READINGS ON

CORPORATE SAFETY PLAN (2003-2013), THE HIGH-LEVEL COMMITTEE REPORT ON DISASTER MANAGEMENT OVER INDIAN RAILWAY (2002) AND REPORT OF TASK FORCE ON SAFETY, 2017

(WITH DISASTER MANAGEMENT ACT, 2005 and DISASTER MANAGEMENT PLAN OF INDIAN RAILWAYS, NOVEMBER 2009)

COMPILED AND EDITED BY

Hari Shankar Verma, IRTS

Director General, IRITM







भारतीय रेल परिवहन प्रबंधन संस्थान

INDIAN RAILWAYS INSTITUTE OF TRANSPORT MANAGEMENT

READINGS ON

CORPORATE SAFETY PLAN (2003-2013), THE HIGH-LEVEL COMMITTEE REPORT ON DISASTER MANAGEMENT OVER INDIAN RAILWAY (2002) AND REPORT OF TASK FORCE ON SAFETY, 2017

(WITH DISASTER MANAGEMENT ACT, 2005 and DISASTER MANAGEMENT PLAN OF INDIAN RAILWAYS, NOVEMBER 2009)

READINGS ON

CORPORATE SAFETY PLAN (2003-2013), THE HIGH-LEVEL COMMITTEE REPORT ON DISASTER MANAGEMENT OVER INDIAN RAILWAY (2002) AND REPORT OF TASK FORCE ON SAFETY, 2017

(WITH DISASTER MANAGEMENT ACT, 2005 and DISASTER MANAGEMENT PLAN OF INDIAN RAILWAYS, NOVEMBER 2009)

COMPILED AND EDITED BY

Hari Shankar Verma, IRTS

Director General, IRITM

वयं राष्ट्रे जागृयाम

INDIAN RAILWAYS INSTITUTE OF TRANSPORT MANAGEMENT

(Hardoi By-Pass Road, P.O. Manak Nagar, LUCKNOW-226011, Uttar Pradesh, India.)

ISBN 978-81-973123-4-2
First Published 2024

© Copyright Reserved by the Compiler and Editor (Shri Hari Shankar Verma), Compiler and Editor is also reserved the right of the editor of present work.

No part of this publication can be reproduced or transmitted in any form or by any means, without prior permission of the Editor. Although every care has been taken to avoid errors or omissions in this publication, inspite of this, inadvertently, errors may creep in. This publication is for use as on the condition and understanding that information given herein is merely for guidance and reference. Disclaimer has already been given in this book. It must not be taken as having authority of, or binding in any way on, the editor, and publisher who do not owe any responsibility for any damage or loss to any person, who may or may not be a purchaser of this publication, on account of any action taken on the basis of this publication. For authoritative text information, please contact the department concerned or refer to the Government publication, office memorandum or the gazette notification. The publishers shall be obliged if any mistake, error, or discrepancy is brought to their notice for carrying out correction in the next edition. In case of sale of publication, binding mistake, misprint, or missing pages etc., the publisher's liability is limited to replacement within one month of the purchase by similar edition/reprint. All disputes are subject to Lucknow Jurisdiction only.

The cost is free for Trainees undergoing training at Indian Railways Institute of Transport Management (IRITM), if Director General, desired so in the interest of learning or requisitioned by Railway Authorities for Internal use. However, for public use, the publication can also be sold, subject to the price fixed by the Director General, IRITM, and money be deposited in Railway Cash.

Printed by Maheshwari Printing Press, 289/214 Moti Nagar Chauraha, Lucknow-226004 & Bound by Rais Ahmad & Sons. 151 Phool Bagh Hussain Ganj Lucknow.

Published by
Director General,
Indian Railways Institute of Transport Management,
(Hardoi By-Pass Road, P.O. Manak Nagar, LUCKNOW-226011, Uttar Pradesh, India.)

DISCLAIMER

The report of Readings on Corporate Safety Plan (2003-2013), The High-Level Committee Report on Disaster Management Over Indian Railway (2002) and Report of Task Force on Safety, 2017 (with Disaster Management Act, 2005 and Disaster Management Plan of Indian Railways, November 2009).

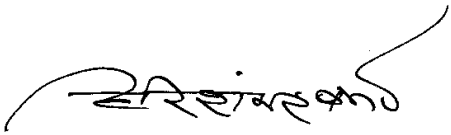
The style of original presentation of report has been changed to accommodate it in a book form, certain grammatical and typographical mistakes have also been corrected. The tables in the report have been re-drawn to accommodate in a Book format thus there may be some variation in presentation, but content remain the same. The page numbering of various paragraph of report has completely changed and wherever, report is lengthy then same is divided into various chapters for easy reading. However, the efforts have been made to keep the report as original as possible however, there may be some variance as the content of report has been taken from different authentic websites and links, but no authenticity can be claimed. In the beginning, several chapters have been added by undersigned for better understanding of the report. The views expressed in those chapters and contents of the report are not the views of Central Government and Authors of these Report. This Volume is to be used for learning and academic purpose only and not to be taken as an authentic document. While, reading the report, the reader must keep in mind as under:

1. This book is printed as reading material for the purpose of training and learning by trainee officers.
2. The reading material is always prepared after reading several codes, manuals, and other relevant information from authentic Railway sources. It's for training purposes and nothing to do with the actual working of Railways in the field.
3. In case there is any contradiction in writing with the

approved source of railways, the readers are advised to follow the codes, manuals and other extent instructions of Ministry of Railway and Zonal Railway.

4. I have tried to remain to the point, but it is the responsibility of the trainer to prepare the digital content, especially PowerPoint presentations, etc. as per the latest guidelines.
5. The various subjects, especially the Acts and Rules referred to in the book, keep changing due to need of the time. Therefore, trainee officers need to update the same.
6. All railway officials are subject to following the rules and instructions given time-to-time to them and those must be followed and not to adhere to the contents written in this reading material.
7. As far as the latest amendments to the rules are concerned, the trainee officers are advised to keep them updated. In case, in any deviation, the Railway publication to be relied upon.

The reading material is for internal use and not for any commercial use and cannot be quoted as an authority or in any legal matter.



Hari Shankar Verma, IRTS
Director General, IRITM,
compiler and editor of
Readings on Corporate Safety Plan (2003-2013), The High-Level Committee Report on Disaster Management Over Indian Railway (2002) and Report of Task Force on Safety, 2017
(with Disaster Management Act, 2005 and Disaster Management Plan of Indian Railways, November 2009) as reading material at IRITM

हरि शंकर वर्मा
भारतीय रेल यातायात सेवा
महानिदेशक

Hari Shankar Verma
Indian Railway Traffic Service
Director General





PREFACE

Safety is integral part of railway operation. Since laying of first line of railway track, the Indian Railways is always in total commitment to provide safe, efficient, and economical rail transport in country. If any accident happens on railway system, it put a question mark on safe railway working to a common man, but it also majorly affects the moral and confidence among railwaymen. The management and staff are always working hard and in thought process to improve the safety in railways.

The training of railway staff and officers is greatly consisting of safety rules. There is no discipline in railways, where safety in rail transportation and maintenance is not taught. At Indian Railways Institute of Transport Management (IRITM), we conduct regular classes to the officers and senior supervisors about the safety and encourage the trainee officers to read and learn the material available in the library about safety.

The primary source of learning in safety are General & Subsidiary Rules (G&SR), several codes and manual, accident reports given by commissioners of railway safety and reports of past Railways Accident Enquiry Committee. Most of the literature is available with the library but Accident Enquiry Reports are not available in

physical form and there is no analysis of these reports in condensed form.

It is not possible by everyone to go through these reports in various digital platforms and read them. Some of the reports are also not available digitally and most of them are not in readable format. Secondly, the Accident Enquiry Reports are also having historical importance to learn from our past and not to repeat the same mistakes in future.

The recommendations given by various Safety Enquiries Committees are not subject to be agreed by Railway Administration at that time and carry immense value for further study and improvement in our working. Most of the reports are prepared by the best of mind during that time and worth for reading. The railway is dynamic organization which keep changing its technology over the time with progress of technology, but the lesson learned about the safety remains the same therefore it is always needed to learn the things from past.

In order to prepare reading materials to the probationary officers and in-service officers, I have read most of the reports and strongly feel that all railway officers who are working with the safety and also the officers who are holding the administrative post like Additional Divisional Railway Manager (ADRM), Divisional Railway Managers (DRMs), Principal Head of the Department (PHODs), Principal Chief Safety Officers (PCSO) of the Zonal Railways, Additional General Managers (AGMs), General Managers (GMs) and officers in Railway Board, who are in policy making must read these reports.

As a mission mode, IRITM is compiling and printing all Accident Enquiry Reports in book form for easy reading and also put digital format of the same in IRITM website

to encourage and facilitate about reading of these reports. These reports would also help the researcher and policy maker to draw the policies for making Indian Railways as one of the safe Railway systems in the world.

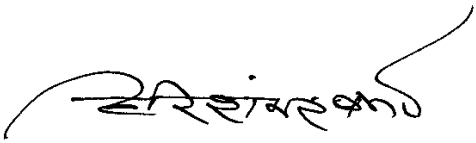
So far Indian Railways had constituted six safety review committees since independence. The purpose of constitution of these safety review committee was to study in deep about the causes leading to railway accident and how to strengthen rail safety. The list of committees which had been formed by Ministry of Railway is as under:

1. The Railway Accidents Enquiry Committee, 1954 **(Shahnawaz Committee 1954)**
2. The Railway Accidents Committee, 1962 **(Kunzru Committee1962)**
3. The Railway Accidents Inquiry Committee, 1968 **(Wanchoo Committee 1968)**
4. The Railway Accidents Enquiry Committee, 1978 **(The Sikri Committee 1978)**
5. The Railway Safety Review Committee **(The Khanna Committee 1998)**
6. High-Level Safety Review Committee 2012 **(Kakodkar Committee)**

High-Level Safety Review Committee, 2012 is the latest committee chaired by Dr. Anil Kakodkar. This committee is most important as it was constituted with scientists and technocrats, who were the pioneers in their respective fields while previous committees were headed by retired supreme court judges except Shahnawaz and Kunzru Committee who were headed by parliamentarians and law makers.

While, readings of these reports, one can visit some part of history of Indian Railways and appreciate the circumstances just after our country got independence. These reports are full of events and anecdotes which remind us of things that have not changed even after passage of time. I personally feel that readers will find in them a good read.

I would like to put on record the hard work done by Mr. Subhash Sonkar for typing and Mr. Rohit Yadav for formatting, proofreading, and converting it into printable format. I am also grateful to Shri Rajesh Kumar, IRTS, Sr. Professor Administration and Miss Krishna Tiwari, IRTS, Professor Administration and OSD to Undersigned for getting it published.



Hari Shankar Verma, IRTS
Director General
Indian Railways Institute of Transport Management (IRITM),
Lucknow, UP, India.
Sunday, 05.09.2024, Teacher's Day.

भारतीय रेल परिवहन प्रबन्धन संस्थान
हरदोई बाई-पास रोड, पोस्ट ऑफिस-मानक नगर, लखनऊ 226011
दूरभाष: 0522-2451942, फैक्स: 0522-2451964, मोबाईल 9794862000, ई-मेल: directorgeneral.iritm@gmail.com
Indian Railways Institute of Transport Management
Hardoi by-pass Road, P.O. Manak Nagar, Lucknow-226011
Telephone: 0522-2451942, Fax: 0522-2451964, Mobile: 9794862000, E-mail: directorgeneral.iritm@gmail.com

CONTENTS

Chapter	Contents	Page No.
	Disclaimer	**I-II**
	Preface	**III-VI**
	Contents	**VII-XIX**
CORPORATE SAFETY PLAN (2003 - 2013)		
Chapter I	Corporate Safety Plan: At A Glance 1	1-3
Chapter II	Corporate Safety Objectives	4-11
Chapter III	Safety Policy Issues	12-16
Chapter IV	The Role of Technology	17-21
Chapter V	Strategies For Targets for Reduction in Accidents	22-46
Chapter VI	Maintenance Practices and Asset reliability - Modernisation and Upgradation	47-63
Chapter VII	Human Resource Management & Development	64-75
Chapter VIII	Modernisation of Disaster Management	76-80
Chapter IX	Investment in Safety related works	81-84
Annexures	List of abbreviations	85-86
THE HIGH-LEVEL COMMITTEE'S REPORT ON DISASTER MANAGEMENT OVER INDIAN RAILWAY 2002		
Introduction		90-96
1. Institutionalizing Golden Hour Drill		97-115
2. Relief measures for injured and survivors		116
3. Care for the dead		117
4. Technological Inputs in ARMs/ARTs		117-125
5. HRD Training		126-129
6. Media Management		129-130
7. Recommendations for Implementation		130-132
REPORT OF TASK FORCE ON SAFETY 2017		
	Submission of Report	**I**
	Order Letter	**II**
	Preface	**III-IV**
	Methodology	**V**
	Contents	**VII-X**
1.	**Accidents – Broad Statistics**	**147**
	Annexure – 01	149
	Annexure – 02	151
	Annexure – 03	154
2.	**Maintenance of Coaches in the field**	**159**

Chapter	Contents	Page No.
	Pitline Examination	159
	Recommendations	160
	Rolling-in Examination	162
	Recommendations	163
	Empowerment of Sr. DMEs and CDOs (K 2.9)	163
	Recommendations	164
3.	**Coach Design and Deployment**	**166**
	Recommendations	167
4.	**A Completely ICF-Design-Free Regime**	**171**
	Recommendations	171
5.	**Fire in Passenger Trains**	**173**
	Recommendations	173
6.	**Freight Trains and Safety Issues**	**175**
	Recommendations	176
	Annexure – 04	177
7.	**Wagon Design**	**178**
	Recommendations	178
8.	**Workshops**	**180**
	Recommendations	181
9.	**Ancillarisation of Workshops**	**182**
	Recommendations	184
10.	**Locomotives**	**185**
	Recommendations	186
11.	**Testing of Rail Vehicles**	**187**
	Recommendations	188
12.	**Derailments**	**189**
	Recommendations	189
	Precautions for Heavy Axle Load Operations	191
13.	**Rail Weld Technology**	**192**
	Recommendations	192
14.	**Ultrasonic Flaw Detection**	**194**
	Recommendations	194
15.	**Broken Rail Detection System**	**196**
16.	**Bridges**	**197**
	Recommendations	197
17.	**Maintenance of Engineering Assets**	**199**
	Recommendations	199
	Empowerment of Sr. DENs/DENs (K 2.9)	200
	Recommendations	201
	Upgradation of Track Materials	202

Chapter	Contents	Page No.
18.	**Encroachments**	**203**
	Recommendations	203
19.	**Protection of Road Users**	**204**
	Recommendations	204
20.	**Signalling**	**205**
	Recommendations	206
	Annexure – 05	208
21.	**Maintenance of Signalling Assets**	**211**
	Recommendations	211
22.	**Automatic Train Protection**	**213**
	Recommendations	213
23.	**Communication Backbone**	**215**
	Recommendations	215
24.	**Signal Passing at Danger (SPAD)**	**217**
	Recommendations	218
	Supervision of Loco Crew	220
	Recommendations	220
	Annexure – 10	221
	Annexure – 11	223
25.	**Train Operations**	**225**
	Recommendations	226
	Distributed Power (DP) or Locotrol	226
	Recommendations	226
	Retroreflective Boards	227
26.	**Realtime Safety Monitoring of Rolling Stock**	**228**
	Recommendations	228
	Weigh Bridges	229
	Recommendations	230
27.	**Material Procurement System**	**231**
	Recommendations	232
	Annexure – 12	234
28.	**Procurement of Safety, Vital and Must-Change Items**	**235**
	Recommendations	236
29.	**Complex Products**	**238**
	Recommendations	240
30.	**Procurement of Hardware**	**241**
	Recommendations	242
31.	**Delegation of Purchase Powers to Purchase Officers in the Field**	**243**

Chapter	Contents	Page No.
	Recommendations	243
32.	**Vendor Approval**	**244**
	Recommendations for Safety, Vital and Must-Change Items	244
33.	**Role of RDSO in Vendor Approval:**	**246**
	Recommendations for Safety, Vital and Must-Change Items	247
	Annexure – 13	249
34.	**Grading of Vendors**	**251**
	Recommendations	252
	Annexure – 14	253
35.	**Manpower Planning and Training**	**255**
	Recommendations	256
	Empowerment for Training and Human Resource Development	258
	Recommendations for Training and Certification of Loco Crew	259
	Training of Station Masters	261
	Recommendations	262
36.	**Protection of Worksites**	**263**
	Recommendations	263
37.	**Protection of Workmen at Worksite**	**264**
	Recommendations	264
38.	**Organizational Reorientation**	**266**
	Recommendations	267
	Safety Whistleblower	268
	Recommendations	268
	Safety Organization	268
	Recommendations	269
	Quality Systems in Procurement of Material and Services	270
	Recommendations	270
	Relationship of Finance and Executive	270
	Recommendations	271
	Innovative Financing	271
	Recommendations	271
	Relocate Sectional Sr. DENs/DENs:	272
	Recommendations	272
39.	**State of Railway's Finances and Impact on Safety**	**273**
	Recommendations	274
	Annexure – 06	276

Chapter	Contents	Page No.
	Annexure – 07	277
	Annexure – 08	278
	Annexure – 09	279
40.	**Application of IT for Asset Management**	**280**
	Recommendations	280
	Chief Information Officer	282
	Recommendations	282
41.	**FOG Operations**	**283**
	Recommendations	283
42.	**Accident Reporting and Enquiry**	**285**
	Recommendations	286
43.	**Disaster Management**	**288**
	Recommendations	288
44.	**Safety Cadre Vacancies, Yardsticks and Staff Surrender**	**290**
	Recommendations	291
	Annexure – 15	293
References		**294**
Annexures - 16		**295-301**
THE DISASTER MANAGEMENT ACT, 2005		
CHAPTER I PRELIMINARY		
	Content	
1	Short title, extent, and commencement	309
2	Definitions.	309
CHAPTER II THE NATIONAL DISASTER MANAGEMENT AUTHORITY		
3	Establishment of National Disaster Management Authority	312
4	Meetings of National Authority	313
5	Appointment of officers and other employees of the National Authority.	313
6	Powers and functions of National Authority.	313
7	Constitution of advisory committee by National Authority	314
8	Constitution of National Executive Committee.	315
9	Constitution of sub-committees.	316
10	Powers and functions of National Executive Committee.	316
11	National plan	318
12	Guidelines for minimum standards of relief	319
13	Relief in loan repayment, etc.	319
CHAPTER III		

Chapter	Contents	Page No.
STATE DISASTER MANAGEMENT AUTHORITY		
14	Establishment of State Disaster Management Authority	320
15	Meetings of the State Authority.	321
16	Appointment of officers and other employees of State Authority.	322
17	Constitution of advisory committee by the State Authority.	322
18	Powers and functions of State Authority.	322
19	Guidelines for minimum standard of relief by State Authority	323
20	Constitution of State Executive Committee.	323
21	Constitution of sub-committees by State Executive Committee.	324
22	Functions of the State Executive Committee	325
23	State Plan	326
24	Powers and functions of State Executive Committee in the event of threatening disaster situation.	327
CHAPTER IV DISTRICT DISASTER MANAGEMENT AUTHORITY		
25	Constitution of District Disaster Management Authority	329
26	Powers of Chairperson of District Authority	330
27	Meetings.	331
28	Constitution of advisory committees and other committees.	331
29	Appointment of officers and other employees of District Authority.	331
30	Powers and functions of District Authority	332
31	District Plan	335
32	Plans by different authorities at district level and their implementation.	336
33	Requisition by the District Authority.	337
34	Powers and functions of District Authority in the event of any threatening disaster situation or disaster	337
CHAPTER V MEASURES BY THE GOVERNMENT FOR DISASTER MANAGEMENT		
35	Central Government to take measures.	339
36	Responsibilities of Ministries or Departments of Government of India.	340
37	Disaster management plans of Ministries or Departments of Government of India.	342
38	State Government to take measures.	343
39	Responsibilities of departments of the State Government.	344
40	Disaster management plan of departments of State	345

Chapter	Contents	Page No.
	CHAPTER VI **LOCAL AUTHORITIES**	
41	Functions of the local authority	347
	CHAPTER VII **NATIONAL INSTITUTEOF DISASTER MANAGEMENT**	
42	National Institute of Disaster Management.	348
43	Officers and other employees of the National Institute	350
	CHAPTER VIII **NATIONAL DISASTER RESPONSE FORCE**	
44	National Disaster Response Force	351
45	Control, direction, etc.	351
	CHAPTER IX **FINANCE, ACCOUNTS AND AUDIT**	
46	National Disaster Response Fund.	352
47	National Disaster Mitigation Fund	353
48	Establishment of funds by State Government	353
49	Allocation of funds by Ministries and Departments.	354
50	Emergency procurement and accounting.	354
	CHAPTER X **OFFENCES AND PENALTIES**	
51	Punishment for obstruction, etc.	355
52	Punishment for false claim	356
53	Punishment for misappropriation of money or materials, etc.	356
54	Punishment for false warning.	356
55	Offences by Departments of the Government.	356
56	Failure of officer in duty or his connivance at the contravention of the provisions of this Act.	357
57	Penalty for contravention of any order regarding requisitioning	357
58	Offence by companies.	357
59	Previous sanction for prosecution.	358
60	Cognizance of offences.	358
	CHAPTER XI **MISCELLANEOUS**	
61	Prohibition against discrimination	360
62	Power to issue direction by Central Government	360
63	Powers to be made available for rescue operations.	361
64	Making or amending rules, etc., in certain circumstances.	361
65	Power of requisition of resources, provisions, vehicles, etc., for rescue operations, etc.	361

Chapter	Contents	Page No.
66	Payment of compensation	362
67	Direction to media for communication of warnings, etc.	364
68	Authentication of orders of decisions.	364
69	Delegation of powers.	365
70	Annual report.	365
71	Bar of jurisdiction of court.	365
72	Act to have overriding effect.	366
73	Action taken in good faith.	366
74	Immunity from legal process.	366
75	Power of Central Government to make rules.	366
76	Power to make regulations.	368
77	Rules and regulations to be laid before Parliament.	368
78	Power of State Government to make rules.	369
79	Power to remove difficulties.	370
DISASTER MANAGEMENT PLAN OF INDIAN RAILWAYS, NOVEMBER 2009		
Abbreviations		
1	**Introduction**	**381-384**
1.0	Background	381
1.1	Recommendations of High-Level Committee on Disaster Management:	382
1.2	Approval of the Disaster Management Plan of Indian Railways	384
2	**Concept of Disaster on Railways**	**385-391**
2.0	Disaster Risks in India	385
2.1	Disaster defined in Railways' context	386
2.2	Strengths of the Railways to handle a Disaster	387
2.3	Types of Disasters	388
2.4	Changed Philosophy of Disaster Management in the Railways	389
2.5	Definition of a Disaster on Railways	390
2.6	Nodal department for Policy Formulation on DM on Indian Railways	390
2.7	Authority to declare a Disaster on Railways	391
3	**Disaster Management Act – 2005**	**392-398**
3.0	National Policy on Disaster Management (NPDM)	392
3.1	Salient Features of the Disaster Management Act, 2005	394
3.2	Important Provisions in the DM Act, 2005 Concerning Railways	395

Chapter	Contents	Page No.
4	**National Disaster Management Authority (NDMA)**	**399-409**
4.0	……	399
4.1	Powers and functions of National Authority	399
4.2	Constitution and Role of NDMA	400
4.3	Constitution of Advisory Committee by National Authority	401
4.4	National Executive Committee	401
4.5	National Plan	403
4.6	Role of the Nodal and other Central Ministries and Departments etc.	405
4.7	Guidelines issued by NDMA and Action thereon	407
4.8	Guidelines on Chemical Disasters	407
4.9	Guidelines on Chemical (Terrorism) Disaster	408
4.10	Guidelines on Nuclear and Biological Disasters	408
4.11	Guidelines on Preparation of State Disaster Management Plans	408
4.12	Guidelines on Management of Earthquakes, Cyclones, and Floods	408
4.13	Guidelines on Medical Preparedness and Mass Casualty Management	409
5	**National Disaster Response Force (NDRF)**	**410-414**
5.0	General – First and Key Responders	410
5.1	Location, Constitution and Functions	411
5.2	Coordination with NDRF	414
6	**Disaster Management Plan of Railways – Periodical Review**	**415-417**
6.1	Preparation of DM Plans on Zonal Railways	415
6.2	Periodical Review of Disaster Management Plans	417
6.3	Safety Deptt. - Nodal Deptt for Compilation/Updating of DM Plans	417
6.4	ISO certification of DM plans	417
7	**Capacity Building to handle Disasters**	**418-422**
7.0	National Disaster Response and Mitigation Funds	418
7.1	Disaster Management to be inbuilt in Developmental Plans	418
7.2	Responsibilities of the Central Ministries and Departments	419
7.3	National Disaster Response and Mitigation Funds	419
7.4	Modernization of Relief/Rescue during Disasters	419

Chapter	Contents	Page No.
7.5	Crowd control and Management of rush at Railway Stations during festivals	421
7.6	Terrorist attacks on a freight train carrying inflammables	421
7.7	Capacity Building to reduce destruction due to earthquakes, floods etc.	422
8	**Medical Preparedness - MCE and Mobile Relief**	**423-431**
8.1	Network of Mobile Medical Infrastructure	423
8.2	Responsibility of Stake Holders	424
8.3	Use of Medical Vans/Special Trains by Railways	429
8.4	……	431
9	**Medical Preparedness – Hospital DM Plan**	**432-434**
9.1	Aim of Hospital Disaster Management Plan	432
9.2	Hospital DM Plan	432
9.3	Objective and Goals of a Hospital Disaster Management Plan	433
9.4	Disaster Drills	433
9.5	Training of Health Care Personnel of Indian Railways	434
10	**Role of Security Department in Disaster Management**	**435-439**
10.0	…….	435
10.1	Role of RPF in Disasters	435
10.2	Current Preparedness	436
10.3	Integrated Security Scheme	437
10.4	Crowd Control and Management	438
10.5	Explosion in trains and railway premises	438
10.6	Terrorist acts & Hijacking of trains	439
11	**Disaster Communication System**	**440-445**
11.1	Communication on Railways for Disaster Management	440
11.2	Communication between stake holders	441
11.3	Back up Communication on Railways	441
11.4	Modernization of Communication on the Railways through Satellite	442
11.5	Incident Command System (ICS)	443
11.6	Coordination – Integrated Command System of Railways with Integrated Operations Centre of MHA	444
12	**Disaster Information Flow and Alerts of Disaster**	**446-455**
12.1	Standard Operating Procedures (SOPs)	446

Chapter	Contents	Page No.
12.2	Levels of Disasters	447
12.3	Integrated Operation Centre of MHA	447
12.4	Categorization of Alerts	447
12.5	Action Plan for Communication of Alert Messages	447
12.6	Action on Division/Zones on Orange/Red Alert	453
12.7	Monitoring/Reporting of Effects of Disaster	454
12.8	Standard Operating Procedure (SOP) on Railways	454
13	**Crisis Management Plan - CMP**	**456-458**
13.1	Difference between a Crisis and Disaster	456
13.2	Crisis - Types	456
13.3	National Level Crisis	457
13.4	Drill for handling Crises	458
14	**Management of Cyclones**	**459-461**
14.1	Cyclone vulnerability in India	459
14.2	National Cyclone Risk Mitigation Project	460
14.3	Coordination by Railways regarding Cyclones Risk Management, Advance Warnings and Mitigation	461
15	**Management of Floods**	**462-468**
15.1	Vulnerability to Floods	462
15.2	Institutional Framework	463
15.3	India Meteorological Department	463
15.4	Activities for Minimizing Flood Risk and Losses	464
15.5	Action Plan for Alignment, Location, Design and Provision of Waterway on Railways Embankments	464
15.6	Flood Forecast	465
15.7	Dissemination of Flood Forecasts and Warnings	466
15.8	The Central Water Commission's Flood Forecasting Network in India	466
15.9	Flood Preparedness	466
15.10	Action Plan	466
16	**Management of Earthquakes**	**469-478**
16.1	Earthquake Risk in India	469
16.2	Nodal Ministry	470
16.3	Monitoring Seismic Activity and Safety Codes	470
16.4	Structural Safety Audit and Strengthening	470
16.5	Institutionalization Earthquake-Resistant Design and Construction	471
16.6	Need for Seismic Strengthening of Existing Structures	471
16.7	Preparedness by Railways	472

Chapter	Contents	Page No.
	ANNEXURE- Summary of NDMA Guidelines on Earthquakes and Floods	473-478
17	**Management of Landslides and Snow Avalanches**	**479-481**
17.1	Landslide Risk	479
17.2	Nodal agency of Government of India	479
17.3	Monitoring and Forecasting of Landslides	480
17.4	Management of Snow Avalanches	480
17.5	Organizations Associated with Landslide Hazard Management	481
17.6	Action Plan	481
18	**Management of Biological Disasters**	**480-484**
18.1	Causes of Biological Disasters	482
18.2	Biological Warfare (BW) and Bioterrorism (BT)	483
18.3	Mitigation	483
18.4	Nodal Ministry and support of other Ministries	483
18.5	Handling CBRN Disaster – Training	484
19	**Management of Chemical Disasters**	**485-489**
19.1	Guidelines by NDMA	485
19.2	Salient features of NDMA Guidelines	486
19.3	Genesis of NDMA's Guidelines on Chemical Disasters	486
19.4	Guidelines on Chemical Disasters	487
19.5	Railways Red Tariff – Transport of Hazchem	487
19.6	Monitoring Movement of Hazchem	488
19.7	Rescue Relief and Restoration Operations	489
20	**Management of Chemical (Terrorism) Disasters**	**490-493**
20.1	Introduction	490
20.2	NDMA's Guidelines	491
20.3	CTD Preparedness Plan	491
20.4	Preparedness for Emergency Response	492
20.5	Training for the Responders	492
20.6	Medical Preparedness for CBRN	493
21	**Management of Nuclear and Radiological Disasters**	**494-496**
21.1	Nuclear/Radiological Emergency	494
21.2	Vulnerability of Nuclear Facilities	495
22	**Disaster Management Training**	**497-502**
22.0	Disaster Management Training on the Railways	497
22.1	National Institute of Disaster Management (NIDM)	497

Chapter	Contents	Page No.
22.2	DM Training on Zonal Railways and Divisions	498
23	**Management of Rail Disaster in Tunnels/Deep Cuttings etc.**	**503-504**
23.1	Expertise To handle Rail Disasters in Tunnels etc.	503
23.2	Ventilation arrangements in Tunnels	503
23.3	Lighting Systems in Tunnels for use in emergency	504
23.4	Rail Disasters in a Lake, River, Sea etc.	504

CORPORATE SAFETY PLAN

(2003 - 2013)



Government of India

Ministry of Railways

(Railway Board)

Corporate Safety Plan

(2003 - 2013)

August 2003

Foreword

1. 'The White Paper on Safety on the Indian Railways' presented in Parliament in April 2003, offered a review of safety performance of the Indian Railways, in terms of accidents occurring on the system during the last 40 years, with a special reference to the last decade. The highlights of the paper revolved around modernization of infrastructure viz. track, bridges, rolling stock etc. and examination of the role of human element specially that of failure of railway staff in accidents. It has also gone into issues related to accident inquiry, fixing up of responsibility and recommendations made by various inquiry committees and Commissions. The document has also raised certain vital issues, for which public response is expected to facilitate resolving the issues. The White Paper has highlighted all aspects about safety on the Indian Railways, normally not deliberated in public.
2. The need for a Corporate Safety Plan has been experienced for quite some time. It was found necessary to prepare a safety blueprint, based on the various factors like technological inputs, work culture, managerial focus and required investments etc. The Railway Safety Review Committee also recommended preparation of a Corporate Safety Plan.
3. The Corporate Safety Plan states the objectives, strategies, and targets for which the IR would be striving in the next decade. The document encompasses the priorities of the safety related works and indicates a broad timeframe to complete them along with assessed approximate requirement of financial investments.
4. While the endeavour is to minimize fatalities in accidents, the plan objectives can be treated as an intermediate stage in our efforts to realize a vision of accident-free and casualty-free IR system. Though achieving a situation of accident-free system is a herculean task, a realistic and analytical approach has been adopted while planning all necessary steps projecting the

required investments in this labour intensive, resource-strapped mammoth organization.

5. The Corporate Safety Plan of the IR (2003-2013) also envisages a safety action plan directed towards continuous reduction in risk level to its customers, implementation of suggested system reforms, imbibing better safety culture, enhancement of asset reliability etc. This covers continuous rehabilitation and modernization of assets, qualitative changes in men and machines, induction of appropriate technologies in support of human efforts etc.
6. To sustain the public pronouncements that safety is not compromised for shortage of funds, it needs to be appreciated that everything has an inbuilt cost in it. Financially, the IR is out of woods, but is still not in a position of ease, comfort, and adequate surplus. Although Budgetary support is increasing still not coming up as per requirement. Market borrowing although has become cheaper, yet it has its inherent limitations. Resource mobilization through non-budgetary initiatives is slow moving. Therefore, productivity and efficiency must attain new peaks of excellence for internal generation of resources.
7. Investment policy and norms are getting re-focussed on this pursuit. Creation of SRSF was the first bold step. To give more and more safety shelter, it appears necessary to reorient our investment policies and sustain the system by not permitting any accumulation of arrears of replacement at any stage. Safety related projects must be clearly defined, planned, funded, and executed. Maximum must be squeezed from the minimum. At the same time, railway assets must not become bottomless pits for constant investments.
8. Challenges of higher safety are interlinked with work culture; the central point being oft discredited human element This is the element, which can turn scarcity into prosperity. Again, this is the component, live and vibrant, which is capable of offering

better and economic options, and still usher in greater safety. But this is the element, which also functions under great stress and strain and deserves to be supported by technologies.

9. All this is to aim at reduction in fatalities in train accidents. However, a major share of fatalities is contributed by road vehicle users in mishaps at level crossings. It is essential that greater discipline is enforced, for which cooperation of society at large is solicited.
10. As announced by Hon'ble Prime Minister on 15th August 2003, Indian Railways will go for Technology Mission on Railway Safety in collaboration with Department of Science and Technology (Ministry of Human Resource Development), IIT/Kanpur and the Consortium of Industries for developing appropriate technology to help achieve higher level of safety in train operation.
11. Funds requirement for safety enhancement works outlined in the Corporate Safety Plan is Rs. 31,835 crores, which includes funds already available under Special Railway Safety Fund (SRSF) and Railway Safety Fund (RSF). Non-budgetary initiatives will have to be stepped up to meet the additional requirement. A special safety scheme may also have to be resorted to in this regard, for which assistance of the Planning Commission and the Ministry of Finance would be sought.

(Nitish Kumar)
Minister for Railways

CORPORATE SAFETY PLAN (2003-2013): AT-A-GLANCE 1

1

Collisions constitute 7% of total accidents but account for **38%** of total fatalities. Collisions will be totally eliminated by extensive use of **the Anti-Collision Device (ACD).**

Derailments constitute **75%** of total accidents but account for only **14%** of total fatalities. Derailments will be reduced by **60%** by following measures:

- Replacement of overaged tracks, bridges, S&T gears and rolling stock under SRSF and current arisings under DRF
- Elimination of four-wheeler tank wagons, which are accident-prone.
- Reduction of thermit welded joints which are weak areas.
- Improved training facilities enhancement of human skills
- Rail/Weld failures cannot be totally eliminated due to inherent weak nature of thermit weld and inherent infirmities in

rail, although measures like "Continuous Track Circuiting" and use of `State-of-the-art SPURT Cars' for rail flaw detection are going to be adopted.

Fire accidents constitute 2% of total accidents and account for 2% of total fatalities. Fire accidents and consequent fatalities will be reduced by 80% by adoption of **fireproof coaches and fire-retardant material in the existing coaches. Fire accidents cannot be totally eliminated as some of them occur because of unidentified elements on which Railways have little control.**

Level Crossing Accidents constitute **16%** of total accidents but account for **46%** of total fatalities. These fatalities comprise of **road users** on which Railways have little control. There has been a rising trend in level crossing accidents in the last decade **(+23%)**, which will, at least, be arrested by following measures.

- Social awareness programmes
- Construction of ROBs/RUBs at level crossings with TVUs > 1 lakh.
- Manning of unmanned level crossings
- Provision of phones & interlocking of level crossing gates
- Use of Train Actuated Warning Device (TAWD) and Anti-Collision Device (ACD)

Bridges - Following measures being adopted:

Under Water Inspection

- Integrity testing of foundations
- Non-destructive testing techniques
- Bridge Management System

- Fatigue life and residual life assessment techniques
- Replacement/ rehabilitation of identified overaged and distressed bridges.

Overall consequential train accidents per million train kilometers will be reduced from **0.44 in 2002-03 to 0.17 in 2012-13**. **Fatalities in case of serious accidents will be appreciably reduced by use of Crash worthy Coaches and tight lock couplers with anti-climbing features.**

Filling up of all **Safety Category posts** on urgency basis. **Safety Related Retirement Scheme (SRRS)** for gangmen and drivers in age group of 50 to 57 years.

Disaster Management measures for ensuring quick relief and rescue operation.

Funds requirement for safety enhancement works, including SRSF, outlined in the Corporate Safety Plan: **Rs. 31,835 crores**.

CORPORATE SAFETY OBJECTIVES

CORPORATE SAFETY PLAN (2003 - 2013): CHAPTER II

2

2.1 The core values of the Indian Railways (IR), which are uniquely in appropriable and sustainable, include safety apart from security, punctuality, and reliability. The constant endeavour of the Indian Railways is to become the leader in the nation's transportation sector by providing modern, reliable, safe, customer-led, and customer-focussed services to the nation.

The demand for introduction of additional passenger services and other facilities on regional considerations is becoming stronger day-by-day.

The demands for new lines in underdeveloped and economically backward areas, though financially not viable, would continue to be made. The main area of concern is safety. With rising awakening of rights, demand for higher safety in travel is bound to increase in near future. Increased rail-road interface at the level crossings, both manned and unmanned, makes them potential accident spots. The continuous increase in the growth of rail traffic on saturated high-density corridors would require lesser

dependence on human beings and greater technological support for the train operating staff for ensuring public safety.

2.2 The Indian Railways have one of the largest skilled, dedicated and qualified pool of professionals in the country. The rail sector is superior to other modes in terms of safety, environmental and noise pollution, energy consumption and land requirement. Public expects very high standards of safety from the Railways.

The Indian Railways, at their own initiative, have been periodically getting the system reviewed and scrutinised for safety performance. During the last four decades, four Safety Review Committees have investigated the deficiencies and suggested reforms for improving safety of the system. Railway Safety Review Committee (RSRC 1998), headed by Justice H.R. Khanna, retired Judge of the Supreme Court, was the last one in the series.

Railway Safety Review Committee (1998), in Part-I of its report recommended, inter-alia, that Railways should formulate a Safety Plan. It says:

"Railways should immediately make out a Comprehensive Corporate Safety Plan which will clearly state:

- Safety policy/objectives & strategies for achieving them.
- Unambiguously enunciate basic tenets & requirements of safety
- Prioritize safety-related works and indicate timeframe, investments proposed, and set benchmarks for safety achievements" (Para 2.26.4)

On Safety Projects, RSRC recommended inter- alia: "Decisions on safety projects should cover the items completely in all aspects like funding, time-schedules, actions, accountability etc. over several years" (Para 2.3.1)

2.3 Major issues

The Corporate Safety Plan, as recommended by the Khanna Committee, is proposed to cover:

- Items to be implemented in order of priority.
- Laying down the timeframe for achieving them
- Defining different managerial responsibilities
- Investments required to complete the safety-related works.

Expectations on the safety front is becoming more demanding and stringent. Risk levels of earlier times are no longer acceptable by the people. Therefore, safety environment on the Indian Railways cannot be viewed in isolation. It must be seen as part of not only the IR system, but an interwoven segment of social ethos. Good management, improved work culture, meticulous planning and prudent financial management are necessary to enhance the safety standards on the system.

The goals to be achieved to enhance safety on Indian Railways are:

- To make railways more reliable and a safer mode for transportation of men and material
- To stimulate the implementation of modern, proactive, and systematic safety measures
- To bring about both qualitative and quantitative improvements in safety performance
- To encourage safety research and development
- To reduce consequential train accidents

2.4 Need for Safety Culture

Safety is an ethos that should pervade all activities of railway operations and maintenance. This ethos must be instilled and nurtured. It is not an attribute that is likely to be evident merely because rules are reiterated, or instructions issued. The

concern for safety must be all pervasive in the functioning of the Indian Railways.

Responsibility for ensuring safety is entirely of different departments and their accountability in this regard cannot be diluted. The safety organisation has essentially to be a co-ordinating service department helping the concerned departments to discharge their safety functions effectively. Changes in policies pertaining to recruitment, training and redeployment taking into account modern developments and ensuring a code of conduct for safety staff will be the thrust areas in the Corporate Plan period. The safety organisation will also be involved in investment planning for safety-related works. A safety action plan based on defined and acceptable levels will be prepared and its implementation will be the joint responsibility of the executive departments concerned and the safety wing.

Although statistically, the Indian Railways performance has been steadily improving and it has remained one of the safest modes of transport; yet a few serious accidents resulting in loss of life have affected the public perception about railway safety. The Khanna Committee made a number of recommendations relating to technological upgradation, institutional changes and investment planning which need to be acted upon.

The Corporate aim of the Indian Railways is to commit itself to ensuring that all its activities are managed to the highest level of safety which is pragmatic and reasonably practicable to achieve. Though the Railway Board retains the ultimate responsibility for ensuring safety, yet it must be discharged through zonal railways and divisions. To see that adequate safety management systems are in place, the Railway Board will have to continue to measure how effectively individual zonal railways are managing the

affairs as far as safety of travelling public and infrastructure is concerned.

2.5 Areas to be covered

Following areas have been identified, being of particular importance, for which targets are to be laid down: -

- Passenger safety
- Road users' safety
- Quantitative reduction in accidents
- Improving asset reliability
- Prompt rescue and relief operations.

Each Zone and Division is required to identify safety risks, particular to its business and will have to prepare a detailed action programme to ensure that the standards of safety are improved. They will have to dovetail their programmes with the Indian Railways safety objectives. Though the Corporate Safety Plan is made for the next 10 years, most of its achievable targets are divided into two phases. Phase-I will cover the period between 2003-2008 and Phase II will span its safety activities up to the year 2012-2013. This has been, basically, done to have a mid-term assessment with changed circumstances, advancement of technology and assimilation of devices.

The Plan, inter alia, involves administrative decisions, policy directives, induction of safety equipment and acquisition of safety materials. It also aims at reduction of passenger casualties, road users' casualties, enhancement of human resource development, revision and modification of rules and efforts to curtail and contain asset failures etc.

2.6 Implementation –The timeframe of many activities cannot be legislated absolutely as it would depend on the quantum of work involved for implementing it

over the entire Indian Railways and availability of funds. The project-wise requirement of funds may undergo changes on periodic reviews. Actual fund allocation for each safety project would also depend on the inter-se priority of the project and the total fund availability in a particular year.

The actual implementation of all safety projects would generally be done route-wise with 'A' and 'B' routes to be taken up first and 'E' and 'E. Spl.' routes lastly; except in case of level crossings, where the works would be taken up on basis of volumes of traffic on the rail-road intersections.

The investment priorities will have to be decided on the following considerations: -

- Rehabilitation, renewal, and replacement of assets
- Safety works and their prioritization
- Modernisation and technological upgradation
- Capacity generation

Most of the arrears of renewals are proposed to be liquidated in a phased manner over a period of 5 years through Special Railway Safety Fund. All fresh arisings of renewals are proposed to be liquidated through the Depreciation Reserve Fund by making adequate provisions. The decision on any safety project will cover the items completely in all respect, like funding, time schedules, and accountability, etc. over the entire duration of the project.

The main principles for operational safety will revolve round efforts to identify and develop appropriate methods and implement the same for reducing the risks associated with human interface in operations. Similarly, the IR would strive to reduce the risks associated with rail-wheel interaction.

2.7 Concerns

Finally, absolute rail safety is a concept that cannot be traded off with any consideration. Risk is an element of everyday life of every transportation mode. To eliminate accidents altogether would mean enormous investments and possibly unacceptable countermeasures. However, the primary aim of achieving higher standards of safety is to achieve zero-tolerance to all risks. Although the collated safety data indicate the improving safety standards on Indian railways, continuous efforts are to be made to improve it further with optimum utilization of technology, funds, and allied resources. **The Corporate Safety Plan (2003-2013) is prepared with this broad objective**.

The Safety Plan, as the long-term safety blueprint, prepared on the 10-year strategy, is generally based on **the Railway Safety Review Committee's recommendations and the major items brought out in the White Paper on Railway safety**. The plan envisages key areas like reduction of collisions, derailments, level crossing mishaps, fire in trains, signal passing at danger, trespass, and vandalism etc with the objective of achieving reasonably higher standards of safety on Indian railways.

2.8 Safety: Plan Objectives

The Safety Plan will have the following broad objectives:

- To achieve reduction in rate of accidents per million train kilometers from the present level of 0.44 to 0.17 by the year 2013.
- Implement measures to reduce chances of passenger fatality substantially in consequential train accidents by 2013.

- Focus on development of manpower through major improvements in working environment and training to reduce the accidents attributable to human failure by 40% by 2013.
- Achieve safety culture on all fronts including maintenance depots, worksites, stations, controls etc.
- Progressively achieve an environment of "Fail-proof" from the present "Fail-safe" system of asset failures by upgrading the systems by 2013.
- Prioritization of safety related projects.
- Implementation of accepted recommendations of RSRC at an accelerated pace.

The following requirements would need to be met to achieve these objectives:

- Safety should take **priority over other considerations**
- Responsibilities should be clearly assigned.
- Every railway zone should introduce **clear safety management plan**.
- Qualitative changes should be brought about in the human resource development.

SAFETY POLICY ISSUES

CORPORATE SAFETY PLAN (2003 - 2013): CHAPTER III

3

3.1 There are many areas requiring administrative decisions and directives for long-term policies. They primarily relate to accountability, supervision, maintenance of assets, quality of material related to safety components, train operations and industrial relations etc. Some of them are enumerated below:

3.2 Managerial Accountability and Human Resource Development

- Responsibility at higher supervisory and managerial level for repeated failures or unsafe working
- Accountability for prolonged abnormal working
- Service review of critical categories at the age of 55 years or on completion of 30 years of service whichever is earlier, by a positive act of approval
- Objective assessment of driving crews and performance-based categorization

- Fighting alcoholism in certain categories at workplaces
- Equipping safety organisation with a pride of place in the hierarchy

3.3 Management of Assets

Track

- Adoption of `zero missing fittings' concept applicable to all track gangs
- Introduction of concept of zero avoidable track defects
- Safety tolerances for track
- Formulation of comprehensive policy for mechanised maintenance of track
- Policy of lubrication on curves, points and crossings, weak track, work sites and at poor formations
- Adoption of long-term policy for rail grindings
- Procurement of longer rails (more than 13 metres) from steel plants
- Planning of portable flash butt welding plant/machinery
- Anti-sabotage measures for protection of track

Rolling Stock

- Zero defects and `zero missing safety fittings at the time of turning out locos from base sheds and sample check and certification by officers
- Adherence to `zero missing safety fittings at the time of turning out of coaches and wagons from workshops and sick lines

- 100% brake power on air brake trains at originating points and 90% at any intermediate points for close circuit rakes
- Review of pattern of examination
- Extending the concept of close circuit rakes to more and more wagon fleet
- Increased stress on quality of out- turn from workshops
- Phasing out of four-wheeler tank wagons

Signalling & Telecommunications

- Laying down maintenance schedules and their adherence for all types of signalling gears and equipments
- Timely overhaul of all signalling installations
- Safety tolerance of all Signal and Telecom gears and equipments for Mean Time Between Failures (MTBF) and Mean Time to Repair (MTTR)
- Long-term policy on provision of Train Protection & Warning System and Anti-Collision Device
- Comprehensive maintenance policy for signal and telecom equipments to achieve zero failure of track circuit and axle counter equipment
- Policy of continuous track circuiting on identified routes
- Mobile train radio communication
- Solid State interlocking
- Train actuated warning device (TAWD)

Level Crossings

Re-classification of all existing level crossings, both manned and unmanned, based on density of trains & road vehicles for the purpose of their manning, upgradation, and review of sanctioned works.

Material Procurement

Identification of safety components related to: -

- Rail wheel interface
- Locomotives, coaches, and wagons etc.
- Improvement of speed of trains or visibility of signals i.e. loco headlights, loco flashers, wipers, speed recorders, data recorders, vacuum and
- air pressure equipment, Alarm Chain Pulling (ACP) equipment in coaches, etc.
- Fire prevention/protection items in locos, coaches, and petroleum (POL) rakes
- Signal equipment related to train operations viz. tail lamps, hand signal lamps, flashers, safety board indicators and signal indicators etc
- Policy of procurement of safety related stores items
- Adoption of life cycle costing principles
- Review of specifications and inspection of material

General

- Fixation of codal life of new assets, with the upgradation of infrastructure and induction of new technology
- Review of codal life with rehabilitation of assets
- Revision of maintenance schedules of new assets with improved technology
- Premature condemnation/ replacement of assets
- Issues related to inter-departmental co-ordination
- Post-project techno-economic audit of safety-related projects

3.4 Train Operations

- Assessment of line capacity, its constraints vis-à-vis new services

- Review of maintenance infrastructure for safe and efficient operations
- Guidelines on locomotives, coaches, wagons, overdue for maintenance schedules
- Phasing out of 4-wheeler tank wagons or limiting their operation
- Formulation and issuance of comprehensive policy for dealing with fire incidents in loaded POL rakes
- Maintenance and operating disciplines for close circuit rakes<
- Issues related to loading beyond the identified carrying capacity
- Assessing physical and mental stress on driving crews and train passing staff.

THE ROLE OF TECHNOLOGY

CORPORATE SAFETY PLAN (2003 - 2013): CHAPTER IV

4

4.1 The goals of new technologies are to improve safety through reduced human dependence, intervention and improved asset reliability and at the same time reduce costs as the most costly technology may not be necessarily the safest. In this direction, rail-wheel interaction must be the thrust area with a view to reduce wears and tear of both rail and rolling stock. Greater association of industries, technologies, R&D institutions, and Department of Science & Technology (Ministry of HRD) will have to be ensured in the development of new technology. The increased periodicity or reduced frequency of maintenance will be another priority area. Appropriate technologies will be adopted in phases during the Plan period.

4.2 Track & Bridges

- Rail flaw detection
- Rail grinding

- Track management system.
- Optimisation of schedule of dimensions
- Improved thermit welding
- Formation/Rehabilitation
- Improved fastening
- Improved high-speed turnouts.
- Bridge management system
- Under-water inspections of bridges
- Mapping of unknown foundations and integrity testing of foundations
- Non-destructive testing techniques like Ultra Sonics, Acoustic Emission, Strain Gauging and Radar etc.
- ki Fatigue life and residual life assessment techniques

4.3 Rolling Stock

- Achievement of zero defect in between two scheduled maintenances of rolling stock
- Disc brakes with microprocessor-controlled wheel slide/slip prevention mechanism.
- Aerodynamic designs
- Radial and self-steering bogies
- Wheels and axles of improved metallurgy
- On-board diagnostics
- Intelligent brake system in locomotives and other rolling stock
- Censors for detecting dragging equipment, Hot-boxes, Hot wheels.
- Crash worthiness in coaches.
- Tight lock CBC couplers with anti-climbing features
- New environmentally friendly paint system

- Bogie mounted brake system.
- Rail-wheel interaction status, including development of track friendly bogies, Wheel flat detection system, on-line monitoring of rail and wheel profiles.
- Derailment detection devices
- Driver friendly cabs in locos
- Guard friendly brake van.
- Disaster Management
- Fire-proof coaches.
- Modification in toilet discharge system in coaches to prevent rail corrosion.
- Computer controlled master-slave multiple loco operation for heavier/longer trains (locotrols)
- Solid state interlocking
- Last Vehicle Check and end of train telemetry devices
- Train Protection and Warning System
- Anti-Collision Device
- Train Actuated Warning Device
- Mobile Train Radio Communication System

4.5 General

- Driver vigilance control device
- Predictive maintenance techniques
- Ergonomic and eco-friendly practices
- Remote monitoring and data recording analysis for maintenance/replacement decisions

(The list is not exhaustive as new areas for improving productivity with further technological developments will become available in future.)

4.6 Information Technology (IT)

One of the goals would be to reduce drudgery and to utilise manpower for more innovative and productive purposes. The Indian Railways would like to have much more asset reliability and higher safety through continuous monitoring of state of health of the assets and feedback. For all these, the IR will have to work on IT-based projects to solve problems and inculcate an IT culture.

Few applications of IT, related to safety, would be in following areas: -

- Track and bridge management.
- Emergency response including accident and disaster management.
- Wireless connectivity
- Train protection and Warning System
- Mapping of rail network and tracking of trains using Global Positioning System (GPS
- Computer aided remote controlled signalling and train describer system with display panels.

4.7 Research and Development (R&D)

The aim is to achieve a high-quality R&D staff in addition to absorption and assimilation of new technology. The functions of Research, Design and Standards Organisation (RDSO) may undergo a major shift. Railways expenditure on R&D, as a proportion to gross earnings, has been about 0.2% o-nly, which may be suitably stepped up as recommended in many studies.

It is proposed to build a scientific cadre in RDSO to provide a continuity in R&D efforts and consequently achieve high quality of research and development.

At present, RDSO is seized of wheel impact load detector, crashworthy coach design, prevention of rock falls in cuttings, datalogger for Ultra Sonic Flaw Detection (USFD) machines, development of track side bogie monitoring system, development of test-track facility, development of measuring wheel technology etc. Technology mission on railway safety is being launched in association with IIT/Kanpur and Department of Science and Technology (Ministry of HRD) to tackle some burning issues like wheel flat detection, problem of visibility during foggy weather etc.

Following items will also be pursued during the Plan period:

- Laying of long-welded rails over bridges
- Vibration signature analysis and development of rail vehicle-based testing car
- Continuous foundation scour monitoring using Time Domain Reflectometry
- Wheel flat detection
- Visibility problems during foggy weather

STRATEGIES FOR TARGETS FOR REDUCTION IN ACCIDENTS

CORPORATE SAFETY PLAN (2003 - 2013): CHAPTER V

5

5.1 Barring a few years, the Indian Railways (IR) have been making continuous improvement in safety performance as far as number of consequential train accidents is concerned. The frequency of accidents per million train kilometers, an index adopted by most of the railway systems, has been falling gradually. The year 2002-2003 has witnessed the lowest number of accidents per million train kilometers.

5.2 Ideally, the Indian Railways should provide accident-free and casualty-free service and achieve zero level of risk for its passengers. Though it may not be possible to achieve the aspired level of safety in the near future, the IR are fully committed to ensure that all its activities are managed to the highest level of safety which is reasonably possible to achieve.

5.3 The trend, composition and fatalities of different types of accidents during the 10-year period (1992-93 to 2001-02) are indicated below:

Type of consequential train accidents	Average number of accidents per year	Percentage share (%) of type of accidents	Fatalities per year in each category of accidents	Percentage share (%) of deaths in each type of accidents	Percentage (%) increase/decrease in average number of accidents w.r.t. previous decade (82-83 to 91-92)
(1)	(2)	(3)	(4)	(5)	(6)
Collisions	32	7	148	38	(-) 18
Derailments	333	75	52	14	(-) 38
Level crossing accidents	72	16	176 (all road users)	46	(+) 23
Fire accidents	8	2	8	2	(-) 40
Misc.	1	-	-	-	
Total	446	100	384	100	
					(-) decrease (+) increase

From the above it is apparent that 46% of total fatalities are of road users and the balance 54% are predominantly of passengers. Collisions contribute substantially to passenger fatalities. Derailments, though in much larger numbers, cause much less fatalities.

5.4 Collision-free System:

With the completion of track circuiting works, provision of block proving axle counters, data loggers and a comprehensive safety coverage proposed to be given by ACD over the next few years, it will become a 'mission area' for Indian Railways to eliminate collisions and consequent deaths. In this direction, all works related to prevention of collisions are proposed to be completed in the Plan period. This is likely to take the IR to realize the dream of a collision-free system.

5.5 Level Crossings: Efforts to contain accidents.

Despite gradual manning of level crossings, construction of Road overbridges / Road under bridges (ROBs/RUBs) and intensive public awareness campaigns, it has not been possible for the Indian Railways to tackle the problem of reduction of level crossing accidents. As they are predominantly due to lapses on the part of road users, and in view of stupendous increase in road traffic, there does not appear to be any let up in the mishaps. As the IR do not have much direct physical control or intervention, it will be the aim of the Indian Railways, at least, to contain and control the accidents at rail-road intersections at the existing level. A coordinated approach, involving State Governments, various influence groups and intensive social awareness programmes will be principal measures to attain the objective.

5.6 Fire Accidents

Though the average number of fire accidents as well as the annual average fatalities are 8 per year for both, a stray major fire in train accident may lead to disaster. In general, nearly 40 % of fire accidents are caused by unidentified elements, of which the Railways have little control. With the rising social awareness, stringent scrutiny on trains, induction of fire-proof coaches & more and more technological inputs, it is assessed that the fire accidents and consequent fatalities would be reduced by 80% as compared to their present level.

5.7 Derailments.

The derailments, being the largest component of total consequential train accidents, are required to be tackled with greater urgency. Around 75% of derailments occur due to

`railway staff failure, and another 10 % of derailments are caused by `equipment failures.

Around 15% are caused by the failure of `other than railway staff', sabotage and incidental reasons.

With the focused attention on human resource, technological upgradation and modern maintenance practices, the present level of human failures causing derailments is bound to improve substantially. With phasing out of derailment-prone and less reliable 4-wheeler tank wagons from the fleet, investments being made through SRSF/DRF into rehabilitation of track and rolling stock etc., and anticipated improvement in the skills and quality of manpower through enhancement of HRD, it is feasible to attain a substantial reduction in derailments.

However, it is noted that few derailments, which occur on account of rail/weld failure (average 25 derailments per year), may not reduce substantially due to inherent infirmities in the existing rails. Taking the non-controllable factors viz. outside interference and incidental factors like landslides etc., as constant, the overall reduction in derailments is assessed to be around 60% by 2013 as against 38% reduction achieved in the previous decade (1992-93 to 2001-02).

The IR has planned for crashworthy coaches (discussed later in this chapter) and tight-lock coupler with anti-climbing features, which will go a long way to contain the number of casualties in case of serious accidents.

5.8 Overall Consequential Train Accidents

Based on the above-mentioned facts, the present level of accidents is targeted to be reduced significantly by the end of the plan period (2012-13) as detailed below. For this purpose, the present level of accidents has been taken as an annual average for three years i.e. 2000-01, 2001-02, & 2002-03.

Type of consequential train accidents	Present Level of accidents (Yearly average)	Estimated accidents in 2012-13	Remarks
Collisions	22	Zero	
Derailments	282	113	60% reduction
Level crossing accidents	90	90	No Change
Fire accidents	14	3	80% reduction
Misc	5	-	-
Total	413	206	-

The total million train kilometers are expected to touch a figure of 1192 in the year 2012-2013. It is, thus, estimated that index of accidents per million train kilometers would be reduced from 0.44 (in 2002-03) to 0.17 in 2012-13.

Zonal Railways and Divisions will set their targets in a similar manner for consequential train accidents, `other train accidents', yard accidents, and indicative accidents.

5.9 Track Circuiting

A major thrust was given to track circuiting at stations in the mid-nineties, to serve as a technical aid to station staff to prevent collisions. It is proposed to cover all the main BG routes, having passenger traffic, in the next five years.

In the last five years, o-n an average of 900 to 1000 locations per year have been provided with track circuits. Track circuiting works on A, B, C, D, D.Spl, E & E.Spl routes are being done in a phased manner. It has been one of the most important safety aids provided at the stations, which has reduced collisions in station areas. Works of track circuiting have been sanctioned under SRSF. Whereas works on over 2250 Stations of A, B, C

have already been sanctioned, projects o-n other routes, of BG and MG are proposed to be taken up.

5.10 Block Proving by Axle Counters

Block proof by axle counters is to be provided on 'A', 'B' and `C' routes. All new works of panels will be provided with this device, to prevent collisions in the block sections due to some `parted' load being left out.

5.11 Auxiliary Warning System (AWS)/Train Protection Warning System (TPWS)

To eliminate human error in passing signals at danger, this system may be tried on certain stretches. The Auxiliary Warning System (AWS) has been working satisfactorily over a decade in Mumbai suburban sections of Central and Western Railways.

5.12 Anti-Collision Device (ACD)

Anti-collision device is a recently developed device by Konkan Railway Corporation to prevent collision like situation e.g., head-on collision, side and rear-end collision. This device may also help in detecting train partings and provide audible and visual warnings at level crossing gates when trains approach them. At present provision of ACD is sanctioned on about 3500 route kilometers on Southern, South Central, South-Western, Northeast Frontier and Northern Railways. ACD survey for 10000 route kilometers is also sanctioned. ACD will be further extended on entire BG section during the plan period on priority.

5.13 Light Emitting Diode (LED) based Loco Flasher Lights are proposed to be provided in rear of Guards brake van (SLRs) on passenger carrying trains. They will be identical to loco flashers and will be in addition to the guard's tail

lamp. They would be switched on during any out-of-course stoppage in the block section.

5.14 LED-based Flashing Tail Lamps are being provided to guards. Similarly, LED-based Hand Signal Lamps would be provided to all stationary staff connected with train operations.

