 Action Plan of Ministry of Railways

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 Directorate of Railway Board is the landslide hazard zonation mapping in macro and micro scales after identification and prioritization of the areas in consultation with the Border Roads Organization, State Governments and local communities.

12.7 Management of Lightning/Thunderstorm:

12.7.1 Lightning/Thunderstorm Risk

In India, on an average, more than 2,500 deaths are recorded due to thunderstorm and lightning every year (Source: Annual Report, NCRB). It accounted for about 39 per cent of deaths from natural disasters in the country from 1967 to 2012. Rural and forest areas are the most vulnerable due to presence of tall trees and water bodies. A majority of the lightning victims are people working in the fields in rural areas. Lightning is also a major cause of electrical power breakdowns and forest fires. It can also damage communication and computer equipment.

A severe thunderstorm can damage power and communication lines as well as roads, besides flooding of escape routes, breaking of tree branches, uprooting of large trees, etc.

Indian Institute of Tropical Meteorology (IITM), Pune, under the Ministry of Earth Sciences, has initiated a project to study the characteristics of lightning by using Lightning Location Network (LLN). This network can accurately detect the location of occurrence of a lightning strike and can help forewarn the public at least 1-2 hours before the occurrence of a thunderstorm.

12.7.2 Definition & classification of Lightning

Lightning is a high-energy luminous electrical discharge accompanied by thunder. It is of three types:

1) Thundercloud or Intra-cloud lightning (IC)
2) Cloud-to-cloud or Inter-cloud lightning (CC)
3) Cloud-to-ground lightning (CG)

The third type of lightning takes a toll on lives and property, and therefore, is of more concern to us. However, inter-cloud and intra-cloud lightning may hit aircrafts.
These are also the precursor to cloud-to-ground lightning.

Lightning has a total path length of a few kilometres. Its peak power and total energy are very high, with the peak power discharge in the order of a 100 million watts per meter of the channel and the peak channel temperature approaching 30,000 °C. Peak currents in a lightning discharge range up to hundreds of kilo amperes (kA) with its typical value being 40 kA. Predicting the precise time and location of lightning is very difficult. However, a season or a period of lightning occurrence is known for many regions.

12.7.3 Early Warning of Lightning

India Meteorological Department (IMD), Ministry of Earth Sciences, is the nodal agency for providing current weather information and forecast, including warnings for all weather-related hazards. Besides, States should establish their own independent early warning and monitoring systems to supplement warnings from the IMD.

A thunderstorm is a small-scale phenomenon and has a life cycle of about three hours. It has a dimension of 2 km to 20 km, and therefore, its detection is difficult. Geostationary Weather Satellite captures images from a height of 36,000 km above the earth. It takes about half an hour to capture the image and another half an hour to process the data. So, by the time someone sees the satellite imagery on IMD's website, it is already one hour late. Due to the short life cycle of thunderstorms, a satellite cannot capture its initiation unless it is a large-scale thunderstorm activity.

Lightning incidents can be detected by the ground-based Lightning Detection Network in real time. There is a need to create a high-density network in regions vulnerable to lightning strikes.

12.7.4 Roles and Responsibilities to deal with Lightning

All the stakeholder Ministries/Departments and agencies should work under a unified command to ensure effective implementation of prevention, preparedness and mitigation measures.
The Chief of Operations (Chief Secretary) will spell out the priorities and issue policy guidelines. The Relief Commissioner will coordinate the services of various stakeholders, including national/State agencies, and central government agencies.

The State Emergency operation centre (SEOC) is the nerve centre to support, coordinate and monitor disaster management activities at the State level, including training and research. It will, under normal circumstances, work under the supervision of the Relief Commissioner. During an emergency situation, it will work as the centre for decision making as long as the need for emergency relief operations continues or until the long-term plans for rehabilitation are finalised.

12.7.5 Action Plan of Ministry of Railways

All essential establishments of railway's network viz. track distribution system, Signal & telecommunication equipments etc. are properly grounded. However, installation of lightning arrestors and sound earthing for each building is essential. Lightning shields are the most commonly employed structural protection measure for buildings and other structures. A lightning shield consists of the installation of a lightning conductor at a suitably high location at the top of the structure. The conductor is grounded using a metal strip of suitable conductance. The grounding of the conductor is also specially designed to ensure rapid dissipation of the electrical charge of a lightning strike into the ground.

Chapter 13

MANAGEMENT OF CBRN DISASTERS (HUMAN INDUCED DISASTERS)

13.1 Background

The NPDM notes that rise in population, rapid urbanization and industrialization, development within high-risk zones, environmental degradation, and climate change aggravates the vulnerabilities to various kinds of disasters. Due to inadequate disaster preparedness, communities, and animals are at increased risk from many kinds of human-induced hazards arising from accidents (industrial, road, air, rail, on river or sea, building collapse, fires, mine flooding, oil spills, etc.). Chemical, Biological, Radiological, and Nuclear (CBRN) hazards rank very high in among the human-induced risks. Terrorist activities and secondary incidents add to these risks and call for adequate preparedness and planning.

13.2 Management of Chemical Disasters

13.2.1 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 Petroleum and Natural Gas (MoP&NG). Department of Atomic Energy (DAE).

13.2.2 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.

13.2.3 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 checklists 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.

13.2.4 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.

13.2.5 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:

I. Explosives
II. Gases, Compressed, liquefied or dissolved under pressure
III. Petroleum & other inflammable liquids
IV. Inflammable solids
V. Oxidising substance
VI. Poisonous (Toxic Substances)
VII. Radio-active substances
VIII. Acids & other Corrosives.

Chapter I to VIII deal with the above classes of dangerous goods which include General rules governing acceptance, handling, Carriage, storage, delivery, DO's &Don'ts, precautions and the list of commodities included in that class. Carriage of Goods of a hazardous nature other than those specified in these chapters shall not be accepted for transport by rail unless specially authorised by the railway administration as provided under these Rules.

Out of the above 8 classes of dangerous goods, classes II (Gases, Compressed, Liquefied or dissolved under pressure), III (Petroleum and other inflammable liquids) and VIII (Acids and

other corrosives) are dealt in bulk on the railways whereas other classes of dangerous goods are dealt in piecemeal/small quantities in parcel vans/SLRs. Railways may refer to the specific paras pertaining to all these classes of dangerous goods.

13.2.6 Emergency Response Guidebook 2016 - Transport of Hazardous Materials

Apart from Railways Red Tariff which contains detailed guidelines on transportation of Chemicals and Hazardous Materials, Ministry of Railways has also published Emergency Response Guidebook 2016 **(**ERG2016) which is intended for use by first responders during the initial phase of a transportation incident involving dangerous goods/hazardous materials. Copies of ERG2016 have been distributed to all Zonal Railways which will further help in transporting hazardous materials safely.

ERG2016 was prepared by the staff of Transport Canada, the U.S. Department of Transportation and the secretariat of Communications and Transport of Mexico with the assistance of many interested parties from government and industry including the collaboration of CIQUIME of Argentina.

13.2.7 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.

13.2.8 Preventive Action in the Rail Route of Movement of Hazchem

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 till at least 50 m away). This is essential as in the case of derailment of Naphtha loaded (or even POL Tank Wagon etc) train, there is a high possibility of spillage of the dangerous products and its spread over a wide area. These products are highly prone to catch fire and even explode, resulting in fire in the Jhuggies etc.

13.3 Management of Biological Disasters:

13.3.1 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.

13.3.2 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.

13.3.3 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 pathogens. The mechanism required however, to face both can be similar if the service providers are adequately sensitized.

13.3.4 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.

13.3.5 Handling CBRN 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 organised.

13.4 Management of Chemical (Terrorism) Disasters:

13.4.1 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.

13.4.2 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, de-corporation, capacity building and infrastructure development.
    (d) Community-centric mechanism for the management of chemical (terrorism) disasters.

13.4.3 CTD 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.

13.4.4 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.

13.4.5 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-medical staff in each Divisional Railway Hospital through training.

