सत्यमेवजयते

GOVERNMENT OF INDIA

MINISTRY OF CIVIL AVIATION

COMMISSION OF RAILWAY SAFETY

ANNUAL REPORT FOR 2021-2022

BY

CHIEF COMMISSIONER OF RAILWAY SAFETY

LUCKNOW

FOREWORD

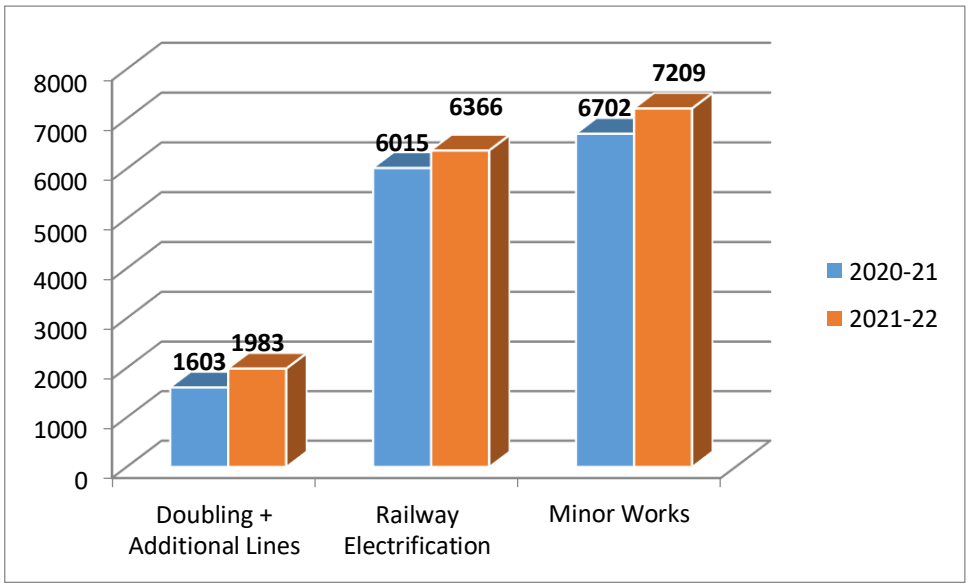
As mandated under Section 10 of The Railways Act, 1989 and Section 12 of Metro Railway (Operation & Maintenance) Act, 2002, the Annual Report for the financial year ended on 31.03.2022 is hereby, presented by the Chief Commissioner of Railway Safety to the Central Government to be laid on the table of the Parliament. The report highlights the activities of the Commission of Railway Safety during the above mentioned period namely opening of new railway lines, doubling of existing lines, gauge conversion works and electrification of Railway lines, investigation of serious train accidents, condonation of infringements of schedule of dimensions and sanctions of minor works, movement of over dimensioned consignments, new rolling stock over Indian Railways and Metro Railways. This Report contains valuable information with respect to measures for improving safety in Railway working and will be useful for Railway personnel.

(S. K. PATHAK)
Chief Commissioner of Railway Safety

PLACE: LUCKNOW
DATE : 01.11.2022

Comparative Performance of the Commission during 2021-22:

Activities	FY 2020-21	FY 2021-22	% variation in FY 2021-22 4=(3-2)*100/3
1	2	3	4
Doubling + Additional lines (Kms)	1603	1983	23.7%
New Lines (Kms)	288	285	-1.04%
Gauge Conversion (Kms)	565	636	12.56%
Total (DL+GC+NL) (Kms)	2456	2904	18.24%
Railway Electrification (Kms)	6015	6366	06%
Minor Works (Cases)	6702	7209	08%
Rolling Stock Inspected & forwarded (Cases)#	34	51	50%



SUMMARY OF THE ACTIVITIES OF COMMISSIONERS OF RAILWAY SAFETY

	Name of Activity	Details of Activity	Quantity	Reference (Chapter no.)
I.	Statutory inquiries of serious accidents entrusted to the commissioners on	(a)Indian Railways	**02**	Chapter III and Appendix I
		(b)Metro Railways	**00**	
		(c) No of recommendations in final inquiry reports made out of (a) above	**20**	
		(d)No of recommendations in final inquiry reports made out of (b) above	**00**	
II.	Statutory Inspections of Lines undertaken by the Commissioners prior to their authorization for opening the line for passenger services	**Indian Railways** (a) New Lines (b) Additional Lines (c) Gauge Conversion (d)Railway Electrification **Metro Railways** **a)** New lines of Mumbai Metro Rail Corporation **b)** New lines of Bengaluru Metro Rail Corporation Limited **c)** New lines of Chennai Metro Rail Corporation Limited **d)** New lines of Kanpur Metro Rail Corporation Limited **e)** New lines of Kolkata Metro Rail Corporation Limited	285 Km 1983 Km 636 Km 6366 Km 26.83 Km 7.46 Km 0.33 Km 8.66 Km 2.33 Km	Appendix II
III.	Sanction accorded by the Commissioners/ Proposals recommended for sanction by Central Government for.	**a)** New Minor Works. **b)** Running of new types of Rolling stock	**7209** **51**	Chapter II Para 2.4 Chapter II Para 2.7
IV.	Inspection of Govt. Railways	Periodic inspections	**5145 Km**	Chapter II Para 2.8

CONTENTS

Chapter – I

ORGANISATION AND FUNCTIONS

1.1 INTRODUCTION –

During British Era, the construction & operation of railways were entrusted to private companies. Consulting engineers were appointed by the British Govt. of India to exercise effective control over them. But later on, the government undertook the construction of Railways themselves, then the consulting engineers were designated as Government Inspectors. In 1883, their position was statutorily recognized. The power of safety controlling authority remained with Railway Board & Inspectorate office was placed under them.