5.15 Signal circuitry of four aspect Multiple Aspect Colour Light Signalling (MACLS) will be modified to provide for interlocking of starter and advanced starter. `Negative' slides with ASM will be dispensed with, wherever existing.

5.16 Continuous Track Circuiting

Continuous track circuiting not o-nly helps in improving the capacity with automatic block signalling where more than one train can be sent in a block section but also improves safety. First, all the level crossing gates o-n the section gets protected by signals. Secondly, if double rail track circuit (audio frequency track circuit) is adopted, it may also detect electrical discontinuity in rails due to rail/weld failures or acts of sabotage etc. Since the Golden Quadrilaterals along with its diagonals o-n the IR carry the maximum traffic, it is proposed to provide continuous track circuiting on priority on these sections. Works o-n about 2000 route kilometers have already been sanctioned at a cost of Rs.425 crores.

5.17 Mobile Train Radio Communication

Mobile Train Radio Communication (MTRC) system has an intrinsic potential in enhancing the safety and security in train operations, besides being a valuable aid in providing reliable and secure communication to all those engaged

in different facets of railway operations and maintenance functions.

Five works covering nearly 2400 Route Kms. at a cost of Rs.185 crores are sanctioned o-n trial basis.

5.18 Track Renewals

While in service, track is subjected to fatigue and wear and tear. For continued ability of track to withstand the expected traffic, it is required to be renewed periodically, as, and when it becomes due for renewal. However, in general, the funds provided for track renewals have been less than those required/projected. Thus, annual arisings of track renewal could not be taken care of as they arose. A large kilometerage of track therefore got accumulated as overdue for renewal. With the creation of non-lapsable Special Railway Safety Fund (SRSF) amounting to Rs. 17,000 crores, it is expected that the arrears of track renewal, which stood at 16,538 km as on 01.04.2001, will get cleared by 31.03.2007. Year-wise work done and planned is as follows:

Year	Physical work (track km)	Cost Rs. Cr. (Net)	Remarks
2001-02	2490	1119	Actual
2002-03	3343	1657	Actual
2003-04	2700	1407	Targeted
2004-05	2676	1400	-
2005-06	2676	1200	-
2006-07	2676	887	-

The annual arising of track renewal is of the order of approximately 2350 track kms for main lines. In addition, certain special works like replacement of bridge timber sleepers, renewal of turnouts, systematic renewal of fittings, welds and ballast are also required at certain time intervals. The yard lines also need

input. This work will be taken care of with funding from the Depreciation Reserve Fund (DRF) or Revenue.

5.19 Rail/Weld fractures

Rail/Weld fractures due to generation of internal defects or due to corrosion etc., have direct impact o-n the safety. They are potential safety hazards and action must be continuously taken to control them by following means:

- **Improvement of quality of rails-** The Hydrogen content in the rail steel plays a very detrimental role in generation of internal rail defects. The IR purchase rails from Steel Authority of India Ltd. (SAIL/Bhilai). With close interaction and constant persuasion with SAIL/Bhilai, maximum permissible Hydrogen content has now been reduced to 2 ppm which earlier used to be permitted up to 5.5 ppm. It is further proposed to be reduced to 1.5 ppm in next two years i.e. by 2005.

  The IR along with SAIL, have taken a decision to produce 65 to 78 m long rails which will be welded in Bhilai Steel Plant to make a rail panel of length 240 to 260 m. These long rail panels will be directly transported to the site thereby reducing the number of welds. This would also reduce the multiple handling of rails thereby improving the quality. The project is planned to be implemented during the Plan period.

  For transportation of these larger rails, ten mechanized rakes are being procured under Rolling Stock Programme and are likely to be commissioned by 2005-06.
- **USFD Testing of rails -** Considering that a large number of rail/weld fractures result in derailments

and some flaws go undetected in USFD testing, new equipments would be procured having a computerized recording device. This would enable exhaustive analysis of defects and to identify those which are growing in size.

The Railways have recently introduced a need-based concept of USFD testing of rails, under which the rails already laid in track will be tested after the passage of 8 gross million tonne (GMT) of traffic. The annual requirement for ultrasonic testing comes to about 1,55,000 km. As the testing at present is being done manually, which is a slow, strenuous, and time-consuming process and largely depends upon human judgement, it is planned to get the testing done through SPURT cars, where identified locations can subsequently be confirmed by manual testing. The testing of these cars would be faster as well as more reliable as it would cover a larger cross-sectional area of rail. Two SPURT cars of the improved version are to be procured by 2004 and three more by 2008.

- **Improved Thermit Welding -** Thermit welding, carried out in an open line, generally suffers from poor quality. Some countries have already obtained better welding technology for stronger tracks. It is proposed to procure the latest technology of thermit welding and the most modern equipment for testing each weld. Efforts are being made to acquire the latest technology of AT welding of rails, being followed o-n developed railway systems. A work costing Rs 30 crores from SRSF has already been sanctioned which is to be completed by 2005.

- **Reduction in thermit welds by mobile flash butt welding-** Alumino-Thermit (AT) welds are the weak links in track, whose population is to be gradually reduced and replaced by Flash Butt (FB) welds executed with the help of mobile flash butt weld plants. As a first step mobile flash butt welding will be introduced in construction projects w.e.f. year 2004 and gradually extended to other areas in next five years.

5.20 Way-Side Detection of overloaded rolling stock by in-motion weigh bridges

Such systems are in use o-n advanced railway systems. They help identify the defective wagons causing over stressing of rail. The in-motion weighbridge will help detect overloading. This will help reduce fatigue of rail/welds and, therefore, reduce chances of fracture. A number of rail/weld failures are caused by overloaded wagons. It has been planned to install weigh bridges at various locations, and brake gear would be improved to prevent generation of wheel flats. The focus will be o-n installing in-motion weigh bridges selectively o-n identified routes and ensure the functioning of these weigh bridges. Procurement and installation of 39 pitless, electronic-in-motion weigh bridges of 120 tonnes capacity is underway. All new weigh bridges will be installed at originating points o-nly.

5.21 Lubrication of Gauge Face and Friction Modifier on top of Rail

Lubrication assists in reduction of wear and prevents derailments. It has therefore been decided that Track Mounted Lubricators should be tried. A work costing Rs 1.55 crores has been sanctioned and after successful trial, it will be adopted as a

regular measure. A trial for Rail Top Friction Modifiers shall also be conducted to assess their suitability.

5.22 In-situ Rail Stress Measurement

The safety of Long Welded Rails (LWR) track is vitally affected by locked up thermal stresses, which play an important role in the phenomenon of buckling or fractures and thus have important bearing on safety. At present, the IR does not have any equipment to objectively assess these stresses and therefore de-stressing operations are carried out based upon the observation of movements at Switch Expansion Joint (SEJ).

Some countries have developed devices to measure stress, in long-welded rails ‘in-situ’ which makes it possible to monitor and take timely action to avoid rail fractures. It has been decided to obtain expertise to measure rail stress `in-situ', in the interest of enhanced safety. This will help in introducing the concept of "Need Based Destressing" of Long Welded Rails (LWR).

5.23 Track Safety Tolerances

As recommended by the Khanna Committee, efforts will be made by Research Design & Standards Organization (RDSO) to draw out safety tolerances for different speeds and categories of track, o-n the basis of practices followed in various countries and after studying the whole gamut of rail-wheel interaction.

5.24 Trespass on Track and sabotage.

To contain outside interference with track fittings, it is proposed to continue with following preventive efforts:

- Development of anti-theft PRC sleepers, fitting and fastening for Short Welded Rail (SWR) stretches in

vulnerable areas. These, however, cannot be used in LWR stretches due to technical reasons.

- Burring of two fish bolts o-n vulnerable locations
- Elimination of fish-plated joints by welding of rails
- Deputing watchmen o-n important bridges, deep cuttings, tunnels, and their approaches, in the sections identified as sabotage prone.
- Undertaking surprise mobile patrolling in night, by joint team of Railway Protection Force (RPF) and Gangman, in such sections

However, State Governments shall have to ensure safety of track and bridges in accordance with the statutory provision of responsibility.

5.25 Modern Bridge Inspection and Management System

Modernization of inspection and assessment systems shall be undertaken. A modern Bridge Management System shall be implemented with following focused areas:

- Underwater Inspections of bridges
- Mapping of unknown foundations and integrity testing of foundations.
- Non-destructive testing techniques like Ultra Sonics, Acoustic Emission, Strain Gauging and Radar, etc.
- Fatigue life and residual life assessment techniques
- Bridge Management system

Projects from (a) to (d) have been approved. After their completion, the technologies shall be adopted over the entire system in a period of 3 to 4 years thereafter.

Mobile Bridge Testing laboratories with some Non-Destructive Testing (NDT) equipments have been approved for 16 zonal railways. In the next five years, these laboratories shall be implemented on the zonal railways along with balance complement of essential NDT equipment like Impact Echo testers, etc. The total cost of this project shall be approx. Rs. 30 crores.

Mobile Bridge Inspection units shall be provided at least o-ne per zonal railway in next 5 years. Two such units have been sanctioned with bucket, platform, and pier inspection units. These will facilitate access to difficult locations like the top of trusses and underside of girders and make them easy for proper inspections.

After absorption of the technology of Modern Bridge Inspection and Management Systems and provision of the necessary training, equipment, and infrastructure over next five years over the entire system, Bridge rebuilding shall be taken up after testing and detailed evaluations of strength and residual life.

Bridge engineers and supervisors working on the bridges for inspection and repairs shall be provided with safety gears like jackets with retro reflective strips, helmets, safety harnesses as required and hard boots etc. in the next two years.

5.26 Provision of microprocessor-based speed recorders

The majority of the speed recorders in use o-n the locos o-n the Indian Railways are of electro-mechanical type resulting in reliability problems. It has been decided to switchover to microprocessor-based paperless speed recorders.

5.27 Flasher lights on locomotives

Automatic flasher units have been provided o-n all locomotives to enable automatic switching `on' of the flasher lights in case of train parting/alarm chain pulling. This would give immediate indication to the driver of the train coming from the opposite direction in case of derailment etc.

5.28 High intensity Twin - beam Head light for locomotives

Twin beam headlights have the advantage of better illumination and superior reliability as compared to the conventional headlights. These are being provided on all new locomotives.

5.29 Provision of Air Dryers on locomotives

Provision of air dryers o-n locos serves to avoid malfunctioning of the sensitive air brake equipment on Rolling Stock such as distributor valves by removing the moisture in the compressed air supplied by the locomotives. All new as well as rebuilt diesel locos are being provided with air dryers.

5.30 Microprocessor-based Electronic Brake System with resetting VCD, Event Recorder

4000 HP GM and three-phase electric locomotives have this feature to monitor the alertness of the driver through all his normal actions. If driver performs no action for 20 seconds at a stretch, he gets an audio-visual indication and if still he does not react, the brakes come o-n automatically within 10 seconds. o-n all indigenous electric and conventional ALCO locomotives, it is planned to retrofit microprocessor control with VCD and Event Recorder.

5.31 Better and Safer Coaches

Design of lightweight, stainless steel passenger coaches has been procured through a Transfer of Technology (TOT) contract from M/s 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. Rail Coach Factory (RCF) has already turned out the first rake.

5.32 Use of high-capacity buffer packs

All new coaches are being manufactured with 10 kj (kilo joules) capacity buffers packs in place of earlier design with 5 kj capacity to absorb more shocks. All new buffers are being procured to the enhanced design.

5.33 Bogie-Mounted Brake System in place of under-floor mounted

Bogie-mounted brake system has superior reliability with fewer brake rigging components. All new coaches are being fitted with this design of air brake system and about 1000 coaches are being retrofitted per annum during POH (Periodic Overhaul).

5.34 Use of disc brakes; 30% reduction in emergency braking distance

Disc brake system with microprocessor-controlled wheel slip control system provides faster braking and increases high-speed capability of the coaches. All new coaches are being manufactured with this brake system. With sufficient experience, the work of retrofitment of coaches with disc brakes will be considered.

5.35 Use of Composition Brake Blocks

All broad-gauge coaches, except high-speed coaches, have been switched over to composition brake blocks. Suitable alternatives are also being developed to replace the Cast Iron brake blocks used on high-speed trains. The composite brake blocks have superior braking behaviour with a more uniform friction coefficient.

5.36 Improved crash worthiness of interior of coaches- 51 modifications to the coach interior have been adopted to minimize the chances of injury to passengers from sharp edges, corners, or protrusions within the coach. Most of these modifications have already been adopted for new coaches. Workshops will also adopt these modifications during the periodic overhaul of coaches.

5.37 Improving the external crash worthiness of coaches.

M/s RITES (Rail India Technical & Economic Services Ltd.) have been awarded a contract to carry out the study and develop crash worthy design for passenger coaches through an international expert of repute. RITES will also help in developing in-house expertise at RDSO (Research, Designs and Standards Organization) as a part of the project. Redesigned coaches will have bodies, which will absorb most of the impact in case of an accident in non-passenger carrying areas, thereby saving precious human life even in the worst disasters.

5.38 Introduction of tight lock couplers and anti-climbing features

Tight lock center buffer type couplers have been adopted for the new technology based on LHB (Linke Hofmann Busch) type of

coaches. Development of center buffer coupler type design for the existing ICF (Integral Coach Factory) coaches has also been completed and testing of the shell of the prototype coach has already been completed. These couplers do not permit the coaches to separate in case of accidents and prevent o-ne coach from climbing o-n another by holding them firmly in vertical plane. This anti-climbing property of the couplers minimizes the chances of a pile up in case of accidents and enhances safety of passengers.

The existing couplers permit disengagement of coupling and consequently climbing of o-ne coach over other, in case of an accident. The adoption of the Tight lock couplers has, therefore, assumed extreme urgency. In view of the safety of passengers ensured by these couplers vis-à-vis the present screw coupling, both the coach manufacturing units have been directed to develop designs of the coaches to allow fitment of the tight lock couplers. This will require major design changes and both ICF and RCF are gearing up to ensure fitment.

5.39 Phasing out of derailment prone and less reliable four-wheeler tank wagons would be done.

5.40 Hot box detectors o-n existing wagon fleet are proposed to be provided.

5.41 Arrears of overaged freight stock (as o-n 31.3.2003) is proposed to be liquidated by 2006. Renewal of fresh overage arisings will be planned o-n year-to-year basis during the 2003-2013 period.

5.42 Use of fire-retardant materials

The Indian Railways have adopted fire retardant interior furnishing including, wall paneling, flooring, roof

paneling etc. to minimize the risk of fire accidents. Fire retardant curtains and upholstery have been adopted all over the system. The prototype of a `nearly fireproof coach' is expected to be manufactured soon by RCF.

5.43 Provision of emergency exit

AC and non-AC coaches are being provided with emergency escape windows. Provision of emergency escape windows in all new coaches and all coaches coming out from POH will be ensured.

5.44 Rear-view mirror outside loco cab, multi-resetting vigilance control device, audio-visual alarm system in SLRs, will be tried out to contain fire accidents.

5.45 Action Plan for Road Users' Safety

5.45.1 To curb accidents at Manned Level Crossing gates, IR will adopt following multi-pronged strategy: -

The 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 applicants 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 marker in lieu of gate leaves shall be provided o-n 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 enhance safety considerably. Extended field trials of Train Actuated Warning Devices are under way. These are likely to enhance safety at manned and unmanned LC gates significantly. o-n its success, it is proposed to extend it further o-n other level crossings.

Of 16500 manned level crossings, 6600 are already interlocked and provided with signals. It is envisaged that another 2000 gates would get interlocked in the next 10 years.

Inclusion of do's and don’ts near level crossings in primary school curriculum.

Reclassification of level crossing gates into `Special Class', `A' class, `B' class and `C' class as per revised criteria based o-n TVU (Train Vehicle Units) and density of road vehicles.

Telephones to facilitate communication between gatemen and station staff and illumination at the level crossing gates.

Distance of lifting barriers may be increased to 5 meters from the center of track instead of 3 meters, wherever feasible.

5.45.2 To reduce accidents at unmanned level crossings, it is considered necessary to adopt following measures: -

All unmanned level crossings shall be provided with modified design of Stop Boards in retro-reflective sheets.

- Basic infrastructure o-n all unmanned level crossings will be ensured and it includes provision of adequate width, normal gradient, level surface for 5 m from center 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 the 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.
  Intensive social awareness campaigns to counter misadventure in front of approaching trains.

5.45.3 It has been decided to provide Road Over/Under Bridges in replacement of all level crossings o-n cost sharing basis where the TVUs (number of trains x number of road vehicles in 24 hours) exceed o-ne lakh. There are 417 level crossings where the TVUs are more than o-ne lakh and have already been sanctioned as o-n 1.4.2003, for replacement with ROBs/RUBs. There are still 1252 level crossings with TVUs of more than o-ne lakh as o-n 1.4.2003 where the ROBs/RUBs are yet to be sanctioned. These will be sanctioned progressively depending upon the response of the State Governments for sharing of the cost and their sponsoring them for the same.

5.46 Employees' Operational Safety

Casualties among employees due to mishaps in the workplace are another area of concern. It is proposed to achieve a substantial reduction in such mishaps by adopting various safety measures. It is the responsibility of an employee not to willfully indulge in unsafe working. Staff must be taught and constantly encouraged to work safely. It should be ensured that all protective systems are working and are in place before staff undertakes any work.

Necessary protective systems will be adopted to prevent recurrence. Training in personal safety will also be given to new entrants during their initial training course and refresher course.

Special training on personal safety will be given to staff deployed to ARTs and operating other breakdown equipment.

Worksites would be supervised at pre-defined appropriate levels. Personal protective equipment would be provided in sufficient quantity, and they would include luminous jackets, protective gloves, crash helmets, safety belts, boots, safety jackets etc. depending upon the job requirement of the staff.

5.47 Accountability for System Failure

The direct responsibility of the persons responsible for an accident is determined by an accident inquiry committee, which also assesses failures at various levels of management. The pros and cons of pinpointing accountability have been deliberated by the Railway Safety Review Committee (RSRC) also. Accidents are the end-result of a series of failures. It recommends that the IR should introduce a system of accountability o-n critical issues relating to discipline, training, system failures, availability of critical safety related stores, etc.

In view of the above it has been decided that GMs/DRMs would be responsible for the continued neglect and grave/widespread failure of safety system and would endeavour to obviate the same by paying close attention to the following specific areas:

- Periodical safety meetings to initiate action o-n emerging areas of concern.
- Monitoring of vital safety inputs in areas like progress of critical safety works, availability of critical safety items, training, availability of infrastructure maintenance requirements, e.g., blocks, movement of material, etc.
- Review of equipment failures and periodical analysis to improve reliability of assets.

- Periodical inspections including surprise/night inspections and their monitoring to ensure that these are effective and meaningful, aimed at removing inadequacy in workmanship and training etc.
- Instill the importance of discipline at all levels and to take deterrent action against any act of indiscipline.

While assessing the accountability at managerial level, following aspects, would also be considered:

- The officers have had sufficiently long and reasonable tenure to assess the prevailing situation and initiate the desired corrective action.
- Wherever GMs/DRMs are held responsible, accountability must also traverse down the line in the concerned departments, unless it can be shown that sufficient and adequate action had been taken by such departmental officials.

General Managers in Zones are ultimately responsible and accountable for achieving safety objectives laid down in their respective zonal railways. They will discharge this responsibility through the management line and will ensure that their Railway has responded appropriately in this regard. They will be responsible and accountable for ensuring that all reportable accidents are promptly reported. Equipment failures are correctly accounted for. Implementation of Safety Plan as per laid down schedule, monitoring of zonal railways' safety performance, safety auditing, completion of all accident inquiries within the stipulated period, completion of all accident-related D&AR cases within fixed schedule, imposition of punishments in accident cases as per norms, monitoring of inspections of HODs, sorting

out inter _ departmental safety issues and conducting annual inspection will be other safety responsibilities of GMs.

Railway Board Members will be individually and jointly responsible for laying down the safety norms, and also ultimately responsible for safe operation and maintenance of railways. The responsibility of the Board, as a collective body, will include determining safety goals and processing, approving and implementation of safety-related projects. It will also ensure that identified safety projects are neither starved of funds, nor will they have time and cost overrun.

MAINTENANCE PRACTICES
AND ASSET RELIABILITY-
MODERNISATION AND UPGRADATION
CORPORATE SAFETY PLAN (2003 - 2013): CHAPTER VI

6

6.1 The aim of better maintenance practices would be to upgrade maintenance technology and methodology for improvement in productivity, performance, and reliability of assets. The most appropriate technologies would be adopted to enhance reliability of motive power and rolling stock. As regards track, OHE, signal & telecom equipment, better maintenance practices would lead to increased safety in train operation and reduced frequency of maintenance.

6.2 The Indian Railways have progressively been using equipment to provide assistance to the staff and to reduce the chances of human error and speed up operations. The equipment is based o-n the logic of ‘fail-safe’. For example, if a signal fails, 'fail-safe concept' implies that the aspect of signal will show 'red' to the driver indicating not to proceed, even though the conditions may be there for signal aspect to show 'green' for the train to proceed. Manual operations must be

performed during the time of equipment failures, be it block instrument failure, point failure, communication failure, panel failure etc. This procedure, though safe in train operation, is however time consuming. At a very low level of traffic, not many safety devices are required. The basic functions get performed manually. As the traffic increases, induction of equipment becomes imperative. The concept of 'fail-safe' is adequate till a stage when the traffic has grown from a low level to medium level. The situation is entirely different when the traffic level is high, when staff tend to adopt short-cut methods and are susceptible to creating an unsafe condition leading to an accident. Equipment failure is the root cause and the concept, therefore, requires to be changed from 'fail safe' to 'fail proof'.

6.3 The life of an equipment needs to be meticulously assessed. It also needs to be ensured that between the two maintenance schedules, no failure takes place. e.g. no roller bearing of a wagon, or a coach fails between the two successive periodic overhauls, or the signal gears do not fail between the two maintenance schedules etc. Standardization of equipment will be ensured, and maintenance practices will be upgraded. Equipment failure is proposed to be treated at par with accident. All efforts will be made to reduce the frequency of equipment failures.

6.4 Maintenance Principles

The chief objectives of any maintenance principle would be:

- Reduced frequency of maintenance
- Increased Mean Time Between Failures (MTBF)
- Reduced Mean Time to Repair (MTTR)
- Reduced cost of maintenance

6.5 Maintenance operations would be geared to preserve any equipment to fulfil functions for which it has been designed. Corrective maintenance comes into play only after an equipment becomes defective. Preventive maintenance, on the other hand, is applied when equipment is still operative and proactive treatment is given consisting of checks, examination, and supervisory inspection. To ensure this, adequate time needs to be made available for the maintenance of various assets. Generally, an equipment failure is preceded by some instances of unsatisfactory working, which is symptomatic of an approaching grave problem. All such warning signals will be investigated promptly to ensure that they are taken care of before an actual failure takes place. Preventive maintenance is a function of manpower, skill, material, technology, and timely maintenance. Equipment failures would include any failure, which is pre-defined and advised to all concerned levels.

Though the ultimate aim is to achieve `zero failure' of assets or adoption of fail-proof concept, efforts have to be made to contain and control asset failures. It is proposed to reduce defects/ failures by 40% up to March 2008 and by another 20% up to March, 2013 as compared to present level.

6.6 Track defects.

Track defects will constitute all rail fractures and weld failures. A consolidated target for all types of track defects is proposed to be laid down as follows.

Reduction from present level of 10.58 defects per billion GTKM (Gross Tonne Kilometers) per year to 6.35 by 31.3.2008 and 4.23 by 31.3.2013.

6.7 Coach defects/failures.

Coach defects will constitute any type of defect that results in detachment of the coach during its run. Targets are proposed to be laid down as follows:

Reduction from present level of 0.59 incidents of coach failure per billion GTKMs to 0.35 by 31.3.2008 and 0.24 by 31.3.2013.

6.8 Wagon detachments/failures

Wagon defects will constitute any type of defect that results in detachment of wagon en-route. Targets are proposed to be laid down as follows:

Reduction from present level of 10.63 incidents of wagon detachments per billion GTKMs to 6.38 by 31.3.2008 and 4.25 by 31.3.2013.

6.9 Poor Brake Power (Goods)

These defects will constitute the defects resulting in vacuum / air pressure trouble and poor brake power in goods trains. Targets are proposed to be laid down as follows:

Reduction from present level of 0.38 incidents of poor brake power per billion GTKMs (Goods) to 0.23 by 31.3.2008 and 0.15 by 31.3.2013.

6.10 Incidence of Train Parting (Goods)

These will constitute the cases of parting of goods trains, while on run. Targets are proposed to be laid down as follows:

Reduction from present level of 1.49 incidents of train partings (Goods) per billion GTKMs (Goods) to 0.89 by 31.3.2008 and 0.60 by 31.3.2013.

6.11 Motive Power defects

Motive Power defects will constitute any type of defect that results in its losing more than half an hour time in case of coaching train and one hour in case of freight train en-route. The targets proposed to be laid down for different types of Motive power are as follows:

- **Diesel Locomotives**
  Reduction from present level of 11.85 incidents per million diesels loco kms. to 7.11 by 31.3.2008 and 4.74 by 31.3.2013.
- **Electric Locomotives**
  Reduction from present level of 8.50 incidents per million electrics loco kms. to 5.10 by 31.3.2008 and 3.4 by 31.3.2013.

6.12 Signal defects/failures.

Signal defects will constitute defects of all types of signal gears and equipment including signal failure, point failure, track circuit failures, axle counter failure, RRI failure, panel failure, point machine failure, block instrument failure, interlocking failure etc. A consolidated target for all types of signal defects is laid down as follows:

Reduction from present level of 13.19 incidents per thousand workloads of Zonal Integrated Signal and Telecom Units (ZISTUs) to 7.91 by 31.3.2008 and 5.28 by 31.3.2013.

6.13 Communication Failures

Communication failures will constitute defects of all types of communication circuits, gears and equipment including control circuit, intra-station communication (connected with train running), IBH communication, level crossing gate telephones

etc. A consolidated target for all types of communication failures is laid down as follows.

- Down time 1% by 31.3.2008.
- Down time 0.5% by 31.3.2013.

6.14 OHE (Overhead Equipment) defects

OHE defects will constitute defects of all types of OHE gears and equipment that result in disruption to traffic, imposition of speed restriction, OHE tripping sustaining for more than 3 minutes affecting train operations. A consolidated target for all types of OHE defects is laid down as follows:

Reduction from present level of 5.02 incidents per thousand electrified track kms. to 3.01 by 31.3.2008 and 2.01 by 31.3.2013.

6.15

Each zonal railway and division will also set its targets accordingly.

6.16 Analysis of failures

To have a correct analysis of various kinds of equipment failures, a computerized database for following types of equipment failures is proposed to be maintained o-n each division:

- Track failures.
- Coach defects.
- Wagon defects
- Motive power defects
- Signal defects.
- Communication failures
- OHE defects
- Defects of safety equipments at level crossing gates
- Defects of safety equipments o-n trains

These equipment failures would be classified and analyzed as `avoidable' or `unavoidable', separately for departmental or inter-departmental activities. All failures which are beyond the control of railway would be treated as `unavoidable'. All avoidable equipment failures will be further analyzed to indicate whether the failure was due to failure of operation management, failure of maintenance management, lack of instructions, lack of training, failure of material, design defect or lack of trained staff etc.

Responsibility for each equipment failure will be appropriately assigned. Periodic analysis of equipment failure will be undertaken by each department to identify problem areas with respect to failure prone vulnerable sections, vulnerable installations, frequent failure of specific components, shortcomings in maintenance practices and whether failures are occurring under certain supervising officials, etc.

`Avoidable' failures will be monitored at higher levels which will ensure that the preventive maintenance concept is implemented, and efforts directed towards zero failures. For timely maintenance of any asset, availability of appropriate material is essential, which will be the responsibility of branch officers in the divisions and HODs in headquarters.

To maintain assets in proper order, following steps are proposed:

6.17 Mechanized laying and Maintenance of Track

Pre-stressed Concrete sleepers (PSC) and LWRs are being laid progressively. To meet the need of better track geometry for high-speed passenger trains and heavier freight trains, use of track machines is a necessity for maintenance as well as laying. This results into better safety environment at work sites, lesser duration for speed restrictions, better quality of work and faster execution of work etc.

State-of-the-art, high output track machines are being procured o-n the IR. The level of mechanization of track renewal and

maintenance activities is being increased progressively. To achieve full mechanization of track renewal and maintenance activities, a Master Plan for procurement of additional track machines by the year 2012, has been drawn and will be implemented through normal Plan outlay.

6.18 Introduction of Mobile Mechanized Units (MMU) for maintenance

Entire group ‘A’ route o-n Indian Railways is to be covered under MMU. A pilot project for implementation of MMU is in advanced stage o-n Allahabad and Kota divisions. After gaining the experience, MMUs are proposed to be set up o-n other Group `A' routes in next five years. This would enhance mechanization of day-to-day track maintenance works for better quality and safety. Thereafter, this MMU concept shall be extended to other routes.

6.19 Inspection and track monitoring

Inspection, repairs, and maintenance of track are carried out as per laid down instructions. Track geometry is recorded through track recording cars (TRC). Oscillation characteristics are recorded to assess the riding quality of track. Total potential of track recording o-n IR is about 1,60,000 kms. per year. There are five TRCs already in use and o-ne new state-of-the-art TRC with laser-based sensors is likely to be commissioned by March 2004. With these six TRCs, all the routes o-n the Indian Railways can be covered at specified frequency.

6.20 Prevention of corrosion

Another area of serious concern is corrosion of the rail, especially in approaches to major stations, coastal areas and also the railway track passing through inhabited areas. Encroachments have become a common problem in approaches to all major towns and metros. At certain places, the drainage from railway track is choked

due to existence of the encroachments o-n either side. The track is frequently being used by the local populace for their morning natural calls, which causes rapid corrosion of rails and track components, in addition to causing difficulty in track maintenance. Toilet discharge is another major source of corrosion of rails and fastenings. Suitable modification in passenger coach toilet chutes will be undertaken to ensure that toilet discharge does not fall o-n rail foot area. As corrosion of rails contributes substantially towards rail fractures, a project has been taken in hand to develop corrosion resistant rails, within next five years i.e. by 2008 to suit Indian conditions.

6.21 Preventive Rail Grinding

The 90 UTS rails have greater hardness and have a tendency of gauge corner cracking due to rolling contact fatigue. This can be prevented by rail grinding to remove the fatigued top layer of rail metal. Many of the World Railways have increasingly adopted this method. Gauge corner cracking can result in accidents due to rail fractures as well as pre-mature renewal. o-ne rail grinding machine, is to be procured by 2005-06.

6.22 Adoption of improved turnouts

The points and crossings are another weak area. Fan shaped concrete sleeper turnouts and curved switches are being laid progressively at the rate of 2500 per year and thereby improving safety and reducing the need for maintenance. It has been decided to provide 20,000 Thick Web Switches (TWS) which are more stable and require less maintenance, o-n entire group `A' route at the rate of 2000 nos. per year. It is further planned to provide weld-able Cast Manganese Steel (CMS) crossings as a part of improved turnouts to facilitate the continuation of LWRs through turnouts, thus reducing many fish plated joints. Funds requirement will be met from normal Plan outlay.

6.23 Ballast Hoppers

Provision of adequate ballast is essential for proper up-keep of track. To wipe out huge arrears of ballast deficiency, procurement of BOBYN wagons has been planned in addition to regular procurement of ballast, mostly from mechanized quarries. Nearly 3800 Hopper wagons are to be procured in the next 5 years through Rolling Stock Programme.

6.24 Corridor Blocks

The concept of Fixed Time Corridor Blocks has been approved and the corridors have been notified in the Working Timetables of Zonal Railways. However, to improve actual availability and for implementation of the Fixed Time Corridor Blocks for integrated maintenance, a committee has been nominated to devise the methodology.

6.25 Integrated Maintenance Block

For implementing the concept of preventive maintenance, granting of adequate time for maintenance of assets both fixed and movable is absolutely essential. To overutilize an asset and temporarily neglect its maintenance is bound to be counter-productive in the long run. Efforts will be made to make optimum use of all such granted blocks and also standard output achieved. Computerized databases would be maintained at divisional level for keeping accurate records of all aspects of working connected with maintenance blocks. Since granting maintenance blocks is an expensive proposition, each maintenance block granted will be simultaneously utilized by all departments. Integrated maintenance vehicles o-n the pattern of accident relief train, may have to be procured in the long-term so that staff and materials of all departments can move together. The work of maintenance staff is to be geared up to ensure that they

are in a position to avail of night maintenance blocks also, especially on oversaturated sections.

6.26 Procurement of Track items having bearing on safety

All track items, having a bearing o-n safety, need to be procured from RDSO approved vendors o-nly. Selected vital track fittings are to be procured o-n the basis of life cycle cost so that the life of such fittings matches with that of rail to avoid intermediate renewal of fittings.

6.27 Maintenance of Meter Gauge/Narrow Gauge Sections

After the launch of Project "Uni-gauge" in 1992, track renewals o-n the sections identified for gauge conversion were frozen and no inputs were given to these sections. on a review, certain minimum inputs are now being given by way of sleeper and rail renewal to these MG sections. During the last five years (1997-2002), over 1175 kms. of track have been renewed on MG/NG. Over 4000 kms. of track renewals on MG have been sanctioned and will be completed by March 2007, out of SRSF.

Out of approximately 18,000 kms of track on MG/NG, 9,000 kms is identified for conversion to BG and this may take up to the year 2013 or so for completion. Sanctioned track renewal works o-n the 9,000 kms identified for gauge conversion would be done using mixed gauge PRC sleepers so that at the time of gauge conversion, no part of expenditure becomes infructuous. As regards the track renewals in the remaining 9,000 kms of track, which is not yet identified for gauge conversion, the sanctioned track renewal works would be done either by using "BG/ST sleeper converted to MG/ST if available" or by using MG/PRC sleeper. Some Tie Tamping Machines (TTMs) will also be

required for MG track maintenance which will be added in the Master Plan.

6.28 Inspection and management of bridges

There are nearly 1.2 lakh bridges o-n the Indian Railway system. Out of these, there are about 565 important bridges, 9792 Major Bridges and 1,09,627 Minor bridges. 51,340 bridges (44%) are more than 100 years old. 327 important and 3,545 major bridges are more than 100 years old. Approximately 89,000 bridges i.e. 74 % are more than 60 years old. Some of the bridges are of obsolete technology and materials e.g. Cast-Iron Pile foundations, Early Steel Girders, Stone slab, Laterite substructure, Steel pipe arch bridges etc.

Rehabilitation/rebuilding of bridges is not based o-n merely the age but o-n condition basis assessed through the laid down inspection procedures. Distressed bridges are inspected at closer intervals.

The present system of inspections and assessment of bridges is based on visual inspections and is subjective. It will be modernized, and a modern bridge management system will be introduced.

6.29 Rehabilitation/rebuilding of railway bridges

Rehabilitation/rebuilding of about 2700 bridges, as identified in October 2001 are in progress and shall be completed over the next four years. Bridges made of material like Cast Iron Pile and Early Steel will be rebuilt/rehabilitated.

Rehabilitation/rebuilding of approx. 600 bridges, including distressed bridges, annually, on condition basis shall be carried out. Funds for the same will be arranged through normal Plan outlay.

Rehabilitation of about 19000 bridges, o-n the basis of technical obsolescence, like small span girders, steel pipe arch bridges,

stone slab bridges shall be carried out over next 10 years. Funds for the same will be arranged through normal Plan outlay.

Modern methods of repair and rehabilitation requiring lesser speed restrictions like Cintec anchors, Helifix Anchors, Advanced Composite Fiber Wrapping, Shock Transmission units /Lock Up devices shall be adopted in larger proportion.

6.30 Signalling Infrastructure Replacement

A number of overaged signalling assets, overdue for replacement, are of mechanical semaphore signalling systems, and they suffer from frequent failures, prone to miscreant activities and cause avoidable delays in train operations. Accordingly, all overaged signalling installations, where the equipment is more than 25 years of age up to D route and more than 35 years of age on E. Spl. route, have already been sanctioned for replacement under SRSF. At about 800 stations, signalling gears, more than 35 years old, will be replaced on E and MG routes on age-cum-condition basis.

The work for replacement of overaged signalling assets on E & MG routes will also be taken up. Fresh accruals as well as overaged signalling installations on important E route and MG routes are to be taken hand in hand to improve reliability and safety in train operations. Funds for this will be arranged through normal Plan outlay.

Nearly 2700 stations are already equipped with Panel, Route Relay or Solid-State interlocked signalling systems. Works for over 1300 stations for replacement of conventional and overaged signalling system are sanctioned and are underway on A, B, C, D & E.Spl. routes. Further works of 630 stations will be considered for replacement on age-cum-condition basis in the plan period, through normal Plan outlay.

6.31 Technological Upgradation of Safety equipments on locomotives

Reliability of equipments provided on locomotives especially o-n under gear has direct bearing on safety. The earlier designs of locomotives provided plain suspension bearing, riveted cage bearings in Traction Motors, a feature which is prone to failure and affects safety. In case of bearing failure, locos must be moved with one axle in lifted condition, which increases the axle load and stress on the track. Hence, it is planned to modify such suspension bearings and traction motor bearings on existing locos of earlier design.

All Electric locomotives will be provided with Dynamic Braking Resistance.

6.32 Sealed Bearings for diesel loco axle

Presently, all ALCO diesel locomotives have been provided with conventional roller bearings o-n axles needing frequent greasing and maintenance attention. This makes it prone to dust and moisture ingress leading to failure. Recently introduced 4000 GM diesel locomotives and ABB electric locomotives are provided with sealed type of bearings on axles. It is planned to progressively modify axle bearings on existing locos for better reliability giving due consideration to residual life.

6.33 Replacement of overaged locomotives

- **Diesel locomotives**
  213 diesel locomotives are overaged as on 31.3.2003. At the end of financial year 2013, total arising of overaged main line BG diesel locomotives shall be 819 (including 213). It is proposed to replace overaged locomotives with

new locomotives with enhanced safety features. The year-wise replacement plan is as under:

Year	No. of locos
1st 5 years (From 2003 to 2008)	@ 90 locos per year
Next 5 years (From 2008 to 2013)	@ 74 locos per year

- **Electric locomotives**

  It is also proposed to replace 333 electric locomotives becoming overaged during the period 2003-2013 by 250 improved locomotives with enhanced safety features. The year-wise replacement plan is as under:

Year	No. of locos
1st 5 years (From 2003 to 2008)	@ 20 locos per year
Next 5 years (From 2008 to 2013)	@ 30 locos per year

Funds for the annual arisings will be provided through the Rolling Stock Programme.

6.34 Safety enhancement of rolling stock

Maintenance infrastructure for rolling stock would be ensured before the introduction of new trains. The works connected with upgradation of ARTs/ARMEs related to efficient rescue and relief operations have been identified. They would include conversion of ICF coaches to ART/ARME. Replacement of tyred EMU/MEMU & DEMU wheels with solid wheels for stock with residual life above 5 years will also be undertaken during the Plan period.

6.35 Inputs for Meter Gauge/Narrow Gauge Rolling Stock

The residual maintenance infrastructure of NG & MG system will require marginal inputs for coaching depots, wagon examination points and MG/NG diesel sheds over next 5 years. Besides, 5 MG and 4 NG workshops will also require investments to sustain their existing infrastructure.

6.36 Wheel traceability and identification system

Since there are over 12 lakh wheel discs/6 lakh axles o-n line, it is proposed to create web-enabled portal to keep trace of all coaches/wagons and details of wheels fitted on them. It can warn each maintenance depot of individual coach, where wheels/axles of suspect nature manifest. The establishment of on-line wheel monitoring system will lead to better safety management.

6.37 Coaching Maintenance Terminals

A zero-based review of sanctioned strength of staff at all existing coaching maintenance depots may be conducted. Primary maintenance schedule of coaches has been laid down o-n kilometers and on time basis.

Time required for maintenance of coaching rakes would also be specified in terms of man-hours per coach, both at primary and secondary maintenance depots. Adequate pitlines will be constructed to ensure proper maintenance of all rakes. A computerized database would also be maintained at all coaching depots to take out the history of a coach.

In order to ensure that rake integrity of every passenger link is maintained, and coaches are maintained invariably at their nominated base depot, it has been decided that coaches shall move to workshop for POH as full rake units instead of piecemeal. Similarly, the workshops shall ensure replacement by overhauled rakes in complete rake units. It will also ensure retrofitment of safety systems in all the coaches of the same rake viz. crashworthy modification, tight lock couplers with anti-climbing features etc.

6.38 Upgradation of freight train examination

Inadequacies of facilities and infrastructure for freight train examination will be made good in a time-bound programme. Upgrading freight stock maintenance infrastructure at some major ROH depots, freight train examination points and sick lines will be completed during the Plan period. Funds will be arranged through normal Plan outlay.

More reliable track friendly bogies with comparable performance to the bogies operating over developed railway systems will be inducted by 2005. Retrofitment of existing wagons with track friendly bogies will be carried out by 2013.

Bogie-Mounted Brake System o-n all newly procured freight stock will be introduced subject to successful field trials in the first phase by 2005. Thereafter, retrofitment of Bogie-Mounted Brake System o-n existing air brake freight stock will be undertaken in the second phase.

ISO-9000 & ISO-14000 certification of 30 air brake ROH depots and 10 tank wagon depots will be done by 2007.

Model coaching depots and model goods yards will be nominated to turn out rolling stock with zero defects.

6.39 More Closed-Circuit Rakes

Closed circuit rakes are not o-nly more productive but also much safer compared to other freight stock. The concept will be introduced as widely as possible, as it generates a sense of belonging and gives better output. The discipline of logging actual kms. will also be enforced.

HUMAN RESOURCE
MANAGEMENT & DEVELOPMENT
CORPORATE SAFETY PLAN (2003 - 2013): CHAPTER VII

7

7.1 Human Resource

Manpower is the most valuable asset in any organization, more so in IR which is highly labour intensive. The Indian Railways with a work force of nearly 1.5 million is o-ne of the biggest employers in the world. To have the optimum output from the workforce, a higher motivation level and stress-free environment is to be ensured. Suiting the job requirements, skills of manpower must be suitably developed requiring adequate attention in their training facilities.

7.2 New Challenges

The challenges and pressures of the coming decades would require Railway staff to be developed in a way different from what has been done hitherto. Technological advances including those in the fields of IT and communication along with rapidly changing expectations of the new generations will force

every railway employee to think and act differently to produce matching results. Not o-nly new management system and expertise would be required but also a totally different organizational culture and management ethos would be called for to maintain competitive edge. Railway employees would have to take advantage of the knowledge explosion, acquire, and assimilate new skills in rapidly changing technology in their respective areas of work.

7.3 Human Failures

Under optimum field conditions and with the best of intentions, a human being is likely to commit a mistake from time to time, i.e. from one in hundred (10_2) to one in thousand (10_3). This is the reason why operating rules include many redundancies in safety procedures and operating practices involve a number of checks and balances. Equipment is utilized to prevent human errors and automation is resorted to. By providing all such technical checks, it is sought to reduce chances of likely mistake to o-ne in million (10_6).

Another reason for the high incidence of human failures is the fact that technical safeguards and backups do not necessarily replace human effort. Direct responsibility for preventing an accident must be properly ascribed. Staff become complacent with the knowledge that technical support is available to them for checking their mistakes. Repeated failure of technical support as merely an overlay creates a situation which is worse. Though an accident occurs only when both fail but it usually gets logged as `human error' with a tendency of glossing over technical failure. With the increase in the number of failures of such safety support systems, technical backup is not really available.

7.4 Maintenance Staff

One important aspect is the staff failure of `other than front line staff'. Derailments constitute around 75% of consequential train accidents on IR. While it is an undisputed fact that frontline staff should be properly trained and their working closely monitored, the focus must now gradually shift to staff working in production and maintenance activities, since they are responsible for majority of the accidents, that occur due to `failures of railway staff'. The necessary infrastructure and staff would be created for maintaining new trains as is done in the case of running staff.

7.5

To enhance the quality of human resources, multi-pronged strategies would have to be adopted.

7.6 Recruitment

The focus will be on appropriate aptitude while selecting personnel.

- A review and update of minimum qualifications prescribed for each category will be undertaken taking into account required knowledge, skill and availability of trained manpower.
- To improve the quality of recruitment of safety category staff, the job eligibility standards would be raised for general as well as reserved category candidates.
- Increase in the proportion of lateral induction at specified levels for critical safety categories would be considered.
- A review of recruitment rules would be carried out for induction of officers and staff for multi-skilled jobs.

- The initiative taken to reorganize the Railway Recruitment Board (RRBs) and enhance the quality of recruitment would be sustained.
- Gangmen and drivers above the age of 50 and up to 57 years would be given option to seek voluntary retirement and o-ne of their wards will be given appointment, if eligible.
- A suitable computerized test programme would be developed and standardized for determining the physical characteristics such as alertness, reaction time, stamina, and ability to withstand frequent changes.

Aptitude Tests

The psychological tests being given to new entrants as well as departmental candidates for Station Masters and Drivers etc. will be upgraded and revalidated through competent external professional agencies. These tests are proposed to be converted into computer-based packages for their conduct and evaluation. A multi-disciplinary team is proposed to be sent to advanced railway systems to apprise themselves of the latest techniques of aptitude tests.

7.7 Training

Modernization and Upgradation of Training Centers

- As main Training Centers have already been granted Rs.73.5 crores out of the SRSF for upgradation, remaining training centers, including Basic Training Centers spread all over the Indian Railways are also proposed to be modernized with provision of necessary infrastructure at an overall

outlay of Rs. 220 crores (inclusive of allotment under SRSF).

- Modernization of training centers would cover institutions imparting training of various disciplines viz. Civil, Mechanical, Signalling and Electrical Engineering etc.
- Special emphasis shall be laid on training of bridge engineers and supervisors on regular and continuous basis, at least for next 5 to 6 years to adapt technologies appropriately.
- ISO certification
  In the long run it is desirable that all staff training centres, and work centres would obtain ISO _ 9002 certification and the concept will be extended to all divisional control offices and stations and other work centers.
- Competency based training to maintenance staff

To improve training methods and switching over to multi-media packages, it is proposed to extend the scheme of competency-based training and the staff working in Workshops and Open Line would be given the necessary certification. It will be necessary to possess a certificate of competency to work on the identified critical safety activities such as TXR depots, Workshops and Flash Butt Welding Plants.

- Apart from conventional methods, interactive training with personal computers would be introduced on the lines of modern training methods.
- Training Modules

A central training cell, composed of a multi-disciplinary team of specially selected staff and officers would be started. It will be

assigned the responsibility of designing training courses and preparing quality training material.

- The selection of trainers would be based on appropriate aptitude and skill.
- The training capsules for Drivers and Assistant Drivers would be thoroughly reviewed and greater emphasis would be laid o-n practical training.
- It is proposed to delegate more powers to field units to make liberal and extensive use of outside training facilities in IT and technology areas.
- Refresher course for each category will have sufficient case studies of accidents caused due to human failure of that category of staff.
- Training modules will give stress on `know-why' and `show how' rather than the know-how to stress o-n the practical aspects of the training system.
- Training at the work-spot via the RAILNET, will be made available.

7.8 Examination system:

Promotion rules and procedure

- Over a period of time, a question bank containing objective type questions with multiple-choice answers covering the entire syllabus will be built up. Data bank containing questions covering the entire syllabus will be made available to trainees. At Training Centers, written examinations/test papers will contain objective type questions covering the entire syllabus in random order with multiple-choice answers.

- When any staff belonging to a safety category becomes overdue for periodic medical examination, refresher course or safety camp, he would not be permitted to continue on duty until he completes the stipulated training/examination.
- After recruitment, for initial training at ZTCs/STCs, pass marks may be upgraded. For promotional course training also, pass marks may be revised.

7.9 Strength of staff and vacancies

- Staff requirements are proposed to be worked out afresh for zero-based assessment of manpower. Based o-n the exercise, sanctioned strength of staff may be revised and made uniform. The concept of multi-skilling would be adopted.
- Categories having difficulties in filling up promotional posts, existing AVCs may be revised.
- All Safety category vacancies would be filled up o-n urgency basis.
- Accountability for filling up of vacancies in safety categories will be clearly assigned at an appropriate level.

7.10 Modification of Rules

- With the changes in operating system and pattern of working, modernization and technology upgradation, rule books and manuals will be taken up for reassessment and making them simpler for compliance.

- A comprehensive accident manual universally applicable to all the Zonal Railways would be framed and circulated.
- Departments/zonal railways that do not have a particular manual would get one prepared within next 2 years.
- Separate modules would be drawn up, category-wise, containing do's and don'ts for ensuring safety and preventing failures and accidents.
- All instructions in consonance with existing manuals would be issued through correction slips to Manuals and Rule Books.
- Handbooks containing relevant rules, framed in simple language, for different categories of staff would be issued.
- Compendium of establishment rules pertaining to running staff, and operating staff would be made available to employees directly.

7.11 Inspections

- To improve quality of inspections, detailed check list of various types of inspections would be made out and circulated.
- The quality and compliance of inspections would be made an important plank of the management tools.
- Special safety audits by multi-disciplinary teams would be intensified.
- A computer data base would be prepared at the Divisional and Zonal Headquarters to assess the efficacy of field inspections.

- Safety critical checks would be conducted by all inspecting officials.
- Safety test checks will be intensified as vigilance-like powers have been given to the safety organization.
- As the element of surprise and the opportunity to observe performance of staff under actual working conditions in the field is of prime
- Importance, surprise inspections give an accurate indication of health of the particular unit. Surprise inspections would be intensified, specially between 0 hrs. and 4 hrs. at night.
- Test checking of inspections of subordinate officers.
- Maintenance depots and other activity centers would also be covered by night inspection.

7.12 Periodical Safety Drives

- Certain activities in the railway working, which are seasonal in nature, are neither required to be performed by staff nor required to be checked by supervisors during the course of normal working for the most part of the year. It is for these kinds of activities that safety drives are generally targeted.
- Safety drives would be launched in order to correct a system failure, whenever detected.
- In the safety drives, all equipment that are to be attended would undergo a cyclic inspection before a particular season. Number, duration and contents of particular safety drives would be selectively decided to retain their focus and value.

7.13 Safety Audit

- Inspections generally single out individual failures, safety audits are expected to identify system failures and generic shortcomings.
- Periodic safety audits would be undertaken at various levels for making an in-depth assessment of safety systems. These safety audits may be of many types viz, multi-disciplinary team from Railway Board, inter-Railway, multi- disciplinary headquarters team, inter-divisional, etc. The main purpose behind conducting safety audit is to check only safety critical items and identify system failures or generic shortcomings.
- Railways will identify the worst sections on the divisions with unsatisfactory safety record. Teams would thoroughly audit different units pinpointing deficiencies including ancillary activities viz. staff training, material supply, availability of funds, defective policies/rules etc.
- Safety audits would be carried out at a number of installations within the target area.

7.14 To promote devotion, dedication and sincerity towards duties, Human Resource Development (HRD) Cells are proposed to be constituted at Zonal, Divisional Headquarters involving dynamic and knowledgeable supervisors to study:

- Working habits of ground level staff
- Factors leading to short cuts.
- To reduce fatigue, minimize monotony and improve safety consciousness.

7.15 Review of working hours

To reduce stress, the working hours for identified critical categories of staff would be reviewed, wherever necessary.

7.16 Simulators Training

More and more simulators would be procured for training drivers to equip them with better capability and reflexes.

7.17 Crew Management

To assess the actual problems faced by the running crews, proper records would be maintained in crew lobbies and follow-up action taken within 24 hours of observations made by drivers. The deficiencies noted during crew runs would be identified and corrected expeditiously.

7.18 Breathalyzer Tests to be strengthened.

The Divisional Officers and Supervisors would be provided with mobile breathalyzers for testing running staff on the footplate with an element of surprise.

7.19 Crew friendly cab for locomotives.

An ergonomic design of loco cab has been developed to provide easy approach to various control handles/buttons. Providing new features will ensure fatigue-free driving for long hours.

7.20 Upgradation of Running Rooms

It is well established that running rooms should be provided with certain basic amenities like proper hygienic toilet facilities, clean drinking water, proper ventilation, desert coolers, subsidized meals, etc. All the new running rooms would be built with improved layout and proper amenities. The existing running rooms are being upgraded on an urgent basis.

7.21 Upgradation of crew lobbies

Crew lobbies also need to be upgraded by providing basic amenities, facility for proper display of various instructions, computer, and software package for proper booking of crew and ensuring adequate rest for running staff.

7.22 Guard-friendly brake van.

5000 Goods brake vans will be provided with several novel features for making them Guard-friendly and easing stress for goods trains guards.

7.23 Strengthening of Railway Protection Force

To combat outside interference with railway installations like track and signalling equipments etc., it is proposed to equip Railway Protection Force/Railway Protection Special Force with specialized training, weaponry, vehicles and wireless communications and necessary backup support in terms of manpower and barracks. These personnel will also help in guarding railway bridges, microwave towers, route relay cabins and track in identified vulnerable sections.

MODERNISATION OF DISASTER MANAGEMENT

CORPORATE SAFETY PLAN (2003 - 2013): CHAPTER VIII

8

8.1 A High-level Committee was constituted in September 2002 to review the Disaster Management over the Indian Railways. The Committee presented its recommendations in a report in April 2003, which has been accepted. The implementation of the recommendations would require an estimated Rs.400 crores. The detailed accepted recommendations, and broad costs are indicated in the report, which are to be implemented in next three years. This estimate, however, does not include some recommendations for which the cost implications are being assessed.

8.2 The main areas of focus on disaster management in the next decade will be:

Faster Response

- Three-coach self-sufficient Self-propelled Accident Relief Train (SPART) capable of running at 140

kmph, for quicker initial response would be introduced.

- Rationalization of existing locations of Accident Relief Trains (ART) and Accident Relief Medical Vans (ARMV) would be undertaken for faster availability at site.
- For rescue operations, need to obtain police clearance would be obviated.

Better facilities and equipments

- Steam cranes will be phased out, including those on MG system.
- Existing ARTs will be speeded up to 100 kmph and ARMV to the highest speed in the sections.

Expanding resources to meet requirements in major accidents.

- Crack teams at each Zonal Railway HQ with containerised equipment to be introduced.
- Standby ART/ARMV gangs will be organised whenever required.
- Assistance by armed forces and para-military forces in rescue effort will be obtained, whenever required.

Better customer focus

Advanced and better communication facilities would be provided to take care and handling of the injured and dead.

Training and Preparedness

Full scale mock drill exercises for each ART.

ART Management will undergo major changes covering rolling stock management, status of equipment, monitoring of utilization of assets and availability and consumption of stores etc.

8.3 It is proposed to review targets for following activities: -

- ARMVs and ARTs would be turned out within the stipulated time and ensuring that they get precedence over all other trains. ARMVs would be given priority in the return direction also, as they may be required at other locations too.
- Reliable and effective communication channels would be established at the site of accident to be in contact with divisional and zonal headquarters on arrival of ARMV at site.
- Transhipment of unaffected passengers and their clearance from the accident site would be organised quickly.
- Even in case of the worst possible accident with adverse and extreme circumstances, all injured passengers would be rescued on priority.
- In rescue operations, top priority will be given to all passengers in critical condition for immediate medical attention.
- Even in case of the worst possible accident, dead bodies would be extricated at fastest possible speed.
- Ex-gratia payment to all injured passengers and next of kin of all deceased passengers (after identification) to be arranged expeditiously.
- Complete medical care will be taken, of all injured passengers, including payment of medical bills, till their final discharge from hospitals.
- Claims compensation booklets containing forms and other instructions will be distributed to all

injured passengers and next of kin of all deceased passengers.

8.4 Strategy to be adopted.

- Each Zonal Railway and each Division will prepare its Disaster Management Plan.
- These Disaster Management Plans will be dovetailed with State / District Disaster Management Plan.
- SPART (Self Propelled Accident Relief Train) consisting of 3 coach units will be deployed one in each division.
- Feasibility of entering into a tie-up with reputed private/civil hospitals and with State Governments to be explored for speedy relief and assistance.
- Rescue Ambulances are to be positioned at hospitals in divisions having good road network.
- Air lifting of needy, seriously injured passengers to nearby hospitals would be explored.
- Armed forces will be approached for assistance during disasters, whenever required.
- Feasibility of introducing emergency rail-cum-road vehicle will be explored.
- Each Zone is proposed to have a professionally trained Crack team of rail rescue experts and containerized equipment, based at headquarters, to be rushed to any major accident site by air or land route.
- Feasibility of providing road access to bridges, tunnels, high embankments, and deep cuttings will be explored by divisions.

- Two roof hatches and one under-floor hatch, for emergency escape are proposed to be provided in all coaches.
- Emergency automatic lights in coaches would be provided.
- Adequate financial powers to DRMs and concerned branch officers will be given to ensure quicker rescue operations.
- Special Disaster Management Team of RPF is proposed to be set up on each division for providing support to relief and restoration.
- Collapsible coffins will be kept at each divisional hospital and transported to the site of accident.
- All ARTs will be provided with Air brake stock.
- A minimum of one 140 Tonne break down crane will be provided in each BG division.
- Disaster Management Training Modules, with special focus on rescue, extrication, medical relief, and restoration techniques etc., will be launched at four nominated training centres.

INVESTMENTS IN SAFETY RELATED WORKS

CORPORATE SAFETY PLAN (2003 - 2013): CHAPTER IX

9

9.1 The Indian Railways for long have, had a system for funding replacement/renewal of its overaged assets. This has been done through the "Depreciation Reserve Fund"(DRF), created for this specific purpose with effect from 1.4.1924 as recommended by the Committee on Depreciation Fund. Annual need-based contributions are made to this fund from Railway revenues. Presently depreciation provided is about Rs.2000 crores per annum. In addition, the lease charges paid to Indian Railway Finance Corporation include an element of capital recovery of more than Rs.1000 crore per annum, which is analogous to provision for depreciation of Rolling Stock assets. While an exercise to review the codal life of various categories of assets is separately underway, duly reckoning technological changes, assets must be replaced on occasion before they have completed their codal life because their usage in terms of traffic hauled so warrants and necessitates replacement.

9.2 Investments of a developmental nature, as also on safety related projects have been done through the "Development Fund." Both these funds are sourced from internal generation of resources. While DRF is essentially for replacement and renewals, Development Fund is to meet the expenditure on safety related other works such as track circuiting, interlocking of level crossings, provision of lifting barriers, Foot-over Bridges etc.

9.3 Railway Safety Fund Safety at Level Crossings

A Railway Safety fund has been created from 1.4.2001 for financing works related to manning of unmanned level crossings and for construction of ROBs/RUBs at busy level crossings. This fund is financed mainly through receipts from Central Road Fund, which is funded by levying of cess of Rs. 1 per liter of diesel and petrol. The Railways get 12.5% of entire petrol cess and 6.25% of entire diesel cess. Two separate plan heads, viz. Road Safety Works - LCs and Road Safety Works-ROBs/RUBs have been created in 2000-01 for executing these works.

9.4 Special Railway Safety Fund (SRSF)

In pursuance of RSRC's recommendation, a non-lapsable Special Railway Safety Fund of Rs.17000 crores were created in October 2001 to clear the arrears of replacement/renewal of overaged safety related assets viz., track, bridges, S&T gears and rolling stock and to cater to certain safety enhancement works. Out of this, Rs.5000 crores is to be the railway's contribution through safety surcharge on passenger fare and balance Rs.12000 crores in the form of dividend-free budgetary support. To the end March 2003, Rs. 3920 crores have been spent through this fund.

9.5 The Corporate Safety Plan has outlined the role of technology, maintenance practices, modernization, and upgradation. There are also important safety policy issues to be decided, which have a bearing on investment profile. An attempt has been made to assess the scenario of approximate fund requirement for broad safety related items in the relevant corporate plan period (Refer Annexures A1 to A10). Also, some of the measures suggested constituting various options available for achieving the same objective and, therefore, the best and the most cost-effective option must be tried out before a managerial decision is taken to adopt the same.

9.6 While clearing of the arrears of replacement of tracks, bridges, signalling gears and rolling stock would be addressed through the SRSF, annual arising for these items will be taken care of by normal provisioning under DRF. In addition, in the plan period, thrust will be given on safety enhancement works as identified and detailed in annexures A-1 to A-9. The total expenditure involved for these safety enhancement works would be Rs. 31,835 crores. (Refer Annexure A-10). Out of this Rs.13,000 crore is available under SRSF for sanctioned works in the Green Book. Further, the requirement under Railway Safety Fund works out to Rs. 8900 crores, implying an expenditure of Rs. 890 crore per year. Presently, the availability under this fund is of the order of Rs. 430 crore per year. Experience shows that the expenditure under Railway Safety Fund has been under Rs. 200 crore per year on account of delay on the part of the State Governments to sponsor ROB/RUB works on cost-sharing basis and also delay in execution of their portion of the work. Thus, the additional requirement to fulfil the plan would be the order of Rs.10,000 crore.

9.7 In conclusion, to achieve the Corporate Safety Plan objectives, Indian Railways will have to initiate a number of business reengineering measures and efficiency enhancement steps. Non-budgetary initiatives to meet the project related expenditure will have to be stepped up so that matching funds become available for safety enhancement works outlined in this corporate plan. Besides, a safety-oriented scheme to meet the projected requirement of funds may also have to be resorted to, for which the assistance of the Planning Commission and the Ministry of Finance would be sought.