13.5 Management Of Nuclear And Radiological Emergency (Disaster):

13.5.1 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.

13.5.2 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 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.

13.6 DOs & DONTs for the Disaster Magistrates in the event of CBRN (Chemical, Biological, Radiological & Nuclear) disasters issued by Ministry of Home Affairs, Disaster Management Division vide letter no.32-35/2003 NDM-ll dated 21.07.2017.

DOs

1. Chemical Disaster

In case of accidental release of a quantity of toxic chemicals into environment, resulting in death or injury to workers or members of nearby communities, then it is a case of chemical disaster. In the event of a chemical disaster, the District Magistrate should immediately contact-

a) The Nodal Ministry for chemical disasters i.e. Ministry of Environment, Forest and Climate Change. Contact details: Shri Bishwanath Sinha, Joint Secretary, Tel No. +91-11-24695274(O), Fax No. =91-11-24695277, +91-11-26160515 (R) Mob: 9999711816, or to Shri Manoj Kumar Gangeya, Director, Telephone: +91-11-24695337 (O), +91-11-24695387 (F), +91-11-22246550 (R).

b) MHA control Room: [1070(Toll Free), 011 23093563, 011 2309366].

c) NDRF Control Room 011 24363260.

2. Biological Disaster

Biological disasters are events caused by microbial agent or its toxin in humans, animals or plants that is beyond the coping ability of the State. Such an event may occur due to (i) epidemic of infectious diseases caused by a microbial agent or toxin in humans, animals or plants (ii) Non-intentional accidental release of microbial agents such as from laboratories or during transportation of samples (iii) Intentional use of microbial agents to cause harm such as use of biological agents or toxins as weapons of mass destruction (biological warfare) or (iv) microbial agents or toxins used by terrorists to cause panic/harm to humans, crops or livestock (bioterrorism/agro-terrorism).

In the event of Biological disasters, the District Magistrates should immediately contact:

a) The nodal Ministry for Biological disasters i.e the Ministry of Health & Family Welfare. The contact details: Shri Lav Agarawal, Joint Secretary, Tel. No. 011-23061195 (O), 011-26889166 ® mob: 9818778177, or to Dr.P. Ravindran, Addl, DDG & Director EMR. Tel No. 011-23061302 (O), 011-45639559 ®, Control Room-23061469.

b) MHA control Room: [1070 (Toll Free), 01123093563, 011 2309366].

c) NDRF Control Room 011 24363260.

3. Nuclear/Radiological disasters-

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

In case of theft/loss of radioactive source from the institution/industrial unit/hospital premises/during transportation, it would normally be noticed first by the field person responsible for handling the same. The head of the concerned organization would be next person to get this information from his own field person. He in turn, would bring the incident to the notice of the local police station as well as to the Atomic Energy Regulatory Board(AERB) who is the regulator (as per Radiation Protection Rule 2004 under the Atomic Energy Act) for transportation, storage and use of radiation sources in the public domain. This will be the trigger mechanism for initiating any mitigation process by state agencies.

Further in case of loss/theft of radioactive sources, the recommended response plan/SOP for recovery/retrieval and disposal of the radiological source would be as follow:

a. AERB will inform the Crisis Management Group (CMG), DAE through DAE Emergency Control Room (DAE-ECR), Contact Details of 24*7 operational DAE-Emergency Control Rooms are – main DAE-ECR [022-22023978, 022-22021714,(Mobile) 09969201364] & alternate DAE-ECR [022-25991070, 022-25515283,(Mobile) 099692013651]. In addition, it is envisaged that the concerned public officials will follow their own SOP & intimate the concerned agencies for ensuring appropriate response.

   i. MHA Control Room: [1070(Toll Free), 011 23093563, 011 2309366].
   ii. NDRF Control Room 011 24363260

b. Expert response agencies (police/NDRF/relevant state authorities) after reaching the incident spot, if feel that they need an expert advice or technical support from nodal ministry (DAE); they should contact CMG, DAE through DAE-Emergency Control Room. While informing, they are requested to provide exact location, contract numbers of concerned DM/SP/local police station and details of incident with brief description of the object (if possible, along with photograph taken from the distance).

c. Upon receipt of such information, the CMG, DAE will get activated and will get in touch with the local authorities to decide about further course of actions.

d. CMG will decide and constitute a team of experts as per requirements. The team of experts will be dispatched to the site by quickest means possible.

e. Member Secretary, CMG (who is also the designated Nodal Officer of DAE) will get regular updates from concerned DAE experts/field agencies and will keep concerned authorities informed and as per scenario, will also keep MHA Control Room updated.

f. DAE experts on recovery/retrieval of the source will examine the integrity of the radiation source & accordingly, AERB will decide about further course of action regarding safe keeping/disposal of the material.

g. Responsibility of source transportation of radioactive material from incident site to a safe storage place should be undertaken by local police.

h. If there is local contamination due to radioactive material, decontamination activities should be taken up by expert response agencies like NDRF and/or be performed under guidance of DAE's technical experts. Local district authorities should provide adequate resources for handling and transportation of the contaminated material to the safe disposal site.

i. In case required, media briefing will be done by the designated state official. He may seek technical inputs from AERB, if he desires.

j. After recovery/retrieval of the source and after completing of activities related with decontamination and safe disposal (as per scenario requirements), with due concurrence of AERB, the closure of radiological emergency scenario will be declared by the concerned DM/SP.

DONTs

For response to CBRN Emergency:

1. Don't send untrained responders/volunteers.
2. Don't send trained responders without proper PPEs and detection equipment.
3. Don't send responders without taking proper guidance from the Nodal Ministry/ Department.

Chapter 14

MANAGING CROWDS

14.0 Guidelines by NDMA.

National Disaster Management Authority(NDMA) has issued a guide for administrators and organizers of events and venues for managing crowds in 2014. The scope of the guidelines involves study of past crowd disasters, framework for administrators to plan and manage events better, to provide practical guidelines to venue managers and event organizers etc.

14.1 Salient Features of NDMA Guidelines.

Important aspects of planning for events/places of mass gathering includes understanding the visitors, various stake holders and their needs, crowd management strategies, risk analysis and preparedness, information management and dissemination, safety and security measures, facilities and emergency planning, transportation and traffic management. One of the important points to be kept in mind is the demand and supply gaps. Depending on the type of event, venue and type of crowd expected proper signage have to be planned. Specific focus should be on fire, electrical and structural safety. NDMA has suggested the following guidelines on Incidence Response System.

(i) Systematic and complete planning process.
(ii) Clear cut chain of command.
(iii) System of accountability for the incident response team members.
(iv) Well thought out pre-designed roles for each member of the response team.
(v) Effective resource management.
(vi) System for effectively integrating agencies into the planning and command structure without infringing on the independence of the concerned agencies;
(vii) Integration of community resources in the response effect and
(viii) Proper and coordinated communications set up.

14.2 Crowd Control and Management.

For effectiveness in this, RPF, GRP and District Police have to act in a synchronized manner in consultation with magisterial authorities. Chapter 10 (Maintenance of Public Order and Tranquillity) of the Criminal Procedure Code (Cr.P.C.) Part-A deals with 'Unlawful Assemblies". Legal procedures are outlined in Sections 129 to 132 of the Cr.P.C. for dealing with Unlawful Assemblies. These provisions empower Members and Officers of Armed Forces (RPF is an Armed Force of the Union) to deal with Unlawful Assemblies.

One of the intelligent video analytics to be incorporated in the Integrated Security System is related to signal for crowd density within station premises when it exceeds the prescribed limit. This will enable RPF personnel and railway authorities to get timely information when heavy crowd builds up within station premises and plan follow-up action. Pictures stored on CCTV system will be of immense help in identifying miscreants and in ensuring effective legal action.

We should prescribe preventive protocols, when laid down footfalls defined separately for important stations become extraordinarily high, as during Melas or other exceptional situations. It may not be out of place to ban all commercial vending and parcel handling on such occasions, supplement exists if possible, and bring more area under illumination.