In 1939, the Pacific Locomotive Committee, set up in connection with the Bihta disaster, recommended that Railway Inspectorate should be separated from the Railway Board, on the principle that those responsible for the inspection of Railways should be independent of the Authority administering the Railways, as contemplated in Section 181(3) of the Government of India Act, 1935. These recommendations were approved by the, Legislative Assembly in 1939, Council of State in 1940 and accepted by the British Government of India. Accordingly in May 1941, Railway Inspectorate was separated from the Railway Board. Post of Chief Government Inspector of Railways **(CGIR**), through whom Government Inspectors of Railways **(GIR**) would report to Government, was created. Later on Inspectorate office was placed under the Department of Communication and now it is under Ministry of Civil Aviation (**MoCA**).

On 01.11.1961, CGIR was re-designated as Commissioner of Railway Safety (**CRS**) and GIR, as Additional Commissioners of Railway Safety (**ACRS).**

From June, 1979 designation of **CRS** was changed to Chief Commissioner of Railway Safety (**CCRS**) and **ACRS,** to **CRS.**

CRS are recruited from amongst officers of Indian Railways (IR) but they do not revert to Railways and are absorbed in the Commission of Railway Safety under Ministry of Civil Aviation.

1.2 ORGANISATIONAL STRUCTURE -

1.2.1 The office of the Chief Commissioner of Railway Safety (CCRS), is headquartered at Lucknow and is a part of Ministry of Civil Aviation (MoCA). He acts as a Principal Technical Advisor to Central Government in all matters with which Commissioners are concerned.

1.2.2 There are 09 Commissioner of Railway Safety (CRS)& 01 circle office of Commissioner of Metro Railway Safety(CMRS) located at different places across the country looking after the works of different Zonal Railways. Their offices are called Circle Offices. Each Circle Office has 9 to 11 office staffs consisting of Sr. Private Secretary (1), Office Superintendent(1), UDC(2), LDC(2) and Multi Tasking Staff.

In each Circle, there is one post of Deputy Commissioner of Railway Safety (Dy.CRS) and they are from different disciplines of Indian Railways (IR). In 2021-22, distribution of Dy.CRS posts were as follows:-

- SC, SCC and SEC are from Civil Engineering
- CC is from Electrical Engineering and
- EC, NC, NEC, NF and WC are from Signal & Telecommunication (S&T) Engineering.
- In addition to above one post of Dy CMRS is there to assist the CMRS.