ABBREVIATIONS

AC	Alternating Current, Air conditioned
ACD	Anti-Collision Device
ACP	Alarm Chain Pulling
ARMV	Accident Relief Medical Van
ART	Accident Relief Train
AT welding	Alumino-Thermit welding
AVCs	Avenue charts
BG	Broad Gauge
BPAC	Block Proving by Axle Counter
BOBYN	Hopper wagon
CAP	Capital
CBC	Centre Buffer Coupler
CC	Closed Circuit
Cr	Crores
DF	Development Fund
DMU/DEMU	Diesel Multiple Unit, Diesel Electric Multiple Unit
DRF	Depreciation Reserve Fund
DRM	Divisional Railway Manager
EMU	Electrical Multiple Unit
FB welding	Flash Butt welding
FWU	Four-wheeler Units
GB	Green Book
GM	General Manager
GPS	Global Positioning System
GTKMs	Gross Tonne Kilometres
HODs	Head of Departments
Hq.	Headquarter
ICF	Integral Coach Factory
IPS	Integrated Power Supply
IR	Indian Railways
IT	Information Technology
LC gate	Level Crossing Gate
LWR	Long Welded Rails
M&P	Machinery & Plant
MACLS	Multiple Aspect colour light signalling
MG	Metre Gauge
MMU	Mobile Mechanised Units
NCR	North Central Railway

NG	Narrow Gauge
OFC	Optical Fibre Cable
OHE	Over-head Equipment
PB	Pink Book
POL	Petrolium
ppm	Parts per Million
PSC sleepers	Pre-stressed Concrete Sleepers
R&D	Research & Development
RCF	Rail Coach Factory
RDSO	Research Design and Standards Organization
ROB/RUB	Road over bridge/Road under bridge
ROH	Routine Overhaul
RPF	Railway Protection Force
RRB	Railway Recruitment Board
RSF	Railway Safety Fund
RSP	Rolling Stock Programme
RSRC	Railway Safety Review Committee
RKms	Route Kilometers
Rev	Revenue
SLR	Guard?s Brake Van
SPART	Self- Propelled Accident Relief Trains
SPURT Car	Self-Propelled Ultrasonic Rail Testing Car
SRSF	Special Railway Safety Fund
STC	Systems Training Centre
TAWD	Train Actuated Warning Device
TRC	Track Recording Car
TTM	Tie Tamping Machines
TVUs	Traffic Vehicle Units
USFD	Ultra Sonic Flaw Detector
UTS	Ultimate Tensile Strength
VCD	Vigilance Control Device
w.r.t	With respect to
ZISTUs	Zonal Integrated Signal and Telecom Units.
ZTC	Zonal Training Centre

HIGH LEVEL COMMITTEE REPORT ON DISASTER MANAGEMENT OVER INDIAN RAILWAY 2002

HIGH LEVEL COMMITTEE
REPORT ON
DISASTER MANAGEMENT

Introduction:

1. Some of the major train accidents in recent years involving heavy casualties have underscored the need for a re- look at the prevailing Disaster Management System on the Indian Railways. In many countries, in the unfortunate event of a railway accident, relief and rescue work is not spearheaded by the Railway organization, but by the civil authorities, as in the case in road accidents/other disasters. The role of the Railway systems in these countriesis restricted to clearing the track and restoring traffic after the rescue work is over. In India, however, Railways have been historically handling rescue and relief operations in railway accidents, and therefore Indian Railways has to rise to the expectations of the public. Further, significant technological advancements have taken place in the area of post disaster relief and rescue operations. Consequently, a number of state-of-the-art relief and rescue equipment, tools and plants and innovative techniques have emerged during the last decade for quickening the pace of rescue and relief operations.
2. In the above backdrop, the Ministry of Railways constituted a high-level committee vide Board's order No. ERB-I/2002/23/44 dt.16.9.2002 to review the **Disaster Management System** over Indian Railways and to give recommendations for strengthening and streamlining the same. This Committee consists of the following:

a. Member Mechanical, Railway Board	Convenor
b. Member Traffic, Railway Board	Member
c. Financial Commissioner, Railway Board*	Member
d. Director General/Railway Health Services	Member
e. Director General/ Railway Protection Force	Member

***Nominated as AM(Budget) and continued to serve the committee as Financial Commissioner.**

Executive Director / Safety, Railway Board is the Secretary of the Committee and the terms of reference of the Committee are:

a. To review the existing Disaster Management System over

IR related to train accidents and natural calamities and to suggest improvements.

b. To identify additional technological and managerial inputs to quicken the pace of relief and rescue operations.
c. To institute a standing arrangement with other Central Ministries, State Governments and Armed Forces to enable quick and smooth restoration operations without any legal or procedural hurdles.

3. At present, accident victims at the railway accident site receive immediate help from:

a. Fellow passengers, particularly those who are qualified in giving first aid/doctorson train.
b. Railway staff/officers on board who, as per Railway Service Conduct Rules, areexpected to assist the accident victims.
c. Neighbouring villages/towns, civil authorities, NGOs, etc.
d. Organized railway rescue and relief team.

Therefore, it is natural and logical that in most railway accidents/disasters, the relief in the form of response arrives quickly in urban /vicinity of urban areas. However, in case of remote area accident/disasters, factors such as lack of communication, lack of immediate accessibility, covering of distance gap to reach the site of accident and conveyance of equipment and trained manpower create serious problems for carrying out rescue and relief. The usual refrain of the media that local help was immediate, while the railways took some time to organize assistance is somewhat uncharitable, since it is impossible to have organized efforts located at each and every remote area in anticipation of an accident/disaster.

4. The Committee sought suggestions directly from various sources such as General Managers, DRMs, AIRF, NFIR, FROA, IRPOF, etc. Further, a website **http://www.indianrailways.gov.in** was also set up to receive suggestions from railway men and public. The Committee also visited GSDMA (Gujarat State Disaster Management

Authority) at Gandhi Nagar. The Committee had detailed discussion with Army/Navy/Air force authorities to explore the possibilities of institutionalizing the standing arrangement for seeking their immediate assistance at the time of natural disaster or railway accidents. Similarly, detailed discussions were held with the Ministry of Communications to institutionalize the standing arrangement for seeking immediate assistance from BSNL/MTNL for providing requisite communication facilities at/around the accident site.

5. The Committee believes that Indian Railways' first responsibility in case of accidents is to reach and extricate accident victims and organize effective trauma care. The Basic Principle of Trauma Management is speed & expediency -- "Most trauma patients die of shock, which comes from sluggish or non-existent circulation and the resulting chemical changes in the body." [Dr. R Adams Cowley, Maryland Institute for Emergency Medical Services, (Pioneer of modern trauma care)].

Thus, the first hour after the accident is termed as 'The Golden Hour' as

a. Most trauma patients can be saved if bleeding is effectively stopped, and blood pressure restored within an hour.
b. It is likely that patients who have experienced shock and remain in that state of shockfor a long duration will die. Surgical intervention within that first one hour is, therefore, crucial for increasing the patients' chances of survival.
c. This hour, called "The Golden Hour," begins the moment the injury occurs.

6. Therefore, the basic steps for quick and effective rescue and relief operations are following:
    a. Rapid access to the site of accident.
    b. Quick extrication of victims and effective on-site medical

management.

c. Stabilization of condition.
d. Expeditious extraction and shifting to rescue vehicle(s).
e. Speedy transportation to hospital.

7. Indian Railways is spread over a vast geographical area, connecting 7000 stations over 63000 route Kms. **Therefore, it is not possible to locate rescue & relief equipment and manpower at each and every station.** Presently, there are 174 Accident Relief Medical Vans (ARMVs), and 185 Accident Relief Trains (A Class, B class & self-propelled ARTs) stationed at strategic locations over BG & MG network in the Indian Railway system **(Details at Annexure -I)**. Each ARMV has to service on an average an area covering a radial distance of over 150 kms. The set norms are that the ARMV must leave within 20 minutes of receiving information of an accident. Therefore, in a remotely located accident, the relief train may take anything between one to four hours to reach the accident site, considering time taken to cover the distance and organizing men and material. Further, in major accidents involving heavy casualties, one or two ARMVs may not be able to cope up with the pressure of immediate relief.
8. As per experience, the present system of railway rescue and relief functions well in most of the accidents involving passenger trains, when the casualties are not heavy. It is also a fact that IR is now running significantly longer passenger trains and heavier freight trains. Hence, some accidents are likely to claim a large number of casualties depending upon nature of accident, location and topographical features, etc. The committee believes that in case of major accidents involving hundreds of lives, there is a need for better managerial and technological inputs for the Disaster Management System to function satisfactorily.
9. Over the years, the accident handling mechanism over IR has

been well defined and put into operation. The Accident Manual of each Zonal Railway lays down detailed drills andsteps to be taken at the time of mishap. Each segment of activities is enumerated in various manuals, be it Medical Manual or Commercial Manual or other such rule books. However, being a multi-departmental emergency function, needing a high degree of precision, speed & coordination, the post-accident management leaves some deficiencies and lacunae occasionally. These are corrected and updated periodically.

10. To ensure that IR's organized disaster management system is designed such that the victims are retrieved within the golden hour, it would require ARMVs/ARTs to be based at each and every station. However, the Committee believes that increasing the number of ARMVs/ARTs indiscriminately to reduce the beat or to increase the number of relief and rescue equipment without any maintenance support would not achieve the objective. On the contrary, any embarrassing failure of equipment at the inappropriate moment during rescue and relief operations would render the very provision counter-productive and the investments infructuous. Further, the ARMVs not properly supported by medical/para medical staff, who cannot be positioned throughout the length of railway track, will be useless for rescue and relief operations.
11. No doubt massive efforts have been made in the decades since independence to modernize and strengthen the infrastructure relating to accident relief and restoration. Replacement of steam cranes by high-capacity diesel cranes and of non-standard stock by ICFall coil coaches along with induction of hydraulic re-railing equipment have imparted considerable strike force to the Accident Relief Trains. There has been general upgradation in the tools, equipment, and the amenities to the staff, which has enhanced their capability and effectiveness. Despite these improvements, the response to the accident and disasters

continues to fall short of rising expectations, especially in case of major accidents involving more than 15-20 casualties in remote areas.

12. These improvements have increased the operating speed of the Accident Relief Trains and brought down the transit time between the base depot to the accident site from the earlier8 to 10 hours to around 1 to 4 hours on an average now. But, in case of an accident involving human life even the least delay can be crucial. However, the concept of golden hour is an ideal one, which cannot be achieved in any disaster/accident unless it occurs in the vicinity of the railway disaster management infrastructure/city/civil/armed forces establishments with adequate medical infrastructure. Therefore, a paradigm shift is now called for. The total approach to the concept of disaster management and the investment decisions thereof needs a revamp. The strategy for setting up an effective Disaster Management System on the railways has to be based upon the twin plank of a stronger and appropriate infrastructure, backed by a well-trained team of disciplined and dedicated manpower.
13. Railway accidents/natural calamities can be categorized into different levels:

    a. Accidents/ natural calamities of a magnitude, which can be managed by the concerned divisional authorities.

    b. Accidents/natural calamities of a magnitude, which also require assistance from neighbouring divisions and can be managed by the Zonal railways, and.

    c. Disasters of a magnitude in terms of their severity or the scale of casualties to be treated as national level disasters and require active involvement of multiple agencies viz., the Central Government (Ministry of Railways & other Ministries).

While it is only in the case of disasters of an exceptionally severe

magnitude that the Central Government's involvement will be necessary in disaster response --managing rescue, relief & restoration etc. --the Ministry of Railways (Railway Board)'s continuing involvement will be required in the pre-disaster phase in assisting the zonal railways in building up appropriate capabilities for disaster management at the divisional and the zonal levels and also in institutionalizing appropriate systems for disaster management and mitigation of human misery and suffering.

14. The Committee notes that a National Disaster Management Authority (NDMA) is being constituted by the Govt. of India. This authority is expected to coordinate disaster management activities among various departments/Ministries. NDMA will work under the overall supervision of the Home Secretary. Ministry of Railways has already nominated Addl. Member (Mech. Engg.) as its representative in NDMA.
15. The Committee also examined in detail the Khosla-Trivedi Committee report on **"Modernization and Reorganization of Accident Relief Trains over IR"** submitted to the Board during 2002. Several recommendations made in this report have been selected and after review are included in the final recommendations given below.
16. In order to ensure their timely implementation, the time frame (e.g. M+'X') and the agency/agencies responsible have also been indicated against each recommendation. **'M'** stands for the month of publication of this report and **'X'** indicates the time period (in number of months) for implementing the recommendation.

1. Institutionalizing Golden Hour Drill

Sl. No.	Recommendations of the High-level Committee	Who will do it & by when?	Financial Implications
1	**National Disaster Management Authority (NDMA)** is being constituted by the Government of India. This authority will be responsible for: a. Coordinating/mandating Government's policies for disaster reduction/mitigation. b. Ensuring adequate preparedness at all levels in order to meet disasters. c. Coordinating response to a disaster when it strikes d. Coordination of post disaster relief and rehabilitation. Consequently, each State and District is expected to prepare its Disaster Management Plan taking into consideration the vulnerability analysis and the local resources (Civil, armed forces, NGOs, etc.). The Committee recommends that each Division and each Zonal railway must revise and rewrite their Disaster Management Plan and dovetail the same with the State/District Disaster Management plans respectively. This would ensure proper coordination and mutual. cooperation among Divisions and Zonal railways authorities with the District/State authorities in managing severe accidents over IR and disasters in general.	Zonal Railways Rly. Board (Safety dte.) **M + 4**	
2	**SP-ART**- Self Propelled ARTs and ARMVs to be bundled into a three-coach train to be called SP-ART (Self Propelled Accident Relief Train). These should be deployed @ one SP-ART per Division. 10 such units each	Zonal Rlys. ICF Railway Board (Mech. &Health Directorates) **M+36**	**Rs.235** Cr. (@Rs.5 Cr.) x 47 **Outlay** 2003-04 Rs.80 Cr.

	of ARTs/ARMVs are already available. These can be made into 20 SP-ARTs by adding 20 more coaches. In addition, 47 more SP-ARTs @ one per Division may be introduced during the next 3 years (2003-06). While allotting these SPARTs, divisions with a geography of sparse road network and/or ghat sections may be given priority.		2004-05 Rs.80 Cr. 2005-06 Rs.75 Cr
3.	**MOU with Civil/Private Hospitals-** To improve the response time, feasibility of entering into a tie up with reputed civil/reputed private hospitals may be explored so that additional ARMVs can be stationed at intervals not exceeding 100 Kms each even in places where the railway medical infrastructure is not available.	Zonal Railways to submit their proposals to Railway Board. (Health & Mech. Dtes) Nodal Dte. – Health Dte. **M+4**	To be assessed
4	**MOU with State Govts-** Notwithstanding the provision of 67 SPARTs and the existing ARMEs, the railway administration may not be able to reach the site of accident in reasonable time, say within two hours in all cases. Therefore, it is proposed to enter into an MOU with the State Governments so that Railway and District administration can join hands for mutual assistance in case of railway/non-railway disasters. Accordingly, railways may provide road mobile Accident Rescue & Relief Van and State Government may provide necessary medical/para-medical support for their manning and deployment. Railways may also station Railway Rescue and Relief Commissioners (Railway Mechanical & Medical officers) at State Headquarters for ensuring coordination between railway and civil authorities. To begin with each zonal railway will	Zonal Railways Railway Board (Mech.& Health Dte.) Nodal Dte. – Mech.	Rs.30 lakh * 67 = Rs.20 Cr. 2003-04 - s.4.8 Cr 2004-05 - Rs.15.3 Cr

	be provided with one rescue and relief mobile van for deployment at strategic locations (preferably at zonal headquarters) during the next one-year, provided States agree to man the accident rescue and relief vans. Based on the response from district authorities /State Government, each division can be provided with one such rescue and relief mobile van during the next one year.		
5.	**Rescue Ambulance**- Divisions where the road network is good should procure one disaster management rescue ambulance and base it at their divisional hospitals. Such rescue ambulance is being manufactured by the Vehicle Ordnance Factory/Jabalpur under the Ministry of Defence. COFMOW to prepare a suitable specification and arrange procurements against indents from railways. To begin with one such ambulance may be introduced over each zone and based on experience gained, additional ambulances may be procured as per need.	COFMOW Zonal Railways Railway Board (Mech. & Health Dte.) Nodal Dte. – Mech. **M+8**	@Rs.30 lakhs * 16 = **Rs.4.8 Cr**
6	**a) Air Support**- The Committee recommends that assistance of air support to dispatch the rescue teams to the site of accident and for air lifting of needy, seriously injured passengers to the nearby hospitals should be sought without any delay. DRM/GM may be empowered to seek this assistance as and when required. GMs & DRMs will have full powers. The issue of seeking assistance from Armed Forces for disaster management has been discussed in detail with the Ministry of Defence. It has been agreed that the Divisional/ Zonal Railway authorities can contact the nearest unit	Zonal Railways Secretary/Rly. Bd. **M+1**	

	of the armed forces for any type of assistance for managing the disaster and that would be provided. The communication from Ministry of Defence indicating the contact details of the concerned Army/Air Force/Navy authorities is enclosed as Annexure II. **b)** i. **Leverage NDMA's dedicated air fleet** - NDMA is considering procurement of on fixed wing aircraft and three helicopters at a cost of Rs.225 crores for ensuring effective response in case of disaster. These aircraft/ helicopters can be used for moving Crack Teams to the site of disaster or for shifting seriously injured to hospitals IR may also leverage this facility as and when needed. Necessary coordination can be done by the Ministry's representative in the NDMA. ii. **MOU with armed forces** - Till the above proposal materialises, an MOU with armed forces may be finalised to seek assistance as and when the need arises. iii. **MOUs with private air operators** - General Managers may also explore the feasibility of entering into MOUs with private air operators for seeking assistance of air support in case of disasters over their zone.	Zonal Railways Railway Board (Min. representative in the NDMA Secretary/Rly. Bd. **M+3** Zonal Railways **M+6**	
7	**Upgrade Speed of ARMVs** - Conventional ARMVs should be made fit to run at a maximum speed of the fastest mail/express train running in the area of operation of ARMV. **High Speed ARMVs** – New ARMVs/SPART should be fit for 140 kmph	Zonal Railways ICF Rly. Bd. (Mech. Dte.) **M+6**	No additional financial implications since such upgradation is an ongoing activity.

8	**Upgrade Speed of ARTs** - Speed of ART's to be increased to 100 kmph by conversion of freight stock to high-speed design.	RDSO to issue necessary guidelines. **M+3** Railway workshops to do the conversion. Rly. Bd. (Mech. Dte.) **M+18**	One-time expenditure of **Rs. 2.5 Cr**. For conversion of 500 freight vehicles to high-speed design.
9	**Emergency rail-cum-road vehicle** - Feasibility of introducing an emergency rail-cum-road vehicle may be explored. WCR/Jabalpur may indent one such vehicle for field trials and base it at Jabalpur Division.	Zonal Railways Railway Board (Mech. Dte.) **M+6**	**Rs.2 Cr**
10.	**Ensure specified minimum running of Dsl.locos on all Electrified Routes** - It has been reported to the Committee by a number of General Managers of zonal railways and DRMs that relief, rescue and restoration operation after a serious passenger train accident over electrified route are adversely affected in case of damage to OHE and disruption of power supply as there is a: i. Delay in loco hauled ARME and ART to reach the site of accident. ii. Delay in relief operations i.e. making arrangements for transportation of injured/non-injured passengers for affected/stranded train/trains. iii. Diversion of trains on diesel routes and making corresponding arrangements for carrying passengers. iv. Delay in dispatching 'Relatives Specials' to the accident site. To meet the requirements of relief, restoration and passenger convenience, it has been projected to the Committee	Zonal Railways Railway Board (Traffic & Mech. Dte.) Nodal Dte. - Traffic **M+3**	

	that diesel locos in electrified territories be deployed in such a manner that there is a diesel loco available in 25–75 kms (average 50 kms) of the accident site so that the above-mentioned constraints in approaching the golden hour concept are overcome thus ensuring speedier rescue and relief operations in case of serious accidents disrupting the route or major power breakdown or grid failures, etc. This would ensure that diesel locos are available for running the rescue trains, relief trains, relative specials and for pulling out the unaffected trains with stranded passengers. The Committee recommends that in the interest of readiness and to meet the aspirations of the people for faster medical relief, each Zonal Railway must ensure that the time tabling and freight operations should be so carefully planned in order that the above stipulation is met at all times without vitiating our efforts to approach the golden hour concept		
11.	**First aid training** to be mandatory for all railway personnel, especially for on board train staff, gangmen and station staff who are usually the first responders at site. **MOU for First Aid Training** - Zonal railways (GMs/DRMs) may explore the feasibility of entering into an MOU with reputed training institutes like St. John Ambulance /Red Cross or any other agency for providing periodic training on disaster management (first aid and other medical relief) for the front-line staff over their zones/divisions. The frequency and contents of first aid	Zonal Railways Railway Board (T&MPP & Health Dte.) Nodal Directorate Health Dte. **M+12** Zonal Railways Railway Board (Commercial & concerned Dtes.)	**Rs.0.5 crores**

	training module as well as category of staff being covered should be reviewed thoroughly. As and when the frontline services etc. get privatized, it must be ensured that the private operator must provide a certificate that his onboard staff is trained in first aid and are conversant with other medical resuscitation techniques. Further, it should be the duty of such private staff to play an active role in rescue and relief operations.		
12	**A Manual /Guide for On Board staff** - A guide be made available with train crew like TTEs, AC coach attendants, AC pantry car staff, safaiwala, TXR staff, catering staff, security staff, driver and guard, which inter alia should include Dos and Don'ts for them in the unfortunate event of their train meeting with an accident. Such frontline staff can form the initial core relief and recovery team under the overall supervision of a train superintendent	Zonal Railways Railway Board (Safety, Mech., Health and Commercial Dtes.) **M+6**	
13	**Crack Team of Rail Rescue Experts** - The Committee recommends that each zone should have a professionally trained **Crack Team of Rail Rescue Experts** (Mechanical and Medical officials) and containerised hospitals based at headquarters who can be rushed to any site of accident by air/land route at short notice. This group will continuously be exposed to the latest rescue, extrication techniques and medical relief. This group will support the accident rescue and relief arrangements made by Divisions at the site of accident. **Crack Teams-** These will be Specialized Disaster Response Units:	Zonal Railways Railway Board (Mech. & Health Dtes.) **M + 12**	To be assessed

	- One complete set of sophisticated equipment/ gadgets required for rescue and relief must be available with one specialized disaster response unit at each Zonal headquarters. - Each unit will be provided with state-of-the-art equipment for entrapment rescue from the accident involved coaches and will be kept at the disposal of GM. - Each specialized multi-disciplinary disaster response unit will be manned by 2 platoons (24 men) of handpicked staff. - This specialized disaster response unit (comprising of both men and material) available at Zonal headquarter must be rushed to accident site of a major disaster by Helicopter or along with GM's special train as needed. They would serve as an additional aid. - Specialized response unit must maintain its elite character. It must not be sent to sites of smaller accidents and should only be rushed to sites of major disasters.		
14	**Details of Local Resources**- All Divisions should be fully aware of the local, civil, army and other resources available for supplementing their disaster management efforts as and when required. For example, GSDMA (Gujarat State Disaster Management Authority) informed that 12 well-equipped mobile health centers have been pressed into service over the State. Divisional control office must have a ready updated list of names, addresses, telephone numbers and any other relevant information of the following:	Zonal Railways Railway Board (Safety Dte.) **M+6**	

	a. For every station/section of a Division, fastest approach by rail or road. b. Detailed road maps. c. Locations where a small plane or a helicopter can land (during day or night). d. Local doctors, hospitals, polyclinics, nursing homes, etc. at all major junctions, along with facilities available. e. Officials of civil administration, district-wise. f. Senior officials of state administration. g. Defence establishments, including army, navy, and air force. h. Paramilitary establishments (BSF/CISF, etc.). i. Names & addresses of Divers (Local/Police) j. Names & addresses of Boatmen & Availability of Boats. k. Social, voluntary, industrial, and other non-government organizations. l. Organizations having road cranes, bulldozers, etc. m. Organizations having flood light equipment, etc. n. Establishments having communication facilities, etc. o. Establishments having tents, etc. p. Fire brigade stations. q. Road transport depots – both State Government and private. r. Local AIR and TV stations. Details of relevant items pertaining to each station must be available individually at major stations also. **These details must be reviewed and updated in the month of January every year**		

15	**a) Disaster management plan** - All Divisions and Zonal Railway headquarters (including Metro Kolkata* & DMRC**) must devise their disaster management plan, if not already done taking into consideration the resources available with them, their neighbouring divisions/Zonal Railways, civil authorities, industrial units and Armed Force bases located in their territory. This would enable the Divisions/Zonal Railways to muster the entire local resources in case of a major disaster/natural calamity. Zonal Railways Disaster Management plan should integrate all divisions and also to take into consideration adjacent railways' framework. *Metro operations are more vulnerable to disaster as underground/elevated tracks are bottlenecks to escape routes. Therefore, their disaster management plans should be more stringent and elaborate. CME/ER, CMD/ER and CSO/ER are nominated to review and draw up afresh, if required, the disaster management plan for Kolkata Metro. ** DMRC will be asked to submit their disaster management plan for review of the high-level committee. Recommendations/revisions suggested by the High-Level Committee would be mandatory on part of DMRC to implement within the stipulated time frame. **b) Preparation of Disaster Management Plan**: The Disaster Management Plan must inter alia include "who is responsible for what activities in detail": i. Preparation and implementation of disaster management Plan is the responsibility of concerned	Zonal Railways Railway Board (Safety Dte.) **M+6** **M+3** **M+1** DMRC to submit their Disaster Mgmt. Plan **M+3** DMRC to implement the recommendations	

	GM/DRM. ii. Authority to order ART/ARMV/Breakdown crane--CME/CMPE(R&L)/Sr. DME/DME, etc. iii. Senior most railway officer at the site of the accident shall be the designated Site Manager. iv. Management of rescue operations– Primarily Mechanical and Medical departments. Assistance to be provided by all railway men (irrespective of their department) as needed. v. Relief operations including care for the dead – Commercial, Medical & RPF Deptts. vi. Communication network – Telecom Deptt. vii. Crowd control and law & order at site – RPF. viii. State police clearance for restoration. – RPF ix. Restoration operations – Rolling stock – Mechanical Deptt. Fixed Infrastructure like track, OHE, signalling system etc. – Concerned departments. x. Maintenance of SPART/ART & ARMV Rolling stock/Breakdown cranes including rail-cum-road and road mobile emergency vehicle etc. – Mech. Deptt. xi. Maintenance of equipment kept in SPART/ART/ARMV for rescue and restoration operations– Concerned Deptts. xii. Media Management at site – a) Site Manager shall be the chief spokesman at site and can be assisted by the concerned branch officers, if needed. b) PR/Commercial Deptts. to	Zonal Railways Railway Board (Safety & concerned Dtes. Nodal Dte. – Safety **M+6**	

	look after the media needs at site. xiii. Checklist for the officers & supervisors must be issued in the form of a pocket booklet indicating DOs and DON'Ts for the benefit of: a) First official reaching the site of accident. b) Senior most officer at the site. c) Divisional/HQ control organisation. d) Station Manager/Station Master. **The disaster management plans must be reviewed and updated in the month of January every year**	Zonal Railways Railway Board (Safety & concerned Dtes. Nodal Dte. - Safety **M+6**	
16	**ISO-9000 Certification**: Disaster Management System of each Division/Zonal Railway to be certified ISO-9001:2000	Zonal Railways Railway Board (Safety Dte.) **M+18**	To be assessed
17	**Multi Disaster Resistant Control Rooms**: Zonal/Divl. Control rooms to be upgraded gradually to become multi-disaster resistant and fully equipped with all backup systems for communication, power, drinking water etc. capable of sustaining for a week.	Zonal Railways Railway Board (TT & CE dtes..) Nodal- TT dte.	To be assessed
18.	**Coordination with civil medical authorities**: Data about civil medical/private medical facilities is available on railnet. This should be kept updated. Railway medical officers should remain in touch with civil/private medical institutions for seeking assistance in case of need without any loss of precious time.	Zonal Railways Railway Board (Health Dte.) **M + 3**	
19	**Leverage St. John Ambulance network**- This organization should be utilised to strengthen the arrangements for transportation of injured /dead from	Zonal Railways Railway Board (Health & Comml. Dtes)	

	site to hospitals.	**M+3**	
20	**Assistance of NGOs**- At present NGOs are offering assistance spontaneously. A drive to identify and register NGOs and working out a tie up should be explored by each Division.	Zonal Railways Railway Board (Comml.& Health Dte.) Nodal Dte. – Comml. **M+6**	
21	**Assistance from Neighbouring Divisions**- Whenever number of injuries is estimated to go beyond 50, assistance must be sought for from adjoining Divisions. As a rough thumb rule, the scale of such outside assistance required would be from one Division for every 50 additional injuries.	Zonal Railways Rly. Bd.(Health, Comml. & Safety Dte.) **With immediate effect**	
22	**Expeditious clearance by the State police** - The issue of expeditious clearance by the State police in case of railway accidents involving loss of human lives or injuries to the passengers has been taken up by the Ministry of Railways with Ministry of Home Affairs. Ministry of Home Affairs, Government of India has already issued necessary instructions to Home Secretaries of all States vide their letter No.VI-24022/11/2002-PN-I dt.24/12/2002 for taking prompt action and to expedite clearance certificate in the event of rail accidents. A copy of this letter is annexed at 'III'. In this context, DG/RPF has also clarified that there is no need for seeking the clearance from State police for launching rescue operations for saving as many human lives as possible which inter alia may involve handling/shifting of the rolling stock (locomotives, coaches & wagons). A copy of this letter is annexed at 'III-A' which may be displayed prominently over all ARTs/ARMVs and may also be widely publicised among the railway officers and staff.	Zonal Railways Rly. Bd. (Security Dte.) **With immediate effect**	
23	**Coordination/liaison with state Police & civil authorities**- The	Zonal Railways Railway Board	

	Committee recommends that necessary coordination/liaison must be maintained with the local police and civil authorities by the Divisional authorities and RPF officers to avoid any situation where precious time is lost in seeking the clearance of state police for carrying out rescue operations.	(Security Dte.) **With immediate effect**	
24	**Gang Men to assist in Rescue operations**- As gangmen are available in large numbers and staff of other departments are inadequate, their active assistance may be necessary at site to assist in rescue operations i.e. shifting of dead and injured. This may be made part of their duty list, unequivocal instructions to be issued and enforced.	Zonal Railways Railway Board (CE Dte.) **M+1**	
25	**Guidelines to be displayed in Coaches** - Guidelines may be exhibited in the coach compartments to educate the passengers for taking suitable precautions and actions in case of accident in order to save human lives.	Zonal Railways Railway Board (Mech. & Health Dtes.) Nodal Dte.- Mech. **M+6**	To be assessed
26	**Road Access to vulnerable locations**- Divisions, having bridges, tunnels, high embankments and deep cuttings may explore the feasibility of providing road access to these vulnerable locations in cooperation with civil administration. Alternatively, plans should be kept ready indicating method to reach every kilometre of the rail track by road in case of accident on that Division	Zonal Railways Railway Board (LM Dte.)	To be assessed
27	**Roof & under floor hatches and emergency windows in Coaches**– Emergency windows are being provided in the coaches. However, there are many railway accidents wherein coaches climb over each other	Railway Board (Mech. Dte.) ICF/RCF Cut in date June '03 and existing	To be assessed

	or capsize with the doorways crushed. In such cases, it becomes difficult to extricate the injured/dead since the emergency windows on one side are inaccessible while on the other side take the position of a roof in capsized coaches. Therefore, two roof hatches and one under floor hatch for emergency escape should be provided in all coaches during the next three years	coaches to be covered within 3 years. **M+36**	
28	**Emergency Automatic Lights**- There should be emergency automatic lights in all the coaches. Further, Zonal railways to provide chemical based emergency lights to on board railway staff	Zonal Railways Railway Board (Elect. Dte.) **M+12** (Concerned Dtes.)	To be assessed
29	**Civil engineering agreements** -All open line/construction civil engineering agreements or track related works must include a clause that vehicles and equipment of contractors can be drafted by Railway administration in case of accidents/natural calamities involving human lives.	Zonal Railways Railway Board (CE Dte.) **M+3**	
30	**Hiring of Vehicles for rescue & relief operations** - Delegation of adequate financial powers to DRMs, Sr. DCM/DCM and medical officials for hiring vehicles for transportation and to medical officers for treatment of injured passengers at nonrailway hospitals must be ensured. Adequate cash imprest/permission to withdraw from station earnings be there.	Zonal Railways Railway Board (Comml., Health & Finance Dte.) M+3	
31	**Powers for procurement of additional lifesaving drugs** from the market by Medical Officers at the site must be delegated.	Zonal Railways Railway Board (Health. & Fin. Dte.) Nodal Dte.- Health. **M+3**	
32	**Power for making on the spot payment to private** hospitals for	Zonal Railways Railway Board	

	treatment of injured must be delegated. Medical manual may be amended suitably.	(Health. & Fin. Dte.) Nodal Dte.- Health. **M+3**	
33	**Requisitioning the medical assistance from the civil side -** Station Master/Station Manager must be delegated adequate powers for requisitioning the medical assistance from the civil side in case of a disaster happening under his jurisdiction. Adequate powers for on-the-spot purchase of essential items including medicine must also be delegated	Zonal Railways Railway Board (Safety, Health & Fin. Dte.) Nodal Dte.- Safety. **M+5**	
34	**Withdrawal of money from station earnings**- There will be no restriction on withdrawal of money from station earnings for rescue and relief operations for Commercial, Safety, Medical and Mechanical officers	Zonal Railways Railway Board (Finance & Comml. Dtes.) **M+3**	
35	**Delegation of adequate financial powers** to DRM and concerned Branch Officers (Mech., Medical and Commercial) to ensure quicker rescue operations.	Zonal Railways Railway Board (Finance Dte.) **M+3** By June '03	
36	**Purchase Powers**- Divisional and HQ Mechanical and Medical officers to be given purchase powers of Stores Officers for ART/ARME rolling stock and all equipment contained therein in line with such power already given to Engineering officers.	Zonal Railways Railway Board (Mech., Health, Stores & Fin. Dte.) Nodal Dte. – Mech. **M+6**	
37	**Procurement of ART/ARMV equipment**- No item/equipment shall be banned while being purchased for ART/ARMV/ breakdown crane. No circular/orders restricting the purchase procedure/powers for ART/ARMV/Crane equipment shall be applicable unless issued by Railway Board (MM & FC).	Zonal Railways Railway Board (Mech. & Fin. Dte.) Nodal Dte.- Mech. **M+3**	

38	**Standing spot purchase Committee for ART/ARMV**- To avoid any deficiency in keeping the ART/ARMV/Crane equipment in good fettle, each Division should have a Standing spot purchase Committee for ART/ARMV which inter alia should include DME/Sr. DME, DAO/Sr. DAO & DMO/Sr. DMO as permanent members and DEE(G)/Sr. DEE(G) & DSTE/Sr. DSTE as additional member as per requirement. Similarly, Standing Spot Purchase Committee at SAG level should exist at each Zonal railway headquarters	Zonal Railways Railway Board (Mech. & Fin. Dte.) Nodal Dte.- Mech. **M+3**	
39	**Full powers for sanctioning cash imprest** for maintaining ART/ARMV/Crane to be given to CME without Finance concurrence.	Zonal Railways Railway Board (Mech. & Fin. Dte.) Nodal Dte.- Mech. **M+3**	
40	**Individual purchase ceiling for ART/ARMV/Crane equipment** of Rs.1000 to be enhanced to 10,000 under normal circumstances and up to Rs.50,000 with the approval of DRM/CMPE/CRSE without Finance vetting.	Zonal Railways Railway Board (Mech. & Fin. Dte.) Nodal Dte.- Mech. **M+3**	
41	**Cash imprest for ARMV incharges** - A monetary imprest is required to be provided at the accident site for expeditious procurement of small items like fuel, food materials etc. which may be essential when the ARMV has to remain at accident site for longer periods. Cash imprest of Rs.5000/- can be provided to ARMV incharge for use during exigencies at the accident site.	Zonal Railways Railway Board (Health & Fin. Dtes.) **M+3**	
42	Cash Imprest with ART incharges- The imprest with all ART incharges should be raised to Rs.25,000/- as also recommended by RSRC	Zonal Railways Railway Board (Mech. & Fin. Dte.)	

		M+3	
43	**a) Satellite phones** – All Divisional and HQs control rooms have been provided with one satellite phone each. Instructions have also been issued for providing an additional satellite phone at each HQ and Divisional control room. **b) One ISD connection at Each Zonal HQ control and Division** control should be provided to establish communication with accident site through satellite phone. **c) Specific DOT telephone No. for Railway Accident**: - This issue was taken up by the committee with Ministry of Communication. It is understood that a four digit no.107 X ('X' is a specific digit to be allotted to Railway by DOT) can be specified for this purpose. The committee recommends that necessary modalities may be worked out with DOT for allotment of a specific four digit number.	Zonal Railways Railway Board (Telecom Dte.) **M+3**	
44	**Powers to hire Cell phones**- In case of a passenger train accident, at a station, which has a cell phone connectivity, a few cell phone should be immediately hired by the Station Master and the stranded passengers should be permitted to use these free of charge. It is learnt from RailTel that within one year, cell phone coverage will be available along the track in most areas. Station Manager should have powers to hire cell phones as needed for use of stranded passengers.	Zonal Railways Railway Board (Telecom & Fin. Dte.) Nodal Dte.- Telecom **M+3**	
45	**Alphabetical list of passengers on board** with their current status must be available and displayed and enquiry counters for quicker dissemination of	Zonal Railways Railway Board (Comml. Dte.) With immediate	

	information.	effect	
46	**Disaster Management Team of RPF**- There should be a Disaster Management Team of RPF on each Division of IR comprising about 15 men in different ranks. This team shall be specially trained in providing necessary support for disaster management over the division/neighbouring division. RPF should play an active role in managing law and order at site.	Zonal Railways Railway Board (Security Dte.) **M+3**	
47	**Equipment for RPF**: This Disaster Management team of RPF should have the following equipment available with them: i. Torches and other lighting arrangements. ii. Nylon ropes and poles for segregating the affected area from unwanted visitors and spectators. iii. Loud hailer for making announcements. iv. Stretchers and first aid equipment. v. Wireless sets for inter-communication. vi. Cameras for photographing the scenes	Zonal Railways Railway Board (Security Dte.) **M+3**	To be assessed
48	**Luminous jackets**: RPF personnel at site should wear luminous jackets of distinct colour.	Zonal Railways Railway Board (Security Dte.) **M+3**	To be assessed
49	**Crowd control**: Area of accident site should be cordoned off by the RPF so that by-standers (onlookers) and unwanted crowd do not disrupt the rescue operations.	Zonal Railways Railway Board (Security Dte.) **M+3**	

2. Relief measures for injured and survivors:

Sl. No.	Recommendations of the High-Level Committee	Who will do it & by when?	Financial Implications
50	**Safe custody & appropriate disposal of the luggage**: RPF and Commercial staff at the site of accident should coordinate their activities regarding safe custody and appropriate disposal of the luggage of the dead and the injured passengers. Commercial staff should properly label and stack the luggage of the dead and injured passengers. This luggage should be guarded by RPF personnel and thereafter can be handed over to the rightful claimants.	Zonal Railways Railway Board (Security & Comml. Dtes.) Nodal Dte.- Comml. **M+3**	
51	**Accident Claims Compensation Booklet**- Railway Board should prepare a comprehensive Accident Claims Compensation Booklet. Above booklet can be priced publication complementary copies of which can be given to accident involved passengers.	Rly. Board (Claims Dte.) **M+6**	
52	**No payment of meal charges at accident site** – Existing instructions stipulate that the meal charges have to be paid at the site of accident. This involves large amount of paper work as well as cash handling at accident site. This also diverts the management's attention from the main objective of rescue and restoration. The Committee recommends that meal charges as admissible should be added to the salary of the staff concerned to avoid cash handling at site.	Zonal Railways Rly. Board (CE, Mech.& Health) **M+3**	

3. Care for the dead

Sl. No.	Recommendations of the High-level Committee	Who will do it & By when?	Financial Implications
53	**20 Nos. of Collapsible coffins** must be kept at each Divisional hospital, which can be transported to the site by ARMV, road vehicles or train service as per need. The design is under finalization and should be circulated to railways by Health Dte	Zonal Railways Railway Board (Health Dte.) **M+3**	**Rs.0.15 Cr.**
54	**Air-conditioned mortuaries** - All divisional hospitals should have air-conditioned mortuaries which can store at least six bodies.	Zonal Railways Railway Board (Health Dte.) **M+12**	**Rs.0.5 Cr.**
55	**Embalming Gun and Chemicals** - All divisional hospitals should have a provision of embalming gun and chemicals for injecting into the bodies. This will ensure that bodies are preserved for reasonable time and if necessary the bodies can be transported to divisional hospital till claimed by relatives.	Zonal Railways Railway Board (Health Dte.) **M+6**	**Rs.0.67 Cr.** (@1 lakh per gun)

4. Technological Inputs in ARMs/ARTs

Sl. No.	Recommendations of the High-level Committee	Who will do it & By when?	Financial Implications
56	**Review, rationalization and relocation of ARTs and ARMVs** – An exercise should be undertaken to address the aberrations, if any, by way of unreasonable clusters or long gaps in the existing placement of the ARTs or ARMVs over IR network.	Railway Board (Mech. & Health Dtes.) **M+3**	
57	**Nominated staff for ARMV and ART** -The present pattern of staffing is not found to be adequate in case of serious accidents involving heavy casualties. There is a need to nominate more	Zonal Railways Railway Board (Mech. & Health Dtes.) **M+3**	

	trained staff for each ARMV/ART.		
58	**Air Brake ARTs**- All coaching and freight stock on ART's should be provided with air-brake system, either by replacing existing stock or by retro fitment of air-brake equipment on existing stock.	Zonal Railways Railway Board (Mech. Dte.) **M+6**	No additional financial expense since such conversion is an ongoing activity. Already a sanctioned work under RSP as part of normal coaching upgradation.
59	**Rebuilt Coaches for ARTs/ARMVs**- Coaches given mid-life rehabilitation at Bhopal Workshop to be rebuilt for ARMV & ART. Such stock should be additionally provided in the bare requirement for train operation.	Zonal Railways to indicate their require-ment. Bhopal Workshop to do the conversion work. Railway Board (Mech. Dte.) Within 3 years (2003-06)	Cost of rebuilding @ 15 lakhs per coach works out to **Rs.7.5 Cr.** for 50 coaches.
60	**Provision Of Emergency Inflatable Lighting Towers** @ two per ARMV and four per A & B Class ART for effective general illumination. Possibility of using external power to light the tower may be examined.	Zonal Railways Railway Board (Mech. Dte.) **M+6**	**Rs.8.2 Cr**
61	**Oxy Fuel Cutting Equipment**- Provision of one set of oxyfuel cutting equipment for all SPARTs.	Zonal Railways Railway Board (Mech. Dte.) **M+6**	**Rs.2 Cr.**
62	**Portable electrically operated cutting and boring tools**- The Committee recommends provision of 1 set portable electrically operated cutting and boring tools comprising trepanner, shell shearer, channel cutter and bar cutter in	Zonal Railways Railway Board (Mech. Dte.) **M+6**	**Rs.1.4 Cr.** @ Rs 1.75 lakhs per set

	each SPART.		
63	**Provision of self-contained breathing apparatus**, @ 4 sets in each 'A' class ART for dealing with accidents involving LPG, Ammonia and other Toxic gases.	Zonal Railways Railway Board (Mech. & Health Dte.) Nodal Dte.- Health **M+6**	**Rs 3.5 Cr**
64	**Inflatable Air Bags-** Provision of inflatable Air Bags in all SPART's.	Zonal Railways Railway Board (Mech. Dte.) **M+6**	**Rs 2.5 Cr.**
65	**One digital video and still camera** each with 5-6 floppy discs may be provided in each Division to be kept for each ART/ARMV/SPART.	Zonal Railways Railway Board (Mech. Dte.) **M+6**	**Rs 0.5 Cr**
66	**Provision of a laptop computer** for accident relief operations (with Sr. DME/DME) (one per Division).	Zonal Railways Railway Board (Mech. Dte.) **M+6**	Rs.67 * 1 lakh = **Rs.0.67 Cr**
67	**Charging Facilities**: Charging facilities for Laptop, cell phones and cameras etc. may be provided in all SPARTs and A & B class ARTs/ARMVs.	Zonal Railways Railway Board (Mech. Dte.) **M+6**	
68	**Provision of Inflatable tents** in 16 SPART's initially. In the second phase, it should be provided in all SPARTs.	Zonal Railways Railway Board (Mech. Dte.) **M+6**	**Rs.2 Cr.**
69	**Provision of Synthetic packings** in all ART's with 140 tonne crane in lieu of wooden packing.	Zonal Railways Railway Board (Mech. Dte.) **M+6**	**Rs.4 Cr.**
70	**Provision of one set of re-railing ramps** in all 'A' & 'B' class ART's for re-railing derailed locomotives wagons and coaches.	Zonal Railways Railway Board (Mech. Dte.) **M+6**	**Rs.0.5 Cr**
71	**New ARMV and ART coaches** should be manufactured / rebuilt on the pattern **of Swiss Federal Railways**, where the side panel unfolds and drops down like a ladder for easy unloading of equipment	RDSO to develop the design. Railway Board (Mech. Dte.) **M+4**	Marginal

72	**Provision of luminescent barrier tapes** in all 'A' & 'B' Class ART's to assist RPF to barricade the work site to prevent tress passers from disturbing the ongoing rescue/relief/restoration operations.	Zonal Railways Railway Board (Mech. Dte.) **M+3**	**Rs.0.15 Cr**
73	**Livery of ART/ARMV Staff**- The livery of ART coaches should be based on signal red colour. For ARMV, the colour scheme should be signal red with white cross on either end.	Zonal Railways Railway Board (Mech. Dte.) **When coaches are replaced or given POH**	No additional financial expense since change of livery would be at POH only
74	**Provision of 20 stackable plastic chairs** in each ART and ARMV/SPARTs.	Zonal Railways Railway Board (Mech. Dte.) **M+3**	**Rs.0.16 Cr.**
75	**Provision of nylon slings of capacity up to 70 ton**, which being lighter in weight shall help in speeding up the operations	Zonal Railways Railway Board (Mech. Dte.) **M+3**	**Rs.1.2 Cr.**
76	**TRIFOR**- Induction of wire rope lifting and pulling machines known as Trifor	Zonal Railways Railway Board (Mech. Dte.) **M+3**	Inexpensive device (Rs 5000), already available in many ART's
77	**Introduction of automatic and spring-loaded measuring gauges** for the measurement of track and rolling stock parameters.	Zonal Railways Railway Board (Mech. Dte.) **M+3**	**Rs.0.19 Cr.**
78	**Steam cranes attached to Accident Relief Trains may be phased out**. For Meter Gauge sections RDSO & Jamalpur Workshop may design and develop such a 75 Tonne crane which can be eventually converted to BG crane of equal capacity with least inputs	Jamalpur Workshop RDSO Railway Board (Mech. Dte.) **M+9**	**Rs.4 Cr.** for each MG crane
79	**POH Periodicity of ART/ARMV Coaches**- ART/ARMV coaches may be	Zonal Railways Railway Board	Savings of **Rs.9.5 Cr.**

	given POH in 3 1/2 years instead of 2 years as at present. For coaches given POH henceforth the return date may be marked 3 1/2 years later, with a maximum limit of 4 years for any extensions that are given on the Railways.	(Mech. Dte.) **M+3**	each year
80	**Ten coffins and body bags** may be provided in each ARMV's in an under-slung area below the underframe of the coach.	Zonal Railways Railway Board (Health Dte.) **M+3**	**Rs.0.15 Cr.**
81	**Wrist bands** may be provided in ARMVs to identify the injured and dead. 100 serially numbered plastic tokens with tapes (1-100) are proposed to be kept in ARMVs, to be tied to the right wrist of the deceased persons and names are written in the list duly connecting to the token number	Zonal Railways Railway Board (Mech. Dte.) **M+3**	To be assessed
82	**Lightweight foldable ladders** of adequate length may be provided in each ART/ARMV.	Zonal Railways Railway Board (Mech. Dte.) **M+3**	
83	**140 Tonnes Break Down Crane**- There should be a minimum of one 140 tonne breakdown crane in each BG division over Indian Railways. The availability and requirement may be reviewed by EDs' Committee after 2 years.	Zonal Railways Railway Board (Mech. Dte.)	
84	**Rescue platform for 140T crane**: RDSO should finalise a design of a platform, which can be hooked on, with the zip of the 140 tonne crane to assist the rescuers in their effort to extricate accident victims from accident-involved coaches, which are not accessible otherwise.	RDSO Railway Board (Mech. Dte.) **M+6**	To be assessed
85	Revised List of ARMV Equipment- A revised list of equipment/materials to be available in ARMV issued by the health Dte. is indicated below Contents of ARMV -- All contents of ARMV scale	Zonal Railways Railway Board (Mech. Dte.) **M+6** **The revised list**	

	I in accordance with Annexure-I of IRMM-2000 Vol. II are proposed to be retained with the following modifications/additions: i. Existing tents in some ARMVs are of old canvas types which take more than 30 minutes for pitching. Light weight synthetic prefabricated waterproof tents can replace existing canvas tents. Synthetic tents can be pitched promptly by two people only in 10 -15-minute time. ii. Thirty number of luminous jackets duly containing white cross on red background are proposed to be provided in each ARMV for use by rescue workers. This will facilitate their ready identification. iii. Four additional number of foldable chairs are proposed to be provided in ARMVs. iv. Portable fire extinguishers – 2 numbers to be provided in the ARMV. v. Augmented first aid boxes- 2 numbers are to be provided in ARMV. vi. 25 number of readymade splints for arm and forearm and 25 number of readymade slings to be provided in ARMVs. vii. One portable generator set with sufficient reserve fuel is proposed to be provided. viii. Battery operated headlights for medical and paramedical staff- 5 number to be provided. ix. Inj. and Tab,. Analgin be replaced by Inj. And Tab. Paracetamol. x. Dettol to be replaced by Betadine/Cidex unit for unit. xi. Anti-inflammatory, analgesic and	**should be implemented**	

	antibiotic ointments for local application and lotions are proposed to be replaced by sets of anti-inflammatory, analgesic, antiseptic, aerosol sprays unit for unit. xii. Dressings in autoclaved drums are proposed to be replaced by pre-sterilized disposal dressing of assorted sizes. xiii. Seldinger nine -Tracheotomy set (1 number) is proposed to be provided. xiv. Inflatable tourniquet (10 numbers) are proposed to be provided. xv. Spinal splint (10 numbers) are proposed to be provided.		
86	**Breakdown staff** should be handpicked and there should not be any fixed tenure. A core group of dedicated men should be kept exclusively for ensuring proper maintenance of ART/ARMV/Crane and rescue and relief equipment.	Zonal Railways Railway Board (Mech. Dte.) **M+6**	
87	**The duty list of all ARMV/ART staff and supervisors** should inter alia include that they shall assist in extricating injured as well as the dead. Only those staff and supervisors should be posted in the breakdown gang and on the ARMV who are willing to do the same and give written confirmation.	Zonal Railways Railway Board (Mech. Dte.) **M+3**	
88	**All ARMV/ART coaches should have a standby arrangement of generator** for the train lighting and air conditioning wherever required besides providing power for portable torchlights, floodlights, drills, abrasive metal cutters, etc.	Zonal Railways Railway Board (Mech. Dte.) **M+9**	To be assessed
89	**A portable rail trolley**- which can be easily disassembled/assembled has been designed by NER for use on the site for moving the heavy equipment from ART to the required point at site. This should form part of ART/ARMV for carrying material.	Zonal Railways Railway Board (Mech. Dte.) **M+9**	To be assessed

90	**Standby Driver for 140 Tonne Crane**- Each 140 T crane must have an extra standby driver, fully trained in all respects.	Zonal Railways Railway Board (Mech. Dte.) **M+2**	
91	**Specialised tunnel rescue equipment**- ARMVs/ARTs of Divisions including Metros (Kolkota & DMRC) that have sections comprising of long tunnels must be provided with additional specialised tunnel rescue equipment.	Zonal Railways Railway Board (Mech. Dte.)	To be assessed
92	**Ramps**- Each ART must have ramps for re-railment of rolling stock.	Zonal Railways Railway Board (Mech. Dte.) **M+3**	
93	**Concrete pathway for approach to ART/ARMV**– There should be a properly illuminated concrete pathway for approach to ART, ARMV and breakdown cranes.	Zonal Railways Railway Board (Mech. Dte.) **M+3**	**Rs.0.5 Cr**
94	**AMCs for critical equipment** - Railways may enter into Annual Maintenance Contracts with OEMs or their authorized agents for critical equipment. The need may be decided by CMPE(R&L)/CRSE on case to case basis and he shall have full powers for approving such AMCs.	Zonal Railways Railway Board (Mech. & Fin. Dte.) **M+6**	No additional expense
95	**Critical spares from approved sources only**- The approved vendor list may be drawn up as follows: i. for HRD/HRE- by **COFMOW** ii. for 140 T Cranes - by JMP/Parel Workshop & iii. (iii) For other items - by CME's. Powers to purchase on PAC from these approved vendors should vest with Mechanical & Medical officers in charge of ART/Crane/ARMV.	Zonal Railways Railway Board (Mech. & Fin. Dte.) **M+3**	No additional expense
96	**Walkie-Talkie & VHF sets** -- ARTs at Divisional Headquarters to be provided with 30 Walkie-Talkie sets and two 25 W VHF sets.	Zonal Railways Railway Board (Telecom Dte.) **M+6**	**Rs.5 Cr**

97	**WLL exchange having 50-line capacity** - ARTs at Divisional Headquarters to be provided with one WLL exchange having 50 line capacity. To begin with 16 divisions will be provided with such exchanges during 2003-04 and, based on experience, rest may be provided during 2004-05.	Zonal Railways Railway Board (Telecom Dte.) **M+9**	**Rs.35 Cr.** (Rs.50 lakhs each) **2003-04 Rs.8 Cr. 2004-05 Rs.27 Cr.**
98	**Video Conferencing facilities from the site of accident** – It is proposed to provide Video Conferencing facility from disaster site to Railway Board and Zonal Railway Headquarter, which will help in assessing the damage and relief and assistance required at the site. Initially, the Video Conferencing equipment will be provided in Railway Board and transportable units will be kept in one railway headquarter at a cost of Rs.1.3 Crore. Based on experience gained with the above units, decision could be taken to provide such facility at other Zonal Railway HQs also.	Zonal Railways Railway Board (Telecom Dte.) **M+6**	(Rs.0.8 crore each for transportable unit for 16 zonal headquarters and **Rs.0.50 Cr.** each for fixed unit for 16 Zonal Headquarters and 1 at Rly. Board) **Outlay 2003-04 - Rs.1.3 Cr.**
99	**Divisional ARTs to be provided with one PC along with high-speed satellite modem (for Internet connectivity).** Further, facility to provide phone for stranded passenger to be included through VOIP.	Zonal Railways Railway Board (Telecom Dte.) **M+9**	**Rs.1.80** Cr. (Rs.2.5 lakhs each for 67 divisions and 4 Zonal Headquarters, where Internet connectivity Through Railnet is available).

5. HRD Training

Sl. No.	Recommendations of the High-level Committee	Who will do it & By when?	Financial Implications
100	**Railway Disaster Management Institute with a special focus on Rescue, Extrication, Medical relief and restoration techniques** - RSRC (in their Part-II report) had recommended the following vide recommendation No.3.18.4 & 3.18.5: i. Setting up of disaster training cells at zonal training centers of each railway. ii. A system of licensing of all ART staff (skill artisans and above) based on successful completion of an initial training programme and refresher courses in alternative years. iii. Training to include- a. Administration of first aid and evacuation/extrication of injured passengers *Handling of traumatized passengers b. Fire Fighting c. Overall management during major accidents. This recommendation has been partially accepted. The Committee notes that there is no such facility for imparting integrated training anywhere in the country. The Committee recommends that Disaster Management modules should be started at an initial cost of Rs.3 Cr each for ZTC/UDZ. ZTC/Bhuli, IRITM/LKO and STS/SBC. This facility can be replicated to a limited extent at other places in a phased manner. The disaster management module to be	Zonal Railways Railway Board (Safety, Mech. & Health Dte.) **M + 36** Southern Railway Railway Board (Mech. & Health Dte.) Nodal- Mech. Dte. **M + 36**	**Rs.19 Cr. Outlay** 2003-04 – **Rs.4 Cr.** 2004-05 – **Rs.4 Cr.** 2005-06 – **Rs.4 Cr**

	set up at STS/SBC should lay special focus on imparting extensive state of the art training on rescue, medical relief and rolling stock restoration techniques. In this context, the state-of-the-art special training equipment for extrication techniques, rescue, medical relief, rolling stock restoration and the software required for training of rescuers in virtual reality will need to be imported/developed in consultation with similar reputed institutes/organizations abroad. This would require an additional investment of around Rs.7 Cr at STS/SBC. Training requirements that need to be addressed for rescue, relief and restoration techniques are annexed at 'IV'. Since such an institute specializing in state-of-the-art rescue, medical and restoration techniques will be first of its kind over IR, it is recommended that a consultancy may be awarded to an international reputed organization engaged in setting up/running such institutes abroad.		
101	**Basic training in search and rescue**-It has been proposed to impart basic training in search and rescue to the 12 specialized rescue and relief teams of NDMA so that the nearest available unit can respond in case of need. The High–Level Committee on Disaster Management constituted by the Ministry of Railways recommends that Group 'A' Railway officers (Mechanical, Safety and Medical) should also be nominated to undergo the proposed basic course in rescue and relief. Further, lessons in Railway Disaster Management will also form the part of rotational training programme and refresher and promotional course at	Zonal Railways RSC Railway Board (T&MPP, Mech. & Health Dte.) **M+12**	To be assessed

	RSC, ZTS & STS.		
102	**Manual on rescue, relief and restoration management** – There is an urgent need of devising and formulating a manual on post-accident rescue & relief operations. The disaster management institute nominated to be developed as a pioneer premier railway institute specialising in extrication, rescue, medical relief and rolling stock restoration techniques shall prepare this manual	Railway Board (Mech. & Health Dtes) Nodal Dte. - Mech. **M+24**	
103	**Human Resource Development**: NDMA proposes to train the local administration in the basics of search, rescue and relief. The national centre for Disaster Management may be asked to work out a plan for this as well as suggest a syllabi for different category of staff which can be built into their initial and refresher training courses. Similarly, the higher management at the site of disaster is handled by District Magistrates/Commissioners and it has been proposed that a capsule course in Disaster Management should form an integral part of IAS and IPS probationers' training. The Committee recommends that similar courses should be built into the probationers' training course of all organised Group 'A' services of railways at RSC and should include one full scale exercise.	Railway Board (T&MPP) RSC **M+12**	To be assessed
104	**Around 5 to 10 disaster management**-training films covering various types of accidents/disasters may be prepared and given to all divisions over Indian Railways.	Railway Board (Mech., Safety & PR Dtes.) Nodal Dte. – Mech. **M+9**	Rs.2 Cr
105	**Periodic training on disaster management for front line staff** - Frontline staff such as RPF, TTEs,	Zonal Railways Railway Board (T&MPP,	To be assessed

	catering staff, TXR, AC attendants, safaiwalas, guard, driver/assistant driver, PWIs, gangman, etc. are usually the first responders in case of an accident. They can form the initial core relief and recovery team. Therefore, periodic training on disaster management for such front-line staff may be organised over zonal railways (ZTS/STS).	Mechanical, Safety, Health and Commercial Dtes.) **M+6**	
106	**Full scale disaster management exercise** - Each division should conduct one full scale disaster management exercise on the similar exercise as army exercises are conducted once in a year.	Zonal Railways Railway Board (Safety, Mech. & Health Dtes.) **M+6**	
107	**Training to handle Fire Related Disasters** - We need to acquire the capability and specific specialisation to handle fire related disasters both in case of goods trains as well as passenger trains. Since inflammable material like naphtha, LPG, diesel/kerosene and other fuels are transported through tank wagons, there exist a vulnerability to fire and explosion. We must equip our ARTs and train our ARTs staff to handle fire related accidents. Assistance of Nagpur Fire College and Oil industry's Safety Coordination Committee may be sought	Zonal Railways Railway Board (T&MPP & Mech. Dte.) Nodal Dte. - Mech. **M+12**	To be assessed

6. Media Management

Sl. No.	Recommendations of the High-level Committee	Who will do it & By when?	Financial Implications
108	**Training in crisis communication** - During the last decade, electronic and IT revolution has brought about a significant improvement in media coverage. Therefore, the subjects of	Zonal Railways RSC Railway Board (PR & T&MPP Dtes.)	To be assessed

	media management and crisis communication have assumed vital importance for all service organisations including IR. The Committee recommends that these topics may be covered at RSC during probationers' training. Further, GMs/PHODs/DRMs/ADRMs and concerned branch officers (Sr.DCM/Sr.DME/Sr.DSO & Medical Officers) should be trained on these topics by organizing special courses either at zonal railways or at RSC. Further, short workshops be arranged specially for GMs/PHODs at Railway Board or Zonal Railways' level. Assistance of Institute of Mass Communication or specialized agencies be taken, if required.	**M+6**	

7. Recommendations for Implementation

Sl. No.	Recommendations of the High-level Committee	Who will do it and by when	Financial Implications
109	**Monitoring Implementation of the Accepted Recommendations**: It shall be the responsibility of the concerned GM/DRM over their systems. All concerned GMs shall send quarterly feedback on the implementation status of the accepted recommendations to the Board (concerned Dtes.)	Zonal Railways Railway Board (Concerned Dtes.) Nodal Dte.-Mech.	
110	**Monitoring Implementation and addressing left out issues**: In order to ensure expeditious implementation of the above recommendations and to address the issues not covered by the high level committee due to paucity of time, it is recommended that another committee headed by AM(ME) with the following members : ED(Safety),	Railway Board Nodal Dte.-Mech	

	ED(Health), ED(F), DME (Frt.), DME(P)II & Director(Telecom) may be nominated. This committee shall function under the overall direction and guidance of the high-level committee (MM- Convenor, MT, FC, DG/RHS & DG/RPF) and shall also review and revise the financial implications of individual recommendations, if required, besides addressing the following issues: a. Addressing all types of disasters, for example, **i. Earthquakes,** **ii. Floods & Cyclones,** **iii. Industrial accidents** **iv. Accidents involving trains carrying explosives/inflammable/ hazardous material,** **v. Fires.** b. To study the Disaster Management Systems prevalent in other countries and adopt/ leverage their strengths. c. Sharply focusing on the training needs for keeping the system in a state of alertness and to evolve a highly professional crisis management all over IR. d. The committee headed by AM(ME) should dovetail the Railway Disaster Management Plan with the NDMA's Global Disaster Management Plan for the country.		
111	Adopt latest techniques/equipment for rescue and relief used by developed countries: The above multi- disciplinary Committees may be deputed abroad for a study tour to some developed countries to learn about the latest	Railway Board Nodal Dte.- Mech	

	systems/techniques being utilised for railway disaster management. These committees would identify the reputed institution/institutions for possible tie up with IR and the areas of cooperation as well. The committees would also indicate the milestones expected to be achieved with such tie-ups along with financial implications for the same. Thereafter, further necessary inputs to strengthen the IR disaster management system, keeping in mind the NDMA's plans and the new technologies that are adopted, may be finalized.		