It is important to press upon the District Magistrate (Dy. Commissioner) or the Civil Police (Senior Superintendent of Police) to give an approximate indication of the number of persons likely to reach Railway stations in the days when rush is expected. The OD flows of the passenger is very important to plan destination wise running of special trains. It may be kept in mind that often the Inward and outward passenger traffic is not equal; there are wide variations. Further the inward rush comes in a staggered and spaced interval; the outward rush goes back at one go. It would be essential for the Zonal Railway or Division to impress upon the State Government (or the District Magistrate) in writing of their peak capacity to clear rush, as also they can do so only direction wise. The District Administration has to regulate and control the entry of more than this number beyond which (in 1-2 hourly slots) the Railway would be unable to evacuate.

14.3 Role of responsibility of Zonal Railways/Divisions

Depending upon the past experience Zonal Railways/divisions should identify events of mass gathering over their system. The events can be of periodic in nature or one time events where mass gathering of passengers is expected in the station which is beyond the normal capacity that can be handled at that station.

Concerned Zonal Railway/division should have a close coordination with the organizers and law enforcement agencies to understand crowd arrival and departure, their numbers for each such event. Railway administration should identify the threats, assess the risk and plan accordingly. Based on the past experience a coordinating officer should be nominated for better planning and execution crowd management at the station. He should be designated as incident commander and shall be overall in charge of that particular station. He shall be assisted by staff drawn from the respective departments to discharge his/her functioning.

14.4 Crowd control and Management of rush at Railway Stations:

Specific defined areas of jurisdiction for crowd control and duties assigned to GRP/RPF and the city Police needs to be placed on record much before the expected days of rush. Close coordination has to be maintained between the 3 wings of security personnel Railway Protection Force, Civil Police and GRP with well-defined areas of responsibilities. Passenger assistance booths shall be established at the prominent locations and frequent announcements shall be made through PA system.

The car and other vehicle parking facility at a station may be discontinued, sale of Platform Tickets can also be banned for short period of time. RPF and GRP personnel deployed on each platform will monitor crowds and rush build up in the circulating areas, booking windows, station platforms and mainly on the FoBs. Special teams of commercial staff will liaise with the RPF/GRP and relay 2/4 hourly position to a centralized location viz. commercial control who will advise the need for running of special trains to specified destination to the operating departments control room.

Chapter 15

DISASTER MANAGEMENT TRAINING

15.0 Disaster Management Training on the Railways

15.1 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.

15.2 Training Institutes of Railways

Indian Railway Institute of Disaster Management, Hejalla, Bangaluru has been set up and inaugurated in 2019 to play a crucial role in curbing train-related accidents across the country. The Disaster Management Institute and Safety Village in Hejjala, a first such initiative by the Indian Railways, is a unique Virtual Reality Centre, which will simulate real-life disasters. The institute will train railway officials in responding to any disaster situation using the right techniques. Virtual Reality software is also being installed which will enable officials to evaluate the result of the actions taken by them in an emergency situation. This will enable officials undergoing training to experiment with the various methods and means available to tackle an emergency situation and decide the best course of action to handle it. An action plan has been approved by Railway Board that IRIDM, Bangaluru will impart safety training to all working officers. Each officer would have to undergo training at IRIDM to update and upgrade their disaster management skills.

In view of the utmost importance being given to safety, senior officers of Railways are already being imparted special training on "Safety Management" through regular courses conducted by Indian Railways Institute of Transport Management (IRITM), Lucknow to enhance the safety skills and knowledge. IRITM is conducting this course regularly since January, 2018.

Apart from these, Indian Railways have many Central Training Institute (CTIs), Zonal Training Institute (ZRTIs), Supervisor Training Centres etc. where officers, supervisors and staff are imparted training on different specialised subjects.

15.3 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. With a view to strengthen and revamp the Training on Disaster Management being imparted to several tiers of railway officials through Railway Training Institutes, Board has decided the following training schedule:

S.No.	Categories of Officials	New Training methodology and schedule
1	Top Level Management (GMs, PHODs, DRMs and other SAG/S4 Officers)	5-day Disaster Management Modules are to be delivered at IRITM/LKO @ once every 3 months. **Frequency of Training:** Once every five years for SG/SAG Officers and above.
2	Middle Level Management (SG & JAG officers)	Some of the latest and relevant topics are included in the AMP and MDP programmes being delivered at NAIR/BRC IRITM, LKO is conducting a special module on Disaster Management developed by them Frequency of Training: Every SG/JAG officer need to undergo the module once every five years either at NAIR 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 Frequency of Training: 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 NAIR/Vadodara. Frequency of Training: As part of the course.
5	Supervisors of all frontline departments (Mechanical, Electrical, Engg., S&T, Traffic Comml. &Optg.)	One-week course at ZRTIs Frequency of Training: 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 out-sourced).	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 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. Frequency of Training: Once every three years.

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 specialised institutions or in-house. IRITM is one of the Training Institutes under consideration. Frequency of Training: 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 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 subordinate officers and staff and training should be imparted at RPF zonal training centres. The respective training modules should include role of RPF at the accident site, security at the railway premises like railway stations, trains etc. Frequency of Training: Once every three years for disaster management team of RPF. Once every five years for other subordinate officers and staff (other than disaster management team members. In addition, (i) At least 10% of the RPF personnel may be got trained in a training module of a minimum duration of 15 days with NDRF by GMs/Zonal Railways. (ii) All outdoor instructors of RPF zonal training centres and RPF Academy, Lucknow, may be trained in training of trainers (ToT) course in disaster management over a period of 2 years by a national training institute nominated as nodal training institute for disaster management like NISA, Hyderabad. (iii) Coordination may also be done with NDRF to obtain the list of necessary resources and equipment along with their Quality Regulations & Trail Directives (QR/TD). The RPF Disaster Management Team will be equipped with these equipments and will be imparted the know-how to operate and maintain these equipments in association with NDRF.
	RPF Officers	Disaster Management training for RPF officers may be also organized in IRITM till such time the capability in RPF academy is developed. Frequency of Training: Once every five years for other RPF officers.

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, fire fighting equipment etc.

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

Chapter 16

NDMA GUIDELINES ON INCIDENT RESPONSE SYSTEM

16.1 Disaster Risk In India

India is vulnerable, in varying degrees, to a large number of natural as well as man-made disasters. As stated in the National Policy on Disaster Management, 2009, in India, 58.6 per cent of the landmass is prone to earthquakes of moderate to very high intensity; over 40 million hectares is prone to floods and river erosion; of the 7516 Kms long coastline, close to 5,700 kms is prone to cyclones and tsunami; 68 per cent of the cultivable area is vulnerable to drought and hilly areas are at risk from landslides and avalanches.

16.2 Overview of Incident Response System

The Incident Response System (IRS) is an effective mechanism for reducing the scope for ad-hoc measures in response. It incorporates all the tasks that may be performed during DM irrespective of their level of complexity. The main purpose of these Guidelines is to lay down the roles and responsibilities of different functionaries and stakeholders, at State and District levels and how coordinates with the multi-tiered institutional mechanisms at the National, State and District level will be done. It also emphasizes the need for proper documentation of various activities for better planning, accountability and analysis. It will also help new responders to immediately get a comprehensive picture of the situation and go in for immediate action.

16.3 IRS Organisation

The IRS Organization functions through Incident Response Teams (IRTs) in the field. In line with our administrative structure and DM Act 2005, Responsible Officers(ROs) have been designated at the State and District level as overall in charge of the incident response management. The RO may however delegate responsibilities to the incident Commander (IC), who in turn will manage the incident through IRTs. The IRTs will be pre-designated at all levels; State, District, Sub-Division and Tehsil/Block. On receipt of Early Warnings, the RO will activate them. In case a disaster occurs without any warning, the local IRT will respond and contact RO for further support, if required. A Nodal Officer (NO) has to be designated for proper coordination between the District, State and National level in activating air support for response.

16.4 Features of IRS

IRS is categorized with features like management by objectives, unity of command and Chain of command, Organizational flexibility, span of control, unified command, accountability, Resource management, etc.