17. The committee recommends that above mentioned 111 recommendations may be accepted and recommendation nos. 1-109 may be implemented over the Zonal railways as per the time frame indicated against each.

(S. Dhasarathy)
Member Mechanical
& Convenor

(M. C. Srivastava)
Member Traffic

(V. Vishwanathan)
Financial
Commissioner

(Dr. K. Suresh)
Director General
Railway Health Services

(Dr. A. K. Pandey)
Director General
Railway Protection Force

REPORT OF
TASK FORCE ON SAFETY

FOR OFFICIAL USE ONLY



Government of India
Ministry of Railways

REPORT
OF
TASK FORCE ON SAFETY

10 January 2017

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS (RAILWAY BOARD)
TASK FORCE ON SAFETY

Secretary,
Railway Board,
Ministry of Railways (Railway Board)
New Delhi

Dear Sir,

Submission of Report

We are happy to submit the Report of the Task Force on Safety, constituted by the Ministry of Railways vide letter no. ERB-I/2016/23/66, dated: 06-12-2016. The Task force made an interim presentation to the Board and General Managers on 29th December delineating some key issues, which needed immediate attention of Indian Railways' Management at all levels. We feel that action on these key points would bring about immediate improvement in the Safety levels in the Railways. A copy of the presentation is attached at the end of the report as an annexure.

The Detailed Report submitted herewith lays down **Short-, Medium- and Long-Term Interventions** required to bring the Standards of Safety in Train Operations and other aspects of Railway functioning to a high, yet sustainable level, and lays down the Technological and Organizational Initiatives to achieve it.

We thank you for the opportunity given to us to contribute to this Important aspect of Train Operations.

ARUN SAKSENA
(Chairman)
General Manager,
North Central Railway

SATISH KUMAR
(Member)
Addl. General Manager,
Eastern Railway

S. ANANTHARAMAN
(Member)
Chief Operations Manager,
Southern Railway

SHUBHRANSHU
(Convener)
Chief Safety Officer
Central Railway

JOHN THOMAS
(Member)
Chief Electrical Engineer
South Central Railway

New Delhi
10th January 2017

भारत सरकार **(GOVERNMENT OF INDIA)**
रेल मंत्रालय **(MINISTRY OF RAILWAYS)**
रेलवे बोर्ड **(RAILWAY BOARD)**

No. ERB-I/2016/23/66 **New Delhi, dated 06.12.2016.**

ORDER

Ministry of Railways (Railway Board) have decided to constitute a Task Force to suggest system and process to improve the safety performance of Indian Railways. The Task Force will consist of the following: -

(i) Mr. Arun Saxena, General Manager/N.C.Railway …. Chairman
(ii) Mr. Shubranshu, CSO/Central Railway …. Convenor
(iii) Mr. Satish Kumar, AGM/Eastern Railway …. Member
(iv) Mr. Ananthraman, COM/Southern R …. Member
(v) Mr. John Thomas, CEE/S.C.Railway …. Member

2. The Terms of reference of the Task Force will be as under: -

1) To conduct data analysis, analysis of samples of previous investigation reports, field interviews etc. to develop a factual view on potential solutions.
2) To identify 4-5 big actionable interventions across each area to improve safety performance i.e. Roiling Stock, Track, OHE, Points and Crossing, Organizational interventions etc.; and
3) For each of the interventions, to develop an implementation plan, clearly laying out who needs to do what by when.

3. The Task Force should submit its succinct and actionable report within two weeks from the date of constitution of the Task Force.

4. The Headquarters of the Task Force will be in New Delhi.

5. Safety Directorate of Railway Board will be the Nodal Directorate for functioning of the Task Force. Therefore, all related works/issues including Parl. Questions, RTI cases, their execution, and other formalities with regard to the Task Force, should be dealt with by Safety Directorate.

6. The Chairman, Convenor and Members of the Task Force will draw TA/DA as per extant Rules.

06/12/16

(Adesh Kumar)
Under Secretary (Estt.)
Railway Board

PREFACE

Members of the Task Force have deliberated on the shortcomings that beset Safety in Indian Railways and solutions to overcome these and to create an environment that nurture a culture of safety, encourage honesty in admitting failures and provide a lasting framework to sustain it, both organizationally and technologically.

2. While we do recommend induction of technology to move away from errors in human judgement and to provide consistency in maintenance standards and response to unsafe situations, we also strongly feel that return to the basic principles of safety and established & proven ways of our working must be given the highest priority. Some of these are laid down in our elaborately enshrined rules in the form of Manuals, Codes, Maintenance Instructions, Technical Guidelines, and Instructions. Some others are laid down in our system of Inspections and their follow-up. Inspection is not only a means to find mistakes and shortcomings, but also provides a first-hand opportunity to Officers and Supervisors to meet the staff in the field and to guide and counsel them.

3. "Going Back to Basics" should be the safety theme of Indian Railways at all times. Shortcuts and workarounds, howsoever easy, tempting, and practical they may seem, must be shunned at all costs. In other words, maintenance practices must be followed to the letter – correct material, fittings and spares as provided in Manuals must be provided without fail, training of staff kept up to date through promotional and refresher courses as well as through direct interaction. Personal whims and convenient interpretation of rules by officers and Supervisors should not be allowed to play havoc with the basic tenets of safety. It would be the role of senior officers to ensure this.

4. As the speeds and throughput increase and availability of staff per unit asset falls, there is a need to adopt a technological strategy of Online Monitoring of all Assets, Fixed & Rolling Stock,

so as to create a Platform for Condition Based Predictive Maintenance for Zero Defects.

5. Technical Specifications of sub-assemblies, spares and tools & plants must be drawn stringently, and suppliers must be chosen carefully. New technology must come with suitable upgradation of skills of those who handle it and a long-term support system from the suppliers and industry at large.

6. There is also a need to provide for funds in our budget for safety works and safety items on topmost priority. Depreciation Reserve Fund must be adequately endowed to enable renewal of old and worn-out assets as an organisational objective sans compromise.

7. Empowerment of field officials is a continuously running theme in the Report. Some of the recommendations will appear outrageous and very high, yet we request the Railway Ministry to consider them with an open mind. "Empower, then question" should be the new organisational ethos, not only in matters of safety, but in all aspects of running a dynamic and nimble organization.

8. A single nodal authority, preferably the Advisor/Safety, should be nominated to ensure implementation of the recommendations of the Task Force.

---ooo---

METHODOLOGY

The task force on safety interacted comprehensively with the stakeholders and players in areas of Railway Safety. We interacted with senior officers in various Zonal Railways and Railway Board and held detailed discussions with them. We also went out into the field and discussed matters of safety with staff and supervisors at the forefront. This exercise gave us insight into the policies, practices, and deviations of one from the other.

2. The task force also studied various reports submitted earlier on Railway Safety, the main ones being the Corporate Safety Plan, the Report of the Railway Safety Review Committee, 1998 (Khanna Committee) and the report of the High-Level Safety Review Committee (Kakodkar Committee). A lot of data was simultaneously collected from the field, Zonal Railways and Railway Board to quantitatively evaluate the ground level realities, statistics, compliance with earlier reports, state of finances, etc.

3. References to earlier reports are given at the appropriate places. The recommendations of this Task Force may be different from the exact recommendations in these earlier reports, yet references will emphasise the fact that the issues mentioned therein have attracted attention of authorities and experts on earlier occasions as well.

4. The task force has considered areas where immediate action will bring about significant improvement in levels of safety without much financial inputs. At the same time the report dwells, at great length, in such areas of technology, which IR must consider for sustained safety with minimal human intervention.

5. The report submitted hereby contains concrete actionable points, short, medium, and long term. Responsibility for each action point and suggested timeframe is mentioned alongside each recommendation in square brackets.

---ooo---

REPORT

CONTENTS

S.N.	Topics	Page No.
	Submission of Report	**I**
	Order Letter	**II**
	Preface	**III-IV**
	Methodology	**V**
	Contents	**VII-X**
1	**Accidents – Broad Statistics**	**147**
	Annexure – 01	149
	Annexure – 02	151
	Annexure – 03	154
2	**Maintenance of Coaches in the field**	**159**
	Pitline Examination	159
	Recommendations	160
	Rolling-in Examination	162
	Recommendations	163
	Empowerment of Sr. DMEs and CDOs (K 2.9)	163
	Recommendations	164
3	**Coach Design and Deployment**	**166**
	Recommendations	167
4	**A Completely ICF-Design-Free Regime**	**171**
	Recommendations	171
5	**Fire in Passenger Trains**	**173**
	Recommendations	173
6	**Freight Trains and Safety Issues**	**175**
	Recommendations	176
	Annexure – 04	177
7	**Wagon Design**	**178**
	Recommendations	178
8	**Workshops**	**180**
	Recommendations	181
9	**Ancillarisation of Workshops**	**182**
	Recommendations	184
10	**Locomotives**	**185**
	Recommendations	186
11	**Testing of Rail Vehicles**	**187**
	Recommendations	188
12	**Derailments**	**189**
	Recommendations	189

	Precautions for Heavy Axle Load Operations	191
13	**Rail Weld Technology**	**192**
	Recommendations	192
14	**Ultrasonic Flaw Detection**	**194**
	Recommendations	194
15	**Broken Rail Detection System**	**196**
16	**Bridges**	**197**
	Recommendations	197
17	**Maintenance of Engineering Assets**	**199**
	Recommendations	199
	Empowerment of Sr. DENs/DENs (K 2.9)	200
	Recommendations	201
	Upgradation of Track Materials	202
18	**Encroachments**	**203**
	Recommendations	203
19	**Protection of Road Users**	**204**
	Recommendations	204
20	**Signalling**	**205**
	Recommendations	206
	Annexure – 05	208
21	**Maintenance of Signalling Assets**	**211**
	Recommendations	211
22	**Automatic Train Protection**	**213**
	Recommendations	213
23	**Communication Backbone**	**215**
	Recommendations	215
24	**Signal Passing at Danger (SPAD)**	**217**
	Recommendations	218
	Supervision of Loco Crew	220
	Recommendations	220
	Annexure – 10	221
	Annexure – 11	223
25	**Train Operations**	**225**
	Recommendations	226
	Distributed Power (DP) or Locotrol	226
	Recommendations	226
	Retroreflective Boards	227
26	**Realtime Safety Monitoring of Rolling Stock**	**228**
	Recommendations	228
	Weigh Bridges	229

	Recommendations	230
27	**Material Procurement System**	**231**
	Recommendations	232
	Annexure – 12	234
28	**Procurement of Safety, Vital and Must-Change Items**	**235**
	Recommendations	236
29	**Complex Products**	**238**
	Recommendations	240
30	**Procurement of Hardware**	**241**
	Recommendations	242
31	**Delegation of Purchase Powers to Purchase Officers in the Field**	**243**
	Recommendations	243
32	**Vendor Approval**	**244**
	Recommendations for Safety, Vital and Must-Change Items	244
33	**Role of RDSO in Vendor Approval:**	**246**
	Recommendations for Safety, Vital and Must-Change Items	247
	Annexure – 13	249
34	**Grading of Vendors**	**251**
	Recommendations	252
	Annexure – 14	253
35	**Manpower Planning and Training**	**255**
	Recommendations	256
	Empowerment for Training and Human Resource Development	258
	Recommendations for Training and Certification of Loco Crew	259
	Training of Station Masters	261
	Recommendations	262
36	**Protection of Worksites**	**263**
	Recommendations	263
37	**Protection of Workmen at Worksite**	**264**
	Recommendations	264
38	**Organizational Reorientation**	**266**
	Recommendations	267
	Safety Whistleblower	268
	Recommendations	268
	Safety Organization	268
	Recommendations	269
	Quality Systems in Procurement of Material and Services	270
	Recommendations	270
	Relationship of Finance and Executive	270

	Recommendations	271
	Innovative Financing	271
	Recommendations	271
	Relocate Sectional Sr. DENs/DENs:	272
	Recommendations	272
39	**State of Railway's Finances and Impact on Safety**	**273**
	Recommendations	274
	Annexure – 06	276
	Annexure – 07	277
	Annexure – 08	278
	Annexure – 09	279
40	**Application of IT for Asset Management**	**280**
	Recommendations	280
	Chief Information Officer	282
	Recommendations	282
41	**FOG Operations**	**283**
	Recommendations	283
42	**Accident Reporting and Enquiry**	**285**
	Recommendations	286
43	**Disaster Management**	**288**
	Recommendations	288
44	**Safety Cadre Vacancies, Yardsticks and Staff Surrender**	**290**
	Recommendations	291
	Annexure – 15	293
References		**294**
Annexures - 16		**295-301**

ACCIDENTS:
BROAD STATISTICS
(PARA NO. 1 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

1

01 Accidents – Broad Statistics

While it is true that train accidents have come down in absolute numbers, Indian Railways, as a public carrier, must ensure safety of very high standards. While accidents cannot possibly be brought down to nil, deaths and injuries should certainly be considered unacceptable, whether in a running train, on LC Gates or at the workplace. Some of the key derivatives from the accident statistics are as follows:

1.1 Even though there has been a significant reduction in train accidents over the last 10-15 years, recent years see a plateauing of figures at around 100-120 Consequential Accidents. **(Annexure – 1)**

1.2 Incidences of derailments constitute over two-thirds of all accidents followed by Unmanned Level Crossing Gate Accidents.

1.3 Failure of Railway Staff is the biggest cause (50-60%) of all accidents.

1.4 Derailments cause maximum deaths and injuries (357 in 2016-17, 136 in 2015-16, 369 in 2014-15) **(Annexure – 2)**

1.5 Asset Failures (Track defects such as Rail Fracture, inadequate maintenance, track geometry etc.) remain the single largest contributor as a cause of accidents. This is followed by the failure of Mechanical Assets. **(Annexure – 3)**

This report addresses the underlying causes and proposed solutions, both organizational and technical, in following paras.

Annexure-1

ACCIDENT DATA

Consequential train accidents since 2006-2007 to 2015-16 & 2016-2017: 1st April 2016 to 15th December 2016

Type of Accident	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Collision	8	8	13	9	5	9	6	4	5	3	2	4
	4.10%	4.12%	7.34%	5.45%	3.55%	6.87%	4.92%	3.39%	3.70%	2.80%	2.41%	4.60%
Derailments	96	100	85	80	80	55	49	53	63	65	46	68
	49.23%	51.55%	48.02%	48.48%	56.74%	41.98%	40.16%	44.92%	46.67%	60.75%	55.42%	78.16%
MLC	7	12	7	5	5	7	5	4	6	6	6	0
	3.59%	6.19%	3.95%	3.03%	3.55%	5.34%	4.10%	3.39%	4.44%	5.61%	7.23%	0.00%
UMLC	72	65	62	65	48	54	53	47	50	29	25	15
	36.92%	33.51%	35.03%	39.39%	34.04%	41.22%	43.44%	39.83%	37.04%	27.10%	30.1%	17.24%
Fire	4	5	3	2	2	4	9	7	6	0	0	0
	2.05%	2.58%	1.69%	1.21%	1.42%	3.05%	7.38%	5.93%	4.44%	0.00%	0.00%	0.00%
Misc.	8	4	7	4	1	2	0	3	5	4	4	0
	4.10%	2.06%	3.95%	2.42%	0.71%	1.53%	0.00%	2.54%	3.70%	3.74%	4.82%	0.00%
Total	195	194	177	165	141	131	122	118	135	107	83	87
Accident per million train KMs	0.23	0.22	0.19	0.17	0.15	0.12	0.11	0.10	0.11	0.10		

Cause-wise:

	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	01/04/15 to 15/12/15	01/04/16 to 15/12/16
Failure of Railway staff	85	88	75	63	56	52	46	51	60	55	38	57
	43.59%	45.36%	42.37%	38.18%	39.72%	39.69%	37.70%	43.22%	44.44%	51.40%	45.78%	65.52%
Failure of other than Railway staff	84	81	76	75	57	63	59	57	58	38	33	18
	43.08%	41.75%	42.94%	45.45%	40.43%	48.09%	48.36%	487.31%	42.96%	35.51%	39.76%	20.69%
Failure of equipment	9	9		6	5	5	6	3	4	2	2	1
	4.62%	4.64%	0.00%	3.64%	3.55%	3.82%	4.92%	2.54%	2.96%	1.87%	2.41%	1.15%
Sabotage	8	7	13	14	16	6	3	3	3	1	1	2
	4.10%	3.61%	7.34%	8.48%	11.35%	4.58%	2.46%	2.54%	2.22%	0.93%	1.20%	2.30%
Combination of factors	1	0	4	1	3	1	0	0	0	1	1	2
	0.514%	0.00%	2.26%	0.61%	2.13%	0.76%	0.00%	0.00%	0.00%	0.93%	1.20%	2.30%
Incidental	7	8	5	4	4	3	7	4	8	9	7	7
	3.59%	4.12%	2.82%	2.42%	2.84%	2.29%	5.74%	3.39%	5.93%	8.41%	8.43%	8.05%
Could not be established	1	1	4	2	0	1	1	0	0	0		
	0.51%	0.52%	2.26%	1.21%	0.00%	0.76%	0.82%	0.00%	0.00%	0.00%	0.00%	0.00%
None Held	0	0	0	0	0	0	0	0	2	1	1	
	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.48%	0.93%	1.20%	0.00%
Awaited	0	0	0	0	0	0	0	0	0			
	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.93%	0.00%	0.00%
Grand Total	**195**	**194**	**177**	**165**	**141**	**131**	**122**	**118**	**135**	**107**	**83**	**87**

Annexure-2

ACCIDENT DATA

Number of persons Killed during 2006-2007 to 2015-2016 & 2016-17: 1st April 2016 to 15th December 2016

Type of Accident	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	01/04/15 to 15/12/15	01/14/16 to 15/12/16
Collision	2	1	8	44	240	22	27	1	15	1	1	5
	0.96%	0.52%	3.83%	18.49%	62.99%	6.90%	13.24%	0.66%	5.14%	0.82%	0.85%	2.62%
Derailments	8	13	10	14	4	73	5	6	104	36	36	154
	3.85%	6.81%	4.78%	5.88%	1.05%	22.88%	2.45%	3.95%	35.62%	29.51%	30.77%	80.63%
MLC	11	27	18	7	7	6	18	6	31	12	12	
	5.29%	14.14%	8.61%	2.94%	1.84%	1.88%	8.82%	3.95%	10.62%	9.84%	10.26%	0.00%
UMLC	146	148	129	170	130	204	123	98	130	58	53	32
	70.19%	77.49%	61.72%	71.43%	34.12%	63.95%	60.29%	64.47%	44.52%	47.54%	45.30%	16.75%
Fire	0	0	31	0	0	9	31	35				
	0.00%	0.00%	14.83%	0.00%	0.00%	2.82%	15.20%	23.03%	0.00%	0.00%	0.00%	0.00%
Misc.	41	2	13	3	0	5		6	12	15	15	
	19.71%	1.05%	6.22%	1.26%	0.00%	1.57%	0.00%	3.95%	4.11%	12.30%	12.82%	0.00%
Total	**208**	**191**	**209**	**238**	**381**	**319**	**204**	**152**	**292**	**122**	**117**	**191**
Accident per million train KMs	**0.05**	**0.01**	**0.06**	**0.07**	**0.24**	**0.10**	**0.06**	**0.04**	**0.10**	**0.03**		

Number of persons injured during 2006-2007 to 2015-2016 & 2016-17: 1st April 2016 to 15th December 2016

Type of Accident	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	01/04/15 to 15/12/15	01/14/16 to 15/12/16
Collision	35	47	53	115	296	191	76	7	58	12	10	28
	8.71%	11.41%	11.94%	28.97%	64.21%	26.64%	19.95%	2.99%	12.69%	6.38%	5.95%	11.34%
Derailments	130	145	142	91	55	367	159	93	265	100	85	203
	32.34%	35.19%	31.98%	22.92%	11.93%	51.19%	41.73%	39.74%	57.99%	53.19%	50.60%	82.19%
MLC	8	43	54	6	12	11	25	2	21	10	11	
	1.99%	10.44%	12.16%	1.51%	2.60%	1.53%	6.56%	0.85%	1.60%	5.32%	6.55%	0.00%
UMLC	156	144	142	150	98	141	81	116	85	41	37	16
	38.81%	34.95%	31.98%	37.78%	21.26%	19.67%	21.26%	49.57%	18.60%	21.81%	22.02%	6.48%
Fire	0	3	11	0	0	7	40	6	0			
	0.00%	0.73%	2.48%	0.00%	0.00%	0.98%	10.50%	2.56%	0.00%	0.00%	0.00%	0.00%
Misc.	73	30	42	35	0	0	0	10	28	25	25	
	18.16%	7.28%	9.46%	8.82%	0.00%	0.00%	0.00%	4.27%	6.13%	13.30%	14.88%	0.00%
Total	**402**	**412**	**444**	**397**	**461**	**717**	**381**	**234**	**457**	**188**	**168**	**247**

Total Casualties during 2006-2007 to 2015-2019 & 2016-17: 1st April 2016 to 15th December 2016

Type of Accident	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	01/04/15 to 15/12/15	01/14/16 to 15/12/16
Collision	37	48	61	159	536	213	103	8	73	13	11	33
	6.07%	7.96%	9.34%	25.04%	63.66%	20.56%	17.61%	2.07%	9.75%	4.19%	3.86%	7.53%
Derailments	138	158	152	105	59	440	164	99	369	136	121	357
	22.62%	26.20%	23.28%	16.54%	7.01%	42.47%	28.03%	25.65%	49.27%	43.87%	42.46%	81.51%
MLC	19	70	72	13	19	17	43	8	52	22	23	0
	3.11%	11.61%	11.03%	2.05%	2.26%	1.64%	7.35%	2.07%	6.94%	7.10%	8.07%	0.00%
UMLC	302	292	271	320	228	345	204	214	215	99	90	48
	49.51%	48.42%	41.50%	50.39%	27.08%	33.30%	34.87%	55.44%	28.70%	31.94%	31.58%	10.96%
Fire	0	3	42	0	0	16	71	41	0	0	0	0
	0.00%	0.50%	6.43%	0.00%	0.00%	1.54%	12.14%	10.62%	0.00%	0.00%	0.00%	0.00%
Misc.	114	32	55	38	0	5	0	16	40	40	40	0
	18.69%	5.31%	8.42%	5.98%	0.00%	0.48%	0.00%	4.15%	5.34%	12.90%	14.04%	0.00%
Total	**610**	**603**	**653**	**635**	**842**	**1036**	**585**	**386**	**749**	**310**	**285**	**438**

Annexure-3

Analysis of Consequential Train Accidents (2016-17)

1st April 2016 to 15th December 2016: 87												
Department	**P.F. Cause-wise Break up**	**No. of Cases**	**SIM ID / Rly. / Divn.**									
Awaited/NH LY:1	**Awaited**											
Comb_Staff 8	**Engg & Coml –** (Track defect & uneven loading)											
	Engg. & Electrical – (Track and EMU defect)	2	1001	CR/CSTM	2002	ER/HWH						
	Engg. & Mechanical – (Track and Loco defect)	1	10002	EC/SPJ								
	Engg. & Mechanical – (Track and Coach defect)	1	6003	SR/PGT								
LY:12	**Engg. & Mechanical –** (Track and Wagon defect)	1	3003	NC/ALD								
	S&T and TFC –	1	3003	NR/LKO								

	(Point operated under moving wheels)											
	Mechanical & Traffic – (Movement on trail through point)	1	10004	EC/DHN								
	Mechanical & Traffic – (negligence of Crew, Guard and C&W control)	1	5001	NF/KIR								
Comb_ 2 Factors LY:1	**FORS & COML-** Falling of leased parcel packet on track after unloading. **IMPROPER STRACKING**	1	10002	EC/SEE								
	FORS & COML- Excessive loading of parcels in leased VP. **WEIGHT OF**	1	11005	ECOR/KUR								

	CONTENTS EXCEEDING CARRYING CAPACITY											
Commercial LY:												
Electrical 5 LY: 3	SPAD	3	10001	EC/DNR	6001	SRMAS	2001	ECoR/KUR				
	Under gear part fallen and entangled	1	3003	NR/DU								
	Over Speeding by LP	1	2002	ER/ASN								
Engineering 31 LY:16	Track defect (Cross level variation, Track measurements not as per requirements .))	4	6002	SR/MAS	3004	NR/LKO	1001	CR/PUNE	3005	NR/MB		
	Track defect (Crossover defect)	3	4001	SEC/R	5001	SWR/MYS	4001	SEC/R				
	Track – Losse fittings	1	8001	WR/BCT								
	Sinkage of Track	1	5001	NF/KIR								
	Rail fracture	13	3002	NR/MB	1001	CR/PUNE	2001	ER/HWH	10003	EC/DNR	6005	SR/TVC
			6002	SR/TVC	3001	NR/FZR	10001	EC/DNR	2002	ECD/WAT		
			3001	NR/DLI	3001	NC/JHS	14001	SEC/R	10001	EC/DHN		

	Track – Loose fittings Weld failure	1	10002	NW/BKN								
	Boulder on track	1	10004	EC/MGS								
	Staff-Obstruction on track	1	2003	ER/HWH								
	Poor maintenance of track	3	10003	ECR/SPJ	6002	SR/MAS	1001	CR/CSTM				
	Rolling down of machine due to T/Machine failure	1	7002	SER/RNC								
	Point Defect	2	8002	WR/RTM	2002	WR/RTM						
Equip. fail. 1 LY:2		1	3002	NR/DLI								
FORS 18	**UMLC**	15	5001	NFR/RNY	15002	SW/UBL	4002	NE/BSB	3001	NR/DLI	3003	NR/UMB
			10001	ECR/SEE	11004	NWR/JU	11002	ER/MLDT	10003	ECR/SEE	4001	NE/BSB
	Derailment		10001	ECR/SPJ	3001	NR/DLI	7003	SE/ADRA	1002	NWR/JU	10001	ECR/DNR
		3	14001	SEC/R	10004	ECR/DHN	8003	WR/RTM				
LY: 33												
Incidental 7	Land slide	3	5002	NF/LMG	5003	NF/LMG	6003	SR/TVC				
LY: 7	Cattle run over	1	2001	ER/MLDT								
	Boulder on track	2	2004	ECO/WAT	90001	KR/KAWR						
	Flash flood	1	8002	WR/BCT								
Mechanical 7	Wagon defect	1	6001	WCR/JBP								
	SPAD	2	6001	WCR/JBP	5001	NFR/APDJ						

LY: 3	Journal Breakage	3	4002	NER/BSB	4002	SEC/NAG	3005	NR/FZR				
	Buffer entanglement	1	8008	WR/BCT								
	Crew failure											
S&T 2	No route	1	10003	ECR/DNR								
LY: 1	Failure of interlocking	1	2001	ER/MLDT								
Sabotage 2	Removal of Fish Plates	2	2001	ECO/WAT	2002	ECO/WAT						
LY: 1												
Traffic 4	ATP issued before correct route setting and securing	2	6001	SR/SA	8007	WR/BVP						
LY: 3	Points operated under moving wheels	2	10002	ECR/DHN	1002	CR/PUNE						
LY TOTAL 83	**TOTAL**	**87**										

Passenger Train	**61**	**At Station**	**38**
Goods Train	**26**	**Mid-section**	**49**
Total	**87**	**Total**	**87**

MAINTENANCE
OF COACHES IN THE FIELD
(PARA NO. 2 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

2

02 Maintenance of Coaches in the field:

Rolling Stock – Nature of Maintenance: Safety of Coaches and Wagons is more Shop-based and process-based, unlike Permanent Way or Signals, where safety is Inspection-based. IOH of rolling Stock too plays a role. This is because in a moving asset time available for safety inspection is infrequent. In most cases maintenance and inspection of Rolling Stock is diffused over many locations and authorities.

2.1 Mainline coaches do thousands of kilometres before they are looked at by maintenance personnel. This includes inspection on pit lines or washing lines, at Platforms for PFTR rakes and Rolling-in Examination. They will be examined one by one:

2.2 **Pitline Examination:** Most pitlines are in a pathetic condition. It is common to find staff walking in knee deep stagnant water in the pit to do a safety examination. It is also common to find toilet drippings falling on their faces and

body during the process. Pitlines are often dark, even during daytime due to non-provision or non-working of pit lights.

2.3 Recommendations:

2.3.1 All pits to be provided with steel grates on the floor so that the artisan does not walk on muck and faeces. Designs exist for the same. Side walls of the pitlines should be lined with stain resistant tiles. [CAMTECH to design: two months, Zonal Railways to implement: one year]

2.3.2 All pits to be provided with low voltage, energy efficient, bright LED lights. Lights should be directed upwards so that the undergear is illuminated. Low voltage is necessary to prevent electrocution. [Zonal Railways: six months]

2.3.3 All pit lines to be provided with self-starting diesel-powered pumps in case of water accumulation. Diesel pumps are necessary to prevent electrocution. [Zonal Railways: six months]

2.3.4 All new pitlines and those to be repaired should be done like the pitless design of Hubli/Siliguri Diesel sheds. These are built to best international practices and provide easy visibility for safety check as well as for movement of men and material. [CAMTECH to design: three months, Mechanical Coaching Directorate: Policy in six months, Zonal Railways to implement: five years]

2.3.5 All future pitlines and those being renovated/ expanded should be built for all-weather use, i.e. with a cover shed and adequate provisions for lighting, drainage etc. [CAMTECH to design: three months, Mechanical Coaching Directorate: Policy in six

months, Zonal Railways to implement: five years]

2.3.6 Catwalks in Coaching Depots are made of RCC. Due to constant flow of water and movement of material they begin to crumble in just a few years. All new catwalks and those to be repaired should be made of steel grating in single cantilever design. This will be easy and fast to construct, cheaper, more durable and user friendly. This design will not block light from the pits and undergear. It will also permit free and safe movement of men and material. Design can be adopted from the catwalk in Loco Frame Shop of DLW. [CAMTECH to design: two months, Mechanical Coaching Directorate: Policy in three months, Zonal Railways to implement: three years]

2.3.7 LHB rakes require straight pitlines. This should be kept in mind for all new pitlines and those being converted for LHB. [Mechanical Coaching Directorate: Policy in three months, Zonal Railways to implement: three years]

2.3.8 Tools and equipment for train examination should be standardised and issued to each staff member with personal lockers too allotted to each person for safekeeping. Standard list of common and personal tools needs to be made and tools procured for TXR and TL Staff. [CAMTECH: standardise in three months, Zonal Railways to implement in one year]

2.3.9 These recommendations should also apply with appropriate modifications to Car Sheds and DEMUs Sheds. [CAMTECH to design: two months, Concerned Board Directorates: Policy in three months, Zonal Railways to implement: three to five years]

2.3.10 **Automatic Coach Washing Plants** must be installed in each Coaching Depot with holding of 300 or more coaches. This not only saves water but improves turnaround time and prevents flooding of train examination area, thus directly improving safety. [Mechanical Coaching Directorate: three years]

2.3.11 Pit Examination should ordinarily not take more than four hours. Necessary tooling and outsourcing to achieve this should be done. [Mechanical Coaching Directorate to issue policy: three months, Zonal Railways to implement: one year]

2.3.12 Capacity of Pit Lines to examine rakes should be possible over the entire 24-hour cycle. [Mechanical Coaching Directorate to issue policy: two months, Zonal Railways to implement: six months]

2.3.13 **Dashpots in ICF Coaches** do not retain oil and fail to perform their basic function of damping. Friction snubber designs are under trials for over a decade. This should be finalized, and directives issued within three months to install them on all ICF coaches within three years. (Kh I 29.1) [RDSO to finalize: three months, Zonal Railways to implement: three years]

2.4 Rolling-in Examination

2.4.1 Rolling-in examination is one of the most effective steps, and often the last step, for catching unsafe situations in trains. TXR staff sits by the side of the tracks and carefully watches as a train rolls-in to a stop at a station. This is done at nominated stations at intervals of say 300-400 km.

2.4.2 As 30kmph turnout are being introduced, the speed of

trains at stations is increasing (as compared to earlier 15kmph turnouts). This makes the job of the TXR staff very difficult, and misses are entirely possible now.

2.4.3 Recommendations:

2.4.3.1 Proper Rolling-in Examination huts to be built to protect the TXR staff from weather. Salem Division's designs can be adopted. [CAMTECH to finalise Design: three months, Zonal Railways to implement: one year]

2.4.3.2 Bright, lightweight and energy efficient LED lights to be introduced in place of the present design of clumsy, heavy lights. [CAMTECH to design and advise: one-month months, Zonal Railways to implement: six months]

2.4.3.3 A switch to Machine Vision Systems with Automatic High-Definition Camera and Artificial Intelligence based fault detection and recording system to be introduced. They should also keep a permanent record of what has been examined. (K 4.8) [Mechanical Development Directorate: Design and Policy: six months, Zonal Railways to implement: three years]

2.4.3.4 Such Automatic Machine Vision Devices as above should also be introduced in pitlines to examine the undergear as trains are placed on them. [Mechanical Development Directorate: Design and Policy: six months, Zonal Railways to implement: three years]

2.5 Empowerment of Sr. DMEs and CDOs (K 2.9)

2.5.1 A typical Sr. DME in a metro city handles nearly two to three lakh bedsheets, half as many blankets, pillow

covers and hand towels. This figure is larger than the largest hotel chain in all its facilities put together across the world! His distribution and collection system surpasses that of any hotel chain.

2.5.2 This is an area that attracts maximum passenger complaints and therefore takes up most of the time of the Sr. DME. It is generally on account of linen, liquid soap, cleanliness etc. that a Sr. DME is questioned and naturally he/she spends most of the time and management effort in this area putting safety on the back burner. This is a stark reality. Failure of a contract, in such areas, creates a situation where no fallback arrangement exists given the volume and geographical limitations.

2.5.3 Sr. DMEs and CDOs have a Cash Imprest of ten thousand Rupees or similar sums. This is about the same as some other officers have for office use, for buying stationery and ink cartridges. A Sr. DME needs to buy essential safety and passenger amenity items on short notice, often **to release a rake or a coach the same day**. Cash Imprest is the most effective and fastest way to meet the needs of Safety and Passenger Amenity.

2.5.4 The Sr. DME has now also been given additional charge of Environment and Health Management (EnHM), which includes cleaning of stations, platform tracks etc. This will further erode his attention to safety issues.

2.5.5 In most cases the same Sr. DME also looks after Freight Train operations.

2.6 Recommendations:

2.6.1 A new post of Sr. DME (Passenger Amenities) should be created in every Division, 68 in all, to exclusively

handle Passenger Amenity and EnHM to ease the work of the main Sr. DME, who should devote his attention exclusively to Safety issues. [EnHM Directorate: six months]

2.6.2 The Cash Imprest of each Sr. DME, in charge of train maintenance and passenger amenities (including EnHM) should be increased to Rs. 10 lakhs, and the Sr. CDO/CDO to Rs. 5 lakhs to be recouped every month. Recoupment should be automatic every month by recharging a prepaid card. Account of the previous month may be sent separately. [Finance Directorate: three months]

2.6.3 A Sr. DME and Sr. CDO/CDO should be permitted to buy stock or non-stock items, without any restrictions, out of this Cash Imprest. [Finance Directorate: three months]

2.6.4 These recommendations regarding Cash Imprest should also apply to Sr. DEEs in charge of Car Sheds and Loco Sheds and Sr. DMEs in charge of DEMUs and Loco Sheds. [Finance Directorate: three months]

2.6.5 Rule 145 of the GFR 2005 for purchase of up to Rs. 15,000 without calling for multiple quotations should be made immediately applicable in Railways. [Finance Directorate: three months]

03 Coach Design and Deployment

3.1 ICF coaches were not originally designed for high-speed long-train operations the IR now demands from them. Modifications to the original design have enabled these coaches to serve somewhat satisfactorily so far, but they have now reached the limit of their capabilities. The LHB Design delivers a much safer passenger coach. (K 4.2.3)

3.2 It is believed that ICF is in a position to make a complete switch to LHB w.e.f. Year 2018-19. RCF should be asked to make a compete switch w.e.f. 2018-19, if not earlier. MCF is already an LHB-only plant.

3.3 LHB, though robust and much safer than the ICF (Originally Schlieren), is not a certified crashworthy coach. A design has already been developed of a crashworthy design on the LHB platform, which has never proliferated. This will go a long way in developing a safe high-speed train system with purely Indigenous efforts.

3.4 A quick solution to the problem of jerks in Coaching CBCs should be found in six months, even if we have to adopt proprietary designs. Without this solution, proliferation of LHB and CBC-ICF Coaches will meet with stiff public resistance and ridicule.

3.5 Recommendations:

3.5.1 ICF should stop the manufacture of ICF Design coaches w.e.f. 01-04-2018 and RCF from 01-04-2019 and completely switch to LHB production for IR. MCF is already making LHB coaches to its entire capacity. (CSP 9.1) [Mechanical PU Directorate to issue policy: three months]

3.5.2 Only Trains with LHB Coaches should run at speeds higher than 100kmph and in compositions of over 18 coaches. (K 9.5)

3.5.3 The crashworthy design of LHB needs to be [Mechanical Coaching Directorate to issue policy: three months] revived and studied for adoption in new manufacture by 01-04-2021. [RDSO to finalize: six months]

3.5.4 All ICF coaches should be equipped with CBC. Though not a substitute of an LHB design, CBCs on ICF are an established safer design. Energy absorption elements should necessarily be built into ICF coaches for this purpose. (K 4.2.5.3) [Mechanical Workshop Directorate to issue policy: three months]

3.5.5 Non-CBC ICF coaches, in the interim, should be used only in branch lines with not more than 14-15 coaches and speeds not more than 90kmph. (K 9.5) [Mechanical Coaching Directorate to issue policy: three months]

3.5.6 The Codal Life of ICF Coaches to be reduced to 20 years. MLR to be done after 9-10 years. [Mechanical Coaching Directorate: three months]

3.5.7 All Corrosion Repair Shops should be audited by RDSO vis-à-vis their shop practices, material procurement systems, welding, skills, and training needs. [Mechanical Workshop Directorate: three months]

3.5.8 Corrosion Repair of Coaches should be done with flux cored MIG Welding wires only. Solid wires do not provide necessary flux for cleaning of dirty and corroded surface. This should be introduced within the next six months. [Mechanical Workshop Directorate to issue policy: one month's]

3.5.9 The proposed MLR Workshops should be commissioned within the next one year. [Mechanical Workshop Directorate: one year]

3.5.10 Mail Express Trains with ICF composition should not have any coach older than 8-9 years from the initial build, after which they should be relegated to branch lines and lower-speed, shorter-length operations till the MLR. Additionally, ICF coaches fresh out of MLR can be deployed in such trains for 5-7 years. [Mechanical Coaching Directorate to issue policy: three months, Zonal Railways to implement: one year]

3.5.11 The possibility of providing an 8mm sole bar in passengers carrying ICF vehicles should be examined as is done in OCVs within three months. If its manufacturability and retrofit possibility is established, it should be done in all MLR coaches starting within six months. [Mechanical Workshop Directorate: six

months]

3.5.12 Trains with ICF coaches should not be longer than 18 coaches and speedier than 100kmph. They were never designed to absorb such high kinetic energies in cases of crash and that is the reason they completely disintegrate in accidents. (K 4.2.1 and 4.2.5.4) [Mechanical Coaching Directorate to issue policy: three months, Zonal Railways to implement: one year]

3.5.13 All ICF coaches older than 7-8 years and 5 years after MLR should work only in branch lines with not more than 14-15 coaches and speeds not more than 90kmph. These steps will mean some short-term loss of capacity, which should soon be overcome with faster induction of LHB coaches in large numbers ex-ICF, RCF and MCF. [Mechanical Coaching Directorate to issue policy: three months, Zonal Railways to implement: one year]

3.5.14 There should be a complete ban on the introduction of new trains so that the entire production of LHB Coaches go into replacement of ICF coaches in long-formation and Mail Express Trains. [Traffic Coaching Directorate: immediate]

3.5.15 The problem of jerks in the CBC of LHB remains unsolved. This needs to be done on top priority to make these coaches acceptable to travelling public. All new manufacture and retrofits should be with suitable draft gear. (K 4.2.5.2 and CSP 9.2) [Mechanical Coaching Directorate: six months]

3.5.16 Airbag pneumatic suspension should be pursued with earnestness in LHB coaches so that GS-type coaches, which have widely varying loads, become suitable for

deployment. [Mechanical Coaching Directorate: one year]

3.5.17 A permanent solution to wheel shelling on LHB Coaches must be found within a year. [Mechanical Coaching Directorate: one year]

A COMPLETELY
ICF-DESIGN-FREE REGIME
(PARA NO. 4 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

4

04 A Completely ICF-Design-Free Regime

4.1 In order to completely eliminate ICF coaches, a design older than seventy-five years, it is necessary to take a holistic view of passenger vehicles. Self-propelled vehicles should be used more and more for short-distance services. These trains have higher seating capacity, benefit from better acceleration, do not need engine reversal and therefore decongest platforms and yards enhancing safety all around. They also have the advantage of having EP Brakes, which ensures uniform braking, shorter braking distance, and time, thereby improving average speeds.

4.2 Even the LHB is a four-decade old design and cannot be relied upon for serving our long-term needs, which must increasingly be served by trainsets or self-propelled stock.

4.3 Recommendations:

4.3.1 All short distance trains, up to 500km, should switch to self-propelled stock. [Railway Board to issue policy: six months, Implementation: ten+ years]

4.3.2 The existing capacity of ICF or RCF may not be able to provide enough self-propelled stock and certainly not of a contemporary design. Hence, it is necessary that a fresh look at the product mix of the proposed Kanchrapara Factory be given quickly. This may be aimed at relieving ICF, RCF and MCF to manufacture only or largely LHB. KPA should be exclusively a high-speed/semi-high-speed self-propelled coach manufacturer. [Mechanical Coaching Directorate: three months]

05 Fire in Passenger Trains (CSP 4.4)

5.1 It is a reality that when a coach catches fire it is generally completely gutted. It is learnt that fire retardant and low-toxicity materials are already in use in passenger coaches. Even with fire retardant furnishings, curtains, linen, rexine and foam, the coach ends up being completely destroyed. Our efforts must, therefore, be to gain extra few minutes, before the compartment is engulfed in flames, so that passengers can escape to the next coach or alight.

5.2 Recommendations:

5.2.1 Aisle curtains in 2AC coaches should be removed as already done in 3AC. [Mechanical Coaching Directorate: three months]

5.2.2 There should be at least four emergency exit windows in each coach marked by illuminate/fluorescent borders. The coach floor should have illuminated/phosphorescent guiding lights to help passengers exit in case of fire and accidents. [Mechanical Coaching Directorate: two years

to implement in all coaches]

5.2.3 Possibility of exit rope, ladders, or ramps at such windows to be explored in next three months. (K 4.6.5) [RDSO: six months to design]

5.2.4 All mobile phone charging points should be USB sockets only, with 5 volts supply. This will prevent passengers from using the 110V sockets for heating water and milk for babies or making tea for themselves. Cases of fires due to such acts have been reported. [RDSO: three months to design, Zonal Railways and PUs: one year to implement]

5.2.5 If we must provide sockets for charging of laptops, their numbers should be limited and protected by a 500mA fuse. [Zonal Railways: six months]

5.2.6 Electric sockets in toilets for use of electric razors in LHB Coaches should be removed. With battery-powered shavers now available, such sockets have outlived their utility. [Zonal Railways: six months]

5.2.7 Electric cables, fittings, fuses, circuit-breakers etc. for use in coach should be procured from a list of approved reputed vendors, not more than five in each case. [RDSO to issue revised list of approved vendors: three months]

5.2.8 Each passenger bay in the coach should be provided with a suitable fire-extinguisher within easy reach of passengers. An alert passenger may be able to use it and dowse an early fire. [Mechanical Coaching Directorate: six months]

5.2.9 Modified Fuse Distribution Board should be universalised within the next one year. [Mechanical Coaching Directorate: six months]

5.2.10 There should be no cooking permitted whatsoever in Pantry Cars. LPG Cylinders should be banned in Pantry Cars. Heating if any, of precooked food, should be done on induction ovens only. It will require an iron-fist to enforce it. (K 4.7.3) [Commercial Catering Directorate: three months]

06 Freight Trains and Safety Issues

6.1 Equipment failures on freight stock are primarily Hot Axles, Flat Tyres, Hanging Parts, Bearing Failures, Train Partings and Detachments. Out of these Hot Box is a condition that may lead to immediate unsafe situations.

6.2 **Annexure – 4** gives distribution of major wagon defects for different levels of certification of freight rakes. It is clear that CC Rakes offer much higher reliability in operations.

6.3 CC Rakes have proven their worth not only by increased availability for traffic, but also by increased safety. It was learnt from EDME/Frt that Premium Rakes (lower levels of certification) account for about 25% of all Freight rales, yet they contribute over 50% of bearing failures. There is a clear case for proliferation of CC Rakes, which account for 50% of all freight rakes and deliver reliability four times that of lower certification rakes.

6.4 Train partings can be nearly completely eliminated if the Newly Developed Couplers to RDSO Specifications WD-70

are properly procured and maintained. It appears that replacement parts of new couplers are being procured to old specification WD-48 on account of high costs.

6.5 Recommendations:

6.5.1 The Coupler Specification WD-48 BD08 should become obsolete w.e.f. 01-01-2017. No coupler or its components should be procured to these specifications. [RDSO: immediate]

6.5.2 All Wagon Couplers and Draft Gears should be procured to RDSO Specifications ED-70 and WD-71 respectively only w.e.f. 01-04-2017. [Mechanical Coaching Directorate: three months]

6.5.3 RDSO should carry out a rate analysis for the new coupler and its components so that purchase decisions are facilitated in the field. [RDSO: three months]

6.5.4 Low torque grease seals should be introduced for CTRBs of Wagons to control temperature rise in the bearings on the run. [Mechanical Freight Directorate: three years]

6.5.5 Induction of zero-torque grease seals should be examined by RDSO and advised to Railway Board with cost-benefit analysis so that a decision can be taken on their eventual induction. [RDSO: one year]

6.5.6 The population of CC Rakes should be increased to 70-75% of all freight rakes. This should be done in one year. (CSP 6.44) [Traffic Transportation Directorate and Mechanical Freight Directorate: one year]

6.5.7 CAMTECH should be asked to audit a few CC Rake Depots and suggest steps to be taken to augment them for increased population and improvement of quality. [CAMTECH: three months]

6.5.8 Infrastructure of CC Rake Maintenance Depots to be strengthened on the basis of CAMTECH audit. A

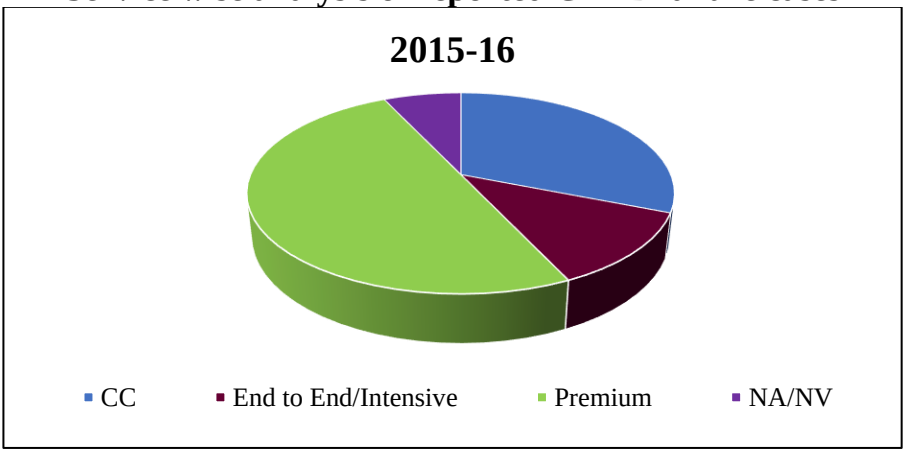
onetime sanction of Rs. 500 Crores should be given for this purpose, to be spent over the next three years. [Mechanical Freight Directorate: three years]

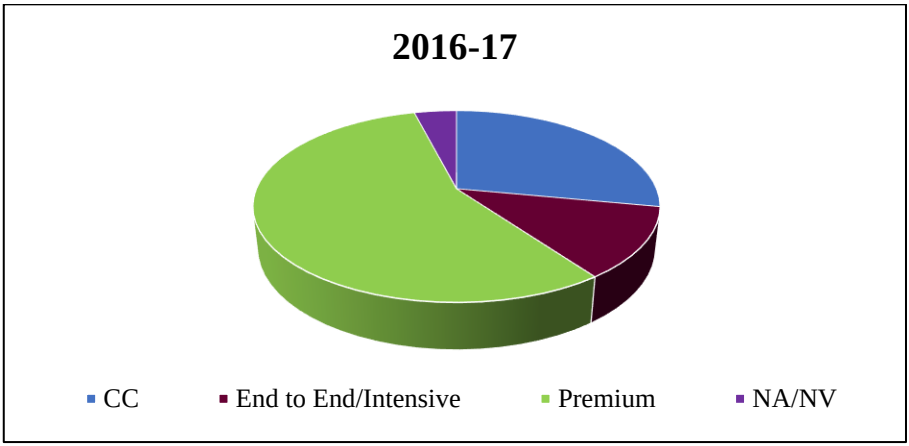
6.5.9 Twin-pipe operations should be universalized, and any deviation should require orders from Zonal Head Quarters for continued Operations. [Mechanical Freight Directorate: three months]

Annexure – 4

CTRB FAILURES IN WAGONS

Service wise analysis of reported CTRB failure cases





WAGON DESIGN
(PARA NO. 7 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

7

07 Wagon Design:

Wagon Designs have remained stagnant as far as safety is concerned. In spite of the intent of High Axle Load Designs to be designed by Experts and induction of Track Friendly Bogie, progress is slow on these fronts.

7.1 Recommendations:

7.1.1 All new wagon procurement should be procured with 25 Tonne axle load capacity. This may add to the cost of acquisition only marginally but make all these wagons compatible and interchangeable with DFCs. [Mechanical Freight Directorate: six months]

7.1.2 The matter of smaller wheel dia of 840mm necessary for 25T wagons and its implications should be entrusted to an IIT for resolution. This is a project, which needs to be pursued not only for safety, but also for the financial health of Railways. To be resolved in

six months. [Mechanical Freight Directorate: six months]

7.1.3 Track Friendly Bogies for Wagons is an old project, but still has to see the light of the day. A design should be finalized in next six months and induction planned w.e.f. 01-04-2019. (K 4.10.2 and CSP 6.40) [Mechanical Freight Directorate: six months]

7.1.4 Goods Guard Vans must be made user-friendly with lights, fan, and comfortable furniture. A rechargeable battery of adequate capacity too should be provided to cover prolonged halts. This battery may also power the EOTT Device. This should be completed within one POH Cycle, i.e. four years. (CSP 7.22) [Mechanical Freight Directorate: four years]

7.1.5 IR must eventually plan to do away with guards completely. [An action plan to be prepared by the Traffic Transportation Directorate: six months]

08 Workshops

8.1 Workshops play the most important role in building safety into Rolling Stock. Since Workshops are "back-offices" of Indian Railways, they do not attract the same level of management attention like passenger amenities, station-cleanliness-campaigns, linen or catering. This needs to be corrected at the systemic level by empowering the Workshop management, which can then independently operate without seeking senior management's intervention at every stage.

8.2 A well laid-out, adequately equipped, clean, safe, and hygienic Workshop is essential for good quality work on rolling stock. CWMs have to look up to DRMs even for small and minor attention to their workshop structures, floors, roads, buildings, drainages, toilets, pit-lines, lighting, telecommunication, networking etc. In spite of a JPO signed by the MM and ME over

a decade ago, CWMs have not been empowered for engineering maintenance at their level.

8.3 Traditionally, Chief Workshop Managers (CWMs) had enjoyed the same level of delegation in the Schedule of Powers as DRMs. Increasingly, due to the limelight on DRMs, the delegation to DRMs has been steadily enhanced and there has come about a disconnect between the two authorities, viz. CWM and DRM.

8.4 Recommendations:

8.4.1 All the powers of CWMs, for Sanction of Works, Sanction of Estimates, Tendering and Contracting, Re-appropriation etc. should be brought at par with the DRMs. These should be automatically linked to the DRMs' powers for future enhancements. Needless to say, such delegations will be done only in areas relevant to the functioning of CWMs. [Mechanical Workshop Directorate: three months]

8.4.2 Mere empowerment is not enough though. Funds should be made available to the CWM to carry out these jobs. Since maintenance of Workshop assets as referred above is essential for proper maintenance of Rolling Stock, it would be appropriate that their upkeep too is charged to WMS, which will eventually reflect in the cost of repairs and POH. CWMs should be empowered to spend on activities as mentioned above out of the Workshop Manufacturing Suspense (WMS). [Mechanical Workshop Directorate: three months]

8.4.3 CWMs must be empowered to spend up to 2% of their annual budget on meeting such needs for the Workshop. CWMs should be the final authority for all such expenditures out of WMS. [Mechanical Workshop Directorate: three months]

8.4.4 Quality of Workshop's Output: Each Workshop will have as an associated Inspector a JAG/SG Officer of the Headquarters, who will carry out periodical or sample checks of the quality of output from each workshop. Such Inspectors should be nominated within the next three months for all Workshops of Mechanical, Electrical, S&T and Engineering Departments. [Mechanical Workshop Directorate: three months]

ANCILLARISATION OF WORKSHOPS
(PARA NO. 9 / REPORT OF TASK FORCE ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

9

09 Ancillarisation of Workshops

9.1 Workshops should concentrate on core activities. For example, Core activities of a Coaching workshop are incoming and outgoing inspection, coach lifting, bogie-shop, corrosion repair, wiring and harnessing, fitting of sub-assemblies in the coach and their inspection. They have a huge pool of manpower, a significant part of which is often employed in non-core activities, such as electroplating, repair of subassemblies such as Distributor Valves, Shock Absorbers, Bearings, Fans, Painting, Air-Conditioning units, Trimming (furnishing and repair of berths and seat cushions) etc.

9.2 The population of Coaches, Wagons and Locomotives will steadily increase and since it will neither be possible nor advisable to increase the manpower commensurately, it is necessary to redeploy the manpower employed in non-core

activities to core activities. There is no other way productivity and quality of Workshop activities can be improved.

9.3 CWMs should be empowered to outsource such activities as identified as non-core on a long-term basis. For example, a bearing company or a traction motor OEM can be given a ten-year contract to set up facilities within the workshops or adjoining it. Such a model already exists in the shape of BOOT laundries. What we have done for a passenger amenity item needs to be replicated for safety items too.

9.4 These facilities should be used only for repair and maintenance.

9.5 Such long-term lease and contract have many benefits:

9.5.1 It releases the executive from repeated exercise of annual contracting and allows him/her to concentrate on his main job.

9.5.2 It encourages the successful bidder, the OEM of major sub-assemblies, to invest in equipment, manpower, training and back-to-back sourcing of parts and services. This improves quality, delivery times and reduces costs.

9.5.3 It is expected that for a ten-year or longer contract and an assured business to the contractor, IR can reduce costs by up to 20% to begin with. This is the model that ensures quality, timely delivery and low costs for car manufacturers.

9.5.4 An ancillary setup like this will be open to periodic inspection by the Railways. A minimum service level agreement should be built into such contracts. Quality and Quantity Level Assurance should be an integral part of such contracts.

9.5.5 An ancillary set up in one Workshop will serve many other workshops for the same make of subassembly, thus making it a viable business for the contractor too.

9.6 Recommendations:

9.6.1 Each Department (Directorate in The Railway Board) that controls Workshops (Mechanical, Electrical, S&T and Engineering) will identify non-core activities that should be outsourced on a long-term basis. (Kh I 2.17 and K 2.11.5) [Mechanical Workshop Directorate to coordinate: three months]

9.6.2 A separate schedule of powers for outsourcing and terms and conditions for such long-term contracts will be prepared for uniformity. CWMs will be fully empowered to enter into such contracts. [Mechanical Workshop Directorate to coordinate: three months]

9.6.3 Similar delegation of powers should also be done for Sr. DMEs and Sr. DEEs in-charge of Train Maintenance, Coaching Depots, Car Sheds, DEMU Sheds and Loco Sheds. [Concerned Board Directorates: three months]

10 Locomotives

10.1 Locomotives require best maintenance attention compared to other rolling stock since they are smaller in number and are homed in a shed, headed by a senior officer. Yet, safety issues spanning diesel and electric traction need to be addressed in a holistic fashion. The uniform design of loco cabs has been attempted for years. This idea needs to be revisited and the uniformity of loco cabs, separately across Diesel and Electric Locomotives, should be studied afresh. Electric Locos may require further division between conventional Locos and 3-phase ones.

10.2 It is important that location of various safety devices used by the loco pilot – like the A9, SA9, Speedometer, VCD reset button, Assistant's Emergency Braking Switch, Hand Brake Operating Device, Various Cutout Cocks are at identical locations in one type of locomotives.

10.3 Recommendations:

10.3.1 Loco and Motor Cabs should be equipped with Audio-Visual Recorders like the cockpit. LPs and ALPs should be provided with noise-cancellation headphones for communicating with each other. [Electrical RS and Mechanical Traction Directorates: two years]

10.3.2 If the VCD of a loco failure, the loco should be declared dead after clearing the block section. [Electrical RS and Mechanical Traction Directorates: one month]

10.3.3 All loco cabs should be air-conditioned. New locos should be turned out with air-conditioning and old ones should be retrofitted within one POH Cycle. (Tripathi 9.75) [Electrical RS and Mechanical Traction Directorates: four years]

10.3.4 An ergonomic design for the seats of Loco Crew and of Motormen should be developed with international standards and installed within next one year. [Electrical RS and Mechanical Traction Directorates: one year]

TESTING
OF RAIL VEHICLES
(PARA NO. 11 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

11

11 Testing of Rail Vehicles

11.1 Indian Railways is the only major railroad in the world that does not have a dedicated test track of its own. As a result, all vehicle testing is done on running tracks. Not only does it affect train operations, the trials are often inadequate due to paucity of traffic blocks. Besides, the rail vehicles are not subjected to simulated track conditions as possible on a test track. This is unavoidable due to ever changing nature of rolling stock, both external and interiors.

11.2 Additionally, test of various track designs and fittings is not possible at all since test conditions cannot be created on a running track.

11.3 There is no dedicated crash testing site and physical simulation facilities for testing crash worthiness of rail vehicles.

11.4 Recommendations:

11.4.1 The plan and specifications for a Dedicated Test Track should be finalised in consultation with the Pueblo Research Centre within next one year. Sanction for the same already exists. [Mechanical Traction Directorate: one year]

11.4.2 The Dedicated Test Track, on the lines of one in Pueblo, USA should be built within the next five years. (Kh II 5.21.2) [Mechanical Traction Directorate: five years]

11.4.3 IR should consult research agencies in Europe, Japan, and USA to develop specifications and layout of a crash test facility and protocols within the next one year. (Kh II 5.15.5) [Mechanical Coaching Directorate: one year]

11.4.4 A crashworthiness testing lab/facility should be built within the test track within the next five years. [Mechanical Coaching Directorate: one year]

12 Derailments

11.5 Derailments are increasingly being attributed to rail fractures and welding failures. There is a need to address the backlog in rail/track renewals and the technology of rail welding. Inspection of Rails is a complex exercise and must be automated as much as possible to reduce dependence on human judgement.