16.5 Summary of Action Points

IRS constitutes an important part of the Disaster Response at the State and District level. These Guidelines will help the States and the Districts in their disaster response. It will also help to reduce chaos and confusion during response. Everyone will know all has to be done and who is in command. The important thing is to get the team members trained in their respective roles. A time bound strategy with fixed responsibilities is essential to achieve this objective.

Chapter 17

DISASTER MANAGEMENT SYSTEM, STRATEGIES, CRITICAL ACTIVITIES AND AVAILABLE RESOURCES

17.0 Disaster Management system and strategies on Indian Railways

The Indian Railways is having an organized system of relief for managing accidents with its own resources. Details of procedures and systems have been laid down in the Accident Manuals of the respective Zonal Railways. Each Zonal Railway has its own Accident Manual for dealing with Railway accidents and unusual occurrences. The manual contains various definitions of the terms used in accident management. Accidents have been classified into various types and categories depending upon the seriousness of the accident. Accident Manual of Railways may be referred for these details. Preparedness to manage accidents is also detailed in the Accident Manual by way of details of Accident Relief Cranes their beats, inspection schedules, turnout times, etc. Presently there are 88 Nos. Cranes (79 Nos. of 140 T, 3 Nos. of 120 T and 6 Nos. of 35 T Cranes over Indian Railway system.(Details of which is given at **Annexure –'I'**)

17.1 Areas of Focus on Disaster Management

The main areas of focus on disaster management are:-

a) Faster Response
b) Better facilities and equipment
c) Expanding resources to meet requirements in major accidents
d) Better customer focus
e) Training and Preparedness
f) ART management to undergo major changes covering rolling stock management, status of equipment, monitoring of utilization of assets and availability and consumption of stores etc.

17.2 Critical Activities for Disaster Management

- 164 ARMVs and 171 Accident Relief trains ARTs, are positioned at strategic locations which cover the entire rail network of Indian Railways for rushing to accident sites on top priority, along with doctors, para medical staff, rescue workers and engineers. 77 of ARTs also have Diesel Hydraulic cranes attached to them.

- ARTs and ARMVs are equipped with rescue and relief equipment. These are located so as to cover an area not beyond a distance of 150 to 200 kms within 2 to 3 hours normally. In addition, there are 320 stationary Accident Relief Medical Equipment (ARME) – Scale II consisting of three sets of Portable Medical Kit for Accidents (POMKA) units positioned at identified stations, placed 80-100 kms. apart in between ARMVs.

- In addition to the recommended list of ART Tools and Equipment, 13 additional items have been recommended by a Committee for adding to the ARMV/ART which includes Life Detector, Scene Tape, Rope manila Nylon, Safety cone, stretcher folding, MFR Kit with Splints, Breathing apparatus set, Portable DG sets, Higher capacity hydraulic, Portable Plasma cutting equipment for cutting stainless steel coaches, Portable Defibrillator, Abrasive cutting equipment and Life Jackets, etc.

- On receiving information of an accident, the ARTs and ARMVs are dispatched to the accident site along with personnel trained in rescue and relief operations. ARMVs and ARTs are powered by locomotives brought from line in case of accidents/ derailments. To avoid delay in arranging locomotives, Self-Propelled ART was developed first time in 2001

indigenously by Rail Coach Factory (RCF), Kapurthala. This concept has been extended to Self-Propelled ARMV also. At present 77 SPART/SPARMV are working on IR network.

- Unlike many other countries where local bodies such as Fire Brigade, Police, Health Services and Civil Defence Organizations etc. are responsible completely for rescue and relief operations during railway accidents, Indian Railways has an organized system of relief and rescue operations for managing accidents mainly with its own resources. The local administrations, however has the responsibility to support Railways.

- Preparedness to manage accidents is detailed in the Accident Manual of each Zonal Railway. It also contains detailed procedures, duties of various Railway Officials, details of rail-mounted relief and rescue equipment i.e., Accident Relief Medical vans (ARMVs) and Accident Relief Trains (ARTs) along with items contained therein, their beats, inspection schedules, turnout times, etc.

- ARTs and ARMVs are rail mounted and located at stations where Railways have suitably trained staff. Movement to the site depends upon operational conditions. Many a time Railway doctors, para-medics and other officials reach site of the accident by road, earlier than ART/ARMV.

- Target time for dispatch of ARMVs is a maximum 20 minutes from their ordering. Target time for dispatch of ARTs is a maximum of 60 minutes from their ordering

- As Accident Relief Train may take upto 3 hours to reach a remote accident site, the resources available near the accident site are very important and pooled for immediate relief and rescue:-

    1. On board staff eg. Loco Pilot, Assistant Loco Pilot, Guard, Commercial Staff, Pantry staff, Carriage and Wagon/Electric staff etc.
    2. Staff nearby accident site eg. Gangmen, Station staff etc.
    3. Help from local people in nearby vicinity.
    4. Local administration eg. Civil administration, Police, Health, Fire etc.
    5. National Disaster Response Force
    6. Air Force/Military services

It is seen that by pooling the resources of local, state and central government and help from local people, effective disaster management can be done during the Golden Hour. Casualties/injuries is reduced effectively with integration of resources belonging to all the stakeholders for managing disasters.

- The main activities undertaken by Railway administration at accident site are:

    - The medical team participates in rescue and stabilisation of injured passengers, those seriously injured are transported to nearby hospitals.
    - The cost of such treatment is borne by the Railways. Deaths are certified by doctors and dead bodies are handed over to Police for further action such as autopsy etc. for medico-legal purpose.

    - Railway doctors are deputed to the hospitals where the injured are admitted, to render necessary assistance, including supply of required medicines, etc.

    - In addition to the above own resources, nearby ambulances and doctors with paramedics, fire brigades, other necessary resources are also requisitioned as per need for expeditious operations.

- Information like names, addresses and telephone numbers of nearby hospitals, local police, fire brigade, officials of Civil Administration etc are available at Stations/Divisional controls and immediate relief is sought at the time of accident.

- In case of serious accidents involving passengers, National Disaster Response Force (NDRF) is also requisitioned. **24X7** control room of Ministry of Home Affairs (MHA) or the control room of concerned ministry is contacted for mustering help from defence services including help of Air Force.

- Relief trains are arranged for clearing stranded passengers.

- Arrangements for supply of meals, drinking water, and beverages etc. are made not only for the injured, but also to other passengers of the affected trains.

- Once affected passengers are attended, accident site is restored back to normal traffic with the help of break-down cranes, hydraulic rescue equipment, etc.

- The accident inquiries are conducted within a time frame and preventive/corrective actions are taken accordingly.

- Timely information is given to the press to avoid misreporting and speculation about the casualties and the cause of the accident.

- Disaster Management plan at Divisional, Zonal and Ministry level are integrated with each other, and are comprehensive and fully prepared to handle disasters.

17.3 Rescue and Relief System on Indian Railways

The Indian Railways is having an organized system of rescue and relief operations for managing accidents with its own resources. Details of procedures and systems have been laid down in the Accident Manuals of the respective Zonal Railways for dealing with Railway accidents and unusual occurrences. Preparedness to manage accidents is also detailed in the Accident Manual by way of details of Accident Relief Medical vans (ARMVs) and Accident Relief Trains (ARTs), equipment contained therein, their beats, inspection schedules, turnout times, etc. The Accident Manual also lists the information to be maintained at the stations, like names, addresses and telephone numbers of nearby hospitals, local police, fire brigade etc. It also details various records and information to be maintained in the Divisional Control, like railway and non-railway hospitals, ambulance services, fire fighting arrangement, contact information of officials of Civil Administration, road maps etc. for ensuring expeditious mustering of resources at the time of accidents. It also prescribes in details the duties of various railway officials and concerned departments to be discharged in managing accidents. The types of accident inquiries, their procedure and timeframe etc. for holding the inquiry are also detailed. It also prescribes the methodology of acceptance and disposal of the accident inquiry reports.

Steps are taken to provide prompt and effective relief to the affected passengers in the event of any serious train accident involving deaths. The senior-most officer at the accident site takes full charge of the situation, and supervises the overall relief operations. Special inquiry booths are opened at originating, terminating and important stations en route. The affected passengers and their relatives are treated in order to alleviate their trauma and discomfort. Railway doctors are deputed to the hospitals where the injured are admitted, to render necessary assistance, including supply of required medicines, etc. Arrangements for supply of meals, drinking water, and beverages etc. to not only the injured, but also to other

passengers of the affected trains are organized. STD-equipped telephones are made available to passengers, to enable them to communicate with their relatives. Officers and Inspectors are also deputed to contact the affected passengers and assist them in their onward travel. Special care is exercised to collect and provide security to the belongings of all passengers. Relief trains are arranged for clearing stranded passengers. A thorough and unbiased investigation into the adequacy of the relief measures is made after every serious accident. Crash courses on 'Disaster Management' for officers and staff at all levels are organized to sustain awareness of the importance of the situation. Timely information is given to the press to avoid misreporting and speculation about the casualties and the cause of the accident.

17.4 Responsibility for Rescue and Relief Operations

Unlike India, in many countries, local bodies such as Fire Brigade, Police, Health Services and Civil Defense Organizations etc. are responsible for rescue and relief operations during railway accidents. The Indian Railways has occasionally been criticized that the railway rescue teams reach the accident site later then the local people. As the railways are spread out over a vast geographical area, it is humanly not possible to maintain rescue and relief equipment and teams at every station. ARMVs can only be located at stations having adequate medical back-up facilities. At times it takes some time for the relief teams and equipment to reach the accident site from the nearest railway rescue facility, depending upon the accessibility to the accident site. Further, consequent to the Disaster Management (DM) Act coming into force, National Disaster Response Force (NDRF) has been constituted at different locations throughout the country. NDRF is a force specialized in handling rescue and relief operations in all types of disasters in the country and Railways take their help in major accidents involving passenger trains.

17.5 High Level Committees on Disaster Management on Indian Railways

- Constituted by the Ministry of Railway in September 2002.
  - To review the existing DM system over IR related to train accidents and natural calamities and to suggest improvements.
  - To identify additional technological and managerial inputs to quicken pace of relief and rescue operations.
  - To institute a standing arrangement with other central Ministries, State government and armed forces to enable quick and smooth restoration operations without any legal or procedural hurdles.
- All 111 recommendations have been accepted by MR in March, 2003.
- The financial implications of implementing these recommendations were estimated to be around Rs. 400 crores.
- 8 recommendations have been dropped by appropriate authority.
- 105 recommendations have been implemented.
- Balance 06 are under implementation.
- 111 recommendations can be broadly grouped in 5 groups.
  - Faster response.
  - Better facilities and equipment-technological inputs.
  - Expanding resources.
  - HRD
  - Other logistics.

Another Disaster management review committee was appointed on 27.02.07 under the chairmanship of Shri Gajendra Narain, an ex-IPS officer with the following terms of reference:

i) Comprehensive study and audit of current preparedness and management practices referring to all types of disasters/hazards for different phases of disaster management i.e. prevention, mitigation, rescue, relief and rehabilitation;
ii) Suggest ways and means for integration of disaster reduction concept into development planning;
iii) Identify the recommend areas needing development of multi-stakeholder partnership and citizen participation with a view to establish a coordinated mechanism for disaster reduction, response and rehabilitation;
iv) Study existing statutory provisions for effective disaster management on IR and suggest changes, if any;
v) Suggest best suited management structure for effective delivery along with enabling tools; and
vi) Suggest any other measures which committee may consider appropriate within the scope of disaster management.

The Committee gave 106 recommendations, out of which recommendation no. 2 has three parts (A, B & C), thus actually there are 108 recommendations, out of which 41 recommendations have been accepted and 67 have not been accepted. Out of the 41 accepted recommendations, 40 have already been implemented and only 1 is under implementation.

An Expert Group committee for Modernization of Indian Railways was constituted by Ministry of Railways which submitted its report in February, 2012. The Committee recommended for upgradation of Disaster Management facilities which inter-alia included provision of high speed self-propelled Accident Relief Trains and Medical Vans, Road Cum Rail Vehicles for accident relief, 175 T cranes, setting up of Disaster Management and other Training Centers.

17.6 Disaster Management Plans

The High Level Committee on Disaster management over Indian Railway stipulated that each Zonal Railway and Division must write its disaster Management Plan dovetailing the same with concerned State Government/District. The Disaster Management Plans are to be prepared to ensure proper coordination and mutual co-operation among Divisions and Zonal Railway Authorities with the state/District authorities in managing severe accidents in the Indian Railways and disasters in general. The Railway should also be fully aware of the local, civil, army and other resources available for supplementing the Disaster Management efforts as and when required. The Disaster Management Plan must include who is responsible for what activities in detail, to ensure the basis steps as below:

- Rapid access to the site of the accident.
- Effective site management by making best use of on-board and locally available resources.
- Quick extrication of victims.
- Speedy transportation of victims to hospital.
- Proper communication system both for assisting the stranded passengers as well as giving out timely information to the media.

In compliance to the above instructions of the Railway Board, all 17 Zonal railway Headquarters and 68 divisions have prepared their respective Disaster Management Plans. Zonal Railways have also hosted their Disaster Management Plans on Safety Information Management System (SIMS) for the widespread sharing.

Chapter 18

MAINTAINING AND UPDATING THE DM PLAN OF RAILWAYS

18.0 Background

Regular maintenance is critical to ensure the relevance and effectiveness of the DM plans. Plan maintenance is the dynamic process. The plan must be periodically updated to make it consistent with the changes in Government policies, initiatives, and priorities as well as to incorporate technological changes and global experiences. Development in Railways, Location of Relief trains contact details etc should also be updated. Evaluating the effectiveness of plans involves a combination of training events, exercises, and real-world incidents to determine whether the goals, objectives, decisions, actions, and timing outlined in the plan led to a successful response. In this way, the emergency preparedness exercises become an integral part of the planning process. The DM planners must be aware of lessons and practices from various parts of India as well as lessons from across the world. The trainings, mock drills and exercises are crucial. Mock Drills conducted with NDRF/Local bodies and lessons learnt from actual train accidents will help in evaluating the operational aspects of the plan, rectify gaps, and improving the efficiency of the plan. The likelihoods of emergencies and actual occurrences are also occasions for evaluating the plan, making innovations, and for updating the plan, SOPs and guidelines. At times, operations experience setbacks due to outdated information, ineffective procedures, incorrect role assignments, and outdated norms. Further, the priorities for a jurisdiction may change over time as the makeup of the included communities change, as resources expand or contract, and as capabilities evolve.

18.1 Mock Drills/Exercises and Training

For coordination and management during Disaster/major train accident, Indian Railways conducts mock drills with NDRF and each NDRF battalion carry out at least one or two exercises/coordination meeting with each Zonal Railways every year. Coordinating DIG/NDRF and ED/Safety(M), Railway Board finalise the calendar and circulate to concerned Zones/Divisions for conducting Full Scale Disaster Management Exercise with NDRF. Such programs are crucial to ensure full preparedness and to maintain operational readiness of the disaster response operation teams, institutional mechanisms, and the equipment. These drills are organized to test their readiness to deploy within the shortest possible time. Various courses on Safety and Disaster management are also conducted at training institutes of Railways. The trainings are crucial because they go beyond concepts and guidelines into inculcating in the individuals the critical importance of working as a coherent team for emergency response with a clear chain of command. The workshops and drills will also provide an opportunity to practice SOPs.

Zonal Railways also conduct Mock drills quarterly in each division utilising the resources of Railways i.e. accident Relief Train (ART), Accident Relief Medical Van (ARMV) etc. Shortcomings noticed and lessons learnt during the mock drill should be documented for corrective action and to improve SOPs.