11.6 Recommendations:

11.6.1 Backlog of rail renewals, deep screening, de-stressing, renewals of Crossings, Welds, glued joints etc. must be taken up on topmost priority overcoming all constraints of budget. [Track Directorate: three years]

11.6.2 Replacement of Defective (D-Marked and others) rails should be the topmost priority for IR and should rank higher than new lines, doubling, gauge conversion etc. [Track Directorate: five years]

11.6.3 Mission Zero-Missing-Track-Fittings must be pursued in right earnest and fulfilled. [Track Directorate: six months]

11.6.4 All future procurement of rails for all new line, doubling, gauge conversion and programmed rail renewal should be 20-rail panels using 65m or 130m rail, flash butt welded at rail manufacturers' factory. [Track Directorate: one years]

11.6.5 Rails should be galvanized or painted with anti-corrosion paint at the manufacturers' factory before dispatch. [Track Directorate: one year]

11.6.6 In-situ Rail Stress Measurement Devices to be acquired for checking stress in LWRs and taking preventive action before rail fracture or rail buckling happens. A limited number, one for each Zonal Railway to be acquired in the next two years and then for each Division over next five years. (Kh II 5.20.3) [Zonal Railways: two years]

11.6.7 Need for special wagons for such transportation of long rails and long panels must be ascertained in next three months and wagons acquired within next one year. [Mechanical Freight Directorate: one year]

11.6.8 Scabbing of Rails must be avoided at all costs as scabbed rails are not immediately attended even though they are known to develop sub-surface cracks, ultimately leading to rail-fracture. For this purpose, the Load Tables for all sections must be reexamined by a committee of CFTM, CELE, CTE and CRSE in each Zonal Railway suitably powering of trains mentioned in the WTT. [Zonal Railways: three months]

11.6.9 Rail Grinding must be put on a sound footing, if necessary by acquiring additional machines on OPEX Model. (CSP 6.21) [Engineering Track Machines Directorate to issue policy: three months, Zonal Railways to acquire: two years]

11.6.10 Track Recording Cars: All Track Recording Cars should be re-equipped with modern systems and laser-based sensors for effective measurements and recording of track parameters. This should be done within the next three years. (CSP 6.19) [Engineering Track Machines Directorate: three years]

11.6.11 The lubrication of gauge face should be done frequently and without fail on curves, points and crossings, locations having exercise lateral wear, work-sites and on bad formations to prevent climbing of wheel. A directive should be issued within a month. (Kh I 3.8.1 and CSP 5.21) [Zonal Railways: immediate]

11.7 Precautions for Heavy Axle Load Operations:

Adequate number of WILDs should be provided. Action on WILD alarms to control excess impact and damage to track to be ensured religiously. Weigh Bridges should be kept in working order at all times. Procedures to handle unweighted or overweight rakes should be followed scrupulously. [Mechanical Development Directorate: three years]

RAIL WELD TECHNOLOGY
(PARA NO. 13 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

13

13 Rail Weld Technology:

Even with the longest rail panels some welding in the field cannot be avoided. Besides, replacement of rails in the field too require in situ welding. AT Welding is still used in modern railroads and is unavoidable in certain conditions. There is, however, a need to not only improve welding techniques, but also induct modern technology to ensure safety.

13.1 Recommendations:

13.1.1 A study should be commissioned to upgrade IR's AT Welding Techniques to the best in the world, viz. ENI 14730-1 or later standards. (K 5.3, Kh I 15.7 and CSP 5.19c) [Track Directorate: six months to begin study, one year to finalize]

13.1.2 Consumables for AT Welding must come from proven sources. The manufacturers of such consumables should also be subject to process control and quality audits, which must be quickly laid down by RDSO with expert help. [RDSO: six months]

13.1.3 Additional sources for AT Welding consumables must be proactively developed to bring competition in the market. This will go a long way in ensuring quality, timely deliveries, and reasonable prices. [RDSO: six months]

13.1.4 Flash Butt Welding is a reliable technique, not only for welding in the plants, but also in the field. Each Division must be equipped with a mobile Flash Butt Welding Machine within the next three years. (K 5.3 and CSP 5.19d) [Track Machine Directorate: three years]

13.1.5 Training of Officers and Supervisors: Engineering Officers and P. Way Supervisors must be given specialized training in Rail Welding Technology with lab-work in appropriate Training Institute within Railways or Outside. If necessary, specialized training centers must be set-up for this purpose within next three years. [All Departmental CTIs: one year]

13.1.6 Training of Welders: Formal training programmes along with lab work should be designed for Welders in the field. Annual refresher course and annual certification for such Welders should be made mandatory. [IRICEN to coordinate and plan: three months]

13.1.7 Traffic Block for Welding of Rails should be of minimum 70 minutes so that Welding is properly cured. This must be ensured even at the cost of punctuality and throughput. A corridor block of 75 minutes should be built for each section in the WTT for this purpose. [Zonal Railways: immediate]

14 Ultrasonic Flaw Detection

The current technique of USFD is neither adequate nor is it user friendly. It leaves blind areas in the cross-section and the current technique causes fatigue in the staff carrying out the inspection, thus further impacting its effectiveness.

14.1 Recommendations:

14.1.1 The existing Trolley Mounted USFD Machines are too dependent on human interpretation of defects. New machines need to be procured, which detect a flaw and record the location of the flaw along the track. [Track Machine Directorates to issue technical specifications: three months, Zonal Railways to acquire: one year]

14.1.2 Vehicle Borne USFD testing for rail and weld inspection, to be inducted, one for each Zonal Railway within next two years. (K 5.2.5.5 and Kh I 2.20.6 iv). OPEX model of acquisition of such devices should be

adopted. [Track Machine Directorate to issue policy in three months]

14.1.3 General Managers should be authorized to acquire one such system each so that large-scale trials can be quickly conducted and concluded. [Zonal Railways: two years]

14.1.4 The number of Vehicle Borne inspection devices to be increased to one in each Division within the next five years. [Track Machine Directorate to issue policy: three months, Zonal Railways to acquire: five years]

15 Broken Rail Detection System

15.1 The ongoing trials of Ultrasonic based real-time broken rail detection system on 25km stretches in underway on NR and NCR. Trials should be expanded to five other locations and concluded within a year. [Track Directorate: one year]

15.2 If found successful, this system should be adopted and proliferated across entire IR within next five years. [Track Directorate: five years]

16 Bridges

16.1 Renewal of Bridges has been an area of focus for a long time. This was given a renewed thrust in the Corporate Safety Plan and was funded by the SRSF. However, induction of modern technology has been sporadic at best. The Corporate Safety Plan laid great emphasis on this. (CSP 5.25)

16.2 Recommendations:

16.2.1 A full-fledged Bridge Management System, standalone of as a part of the TMS should be created within the next one year. [Track Management Directorate: one year]

16.2.2 Rehabilitation and strengthening of bridges for 25 tonne axle loads to be completed on priority. [Bridge and Structures Directorate: five years]

16.2.3 Replacement of corroded steel and concrete girders with anti-corrosive measures in corrosion-prone area. [Bridge and Structures Directorate: five years]

16.2.4 The project of instrumentation of major bridges for online monitoring has been abandoned. This should be revived immediately and installed on 200 major bridges as planned earlier. [Bridge and Structures Directorate: three years]

16.2.5 A scientific and proven system of inspection of underwater portions of bridges should be developed, with expert help, within next one year. IIT-Madras has done work in this area. They should be consulted. [Engineering Bridge and Structures Directorate: one year]

16.2.6 Mobile Bridge Testing Labs, on the lines of Emission Test Car of RDSO should be developed. At least five of these should be inducted within next three years. [Bridge and Structures Directorate: three years]

16.2.7 Mobile Bridge Inspection Units should be inducted with modern techniques. One for each Zonal Railway within next five years. [Bridge and Structures Directorate: five years]

16.2.8 Drones with Ultra High-Definition Machine Vision should be designed within next one year on commercially available drone platforms within next one year. A drone for each Division should be acquired within next three years. These should work in synergy with the Mobile Bridge Inspection Units. [Bridge and Structures Directorate: one year]

16.2.9 Tractive Effort limiting devices should be a standard feature in all locomotives. [Electrical RS and Mechanical Traction Directorates: two years]

17 Maintenance of Engineering Assets

17.1 Traffic Blocks: Engineering assets, like tracks, bridges and tunnels often require extended traffic blocks, manpower and track machines as well as ETA for proper maintenance.

17.2 Recommendations:

17.2.1 Dedicated Maintenance Block on all routes for at up to three hours should be given by the DRM, without referring the matter to Headquarters. If necessary, trains to be cancelled, rerouted, or regulated. The ETA will accordingly be revised for each section. All maintenance backlog for tracks should be wiped out in one year. (CSP 6.24 and 6.25) [Zonal Railways: one year]

17.2.2 Blocks will be in the nature of integrated corridor blocks to be utilized for Engineering and TRD assets. As far as possible, S&T Maintenance should also be

combined within these blocks. [Zonal Railways: one year]

17.2.3 The authority seeking block will clearly specify, in advance, the quantum of work that will be carried out during the block period. This should be a verifiable volume of work. [Zonal Railways: one year]

17.2.4 DRM's performance will be evaluated on the hours of block granted and output delivered as per standardized norms. [Zonal Railways: one year]

17.2.5 Before a traffic block is granted, the Sectional Sr. DEN/DEN will certify that all material, equipment and manpower for the work to be done during the block has been arranged. [Zonal Railways: one year]

17.2.6 A Special allowance of 30% should be given to Keymen and Gatekeepers, currently unpopular categories, so that we get willing and sincere staff for manning these important posts. [Track Directorate: three months]

17.2.7 Vacancies of Trackmen should be filed on top priority in a time bound manner.

17.2.8 There is an urgent need to take a new look at the tools and equipment of the Keyman to make his job easier, more hands-free and less tiring. [Track Directorate: three months]

17.3 Empowerment of Sr. DENs/DENs (K 2.9)

17.3.1 A typical Sectional Sr. DEN/DEN is constantly struggling to meet even basic material requirements of the field. Most procurement is centralized in the Headquarters. This often results in sub-standard or incomplete work even when a long traffic block is

granted ultimately leading to frequent demands of blocks.

17.3.2 The urgent needs of the field are best met by the officer facing it directly, day in and day out.

17.4 Recommendations:

17.4.1 Sectional Sr. DENs and DENs should be given a Cash Imprest of Rs. 10 lakh, to be recouped every month. Recoupment should be automatic every month by recharging a prepaid card. Account of the previous month may be sent separately. [Finance Directorate: three months]

17.4.2 A Sr. DENs or DENs should be permitted to buy stock or non-stock items, without any restrictions, out of this Cash Imprest. [Finance Directorate: three months]

17.4.3 Rule 145 of the GFR 2005 for purchase of up to Rs. 15,000 without calling for multiple quotations should be made immediately applicable in Railways. [Finance Directorate: three months]

17.4.4 Divisions should also be empowered to procure tack fittings like ERCs, Liners, GRSPs and Fittings for Points and Crossings through the Divisional Stores Officer. [Finance Directorate: three months]

17.4.5 Essential Track Fittings like ERCs, Liners, GRSPs, Fish Plates, Joggle Fish Plates, SEJs etc. should be made Stock Items and regular procurement made to an established EAR/AAC. [Track and Stores Directorates: three months]

17.4.6 PWIs should have a Cash Imprest of Rs. One lakh for prior cleaning of tracks before maintenance work in undertaken. [Finance Directorate: three months]

17.5 Upgradation of Track Materials:

17.5.1 Adoption of superior quality corrosion resistant rails having high fracture-toughness needs to be expedited. [Track Directorate: five years]

17.5.2 Wider and heavier sleepers (already under trial) with improved elastic fastening to be adopted. [RDSO to finalize trials: one year]

17.5.3 Thick Web Switches should be installed on all major trunk routes within the next three years. (Kh II 4.8.3) [Track Directorate: three years]

18 Encroachments

18.1 Encroachments near tracks affect operations and maintenance. Defecation and trespassing affects track due to accelerated corrosion. There is a need to fence tracks to prevent these and also to prevent Cattle runover.

18.2 Recommendations:

18.2.1 New track works like new lines, doubling and gauge conversion should include fencing in all estimates. [Works Directorate to issue policy: three months]

PROTECTION
OF ROAD USERS
(PARA NO. 19 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

19

19 Protection of Road Users

19.1 Protection of Road Users at Level Crossing Gates is an avowed objective of the IR. Unmanned Level Crossings (UMLC) are the spots where maximum casualties of Road Users happen. Removal or manning of UMLCs has been undertaken in right earnest. Eventually, though Manned Level Crossing Gates too need to be eliminated to facilitate operations and to eliminate LC accidents due to human error.

19.2 Recommendations:

19.2.1 The mission of elimination of LC Gates should be pursued in right earnest.

19.2.2 A system needs to be devised to periodically open the LC Gates, which are Closed to Road Traffic, so that the accumulated road traffic gets cleared. [Safety Directorate: three months]

PROTECTION
OF ROAD USERS
(PARA NO. 20 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

20

20 Signalling

20.1 Safety of Trains depends on Integrity of Signaling Systems. Human interventions should be minimized, if not altogether eliminated.

20.2 In spite of advancement of signaling systems in the world and even on IR, there are nearly 370 stations having Lever-Frames and Semaphore Signals. A similar number of stations have Lever-Frames, equipped with Colour Light Signals.

20.3 The current throw-forward for signal Works in under PH-33 is about Rs. 7800 Crores. This implies a liquidation of these works alone will take 7-8 years at current levels of funds provisions and resources, leave aside investments in Advance Signaling Systems.

20.4 There is a growing backlog of stations, where signaling gears become due for replacement. We are replacing only about 100

stations against an arising of 200 per annum. A glaring example was the catastrophe in Itarsi RRI, which happened due to a delay in renewal. A list of Major Yards due for replacement can be seen at **Annexure – 5**.

20.5 Recommendations:

20.5.1 All Lever- Frames and Semaphore Signaling should be replaced in the next three years. [Signal Directorate: three years]

20.5.2 All Relay Rooms of interlocked stations having more than 100 routes should be Air-conditioned, Dust-proofed and fitted with Fire Detection and Dowsing System. [Signal Directorate: three years]

20.5.3 Signal and Telecom Assets are nerve centers of Train Operations. A study should be conducted to evaluate threats of sabotage, terrorist attacks etc. to them and to provide necessary protection. This should be done within next six months in consultation with the RPF to define the security protocol for implementation. [Signal Directorate: six months]

20.5.4 Redundancy must be built/provided for items like BPAC so that in case of failure the backup system takes over in case of failure of one. [Signal Directorate: three years]

20.5.5 Raise standard of interlocking to provide isolation for safe operation and to improve speeds. [Signal Directorate: five years]

20.5.6 All starters at stations should be made free starters so that the need for physically ensuring correct setting of points protected by the signal is not required during failures like block failures. If due to the complexity of

the signaling system, a free starter is not possible, a calling-on signal should be provided below the starter so that correct setting and locking of points can be ensured with the clearing of the calling-on signal. [Signal Directorate: five years]

20.5.7 Dual Detection: Redundancy in design is an established Engineering Practice to improve the System Availability for Operational Use at the same time maintaining the required Level of Safety in Train Operations. This has been extensively used in all critical applications, which includes apart from Satellite Systems, Nuclear Power Stations, Aeronautic Engineering Equipment, the Railway Train Control System. This comment has also been recommended by the Kakodkar Committee vide Para 2.5.3 (Recommendation No.1-2). The system has been deployed on Indian Railways for Fail Safe Train Detection, which forms the base for the Integrity of the Signalling & Interlocking Systems. The System does not claim to detect Rail Fractures at all, especially those which are on the Rail Head or are of Hairline nature and are on the Negative/Traction Current carrying Rail. In addition, Rail Head Cracks and Hairline Fractures even on the Positive Rail also will not get detected.

There is need to appreciate the difference between Fail Safe Train Detection System, which is the base of Interlocking and the System of Rail Integrity Monitoring System deployed Worldwide. On IR, One Rail, which carries Traction Current or is used for Polarity Staggering for Safe Train Movement Detection cannot be monitored for Rail Breakage.

For detection of Broken Rail or Weld, Track Bound Instrumented Inspection Vehicle and Online Rail Monitoring Systems have been deployed in developed Railway Systems.

Striking Balance between Mobility and Safe Enough Strategy, the Signals can be restricted to Double Yellow or even Yellow, when the Track Circuit has dropped, and the Axle Counter shows clear. This is in addition to the ASMs response as per SWRs, to such indications on the Panel and the Maintenance System stipulated for Rail/Welds. [Safety Directorate: Six Months]

20.5.8. Alerts on Panels: An alert system to be built in the Panel/VDU to warn ASM of non-compliance of important rules such as GR 3.38(2) as available on Chennai Division and alerts for dealing with GR 3.68, 3.69,3.70. [Signal Directorate: one year]

Annexure – 5

LIST OF LEVERFRAMES/RRI (MEDIUM/LARGE YARDS) DUE FOR REPLACEMENT

S. No.	Railway	Route	Station Name	MACLS/ Semaphore	Type
1	NR	D	Amritsar	MACLS	Lever Frame
2	NR	B	Ambala Cantt	MACLS	RRI
3	NR	A	Andal	MACLS	RRI
4	ER	D Spl	Amausi	MACLS	Lever Frame
5	NR	B	Balamau	MACLS	Lever Frame
6	NCR	D	Banda		Lever Frame
7	NR	E	Bathinda Cantt	MACLS	Lever Frame
8	CR	A	Bhusawal	MACLS	Lever Frame
9	WCR	A	Bina Cabins	MACLS	Lever Frame
10	SER	E	Bokaro Cabins	MACLS	Lever Frame

11	CR	C	Dadar	MACLS	RRI
12	NCR	A	Dadri	MACLS	PI
13	ECR	B	Danapur	MACLS	Lever Frame
14	NR	E	Dhuri	Semaphore	Lever Frame
15	ECR	E	Dugdha	Semaphore	Lever Frame
16	NR	D	Faizabad	Semaphore	Lever Frame
17	NR	A	Ghaziabad	MACLS	RRI
18	WR	D Spl	Hapa	Semaphore	Lever Frame
19	NCR	E	Harduaganj	MACLS	Lever Frame
20	CR	A	Igatpuri	MACLS	RRI
21	ER	B	Jamalpur	Semaphore	Lever Frame
22	NR	B	Jammu Tawi	MACLS	Lever Frame
23	NCR	A	Jhansi	MACLS	Lever Frame
24	SR	B	Jolarpettai Jn.	MACLS	RRI
25	NCR	A	Juhi "Cabins	MACLS	Lever Frame
26	CR	C	Kalyan	MACLS	RRI
27	CR	B	Karjat	MACLS	RRI
28	NER	E	Kashipur Jn.	Semaphore	Lever Frame
29	NR	B	Khanalampura	MACLS	Lever Frame
30	SER	A	Kharagpur	MACLS	RRI
31	ECR	B	Kiul	MACLS	Lever Frame
32	ECR	E	Krshnshila	Semaphore	Lever Frame
33	WCR	A	Kota	MACLS	End PI
34	ECR	E	Kusunda	MACLS	Lever Frame
35	NWR	E	Lalgarh Jn	Semaphore	Lever Frame
36	CR	B	Lonavala	MACLS	PI
37	NR	D Spl	Manak Nagar	MACLS	Lever Frame

38	SCR	A	Manikgarh	MACLS	End PI
39	ECR	B	Mokama	MACLS	Lever Frame
40	ECR	D Spl	Muzaffarpur	MACLS	PI
41	SCR	B	Nadikudi	MACLS	End PI
42	NR	D	Narwana	Semaphore	Lever Frame
43	SER	E	Nimpura Cabins	MACLS	Lever Frame
44	NCR	A	Panki	MACLS	Lever Frame
45	ECR	E	Patherdih	Semaphore	Lever Frame
46	NR	E	Patiala	MACLS	Lever Frame
47	ECR	D Spl	Patratu	MACLS	Lever Frame
48	NR	B	Pratapgarh	Semaphore	Lever Frame
49	CR	B	Pune	MACLS	Lever Frame
50	NR	B	Raibareilly	Semaphore	Lever Frame
51	WR	A	Ratlam	MACLS	RRI
52	NWR	E	Satrod	Semaphore	Lever Frame
53	NR	D	Shakurbasti	MACLS	Lever Frame
54	ECR	A	Sonanagar	MACLS	Lever Frame
55	SCR	A	Tenali South	MACLS	End PI
56	NR	A	Tughlakabad Cabins	MACLS	Lever Frame
57	NCR	A	Tundla	MACLS	Lever Frame
58	WR	A	Udhna	MACLS	RRI
59	NR	D Spl	Unnao	MACLS	Lever Frame

21 Maintenance of Signalling Assets

21.1 Proper functioning of signal gear ensures safe running of trains. More importantly, it eliminates shortcuts that directly impact safety.

21.2 There has been a constant decline in staff for signal maintenance per unit asset over the years. The quality of staff has also not kept pace with the increased sophistication of signal assets. This shortcoming can be largely overcome by induction of technology for online monitoring and diagnostics, better communication, and logistics.

21.3 Recommendations:

21.3.1 An IT based Asset Management System for online recording of signal defects, keeping records of assets, their age and maintenance history and management level monitoring, on the lines of CMM, FMM or TMS

should be created within next one year. [Signal Directorate: one year]

21.3.2 The Cash Imprest of each Sr. DSTE should be increased to Rs. 10 lakhs to be recouped every month. Recoupment should be automatic by recharging a prepaid card. Accounts of the previous month may be sent separately. [Finance directorate: three months]

21.3.3 A Sr. DSTE should be permitted to buy stock or non-stock items, without any restrictions, out of this Cash Imprest. [Finance directorate: three months]

21.3.4 Rule 145 of the GFR 2005 for purchase of up to Rs. 15,000 without calling for multiple quotations should be made immediately applicable in Railways. [Finance directorate: three months]

21.3.5 A Sr. DSTE should be empowered to hire road transport for movement of men and material to attend to failures and exigencies without Finance concurrence. [Finance directorate: three months]

22 Automatic Train Protection (CSP 4.6)

22.1 The issue is important enough to be discussed separately from the para on Signalling. No modern train system in the world operates without an ATP System in place. (Kh I 2.12, K 3.5.1 and K Suppl. 3.2)

22.2 In spite of frequent SPADs in Europe there have been no casualties. (K Suppl. 3.2)

22.3 Each country has developed its own version of ATP and most of these meet the ETCS-I level stipulations. (K Suppl. 3.2)

22.4 Recommendations:

22.4.1 IR should now lay down a roadmap for the introduction of ATP on its network. This should be done within the next six months. [Signal Directorate: six months]

22.4.2 An India specific ATP system, matching at least ETCS L-1 standards should be developed. The endeavour

should be to ensure significant indigenization of the hardware and software and full indigenous support. This should be finalised within a year. [Signal Directorate: one year]

22.4.3 TCAS should be developed as a sub-set of the ATP. Necessary upgrades and changes in the TCAS system should be done to ensure this simultaneously. [Signal Directorate: one year]

22.4.4 Assured Funding should be provided for the ATP System so that ATP on all A&B Routes can be provided by March 2022. [Finance Directorate: four years]

COMMUNICATION BACKBONE
(K 4.4.4 AND CSP 5.17)
(PARA NO. 23 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

23

23 Communication Backbone (K 4.4.4 and CSP 5.17)

23.1 Wireless is the way forward. With increasing number of devices, portable radios, other communications systems, on-board equipment and Trackside installations, Distribute Power (Locotrol), EOTT etc. it is unavoidable that IR sets up a secure, irrepudiable and recordable communication system as the step towards "Internet of Trains". It is also the sine qua non for a robust Automatic Train Protection System (ATP).

23.2 A Mobile Train Communication System based on Radio and GSM-R is the need of any modern railway system. This provides for communication so secure that even train passing, gate operations, operation of blocks etc. can be based on it through suitable changes in GR and Operating Rules.

23.3 Recommendations:

23.3.1 A clear roadmap for Communication Backbone including Mobile Train Radio Communication should

be drawn within next six months. (K 8.6) [Telecom directorate: six months]

23.3.2 Mobile Train Radio Communication should be installed on Routes A and C within the next three years. B and D Routes should be covered in another three years thereafter. (Kh I 2.11.1 and Kh II 3.2.2) [Telecom directorate: three and six years]

23.3.3 A detailed plan for Communication Based Train Control (CBTC) in Suburban sections should be created within next one year and implemented in five years. (K 8.5) [Telecom Directorate: one year]

23.3.4 A pan-India license for radio frequency (spectrum) should be taken centrally by the Railway Ministry to enable communication between wireless devices. This should be done within the next six months. [Telecom Directorate: six months]

24 Signal Passing at Danger (SPAD)

24.1 SPAD is a worldwide phenomenon, and a lot of research is being done to control, if not eliminate it altogether.

24.2 Analysis of SPAD **(Annexure – 10)** indicates that majority of incidences happen after "home rest" (HQ Rest) or full rest or leave. This is counter intuitive but point us towards a need for not only counselling, but also to a scientific approach to the problem. This is due to the fact that quality rest is missing during such long home-station rest as the loco pilot is preoccupied with attending to personal and family matters.

24.3 SPAD by departmentally promoted crew is much higher as compared to directly recruited crew through RRB and stands at 9.91 and 3.85 per thousand crew in each category respectively. **(Annexure – 11)**

24.4 SPAD is directly related to fatigue.

24.5 Enquiries into SPAD are perfunctory and only indicate who was guilty, not why it happened. (Kh II 5.5.4)

24.6 Recommendations.

24.6.1 SPAD should be classified accordingly to the distance of overshooting. Cases of SPAD should be dealt differently upon whether the LP, after committing SPAD, has stopped within the signal overlap or crossed the overlap. This should also decide the penalty imposed on the erring crew. In ATP/AWS Territory this differentiation will not, however, apply. (Kh II 5.5.4) [Safety Directorate: three months]

24.6.2 All new Loco Crew should be recruited with the minimum qualification of a Diploma. Even departmental candidates should fulfil this criterion. (K 6.3)

24.6.3 All Running Rooms should be air-conditioned and made noise-proof regardless of their geographical location.

24.6.4 There should be a separate Plan Head for Running Rooms, Lobbies and Crew Rest Rooms. (Tripathi 7.5.3)

24.6.5 Loco Pilots coming to duty after availing a periodic rest or after a leave should be made to take a mandatory rest of 6 hours in the running room before being booked for a train.

24.6.6 Loco Crew should be called to duty not before 08:00 hrs. after availing leave till the previous day. (K 6.6)

24.6.7 Breathalyzers and Bio-Metric Identification should be integrated into the CMS across all Lobbies within six months.

24.6.8 Loco Inspectors and Officers on footplate should be provided with portable breathalyzers to test the crew on the run. (Kh II 3.10.3)

24.6.9 Loco crew should be mandatorily provided with accommodation in their headquarters and required to stay in them.

24.6.10 A study should be commissioned with expert outside help within next three months on Alertness Management and Fatigue Mitigation. IIT-Kharagpur has done work on fatigue in Airlines Pilots. They must be consulted. (Kh II 5.4) [Mechanical Traction Directorate: six months]

24.6.11 There is a need to revise and update the Psychological Tests for running crew. Vienna Test System, an acclaimed testing methodology may be consulted for this purpose. [RDSO: six months]

24.6.12 There is a need to lay down that maximum speed for crossing a signal at caution should not be more than a maximum specified. Provision for speed control already exists in GR 3.07, but no limit has been set by any Railway. This is also in line with maximum speeds prescribed after passing a signal at caution in AWS territory. [Safety Directorate: Three months]

24.6.13 Cellphone jammers should be installed in Loco Cabs to prevent use of Mobile Phones by Loco Crew, a known cause of SPAD and collisions. [Electrical and Mechanical Directorates dealing with Locos and Self-Propelled Stock: six months]

24.6.14 LPs/ALPs found guilty of SPAD should never be put back on running duty, if taken back after removal.

Establishment Rules need to be changed to enable their posting in other categories. [Establishment Directorate: three months]

24.6.15 The ALP should be tested and certified for application of Assistant's Emergency Brake operation on the driving simulator by the trainer by simulating a condition where the LP doesn't react to an unsafe situation. [Zonal Railways: Immediate]

24.6.16 There is not direct supervision of ALPs as available for LPs and LP Shuting. There needs to be an LI for every 50 ALPs for better monitoring and mentoring. [Establishment Directorate to issue yardstick: three months]

24.6.17 During categorization of LPs as A, B or C, the present system of 1 or 0 mark for each of the hundred attributes results in most of the LPs getting categorized as A. This needs to be reviewed and better system designed. [Mechanical Traction Directorate: six months]

24.7 Supervision of Loco Crew:

Loco crews are counselled and monitored largely by Loco Inspectors and occasionally by the CPRC/CTLC/CCC. There is a need to ensure that experienced and competent staff are selected to these posts.

24.8 Recommendations:

24.8.1 Loco Inspectors must not only be experienced, but also drawn from senior levels of the cadre. We must revert to the pre-2009 norms for selection of Loco Inspectors. All Loco Inspectors must be experienced

Mail/Express Drivers. [Mechanical Traction Directorate: three months]

24.8.2 CCC/CPRC/CTLC should be drawn from the cadre of Lis. This will ensure correct counselling and monitoring of crew and meaningful interaction with the respective Branch Officers. [Mechanical Traction Directorate: three months]

Annexure – 10

Table No. – 5					
Last Test availed (HQ/Outstation)					
Rest availed	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**Total**
HQ rest	41	45	28	23	137
Outstation Rest	27	31	15	11	84
Total					

Table No. – 6									
Time of SPAD									
Time	**2013-14**		**2014-15**		**2015-16**		**2016-17**		**Total**
	P	**G**	**P**	**G**	**P**	**G**	**P**	**G**	
00.00 – 02.00	1	2	2	8	0	4	0	2	19
02.00 – 04.00	4	2	4	3	3	0	3	1	20
04.00 – 06.00	1	8	2	3	2	0	4	2	22
06.00 – 08.00	6	3	4	3	3	3	1	2	25
08.00 – 10.00	10		4	1	5	2	0	0	22

10.00 – 12.00	7		2	3	2	2	1	0	17
12.00 – 14.00	1	2	2	6	2	3	1	1	18
14.00 – 16.00	3		3		4	2	1	1	14
16.00 – 18.00	1		6	1	1	2	3	0	14
18.00 – 20.00	4	3	4	1	0	0	5	2	19
20.00 – 22.00	2	1	2	1	1	0	3	2	12
22.00 – 24.00	4	3	6	3	4	0	1	0	21
Total	**44**	**24**	**41**	**33**	**27**	**18**	**23**	**13**	**223**

Table No. - 7

Duty done till SPAD

Duty Done (Hrs.)	**2013-14**		**2014-15**		**2015-16**		**2016-17**		**Total**
	P	**G**	**P**	**G**	**P**	**G**	**P**	**G**	
< 2 Hrs.	6	2	10	4	9	0	8	2	41
2-4 Hrs.	16	4	15	1	9	4	4	2	55
4-6 Hrs.	13	5	7	8	5	6	8	3	55
6-8 Hrs.	5	5	5	7	3	3	2	3	33
8-10 Hrs.	2	3	2	8	0	3	1	1	20
> 10 Hrs.	0	6	0	3	0	1	0	0	10
Total	**42**	**25**	**39**	**31**	**26**	**17**	**23**	**11**	**214**

Annexure – 11

ANALYSIS OF SPAD

Table 4A

Railways	Total SPAD (Excluding Engg. & TRD)	Main line SPAD	Suburban SPAD (1.4.2013 to 28.9.2016)	Main Line Crew	Suburban Crew	Total Crew	Main line SPAD per 1000 crew	Suburban SPAD per 1000 crew	Total SPAD per 1000 crew
CR	35	25	10	2471	762	3233	10.1	13.1	10.8
ECoR	5	5		2364		2364	2.1		2.1
ECR	6	6		2196	20	2216	2.7		2.7
ER	1	0	1	2219	696	2915	0.0	1.4	0.3
Metro	0	0	0	0	196	196	0.0	0.0	0.0
NCR	23	23	0	2846		2846	8.1		8.1
NER	9	9		1023	0	1023	8.8		8.8
NFR	3	3		1006	0	1006	3.0		3.0
NR	24	24	0	3601	0	3601	6.7		6.7
NWR	2	2		1364	0	1364	1.5		1.5
SCR	21	21		3178	0	3178	6.6		6.6
SECR	6	6		2275	0	2275	2.6		2.6
SER	0	0	0	2586	153	2739	0.0	0.0	0.0
SR	20	19	1	1480	365	1845	12.8	2.7	10.8
SWR	9	9		912	0	912	9.9		9.9
WCR	6	6		1899	0	1899	3.2		3.2

WR	35	24	11	2432	466	2898	9.9	23.6	12.1
KRCL	1	1		140	0	140	7.1		7.1
IR	**206**	**183**	**23**	**33992**	**2658**	**36650**	**5.4**	**8.7**	**5.6**

Table 4B

Type of traction	RRB	Deptt	RRB Crew	Deptt Crew	Total SPAD per 1000 crew	
					RRB	Deptt
Diesel	35	62	10194	6348	3.43	9.77
Electrical	67	39	16269	3839	4.12	10.16
Total	**102**	**101**	**26463**	**10187**	**3.85**	**9.91**

25 Train Operations

25.1 Several devices have been under deliberation for years. Enough trials have been conducted successfully. There is a need to induct them on full scale.

25.2 End of Train Telemetry of EOTT: This enables guard less operations of trains as it checks for air pressure continuity and train integrity. If provided with features of brake application, it will also apply brake from the rear end of the train, thus improving braking performance.

EOTT also enables elimination of the Guard Van or the Brake Van, which are prone to derailments. It also enables the addition of an extra wagon in place of the Brake Van, thus increasing revenue.

Even if we do not eliminate the Guard and the Brake Van, the EOTT, by itself, provides additional safety.

25.3 Recommendations:

25.3.1 EOTT trails should be concluded, and policy issued to begin installing the EOTT device in Freight Trains. [Mechanical Development Directorate to conclude trail: six months, Traffic Transportation Directorate to issue policy: one year]

25.4 Distributed Power (DP) or Locotrol: DP is required not only for long haul trains but is immensely useful for a normal length (59-60 wagons) freight train. (CSP 4.4)

25.4.1 Wherever double heading or a "multi" is required, Locotrol can be fruitfully deployed. It enables elimination of the Brake Van, thus permitting an additional wagon. It eliminates possibilities of derailments of Brake Vans. Locotrol also allows brake application from both ends of the freight train, thus improving braking performance and safety.

25.4.2 Locotrol eliminates need for shunting for engine and Brake Van reversal, reduces coupler forces, prevents wheel-burns and train-parting thus making operations simpler and safer. (K 4.10.3)

25.4.3 Locotrol saves about 8-10% of energy as well.

25.5 Recommendations:

25.5.1 Distributed Power Systems should be installed on Locomotives, where the same has been adequately proven. [Electrical RS and Mechanical Traction Directorates to install first five hundred DPs each in electrical and Diesel Locos: two years]

25.5.2 Interoperability between various makes of DP should be ensured by creating an IR Standard for the same. [RDSO: three months]

25.6 Retroreflective Boards:

All Boards meant for guidance of loco crew, such as Speed Restriction and Termination Boards, Signal Sighting Boards, km Stones, Boards on OHE Masts, Boards on Signal Posts etc. should be retroreflective. This should be done within a year. [Zonal Railways: one year]

REALTIME SAFETY MONITORING OF ROLLING STOCK
(PARA NO. 26 / REPORT OF TASK FORCE ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

26

26 Realtime Safety Monitoring of Rolling Stock

26.1 Trackside safety devices are a standard provision in modern railway systems. They monitor a running train for bearing defects, broken, and hanging parts, flat wheels, unusual sounds etc. They can even detect incipient defects that would fail after a few days. It is rather disconcerting that we have not introduced them even after nearly a decade of deliberations. This has become an urgent need since the elimination of LC Gates also leads to an important checkpoint, the Gatekeeper, who often detects hot boxes and hanging parts etc. preventing disaster. (K 4.4)

26.2 Recommendations:

26.2.1 A study to be commissioned to study provision of Trackside Safety Devices in Modern Railroad Systems. This should be done within the next three months. Specifications, distance between successive installations, communication protocols etc. must be

determined. [Mechanical Development Directorate: three months]

26.2.2 There should be an immediate introduction of such Trackside Detection and Monitoring Systems (Online Monitoring of Rolling Stock, OMRS) with composite features of hot-box, bearing noise, camera-based inspection system, flat wheels, hanging-parts detection etc. The hundred sites as already planned should be installed quickly. [Mechanical Development Directorate: two years for first fifty and another two years for the remaining fifty]

26.2.3 On-board Condition Monitoring Systems (OBMS) that monitor bearings, vibrations, and other parameters of rolling stock and communicate to a central server for alerts and action has been under deliberations for many years. OBMS should be fitted in all locomotives, coaches, and wagons along with associated IT infrastructure and control room. [Mechanical Development Directorate: two years for the first 2000 locomotives, 20,000 coaches and one lakh wagons, five years for 100% coverage]

26.2.4 Machine Vision Intelligent Devices for detection of rolling stock defects should also be installed at entry of major yards. They should also be equipped with automatic wheel profile detectors. The first twenty such machines must be installed within the next two years (K 4.8). [Mechanical Development Directorate: two years]

26.3 Weigh Bridges: Weigh bridges are essential to detect and prevent overloading of wagons. Proper functioning,

calibration and periodical inspection of weighbridges must therefore be ensured. [Zonal Railways: Immediate]

26.4 Recommendations:

26.4.1 A Uniform Operating Protocol for weighing, movement of un-weighed wagons, movement of overloaded wagons etc. should be issued on the lines of that in use on NCR. [Traffic Transportation Directorate: three months]

26.4.2 Periodic Inspections of Weigh Bridges should be ensured and made a KPC for evaluation of ADRMs' performance. In due course, all Trackside Safety Devices should be included in the protocol. [Zonal Railways: Immediate]

27 Material Procurement System

27.1 There is a serious disconnect between the Stores Department and User Departments on definition of out-of-stock situation. Whereas claims of near 100% availability is made by the Stores Department, High Level Accident Enquiries, Corporate Safety Plan or the Kakodkar Report have indicated that there was a chronic shortage of material. A example of shortage, as reported by the CWM, Carraige Workshop, Matunga, Central Railway is placed at **Annexure – 12**. It lists some safety and critical items, where availability over two years is shown at less than 10% to 50% of the AAC.

27.2 In a recent inter-Railway Safety Audit, the SWR team found that a freight rake certified fit for movement by the NGP TXR was not fit at all. The SWR officer, who was understandably looking only for safety, found that 15 wagons were unfit and marked them sick. The SSE/C&W of NGP was suspended for his "lapse"! When questioned the SSE said that he had chronic

shortage of material and that he had no other way out. He was doing it under "pressure" of train operations, an euphemism for blatant disregard for safety.

27.3 If we ignore this reality of chronic shortage of material, we will never achieve the safety standards expected of a public carrier. Same is the situation in all areas of maintenance of railway assets.

27.4 EDME/Coaching, during his interaction with the Safety Task Force, indicated that 35% items for coach maintenance (20% being safety items) were out of stock on any given day. He mentioned that even coaches being turned out after POH are often fitted with used brake blocks. Similarly, tack renewals are often done with release track fittings.

27.5 As mentioned above, the AAC is a purely technical decision. The advantage of this step would be that the system is aware, at all times, of the actual requirement of material, the needed budget and purchase grant even if it is unable to purchase the desired quantity for the present. This creates realistic grounds for projection of budget and purchase grants for coming years. Artificially depressing the AAC gives a false sense of fulfilment that the necessary material had been provided for.

27.6 Timely availability and quality of supply both are important in the case of safety items.

27.7 Recommendations:

27.7.1 Anticipated Annual Consumption (AAC), also known as the Estimated Annual Requirement (EAR), should be treated as a purely technical decision. It is based on Maintenance Manuals, RDSO recommendations or real-life ground level experience. There is no role for Finance or Stores in deciding or changing the AAC.

Likewise past consumption due to bad decisions, or non-availability for whatever reason is not a ground for reduction in AAC. [Stores Directorate to issue policy: one month]

27.7.2 AAC should be fixed by the Executive Department based on the factors referred to above. This should be enhanced or reduced depending upon the population of assets in the field. This AAC will remain sacrosanct. [All Technical Directorates to issue policy: one month]

27.7.3 The Finance, Procurement Officer or the Tender Committee will not reduce or enhance the AAC at all on account of lack of funds or record of past consumption. If Stores or Finance feel at any given stage, such as the initiating the procurement process, vetting of tender proposal, Tender Committee proceedings, it must mention that "While the AAC is 100 (for example), a Purchase Order can be placed only for 60 due to shortage of funds in budget or shortage of purchase grant". [Stores Directorate to issue policy: one month]

27.7.4 When the stock level of an item falls to three months' consumption as per AAC, it should be treated as out of stock and emergency procurement process should automatically set in motion. [Stores directorate to issue policy: one month]

Annexure – 12

S.N.	Item description with P.L. No.	AAC	Material Received in MTN Store During	
			2015-16	2016-17
1	Buffer plunger (37.13.0912)	2100 Nos.	2472	1368
2	Axle box housing (30.02.0487)	700 Nos.	363	330
3	Compreg Plywood 12 mm (93.50.0208)	7200 Nos.	6317	1495
4	Paint Ena. Syn. Ext. Brus. Fin. Post office red. (77.03.3012)	1800 Ltrs.	1000	Nil
5	Paint Ena. Syn. Ext. Brus. Fin. Air Craft Blue. (77.03.3012)	25200 Ltrs.	8500	24960
6	110V/120AH cap. valve Regulated Lead Acid Battery (45.17.8460)	750 Set	199	202
7	Head Stock complete assembly (30.12.6150)	100 Nos.	42	13
8	M.S Plate 6 mm thick size: 2500 x 1250 x 6 mm (90.40.3502)	400 Qtls.	483	162
9	Aluminum Chequered sheet for EMU Size: 3048 x 880 x 2.03 mm	40000 Kgs.	11762	895 + 5185 U/I
10	Aluminum Chequered sheet for Mainline Size: 2770 x 813 x 2.03 mm	51000 Kgs.	2030	3779
11	EMU Poly carbonate sheet (31.54.7540)	40 Nos.	Nil	5

	2015-16	2016-17
AAC Revision Sent to HQ.	Vide Lt. No. RR/PR/277 dt. 13.01.2015 & 27.01.2015	Vide Lt. No. RR/PR/277 dt. 15.03.2016
AAC Revised by HQ.	Vide Lt. No. M.205.DM66/ZBBAAC dt. 07.07.2015	Not Vetted till date.

PROCUREMENT
OF SAFETY, VITAL
AND MUST-CHANGE ITEMS
(PARA NO. 28 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

28

28 Procurement of Safety, Vital and Must-Change Items

28.1 "The most skilled manpower and the finest maintenance practices can achieve little if the materials required for upkeep are substandard or unavailable" (Kh I 2.16.1)

28.2 Whereas stock out of non-safety items can sometimes be tolerated, the same cannot be done for safety items. It is a perishable need. If an asset has gone without it even once, safety has been compromised whether an accident happens or not. Vital and Must-Change items too indirectly impact safety.

28.3 Supply of Safety Items has been uniformly unsatisfactory across the entire Indian Railways. (K 2.13.2, Kh I 2.16.1 and 2.16.6)

28.4 The reality is that in spite of the purchase muscle of IR, suppliers take us for granted. P.O. supply dates are ignored so that sub-standard material is accepted by the user out of desperation. Such instances are too numerous to be ignored. There is at best complacency or at worst a nefarious design.

28.5 In matters of safety, timely supply is as important as quality of supply. Suppliers must therefore be kept on their toes, which is best done by the final user since he/she knows where the shoe pinches. This can be best done by creating a scenario of competition "even after the P.O has been placed".

28.6 Recommendations:

28.6.1 In each tender case for Safety, Vital and Must-Change items, P.O. should be placed on two firms for half the required quantity each. It will work like a mini–Rate Contract. The end user, for example, a Sr. DSTE, a Sr. DME/C&W or a Sr. DEE/Car Shed will be empowered to directly requisition material from either of the suppliers based on his performance against yardsticks of timely supply and quality. This will revolutionize the availability of such items. (Kh II 2.16.6) [Stores Directorate to issue policy: one month]

28.6.2 P.O. for Safety, Vital and Must-Change Items should be placed for long term for up to 3 years. [Stores Directorate to issue policy: one month]

28.6.3 Each bidder in tenders for Safety, Vital and Must-Change item must give an undertaking that if any malpractice is found in its business with Railways he will be summarily removed from the Approved List. A clause to this effect should be drafted by RDSO and circulated within the next three months for inclusion in tender notices. [Stores Directorate to issue policy: one month]

28.6.4 Tenders for Safety, Vital and Must Change items should necessarily have provision of Earnest Money and

Security Deposit. [Stores Directorate to issue policy: one month]

28.6.5 Each Department will prepare a list of up to fifty Safety Items, fifty Vital Items and a hundred Must-Change Items for each type of asset, such as the LHB Coach, ICF Coach, WAG9 Loco, EMUs, BOXN Wagons, BLC Wagons, Signals, Track Circuits, OHE, PSI, etc. Procurement of these items will be governed by the provisions given above. (K 2.13.1) The lists will be issued by respective Directorates in the Railway Board as a purely technical decision unencumbered by the Finance or Stores Directorates. The list and the AAC for each of these items will be approved at the Zonal level by the PHOD of the Department independent of Stores and Finance departments since this is a purely technical exercise. [All Technical Directorates: three months]

28.6.6 Availability of funds should not be a pre-requisite for initiating purchase of Safety Items. (Kh I 2.16.7) [Stores Directorate to issue policy: one month]

28.6.7 If the full monthly quota of a Safety, Vital and Must-Change Item is not issued, it must be considered out-of-stock. [Stores Directorate to issue policy: one month]

28.6.8 There should be no vetting of the P.O. for Safety, Vital and Must-Change Items. The Finance Officer in the TC should carry out the necessary checks. [Stores Directorate to issue policy: one month]

28.6.9 Finance Concurrence for operating the 30% Option clause for Safety, Vital and Must-Change Items should be dispensed with. [Stores Directorate to issue policy: one month]

29 Complex Products

29.1 With the increasing complexity of Rolling Stock, Signal and Telecom Equipment, more and more of these or their subassemblies are being procured to "performance specifications". Indeed, this is the trend worldwide and, in all spheres, not merely in Railways. To a Railway maintenance personnel such systems or sub-systems are mere black boxes, which must perform certain tasks given certain inputs.

29.2 A brake block or a wheel does not require maintenance; it is a use and throw product. We could theoretically buy it from an unlimited number of sources as long as out Quality Assurance Plans are robust. But the same cannot be said about a modern Computer Controlled Brake System, Traction Convertor, SSI etc. which have hundreds of components and proprietary software. It has a codal life of, say ten or fifteen years during which it requires

servicing, replacement of parts and filters, updating of software and so on, all proprietary.

29.3 Besides, even a qualified Railway engineer is not well versed with the internals of such diverse designs procured for the same purpose. It would therefore be wrong, unfair, and infructuous to expect any useful repair or attention from our artisans, who have a minimum qualification of Class 10 pass, leave aside a few better educated and dedicated staff members.

29.4 Since the public purchase procedure is such that each tender must generally be an open tender, we end up with supplies of many such black boxes from different vendors. Each one of these designs has its own internal layout and parts and components, for which we must necessarily depend on the OEM, either for costly proprietary AMC or proprietary purchases of spare parts. The total cost of ownership of such systems procured on lowest suitable tenders may soon spiral up due to post-purchase proprietary support.

29.5 Every annual tender throws up new players, who, in order to find an entry (typically Chinese companies), bid low and our system finds it difficult to ignore them thus compounding the problem of technology management.

29.6 When the older suppliers, who were the pioneers of those technologies, get edged out by copycat bidders, they leave the business and stop supporting even the systems IR has in the field. The best example is of the Microprocessor Based Control System (MBCS) of ALCo Locomotives, where the original developers, GE and SIEMENS have stopped bidding in our tenders and stopped supporting the

products in the field on the pleas that support alone doesn't pay for their expenses. This is a stark reality, and we must be alive to this.

29.7 There is, therefore, a need to limit number of manufacturers of such Complex Products to three as a policy. The ideal would be two competing suppliers, but we can probably not adopt such a policy. It requires a wide knowledge of technologies as they develop, market dynamics and exceptional negotiation skills to get reasonable prices. This alone will keep out fly by night operators and prevent cut-throat pricing, both causing harm to our safety and reliability.

29.8 Recommendations:

29.8.1 Each Directorate will identify such Complex Products used in assets/areas controlled by it. [All Technical Directorates: three months]

29.8.2 A Policy Directive to be issued for technology management, including purchase, restriction on numbers of vendor-designs, AMC, and Proprietary Purchase etc. in such areas, keeping in mind the need to control diversity, skills of manpower and indigenous support systems. (K 2.13.5) [RDSO: three months]

29.8.3 For each Complex System, the Purchase Order should include training in selecting Railway Supervisors and Artisans from each consignee in different aspects, such as design, maintenance, and troubleshooting. [All Technical Directorates: three months]

30 Procurement of Hardware

30.1 Hardware and fasteners (nuts, bolts, screws, washers etc.) is another critical item. The world of engineering and design has moved to high-tensile fasteners; indeed, IR too has done so in many applications. Failure of hardware can be catastrophic even though its cost may be miniscule. High Tensile fasteners come with high strength and are certified for a given torque and strength by the manufacturer. Opening of Traction return current bonds, fish plate bolts and other track fastenings, falling of battery boxes, falling of brake gear are not uncommon phenomenon, each one of these have caused accidents on occasions and have a continued potential to do so in future. (K 2.13.5)

30.2 Recommendations:

30.2.1 All Departments should be asked to study and identify mild steel fasteners which must be replaced with high tensile fasteners. If they choose not to do so, they should be asked to give a certificate that there would be no unsafe situation due to continuing with the old fasteners. [All Technical Directorates: three months]

30.2.2 High Tensile Fasteners should only be procured from reputed manufacturers. There are enough players in the market to get competitive rates. RDSO will prepare a list of approved vendors for the same within the next three months. (K 2.13.5) [RDSO: six months]

DELEGATION
OF PURCHASE POWERS
TO PURCHASE OFFICERS IN THE FIELD
(PARA NO. 31 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

31

31 Delegation of Purchase Powers to Purchase Officers in the Field:

31.1 A crisis is best handled by those who face it. The response time of the Headquarters purchase office is slow and does not address crisis in the field just due to the sheer number of additional levels it has to go through.

31.2 Recommendations:

31.2.1 Purchase Officers in the field, viz. the Sr. DMM attached with DRMs and the Dy. CMMs attached with CWMs should be delegated the same levels of purchase powers in the SOP as their counterparts of same rank in the Headquarters, both for stock and non-stock items. This should be done within three months. [Stores directorate: three months]

31.2.2 For tenders floated by Purchase Officers in the field, where acceptance must be at the level of SAG, the DRM or the CWM will exercise the power to accept tenders. [Stores directorate: three months]

32 Vendor Approval

32.1 Pre-approval of vendors, or an approved list of vendors is a globally accepted practice. It does not violate the principles of public procurement as long as the pre-approval process is open and transparent. All major manufacturers of industrial equipment, cars, aircraft and railway vehicles to that.

32.2 Vendor approval is a purely technical decision. There should be no role of Stores or Finance in the process. It doesn't happen in any organization. This needs to be enforced for all Safety, vital and Must-Change items, to start with.

32.3 Recommendations for Safety, Vital and Must-Change Items:

32.3.1 In the case of Safety, Vital and Must-Change items there should not be more than five approved vendors. If a safety item is also a Complex Product,

the number of vendors should be restricted to three. (K 2.13.5) [Stores Directorate: three months]

32.3.2 In case a new vendor has to be inducted, the worst performing out of the existing five (three in case of Complex Products) must be ejected from the list. This prescription will keep the vendor approving authority on his toes since due diligence would be required for replacing an existing vendor with a new one. It will also ensure that the existing vendors continue to meet quality and delivery schedules. This will eliminate a situation like 100+ approved vendors for ERCs. (K 2.13.6 and Kh I 2.16.3) [Stores Directorate: three months]

ROLE OF RDSO
IN VENDOR APPROVAL
(PARA NO. 33 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

33

33 Role of RDSO in Vendor Approval:

33.1 Board's Letter no. 2001/RS(G)/779/7 dated: 07-12-2013 has completely eliminated the role of RDSO in approval of vendors, except for Wagon, TRD, Signal and Engineering Materials. Vendor approval duties have been given to select Production Units. This runs counter to principles of eliminating nexus in purchases.

33.2 If the same authority that approves vendors is entrusted with the role of procurement, the possibility of nexus is much wider and deeper at worst and of compromise in quality (due to pressures of outturn) is possible at best.

33.3 RDSO gets a lot of applications for Vendor Registration and Approval and a lot of manpower is employed in their evaluation. There is a need to keep out non-serious applicants.

33.4 In case of Railroads in developed countries, the R&D and Standards organizations are entrusted with vendor

approval. The TTCI of AAR **(Annexure – 13)** or the UIC do it for North American and European Railroads respectively. Same is the prevailing practice in Japan, Korea, and China. Even in India, the DGCA approves vendors of many items for purchase by Airlines. These vendor approval authorities do not undertake any purchase.

33.5 We should not lose sight of the fact that RDSO is also a standards organization, a role vital for running a public service across a vast country.

33.6 Recommendations for Safety, Vital and Must-Change Items:

33.6.1 The role of RDSO should be expanded in the area of Vendor Development, Vendor Approval and Inspections since it has all necessary test labs and associated directorates under one roof. [Efficiency and Research Directorate: three months]

33.6.2 The Board's letter no. 2001/RS(G)/779/7 dated: 07-12-2013 should be withdrawn immediately. This is in contravention of the Report of a Judicial Committee headed by Justice Khanna. (Kh I 2.16.5) [Stores Directorate: one month's]

33.6.3 Approval of Vendors for Safety, Vital and Must-Change Items as identified by various Directorates of the Railway Board should be entrusted to RDSO within next three months. [Efficiency and Research Directorate: three months]

33.6.4 Likewise, Inspection of these items should also be entrusted to RDSO. [Efficiency and Research Directorate: three months]

33.6.5 Inspections should also look at process control of the vendor rather than just the final quality. This should be incorporated in the RDSOs QAPs within the next six months. [RDSO to revise QAPs: six months]

33.6.6 The supervisory cadre of RDSO suffers from chronic shortage. These should be filled up within the next six months so that RDSO can take up this expanded task in right earnest. RDSO should be permitted to select technically competent and willing personnel for this purpose. [Efficiency and Research Directorate: three months]

33.6.7 A Supervisor selected to work in RDSO should be given a special allowance of 30% to encourage and motivate the best brains. [Efficiency and Research Directorate: three months]

33.6.8 The registration application fee prescribed for aspiring Vendors should be raised to Rs. 2 lakhs for small and medium companies and Rs 5 lakh for large companies. For foreign applicants the fee should be raised to US$ 10,000/- [RDSO; three months]

33.6.9 Vendors failing in delivery schedule and quality need to be ruthlessly stamped out. RDSO should create an on-line portal for logging of vendor performance by users of safety, vital and must-change items. A robust, yet user-friendly reporting system is the sine qua non for Vendor Evaluation. (K 2.13.6 and Kh I 2.16.3) [RDSO; three months]

Annexure – 13

AAR – THE VENDOR APPROVAL AUTHORITY

AAR Manual of Standards and Recommended Practices
Administrative Specifications

S-060

APPLICATION FOR COMPONENT APPROVAL PROCEDURE

S-060-00

Adopted: 1987; Revised: 1989,2000

1.0 SCOPE

1.1 This standard outlines the procedures governing application for approval of components, rolling stock, and locomotive equipment contained in the Manual of Standards and Recommended Practices. This standard should be followed when AAR approval is required for the individual product specification.

1.2 The individual product specification should be consulted for additional approval requirements that may be contained therein. When procedures outlined in this standard conflict with approval procedures contained in the individual product specification, the individual product specification shall take precedence.

1.3 It is the responsibility of the manufacturer to ensure that all suppliers of subcomponents meet AAR requirements.

2.0 APPLICATION FOR APPROVAL OR CONDITIONAL APPROVAL

2.1 The request for approval and all other correspondence regarding approval shall be directed to the Association of American Railroads, c/o Chief, Technical Standards, Transportation Technology Center, Inc., PO Box 11130, 55500 DOT Road, Pueblo, CO 81001.

2.2 A separate application for approval shall be made for each different design of product for which approval is requested. Each application shall designate the specification under which approval is requested, including the specification revision date (year).

2.2.1 Should the applicant determine that no existing specification clearly covers the product, the request for approval shall so state and request direction from the responsible AAR technical committee for handling of such circumstances. In such situations, manufacturers must submit proposed testing criteria for review by the AAR.

2.2.2 With the approval of the responsible technical committee, previously approved product designs may be used as a basis for approval of

elated product on a case-by-case basis. In instances not affecting design, material, or performance, such requests for approval must cite the product on which such a request is based. Applicant must provide details of variances from the previously approved design and include a statement to the effect that no change in design, mate- rial, or perf performance will be made.

2.3 Each request for approval must be accompanied by all relevant information, including drawings, calculations, material listings, test data, and other information pertinent to the approval. Drawings shall be submitted in 8 1/2" x 11" size. For drawings not submitted in 8 1/2" x 11" size, a, sufficient number of copies must be provided that are folded to approximately that size (contact TTC). All material identified as confidential or proprietary will be handled as such by the responsible technical committee and AAR and TTCI staff.

2.4 The applicant shall identify the country of origin of the product if manufactured or assembled outside North America.

2.5 If the applicant utilized more than one facility to manufacture the product, a separate request for approval is required for each facility.

2.6 Applicant is responsible for all inspection and testing costs, including transportation and out- of-pocket expenses for the official AAR representative fee ($750 per day), and AAR service fee (see

34 Grading of Vendors

34.1 Railway Board, vide Letter no. 99/RS(G)/709/1, dated: 18-11-2016, has removed the grading of Vendors into Part 1 and Part 2. This is contrary to international railroad practices. AAR (TTCI), for example, provides for two levels of vendor approvals as "Conditional or Limited Approval" and "(Unlimited) Approval". **(Annexure – 14)** Progression from Limited Approval to the Next Level requires a minimum of two years of supplies and satisfactory performance. We are running public transport. Certification of a vendor through steps provides for close monitoring of quality of vendors at Development and Part II stages. This is also reflected in categorization of Loco Pilots and Station Masters as A, B and C and D where attention of the supervisor is more on the lower categories.

34.2 Stages of Part I and Part II have been extremely helpful in disciplining vendors by nudging them and not stamping them out completely.

34.3 Recommendations:

34.3.1 Railway Board's Letter no. 99/RS(G)/709/1 dated: 18-11-2016 should be modified with clarification that the provisions therein will not apply to Safety, Vital and Must-Change Items. [Stores Directorate: one month]

34.3.2 There should be no provision of a 20% (or up to 20%) Developmental/Educational order for Safety, Vital and Must-Change items. All vendors must be pre-approved by RDSO. (Kh I 2.16.3) [Efficiency and Research Directorate: three months]

34.3.3 Even the provision of 5% order outside the tender quantity should not apply to Safety, Vital and Must-Change items. All vendors must be pre-approved by RDSO. (Kh I 2.16.3) [Efficiency and Research Directorate: three months]

Annexure – 14

AAR – STAGEWISE VENDOR APPROVAL

AAR Manual of Standards and Recommended Practices
Administrative Specifications

S-060

4.0 CONDITIONAL AND UNLIMITED APPROVAL

As a result of the appropriate AAR technical committee's satisfactory review of the application and all available test or inspection results, conditional approval or approval will be granted in accordance with the individual product specification and the applicant so notified.

4.1 Conditional Approval

4.1.1 In order to provide a uniform method of evaluating service experience, the AAR often grants conditional approval of specific allotments of equipment for test in North America interchange to determine actual service performance. Reports are required to identify the number of units distributed, along with subsequent service performance experience. This information is used by the AAR in consideration of requests for unlimited approval, new location of manufacture, and change in design or material.

4.1.2 When stipulated in the AAR letter of conditional approval, the manufacturer is required to furnish semiannually a distribution and service report that is due within thirty (30) days of the January 1 and July 1 reporting dates. The distribution portion must include the total distribution at the end of the reporting period. The service performance portion must include all known malfunctions or difficulties experienced during the reporting period, as well as the action taken to correct such difficulties or malfunctions.

4.2 Approval

In the instance where conditional approval is granted, after a two-year service test period or other period specified by the individual product specification, the manufacturer may request unlimited approval (also called "approval"). The appropriate AAR technical committee shall review distribution and service reports covering the test period and may require further laboratory testing or inspection of field test devices. Based upon the technical committee's review of

service reports and reports of additional testing (if required), unlimited approval will be granted or denied, and the applicant so notified.

5.0 WITHDRAWAL OR DENIAL OF APPROVAL

5.1 In the event that the manufacturer fails to respond to AAR correspondence within a reason- able period of time (60 days from the date of correspondence), or if the manufacturer fails to com- ply with the foregoing reporting requirements, the AAR may consider withdrawal of conditional approval or unlimited approval of the device, product, or equipment.

5.2 In the event that conditional approval is pending and the manufacturer fails to respond to AAR correspondence within a reasonable period of time (60 days from the date of AAR correspondence), the technical committee may terminate consideration of the application for conditional approval, with resultant denial of approval. Denial of conditional approval for this reason may require the applicant to begin the application process again and repeat all required testing if the applicant desires to gain conditional approval of the device at some future date. This determination will be made by the AAR technical committee when the subject is reopened.

5.3 The technical committee may withdraw conditional approval or approval at any time, on the basis of unsatisfactory service performance or for safety reasons. In such case, the manufacturer will be notified of reasons for pending withdrawal of approval and afforded the opportunity to correct such deficiencies prior to withdrawal of approval.