18.2 Testing the Plan and Learning to Improve

Evaluating the effectiveness of a plan involves a combination of training events, exercises and real-time incidents to determine whether the goals, objectives, decisions, actions and timings outlined in the plan led to a successful response. The purpose of exercises and

drills is to promote preparedness by testing the plan with equal participation of all relevant stakeholders. The process of evaluation and remedial actions will identify, illuminate, and correct problems with the DMP. This process must capture information from exercises, post-disaster critiques, self-assessments, audits, administrative reviews, or lessons-learned processes that may indicate that deficiencies exist. Members of the planning team should reconvene to discuss the problem and to consider and assign responsibility for generating remedies across all mission areas. Remedial actions may involve revising planning assumptions and operational concepts, changing organizational tasks, or modifying organizational implementing instructions (i.e., the SOPs/SOGs). Remedial actions may also involve reassessment of capabilities, revisiting assumptions made in the DMP, and finding solutions to overcome the deficiencies. The final component of a remedial action process is a mechanism for tracking and following up on the assigned actions. As appropriate, significant issues and problems identified through a remedial action process and/or the annual review should provide the information needed to allow the planning team to make the necessary revision(s) to the plan.

18.3 Preparation of DM Plans on Zonal Railways

Zonal Railways will prepare Disaster Management Plans at HQ and Divisional Levels as per the provision of Disaster Management Act, 2005 as detailed in the earlier chapters and the DM Plan of the Indian Railway (prepared by Railway Board). These Plans will encompass the National Policy of Disaster Management (NPDM) and Guidelines issued by NDMA; as also all types of disasters that can occur on the Railway system. It is reiterated that the High Level Committee on Disaster Management Constituted in 2003 had mainly dealt with the upgradation of Railways relief/rescue facilities to handle train accidents. These are, therefore, only of limited use and relevance in the DM plan now to be framed based on the new concept of a Disaster as given in the DM Act, 2005. The Plans of the Zonal Railways should detail for all types of disasters, the preventive, and mitigation and preparedness measures being taken by the railways and also the rescue, relief and restoration systems in place to meet with them.

NDMA guidelines, instructions issued by the Boards office from time to time and the action plan as framed by the zonal railways will form the backbone of the DM Plans of Zonal Railways. These plans must be dovetailed with the State and District Disaster Management Plans wherever the same have been prepared. Zonal Railways will keep their focus on the developments happening in their local area in the Government, non-govt. and private sector to build on the expertise-based all-inclusive approach as envisaged in the Disaster Management Act, 2005.

For ensuring the uniformity and best possible use of the information, the effort needs to be made to broadly format these plans as under:

18.3.1 Divisional Disaster Management Plans will contain division specific information. It will generally contain divisional action plan for dealing with all types of railway disaster. It not be restricted only to detailed inventory of Railway and non-Railway resources as envisaged in High Level Committee's Report on Disaster Management. It should focus mainly on further new developments of sharing of resources with all stake holders. It should also have, thereafter, divisional specific information like road maps, etc. Information common to all divisions of a Zonal Railway may be replicated uniformly in DM Plans of all divisions of the Zonal Railway. Divisional DM plan should contain information about the following:-

1. Role and responsibilities of officers and other stake holders at the accident site and in the divisional control room.
2. Site Management plans
3. Do's and don'ts in handling various types of accidents involving chemicals, oil and natural gas, nuclear materials etc.,
4. Precautions to be taken in case of fire accidents.
5. Action plan for Management of Crowd at stations during festivals and events of mass gathering.
6. Details of Incidence Response System
7. Passenger care and Managing of Dead Bodies.
8. Media Management
9. Vulnerability profile of the division from various natural disasters like Earth Quakes, Tsunami, Floods, Avalanches, Landslides, Cyclones etc.,
10. Details of Vulnerable bridges and their location.
11. Telephone Nos. including Mobile Nos. of all important railway officials at both Zonal & Divisional level and telephone Nos. of all stations, blocks etc.
12. Location of ART&ARME/SPART and of adjoining division and of adjoining Zonal Railways.
13. Inventory of medical facilities within Division, Doctors, Hospitals including their specialisation/No of beds, Nursing Home, Ambulances etc.,
14. Details of District & State Officials
15. Details of Fire service stations.
16. Details of Defence establishment including Army, Navy & Air Force.
17. Details of Helipads/location where a small plane or helicopter can land.
18. Contact details of Oil and Gas companies and Chemical industries.
19. Details of social organisation/NGOs.
20. Inventory of agencies with earth moving equipment like road crane, bulldozer, boats, diving equipment etc.
21. Details of skilled divers with their name and contact details.
22. Details of road transport facilities, distance map superimposed on division map, detailed road maps etc.
23. Details of forensic personal.
24. List of materials in ART&ARME.
25. Details of para military establishments.
26. List of Government and private helicopter service providers/their contact numbers.
27. Contact numbers of Scouts and Guides.
28. Contact details of St.John Ambulace services

18.3.2 Headquarter level Disaster Management Plans will have information common to all divisions of Zonal Railway. It will generally contain Railway's action plan for dealing with all types of Railway disaster. Action items along with their progress will be detailed for all type Railway disasters. Contrary to the divisional Plan this will be more centric towards prevention, mitigation and preparedness than rescue and relief. Information like formation of relief and rescue teams at the accident site, Disaster Management Control Cell, Duties of various officers/officials etc. in addition to the information specific to headquarter will be contained in this plan. Information common to all divisions of a Zonal Railway may be replicated uniformly in DM Plans of all divisions of Zonal Railway. Divisional Specific information need not be contained in headquarter DM Plan.

18.4 Periodical Review of Disaster Management Plans:

This step closes the loop in the planning process. It focuses on adding the information gained by exercising the plan to the lessons learnt while executing, and start the planning cycle all over again. All the relevant stakeholders should establish a process for reviewing and revising the plan. Reviews should be a recurring activity. It should also be reviewed and updated as indicated below:

- Major review and revisions after each major incident
- After significant change in operational resources (e.g., policy, personnel, organizational structures, management processes, facilities, equipment)
- Subsequent to any notification or formal update of planning guidance or standards
- After every case of plan activation in anticipation of an emergency
- After the completion of major exercises
- A change in the district's demographics or hazard or threat profile
- Enactment of new or amended rules**,** laws or ordinances

The DM Plans is to be reviewed and updated at least once in a year, i.e. in January every year. In the review changes in policy (including the NPDM) issued by NDMA/NEC and by the Central Governments and Railway Board are to be made. The DM Plans of the State Governments and of the Districts need to be gone into periodically and changes incorporated in the respective DM Plans of Zonal Railways/ Divisions.

18.5 Nodal Department for Policy Formulation and Updation of DM plan:

Disaster Management plan of Ministry of Railways, Zonal and Divisional plans has to be prepared by the safety department in coordination with the concerned departments of the railways and all other stake holders. Each DM plan must be reviewed at least once in a year i.e. in January. These Plans will also to be hosted on the rail-net server of the Zonal Railways and on Safety Information Management System (SIMS) in an interactive format so that the information can be shared and its retrieval is simpler.

The Hospital DM plans and the Security arrangements (drills etc) shall be prepared and coordinated by the Medical and the Security department respectively.

The Management of Floods, Cyclones, Earthquakes, Landslides, etc, and preventive action/ mitigation shall be coordinated by the Civil Engineering Department.

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

Annexure-I

Zone-wise Location of Accident Relief Cranes

S.No.	Railway(s)	Location	Total
1	Central	DAUND, BHUSAWAL, KALYAN/KURLA, NAGPUR, AJNI, MIRAJ, MANMAD	**06**
2	East Coast	VISHAKHAPATNAM/ WALTAIR, KANTABANJI, VISHAKHAPATNAM(120T), SAMBHALPUR, KHURDA ROAD, KORAPUT(120T), KIRANDUL(120T)	**07**
3	East Central	BARWADIH, MUGHALSARAI, DANAPUR, SONEPUR, DHANBAD, SMASTIPUR	**06**
4	Eastern	AJIMGANJ/RAMPURHAT, HOWRAH, SAHIBGANJ, ASANSOL, BELIGHATA	**05**
5	North Central	AGRA, JHANSI, KANPUR	**03**
6	North Eastern	GORAKHPUR, MAILANI(35T), KASGANJ	**03**
7	Northeast Frontier	NEW GUWAHATI, NEW BONGAIGAON, NEW JALPAIGURI, TINSUKIA, BADARPUR, RANGAPARA, LUMDING(35T)- 2 Nos., KXJ(35T)-3 Nos.	**12**
8	Northern	DELHI, MORADABAD, BHATINDA, LUDHIANA, AMBALA, LUCKNOW, PATHANKOT, FIROZEPUR, KATRA	**09**
9	North Western	ABU ROAD, JAIPUR, JODHPUR, LALGARH	**04**
10	South Central	SECUNDERABAD, KAZIPET, VIJAYAWADA, GOOTY, PURNA	**05**
11	Southeast Central	GONDIA, BILASPUR, BHILAI	**03**
12	South Eastern	KHARAGPUR, CHAKRADHARPUR, BONDAMUNDA, BOKARO STEEL CITY, ADRA(120T), HATIA	**06**
13	Southern	ERODE, TONDIARPET, MADURAI, TIRUCHIRRAPALLI, ERNAKULAM, SHORANUR	**06**
14	South Western	HUBLI, ARSIKERE, BANGALORE-2 Nos.	**04**
15	West Central	KOTA, NEW KATNI JN., BINA, ITARSI	**04**
16	Western	UDHNA, KANKARIA, RATLAM, RAJKOT	**04**
17	KRCL	VERNA	**1**
TOTAL			**88**

Annexure - II

Accident Relief Trains over Indian Railways

ARME Scale-I		A-Class ART	B-Class ART	C-Class ART
SPART/ SPARMV	Conventional			
77	87	77	78	16
		171		

S. No.	Zone	Divisions	ARME Scale-I		A-Class ART	B-Class ART	C-Class ART
			SPART/ SPARMV	Conventional			
1.	CR	**Mumbai**	Kalyan	Igatpuri	Kurla	Kalyan, Igatpuri	Lonavala
		Bhusaval	Bhusaval	-	Bhusaval, Manmad	-	-
		Nagpur	Amla, Wardha	Nagpur,	Ajni	Amla, Wardha	-
		Pune		Pune, Miraj	Miraj	-	Pune
		Solapur	Solapur	Wadi, Daund	Daund	Wadi	-
		Total	***5***	***6***	***6***	***5***	***2***
2.	ECoR	**Waltair**	VSKP, Koraput, Rayagada	-	VSKP, Kirandul(120T), Koraput (120T)	Rayagada	-
		Khurda Road	Khurda Road	Palasa, Bhadrak	Khurda Road	Palasa, Bhadrak, Talcher	
		Sambalpur	Sambalpur	Titlagarh	Sambalpur, Kantabanji	-	-
		Total	***5***	***3***	***6***	***4***	**-**
3.	ECR	**Sonepur**	Sonepur	Barauni	Sonepur	Barauni	-
		Samastipur	Samastipur	-	Samastipur	-	**-**
		Danapur	Danapur	Jhajha	Danapur	Jhajha	**-**
		Mugalsarai	Mugalsarai	Gaya	Mugalsarai	Gaya	**-**
		Dhanbad	Gomoh, Chopan(under Commissioning)	Dhanbad, Barwadih, Chopan	Dhanbad, Barwadih	Chopan, Gomoh, Barkakana, Patherdih	**-**
		Total	***6***	***6***	***6***	***7***	**-**
4.	ER	**Sealdah**	Beliaghata	Ranaghat	Beliaghata	Ranaghat	-
		Howrah	Bardhaman, Howrah	Rampurhat	Howrah, Rampurhat	Bandel	-
		Asansol	Asansol	-	Asansol	Andal	-
		Malda	Jamalpur	Malda, Sahibganj	Sahibganj	Malda, Jamalpur	-
		Total	***5***	***4***	***5***	***5***	**-**

5.	NCR	**Allahabad**	Allahabad, Kanpur	Tundla,	Kanpur	Allahabad, Tundla	-
		Jhanshi	Banda	Banda, Jhanshi	Jhanshi	Gwalior(NG)	-
		Agra		Agra	Agra		-
		Total	***3***	***4***	***3***	***3***	**-**
6.	**NER**	**Izzatnagar**	Lalkuan	Kasganj	Kasganj	-	**-**
		Lucknow	Gorakhpur	Gonda, Mailani(MG), Lucknow	Gorakhpur, Mailani(MG)	Gonda, Lucknow	-
		Varanasi	Chhapra, Manduadih	Mau	-	Chhapra, Mau	-
		Total	***4***	***5***	***3***	***4***	**-**
7.	NFR	***Katihar***	New Jalpaiguri	Katihar	New Jalpaiguri	Katihar	-
		Alipur Duar	Alipur Duar	-	-	Alipurdwar	-
		Rangiya	Rangapara	New Bongaigaon	New Bongaigaon, RPAN	-	-
		Lumding	Guwahati, Badarpur	Lumding	NGC, Badarpur	Lumding	-
		Tinsukia	-	Tinsukia, Mariani	Tinsukia		Mariani
		Total	***5***	***5***	***6***	***3***	***1***
8.	NR	**Delhi**	Delhi	-	Delhi	-	-
		Ambala	Saharanpur	Ambala, Bhatinda, Kalka(NG)	Ambala, Bhatinda	Saharanpur, Kalka(NG)	-
		Firozpur	Badgam, Amritsar	Firozpur, Ludhiana, Pathankot, BJPL(NG)	Ludhiana, Pathankot	Firozpur, Amritsar, Pathankot(NG), SVDK	BJPL(NG)
		Moradabad	Moradabad	RAC	Moradabad	Roza(RAC)	-
		Lucknow	Lucknow	Faizabad	Lucknow	Faizabad	-
		Total	***6***	***9***	***7***	***8***	***1***
9.	NWR	**Ajmer**	Udaipur,	Ajmer, Mavli(MG)	Abu Road	-	Ajmer
		Bikaner	Churu	Lalgarh, Suratgarh	Lalgarh	-	Suratgarh
		Jaipur	Rewari,	Jaipur	Jaipur	-	-
		Jodhpur	Barmer	Jodhpur, Merta Road	Jodhpur	-	-
		Total	***4***	***7***	***4***	**-**	***2***

10.	SCR	**Secunderabad**	SC, Kazipet	-	SC, Kazipet	Bellampalli, SC & Kazipet (SPART- only HRE)	-
		Vijayawada	Vijayawada, Bittragunta, Rajamundry	-	Vijayawada (SPART + 140T – only HRE)	Rajamundry, Bittragunta	-
		Guntakal	Guntakal	Dharmavaram, Renigunta	Gooty	Guntakal, Dharmavaram, Renigunta	-
		Nanded	Purna	-	Purna		-
		Hyderabad	Nizamabad	-	-	Nizamabad	-
		Guntur	-	-	-	Guntur	-
		Total	***8***	***2***	***5***	***10***	**-**
11.	SECR	Bilaspur	Raigarh	Bilaspur,	Bilaspur	Sahdol, Korba	Brajrajnagar, Manendragarh
		Raipur	Bhilai	-	Bhilai	-	
		Nagpur	Gondia	Itwari, Motibagh	Gondia	Itwari, Motibagh	Dongargarh
		Total	***3***	***3***	***3***	***4***	***3***
12.	SER	***Adra***		Adra, Bokaro	Adra(120T), Bokaro	-	-
		Kharagpur	Kharagpur	Santaragachi	Kharagpur	Santragachi	-
		Chakradharpur	CKP	Tata, Bondamunda, Dangoaposi	CKP, Bondamunda	Tata, Dangoaposi	-
		Ranchi	Hatia	-	-	Hatia	-
		Total	***3***	***6***	***5***	***4***	**-**
13.	SR	**Chennai**	Mgr Chennai Central	Jolarpettai	Tondiarpet	Mgr Chennai Central, Jolarpettai	-
		Salem	Erode	-	Erode	-	-
		Palakkad	Soranur	Mangalore	Soranur	Mangalore	-
		Trivandrum	Ernakulam	Trivandrum	ERM	Trivandrum	-
		Madurai	Madurai		Madurai	Tirunelveli	-
		TPJ	TPJ	Villupuram	TPGY	Villupuram	-
		Total	***6***	***4***	***6***	***6***	**-**
14.	SWR	**Hubli**	Hubli	Castle Rock, Vijayapura	Hubli	Castle Rock,	Hospet, Vijayapur, VSG
		Bengaluru	Bengaluru	-	Bengaluru		
		Mysore	Mysuru	Arsikere Harihar, Sakleshpur, Shivamogga	Arsikere	Sakleshpur	Harihar
		Total	**3**	**6**	**3**	**2**	**4**