6.0 APPEAL PROCESS

6.1 If conditional approval or approval is denied by the technical committee, the applicant will be notified of the reasons for denial. The applicant may appeal the committee's decision by responding in writing to the AAR, Chief Technical Standards, TTCI, P.O. Box 11130, 55500 DOT Road, Puebla, CO 81001. Applicant's correspondence must address all reasons for denial of approval.

6.2 At the request of the applicant, and at the applicant's expense, the AAR technical committee will meet with the applicant during a regularly scheduled committee meeting or at a time desig-

MANPOWER PLANNING AND TRAINING
(PARA NO. 35 / REPORT OF TASK FORCE ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

35

35 Manpower Planning and Training

35.1 Training of Technical Officers (Engineers): Railway Officers in Engineering, Electrical, Mechanical, Signal & Telecom serve core engineering functions. Upon their ability to cope with ever changing technology depends on safety. Indeed, even adoption of new technology and its acceptability depends upon the currency of an engineer's knowledge. They must therefore be encouraged and facilitated to continuously upgrade their knowledge. All technical officers need to be exposed to the latest technological developments in India and abroad.

35.2 Technical staff (artisans/technicians) of Railways, in Mechanical, Electrical, Engineering and Signal may see three or more disruptions in his way of working due to new technologies being inducted. Even graduate engineers, recruited through the UPSC find it difficult to cope with this. Expecting Artisans, who are often no more

than Class 10 pass, to seamlessly adapt to new technologies is invitation to trouble. With multi-sourcing of Complex Products, the situation is further compounded.

35.3 Recommendations:

35.3.1 Technical Officers must be freely allowed, indeed actively deputed, for short-term training programmes in International Institutes teaching advanced railroad technologies. A two-week programme for each officer early in JA Grade, early in Selection Grade and then early in SA Grade should be planned, at least two of which should be in Institutes abroad. [Training and MPP Directorate: three months]

35.3.2 Select technical supervisors too should be nominated for such training courses in India and abroad. [Training and MPP Directorate: three months]

35.3.3 Refresher courses for Supervisors and Artisans/Technicians involved in maintenance must undergo an annual refresher course of one week, instead of three weeks or longer every three years. [Training and MPP Directorate: three months]

35.3.4 For high-skill trades like TXR Staff, Welders, ESMs, Loco Shed Staff etc. the annual refresher course should be of two-week duration, followed by a test and certification/re-certification. (CSP 7.7) [All Technical Directorates to issue policy: three months]

35.3.5 Recruitment of Artisans: Recruitment of artisans and technicians in Group D or Group C needs to be done so that only those persons are recruited, who have hands-on training and certification in the related trades. With the government's emphasis on vocational training, it is now increasingly possible. It is therefore recommended that only Class 10/12 and ITI pass candidates should be selected for the Railways through RRBs and RRCs. This will ensure that they are ready for mechanization and automation as and when IR adopts more and more modern ways of working. (K 6.3) [Establishment Directorate to issue policy: three months]

35.3.6 Additionally, Group D Staff being recruited as Trackmen should be subjected to rigorous physical test since their job in the initial years of service will involve heavy lifting and tiring work. Yardsticks for the same should be redrafted within next three months, especially for women candidates. [Establishment Directorate: six months]

35.3.7 e-Learning for all artisan staff should be a mission item, where they are encouraged to attend at workplace or at home. e-Learning courses should be prepared through professional agencies in the field. (Kh II 5.2.7 and CSP 7.7) [Training and MPP Directorate to issue policy: three months]

35.3.8 Similar e-Learning programmes should be created for Station Masters and Loco Crew. [Training and MPP Directorate to issue policy: three months]

35.4 Empowerment for Training and Human Resource Development

35.4.1 GMs should have full powers to upgrade old and open new Institutes and Sanction Teaching Allowance to the Teaching Staff thereof. They should also have full powers to create new training facilities in Emerging Areas of Technology. [Training and MPP Directorate to issue policy: three months]

35.4.2 Teaching staff of ZRTIs, Divisional and Workshop training centers should be selected by DRMs and CWMs respectively in consultation with their associate Personnel Officers without dependence on Head Quarters. [Establishment Directorate to issue policy: three months]

35.4.3 Delegation of Powers to PHODs, DRMs, CWMs for training in non-Railway establishments for up to Rs. 10,000 per day and Rs. One lakh per training programme without Finance Concurrence with an annual limit of Rs. One Crore. [Training and MPP Directorate to issue policy: three months]

35.4.4 GMs should have unrestricted powers for sanctioning training in non-Railway establishments without Finance Concurrence. [Training and MPP Directorate to issue policy: three months]

35.4.5 Each CTI should be provided with an Annual Lump-Sum Improvement Fund of Rs. One Crore, to be utilized as per the discretion and judgement

of the Director. [Training and MPP Directorate to issue policy: three months]

35.4.6 Each ZRTI and lower-level Training Institute should be provided with an annual lump-sum improvement fund of Rs. Fifty Lakh, to be utilized as per the discretion and judgement of the Principal and PHOD/DRM/CWM. [Training and MPP Directorate to issue policy: three months]

35.4.7 Each CTI should be independent of the adjoining Railway in matters of Sanction of Works (PH-65) and for Maintenance of its Assets - engineering, electrical and telecom etc.) [Training and MPP Directorate to issue policy: three months]

35.4.8 Directors of CTI's should be empowered to invite faculty and experts from within India and abroad for up to an annual limit of Rs. One Crore without Finance Concurrence. (K 6.2.3) [Training and MPP Directorate to issue policy: three months]

35.4.9 Principal and PHOD/DRM/CWM of ZRTIs and Lower Institutes should be empowered to invite faculty and experts from within India for up to an annual limit of Rs. Twenty Lakh without Finance Concurrence. [Training and MPP Directorate to issue policy: three months]

35.5 Recommendations for Training and Certification of Loco Crew

35.5.1 Each LP and LP must undergo a refresher course of one week every two years, which should include GR&SR, Safety Rules, and instructions and a

Simulator Test. A three-yearly refresher course is inadequate. (Kh II 5.3.1)

35.5.2 The current practice of issue of Competency Certificate to loco crew by the Branch Officer needs to be backed by actual foot-plate test by a Loco Inspector specifically nominated for this purpose.

35.5.3 Each loco pilot training center, at least one in each Zonal Railway, should be equipped with a full scale in-motion driving simulator for each generation of Locomotive, EMU/MEMU/DEMU. [Training and MPP Directorate to issue policy: three months]

35.5.4 These simulators are to be used for testing and certification. If a loco pilot fails the simulator test, he/she should be treated as having failed in the training programme and made to repeat the entire training again. [Training and MPP Directorate to issue policy: three months]

35.5.5 Each major crew booking, at least one in each Division, should be equipped with a table-top driving simulator. These are low-cost machines but are capable of giving a loco pilot a quick refresher in areas he needs. A countrywide Railnet based network and a central database of running crew should be prepared. This will have specific training needs of each loco pilot, as noted by the LI or Officers-in-Charge. Each loco pilot, once in a month, upon signing off, will be required to undergo a 1–2-hour long simulator training session specifically determined for him. (K 6.7 and CSP

7.16) [Training and MPP Directorate to issue policy: three months]

35.5.6 Simulators should also be procured for EMU/MEMU and DEMU motormen. (CSP 7.16) [Training and MPP Directorate to issue policy: three months]

35.5.7 There should be a system which ensures that errors in the field are communicated to Training Institutes to create a case-study based learning technique. [Safety Directorate: three months]

35.6 Training of Station Masters

35.6.1 Each SM/ASM involved in train operations must undergo a refresher course of one week every two years, which should include GR&SR, Safety Rules and instructions, counselling by a TI and a Simulator Test. A three-yearly refresher course is inadequate.) [Training and MPP Directorate to issue policy: three months]

35.6.2 Panel Simulators should be provided in each ZRTI like that in Maula Ali.) [Training and MPP Directorate to issue policy: three months]

35.6.3 There is a need to revise and update the Psychological Tests for SMs/ASMs.) [Training and MPP Directorate to issue policy: three months]

35.6.4 Monitoring of Training and Coordination with Various Training Institutes: The Personnel Department should play a proactive role in keeping records of training, recommending, and monitoring the same.) [Training and MPP Directorate to issue policy: three months]

35.6.5 There should be a system which ensures that errors in the field are communicated to Training Institutes to create a case-study based employee-focused learning technique.) [Training and MPP Directorate to issue policy: three months]

35.7 Recommendations:

35.7.1 Training Manager: Every Zonal Railway and PU should nominate a Dy. CPO/SPO as Training Manager, whose exclusive charge should be training of Officers, Supervisors and Staff. (CSP 7.14) [Training and MPP Directorate to issue policy: three months]

PROTECTION OF WORKSITES
(PARA NO. 36 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

36

36 Protection of Worksites:

36.1 Precautions at worksites are sometimes lacking, which leads to unsafe conditions for staff and train operations.

36.2 Recommendations:

36.2.1 After every reconnection following work on signal gear, correspondence between site and panel should be ensured before permitting traffic. [Safety Directorate: one month]

36.2.2 Before every crane works, the site should be inspected and certified by a senior supervisor and prepared for location, propping, movement, and physical clearances for crane operations. [Safety Directorate: one month]

36.2.3 In case work is taken up by non-open line agencies, such as Construction, RVNL etc. the responsibility for protection and safety for up to 100m on either side shall rest with such agency. [Safety Directorate: one month]

PROTECTION
OF WORKMEN AT WORKSITE (K 5.46)
(PARA NO. 37 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

37

37 Protection of Workmen at Worksite (K 5.46)

37.1 It is sad that Railways spend so much time and money in endeavour to provide safe journey to passengers see a large number of its own workmen dying or getting injured at worksites. This saps the morale of the workforce and dilutes dedication.

37.2 Recommendations:

37.2.1 Worksites of major works, extending for more than a day, must be audited at the level of an officer before commencement of work to ensure that all safety measures for protection of workmen, Railway's or Contractor's have been put in place. [Track Directorate: one month]

37.2.2 Periodical audit for ensuring Workmens' safety should be done every week if the work extends to longer than a week. [Track Directorate: one month]

37.2.3 All Railway's and Contractor's employees should be mandatorily provided with necessary safety gear such as luminous jackets, crash helmets, industrial boots, safety belts, safety jackets etc. (K 5.46 ii) [Track Directorate: one month]

37.2.4 Disaster Management Staff of ART, ARME and others should be provided with special training in personal safety. [Mechanical Traction Directorate to issue policy: one month]

38 Organizational Reorientation

38.1 Information Driven Organization: IR must become an Information driven organization from an Opinion or Anecdote driven one. This requires massive influx of IT Systems, Data Analysis Tools and an Organization wide information sharing culture. The Task Force was told that the One ICT platform endeavours to do this.

38.2 Following is, however recommended to prepare the organization for One ICT:

38.2.1 Purchase of PCs and Accessories should be liberalized. Each PHOD/CHOD/DRM/CWM should be empowered to sanction up to fifty additional PCs and Accessories every year without Finance concurrence. This is essential for the very first step of IR-One ICT, i.e. "Transformation Office Set-up" [C&IS Directorate: three months]

38.3 Supervisors: Supervisors have traditionally been the front-end managers and the backbone of Indian Railways. There has been a dilution in their contribution to the well-being of Railways as felt all across. This has been felt by the Group on Railway Safety, 1996 and also the Khanna Committee. (Kh I 3.2.3).

38.4 At the same time, it is necessary to strengthen the hands of Supervisors to empower them.

38.5 Recommendations:

38.5.1 Supervisors should not be allowed to join Trade Unions. (Kh I 3.2.3). [Establishment IR Directorate: three months]

38.5.2 They should be encouraged to form their own Association for collective bargaining and negotiation and should find a place in PNMs and PREM Group. Similar provision has already been done for the RPF Staff. (Kh I 3.2.4) [Establishment IR Directorate: three months]

38.5.3 D&AR Powers of Senior Supervisors was completely withdrawn as a consequence of the 6th Pay Commission. This should be restored. [Establishment Directorate: three months]

38.5.4 Likewise, D&AR Powers of Junior Scale Officers should also be restored. There is, in reality, a need to restore all D&AR Powers to pre 6th PC provisions. [Establishment Directorate: three months]

38.5.5 Supervisors should be empowered to grant spot cash awards to their staff to the extent of Rs. 500 in

each case subject to an annual limit of Rs. 10,000. (Kh I 3.4.2) [Finance Directorate: one month]

38.6 Safety Whistleblower: In order to receive inputs and feedback about unsafe situations in train operations, maintenance and other areas of organization, IR must encourage Railway Persons and General Public to freely and without fear of reprisal communicate.

38.7 Recommendations:

38.7.1 A portal will be created by the Railway Board within the next three months to receive inputs on matters of safety. [Safety Directorate: three months]

38.7.2 If the sender desires to remain anonymous, his/her name and other details should be kept secret.

38.7.3 The portal should have the features to forward the communication to the concerned persons and to receive feedback from them.

38.8 Safety Organization

38.9 IR provides that ex-DRMs should be posted as Chief Safety Officers. Some yardstick has also been laid down for Sr. DSOs and Dy. CSOs. But, with nearly everyone getting "Very Good" or "Outstanding" grading in his appraisals, the posting of officers, other than CSOs remains an area of indifference. A Sr. DSO or a Dy. CSO has to work practically without any assistance and must do tough inspection calls apart from copious paperwork. This makes the post of a Dy. CSO or a Sr. DSO very unattractive and unwilling officers are pushed into the Safety Department. Most Railways have their Safety Department cadres of support staff sanctioned as part of

the Operating Department. This situation needs to be cured.

38.10 Recommendations:

38.10.1 The Safety Department in each Zonal Railway should have a clearly defined sanctioned strength as follows: [Safety Directorate: three months]

- CSO – 1 Dy. CSOs – 4 Safety Counsellors – 5
- Chief OS – 1 OS – 1 Sr. Clerk/ Clerk – 4 PS/Stenographers – 3
- Office Peons – 4 Motor Drivers – 2

38.10.2 A similar enabling set-up in divisions should also be created as follows: [Safety Directorate: three months]

- Sr. DSO – 1 DSO/ADSO – 1 Safety Counsellors – 5
- Chief OS – 1 OS – 1 Sr. Clerk/Clerk – 4 PS/Stenographers – 1
- Office Peons – 2 Motor Driver – 1

38.10.3 The CSO, Dy. CSOs, Sr. DSOs and Safety Counsellors should be entitled to a Safety Allowance @30% of their basic pay. [Establishment Directorate: three months]

38.10.4 The CSO and each Dy. CSO and Sr. DSO should be provided with a motor vehicle – departmental or hired. [Establishment Directorate: three months]

38.10.5 Every Safety Officer, upon posting to Safety organization, should be given a two-week cross functional training in NAIR, which brings out interplay of factors leading to unsafe situations and accidents. [NAIR: three months]

38.10.6 Every Safety Officer should be given a one-week training in Accident Investigation in a specialized Institute in India or abroad. [NAIR: three months]

38.11 Quality Systems in Procurement of Material and Services: While Railways have a proven system of internal checks and balances, the impact remains incomplete without implementing a robust quality system on our suppliers and contractors.

38.12 Recommendations:

38.12.1 A thorough review of the quality system for material procurement processes should be commissioned from an external expert agency. User departments should play an active role in the process. This should be done within the next three months and a report obtained and implemented within the next one year. (K 2.13.8) [RDSO: three months]

38.12.2 A similar study should be commissioned for quality systems to evaluate deliveries through works contracts. This should be done within the next three months and a report obtained and implemented within the next one year. [Finance Directorate: three months]

38.13 Relationship of Finance and Executive: Para 108 of the Indian Railways Accounts Code underlines that there may be occasions of disagreement between Finance and Executive. The procedure to handle such a disagreement lays down the possibility of an endless escalation of the matter by the Finance to Zonal Railway Head Quarters and then to the Railway Board. At each level, the Finance has the overriding authority to escalate the matter to the next higher level in case of disagreement with the executive at that level. It is not only time consuming, but

also provides an escape route to officials at lower levels of passing the buck to higher levels. Such a procedure is not conducive to quick and responsible decision making in a dynamic organization like the Railways. The executive has to finally deliver and hence must be empowered to take the final call.

38.14 Recommendations:

38.14.1 The Executive at each level will normally act on the advice of the associate Finance. But, if the Executive thinks that the observations of advice of Finance is not conducive to smooth functioning of the organization, obstructs speedy implementation of projects, or directly impacts safety or output, he/she should, record his/her opinion in writing and go ahead with the proposed action under advice to the next higher authority. [Finance Directorate to issue amendment to the provision in Accounts Code: three months]

38.15 Innovative Financing: Capital is always scarce. Besides, sanction in Capital requires Parliamentary approval and is time consuming. Expensive Machines and Equipment can be more easily acquired on lease of on OPEX Model. Similar exercise is already being done for official transport vehicles in the Railways. This needs to be expanded to higher levels. Some ready examples are acquisition of Rail Grinding Machines, Track Recording Cars, Mobile Flash Butt Welding Machines, Vehicle Borne Rail Testing Machines etc.

38.16 Recommendations:

38.16.1 A Comprehensive Policy on OPEX route of hiring/leasing expensive equipment should to be

issued within the next six months. [Efficiency and Research directorate: three months]

38.16.2 PHODs/CWMs should be empowered to enter into OPEX contracts once such a policy is in place. [Finance Directorate: six months]

38.17 Relocate Sectional Sr. DENs/DENs: It is not uncommon to find Sectional Sr. DENs/DENs sitting at Divisional Headquarters, even when their sections start a hundred kilometers away from office location. It implies that even their first foot in the section is a "tour" and just travelling to and from the beginning point of their section may take hours. This severely impacts involvement and dilutes supervision. On the other hand, Branch Officers like Sr. DME/Dsl or Sr. DEE/RS sit in their workplaces in the shed. Area Officers too sit in their areas.

38.18 Recommendations:

38.18.1 Sectional Sr. DENs/DENs should be relocated within their "Sections", if necessary, by creating office and residential infrastructure. They may retain an office chamber in the Divisional Office too. [Engineering Directorate: three months]

STATE OF RAILWAY'S
FINANCES AND IMPACT ON SAFETY
(PARA NO. 39 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

39

39 State of Railway's Finances and Impact on Safety

39.1 It is now well known that Railways Finances are under pressure and earnings are not keeping pace with Budget Projections or even with last year's levels. Yet, our spend on core maintenance activities should not take a hit on that account. Recent years, probably the last two decades, have seen increased dependence on Capital for even routine maintenance. For example, more and more spares for Rolling Stock are now being sourced through Capital or DRF rather than Revenue.

39.2 It was learnt in a Safety Audit of Northern Railway that even routine inputs like Ballast for Track are being denied from Revenue heads. A large survey of P. Way Depots in Central Railway revealed **(Annexure – 6)** that even the essential supply of track fittings is made only to the extent of 15-25% of the annual requirement. A certain frustration has set in due to non-availability of funds under Revenue

and the system has started depending on Capital Sanctions, which is sporadic and inadequate.

39.3 A look at **Annexure – 7** will reveal that allocation under PU-27 and PU-28 of Demand Head 4 (Repairs and Maintenance of P. Way and Works) has not only been meagre (Just about Rs. 400 Crores for the entire Indian Railways) but has also remain virtually stagnant for the last ten years when adjusted for inflation. Similar Situation exists for PU-27 and PU-28 in Demand 6 (Repairs and Maintenance of Carriages and Wagons) in spite of a significant increase in population of these stocks.

39.4 The allocations for DRF has seen even more disturbing decline **(Annexure – 8)**. Gross outlay for replacement of ageing assets has declined, adjusted for inflation, over the last ten years. In fact, the allocation for the Year 2016-17 is lower than that in 2007-08 even in absolute terms – Rs. 7160 Crores against Rs. 7602.72 Crores.

39.5 Recommendations:

39.5.1 Allocation to Primary Units for purchase of stock and non-stock should see a multifold increase. This will require the issue of a policy directive to make stocking of items and their purchase easier, such as not comparing the new demands with past years' consumptions, stocking of items actively being encouraged and simplified. [Finance Directorate: one year]

39.5.2 Technical Departments should go back to basics, consult maintenance manuals, best practices, RDSO's recommendations and technical orders to

determine realistic demands for Safety, Vital and Must-Change Items. [All Technical Directorates: six months]

39.5.3 Allocation to DRF should not only neutralize inflation, it should also consider the increasing asset base and increased traffic levels. [Finance Directorate: one year]

39.5.4 The Purchase Grant given to the Stores Department should be split into two parts, one for Safety, vital and Must-Change Items and another for the rest. (Kh I 2.16.7) [Finance Directorate: three months]

39.5.5 Railway Safety Fund, which is now well endowed (Rs. 10,780 Crores for the Year 2016-17 as per **Annexure – 9**, should cover track renewal, bridge safety works, Modernization of Signal & Telecom and Safety Retrofits on rolling Stock as well. [Finance Directorate: three months]

39.5.6 Expenditure Control Circulars should not apply to Safety, Vital and Must-Change Items. [Finance Directorate: immediate]

Annexure – 6

Availability of Track Fittings on Central Railway a Serious Managerial issue

1. At Higher Codal Life

Availability of Track Fittings in Central Railway for Codal Live 4 Years for GRSP and Liner, 8 Years For ERC						
	GRSP- All Types		ERC – All Types		Liner	
DIVN	Average Availability %	Worst Case % (Depot)	Average Availability %	Worst Case %	Average Availability %	Worst Case %
BSL	26.8	7.4 (SEG)	52.4	16.8 (NGN)	48.6	6.5 (PC)
NGP	26.9	1.4 (PLO)	44.9	1.0 (BZU)	10.6	2.7 (KTL)
PA	27.8	10.0 (DD)	35.5	20.1 (KRD)	24.4	3.7 (KRD)
SUR	27.2	1.6 (PVR)	32.3	5.6 (LUR)	10.2	36. (JH)

2. At Minimum Codal Life

Availability of Track Fittings in Central Railway for Codal Live 2 Years for GRSP and Liner, 5 Years For ERC						
	GRSP- All Types		ERC – All Types		Liner	
DIVN	Average Availability %	Worst Case % (Depot)	Average Availability %	Worst Case %	Average Availability %	Worst Case %
BSL	13.4	3.7(SEG)	32.8	10.5(NGN)	24.3	3.6(PC)
NGP	13.5	0.6(PLO)	28.0	0.6(BZU)	5.3	1.4(KTL)
PA	13.9	5.0(DD)	22.2	12.6(KRD)	12.2	1.8(KRD)
SUR	13.6	0.8(PVR)	20.2	1.6(LUR)	5.1	1.8(JH)

Annexure - 7

ALLOCATIONS IN PU-27 AND PU-28

	D04				D05			
	PU-27 MSTK	**PU-28 MDPUR**	**PU-32 CP**	**Total**	**PU-27 MSTK**	**PU-28 MDPUR**	**PU-32 CP**	**Total**
Actual 2006-07	93.75	129.96	821.24	**1044.95**	433.92	112.15	58.13	**604.2**
Actual 2007-08	104.97	112.42	959.21	**1176.6**	450.05	122.82	64.93	**637.8**
Actual 2008-09	129.24	139.21	1133.09	**1401.54**	550.85	137.59	71.15	**759.59**
Actual 2009-10	131.4	157.74	1199.61	**1488.75**	624.93	150.59	69.05	**844.57**
Actual 2010-11	113.36	165.22	1280.71	**1559.29**	609.23	136.41	92.97	**838.61**
Actual 2011-12	134.67	179.2	1263.68	**1577.55**	706.3	148.65	110.67	**965.62**
Actual 2012-13	119.65	183.05	1332.76	**1635.46**	777.76	142.86	109.14	**1029.76**
Actual 2013-14	132.12	218.96	1494.98	**1846.06**	909.88	137.38	119.75	**1167.01**
Actual 2014-15	162.33	262.68	1851.38	**2276.39**	913.55	139.54	147.78	**1200.87**
Actual 2015-16	178.03	233.45	2107.96	**2519.44**	1061.21	140.55	168.58	**1370.34**
BE 2016-17	201.62	268.79	2279.93	**2750.34**	1028.18	163.32	237.53	**1429.03**
	D06				**D07**			
	PU-27 MSTK	**PU-28 MDPUR**	**PU-32 CP**	**Total**	**PU-27 MSTK**	**PU-28 MDPUR**	**PU-32 CP**	**Total**
Actual 2006-07	359.46	90.47	82.63	**532.56**	123.5	218.71	98.85	**441.06**
Actual 2007-08	372.58	90.23	93.98	**556.79**	160.75	253.59	114.96	**529.3**
Actual 2008-09	474.89	111.32	125.13	**711.34**	176.09	296.41	1666.78	**639.28**
Actual 2009-10	549.89	120.12	159.41	**829.42**	213.88	316.01	196.01	**725.9**
Actual 2010-11	514.38	110.11	212.07	**836.56**	193.72	310.8	236.97	**741.49**
Actual 2011-12	552.08	104.55	264.76	**921.39**	206.13	282.34	243.73	**732.2**
Actual 2012-13	583.83	108.76	278.72	**971.31**	241.48	301.47	286.97	**829.92**
Actual 2013-14	730.02	117.42	342.6	**1190.04**	274.97	354.52	353.83	**983.32**
Actual 2014-15	732.85	126.11	344.71	**1203.67**	326.78	342.36	455.57	**1124.71**
Actual 2015-16	708.72	119.92	352.37	**1181.01**	322.74	333.87	495.92	**1152.53**
BE 2016-17	791.1	137.68	467.97	**1396.75**	339.12	375.3	622.39	**1336.81**

MSTK (Material from stock), **MDPUR** (Material direct purchase), **CP** (Contractual Payments)

Annexure – 8

DEPRECIATION RESERVE FUND ALLOCATIONS

(Figures in Crores of Rupees)

	Depreciation Reserve Fund										
	Actual 2006-07	**Actual 2007-08**	**Actual 2008-09**	**Actual 2009-10**	**Actual 2010-11**	**Actual 2011-12**	**Actual 2012-13**	**Actual 2013-14**	**Actual 2014-15**	**RE* 2015-16**	**BE** 2016-17**
New Lines (Const.)						1.51					
Gauge Conversion	65.58	74.44	35.60	79.57	20.56	11.43	23.71	17.95	3.77	10.00	5.00
Doubling	0.50	0.01	14.54	0.40	25.96			5.44	6.52	1.30	
Traffic Facilities	7.70	6.55	4.41	5.96	5.51	6.34	8.06	15.28	11.11	21.86	25.73
Computerization	7.87	11.51	7.43	5.85	7.18	14.70	8.80	19.64	30.40	46.62	84.89
Railway Research	2.55	9.88	5.67	19.42	13.40	6.87	17.99	5.57	3.11	4.00	5.98
Rolling Stock	1195.72	2317.31	2810.71	1773.34	1988.64	24.68.91	2298.79	2126.55	1978.27	1873.35	865.42
Level Crossings											
ROB/RUBs											
Track Renewals	3936.56	4241.06	5248.98	4105.87	4984.54	5285.98	5426.19	4985.35	5371.55	5426.06	4000.03
Bridge Works	219.66	217.05	396.31	353.87	336.83	276.80	298.45	357.10	405.14	438.24	500.00
S&T Works	141.67	191.35	658.10	467.21	446.27	379.55	416.15	413.12	533.32	422.18	500.00
Electrification											
O. Elec. Works	135.39	163.12	269.94	227.42	166.95	152.04	67.13	44.91	46.97	45.14	74.99
TRDW							93.99	134.26	148.19	136.00	175.00
M&P	105.73	121.21	219.30	274.43	228.67	252.24	253.48	266.61	292.43	220.48	250.00
Workshops incl PUs	34.55	38.75	70.60	54.94	59.21	7342	66316	108.48	93.97	67.43	91.55
Staff Quarters	54.15	84.22	152.89	161.74	137.76	114.82	105.53	160.74	167.47	189.49	250.00
Amenities for Staff	46.82	57.84	91.19	103.61	113.40	110.10	98.16	95.22	86.93	99.84	130.00
P. Amenities	28.08	54.05	79.67	87.19	138.90	180.41	148.47	127.34	131.41	126.57	150.00
OSW	17.94	14.40	16.57	21.35	26.32	15.40	17.60	17.69	19.76	27.23	51.39
Training/HRD											0.02
MTP	8.00										
Credits/recoveries	1050.69	1827.79	1710.35	2010.98	3114.98	2669.80	2303.19	1781.34	2043.39	1855.79	4000.00
Total Outlay (Gross)	**6008.46**	**7602.72**	**10081.91**	**7742.18**	**8700.10**	**9350.52**	**9348.67**	**8901.25**	**9330.32**	**9155.78**	**7160.00**
Total (Net)	**4957.78**	**5774.94**	**8371.56**	**5731.19**	**5585.12**	**6680.72**	**7045.47**	**7119.91**	**7286.93**	**7300.00**	**3160.00**

Annexure - 9

	(Figures in Crores of Rupees)										
	Railway Safety Fund										
	Actual 2006-07	Actual 2007-08	Actual 2008-09	Actual 2009-10	Actual 2010-11	Actual 2011-12	Actual 2012-13	Actual 2013-14	Actual 2014-15	RE* 2015-16	BE** 2016-17
New Lines (Cont.)											49.12.48
Gauge Conversion											28.69.58
Doubling											
Traffic Facilities											
Computerization											
Railway Research											
Rolling Stock											
Level Crossings	145.13	185.83	249.68	341.24	414.23	518.94	527.56	503.96	442.00	517.76	555.30
ROB/RUBs	215.14	347.72	315.89	465.94	687.22	810.12	1056.53	1482.35	1791.66	2144.24	2442.94
Track Renewals											
Bridge Works											
S&T Works											
Electrification											
O. Elec. Works											
TRD Works											
M&P											
Workshops incl PUs											
Staff Quarters											
Amenities for Staff											
Pass. Amenities											
OSW											
Training/HRD											
MTP											
Credits/recoveries	0.33	0.20	0.49	1.93	1.17	5.70	5.77	3.33	27.22	0.60	0.30
Total Outlay (G.)	**360.27**	**533.55**	**565.57**	**807.18**	**1101.44**	**1329.06**	**1584.09**	**1986.31**	**2233.66**	**2662.00**	**10780.30**
Total (Net)	**359.94**	**533.35**	**565.08**	**805.25**	**100.28**	**1323.36**	**1578.32**	**1982.98**	**2206.44**	**2661.40**	**10780.00**

***RE-** Revised Estimate, ****BE-** Budget Estimate

APPLICATION
OF IT FOR ASSET MANAGEMENT
(PARA NO. 40 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

40

40 Application of IT for Asset Management

40.1 Even though IT has been gainfully adopted in areas of passenger interface, such as Passenger Reservation, Ticketing, Freight invoicing etc. Technical Departments have not used it effectively for monitoring assets and safety, the sole exception being the Track Management System (TMS). REMMLOT, an online monitoring system for the health of Diesel Locomotives is a shining example of IT and Communication put to effective use. Same/similar level of monitoring should eventually come to other stocks as well.

40.2 Recommendations:

40.2.1 Each and every Vehicle moving on rails, such as Coaches, Wagons, Locomotives, Self-propelled Stock, Motor/Moped & Push Trolleys, Utility Vehicles, ARTs/ARMEs, Cranes, Track Machines, Tower Wagons, everything, must be radio tagged and

provided with tamper-proof RFID tags. (K 4.4.4) [Mechanical Development Directorate: two years]

40.2.2 There should be a reliable traceability of wheels built into the system. (CSP 6.36) [Mechanical Workshop Directorate: six months]

40.2.3 Comprehensive database of Rolling Stock, every Coach, Wagon and Locomotive to be built with its maintenance history, which can deliver a reliable MIS for actionable points across the country. They should be IR-One ICT compliant. [Mechanical Workshop Directorate: six months]

40.2.4 The IT system so created should also capture "transaction data history", i.e. the date of entering of data so that tampering of data or post-event entry is easily detected. [C&IS Directorate: six months]

40.2.5 Disjointed and half-hearted efforts for Coach Maintenance, Wagon Maintenance and Loco Maintenance have been going on for last many years. CMM, FMM and SLAM need to be expedited, rolled out nationwide and officers and staff trained to make full use of it. [Mechanical Development Directorate: one year]

40.2.6 It was learnt from AM/IT that funds have been in short supply for these projects. It is felt that investments in these applications have a direct impact on reliability and increased availability for rolling stock apart from safety. It is therefore felt that funding from EBR should be done for these applications provided a workable ROR is possible. [Finance Directorate: six months]

40.2.7 Similar on-line data capture and MIS should be adopted for Signal & Telecom assets as well. [Signal Directorate: one year]

40.2.8 The Safety Department should have unrestricted read-only access to such databases. [C&IS Directorate: immediate]

40.2.9 REMMLOT should be installed in all new Electric Locomotives w.e.f. 01-04-2017. [Electrical RS Directorate: immediate]

40.2.10 REMMLOT must be retrofitted in all existing Electric Locomotives within the next three years. [Electrical RS Directorate: immediate]

40.3 Chief Information Officer: IR has steadily been increasing its dependence on IT Systems. There is a need to consolidate these to create a seamless way of working. All major companies have a full time CIO to handle such issues.

40.4 Recommendations:

40.4.1 Each Zonal Railway, Production Unit and CTI will nominate a full-time Chief Information Officer. This should be done within the next three months by redesignating an SG/SAG post from any department. The model of NCR, where a Chief Manager IT (CMIT) has been appointed, may be followed. [C&IS Directorate to issue policy: one month]

40.4.2 The CIO will look after the IT facilities such as Networking, Servers, AMCs, Purchases, Database backups and liaise with outside agencies like CRIS, FOIS, RAILTEL etc. [C&IS Directorate to issue policy: one month]

40.4.3 Applications will continue to be owned by the respective Departments.

41 FOG Operations

41.1 Fog, during winter, not only disrupts train operations, but many accidents have also happened due to poor visibility in fog.

41.2 There is no known technology, not even for air-operations, that enable vision in fog. Only assistive technologies exist, which combine various cameras to project an image of the road ahead.

41.3 Recommendations:

41.3.1 Modified Automatic Signalling, as already adopted, must continue.

41.3.2 Fog pass has undergone several refinements. It must be made SIL 4 compliant, its locational accuracy enhanced and then inducted in adequate numbers to provide assistance to crew during fog. To be done within next one year. [Mechanical Traction Directorate: six months]

41.3.3 Trials with Composite Camera based technologies, which use optical, radio and infrared wavelengths to create a workable image of the path ahead, should be started in right earnest. [Mechanical Traction Directorate: six months]

41.3.4 If found successful, these Fog vision Cameras should be installed in locomotives and Motor Cabs in Fog Prone areas. [Electrical RS and Mechanical Traction Directorate: six months]

41.3.5 As an interim measure retro reflective Zigma Boards should be provided on all masts for five masts in rear of stop signals in electrified territory to indicate to the loco pilot about an approaching stop signal. Similar arrangements should be done for non-electrified territory. [Zonal Railways: six months]

42 Accident Reporting and Enquiry

42.1 The ground reality is that Accident Enquiries, in most/many cases, do not reveal the real cause of accident, not even the proximate cause, such as whether it was a track defect or a Rolling Stock defect. Enquiries often get mired in departmental fights and end up either being compromised or delivering a finding, which is incorrect.

42.2 There is an immediate need to organize Accident Enquiries on the lines of that done by the National Transportation Safety Board (NTSB) of USA. At least the CRS level enquiries should adopt this methodology. (Kh II 5.6.1)

42.3 Departmentalism is the root cause that prevents honest accident enquiries. Departmentalism starts from the daily chore of logging and de-logging of punctuality losses. Copious documents are written, and acrimony generated that hits the general harmony in the Divisional working.

42.4 "A new management ethos should be evolved which will encourage and aid honesty even in admission of failure". (Kh I 2.15.9)

42.5 Recommendations:

42.5.1 An honest and transparent system of capture of accident and safety related data should be put in place with a so that no comparison with past statistics would be made as two sets would be incompatible. Reporting of unsafe acts and accidents, howsoever minor should be encouraged. (Kh I 2.15.8) [Safety directorate: immediate]

42.5.2 Equipment failure, as reported first in the Control Office Application by the Controllers, should be taken as sacrosanct. Any subsequent intervention is likely to vitiate the truth. (Kh I 2.15) [Safety directorate to issue policy: one month]

42.5.3 All train timings should be captured through data loggers into the Control Office Application. This may require integrating the Control Office Application with SIMS or any SIMS-like platform created for this purpose. [Signal and C&IS Directorates: six months]

42.5.4 Loss of punctuality should cease to be a Key Performance Metric for the annual evaluation of a Branch Officer. The number of failures should, instead, be the Performance Metric. [Efficiency and Research directorate: three months]

42.5.5 An IT based system to compile and analyze the equipment failures thus captured needs to be built

to generate an MIS and action plans for corrective action. [Safety Directorate: six months]

42.5.6 Standard proforma for measurements of track and rolling stock has been finalised by RDSO and is awaiting issue. This should be included in the Accident Manual. [Safety Directorate: three months]

42.5.7 Accident Enquiries should go beyond the immediate cause and establish whether there has been a systemic neglect of maintenance, lack of material inputs, poor quality material, lack of training, lapses in supervisory and officer-level monitoring etc. There needs to be created a standard performa for accident enquiries to ensure this. [Safety directorate: three months]

42.5.8 Emphasis in every enquiry should be on "what went wrong" rather than "who went wrong". A policy directive needs to be issued in this matter. [Safety directorate: three months]

42.5.9 A system for "Error Counting" rather than counting of actual incidents or accidents should be established as per the Heinrich Ratio Principle. This is a scientific principle that can prevent actual accidents. [Safety directorate: three months]

43 Disaster Management

43.1 IR has created detailed Disaster Management Plans at the Apex level, Zonal Levels and Divisional Levels. Equipment for Disaster Management should also be upgraded in view of induction of high axle load wagons, increase in number of long tunnels, and stainless-steel stock. Cold cutting devices currently available in ARTs and ARMEs are not capable of cutting through stainless steel.

43.2 Recommendations:

43.2.1 Telescopic Boom Cranes with Tunnel Rescue Arrangement have been sanctioned over a decade ago. It was learnt that a tender is under process for over four years. This should be concluded in the next three months. (Kh I 3.19.8) [Mechanical Traction Directorate: three months]

43.2.2 Air-plasma cutting devices, as already sanctioned, need to be inducted immediately. To be done within six months. [Mechanical Traction Directorate: three months]

43.2.3 Explore cold cutting devices for stainless steel within the next three months and induct within two years. [Mechanical Traction Directorate: three months]

SAFETY CADRE VACANCIES,
YARDSTICKS AND STAFF SURRENDER
(PARA NO. 44 / REPORT OF TASK FORCE
ON SAFETY, MINSITRY OF RAILWAYS, 10 JAN 2017)

44

44 Safety Cadre Vacancies, Yardsticks and Staff Surrender

44.1 Safety Category Cadres have a vacancy of 16.44% on a sanctioned strength of 7.47 lakhs, i.e. a shortfall of 1.23 lakhs. The worst affected cadres are those of Guards (27.45%), SSE/SE/JE P. Way (20.08%), Keyman (40.01%), Trackmen (21%), SSE/SE/JE C&W (20.72%) and Drivers (24.24%) **[Annexure – 15]**

44.2 Yardsticks for various jobs must continuously be tightened in view of emerging technologies and their adoption. [Various Directorates: six months]

44.3 Sanction of Staff Essential for Safety, such as C&W Maintenance, Loco Sheds, Signal, TRD, Track and Station Staff, should be done on the lines of that prescribed for Loco Crew, i.e. without matching surrender and purely on the basis of additional workload.

44.4 The surrender of staff is a contentious matter even though it is a desired objective of IR is to lean out its work force.

Surrenders are done under coercion and often complied with as a matter of "quota". There is an immediate drop in level of maintenance due to depletion of manpower levels unless there is a matching induction of technology or labour-saving devices. It is expected that the executive will be more willing to surrender staff if this scheme is implemented, at the same time bringing in technology to improve safety and performance.

44.5 Recommendations:

44.5.1 In order to incentivize Staff, Surrender the Department or the Officer surrendering such staff should be given two years' saving on the surrendered staff's salaries and allowances to acquire labour saving devices, bring in automation, material handling implements, inspection tools, IT equipment etc. to compensate for the loss of manpower. This money will, of course, not be spent in one year and will most likely be spread out over 2-4 years.

44.5.2 RRBs must speed up their process if tightening of yardsticks is to be acceptable. Vacancies yardsticks need to be quickly filled up. The time cycle for recruitment through RRBs and RRCs should be cut down to six months, i.e. from the date the indent reaches an RRB the panel should be ready within six months. (K 2.11.4 and 5.1)

44.5.3 RRBs should make a standby panel of 100% of indented numbers in each selection so that coverage for non-joining and attrition can be made without waiting for the next selection cycle.

44.5.4 A comprehensive Outsourcing Policy for non-core activities needs to be issued so that surrender of staff does not result in degradation of performance in safety and non-safety areas. This should be done within the next six months. (K 2.11.5 and 5.5)

44.5.5 The stipulation of matching surrender for new assets, new services and new facilities should be withdrawn. New assets, services and facilities require additional manpower. [Finance Directorate: three months]

Annexure – 15

VACANCIES IN SAFETY CATEGORY

S.N.	Railway	As on 01/04/2016			
	CATEGORY	SS	OR	Vacancy	Vac.%
		1	2	3	4
1	ASMS/SMS/SSS	39671	34398	5273	13.29
2	Controllers	2814	2346	468	16.63
3	Guards	38704	28078	10626	27.45
4	Gateman (Traffic)	10061	9332	729	7.25
5	Switchmen	1405	983	422	30.04
6	Cabinmen	5140	4124	1016	19.77
7	Leverman	2264	1695	569	25.13
8	Pointsman	40577	37816	2761	6.8
9	JE/SE/SSE (P. Way)	10063	8042	2021	20.08
10	Supervisor (P. Way)	236	315	-79	-33.47
11	Gangmen/Gangmate	247758	206291	41467	16.74
12	Keymen	6083	3649	2434	40.01
13	Gateman (Engg.)	11110	10047	1063	9.57
14	JE/SE/SSE(Signal)	3973	3456	517	13.01
15	ESM/MSM	17158	14221	2937	17.12
16	Drivers	47212	35770	11442	24.24
17	Motormen	3926	3309	617	15.72
18	Shunters/ Engine Turners	8243	5529	2714	32.92
19	Dsl./Elec. Asstts.	45064	38490	6574	14.59
20	JE/SE/SSE(C&W)	9337	7402	1935	20.72
21	Counsellors of all Deptts.	936	740	196	20.94
22	All other safety categories	194941	167880	27061	13.88
	Total	**746676**	**623913**	**122763**	**16.44**

--- end of report ---

References:

Previous Reports related to Safety are referred to as follows:

Kh I: Report of the Railway Safety Review Committee, 1998 (Part I): Khanna Committee

Kh II: Report of the Railway Safety Review Committee, 1998 (Part II): Khanna Committee

CSP: Corporate Safety Plan (2003-2013), August 2003

K: Report of the High-Level Safety Review Committee, Feb 2002: Kakodkar Committee

Tripathi: Report of the High-Power Committee to Review the Duty Hours of Running and Other Safety Related Categories of Staff, 2013 (Tripathi Committee)

Annexure – 16

Presentation by the Task Force on Safety

(29 December 2016)

Key Findings and Recommendations

Safety Task Force

Set up by the Railway Board on December 6
Directed to recommend Short-, Medium- and Long-Term measures.
Detailed Report being submitted shortly.
This presentation deals with Immediate and Short-Term Measures (one year) to improve Safety.

Go Back to Basics

Adherence to Rules, Manuals and Codes.
Work according to Rules.
No ad hocism.
Superchecks of Inspections and Work
DRMs to ensure compliance by Branch Officers and supervisors.
Monitor in Weekly Meetings – Structured manner.

Inspections - Basics

Inspection Schedules to be enforced.
Simplified and focused inspection formats. **(Immediate)**
Computerize inspection reports for monitoring and compliance. **(three months)**
Safety Department to pursue key shortcomings till they are resolved.
Super check of Supervisor's Work and Inspections. Weekly Meetings of GMs/AGMs/DRM to discuss Safety First. **(immediate)**

Inspections – Track & Bridges

Sr. DENs to inspect as per schedule, super check and monitor compliance – PWI Depots, Gang work records, USFD, Toe-load etc. **(immediate)**

Inspection of Yards and Bridges by Sr. DENs/DENs. **(immediate)**

Push Trolley or foot Inspections – do the full quota. **(immediate)**

PWIs to spend time in the field – to be cross-checked with mobile phone records. **(immediate)**

TMS Passwords to be given to Safety department – already ordered by Hon'ble MOSR(S). **(immediate)**

Track Fittings

Track fittings – perished and missing on a large scale. Take stock of the situation immediately. **(one month)**

Typical supplies are only 15-30% of Annual Requirements. Mission Zero-Missing-Fittings: Ensure compliance in **six months**. To be done on war-footing. Not negotiable.

Track Maintenance

Integrated Blocks to be given by DRMs for up to 3 hours if long distance trains are not affected.

Blocks after ensuring mobilization of men, machine and material – measurable output.

Greasing of Gauge Face, outer rails on curves and both rails on Points and Crossings. **(immediate)**

Follow-up on Track Recording Car and OMS Readings: DRMs/GMs to monitor. **(immediate)**

Weigh Bridges and WILD to be in fine fettle. Exceptions to be handled with due process.

Keyman, Patrolman

The Last Frontier of Track Safety.
Special Allowance of 30% to Keyman/Patrolman to fill up these unpopular posts. **(3 months)**
Ensure Keyman and Patrolman have tools and equipment. **(immediate)**
Theft reporting by Keyman to be facilitated. **(immediate)**

Re-organize Field Offices

Sectional Sr. DENs/DENs to be relocated to their Sections with full office support. **(one month)**
In many cases the Sectional Sr. DEN/DEN has to travel 2-8 hours just to set foot in his area.
Likewise, DSTEs/ASTEs/AME(C&W) to be relocated to major work areas. **(one month)**
The system already exists for Mechanical and Electrical Shed Officers, some S&T Officers too. Area Officers exist in Operating Deptt.

Rolling Stock – 1

Rolling-in Examination: Last opportunity check for rolling-stock defects.
Build proper rolling-in examination huts. Provide bright lighting. **(six months)**
No operations with expired BPC. Not negotiable. **(immediate)**
TXR Certificate RS-7: to be cross-checked by officers. **(immediate)**

Rolling Stock – 2

Lighting and Drainage improvement in Pitlines – Mission Mode **(3 months)**

Freight Train Examination Lines to be Audited by DRMs – Proper Lighting, Pathway and Welding Facilities to be provided. **(audit: one month, improvements: one year)**

Corrosion Repair Practices in Workshops to be Audited. **(3 months)**

SPAD – 1

No Breach of Rest for Crew **(immediate)**

Mandatory 6-hour rest in Running Room before booking for duty after Periodical Rest and Long Leave. **(immediate)**

Link CMS with Biometrics and Breath Analyzers **(3 months)**

IIT-KGP Video Test to be introduced **(3 months)**

Counselling, foot-plating by Loco Inspectors. Check TA Bills with Mobile Phone Records. Exemplary Penalties in case of false claims. **(immediate)**

SPAD – 2

Speed Limit at Caution Signal (Single yellow) to 45kmph. (GR 3.07) **(one month)**

All Boards (caution, signal sighting, OHE Masts, Signal Posts etc.) to be Replaced with Retro-Reflective Ones **(six months)**

Ambush Checks on Drivers – LPs not to presume signals. 20-30% of Walkie-Talkies are out of order. Repair them all. **(three months)**

Air-condition ALL running rooms **(one year)**

Shunting (Immediate)

Shunting to be done as per GR & SR Provisions.

No Use of Walkie Talkie – Only Flags and/or lamps. Ensure proper fitting cotters.

Points and Crossings

Two thirds of all derailments happen in yards.

Joint Inspection of Points and Crossings by P. Way and Signal in right earnest – no instances of 30-40 inspections in a day.

Inspection Register to be super-checked by Engg. and S&T Officers for concordance with site conditions.

Safety Items

Directorates to (re)issue fresh lists of Safety, Must Change and Vital items. **(one month)**

Ensure 100% Availability of Safety, Vital and Must Change Items – in Mission Mode. **(six months)**

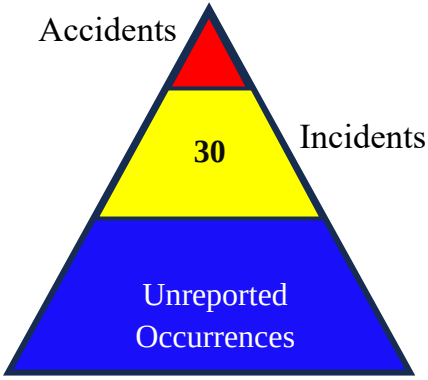
Divisional and Depot Purchase Officers to be empowered to same level as HQ Purchase Officers – to buy stock and non-stock items without restrictions. **(one month)**

Cash Imprest of Field Officers (Engg, Mech, Elect, S&T) to be increased to Rs. Ten Lakhs per month. Permit to buy Stock and non-Stock Items. GFR Rules to Apply. **(one month)**

Near Misses – New Paradigm

Near Misses are Warnings we must pay heed to.

Heinrich Triangle – For every accident, there are 29 near-misses.



Near Misses

Incidents as reported to Controllers must be captured. Any subsequent data is doctored.

Seek information from Field on Near Misses.

Inattentive Station Masters – non-exchange of alright signal

Gatekeepers not-alert or missing from post.

Malfunctioning signals, wrong caution orders.

Faulty Panel Operation – GR 3.36(2), 3.38(2), 5.23, 3.68, 3.69, 3.70.

To be discussed/monitored by DRMs/GMs. **(immediate)**

Thank You
Let's Go Back to Basics

--- END ---

THE DISASTER MANAGEMENT ACT, 2005

THE DISASTER MANAGEMENT ACT, 2005
ARRAGEMENT OF SECTIONS

CHAPTER I
PRELIMINARY

SECTIONS

1. Short title, extent, and commencement
2. Definitions.

CHAPTER II
THE NATIONAL DISASTER MANAGEMENT AUTHORITY

3. Establishment of National Disaster Management Authority
4. Meetings of National Authority
5. Appointment of officers and other employees of the National Authority.
6. Powers and functions of National Authority.
7. Constitution of advisory committee by National Authority
8. Constitution of National Executive Committee.
9. Constitution of sub-committees.
10. Powers and functions of National Executive Committee.
11. National plan
12. Guidelines for minimum standards of relief
13. Relief in loan repayment, etc.

CHAPTER III
STATE DISASTER MANAGEMENT AUTHORITY

14. Establishment of State Disaster Management Authority.
15. Meetings of the State Authority.
16. Appointment of officers and other employees of State Authority.
17. Constitution of advisory committee by the State Authority.
18. Powers and functions of State Authority.
19. Guidelines for minimum standard of relief by State Authority
20. Constitution of State Executive Committee.

21. Constitution of sub-committees by State Executive Committee.
22. Functions of the State Executive Committee
23. State Plan
24. Powers and functions of State Executive Committee in the event of threatening disaster situation.

CHAPTER IV
DISTRICT DISASTER MANAGEMENT AUTHORITY

25. Constitution of District Disaster Management Authority
26. Powers of Chairperson of District Authority

SECTIONS

27. Meetings.
28. Constitution of advisory committees and other committees.
29. Appointment of officers and other employees of District Authority.
30. Powers and functions of District Authority
31. District Plan
32. Plans by different authorities at district level and their implementation.
33. Requisition by the District Authority.
34. Powers and functions of District Authority in the event of any threatening disaster situation or disaster

CHAPTER V
MEASURES BY THE GOVERNMENT FOR DISASTER MANAGEMENT

35. Central Government to take measures.
36. Responsibilities of Ministries or Departments of Government of India.
37. Disaster management plans of Ministries or Departments of Government of India.
38. State Government to take measures.
39. Responsibilities of departments of the State Government.
40. Disaster management plan of departments of State

CHAPTER VI
LOCAL AUTHORITIES
41. Functions of the local authority

CHAPTER VII
NATIONAL INSTITUTEOF DISASTER MANAGEMENT
42. National Institute of Disaster Management.
43. Officers and other employees of the National Institute

CHAPTER VIII
NATIONAL DISASTER RESPONSE FORCE
44. National Disaster Response Force
45. Control, direction, etc.

CHAPTER IX
FINANCE, ACCOUNTS AND AUDIT
46. National Disaster Response Fund.
47. National Disaster Mitigation Fund
48. Establishment of funds by State Government
49. Allocation of funds by Ministries and Departments.
50. Emergency procurement and accounting.

CHAPTER X
OFFENCES AND PENALTIES
SECTIONS
51. Punishment for obstruction, etc.
52. Punishment for false claim
53. Punishment for misappropriation of money or materials, etc.
54. Punishment for false warning.
55. Offences by Departments of the Government.
56. Failure of officer in duty or his connivance at the contravention of the provisions of this Act.
57. Penalty for contravention of any order regarding requisitioning
58. Offence by companies.
59. Previous sanction for prosecution.
60. Cognizance of offences.

CHAPTER XI
MISCELLANEOUS

61. Prohibition against discrimination
62. Power to issue direction by Central Government
63. Powers to be made available for rescue operations.
64. Making or amending rules, etc., in certain circumstances.
65. Power of requisition of resources, provisions, vehicles, etc., for rescue operations, etc.
66. Payment of compensation
67. Direction to media for communication of warnings, etc.
68. Authentication of orders of decisions.
69. Delegation of powers.
70. Annual report.
71. Bar of jurisdiction of court.
72. Act to have overriding effect.
73. Action taken in good faith.
74. Immunity from legal process.
75. Power of Central Government to make rules.
76. Power to make regulations.
77. Rules and regulations to be laid before Parliament.
78. Power of State Government to make rules.
79. Power to remove difficulties.

THE DISASTER MANAGEMENT ACT, 2005

ACT No. 53 OF 2005

[23rd December 2005.]

An Act to provide for the effective management of disasters and for matters connected therewith or incidental thereto.

BE it enacted by Parliament in the Fifty-sixth Year of the Republic of India as follows-

PRELIMINARY
(DISASTER MANAGEMENT ACT 2005: CHAPTER I)

1

01 Short title, extent, and commencement.

(1) This Act may be called the Disaster Management Act, 2005.
(2) It extends to the whole of India
(3) It shall come into force on such date as the Central Government may, by notification in the Official Gazette appoint, and different dates may be appointed for different provisions of this Act and for different States, and any reference to commencement in any provision of this Act in relation to any State shall be construed as a reference to the commencement of that provision in that State.

02 Definitions- In this Act, unless the context otherwise requires,

(a) "Affected area" means an area or part of the country affected by a disaster,
(b) "Capacity-building" includes-
- **(i)** identification of existing resources and resources to be acquired or created.
- **(ii)** acquiring or creating resources identified under sub-clause (1).

(iii) organisation and training of personnel and coordination of such training for effective management of disasters,

(c) "Central Government" means the Ministry or Department of the Government of India having administrative control of disaster management,

(d) "disaster" means a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area;

(e) "Disaster management" means a continuous and integrated process of planning, organising, coordinating, and implementing measures which are necessary or expedient for

(i) prevention of danger or threat of any disaster,

(ii) mitigation or reduction of risk of any disaster or its severity or consequences.

(iii) capacity-building.

(iv) preparedness to deal with any disaster,

(v) prompt response to any threatening disaster situation or disaster,

(vi) assessing the severity or magnitude of effects of any disaster.

1. 28th July 2006 (ss. 2, 3, 4, 5, 6, 8, 10, 75, 77, 79), vide notification No 5.0. 1216(E), dated 28th July 2006, 1st August 2007 [55. 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 38, 39, 40, 41, 48, 51, 52, 53, 54, 55, 5658, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, sub-sec. (2) of s. 70, 71, 72, 73, 74, 78, 79], vide notification No. S.O. 722(E) dated 7th May, 2007;

*17th March 2008 (ss. 44, 45), vide notification No. 517(E), dated 17th March 2008,

*18th October 2011 (s, 46) vide notification No. S.O. 2397(E). dated 18th October 2011, see Gazette of India, Extraordinary, Part II, sec. 3(ii).

5th February 2021, sub (1) of s. 47, vide notification No. S.O. 564(E), dated 5th February 2021, see Gazette of India, Extraordinary, Part II, sec 3 (ii)

(vii) evacuation, rescue, and relief,

(viii) rehabilitation and reconstruction

(f) "District Authority" means the District Disaster Management Authority constituted under sub- section (1) of section 25:

(g) "District Plan" means the plan for disaster management for the district prepared under section 31:

(h) "Local authority" includes Panchayati raj institutions, municipalities, a district board, cantonment board, town planning authority or Zila Parishad or any other body or authority, by whatever name called, for

the time being invested by law, for rendering essential services or, with the control and management of civic services, within a specified local area,

(i) "mitigation" means measures aimed at reducing the risk, impact or effects of a disaster or threatening disaster situation.

(j) "National Authority" means the National Disaster Management Authority established under sub-section (1) of section 3.

(k) "National Executive Committee" means the Executive Committee of the National Authority constituted under sub-section (1) of section 8:

(l) "National Plan" means the plan for disaster management for the whole of the country prepared under section 11.

(m) "preparedness" means the state of readiness to deal with a threatening disaster situation or disaster and the effects thereof,

(n) "prescribed" means prescribed by rules made under this Act,

(o) "reconstruction" means construction or restoration of any property after a disaster,

(p) "resources" includes manpower, services, materials, and provisions.

(q) "State Authority" means the State Disaster Management Authority established under sub- section (1) of section 14 and includes the Disaster Management Authority for the Union territory constituted under that section.

(r) "State Executive Committee" means the Executive Committee of a State Authority constituted under sub-section (1) of section 20.

(s) "State Government" means the Department of Government of the State having administrative control of disaster management and includes Administrator of the Union territory appointed by the President under article 239 of the Constitution.

(t) "State Plan" means the plan for disaster management for the whole of the State prepared under section 23.

THE NATIONAL DISASTER MANAGEMENT AUTHORITY
(DISASTER MANAGEMENT ACT 2005: CHAPTER II)

2

03 Establishment of National Disaster Management Authority-

(1) With effect from such date as the Central Government may, by notification in the Official Gazette appoint in this behalf, there shall be established for the purposes of this Act, an authority to be known as the National Disaster Management Authority.

(2) The National Authority shall consist of the Chairperson and such number of other members, not exceeding nine, as may be prescribed by the Central Government and, unless the rules otherwise provide, the National Authority shall consist of the following-

(a) the Prime Minister of India, who shall be the Chairperson of the National Authority, ex officio.

(b) other members, not exceeding nine, to be nominated by the Chairperson of the National Authority

(3) The Chairperson of the National Authority may designate one of the members nominated under clause (b) of sub-

section (2) to be the Vice-Chairperson of the National Authority.

(4) The term of office and conditions of service of members of the National Authority shall be such as may be prescribed.

04 Meetings of National Authority

(1) The National Authority shall meet as and when necessary and at such time and place as the Chairperson of the National Authority may think fit.

(2) The Chairperson of the National Authority shall preside over the meetings of the National Authority

(3) If for any reason the Chairperson of the National Authority is unable to attend any meeting of the National Authority, the Vice-Chairperson of the National Authority shall preside over the meeting.

05 Appointment of officers and other employees of the National Authority-

The Central Government shall provide the National Authority with such officers, consultants, and employees, as it considers necessary for carrying out the functions of the National Authority.

06 Powers and functions of National Authority.

(1) Subject to the provisions of this Act, the National Authority shall have the responsibility for laying down the policies, plans and guidelines for disaster management for ensuring timely and effective response to disaster.

(2) Without prejudice to generality of the provisions contained in sub-section (1), the National Authority may

(a) lay down policies on disaster management,

(b) approve the National Plan

(c) approve plans prepared by the Ministries or Departments of the Government of India in accordance with the National Plan.

(d) lay down guidelines to be followed by the State Authorities in drawing up the State Plan:

(e) lay down guidelines to be followed by the different Ministries or Departments of the Government of India for the purpose of integrating the measures for prevention of disaster or the mitigation of its effects in their development plans and projects.

(f) coordinate the enforcement and implementation of the policy and plan for disaster management,

(g) recommend provision of funds for the purpose of mitigation,

(h) provide such support to other countries affected by major disasters as may be determined by the Central Government,

(i) take such other measures for the prevention of disaster, or the mitigation, or preparedness and capacity building for dealing with the threatening disaster situation or disaster as it may consider necessary,

(j) lay down broad policies and guidelines for the functioning of the National Institute of Disaster Management.

(3) The Chairperson of the National Authority shall, in the case of emergency, have power to exercise all or any of the powers of the National Authority but exercise of such powers shall be subject to ex post facto ratification by the National Authority.

07 Constitution of advisory committee by National Authority. –

(1) The National Authority may constitute an advisory committee consisting of experts in the field of disaster management and having practical experience of disaster management at the national, State or district level to make recommendations on different aspects of disaster management.

(2) The members of the advisory committee shall be paid such allowances as may be prescribed by the Central Government in consultation with the National Authority.

08 Constitution of National Executive Committee.

(1) The Central Government shall, immediately after issue of notification under sub-section (1) of section 3, constitute a National Executive Committee to assist the National Authority in the performance of its functions under this Act.

(2) The National Executive Committee shall consist of the following members, namely: -

(a) the Secretary to the Government of India in charge of the Ministry or Department of the Central Government having administrative control of the disaster management, who shall be Chairperson, ex officio.