15.	WCR	**Jabalpur**	NKJ	Satna, Jabalpur	NKJ	Jabalpur	Satna
		Bhopal	Guna	Bhopal, Itarsi, Bina	Itarsi, Bina	Bhopal	-
		Kota	Kota	Gangapur City	Kota	Gangapur City	-
		Total	***3***	***6***	***4***	***3***	***1***
16.	WR	**Mumbai Central**	Bandra	BCT, Valsad, Udhna	Udhna	Valsad	Nandurbar, Billimora(NG)
		Vadodara	BRC	-		BRC	-
		Ahmedabad	Ahmedabad	Palanpur, GIM	KKF	GIM	-
		Bhavnagar	Bhavnagar	VRL, Porbandar	-	Bhavnagar, VRL	-
		Rajkot	HAPA	Rajkot	Rajkot	-	-
		Ratlam	Ratlam	Ujjain, Chittaurgarh, DADN(MG)	Ratlam	Ujjain, Chittaurgarh, DADN(MG)	-
		Total	***6***	***11***	***4***	***8***	***2***
17.	KRCL		Ratnagiri, Verna	-	Verna	-	-
		Total	**2**	**-**	***1***	**-**	**-**
18.	Metro	**Kolkata**	-	-	-	Noapara Car Shed, Kavi Subhash Car Shed	-
		Total	-	-	-	***2***	-
		Grand Total	***77***	***87***	***76***	***78***	***16***

ANNEXURE-III

List of Hospitals over Indian Railways

CENTRAL HOSPITALS

S.No.	ZONE	NAME OF HOSPITAL	PLACE OF HOSPITAL
1	CR	B.A.M. Hospital	Bvculla
2	ER	B.R. Singh Hospital	Sealdah in Kolkata
3	ECR	Central Hospital	Patna
4	ECoR	Central Hospital	Bhubaneswar
5	NR	Central Hospital	New Delhi
6	NCR	Central Hospital	Allahabad
7	NER	LNMR Hospital	Gorakhpur
8	NFR	Central Hospital	Maligaon
9	NWR	Central Hospital	Jaipur
10	SR	Central Hospital	Perambur
11	SCR	Central Hospital	Lallaguda
12	SER	Central Hospital	Garden Reach/Kolka
13	SECR	Central Hospital	Bilaspur
14	SWR	Central Hospital	Hubli
15	WR	J.R.H. Hospital	Mumbai
16	WCR	Central Hospital	Jabalpur

DIVISIONAL HOSPITALS

S.No.	ZONE	NAME OF DIVISION	TYPE OF HOSPITAL
1	CR	Kalyan	Divisional
2		Pune	Divisional
3		Bhusawal	Divisional
4		Nagpur	Divisional
5		Solapur	Divisional
6	ER	Howrah	Orthopaedic Hospital
7		Asansol	Divisional
8		Malda	Divisional
9	ECR	Danapur	Divisional
10		Mugalsarai	Divisional
11		Dhanbad	Divisional
12		Sonepur	Divisional
13		Samastipur	Divisional
14	ECoR	Vishakhapatnam/Waltair	Divisional
15		Khurda Road	Divisional
16		Sambalpur	Divisional
17	NR	Delhi	Divisional
18		Moradabad	Divisional
19		Lucknow	Divisional
20		Ferozpur	Divisional
21		Ambala	Divisional
22	NCR	Jhansi	Divisional
23		Agra	Divisional
24	NER	Izatnaqar	Divisional

25		Lucknow	Divisional
26		Varanasi	Divisional
27		Varanasi	CRI/Varanasi
28	NFR	Katihar	Divisional
29		Alipurduar	Divisional
30		Lumdinq	Divisional
31		New Bongaigaon	Divisional
32		Tinsukia	Divisional
33	NWR	Ajmer	Divisional
34		Bikaner	Divisional
35		Jodhpur	Divisional
36	SR	Arakonam	Divisional
37		Golden Rock	Divisional
38		Madurai	Divisional
39		Palqhat	Divisional
40		Trivendrum	Divisional
41	SCR	Viiawada	Divisional
42		Guntakal	Divisional
43		Nanded	Divisional
44	SER	Adra	Divisional
45		Chakradharpur	Divisional
46		Ranchi	Divisional
47		Kharagpur	Divisional
48	SECR	Raipur	Divisional
49	SWR	Bangalore	Divisional
50		Mysore	Divisional
51	WR	Vadodara	Divisional
52		Amhmedabad	Divisional
53		Ratlam	Divisional
54		Rajkot	Divisional
55		Bhavnagar	Divisional
56	WCR	Bhopal	Divisional
57		Kota	Divisional

SUB- DIVISIONAL HOSPITALS

S.No.	ZONE	PLACE OF HOSPITAL	TYPE OF HOSPITAL
1	CR	Igatpur	Sub-divisional
2		Manmad	Sub-divisional
3		Amla	Sub-divisional
4		Kurduwadi	Sub-divisional
5		Daund	Sub-divisional
6	ER	Andal	Sub-divisional
7		Kanchrapara	Workshop Hospital
8		Liluah	Workshop Hospital
9		Jamalpur	Workshop Hospital
10	ECR	Gaya	Sub-divisional
11		Patratu	Sub-divisional

12		Garhara	Sub-divisional
13	NR	Amritsar	Sub-divisional
14		Saharanpur	Sub-divisional
15		Jagadhari	Workshop Hospital
16	NCR	Kanpur	Sub-divisional
17		Tundla	Sub-divisional
18	NER	Gonda	Sub-divisional
19	NFR	New/Jalgaipuri	Sub-divisional
20		Badarpur	Sub-divisional
21		Rangapara	Sub-divisional
22		Tinsukia	Sub-divisional
23		Tindharia	Sub-divisional
24	NWR	Abu Road	Sub-divisional
25		Ranapratap Nagar	Sub-divisional
26		Bandikuian	Sub-divisional
27		Rewari	Sub-divisional
27	SR	Perambur	P.U.Hospital./ICF
28		Villupurum	Sub-divisional
29		Erode	Sub-divisional
30		Podanur	Sub-divisional
31		Shoranur	Sub-divisional
32	SCR	Raynapadu	Sub-divisional
33		Purna	Sub-divisional
34		Kazipet	Poly Clinic
35	SER	Tatanagar	Sub-divisional
36		Bondamunda	Sub-divisional
37	SECR	Bhilai/Shahdol	Sub-divisional
38		Nainpur	Sub-divisional
39		Raipur	BMY
40	WR	Valsad	Sub-divisional
41		Gandhidham	Sub-divisional
42		Dahod	Workshop Hospital
43	WCR	New katni	Sub-divisional
44		Itarsi	Sub-divisional
45		Bina	Sub-divisional
46		Gangapur City	Sub-divisional
47	CLW	Chittranjan	K.G. Hospital CLW
48	DLW	Varanasi	P.U.Hospital./DLW
49	DMW	Patiala	Workshop Hospital
50	ICF	Chennai	PU Hospital
51	RCF	Kapurthala	Workshop Hospital
52	RWF	Yelahanka	P.U. Hospital/RWF
53	RDSO	Lucknow	Workshop Hospital RDSO