(b) the Secretaries to the Government of India in the Ministries or Departments having administrative control of the agriculture, atomic energy, defence, drinking water supply, environment and forests, finance (expenditure), health, power, rural development, science and technology, space, telecommunication, urban development, water resources and the Chief of the Integrated Defence Staff of the Chiefs of Staff Committee, ex officio.

(3) The Chairperson of the National Executive Committee may invite any other officer of the Central Government or a State Government for taking part in any meeting of the National Executive Committee and shall exercise such powers and perform such functions as may be prescribed by the Central Government in consultation with the National Authority.

(4) The procedure to be followed by the National Executive Committee in exercise of its powers and discharge of its functions shall be such as may be prescribed by the Central Government.

09 Constitution of sub-committees.

(1) The National Executive Committee may, as and when it considers necessary, constitute one or more sub-committees, for the efficient discharge of its functions.

(2) The National Executive Committee shall, from amongst its members, appoint the Chairperson of the sub-committee referred to in sub-section (1).

(3) Any person associated as an expert with any sub-committee may be paid such allowances as may be prescribed by the Central Government.

10 Powers and functions of National Executive Committee

(1) The National Executive Committee shall assist the National Authority in the discharge of its functions and have the responsibility for implementing the policies and plans of the National Authority and ensure the compliance of directions issued by the Central Government for the purpose of disaster management in the country.

(2) Without prejudice to the generality of the provisions contained in sub-section (1), the National Executive Committee may-

(a) act as the coordinating and monitoring body for disaster management:

(b) prepare the National Plan to be approved by the National Authority.

(c) coordinate and monitor the implementation of the National Policy,

(d) lay down guidelines for preparing disaster management plans by different Ministries or Departments of the Government of India and the State Authorities.

(e) provide necessary technical assistance to the State Governments and the State Authorities for preparing their disaster management

plans in accordance with the guidelines laid down by the National Authority,

(f) monitor the implementation of the National Plan and the plans prepared by the Ministries or Departments of the Government of India,

(g) monitor the implementation of the guidelines laid down by the National Authority for integrating of measures for prevention of disasters and mitigation by the Ministries or Departments in their development plans and projects,

(h) monitor, coordinate, and give directions regarding the mitigation and preparedness measures to be taken by different Ministries or Departments and agencies of the Government,

(i) evaluate the preparedness at all governmental levels for the purpose of responding to any threatening disaster situation or disaster and give directions, where necessary, for enhancing such preparedness,

(j) plan and coordinate specialised training programme for disaster management for different levels of officers, employees, and voluntary rescue workers.

(k) coordinate response in the event of any threatening disaster situation or disaster.

(l) lay down guidelines for, or give directions to, the concerned Ministries or Departments of the Government of India, the State Governments, and the State Authorities regarding measures to be taken by them in response to any threatening disaster situation or disaster.

(m) require any department or agency of the Government to make available to the National Authority or State Authorities such men or material resources as are available with it for the purposes of emergency response, rescue, and relief,

(n) advise, assist, and coordinate the activities of the Ministries or Departments of the Government of India, State Authorities, statutory bodies, other governmental or non-governmental organisations and others engaged in disaster management,

(o) provide necessary technical assistance or give advice to the State Authorities and District Authorities for carrying out their functions under this Act.

(p) promote general education and awareness in relation to disaster management, and

(q) perform such other functions as the National Authority may require it to perform.

11 National Plan

(1) There shall be drawn up a plan for disaster management for the whole of the country to be called the National Plan.

(2) The National Plan shall be prepared by the National Executive Committee having regard to the National Policy and in consultation with the State Governments and expert bodies or organisations in the field of disaster management to be approved by the National Authority

(3) The National Plan shall include-

(a) measures to be taken for the prevention of disasters, or the mitigation of their effects,

(b) measures to be taken for the integration of mitigation measures in the development plans.

(c) measures to be taken for preparedness and capacity building to effectively respond to any threatening disaster situations or disaster.

(d) roles and responsibilities of different Ministries or Departments of the Government of India in respect of measures specified in clauses (a). (b) and (c)

(4) The National Plan shall be reviewed and updated annually.

(5) Appropriate provisions shall be made by the Central Government for financing the measures to be carried out under the National Plan

(6) Copies of the National Plan referred to in sub-sections (2) and (4) shall be made available to the Ministries or Departments of the Government of India and such Ministries or Departments shall draw up their own plans in accordance with the National Plan

12 Guidelines for minimum standards of relief- The National Authority shall recommend guidelines for the minimum standards of relief to be provided to persons affected by disaster, which shall include

(i) the minimum requirements to be provided in the relief camps in relation to shelter, food. drinking water, medical cover, and sanitation.

(ii) the special provisions to be made for widows and orphans.

(iii) ex gratia assistance on account of loss of life as also assistance on account of damage to houses and for restoration of means of livelihood.

(iv) such other relief as may be necessary.

13 Relief in loan repayment, etc.- The National Authority may, in cases of disasters of severe magnitude, recommend relief in repayment of loans or for grant of fresh loans to the persons affected by disaster on such concessional terms as may be appropriate.

STATE DISASTER MANAGEMENT AUTHORITIES
(DISASTER MANAGEMENT ACT 2005: CHAPTER III)

3

14 Establishment of State Disaster Management Authority.

(1) Every State Government shall, as soon as may be after the issue of the notification under sub-section (1) of section 3, by notification in the Official Gazette, establish a State Disaster Management Authority for the State with such name as may be specified in the notification of the State Government.

(2) A State Authority shall consist of the Chairperson and such number of other members, not exceeding nine, as may be prescribed by the State Government and, unless the rules otherwise provide, the State Authority shall consist of the following members, namely-

(a) the Chief Minister of the State, who shall be Chairperson, ex officio,

(b) other members, not exceeding eight, to be nominated by the Chairperson of the State Authority,

(c) the Chairperson of the State Executive Committee, ex officio.

(3) The Chairperson of the State Authority may designate one of the members nominated under clause (b) of sub-section (2) to be the Vice-Chairperson of the State Authority

(4) The Chairperson of the State Executive Committee shall be the Chief Executive Officer of the State Authority, ex officio:

Provided that in the case of a Union territory having Legislative Assembly, except the Union territory of Delhi, the Chief Minister shall be the Chairperson of the Authority established under this section and in case of other Umon territories, the Lieutenant Governor or the Administrator shall be the Chairperson of that Authority.

Provided further that the Lieutenant Governor of the Union territory of Delhi shall be the Chairperson and the Chief Minister thereof shall be the Vice-Chairperson of the State Authority

(5) The term of office and conditions of service of members of the State Authority shall be such as may be prescribed.

15 Meetings of the State Authority-

(1) The State Authority shall meet as and when necessary and at such time and place as the Chairperson of the State Authority may think fit.

(2) The Chairperson of the State Authority shall preside over the meetings of the State Authority.

(3) If for any reason, the Chairperson of the State Authority is unable to attend the meeting of the State Authority, the Vice-

Chairperson of the State Authority shall preside at the meeting.

16 Appointment of officers and other employees of State Authority- The State Government shall provide the State Authority with such officers, consultants, and employees, as it considers necessary, for carrying out the functions of the State Authority.

17 Constitution of advisory committee by the State Authority-

(1) A State Authority may, as and when it considers necessary, constitute an advisory committee, consisting of experts in the field of disaster management and having practical experience of disaster management to make recommendations on different aspects of disaster management.

(2) The members of the advisory committee shall be paid such allowances as may be prescribed by the State Government.

18 Powers and functions of State Authority. –

(1) Subject to the provisions of this Act, a State Authority shall have the responsibility for laying down policies and plans for disaster management in the State

(2) Without prejudice to the generality of provisions contained in sub-section (1), the State Authority may-

(a) lay down the State disaster management policy,

(b) approve the State Plan in accordance with the guidelines laid down by the National Authority,

(c) approve the disaster management plans prepared by the departments of the Government of the State:

(d) lay down guidelines to be followed by the departments of the Government of the State for the purposes of integration of measures for prevention of disasters and mitigation in their development plans and projects and provide necessary technical assistance therefor.

(e) coordinate the implementation of the State Plan.

(f) recommend provision of funds for mitigation and preparedness measures:

(g) review the development plans of the different departments of the State and ensure that prevention and mitigation measures are integrated therein,

(h) review the measures being taken for mitigation, capacity building and preparedness by the departments of the Government of the State and issue such guidelines as may be necessary.

(3) The Chairperson of the State Authority shall, in the case of emergency, have power to exercise all or any of the powers of the State Authority but the exercise of such powers shall be subject to ex post facto ratification of the State Authority

19 Guidelines for minimum standard of relief by State Authority-The State Authority shall lay down detailed guidelines for providing standards of relief to persons affected by disaster in the State:

Provided that such standards shall in no case be less than the minimum standards in the guidelines laid down by the National Authority in this regard

20 Constitution of State Executive Committee-

(1) The State Government shall, immediately after issue of notification under sub-section (1) of section 14, constitute a State Executive Committee to assist the State Authority in the performance of its functions and to coordinate action in

accordance with the guidelines laid down by the State Authority and ensure the compliance of directions issued by the State Government under this Act.

(2) The State Executive Committee shall consist of the following members, namely

(a) the Chief Secretary to the State Government, who shall be Chairperson, ex officio,

(b) four Secretaries to the Government of the State of such departments as the State Government may think fit, ex officio.

(3) The Chairperson of the State Executive Committee shall exercise such powers and perform such functions as may be prescribed by the State Government and such other powers and functions as may be delegated to him by the State Authority

(4) The procedure to be followed by the State Executive Committee in exercise of its powers and discharge of its functions shall be such as may be prescribed by the State Government.

21 Constitution of sub-committees by State Executive Committee-

(1) The State Executive Committee may, as and when it considers necessary, constitute one or more sub-committees, for efficient discharge of its functions.

(2) The State Executive Committee shall, from amongst its members, appoint the Chairperson of the sub-committee referred to in sub-section (1)

(3) Any person associated as an expert with any sub-committee may be paid such allowances as may be prescribed by the State Government.

22 Functions of the State Executive Committee-

(1) The State Executive Committee shall have the responsibility for implementing the National Plan and State Plan and act as the coordinating and monitoring body for management of disaster in the State.

(2) Without prejudice to the generality of the provisions of sub-section (1), the State Executive Committee may-

(a) coordinate and monitor the implementation of the National Policy, the National Plan, and the State Plan,

(b) examine the vulnerability of different parts of the State to different forms of disasters and specify measures to be taken for their prevention or mitigation,

(c) lay down guidelines for preparation of disaster management plans by the departments of the Government of the State and the District Authorities,

(d) monitor the implementation of disaster management plans prepared by the departments of the Government of the State and District Authorities,

(e) monitor the implementation of the guidelines laid down by the State Authority for integrating of measures for prevention of disasters and mitigation by the departments in their development plans and projects.

(f) evaluate preparedness at all governmental or non-governmental levels to respond to any threatening disaster situation or disaster and give directions, where necessary, for enhancing such preparedness.

(g) coordinate response in the event of any threatening disaster situation or disaster.

(h) give directions to any Department of the Government of the State or any other authority or body in the State regarding actions to be taken in response to any threatening disaster situation or disaster,

(i) promote general education, awareness, and community training in regard to the forms of disasters to which different parts of the State are vulnerable and the measures that may be taken by such

community to prevent the disaster, mitigate and respond to such disaster.

(j) advise, assist, and coordinate the activities of the Departments of the Government of the State, District Authorities, statutory bodies, and other governmental and non-governmental organisations engaged in disaster management.

(k) provide necessary technical assistance or give advice to District Authorities and local authorities for carrying out their functions effectively.

(l) advise the State Government regarding all financial matters in relation to disaster management.

(m) examine the construction, in any local area in the State and, if it is of the opinion that the standards laid for such construction for the prevention of disaster is not being or has not been followed, may direct the District Authority or the local authority to take such action as may be necessary to secure compliance of such standards.

(n) provide information to the National Authority relating to different aspects of disaster management.

(o) lay down, review and update State level response plans and guidelines and ensure that the district level plans are prepared, reviewed, and updated:

(p) ensure that communication systems are in order and the disaster management drills are carried out periodically.

(q) perform such other functions as may be assigned to it by the State Authority or as it may consider necessary.

23 State Plan-

(1) There shall be a plan for disaster management for every State to be called the State Disaster Management Plan.

(2) The State Plan shall be prepared by the State Executive Committee having regard to the guidelines laid down by the National Authority and after such consultation with local

authorities, district authorities and the people's representatives as the State Executive Committee may deem fit.

(3) The State Plan prepared by the State Executive Committee under sub-section (2) shall be approved by the State Authority

(4) The State Plan shall include, -

(a) the vulnerability of different parts of the State to different forms of disasters,

(b) the measures to be adopted for prevention and mitigation of disasters,

(c) the manner in which the mitigation measures shall be integrated with the development plans and projects.

(d) the capacity-building and preparedness measures to be taken,

(e) the roles and responsibilities of each Department of the Government of the State in relation to the measures specified in clauses (b). (c) and (d) above.

(f) the roles and responsibilities of different Departments of the Government of the State in responding to any threatening disaster situation or disaster.

(5) The State Plan shall be reviewed and updated annually.

(6) Appropriate provisions shall be made by the State Government for financing for the measures to be carried out under the State Plan.

(7) Copies of the State Plan referred to in sub-sections (2) and (5) shall be made available to the Departments of the Government of the State and such Departments shall draw up their own plans in accordance with the State Plan

24 Powers and functions of State Executive Committee in the event of threatening disaster situation- For the purpose of, assisting and protecting the community affected by disaster or providing relief to such community or preventing or combating disruption or dealing with

the effects of any threatening disaster situation, the State Executive Committee may-

(a) control and restrict, vehicular traffic to, from or within, the vulnerable or affected area.

(b) control and restrict the entry of any person into, his movement within and departure from, a vulnerable or affected area.

(c) remove debris, conduct search, and carry out rescue operations.

(d) provide shelter, food, drinking water, essential provisions, healthcare, and services in accordance with the standards laid down by the National Authority and State Authority,

(e) give direction to the concerned Department of the Government of the State, any District Authority or other authority, within the local limits of the State to take such measure or steps for rescue, evacuation or providing immediate relief saving lives or property, as may be necessary in its opinion,

(f) require any department of the Government of the State or any other body or authority or person in charge of any relevant resources to make available the resources for the purposes of emergency response, rescue, and relief,

(g) require experts and consultants in the field of disasters to provide advice and assistance for rescue and relief.

(h) procure exclusive or preferential use of amenities from any authority or person as and when required.

(i) construct temporary bridges or other necessary structures and demolish unsafe structures which may be hazardous to public,

(j) ensure that non-governmental organisations carry out their activities in an equitable and non- discriminatory manner.

(k) disseminate information to public to deal with any threatening disaster situation or disaster.

(l) take such steps as the Central Government or the State Government may direct in this regard or take such other steps as are required or warranted by the form of any threatening disaster situation or disaster.

DISTRICT DISASTER MANAGEMENT AUTHORITY
(DISASTER MANAGEMENT ACT 2005: CHAPTER IV)

4

25 Constitution of District Disaster Management Authority-

(1) Every State Government shall, as soon as may be after issue of notification under sub-section (1) of section 14, by notification in the Official Gazette, establish a District Disaster Management Authority for every district in the State with such name as may be specified in that notification.

(2) The District Authority shall consist of the Chairperson and such number of other members, not exceeding seven, as may be prescribed by the State Government, and unless the rules otherwise provide, it shall consist of the following, namely

(a) the Collector or District Magistrate or Deputy Commissioner, as the case may be, of the district who shall be Chairperson, ex officio,

(b) the Collector or District Magistrate or Deputy Commissioner, as the case may be, of the district who shall be Chairperson, ex officio,

(c) the elected representative of the local authority who shall be the co-Chairperson, ex officio.

Provided that in the Tribal Areas, as referred to in the Sixth Schedule to the Constitution, the Chief Executive Member of the district council of autonomous district, shall be the co-Chairperson ex officio.

(d) the Chief Executive Officer of the District Authority, ex officio,

(e) the Superintendent of Police, ex officio,

(f) the Chief Medical Officer of the district, ex officio.

(g) not exceeding two other district level officers, to be appointed by the State Government.

(3) In any district where zila parishad exists, the Chairperson thereof shall be the co-Chairperson of the District Authority.

(4) 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 to exercise such powers and perform such functions as may be prescribed by the State Government and such other powers and functions as may be delegated to him by the District Authority.

26 Powers of Chairperson of District Authority-

(1) The Chairperson of the District Authority shall, in addition to presiding over the meetings of the District Authority, exercise and discharge such powers and functions of the District Authority as the District Authority may delegate to him.

(2) The Chairperson of the District Authority shall, in the case of an emergency, have power to exercise all or any of the powers of the District Authority but the exercise of such powers shall be subject to ex post facto ratification of the District Authority

(3) The District Authority or the Chairperson of the District Authority may, by general or special order, in writing, delegate such of its or his powers and functions, under sub-section (1) or (2), as the case may be, to the Chief Executive Officer of the District Authority, subject to such conditions and limitations, if any, as it or he deems fit

27 Meetings-The District Authority shall meet as and when necessary and at such time and place as the Chairperson may think fit.

28 Constitution of advisory committees and other committees-

(1) The District Authority may, as and when it considers necessary, constitute one or more advisory committees and other committees for the efficient discharge of its functions.

(2) The District Authority shall, from amongst its members, appoint the Chairperson of the Committee referred to in sub-section (1).

(3) Any person associated as an expert with any committee or sub-committee constituted under sub-section (1) may be paid such allowances as may be prescribed by the State Government

29 Appointment of officers and other employees of District Authority-The State Government shall

provide the District Authority with such officers, consultants, and other employees as it considers necessary for carrying out the functions of District Authority

30 Powers and functions of District Authority-

(1) The District Authority shall act as the district planning, coordinating, and implementing body for disaster management and take all measures for the purposes of disaster management in the district in accordance with the guidelines laid down by the National Authority and the State Authority.

(2) Without prejudice to the generality of the provisions of sub-section (1), the District Authority may-

(i) prepare a disaster management plan including district response plan for the district,

(ii) coordinate and monitor the implementation of the National Policy, State Policy. National Plan, State Plan and District Plan.

(iii) ensure that the areas in the district vulnerable to disasters are identified and measures for the prevention of disasters and the mitigation of its effects are undertaken by the departments of the Government at the district level as well as by the local authorities.

(iv) ensure that the guidelines for pre prevention of disasters, mitigation of its effects, preparedness and response measures as laid down by the National Authority and the State Authority are followed by all departments of the Government at the district level and the local authorities in the district,

(v) give directions to different authorities at the district level and local authorities to take such other measures for the prevention or mitigation of disasters as may be necessary,

(vi) lay down guidelines for prevention of disaster management plans by the department of the Government at the districts level and local authorities in the district,

(vii) monitor the implementation of disaster management plans prepared by the Departments of the Government at the district level,

(viii) lay down guidelines to be followed by the Departments of the Government at the district level for purposes of integration of measures for prevention of disasters and mitigation in their development plans and projects and provide necessary technical assistance therefor.

(ix) monitor the implementation of measures referred to in clause (viii).

(x) review the state of capabilities for responding to any disaster or threatening disaster situation in the district and give directions to the relevant departments or authorities at the district level for their up gradation as may be necessary.

(xi) review the preparedness measures and give directions to the concerned departments at the district level or other concerned authorities where necessary for bringing the preparedness measures to the levels required for responding effectively to any disaster or threatening disaster situation.

(xii) organise and coordinate specialised training programmes for different levels of officers. employees and voluntary rescue workers in the district,

(xiii) facilitate community training and awareness programmes for prevention of disaster or mitigation with the support of local authorities, governmental and non-governmental organisations.

(xiv) set up, maintain, review, and upgrade the mechanism for early warnings and dissemination of proper information to public.

(xv) prepare, review and update district level response plan and guidelines,

(xvi) coordinate response to any threatening disaster situation or disaster,

(xvii) ensure that the Departments of the Government at the district level and the local authorities prepare their response plans in accordance with the district response plan.

(xviii) lay down guidelines for, or give direction to, the concerned Department of the Government at the district level or any other authorities within the local limits of the district to take measures to respond effectively to any threatening disaster situation or disaster.

(xix) advise, assist, and coordinate the activities of the Departments of the Government at the district level, statutory bodies and other governmental and non-governmental organisations in the district engaged in the disaster management,

(xx) coordinate with, and give guidelines to, local authorities in the district to ensure that measures for the prevention or mitigation of threatening disaster situation or disaster in the district are carried out promptly and effectively.

(xxi) provide necessary technical assistance or give advice to the local authorities in the district for carrying out their functions.

(xxii) review development plans prepared by the Departments of the Government at the district level, statutory authorities, or local authorities with a view to make necessary provisions therein for prevention of disaster or mitigation.

(xxiii) examine the construction in any area in the district and, if it is of the opinion that the standards for the prevention of disaster or mitigation laid down for such construction is not being or has not been followed, may direct the concerned authority to take such action as may be necessary to secure compliance of such standards.

(xxiv) identify buildings and places which could, in the event of any threatening disaster situation or disaster, be used as relief centres or camps and make arrangements for water supply and sanitation in such buildings or places,

(xxv) establish stockpiles of relief and rescue materials or ensure preparedness to make such materials available at a short notice.

(xxvi) provide information to the State Authority relating to different aspects of disaster management.

(xxvii) encourage the involvement of non-governmental organisations and voluntary social- welfare institutions working at the grassroots level in the district for disaster management,

(xxviii) ensure communication systems are in order, and disaster management drills are carried out periodically,

(xxix) perform such other functions as the State Government or State Authority may assign to it or as it deems necessary for disaster management in the district.

31 District Plan-

(1) There shall be a plan for disaster management for every district of the State.

(2) The District Plan shall be prepared by the District Authority, after consultation with the local authorities and having regard to the National Plan and the State Plan, to be approved by the State Authority

(3) The District Plan shall include

(a) the areas in the district vulnerable to different forms of disasters,

(b) the measures to be taken, for prevention and mitigation of disaster, by the Departments of the Government at the district level and local authorities in the district,

(c) the capacity-building and preparedness measures required to be taken by the Departments of the Government at the district level and the local authorities in the district to respond to any threatening disaster situation or disaster.

(d) the response plans and procedures, in the event of a disaster, providing for-

(i) allocation of responsibilities to the Departments of the Government at the district level and the local authorities in the district,

(ii) prompt response to disaster and relief thereof,

(iii) procurement of essential resources,

(iv) establishment of communication links, and

(v) the dissemination of information to the public.

(e) such other matters as may be required by the State Authority

(4) The District Plan shall be reviewed and updated annually.

(5) The copies of the District Plan referred to in sub-sections (2) and (4) shall be made available to the Departments of the Government in the district.

(6) The District Authority shall send a copy of the District Plan to the State Authority which shall forward it to the State Government.

(7) The District Authority shall, review from time to time, the implementation of the Plan and issue such instructions to different departments of the Government in the district as it may deem necessary for the implementation thereof.

32 Plans by different authorities at district level and their implementation- Every office of the Government of India and of the State Government at the district level and the local authorities shall, subject to the supervision of the District Authority, -

(a) prepare a disaster management plan setting out the following, namely-

(i) provisions for prevention and mitigation measures as provided for in the District Plan and as is assigned to the department or agency concerned,

(ii) (ii) provisions for taking measures relating to capacity-building and preparedness as laid down in the District Plan.

(iii) the response plans and procedures, in the event of, any threatening disaster situation or disaster

(b) coordinate the preparation and the implementation of its plan with those of the other organisations at the district level including local authority, communities, and other stakeholders.

(c) regularly review and update the plan, and

(d) submit a copy of its disaster management plan, and of any amendment thereto, to the District Authority

33 Requisition by the District Authority- The District Authority may by order require any officer or any Department at the district level or any local authority to take such measures for the prevention or mitigation of disaster, or to effectively respond to it, as may be necessary, and such officer or department shall be bound to carry out such order.

34 Powers and functions of District Authority in the event of any threatening disaster situation or disaster- For the purpose of assisting, protecting or providing relief to the community, in response to any threatening disaster situation or disaster, the District Authority may-

(a) give directions for the release and use of resources available with any Department of the Government and the local authority in the district,

(b) control and restrict vehicular traffic to, from and within, the vulnerable or affected area.

(c) control and restrict the entry of any person into, his movement within and departure from, a vulnerable or affected area:

(d) remove debris, conduct search, and carry out rescue operations.

(e) provide shelter, food, drinking water and essential provisions, healthcare, and services.

(f) establish emerge emergency communication systems in the affected area.

(g) make arrangements for the disposal of the unclaimed dead bodies.

(h) recommend to any Department of the Government of the State or any authority or body under that Government at the district level to take such measures as are necessary in its opinion,

(i) require experts and consultants in the relevant fields to advise and assist as it may deem necessary.

(j) procure exclusive or preferential use of amenities from any authority or person,

(k) construct temporary bridges or other necessary structures and demolish structures which may be hazardous to public or aggravate the effects of the disaster,

(l) ensure that the non-governmental organisations carry out their activities in an equitable and non-discriminatory manner.

(m) take such other steps as may be required or warranted to be taken in such a situation.

MEASURES BY THE GOVERNMENT FOR DISASTER MANAGEMENT
(DISASTER MANAGEMENT ACT 2005: CHAPTER V)

5

35 Central Government to take measures-

(1) Subject to the provisions of this Act, the Central Government shall take all such measures as it deems necessary or expedient for the purpose of disaster management.

(2) In particular and without prejudice to the generality of the provisions of sub-section (1), the measures which the Central Government may take under that sub-section include measures with respect to all or any of the following matters, namely

(a) coordination of actions of the Ministries or Departments of the Government of India, State Governments, National Authority, State Authorities, governmental and non-governmental organisations in relation to disaster management.

(b) ensure the integration of measures for prevention of disasters and mitigation by Ministries or Departments of the Government of India into their development plans and projects.

(c) ensure appropriate allocation of funds for prevention of disaster, mitigation, capacity-building and preparedness by the Ministries or Departments of the Government of India,

(d) ensure that the Ministries or Departments of the Government of India take necessary measures for preparedness to promptly and effectively respond to any threatening disaster situation or disaster.

(e) cooperation and assistance to State Governments, as requested by them or otherwise deemed appropriate by it,

(f) deployment of naval, military and air forces, other armed forces of the Union or any other civilian personnel as may be required for the purposes of this Act,

(g) coordination with the United Nations agencies, international organisations, and governments of foreign countries for the purposes of this Act,

(h) establish institutions for research, training, and developmental programmes in the field of disaster management,

(i) such other matters as it deems necessary or expedient for the purpose of securing effective implementation of the provisions of this Act.

(3) The Central Government may extend such support to other countries affected by major disaster as it may deem appropriate

36 Responsibilities of Ministries or Departments of Government of India- It shall be the responsibility of every Ministry or Department of the Government of India to

(a) take measures necessary for prevention of disasters, mitigation, preparedness, and capacity- building in accordance with the guidelines laid down by the National Authority.

(b) integrate into its development plans and projects, the measures for prevention or mitigation of disasters in accordance with the guidelines laid down by the National Authority,

(c) respond effectively and promptly to any threatening disaster situation or disaster in accordance with the guidelines of the National Authority or the directions of the National Executive Committee in this behalf.

(d) review the enactments administered by it, its policies, rules, and regulations, with a view to incorporate them the provisions necessary for prevention of disasters, mitigation, or preparedness:

(e) allocate funds for measures for prevention of disaster, mitigation, capacity-building, and preparedness,

(f) provide assistance to the National Authority and State Governments for-

- **(i)** drawing up mitigation, preparedness and response plans, capacity-building, data collection and identification and training of personnel in relation to disaster management.
- **(ii)** carrying out rescue and relief operations in the affected area.
- **(iii)** assessing the damage from any disaster,
- **(iv)** carrying out rehabilitation and reconstruction,

(g) make available its resources to the National Executive Committee or a State Executive Committee for the purposes of responding promptly and effectively to any threatening disaster situation or disaster, including measures for-

- **(i)** providing emergency communication in a vulnerable or affected area:
- **(ii)** (ii) transporting personnel and relief goods to and from the affected area,
- **(iii)** providing evacuation, rescue, temporary shelter, or other immediate relief.
- **(iv)** setting up temporary bridges, jetties, and landing places,
- **(v)** providing, drinking water, essential provisions, healthcare, and services in an affected area,

(h) take such other actions as it may consider necessary for disaster management.

37 Disaster management plans of Ministries or Departments of Government of India-

(1) Every Ministry or Department of the Government of India shall-

(a) prepare a disaster management plan specifying the following particulars, namely -

(i) the measures to be taken by it for prevention and mitigation of disasters in accordance with the National Plan

(ii) (ii) the specifications regarding integration of mitigation measures in its development plans in accordance with the guidelines of the National Authority and the National Executive Committee,

(iii) its roles and responsibilities in relation to preparedness and capacity-building to deal with any threatening disaster situation or disaster.

(iv) its roles and responsibilities in regard to promptly and effectively responding to any threatening disaster situation or disaster,

(v) the present status of its preparedness to perform the roles and responsibilities specified in sub-clauses (ii) and (m)

(vi) the measures required to be taken in order to enable it to perform its responsibilities specified in sub-clauses (in) and (iv).

(b) review and update annually the plan referred to in clause (a),

(c) forward a copy of the plan referred to in clause (a) or clause (b), as the case may be, to the Central Government which Government shall forward a copy thereof to the National Authority for its approval.

(2) Every Ministry or Department of the Government of India shall-

(a) make, while preparing disaster management plan under clause (a) of sub-section (l) provisions for financing the activities specified therein.

(b) furnish a status report regarding the implementation of the plan referred to in clause (a) of sub-section (1) to the National Authority, as and when required by it.

38 State Government to take measures-

(1) Subject to the provisions of this Act, each State Government shall take all measures specified in the guidelines laid down by the National Authority and such further measures as it deems necessary or expedient, for the purpose of disaster management.

(2) The measures which the State Government may take under sub-section (1) include measures with respect to all or any of the following matters, namely:

(a) coordination of actions of different departments of the Government of the State, the State Authority, District Authorities, local authority, and other non-governmental organisations.

(b) cooperation and assistance in the disaster management to the National Authority and National Executive Committee, the State Authority and the State Executive Committee, and the District Authorities,

(c) cooperation with, and assistance to, the Ministries or Departments of the Government of India in disaster management, as requested by them or otherwise deemed appropriate by it,

(d) allocation of funds for measures for prevention of disaster, mitigation, capacity-building, and preparedness by the departments of the Government of the State in accordance with the provisions of the State Plan and the District Plans,

(e) ensure that the integration of measures for prevention of disaster or mitigation by the departments of the Government of the State in their development plans and projects:

(f) integrate in the State development plan, measures to reduce or mitigate the vulnerability of different parts of the State to different disasters,

(g) ensure the preparation of disaster management plans by different departments of the State in accordance with the guidelines laid down by the National Authority and the State Authority.

(h) establishment of adequate warning systems up to the level of vulnerable communities:

(i) ensure that different departments of the Government of the State and the District Authorities take appropriate preparedness measures.

(j) ensure that in a threatening disaster situation or disaster, the resources of different departments of the Government of the State are made available to the National Executive Committee or the State Executive Committee or the District Authorities, as the case may be, for the purposes of effective response, rescue and relief in any threatening disaster situation or disaster.

(k) provide rehabilitation and reconstruction assistance to the victims of any disaster, and

(l) such other matters as it deems necessary or expedient for the purpose of securing effective implementation of provisions of this Act.

39 Responsibilities of departments of the State Government- It shall be the responsibility of every department of the Government of a State to-

(a) take measures necessary for prevention of disasters, mitigation, preparedness, and capacity- building in accordance with the guidelines laid down by the National Authority and the State Authority,

(b) integrate into its development plans and projects, the measures for prevention of disaster and mitigation:

(c) allocate funds for prevention of disaster, mitigation, capacity-building, and preparedness.

(d) respond effectively and promptly to any threatening disaster situation or disaster in accordance with the State Plan, and in accordance with the guidelines or directions of the National Executive Committee and the State Executive Committee.

(e) review the enactments administered by it, its policies, rules, and regulations with a view to incorporate therein the provisions necessary for prevention of disasters, mitigation or preparedness,

(f) provide assistance, as required by the National Executive Committee, the State Executive Committee and District Authorities, for

- **(i)** drawing up mitigation, preparedness and response plans, capacity building, data collection and identification and training of personnel in relation to disaster management,
- **(ii)** (ii) assessing the damage from any disaster,
- **(iii)** carrying out rehabilitation and reconstruction,

(g) make provision for resources in consultation with the State Authority for the implementation of the District Plan by its authorities at the district level,

(h) make available its resources to the National Executive Committee or the State Executive Committee or the District Authorities for the purposes of responding promptly and effectively to any disaster in the State, including measures for-

- **(i)** providing emergency communication with a vulnerable or affected area,
- **(ii)** (ii) transporting personnel and relief goods to and from the affected area.
- **(iii)** providing evacuation, rescue, temporary shelter, or other immediate relief,
- **(iv)** carrying out evacuation of persons or live-stock from an area of any threatening disaster situation or disaster,
- **(v)** setting up temporary bridges, jetties, and landing places.
- **(vi)** (vi)providing drinking water, essential provisions, healthcare, and services in an affected area,

(i) such other actions as may be necessary for disaster management.

40 Disaster management plan of departments of State-

(1) Every department of the State Government, in conformity with the guidelines laid down by the State Authority, shall-

(a) prepare a disaster management plan which shall lay down the following -

(i) the types of disasters to which different parts of the State are vulnerable.

(ii) (ii) integration of strategies for the prevention of disaster or the mitigation of its effects or both with the development plans and programmes by the department

(iii) the roles and responsibilities of the department of the State in the event of any threatening disaster situation or disaster and emergency support function it is required to perform.

(iv) present status of its preparedness to perform such roles or responsibilities or emergency support function under sub-clause (iii)

(v) the capacity-building and preparedness measures proposed to be put into effect in order to enable the Ministries or Departments of the Government of India to discharge their responsibilities under section 37,

(b) annually review and update the plan referred to in clause (a), and

(c) furnish a copy of the plan referred to in clause (a) or clause (b), as the case may be, to the State Authority.

(2) Every department of the State Government, while preparing the plan under sub-section (1), shall make provisions for financing the activities specified therein.

(3) Every department of the State Government shall furnish an implementation status report to the State Executive Committee regarding the implementation of the disaster management plan referred to in sub-section (1)

LOCAL AUTHORITIES
(DISASTER MANAGEMENT ACT 2005: CHAPTER VI)

6

41 Functions of the local authority-

(1) Subject to the directions of the District Authority, a local authority shall

(a) ensure that its officers and employees are trained for disaster management,

(b) ensure that resources relating to disaster management are so maintained as to be readily available for use in the event of any threatening disaster situation or disaster,

(c) ensure all construction projects under it or within its jurisdiction conform to the standards and specifications laid down for prevention of disasters and mitigation by the National Authority, State Authority, and the District Authority,

(d) carry out relief, rehabilitation, and reconstruction activities in the affected area in accordance with the State Plan and the District Plan.

(2) The local authority may take such other measures as may be necessary for the disaster management.

NATIONAL INSTITUTEOF
DISASTER MANAGEMENT
(DISASTER MANAGEMENT ACT 2005: CHAPTER VII)

7

42 National Institute of Disaster Management-

(1) With effect from such date as the Central Government may, by notification in the Official Gazette appoint in this behalf, there shall be constituted an institute to be called the National Institute of Disaster Management

(2) The National Institute of Disaster Management shall consist of such number of members as may be prescribed by the Central Government

(3) The term of office of, and vacancies among, members of the National Institute of Disaster Management and manner of filling such vacancies shall be such as may be prescribed.

(4) There shall be a governing body of the National Institute of Disaster Management which shall be constituted by the Central Government from amongst the members of the

National Institute of Disaster Management in such manner as may be prescribed

(5) The governing body of the National Institute of Disaster Management shall exercise such powers and discharge such functions as may be prescribed by regulations.

(6) The procedure to be followed in exercise of its powers and discharge of its functions by the governing body, and the term of office of, and the manner of filling vacancies among the members of the governing body, shall be such as may be prescribed by regulations

(7) Until the regulations are made under this section, the Central Government may make such regulations; and any regulation so made may be altered or rescinded by the National Institute of Disaster Management in exercise of its powers.

(8) Subject to the provisions of this Act, the National Institute of Disaster Management shall function within the broad policies and guidelines laid down by the National Authority and be responsible for planning and promoting training and research in the area of disaster management, documentation and development of national level information base relating to disaster management policies, prevention mechanisms and mitigation measures.

(9) Without prejudice to the generality of the provisions contained in sub-section (8), the National Institute, for the discharge of its functions, may-

(a) develop training modules, undertake research and documentation in disaster management and organise training programmes,

(b) formulate and implement a comprehensive human resource development plan covering all aspects of disaster management.

(c) provide assistance in national level policy formulation,

(d) provide required assistance to the training and research institutes for development of training and research programmes for stakeholders including Government functionaries and undertake training of faculty members of the State level training institutes,

(e) provide assistance to the State Governments and State training institutes in the formulation of State level policies, strategies, disaster management framework and any other assistance as may be required by the State Governments or State training institutes for capacity-building of stakeholders. Government including its functionaries, civil society members, corporate sector, and people's elected representatives,

(f) develop educational materials for disaster management including academic and professional courses.

(g) promote awareness among stakeholders including college or schoolteachers and students, technical personnel and others associated with multi-hazard mitigation, preparedness, and response measures.

(h) undertake, Organise, and facilitate study courses, conferences, lectures, seminars within and outside the country to promote the aforesaid objects,

(i) undertake and provide for publication of journals, research papers and books and establish and maintain libraries in furtherance of the aforesaid objects.

(j) do all such other lawful things as are conducive or incidental to the attainment of the above objects, and

(k) undertake any other function as may be assigned to it by the Central Government

43 Officers and other employees of the National Institute- The Central Government shall provide the National Institute of Disaster Management with such officers, consultants, and other employees, as it considers necessary, for carrying out its functions.

NATIONAL DISASTER RESPONSE FORCE
(DISASTER MANAGEMENT ACT 2005: CHAPTER VIII)

8

44 National Disaster Response Force-

(1) There shall be constituted a National Disaster Response Force for the purpose of specialist response to a threatening disaster situation or disaster.

(2) Subject to the provisions of this Act, the Force shall be constituted in such manner and, the conditions of service of the members of the Force, including disciplinary provisions, therefore, be such as may be prescribed.

45 Control, direction, etc. - The general superintendence, direction and control of the Force shall be vested and exercised by the National Authority and the command and supervision of the Force shall vest in an officer to be appointed by the Central Government as the Director General of the National Disaster Response Force.

FINANCE, ACCOUNTS AND AUDIT
(DISASTER MANAGEMENT ACT 2005: CHAPTER IX)

9

46 National Disaster Response Fund-

(1) The Central Government may, by notification in the Official Gazette, constitute a fund to be called the National Disaster Response Fund for meeting any threatening disaster situation or disaster and there shall be credited thereto-

(a) an amount which the Central Government may, after due appropriation made by Parliament by law in this behalf provide,

(b) any grants that may be made by any person or institution for the purpose of disaster management.

(2) The National Disaster Response Fund shall be made available to the National Executive Committee to be

applied 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 National Authority

47 National Disaster Mitigation Fund-

(1) The Central Government may, by notification in the Official Gazette, constitute a Fund to be called the National Disaster Mitigation Fund for projects exclusively for the purpose of mitigation and there shall be credited thereto such amount which the Central Government may, after due appropriation made by Parliament by law in this behalf, provide.

(2) The National Disaster Mitigation Fund shall be applied by the National Authority.

48 Establishment of funds by State Government-

(1) The State Government shall, immediately after notifications issued for constituting the State Authority and the District Authorities, establish for the purposes of this Act the following funds, namely-

(a) the fund to be called the State Disaster Response Fund.

(b) the fund to be called the District Disaster Response Fund

(c) the fund to be called the State Disaster Mitigation Fund,

(d) the fund to be called the District Disaster Mitigation Fund

(2) The State Government shall ensure that the funds established

(i) under clause (a) of sub-section (1) is available to the State Executive Committee

(ii) (ii) under sub-clause (c) of sub-section (1) is available to the State Authority,

(iii) under clauses (b) and (d) of sub-section (1) are available to the District Authority

49 Allocation of funds by Ministries and Departments-

(1) 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.

(2) The provisions of sub-section (1) shall, mutatis mutandis, apply to departments of the Government of the State.

50 Emergency procurement and accounting- Where by reason of any threatening disaster situation or disaster, the National Authority or the State Authority or the District Authority is satisfied that immediate procurement of provisions or materials or the immediate application of resources are necessary for rescue or relief, -

(a) it may authorise the concerned department or authority to make the emergency procurement and, in such case, the standard procedure requiring inviting of tenders shall be deemed to be waived.

(b) a certificate about utilisation of provisions or materials by the controlling officer authorised by the National Authority, State Authority or District Authority, as the case may be, shall be deemed to be a valid document or voucher for the purpose of accounting of emergency, procurement of such provisions or materials.

51 Punishment for obstruction, etc.-

Whoever, without reasonable cause-

(a) obstructs any officer or employee of the Central Government or the State Government, or a person authorised by the National Authority or State Authority or District Authority in the discharge of his functions under this Act, or

(b) refuses to comply with any direction given by or on behalf of the Central Government or the State Government or the National Executive Committee or the State Executive Committee or the District Authority under this Act,

shall on conviction be punishable with imprisonment for a term which may extend to one year or with fine, or with both, and if such obstruction or refusal to comply with directions results in loss of lives or imminent danger thereof, shall on conviction be punishable with imprisonment for a term which may extend to two years.

52 Punishment for false claim- Whoever knowingly makes a claim which he knows or has reason to believe to be false for obtaining any relief, assistance, repair, reconstruction or other benefits consequent to disaster from any officer of the Central Government, the State Government, the National Authority, the State Authority or the District Authority, shall, on conviction be punishable with imprisonment for a term which may extend to two years, and also with fine.

53 Punishment for misappropriation of money or materials, etc.- Whoever, being entrusted with any money or materials, or otherwise being, in custody of, or dominion over, any money or goods, meant for providing relief in any threatening disaster situation or disaster, misappropriates or appropriates for his own use or disposes of such money or materials or any part thereof or willfully compels any other person so to do, shall on conviction be punishable with imprisonment for a term which may extend to two years. and also, with fine.

54 Punishment for false warning- Whoever makes or circulates a false alarm or warning as to disaster or its severity or magnitude, leading to panic, shall on conviction, be punishable with imprisonment which may extend to one year or with fine.

55 Offences by Departments of the Government-

(1) Where an offence under this Act has been committed by any Department of the Government, the head of the Department shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly

unless he proves that the offence was committed without his knowledge or that he exercised all due diligence to prevent the commission of such offence.

(2) Notwithstanding anything contained in sub-section (1), where an offence under this Act has been committed by a Department of the Government and it is proved that the offence has been committed with the consent or connivance of, or is attributable to any neglect on the part of any officer, other than the head of the Department, such officer shall be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly

56 Failure of officer in duty or his connivance at the contravention of the provisions of this Act- Any officer, on whom any duty has been imposed by or under this Act and who ceases or refuses to perform or withdraws himself from the duties of his office shall, unless he has obtained the express written permission of his official superior or has other lawful excuse for so doing, be punishable with imprisonment for a term which may extend to one year or with fine.

57 Penalty for contravention of any order regarding requisitioning- If any person contravenes any order made under section 65. He shall be punishable with imprisonment for a term which may extend to one year or with fine or with both.

58 Offence by companies-

(1) Where an offence under this Act has been committed by a company or body corporate, every person who at the time the offence was committed, was in charge of, and was

responsible to, the company for the conduct of the business of the company, as well as the company, shall be deemed to be guilty of the contravention and shall be liable to be proceeded against and punished accordingly:

Provided that nothing in this sub-section shall render any such person liable to any punishment provided in this Act, if he proves that the offence was committed without his knowledge or that he exercised due diligence to prevent the commission of such offence.

(2) Notwithstanding anything contained in sub-section (1), where an offence under this Act has been committed by a company, and it is proved that the offence was committed with the consent or connivance of or is attributable to any neglect on the part of any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall also, be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

Explanation- For the purpose of this section-

(a) "company" means anybody corporate and includes a firm or other association of individuals,
and

(b) "director", in relation to a firm, means a partner in the firm.

59 **Previous sanction for prosecution**-No prosecution for offences punishable under sections 55 and 56 shall be instituted except with the previous sanction of the Central Government or the State Government, as the case may be, or of any officer authorized in this behalf, by general or special order, by such Government.

60 **Cognizance of offences**-No court shall take cognizance of an offence under this Act except on a complaint made by-

(a) the National Authority, the State Authority, the Central Government, the State Government, the District Authority or any other authority or officer authorised in this behalf by that Authority or Government, as the case may be, or

(b) any person who has given notice of not less than thirty days in the manner prescribed, of the alleged offence and his intention to make a complaint to the National Authority, the State Authority, the Central Government, the State Government, the District Authority or any other authority or officer authorised as aforesaid.

MISCELLANEOUS
(DISASTER MANAGEMENT ACT 2005: CHAPTER XI)

11

61 Prohibition against discrimination- While providing compensation and relief to the victims of disaster, there shall be no discrimination on the ground of sex, caste, community, descent, or religion.

62 Power to issue direction by Central Government.- Notwithstanding anything contained in any other law for the time being in force, it shall be lawful for the Central Government to issue direction in writing to the Ministries or Departments of the Government of India, or the National Executive Committee or the State Government, State Authority, State Executive Committee, statutory bodies or any of its officers or employees, as the case may be, to facilitate or assist in the disaster management and such Ministry or Department or Government or Authority, Executive Committee, statutory body, officer or employee shall be bound to comply with such direction.

63 Powers to be made available for rescue operations- Any officer or authority of the Union or a State, when requested by the National Executive Committee, any State Executive Committee or District Authority or any person authorized by such Committee or Authority in this behalf, shall make available to that Committee or authority or person, such officers and employees as requested for, to perform any of the functions in connection with the prevention of disaster or mitigation or rescue or relief work.

64 Making or amending rules, etc., in certain circumstances.- Subject to the provisions of this Act, if it appears to the National Executive Committee, State Executive Committee or the District Authority, as the case may be, that provisions of any rule, regulation, notification, guideline, instruction, order, scheme or bye-laws, as the case may be, are required to be made or amended for the purposes of prevention of disasters or the mitigation thereof, it may require the amendment of such rules, regulation, notification, guidelines, instruction, order, scheme or bye-laws, as the case may be, for that purpose, and the appropriate department or authority shall take necessary action to comply with the requirements.

65 Power of requisition of resources, provisions, vehicles, etc., for rescue operations, etc.-

(1) If it appears to the National Executive Committee, State Executive Committee or District Authority or any officer as may be authorised by it in this behalf that-

(a) any resources with any authority or person are needed for the purpose of prompt response,

(b) any premises are needed or likely to be needed for the purpose of rescue operations; or

(c) any vehicle is needed or is likely to be needed for the purposes of transport of resources from disaster affected areas or transport of resources to the affected area or transport in connection with rescue, rehabilitation, or reconstruction,

such authority may, by order in writing, requisition such resources or premises or such vehicle, as the case may be, and may make such further orders as may appear to it to be necessary or expedient in connection with the requisitioning.

(2) Whenever any resource, premises or vehicle is requisitioned under sub-section (1), the period of such requisition shall not extend beyond the period for which such resource, premises or vehicle is required for any of the purposes mentioned in that sub-section.

(3) In this section,

(a) "resources" includes men and material resources.

(b) "services" includes facilities,

(c) "premises" means any land, building or part of a building and includes a hut, shed or other structure or any part thereof.

(d) "vehicle" means any vehicle used or capable of being used for the purpose of transport, whether propelled by mechanical power or otherwise.

66 Payment of compensation-

(1) Whenever any Committee, Authority or officer referred to in sub-section (1) of section 65, in pursuance of that section requisitions any premises, there shall be paid to the persons interested compensation the amount of which shall be determined by taking into consideration the following, namely-

(i) the rent payable in respect of the premises, or if no rent is so payable, the rent payable for similar premises in the locality,

(ii) (ii) if as consequence of the requisition of the premises the person interested is compelled to change his

residence or place of business, the reasonable expenses (if any) incidental to such change

Provided that where any person interested being aggrieved by the amount of compensation so determined makes an application within the thirty days to the Central Government or the State Government, as the case may be, for referring the matter to an arbitrator, the amount of compensation to be paid shall be such as the arbitrator appointed in this behalf by the Central Government or the State Government, as the case may be, may determine:

Provided further that where there is any dispute as to the title to receive the compensation or as to the apportionment of the amount of compensation, it shall be referred by the Central Government or the State Government, as the case may be, to an arbitrator appointed in this behalf by the Central Government or the State Government, as the case may be, for determination, and shall be determined in accordance with the decision of such arbitrator.

Explanation-In this sub-section, the expression "person interested" means the person who was in actual possession of the premises requisitioned under section 65 immediately before the requisition, or where no person was in such actual possession, the owner of such premises.

(2) Whenever any Committee, Authority or officer, referred to in sub-section (1) of section 65 in pursuance of that section requisitions any vehicle, there shall be paid to the owner thereof compensation the mount of which shall be determined by the Central Government or the State Government, as the case may be, on the basis of the fares or rates prevailing in the locality for the hire of such vehicle:

Provided that where the owner of such vehicle being aggrieved by the amount of compensation so determined makes an application within the prescribed time to the

Central Government or the State Government, as the case may be, for referring the matter to an arbitrator, the amount of compensation to be paid shall be such as the arbitrator appointed in this behalf by the Central Government or the State Government, as the case may be, may determine

Provided further that where immediately before the requisitioning the vehicle or vessel was by virtue of a hire purchase agreement in the possession of a person other than the owner, the amount determined under this sub-section as the total compensation payable in respect of the requisition shall be apportioned between that person and the owner in such manner as they may agree upon, and in default of agreement. in such a manner as an arbitrator appointed by the Central Government or the State Government, as the case may be, in this behalf may decide.

67 Direction to media for communication of warnings, etc.- The National Authority, the State Authority, or a District Authority may recommend to the Government to give direction to any authority or person in control of any audio or audio-visual media or such other means of communication as may be available to carry any warming or advisories regarding any threatening disaster situation or disaster, and the said means of communication and media as designated shall comply with such direction.

68 Authentication of orders or decisions- Every order or decision of the National Authority or the National Executive Committee, the State Authority, or the State Executive Committee or the District Authority, shall be authenticated by such officers of the National Authority or the National Executive Committee or, the State Executive Committee, or the District Authority, as may be authorized by it in this behalf.

69 Delegation of powers- The National Executive Committee, State Executive Committee, as the case may be, by general or special order in writing, may delegate to the Chairperson or any other member or to any officer, subject to such conditions and limitations, if any, as may be specified in the order, such of its powers and functions under this Act as it may deem necessary

70 Annual report-

(1) The National Authority shall prepare once every year, in such form and at such time as may be prescribed, an annual report giving a true and full account of its activities during the previous year and copies thereof shall be forwarded to the Central Government and that Government shall cause the same to be laid before both Houses of Parliament within one month of its receipt.

(2) The State Authority shall prepare once in every year, in such form and at such time as may be prescribed, an annual report giving a true and full account of its activities during the previous year and copies thereof shall be forwarded to the State Government and that Government shall cause the same to be laid before each House of the State Legislature where it consists of two Houses, or where such Legislature consists of one House, before that House.

71 Bar of jurisdiction of court- No court (except the Supreme Court or a High Court) shall have jurisdiction to entertain any suit or proceeding in respect of anything done, action taken, orders made. direction, instruction, or guidelines issued by the Central Government, National Authority, State Government, State Authority or District Authority in pursuance of any power conferred by, or in relation to its functions, by this Act.

72 Act to have overriding effect- The provisions of this Act, shall have effect, notwithstanding anything inconsistent therewith contained in any other law for the time being in force or in any instrument having effect by virtue of any law other than this Act

73 Action taken in good faith- No suit or prosecution or other proceeding shall lie in any court against the Central Government or the National Authority or the State Government or the State Authority or the District Authority or local authority or any officer or employee of the Central Government or the National Authority or the State Government or the State Authority or the District Authority or local authority or any person working for on behalf of such Government or authority in respect of any work done or purported to have been done or intended to be done in good faith by such authority or Government or such officer or employee or such person under the provisions of this Act or the rules or regulations made thereunder.

74 Immunity from legal process- Officers and employees of the Central Government, National Authority, National Executive Committee, State Government, State Authority, State Executive Committee or District Authority shall be immune from legal process in regard to any warning in respect of any impending disaster communicated or disseminated by them in their official capacity or any action taken, or direction issued by them in pursuance of such communication or dissemination.

75 Power of Central Government to make rules. –

(1) The Central Government may, by notification in the Official Gazette, make rules for carrying out the purposes

of this Act.

(2) In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely -

(a) the composition and number of the members of the National Authority under sub-section (2). and the term of office and conditions of service of members of the National Authority under sub-section (4), of section 3.

(b) the allowances to be paid to the members of the advisory committee under sub-section (2) of section 7.

(c) the powers and functions of the Chairperson of the National Executive Committee under sub-section (3) of section 8 and the procedure to be followed by the National Executive Committee in exercise of its powers and discharge of its functions under sub-section (4) of section 8,

(d) allowances to be paid to the persons associated with the sub-committee constituted by the National Executive Committee under sub-section (3) of section 9.

(e) the number of members of the National Institute of Disaster Management under sub-section (2), the term of the office and vacancies among members and the manner of filling such vacancies under sub-section (3) and the manner of constituting the Governing Body of the National Institute of Disaster Management under sub-section (4) of section 42,

(f) the manner of constitution of the Force, the conditions of service of the members of the Force, including disciplinary provisions under sub-section (2) of section 44,

(g) the manner in which notice of the offence and of the intention to make a complaint to the National Authority, the State Authority, the Central Government, the State Government or the other authority or officer under clause (b) of section 60.

(h) the form in which and the time within which annual report is to be prepared under section 70:

(i) any other matter which is to be, or may be, prescribed, or in respect of which provision is to be made by rules.

76 Power to make regulations-

(1) The National Institute of Disaster Management, with the previous approval of the Central Government may, by notification in the Official Gazette, make regulations consistent with this Act and the rules made thereunder to carry out the purposes of this Act.

(2) In particular, and without prejudice to the generality of the foregoing power, such regulations may provide for all or any of the following matters, namely

(a) powers and functions to be exercised and discharged by the governing body:

(b) procedure to be followed by the governing body in exercise of the powers and discharge of its functions,

(c) any other matter for which under this Act provision may be made by the regulations.

77 Rules and regulations to be laid before Parliament. - Every rule made by the Central Government and every regulation made by the National Institute of Disaster Management under this Act shall be laid, as soon as maybe after it is made, before each House of Parliament, while it is in session. for a total period of thirty days which may be comprised of one session or in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the rule or regulation or both Houses agree that the rule or regulation should not be made, the rule or regulation shall thereafter have effect only in such modified form or be of no effect, as the case may be, so, however, that any such modification or

annulment shall be without prejudice to the validity of anything previously done under that rule or regulation.

78 Power of State Government to make rules. –

(1) The State Government may, by notification in the Official Gazette, make rules to carry out the provisions of this Act.

(2) In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely-

(a) the composition and number of the members of the State Authority under sub-section (2), and the term of office and conditions of service of the members of the State Authority under sub-section (5), of section 14.

(b) the allowances to be paid to the members of the advisory committee under sub-section (2) of section 17,

(c) the powers and functions of the Chairperson of the State Executive Committee under sub-section (3), and the procedure to be followed by the State Executive Committee in exercise of its powers and discharge of its functions under sub-section (4) of section 20.

(d) allowances to be paid to the persons associated with the sub-committee constituted by the State Executive Committee under sub-section (3) of section 21,

(e) the composition and the number of members of the District Authority under sub-section (2), and the powers and functions to be exercised and discharged by the Chief Executive Officer of the District Authority under sub-section (3) of section 25.

(f) allowances payable to the persons associated with any committee constituted by the District Authority as experts under sub-section (3) of section 28.

(g) any other matter which is to be, or may be, prescribed, or in respect of which provision is to be made by rules.

(3) Every rule made by the State Government under this Act shall be laid, as soon as may be after it is made, before each House of the State Legislature where it consists of two

Houses, or where such Legislature consists of one House before that House

79 Power to remove difficulties. –

(1) If any difficulty arises in giving effect to the provisions of this Act, the Central Government, or the State Government, as the case may be, by notification in the Official Gazette, make order not inconsistent with the provisions of this Act as may appear to it to be necessary or expedient for the removal of the difficulty.

Provided that no such order shall be made after the expiration of two years from the commencement of this Act.

(2) Every order made under this section shall be laid, as soon as may be after it is made, before each House of Parliament or the Legislature, as the case may be.

DISASTER MANAGEMENT PLAN
OF
INDIAN RAILWAYS

NOVEMBER 2009



DISASTER MANAGEMENT PLAN

of

INDIAN RAILWAYS

Issued by:

Ministry of Railways (Railway Board)

NOVEMBER 2009

INDEX

Chapter	TOPICS	Pages
1	Introduction	
2	Concept of Disaster on Railways	
3	Disaster Management Act – 2005	
4	National Disaster Management Authority (NDMA)	
5	National Disaster Response Force (NDRF)	
6	Disaster Management Plan of Railways – Periodical Review	
7	Capacity Building to handle Disasters	
8	Medical Preparedness - MCE and Mobile Relief	
9	Medical Preparedness – Hospital DM Plan	
10	Role of Security Department in Disaster Management	
11	Disaster Communication System	
12	Disaster Information Flow and Alerts of Disaster	
13	Crisis Management Plan - CMP	
14	Management of Cyclones	
15	Management of Floods	
16	Management of Earthquakes	
17	Management of Landslides and Snow Avalanches	
18	Management of Biological Disasters	
19	Management of Chemical Disasters	
20	Management of Chemical (Terrorism) Disasters	
21	Management of Nuclear and Radiological Disasters	
22	Disaster Management Training	
23	Management of Rail Disaster in Tunnels/Deep Cuttings etc.	

Abbreviations

AC	Air Conditioned
AGM	Additional General Manager
ARME	Accident Relief Medical Equipment
ARMV	Accident Relief Medical Van
ART	Accident Relief Train
BIS	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
CCTV	Close Circuit Television
CDM	Chief Disaster Management
CE	Civil 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	DDMA
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 Centres
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
ICS	Incident Command System
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
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
ML	Member Electrical
MM	Member Mechanical
MoD	Ministry of Defense
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
NAHI	National Association of Home Inspectors
NBC	Nuclear, Biological & Chemical
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 Centres
ROB	Road Over Bridge
RPF	Railway Protection Force
RPSF	Railway Protection Special Force
RR	Railway Receipt
RSC	Railway Staff College
RUB	Road Under Bridge
S&T	Signal & Telecommunication
SDMA	State Disaster Management Authority
SDRF	State Disaster Response Force
SE	Section Engineer
SEC	State Executive Committee
SLR	Sitting Luggage Rake
SOP	Standard Operating Procedure
SP-RMV	Self-Propelled Accident Relief Medical Van
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
UT	Union Territory
ZRTI	Zonal Railway Training Institute

INTRODUCTION
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER I)

1

1.0 Background

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's (ARMEs). Till the beginning of the year 2005, a disaster on the railway in effect meant a serious train accident, other items of disaster viz Floods, Earthquakes etc., were handled in an uncoordinated manner. Disaster preparedness of the Railways, mainly pertaining to handling train accidents, had been gone into by a High-Level Committee (HLC) in the year 2002/03 whose recommendations, where relevant, have been kept in view in the preparation of Railways' Disaster Management Plan.

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

1.1 Recommendations of High-Level Committee on Disaster Management:

1. Various committee have been appointed on the Indian Railways to review Preparedness to handle a Disaster. A high-level committee (HLC) was constituted in Sep 02 (headed by Mr. S. Dhasarathy, retd MM, Rly Bd) to review Disaster Management on the Railways. The terms of reference of this committee were "to review the existing DM system over Indian Railways related to train accidents and natural calamities and to suggest improvements". Despite the above Terms of Reference incorporating an item of natural calamities, the high-level committee had mainly gone into DM

system over Indian Railways related to train accidents; natural calamities were hardly.

The recommendations had varying time frame of implementation with maximum being 36 months. Implementation of some of the recommendations has been delayed as the associated policy decision, research and development and vendor identification took some time. With the change in national scenario, some of the recommendations were reviewed to fall in line with the latest concept of participation by all stakeholders during disasters.

2. The Ministry of Railways appointed another committee in the year 2004 headed by Shri II.M.S. Rana, retired Chairman Railway Board, to re-examine the entire gamut of facilities available with the railways to handle disasters including natural calamities, earthquakes, cyclones, floods etc. This committee submitted its interim report in 2004; before it could submit a detailed report, it was wound up.

3. Another Disaster Management Review Committee was appointed on 27.02.07 under the Chairmanship of Mr. G. Narayan, an ex IPS officer, with Terms of Reference to audit the current preparedness of all types of disasters/hazards for prevention, mitigation, rescue, relief and rehabilitation; integration of disaster reduction concept into development planning, and to recommend areas of multi-stakeholder partnership and citizen participation to establish a coordinated mechanism for disaster reduction, response and rehabilitation etc.

Report of the Disaster Management Review Committee (Headed by Shri G. Narayan) was submitted on 22.12.08 and is presently being examined on the zonal railways and in the Board's office.

1.2 Approval of the Disaster Management Plan of Indian Railways: -

The Disaster Management Plan of Indian Railways will be submitted to the concerned Ministries of the Government of India (and especially to the MHA) and to the NDMA for comments, suggestions and approval and subsequent updating especially where there is an interface between 2 or more departments in the management of a disaster.

CONCEPT OF
DISASTER ON RAILWAYS
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER II)

2

2.0 Disaster Risks in India:

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

2.1 Disaster defined in Railways' context:

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

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

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

While this Disaster Management Plan is a comprehensive Document, more detailed guidelines where required will be laid down on specific topics under the overall philosophy of Disaster

Management laid down in this document. For instance, this has been done in the Guidelines on Chemical Disasters and the Hospital Disaster Management Plan

2.2 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 Defense Organization
- An army of Gang men spread out all over the Indian Railways
- Scouts and Guides (they can at best provide background support)
- Dedicated Rescue/Restoration and Medical Equipment on Rails

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

Railway's shortcomings to handle Disaster:

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

- Absence of Tunnel rescue equipment in case of collapse of or mishap in a rail Tunnel, expertise and related equipment on this aspect is lacking.

- Non-availability of trained divers for extrication of passengers and/or casualties (dead bodies and drowning/drowned passengers) from rolling stock fallen down in sea/river/lake etc. Limited help from sports people (Swimmers) can be taken for this; the time of their mobilization is a factor to be kept in view.
- Non-availability of cranes operated from a ship/barge for lifting of the coaches/bogies from a water body.
- Ability to handle a CBRN Disaster and major fire.
- Limited resources to handle a terrorist attack on a train and/or a station, other railway premises etc.

2.3 Types of Disasters

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

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

(b) Train Accident-related Disaster

Collisions (with a huge number of casualties), Train marooned (flash floods), derailments at a bridge over a river, and coaches falling down, train washed away in cyclone, derailment of a train carrying explosives or highly inflammable material, tunnel collapse on a train, fire or explosion in trains, 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 fire to a Train, Railway installations etc., bomb blast at Railway Station/Train, Chemical (Terrorism) Disaster, Biological and Nuclear Disaster.

2.4 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 earthquake, cyclone, floods etc.
- No more Relief and Rescue Centric
- Holistic Approach adopted to incorporate-
  - Prevention
  - Mitigation
  - Preparedness
  - Rescue, Relief
  - Rehabilitation

New Philosophy gives more Emphasis on Prevention and Mitigation as under

- Prevent and mitigate disasters.
- Audit Existing Systems for Disaster Resistance, Disaster Prevention and Mitigation on the basis of NDMA's and self-prepared guidelines.
- Disaster Management in Developmental Planning - New activities should be disaster resistant.

- Preparedness, Rescue, Relief and Rehabilitation Dimensions of DM
- Expertise based response from all stake holders.
- Pooling of resources of all agencies, e g. local administration, community, defense, hospitals, and other Govt. organizations.

2.5 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."

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

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

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

The Management of Floods, Cyclones, Earthquakes, Landslides, etc, and preventive action to be taken for mitigation shall be coordinated by the Civil Engg Deptt

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

2.7 Authority to declare a Disaster on Railways:

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

DISASTER MANAGEMENT ACT-2005
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER III)

3

3.0 National Policy on Disaster Management (NPDM):

The Disaster Management Act, 2005 (hereinafter referred to as the Act), enacted by the Parliament was notified in the Gazette of India on 26th December 2005. The Act provides for the legal and institutional framework for the effective management of disasters. The Act mandates the creation of new institutions and assignment of specific roles for Central, State and Local Governments. Under the provisions of the Act, the National Disaster Management Authority (NDMA) has been established under the chairmanship of the Prime Minister and a National Executive Committee (NEC) of Secretaries has been created to assist the NDMA in the performance of its functions. At the State level, a State Disaster Management Authority has been created under the chairmanship of Chief Minister, which has been assisted by a State Executive Committee.

At the District level, District Disaster Management Authorities have been created.

The responsibility of laying down the policies on disaster management, approving the National Policy on Disaster Management (NPDM) and laying down the guidelines on Disaster Management has been given to NDMA under the Act. The NDMA accordingly prepared a draft of the National Policy on Disaster Management in consultation with the Home Ministry and submitted the same for approval of the Government.

The Home Ministry has circulated the draft NPDM to the concerned Central Ministries and all the State Governments/Union Territories. The comments received by the Central Ministries/State Governments/Union Territories were duly examined and the acceptable views/comments of Central Ministries/State Governments/Union Territories have been duly incorporated in the NPDM.

Approval of the Cabinet to the NPDM was given in the Cabinet Meeting held on 22.10.2009.

The NPDM envisages a holistic approach to disaster management, encompassing the entire disaster management cycle including prevention, mitigation, preparedness, relief, response, rehabilitation and reconstruction. It addresses all aspects of disaster management covering institutional, legal and financial arrangements, capacity building, knowledge management, research and development. It focuses on the areas where action is needed and the institutional mechanism through which such action can be channelised.

3.1 Salient Features of the Disaster Management Act, 2005:

It is the central legislation on Disaster Management around which all the Disaster Management related activities revolve since its enactment. It legislates a holistic approach to Disaster Management: from mere responding to disasters to greater attention to prevention and mitigation, capacity building and preparedness The Disaster Management Plan of the Railways has been prepared by taking relevant provision of this Act into consideration.

Disaster has been defined in this Act as under

"Disaster means a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area."

Disaster Management has been explained in this Act as under

"Disaster Management means a continuous and integrated process of planning, organizing, coordinating and implementing measures which are necessary or expedient for-

- prevention of danger or threat of any disaster.
- mitigation or reduction of risk of any disaster or its severity or consequences,
- capacity-building.
- preparedness to deal with any disaster.
- prompt response to any threatening disaster situation or disaster,

- assessing the severity or magnitude of effects of any disaster.
- evacuation, rescue, and relief
- rehabilitation and reconstruction"

3.2 Important Provisions in the DM Act, 2005 Concerning Railways:

Sections 35, 36 & 37 of the DM Act, 2005 detail the responsibilities of Ministries and Departments of Central Govt. as per which a number of measures/actions are to be taken either on their own or in consultation with NDMA Drawing up mitigation, preparedness and response plans, capacity building, data collection and identification and training of personnel in relation to Disaster Management is one of the key responsibilities. These provisions are summarized as under: -

Section 35

The Central Government shall take all such measures as it deems necessary or expedient for the purpose of disaster management and it shall include.

(a) coordination of actions of the Ministries or Departments of the Government of India, State Governments, National Authority, State Authorities, governmental and non-governmental organizations in relation to disaster management,

(b) ensure the integration of measures for prevention of disasters and mitigation by Ministries or Departments of the Government of India into their development plans and projects,

(c) ensure appropriate allocation of funds for prevention of disaster, mitigation, capacity-building and preparedness by the Ministries or Departments of the Government of India:

(d) ensure that the Ministries or Departments of the government of India take necessary measures for preparedness to promptly and effectively respond to any threatening disaster situation or disaster,

(e) cooperation and assistance to the State Governments, as requested by them,

(f) deployment of naval, military and air forces, other armed forces of the Union or any other civilian personnel as may be required for the purposes of this Act.

Section 36

It shall be the responsibility of every Ministry or Department of the Government of India to-

(a) take measures necessary for prevention of disasters, mitigation, preparedness, and capacity-building in accordance with the guidelines laid down by the National Authority,

(b) Integrate into its development plans and projects, the measures for prevention or mitigation of disasters in accordance with the guidelines laid down by the National Authority,

(c) Respond effectively and promptly to any threatening disaster situation or disaster in accordance with the guidelines of the National Authority or the directions of the National Executive Committee in this behalf.

(d) Review the enactments administered by it, its polices, rules and regulations, and incorporate provisions for prevention of disasters, mitigation or preparedness;

(e) Allocate funds for measures for prevention of disaster, mitigation, capacity-building and preparedness,

(f) Provide assistance to the National Authority and State Government for

i) Drawing up mitigation, preparedness and response plans, capacity building, data collection and identification and training of personnel in relation to disaster management

ii) Carrying out rescue and relief operation in the affected area.

iii) Assessing the damage from any disaster,

iv) Carrying out rehabilitation and reconstruction,

(g) make available its resources to the National Executive Committee or a State Executive Committee for the purposes of responding

promptly and effectively to any threatening disaster situation or disaster, including measures for-

(i) providing emergency communication in a vulnerable or affected area:

(ii) (ii) Transporting personnel and relief goods to and from the affected area,

(iii) (iii)Providing evacuation, rescue, temporary shelter or other immediate relief,

(iv) Setting up temporary bridges, jetties and landing places,

(v) Providing, drinking water, essential provisions, healthcare, and services in an affected area,

(vi) Take such other actions as it may consider necessary for disaster management.

Section 37

(1) Every Ministry or Department of the Government of India shall-

a) prepare a disaster management plan specifying the following particulars, namely,

(i) The measures to be taken by it for prevention and mitigation of disasters in accordance with the National Plan

(ii) The specifications regarding integration of mitigation measures in its development plans in accordance with the guidelines of the National Authority and the National Executive Committee.

(iii) Its roles and responsibilities in relation to preparedness and capacity-building to deal with any threatening disaster situation or disaster,

(iv) Its roles and responsibilities in regard to promptly and effectively responding to any threatening disaster situation or disaster,

(v) The present status of its preparedness to perform the roles and responsibilities specified in sub-clauses (iii) and (iv)

(vi) The measures required to be taken in order to enable it to perform its responsibilities specified in sub-clauses (iii) & (iv

b) Review and update annually the plan referred to in clause (a).

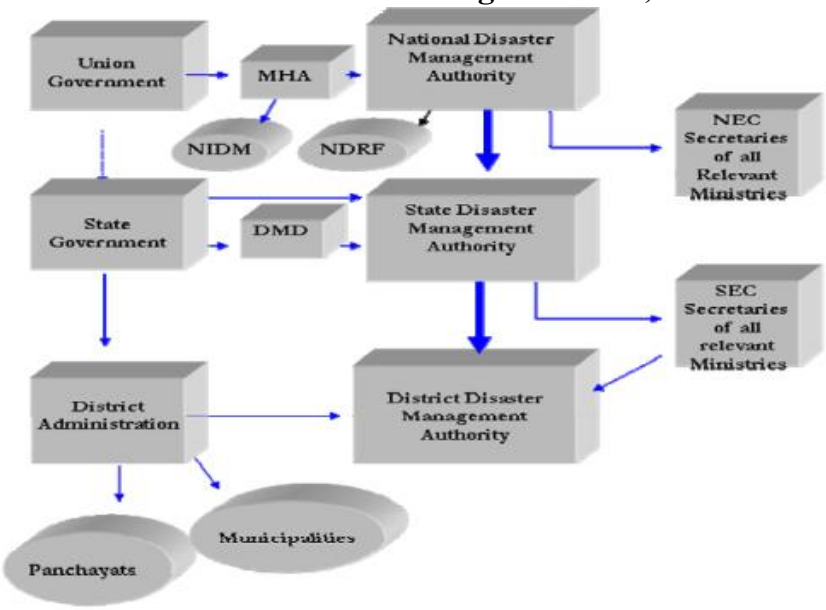
c) Forward a copy of the plan referred to in clause (a) or clause (b), as the case may be, to the Central Government which Government shall forward a copy thereof to the National Authority for its approval.

(2) Every Ministry or Department of the Government of India shall-

a) Make, while preparing disaster management plan under clause (a) of sub section (1), provisions for financing the activities specified therein,

b) Furnish a status report regarding the implementation of the plan referred to in clause (a) of sub- section (1) to the National Authority, as and when required by it.

Institutional Framework
Under the Disaster Management Act,2005



No Railway official is nominated either in National Executive Committee (NEC) or State Executive Committee (SEC), though they can be co-opted as per need.

NATIONAL DISASTER MANAGEMENT AUTHORITY (NDMA)

(DISASTER MANAGEMENT PLAN OF IR: CHAPTER IV)

4

4.0 The Disaster Management Act, 2005, provides the powers, roles and jurisdiction of a National Authority as under-.

4.1 Powers and functions of National Authority:

Subject to the provisions of this Act, the National Authority shall have the responsibility for laying down the policies plans and guidelines for disaster management for ensuring timely and effective response to disaster.

The National Authority may-

- **a)** lay down policies on disaster management,
- **b)** approve the National Plan.
- **c)** approve plans prepared by the Ministries or Departments of Government of India in accordance with the National Plan.
- **d)** lay down guidelines for the State Authorities to draw up the State Plan,

e) lay down guidelines to be followed by the different Ministries or Departments of the Government of India for the purpose of integrating the measures for prevention of disaster or the mitigation of its effects in their development plans and projects.

f) coordinate the enforcement and implementation of the policy and plan for disaster management,

g) recommend provision of funds for the purpose of mitigation.

h) provide such support to other countries affected by major disasters as may be determined by the Central Government,

i) take such other measures for the prevention of disaster, or the mitigation, or preparedness and capacity building for dealing with the threatening disaster situation or disaster as it may consider necessary.

j) lay down broad policies and guidelines for the functioning of the National Institute of Disaster Management,

4.2 Constitution and Role of NDMA:

It is constituted under the DM Act as the apex body in the country to deal with disaster management holistically. Hon'ble Prime Minister is the ex-officio Chairperson of the Authority and presently General (Retd.) N. C. Vij is the Vice-Chairperson. The Members have also been nominated and the total number of Members is limited to nine to be nominated by the Chairperson. The Vice Chairperson is Cabinet rank and Members are State rank Ministers.

NDMA is responsible for laying down the policies, plans and guidelines for disaster management for ensuring timely and effective response to disaster.

State and Districts have also been mandated to constitute State and District Disaster Management Authorities respectively on the line of NDMA.

4.3 Constitution of Advisory Committee by National Authority:

The National Authority may constitute an Advisory Committee consisting of experts in the field of disaster management and having practical experience of disaster management at the National, State or District level to make recommendations on different aspects of disaster management,

4.4 National Executive Committee:

The Central Government shall, immediately after issue of notification under sub-section (1) of section 3, constitute a National Executive Committee to assist the National Authority in the performance of its functions under this act.

The National Executive Committee shall consist of the following members, namely.

(a) the Secretary to the Government of India in charge of Ministry or Department of the Central Government having administrative control of the disaster management, who shall be Chairperson, ex-officio,

(b) The Secretaries to the Government of India in the Ministries or Departments having administrative control of the agriculture, atomic energy, defence, drinking water supply, environment and forests, finance (expenditure), health, power, rural development, science and technology, space, telecommunication, urban development, water resources and the Chief of the Integrated Defence Staff of the Chiefs of Staff Committee as ex- officio, members.

The National Executive Committee shall assist the National Authority in the discharge of its functions and have the responsibility for implementing the policies and plans of the National Authority and ensure the compliance of directions issued

by the Central Government for the purpose of disaster management in the country.

The National Executive Committee may-

- act as the coordinating and monitoring body for disaster management,
- prepare the National Plan to be approved by the National Authority,
- coordinate and monitor the implementation of the National Policy,
- lay down guidelines for preparing disaster management plans by different Ministries or Departments or State Authorities,
- provide necessary technical assistance to the State Government and State Authorities for preparing their DM plans in accordance with the guidelines laid down by the National Authority,
- monitor the implementation of the guidelines laid down by the National Authority for Integrating of measures for prevention of disasters and mitigation by the Ministries or Departments in their development plans and projects,
- monitor, coordinate and give directions regarding the mitigation and preparedness measures to be taken by different Ministries or Departments and agencies of the Government,
- evaluate the preparedness at all governmental levels for the purpose of responding to any threatening disaster situation and give directions where necessary for enhancing such preparedness:
- plan and coordinate specialized training programme for disaster management for different levels of officers. employees and voluntary rescue workers.
- coordinate response in the event of any threatening disaster situation or disaster,
- lay down guidelines for, or give directions to, the concerned Ministries or Departments of the Government of India, the State Government and the State Authorities regarding measures to be taken by them in response to any threatening disaster situation or disaster:

- require any department or agency of the Government to make available to the National Authority or State Authorities such men or material resources as are available with it for the purposes of emergency response, rescue and relief:
- advise, assist and coordinate the activities of the Ministries or Departments of the Government of India, State Authorities, statutory bodies, other governmental or non- governmental organizations and others engaged in disaster management.
- provide necessary technical assistance or give advice to the State Authorities and District Authorities for carrying out their functions under this Act:
- promote general education and awareness in relation to disaster management; perform such other functions as the National Authority may require it to perform.

4.5 National Plan: -

There shall be drawn a plan for Disaster Management for the whole of the country to be called the National Plan:
The National Plan shall be prepared by the National Executive Committee having regard to the National Policy and in consultation with the State Governments and expert bodies in the field of Disaster Management to be approved by the National Authority.

The National Plan shall include-

- measures to be taken for the prevention of disasters, or the mitigation of their effects.
- measures to be taken for the integration of mitigation measures in the development plans.
- measures to be taken for preparedness and capacity building to effectively respond to any threatening disaster situations or disaster,

- role and responsibilities of different Ministries or Departments of the Government of India in respect of measures specified in clauses (a), (b) and (c).

The National Plan shall be reviewed and updated annually.

Appropriate provisions shall be made by the Central Government for financing the measures to be carried out under the National Plan.

Copies of the National Plan referred to above shall be made available to the Ministries or Departments of the Government of India and such Ministries or Departments (including Railways) shall draw up their own plans in accordance with the National Plan.

Guidelines for minimum standards of relief:

The National Authority shall recommend guidelines for the minimum standards of relief to be provided to persons affected by disaster, which shall include-

a) the minimum requirements to the provided in the relief camps in addition to shelter, food, drinking water, medical cover and sanitation.

b) the special provisions to be made for widows and orphans:

c) ex gratia assistance on account of loss of life as also assistance on account of damage to houses and for restoration of means of livelihood:

d) such other relief as may be necessary:

Relief in loan repayment, etc.

The National Authority may, in cases of disasters of severe magnitude recommend relief in repayment of loans or for grant of fresh loans to the persons affected by disaster on such concessional terms as may be appropriate:

4.6 Role of the Nodal and other Central Ministries and Departments etc.: -

For various types of disasters, the nodal Ministry concerned will chart out detailed Response Plans which will be integrated into the National Response Plan. The NEC may coordinate response in the event of any threatening disaster situation or disaster.

- **Role of Central Ministries and Departments**

As disaster management is a multi-disciplinary process, the National Policy on Disaster Management lays down that all Central Ministries and Departments will have a key role in the field of disaster management. The nodal Ministries and Departments of Government of India (i.e. the Ministries of Agriculture, Atomic Energy. Civil Aviation, Earth Sciences, Environment and Forests, Home Affairs, Health, Mines, Railways, Space. Water Resources etc.) will continue to address specific disasters as assigned to them.

- **Institutional Arrangements of Central Government**
  - **Armed Forces:**

    Conceptually, the Armed Forces are called upon to assist the civil administration only when the situation is beyond their coping capability. In practice, however, the armed forces form an important part of the Government's response capacity and are immediate responders in all serious disaster situations. On account of their vast potential to meet any adverse challenge, speed of operational response and the resources and capabilities at their disposal, the armed forces have historically played a major role in emergency support functions. These include communication, search and rescue operations, health and medical facilities, and transportation, especially in the immediate aftermath of a disaster. The air and heli-lift and movement of assistance to neighbouring

countries primarily fall within the expertise and domain of the armed forces. The armed forces will participate in imparting training to trainers and DM managers. especially in CBRN aspects, heli-insertion, high altitude rescue, watermanship and training of paramedics. At the national level, the Chief of the Integrated Defence Staff and the Chairman Chiefs of Staff Committee has already been included in the NEC. Similarly, at the State and District levels, the local representatives of the armed forces may be included in their executive committees to ensure closer coordination and cohesion.

- **Central Para Military Forces:**
  The Central Paramilitary forces, which are also the armed forces of the Union, play a key role at the time of immediate response to disasters. Besides contributing to the NDRF. they will develop adequate disaster management capability within their own forces and respond to disasters which may occur in the areas where they are posted. The local representatives of the CPMFs may be co-opted/invited in the executive committee at the State level.
- **State Police Forces and Fire Services:**
  The State Police forces and the Fire Services are crucial immediate responders to disasters. The police force will be trained, and the Fire Services upgraded to acquire multi-hazard rescue capability.
- **Civil Defence and Honie Guards:**
  The mandate of the Civil Defence and the Home Guards will be redefined to assign a effective role in the field of disaster management. They will be deployed for community preparedness and public awareness. A culture of voluntary reporting to duty stations in the event of any disasters will be promoted.

- **State Disaster Response Force (SDRF):**
  States will be encouraged to create response capabilities from within their existing resources. To start with, each state may aim at equipping and training one battalion equivalent force. They will also include women members for looking after the needs of women and children. NDRF battalions and their training institutions will assist the States/UTs in this effort. The States/UTs will also be encouraged to include DM training in their respective Police Training Colleges and basic and in-service courses, for gazetted and non-gazetted officers.

4.7 Guidelines issued by NDMA and Action thereon.

Till the mid-2009. NDMA have already issued guidelines on the Management of Earthquakes. Cyclones, Floods. Medical Preparedness and Mass Casualty Management, Chemical Disasters. Biological Disasters, Nuclear Disasters, Chemical (Terrorism) Disaster, Landslides and Snow Avalanches and Preparation of State Disaster Management Plans etc. These guidelines are available on the NDMA website at http://ndma.gov.in. These Guidelines are statutory and mandate all the stakeholders including Railways to take necessary measures for prevention and mitigation of all types of disasters possible on their system and also to have mechanism in place for rescue, relief and restoration, if these happen.

4.8 Guidelines on Chemical Disasters issued by NDMA are very relevant for the Railways, as we transport a number of hazardous chemicals by rail. These guidelines add to safeguards listed in the Red Tariff on handling, storage and transportation of hazardous material. These guidelines are directed

more towards their prevention and mitigation of their effects, if these happen, than on rescue and relief operations afterwards.

4.9 Guidelines on Chemical (Terrorism) Disaster call for the railways to strengthen mechanism against chemical terrorism related disasters. Medical and RPF personnel would be required to be given specialized training to handle such a disaster.

4.10 Guidelines on Nuclear and Biological Disasters call for the railways to take stipulated precautions in the transportation of Radio-active substances and Chemical (Biological) items.

4.11 Guidelines on Preparation of State Disaster Management Plans concern the zonal Railways to the extent that co-ordination mechanism between the State Governments and the Railways should be institutionalized for disaster response. The Relief Commissioners in the States may be coordinated for assistance required from the State Governments, district officials as also to involve NGOs. Mutual sharing of each other's strengths and facilities has to be institutionalized as a system.

4.12 Guidelines on Management of Earthquakes, Cyclones, and Floods broadly necessitate zonal Railways to survey their existing infrastructure with respect to earthquake, floods and cyclone preparedness based on the vulnerability maps and to take necessary action for making the infrastructure resistant to such disasters. All new construction should henceforth necessarily be disaster resistant.

4.13 Guidelines on Medical Preparedness and Mass Casualty Management envisage train-based casualty transport and evacuation system with following highlights:

1. In MCM (Mass Casualty Management), wherever required Railways needs to provide transportation facility for Mass Casualty Evacuation (MCE). Where required, ARMVs or special trains may be run to facilitate relief from the nearest coaching terminal to the disaster Site.
2. The railway disaster plan will provide support to the community and local administration during mass casualty emergencies. Assistance through Railways' infrastructure of Hospitals etc. has to be provided as and when it is asked for.

The Railway Board examined the workability of the NDMA guidelines and held a meeting with NDMA officials on 30.4.09. Suggested changes in the guidelines as agreed to by NDMA are now to be suitably incorporated in the HQ and Division Level DM Plans of Zonal Railways. Necessary instructions on the above have been issued vide Board's letter No. 2003/Safety (DM)/6/3 Pt dated 21.5.09.

NATIONAL DISASTER RESPONSE FORCE
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER V)

5

5.0 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 (18 teams per battalion), 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. Establishment/raising of NDRF should progressively reduce deployment of the Armed Forces. However,

Armed Forces would be deployed only when the situation is beyond the coping capacity of State Government and NDRF.

5.1 Location, Constitution and Functions

These have been formed under the Disaster Management Act at 8 selected locations in the country for dealing with relief and rescue operations related to all types of disasters. 8 battalions, 2 each from CRPF, CISF, ITBP and BSF have been placed in different parts of the country DG, Civil Defense under MHA is additionally looking after the work of NDRF at the Centre. Out of these 8 battalions, 4 (1 each from 4 Para Military forces) to deal with Nuclear, Chemical and Biological (NBC) Disasters and balance 4 will deal with Non- NBC Disasters. 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 Further details are as under

Details of NDRF organization and 8 battalions are as under:

S.N.	Name of Officres/Designation and Location of Deployment	STD Code	Tele(o)	Mobile No.	Fax Nos.
Hd. Qrs.	Sh.R.K. Bhatia, DG	011	26712851 24101450	971771248	26715303
	Sh.Sekhar Sundhan, SSO		26712944	9871464227	
1	Commandant, 6 Bn ITBP Gautam Budh Nagar	0120	2935114	9968610011	2351087
2	Commandant, 27 Bn, ITBP Bhatinda (Pubjab)	0164	2246030 2246570 (Exchange)	--	2246570
	Second-in-Command		2246570		
3	Commandant, 6th Bn, CISF man Vellore (TN)	04177	246269 246233	09442105069	246269
4	Commandant, 4th CISF Mundali (Orissa)	0671	2879710	09437964571	2879710 9937186222 (C/R)
	Second-in-Command			09442105169	
5	Commandant, 106 Bn, BSF Kolkata(WB)	033	25264394	9434742836	25264394

	Second-in-Command			09435545951	
5	Commandant, 128 BSF Kamrup (Assam)	0361	2841464	09435545951	2840284
6	Second-in-Command			09435545949	
7	Commandant, 145 Bn. CRPF Pune (Maharashtra)	02411	231245 231509	09423506765	231245
	Second-in-Command			09423578446	
8	Commandant, 146 Bn CRPF Gandhinagar (Gujarat)	079	23262540 23262547	09427304100 09427304218	23262587 23262549

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.

5.2 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 their cost for attending to rail disasters. Railways may also have to provide rail transportation logistics for transporting NDRF even in case of non-railway exigencies.

The Railway Board had earlier empowered DRMs 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. However, in the Cabinet Meeting held on 22nd October 2009, the National Policy on the Disaster Management has been approved. This Policy lays down modalities for the requisitioning of the NDRF as under-.

The general superintendence, direction and control of this force shall be vested in and exercised by the NDMA and the command and supervision of the Force shall vest in an officer to be appointed by the Central Government as the Director General of Civil Defence and National Disaster Response Force Board's policy directions given to the Zonal Railways that the DRMs can directly approach for requisitioning the services of the NDRF now stand revised. The need for the services of the NDRF shall be communicated in a centralized manner by the Zonal Railways through the NDMA only.

DISASTER MANAGEMENT PLAN OF RAILWAYS-PERIODICAL REVIEW

(DISASTER MANAGEMENT PLAN OF IR: CHAPTER VI)

6

Disaster Management Plan of Zonal Railways (HQ/Divisional levels)

6.1 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 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

- **Divisional Disaster Management Plans** will contain division specific information. It will generally contain divisional action plans for dealing with all types of railway disasters. It is not restricted only to a 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 stakeholders. 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 Specific information need not be contained in headquarter DM Plan
- **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 Management, 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.

6.2 Periodical Review of Disaster Management Plans:

The DM Plans is to be reviewed and updated at least once a year, i.e., January. In the review changes in policy 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.

6.3 Safety Deptt. Nodal Deptt for Compilation/Updating of DM Plans: -

Safety department on the Zonal Railways is responsible for compilation of DM Plans at HQ and Divisional Levels which also need to be reviewed in January every year These Plans will also to be hosted on the rail-net server of the zonal railways in an interactive format so that the information can be shared, and its retrieval is simpler.

6.4 ISO certification of DM plans: -

ISO 9000 certification is to be obtained initially for HQ and later for the Divisional DM Plans.

CAPACITY BUILDING
TO HANDLE DISASTER
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER VII)

7

7.0 National Disaster Response and Mitigation Funds:

7.1 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.

7.2 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.

7.3 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. NDMF shall be applied by the NDMA and shall be as recommended by the Finance Commission from time to time.

7.4 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. The images of the year 2001 of a crash of an intercity train in Germany, killing more than 100 people, show 35 to 40 helicopters landing and taking off near accident site.

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 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 In Stations, Major Bridges, Tunnels of long lengths, Hospitals etc. are very sensitive/vulnerable locations.

7.5 Crowd control and Management of rush at Railway Stations during festivals:

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 exits if possible, and bring more area under illumination.

The car and other vehicle parking facility at a station where a terrorist strike is expected 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 liase 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.

7.6 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 foam extinguishers along with the expertise in fire control available with them.

Gradually, Railways may have to develop the expertise through training in the Railways Rescue, Relief Training Institute being set up at Bangalore; also procure gradually foam type of fire extinguishers in limited numbers.

7.7 Capacity Building to reduce destruction due to earthquakes, floods etc.: -

RDSO has been assigned the task of identifying vulnerable buildings, locations, rail infrastructure including bridges, sensitive location, waterways embankments etc. Based on this, strengthening Works would be undertaken by prioritizing essential locations/buildings so as to strengthen Railways infrastructure.

MEDICAL PREPAREDNESS-
MCE AND MOBILE RELIEF
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER VIII)

8

8.1 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 172 Accident Relief medical Vans (ARMV) - Scale I (Unit of accident relief trains situated at an average distance of every 100 kms on main lines and 200 km on branch lines), 325 Accident Relief Medical Equipment (ARME) - Scale II (situated at every 80-100 km on either side of ARMV - Scale I) and consisting of three sets of Portable Medical Kit of 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.

8.2 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 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 from the center 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, 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.

The 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 the 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 elaborated in the NDMA's guidelines. A brief outline of t 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 Organizations and various laboratories. Among the various international initiatives, the role of the recently operationalized 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 along with 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 specialized 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, specialized 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 center state and district levels are also described. The salient highlights in the guidelines include:

- Preventive measures like strengthening of epidemic control programmes, immunization, 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 and 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 Centers (ERCs), ESIC medical services and related emergency functionaries with laid down Standard Operative Procedures (SOPs) for all stakeholders.
- Full-fledged containerized 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 twice 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 includes items 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 victums 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, specialized mobile laboratories and ambulances fitted with CBRN filters. Special CBRN stores

and necessary laboratory facilities will be established at various levels.

8.3 Use of Medical Vans/Special Trains by Railways:

- The infrastructure of ARMVs available with the Railways has been overrated in the NDMAS Guidelines. There are a number of constraints in the movement of the ARMV's as also in the space available for MCE. Bulk evacuation of 50 casualties or more by the ARMV would not be possible with the present design of the ARMV. It is not desirable to increase the size of the ARMV as it would then become further away from the site creating difficulty in the evacuation of injured. The ARMV's would continue to be useful for evacuation of a small number of injured.
- The paras mentioned in Item 4.3.2 in NDMA's Guidelines on Medical Preparedness and MCE under the heading of "Transportation and Evacuation of Casualties", subject Item IX, page 35, Item (a) to (g). needs to be adopted keeping in view that the ARMVs would not be able to evacuate the casualties in large numbers as mentioned in the Guidelines. Along with mass evacuation of casualties there may be a need in some cases of disasters for large scale evacuation of fit humans. The ARMV is too small to cater to this need.

We have two coaches in the ARME; one of the coaches is mainly used for stocking cold cutting equipment, jacks etc. The other coach provides elementary level hospital facilities for a limited no. of injured persons. A portion of one coach is for accommodation for Railway Staff, Paramedical staff and Doctors etc. Any increase in capacity of the ARME to take care of enhanced need of evacuation of a large no of chemical casualties will require much more

equipment (including PPE), more space in the ARME along with a heavy component of trained manpower to look after CBRN casualties.

As an alternative 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 Teams 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.

In case there is more than one closely located affected area, on different rail routes even 3 or more special trains can be run, each to cater to a respective area. This cannot be done by ARME's as these are few in nos.

Each different type of casualty requires specialized training to handle it. The Railway Medical Department neither has the training nor can they digress from their principal 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 the 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 is 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. The Skeleton First Aid facility can be extended by the Railways Medical Team on 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.

8.4 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 is 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 (u) (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.

MEDICAL PREPAREDNESS IN HOSPITALS HOSPITAL DISASTER MANAGEMENT PLAN
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER IX)

9

9.1 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.

9.2 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 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."

9.3 Objective and Goals of a Hospital Disaster Management Plan:

The hospital disaster management plans should address not only mass causalities that have 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.

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.

9.4 Disaster Drills:

As a part of the emergency management plan, every hospital is required to have a 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 etc., i.e., role of mortuary services and forensic departments.

Hospital Disaster Management Plan should be tested once a year by mock drills for updation.

9.5 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.

ROLE OF SECURITY DEPARTMENT IN DISASTER MANAGEMENT

(DISASTER MANAGEMENT PLAN OF IR: CHAPTER X)

10

The security on Indian Railways is being managed by 3 agencies - District Police, Government Railway Police and Railway Protection Force. The District Police and the Government Railway Police function under administrative control of respective State Government and their role is prevention and detection of crime [except those covered by the Railway Act and the Railway Property (Unlawful Possession) Act] and tackling of law-and-order problems. Due to this coordination amongst the different agencies is very essential to effectively tackle a Disaster situatlaw-and-order Protection Force is an Armed Force of the Union' constituted by an Act of Parliament, the Railway Protection Force Act 1957, for the protection and security of railway property, passenger area & passengers and for matters connected therewith.

10.1 Role of RPF in Disasters: -

In case of any disaster especially serious train accidents, fire incidents, explosion in trains or on railway premises, terrorist acts, hijacking of train etc. RPF has to play lead role in

coordination with other Departments of Indian Railways and various agencies of State and Central Government.

In cases of CBRN Disasters, or a natural calamity, RPF has to provide support services in rescue, rehabilitation and mitigation efforts.

RPF has a major role in crowd control and arranging firefighting infrastructure by coordinating with the State Governments/District Administration. The deployment of the RPF may be done on need basis to provide relief, rescue and rehabilitation consequent to a Terrorism Disaster. The Dog Squad may need to be deployed even for preventive checks on terrorist strikes.

10.2 Current Preparedness: -

As per guidelines of the High-Level Committee, Disaster Management Team of 15 RPF personnel has been constituted on each Division of Indian Railways. The team is equipped with following equipment:

(i) Torches and other lighting arrangements
(ii) Nylon ropes and poles for segregating the affected areas from unwanted visitors and spectators.
(iii) Loud hailer for making announcement.
(iv) Stretchers and first aid equipment
(v) Wireless sets for inter-communication
(vi) Cameras for photography of clues.
(vii) Luminous jackets.

Members of this team have been trained in providing the basic level support in crowd control and functional support in case of Disasters RPF staff will ensure safe custody and disposal of the luggage of passengers affected by train accidents in coordination with commercial staff as recommended by the High-Level Committee.

Coordination with State Police and civil authorities is ensured at the divisional and zonal level by concerned RPF officials. Regarding clearance from State police in case of railway accidents due to suspected sabotage, on a reference made by the DG/RPF, the Ministry of Home Affairs has directed Home Secretaries of the State for taking necessary action. This letter of the Ministry of Home Affairs has already been circulated to all the General Managers vide letter No. 2002/Sec (Cr.)/45/47 dated March 27, 2003, of the Security Directorate.

To ensure availability of maximum possible RPF personnel in case of disaster/serious train accidents, off duty RPF personnel are to be called on duty in such situations.

In liaison with the National Disaster Management Authority (NDMA), 'training for trainers' has been organized so as to develop in-house expertise on training. 30 categories of security equipment have been identified as required by RPF to upgrade their effectiveness. These need to be gradually procured.

10.3 Integrated Security Scheme: -

An Integrated Security Scheme has been sanctioned for installation at 195 stations of Indian Railways. The system envisages multi-layered surveillance of vehicles, luggage, and passengers in station premises. The system comprises of following broad categories.

- Internet Protocol based CCTV surveillance system with intelligence video analytics.
- Access control,
- Personal and baggage screening system,
- Bomb Detection and Disposal System

Installation at 195 major stations is planned to be completed by the end of 2010.

10.4 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 Tranquility) of the Criminal Procedure Code (Cr. PC) 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 Umon) 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.

10.5 Explosion in trains and railway premises:

One of the key components of the Integrated Security System is explosive detection and disposal. It provides for effective detection and disposal capability with RPF. Explosive detection and disposal, being a highly skilled and challenging job, requires a Bomb Detection and Disposal Squad comprising of personnel. Such RPF personnel have been identified on each zonal railway and they are being trained in phased manner by the National Security Guard

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

10.6 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 the 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. The National Security Guard (NSG) has to be requisitioned in such situations. The 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 on 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. Quick Reaction Teams (QRTs) of RPF personnel should be available round the clock at bigger stations which will be of immense help to tackle such situations during initial phases specially in cases of terrorist attacks.

DISASTER
COMMUNICATION SYSTEM
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER XI)

11

11.1 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 the 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 makeshift raft, boat etc. Similar arrangements can also be made in earthquake affected areas.

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

11.2 Communication between stake holders

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

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

11.3 Back up Communication on Railways:

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

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

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

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

Further to provide better communication facilities during disaster, it is necessary that either the Railnet an 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 center to different railways and divisions need to be planned and catered to.

11.4 Modernization of Communication on the Railways through Satellite:

Feasibility of satellite-based updating of trains status as well as field imagery relating to the disaster site needs to be examined.

Instead of relying on GPS/GSMR which support mobile telephony, and which have uneven signal strength in various regions dependent

on the revenue earning models followed by the Service Providers, a more reliable system based on up linking with ISRO 3C satellite may be examined.

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

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

11.5 Incident Command System (ICS):

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

A traditional command structure exists in the administrative hierarchy which manages disasters in India It has been planned to strengthen and professionalize the same by drawing upon the principles of the ICS with suitable modifications. The ICS is essentially a management system to organize various emergency functions in a standardized manner while responding to any disaster. It will provide specialist incident management teams with

an incident commander and officers trained in different aspects of incident management, such as logistics, operations planning, safety, media management, etc. It also aims to put in place such teams in each district by imparting training in different facets of incident management to district level functionaries. The emphasis will be on the use of technologies and contemporary systems of planning and execution with connectivity to the joint operations room at all levels.

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

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

Traditionally the Control Room in each Division monitors on a "Real Time" basis the train operations. This Control Room is manned round the clock and has representatives of all the departments concerned with train operations as also with abnormalities which may affect train running. The "Command and Control" of the Divisions Control Room is with the operating department who plan, execute and monitor the running of trams (both freight and coaching trains). The assistance of a number of departments, viz. Mechanical (Power), Electrical (Power and OHE Traction Distribution), Mechanical (Carriage and Wagon), Civil Engineering (track maintenance and monitoring), Commercial (passenger information interface), Signal and Telecom (through a 'Test Room'), Security (RPF) etc. is given round the clock in the Operations Control Room

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

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

The Zonal ICS will constantly update the position periodically to Railway Board.

DISASTER INFORMATION FLOWS AND ALERTS OF DISASTER
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER XII)

12

12.1 Standard Operating Procedures (SOPs):

The Ministry of Home Affairs (MHA), as the nodal Ministry is responsible for coordinating response and relief efforts with various Ministries/Departments of the Government of India, State Governments and District Authorities. They have prepared the Standard Operating Procedures (SOPs) for handling man-made disasters (for eq. Terrorism related disasters) for which they are earmarked as the lead Ministry for disaster response, relief, and mitigation.

All Central Ministries, State Governments, District Authorities, and other stakeholders will prepare SOPs in consonance with the National and State Plans. The SOPs will be prescribed for activities like search and rescue, medical assistance and casualty management, evacuation, restoration of essential services and communication at disaster sites, etc. the other important activities

are provision of food, drinking water, sanitation, clothing, and management of relief camps. Detailed SOPs will also be devised by all concerned for dispatch, receipt, and deployment of central resources.

12.2 Levels of Disasters:

The Standard Operating Procedures (SOPs) will determine the levels of disasters and for issuing alerts to electronic messaging systems to various agencies about disasters have been formulated by Ministry of Home Affairs. These SOPs will be reviewed periodically for disaster response management in case of natural and man-made disasters.

12.3 Integrated Operation Centre of MHA:

Integrated Operation Centre (IOC) has been set up in the Ministry of Home Affairs to handle disaster situations on a 24X7 basis. IOC is responsible for initiating incident alert messages when a disaster is likely to occur or when it has actually taken place.

12.4 Categorization of Alerts:

A Standard Operating Procedure has been prepared for alerts of events of different types and identifies the situations when alerts are to be sent by the IOC.

Specific hazards have different categories of alerts. Accordingly, a uniform system has been devised by categorizing each type of alert in stages **- Yellow, Orange and Red.**

12.5 Action Plan for Communication of Alert Messages:

Whenever a crisis is about to be faced, Government of India has laid down systems for warning its respective departments through an

Alert It should be understood that mere issue of an 'Alert' (Yellow or Orange) is not an indication of the occurrence of a Disaster. This only signifies the existence of a crisis for which provisions of the Crisis Management Plan would come into operation.

The Action Plan for Alert Messages lays down as under:

(i) All concerned Ministries/ Departments/ Organizations/ Agencies will report events to IOC, MHA.

(ii) (ii) While generating and transmitting alerts to IOC, MHA, the concerned agency, will indicate the category of the event as well as its corresponding stage (Red/Orange/Yellow).

(iii) For natural calamities and other crisis situations categorization of Alerts is as under-

(a) AVALANCHES (Defence Research & Development Organization)

Category	Description	Stage
Low	Generally favourable condition. Triggering is generally possible only with high additional loads and on very few extreme slopes. Only sluffs possible and reach valley in small sizes. Valley movement is safe. Movement on slopes with care.	Yellow
Medium	Partly un-favourable condition. Triggering is possible on most avalanche prone slopes with low additional loads and may reach the valley in medium size. Movement on slopes with extreme care. Valley movements with caution. Avoid steep slopes. Routes should be selected with care	Yellow
High	Unfavourable condition Triggering possible from all avalanche's prone slopes even with low additional loads and reach the valley in large size. movements. Airborne avalanches likely Suspend all	Orange

All round	Very unfavourable condition. Numerous large avalanches are likely from all possible avalanche slopes even on moderately steep terrain Suspend all movements. Airborne avalanches likely.	Red

(b) TSUNAMI (Department of Ocean Development)

Category	Description	Stage
No Yellow Stage		
Moderate	When an earthquake of greater than 6.0 is reported and/or a Tsunami watch alert is received from JMA/PTWC.	Orange
Greate	When a change in water level after an earthquake is reported by National Institute of Ocean Technology, ITWC would issue a Tsunami Warning down channels. as per laid	Red

* The warning may be withdrawn after a better assessment of the level of rise in water level.

(c) LANDSLIDES (Geological Survey of India)

Category	Description	Stage
IV	Landslides of small dimensions that occur away from habitations and do not affect either humans or their possessions. These may occur near infrastructural installations, agricultural and forestlands and may not affect them in a significant manner. These slides may include small incidents that block communication routes for short periods or do not affect the society in a significant manner.	Yellow
III	Landslides which are fairly large and affect infrastructural installations like strategic and important highways and roads rail routes and other civil installations like various	Orange

	appurtenant structures of hydroelectric and irrigation projects. The landslides that enter large water bodies like reservoirs of hydroelectric projects and could damage some of components of these projects.	
II	The landslides that may occur on the fringes of inhabited areas and result in limited loss of life and property. Landslides, which result in blockade of courses of relatively smaller natural drainages. If the blockade is of relatively smaller dimensions its impact would be of a lower order. Although a threat potential is there, it may not be immediate.	Orange
I	Landslides of large dimensions that are located over or in close vicinity of inhabited areas like urban settlements or fairly large rural settlements. Activity on these slides can result in loss of human lives, dwellings on large scale. These slides may also inflict heavy losses on urban infrastructure. The slides that block busy pilgrimage routes during peak times resulting in hardships to thousands of pilgrims and sometimes resulting in loss of human life. Landslides which result in blockade of courses of relatively large natural drainages. If the blockade is fairly large it could lead to formation of a very large reservoir of water behind it. Formation of a large landslide dam could result in sudden flooding of areas located upstream. Abrupt breaching of landslide dam would suddenly release enormous quantities of water in the downstream areas leading to flash floods that could result in loss of life and damage to property on large scale.	Red

(d) CYCLONE (India Meteorological Department)

Category	Description	Stage
Cyclone Alert	Issued 48 hrs. before the commencement of bad weather when a system is located about 500 km or more away from the coast. The forecast may not contain information about landfall and hence it is still of informatory type but at the same time meant to trigger preparatory actions. During this stage, Disaster Managers plans on the course of action required to be initiated once the system moves closer to the coast.	Yellow
Cyclone Warning	These messages are issued 24 hours before commencement of bad weather and are of a "serious nature". During this stage the system is monitored closely and 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. Disaster Management Machinery is expected to be geared up fully during this phase.	Orange
Post landfall outlook:	During this phase warning messages are issued about 12 hours before actual landfall and are of a "very serious nature". At this stage, it is expected that the Disaster Management machinery is in full operational mode to face the impending disaster. All preparedness action should have been completed by this time. MHA would be closely monitoring steps taken by the concerned State Governments regarding evacuation and relief activities like food,	Red

	sanitation etc. This phase is fit to be classified as "Great Danger" and all warning messages issued to MHA Control Room are required to be forwarded to senior officials of the PMO.	

(e) EARTHQUAKE (India Meteorological Department)

Category	Description	Stage
Slight	$M \leq 5.0$	Yellow
Moderate	$5.0 \geq M \leq 6.9$	Orange
Great	$M \geq 7.0$	Red

(f) FLOOD (Central Water Commission)

Category	Description	Stage
IV	Low Flood (Water level between Warning Level and Danger Level)	Yellow
III	Moderate Flood (Water level below 0.50m, less than HFL and above Danger Level)	Yellow
II	High Flood (Water level less than Highest Flood Level but still within 0.50m of the HFL)	Orange
I	Unprecedented Flood (Water level equal and above Highest Flood Level (HFL))	Red

(g) RAILWAYS (Ministry of Railways)

Category	Description	Stage
Minor	50 or more casualties (inclusive of death and injuries)	Yellow
Medium	51-99 deaths.	Orange
Major	100 or more deaths, or where additional assistance is sought by the Ministry of Railways	Red

(h) FOREST FIRE (Ministry of Environment & Forests)

Category	Description	Stage

Ordinary Fire	Localised fires which can be controlled by the concerned territorial Conservator of Forests.	Yellow
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
Major Fire	Large fire, which may result in substantial loss of human lives, massive environmental degradation or loss of wildlife.	Red

12.6 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: -

- Mobilization of Gangmen
- Hospitals to mobilize Doctors and Paramedic 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.

12.7 Monitoring/Reporting of Effects of Disaster:

The Safety Dte in the Board would be given information regarding Orange/Red Alerts. 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 give 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.

12.8 Standard Operating Procedure (SOP) on Railways:

National 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 ICS. 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 ICS. 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.

CRISIS MANAGEMENT PLAN-CMP
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER XIII)

13

13.1 Difference between a Crisis and Disaster:

A Crisis indicates either an impending calamity, or the occurrence of an incident which would adversely affect society and human population.

A Disaster is a much bigger occurrence of an event which would cause large scale devastation, damage to property and loss of human life etc.

While a Crisis may or may not turn into a Disaster, the opposite is normally true, but with the condition the crises situation is more in the initial stages.

13.2 Crisis-Types: -

There can be broadly 4 types of crisis situation which the Ministry of Railways may be confronted with-

(a) The national level crisis developed in the Railways and is specific to railways, which is to be managed with the help and

assistance of other Ministries. All India Railway Strike is only such crisis identified in the CMP 2007 for which Ministry of Railways is the nodal ministry.

(b) The national level crisis affects the country including Railways and different ministries/departments have to help and assist each other based on their strengths. Cyclone, Earthquake etc. can be such crisis where railways have to assist by running special trains. Ministry of Home Affairs has to assist railways under security related crisis situations like sabotage, bomb blasts, etc.

(c) Crisis situation, which is not a national level crisis, affects the railway system, which is to be managed with the help and assistance of other Ministries/departments. Chemical explosions in trains, fire in train, tram falling in river, etc may be such situations.

(d) A crisis situation which is not a national level crisis affects the railway system, which can be managed with the help of internal resources from the railways only.

13.3 National Level Crisis: -

The Crisis Management Plan deals with National level crisis situations as under:

(i) **All India Railway Strike** - Ministry of Railways is the nodal ministry.

(ii) **Terrorism/Security related Crisis**- Ministry of Home Affairs is the nodal ministry, but Railways have to maintain liaison and flow of information.

(iii) **Natural Factor(s) related Crisis leading to traffic disruption-** Ministry of Home Affairs is the nodal ministry, but Railways have to maintain liaison and flow of information for assistance to restore the affected railway system.

(iv) Crisis where railways have to help other ministries by way of rail transport. The ministries concerned will make their own Crisis Management Plans bringing out the assistance that the Railways will be required to provide to them.

13.4 Drill for handling Crises: -

The Crisis Management Plan (CMP) is intended to deal with the afore-mentioned crisis situations only. The drill to be followed in the Ministry of Railways (Railway Board) as well as on the Zonal Railways in respect of crisis group, functioning of the Control room, communication etc., are basically the same for all crisis situations and the same general drill will follow, to be supplemented by the special instructions depending upon the nature of the crisis.

MANAGEMENT OF CYCLONES
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER XIV)

14

14.1 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.

14.2 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.

14.3 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.

MANAGEMENT OF FLOODS
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER XV)

15

15.1 Vulnerability to Floods

Floods have been a recurrent phenomenon in India and cause huge losses to live, 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.

15.2 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.

There is a need to be set up a central organization to lay down policy and implement FM measures in consultation with the states and other stakeholders as floods are not confined to one state and flooding in one state leads to flooding in adjoining states Accordingly, it has been proposed to set upriver Basin Organizations to deal with the management of water resources at river basin level. It is also proposed to set up a National Flood Management Institute (NFMI) at an appropriate location in one of the flood prone states, to impart training to engineers, administrators, personnel of the police departments, Non-governmental Organizations (NGOs) and Community Based Organizations (CBOs) etc.

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

15.3 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 Metrological Centers (RMCs) located at Mumbai, Chennai, New Delhi, Kolkata, Nagpur, and Guwahati.

15.4 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 railway embankments (and roads) by the Ministry of Shipping, Road Transport and Highways (MOSRTH), Ministry of Railways, Ministry of Defence, National Highways Authority of India, Border Road Organization and State governments.

15.5 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 an 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.

15.6 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 a non-common format designed for issuing flood forecasts by various fields divisions, as forecasts are issued according to the user's 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.

15.7 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.

15.8 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.

15.9 Flood Preparedness: -

Based on NDMA's guidelines, a lot of data is to be collected by the Civil Engineering Directorate, Railway Board, so as to plan flood protection works and to reduce vulnerability. Board has asked RDSO to compile the Flood vulnerable areas in Formation, Cutting Bridges and Buildings etc. vide Questionnaire in Annexure after chapter 16.

15.10 Action Plan: -

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

- Flood/weather forecasting in consultation with IMD and other

agencies like CWC, State Government, local bodies etc.

- Development of system of collecting data using modern techniques, Monitoring of landslides, 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.
- Improvement to water ways of bridges in track formation (if necessary) including sanction and execution of works.
- Development of Flood Shelters for staff and passengers at suitable locations in the areas prone to repeated floods.
- Implementation of Byelaws 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 overflow and need of additional waterway.
- Study of changed water encatchment area due to construction of highways, Dams.
- Study of changed rainy season month on a particular region.

MANAGEMENT OF EARTHQUAKES
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER XVI)

16

16.1 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.

16.2 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.

16.3 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 and departments and State Governments/SDMAs will develop detailed DM plans, recognizing 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 along with all other stakeholders to ensure that, hereafter, all new structures are built in compliance of earthquake-resistant building codes and town planning byelaws. This will be taken up as a national resolve.

16.4 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 prioritized 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.

16.5 Institutionalization Earthquake-Resistant Design and Construction:

The Railways along with 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 harbors, and other lifeline and operationally important structures including track infrastructure etc. falling within their administrative control.

16.6 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 Most of these buildings are not earthquake-resistant and are potentially vulnerable to collapse in the event of a high intensity earthquake. 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.

16.7 Preparedness by Railways:

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

Action to be taken by the Railways/PUs on these guidelines are briefly summarized in Annexure (after this chapter) in a tabular form to facilitate this review. Zonal Railway may also keep the effect of Cyclones and Landslides in mind in such vulnerable areas while reviewing preparedness on each item covered in NDMA guidelines.

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

ANNEXURE

Summary of NDMA Guidelines on Earthquakes and Floods

Railway Infrastructure	Earthquake Proneness Review	Flood Proneness Review
Railway Formation station Track (incl Yards, bridges/culverts, ROBS/RUBs, etc. Buildings housing signalling gears like RRL, SSI etc. Buildings in open line maintenance work centres like loco sheds. Coaching depots etc. Station buildings Control room, other Important office building, etc. High-rise residential buildings, other important residential buildings	**New Construction** Must be earthquake resistant. **Existing Infrastructure** Identify existing railway infrastructure falling under various seismic zones. Review earthquake for 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:**

Railway hospitals	**-Any other item that railway may like to add.**	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. Byelaws for buildings in flood plains Making existing and new buildings and infrastructure capable of withstanding fury of floods **Any other item that railway may like to add.**

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.

NDMA's Guidelines on Management of Earthquakes' along with on 'Management of Floods' (August 07) were sent to RDSO for coordinating implementation on Indian Railways, as decided by Board (ME, ML, MM, FC & CRB)

Sr ED(Civil)/RDSO is to submit Action Plan of all the Railways and Production Units to Railway Board. There is a need for RDSO to prepare the Action Plan early.

ANNEXURE

1.0 Position relating to existing Buildings (NDMA Guidelines on Earthquakes)

S. No.	Divn.	Description of Building	Location	Description Of deficiency for earthquakes	Retrofitting or replacement	Broad approach for retrofitting	Approx. Cost (Rs. Lakhs)	Whether work would be done under GM's power or shall be sent to Rly. Bd. for sanction	Remarks

2.0 Position relating to Buildings (NDMA Guidelines on Floods)

S. No.	Divn.	Description of Building	Location	Description Of deficiency for flood	Retrofitting or replacement	Broad approach for modifications	Approx. Cost (Rs. Lakhs)	Whether work would be done under GM's power or shall be sent to Rly. Bd. for sanction	Remarks

3.0 Position relating to Bridges (NDMA Guidelines on Earthquakes)

S. No.	Divn.	Description of Bridge	Location	Description Of deficiency	Retrofitting or replacement	Broad approach for retrofitting	Approx. Cost (Rs. Lakhs)	Whether work would be done under GM's power or shall be sent to Rly. Bd. for sanction	Remarks

4.0 Position relating to Bridges (NDMA Guidelines on Floods)

S. No.	Divn.	Description of Bridge locations	Location	Description Of deficiency	Requirement of actual work (increase in waterway & or raising or new openings)	Extra waterway required.	Approx. Cost (Rs. Lakhs)	Whether work would be done under GM's power or shall be sent to Rly. Bd. for sanction	Remarks

5.0 Position relating to Formation (NDMA Guidelines on Floods)

S. No	Divn.	Description	Location	Description of deficiency	Requirement of actual work)	Approx. Cost (Rs. Lakhs)	Whether work would be done under GM's power or shall be sent to Rly. Bd. for sanction	Remarks

6.0 Position relating to Protection of cuttings (NDMA Guidelines on Floods)

S. No	Divn.	Description Of cutting	Location	Description of deficiency	Requirement of actual work)	Approx. Cost (Rs. Lakhs)	Whether work would be done under GM's power or shall be sent to Rly. Bd. for sanction	Remarks

Note: Requirement pertaining to other departments may be indicated separately in above proformas suitably

MANAGEMENT OF LANDSLIDES AND SNOW AVALANCHES
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER XVII)

17

17.1 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.

17.2 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.

17.3 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

17.4 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.

17.5 Organisations Associated with Landslide Hazard Management

The is a need to set up a central organisation that will deal exclusively with all the fields of landslide management in a comprehensive manner has been accepted by Government of India. The central government through the Ministry of Mines will, therefore, set up a centre for landslide research, studies, and management in one of the landslide prone states to ensure a wider view of landslides as a component of the environment and bring the existing pool of expertise in earth sciences (coastal stability, seismology and meteorology included) to bear upon this new initiative.

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

17.6 Action Plan: -

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

MANAGEMENT OF
BIOLOGICAL DISASTERS
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER XVIII)

18

18.1 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 has 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.

18.2 Biological Warfare (BW) and Bio-Terrorism (BT):

The historical association between military action and outbreaks of infections suggest a strategic 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.

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

18.4 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.

18.5 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 planned.

MANAGEMENT OF
CHEMICAL DISASTERS
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER XIX)

19

19.1 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 Petroleuum and Natural Gas (MoP &NG). Department of Atomic Energy (DAE).

19.2 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.

19.3 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

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

19.4 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.

19.5 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:

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

Chapter I to VIII respectively deal with the above classes of dangerous goods which include General rules governing acceptance, handling, Carriage, storage, delivery 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.

19.6 Monitoring Movement of Hazchem:

Dedicated communication system is to be established for Rail Transportation to monitor movement of Toxic Chemical Agents. A mechanism is to be developed like a Geographic

Information system (GIS) for continuous monitoring of such Transport Vehicles along their route This may require to be dove-tailed with the FOIS network of the Railways, once the TMS/FOIS is extended for booking (preparation of RRs) and movement of chemical items in wagons to be included in FOIS.

19.7 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.

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 firefighting fire extinguishers etc at short notices.

Vulnerability on this Highway needs to be reduced by the removal of Jhuggies from close to the track (say at least 15 m away).

MANAGEMENT OF
CHEMICAL (TERRORISM) DISASTERS
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER XX)

20

20.1 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 marketplaces, 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.

20.2 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, decorporation, capacity building and infrastructure development.
  - **(d)** Community-centric mechanism for the management of chemical (terrorism) disasters

20.3 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.

20.4 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.

20.5 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-medis in each Divisional Railway Hospital through training.

20.6 Medical Preparedness for CBRN: -

This is covered already in the chapter 9 (item 9.2) under the heading "Medical Preparedness - MCE and Mobile Relief Arrangements".

MANAGEMENT OF NUCLEAR AND RADIOLOGICAL EMERGENCY (DISASTER)
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER XXI)

21

21.1 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.

21.2 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 elaborated 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 device

in which the radioactive material has been so added that, on its being exploded, there would be dispersal of radioactivity in the environment.

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

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

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

DISASTER
MANAGEMENT TRAINING
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER XXII)

22

22.0 Disaster Management Training on the Railways

22.1 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.

22.2 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 vaster and more varied. However, even today some of the Railway staff need are given training only on the older concept, i.e. on a limited syllabi of Management of a train accident. Amongst the staff which falls in this category are the frontline staff (and their superiors) either traveling on the train or available online.

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

S.No.	**Categories of Officials**	**New Training methodology and schedule**
1	Top Level Management (GMs, PHODs, DRMs and other SAG Officers)	3-day Disaster Management Modules are to be delivered at IRITM/LKO @ once every 3 months. **Frequency of Training:** Once every five years for SAG Officers and above.
2	Middle Level Management (SG & JAG officers)	Some of the latest and relevant topics are to be included in the AMP and MDP programmes being delivered at RSC/BRC IRITM, LKO will also deliver special module being developed by them @ one every month. **Frequency of Training:** Every SG/JAG officer need to undergo the module once every five years either at RSC as regular MDP/AMP course or special DM module at IRITM.
3	Lower-Level Management (SS & JS officers including serving Group B officers).	Disaster management training to be imparted at IRITM/LKO @ one course every month **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 RSC/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 @ one every month. **Passing this course is compulsory for promotion to SE and above.**

		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 Officers and staff and should be imparted at RPF Academy at Lucknow.
9	RPF Officers	Disaster Management training for RPF officers may be also organized in IRITM till such time the capability in RPF academy is developed.

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

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

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

MANAGEMENT OF
RAIL DISASTER IN TUNNELS/DEEP
CUTTINGS OR IN A WATER BODY
(DISASTER MANAGEMENT PLAN OF IR: CHAPTER XXIII)

23

23.1 Expertise To handle Rail Disasters in Tunnels etc.:

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

23.2 Ventilation arrangements in Tunnels:

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

In case a train stalls in long tunnel due to derailment/fire or any unusual condition, automatically alarm will be sounded in the control room to alert the Ventilation Operator/Controller or if Guard/Driver of a train or any other person gives such call on

'Emergency' Telephone the Ventilation Operator should control the ventilation in tunnel as per the procedure given.

23.3 Lighting Systems in Tunnels for use in emergency:

Depending on length of a tunnel, emergency lighting arrangements may be provided to give immediate assistance in handling a disaster.

20.4 Rail Disasters in a Lake, River, Sea etc.:

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



वयं राष्ट्रे जागृयाम

भारतीय रेल परिवहन प्रबंधन संस्थान
रेल मंत्रालय, भारत सरकार
INDIAN RAILWAYS INSTITUTE OF TRANSPORT MANAGEMENT
(Hardoi By-Pass Road, PO Manak Nagar, Lucknow-226011, Uttar Pradesh)