1.2.3 There are two wings in the office of CCRS i.e. Railway Safety Wing and Technical Wings.

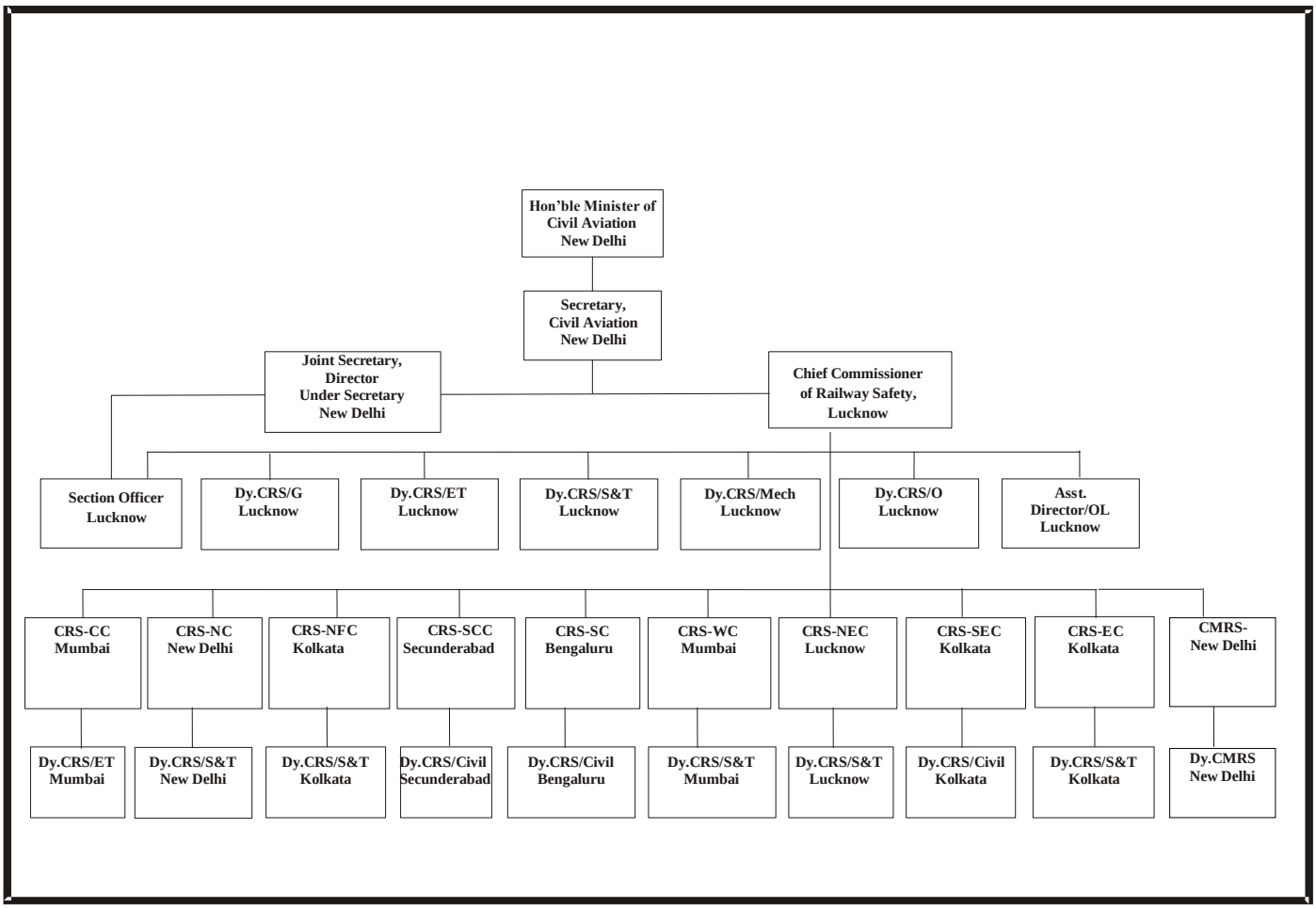
In the Railway Safety wing, there is one Dy.CRS (General) to assist CCRS in day to day official working as well as for maintaining the interface with the Ministry of Railway (MoR) and MoCA. It has Sr. Private Secretary (1), Section Officer (1), Assistants Section Officer (5), Personal Assistant (1), UDC (1), LDC (1) and Multi Tasking Staff.

In the Technical Wing, there are 4 Dy. CRS of various disciplines (Mechanical, S&T, Electrical Engineering and Transportation) to assist CCRS and CRS as and when required on technical matters. This wing works as think tank and maintains the institutional memory / strength of the Commission of Railway Safety. To assist the Technical Wing, the requisite staff / officers are posted such as one Assistant Director (Official Language), Junior Hindi Translator(1),

Technical Assistant (2) LDC(2), Stenographer(2), Staff Car Driver (1) and Multi Tasking Staffs (4).

Dy. CRS are not statutory authorities. They come from Railways on deputation basis and go back after completion of their deputation period.

1.2.4 Organizational Chart is given below:-



1.3 VACANCIES IN THE COMMISSION - As on 31.03.2022, 03 posts of CRS and 06 posts of Dy.CRS/Dy.CMRS are vacant.

1.4 CHANGE IN ORGANISATION - The Cabinet has accorded the approval for upgradation of the post of Chief Commissioner of Railway Safety from Level 16 to Apex level, i.e. Level 17. The same was notified vide Gazette Notification dated 08th December 2021.

1.5 INCUMBENCY OF OFFICERS –

1.5.1 Chief Commissioner of Railway Safety, Lucknow

S.No.	Designation	Period	Name (Shri/Smt.)

(i)	CCRS	Full Duration	S K Pathak

1.5.2 Commissioners of Railway Safety (CRS)

S.No.	Circle office	Period	Name of CRS (Shri/Smt.)
(i)	CRS-CC	01.04.21 to 30.06.21	A K Jain
		01.07.21 to 02.08.21	Vacant*
		03.08.21 to 31.03.22	Manoj Arora
(ii)	CRS-EC	Full Duration	A M Chowdhary
(iii)	CRS-NC	Full Duration	Vacant*
(iv)	CRS-NEC	Full Duration	Md. Latief Khan
(v)	CRS-NFC	Full Duration	Vacant*
(vi)	CRS-SC	Full Duration	A K Rai
(vii)	CRS-SCC	Full Duration	Vacant*
(viii)	CRS-SEC	01.04.21 to 05.04.21	Vacant*
		06.04.21 to 31.03.22	Suvomoy Mitra
(ix)	CRS-WC	Full Duration	R K Sharma
(x)	CMRS-New Delhi	Full Duration	Janak Kumar Garg

*All vacant posts of Commissioners are being looked after under additional charge by other CsRS as per the order of Appointment Committee of cabinet.

1.5.3 Deputy Commissioners of Railway Safety in CCRS office

S.No.	Dy.CRS	Period	Name (Shri/Smt.)
Railway Safety Wing			
(i)	Dy.CRS(General)	Full Duration	Rajiv Kumar
Technical Wing			
(i)	Mechanical	Full Duration	Ahmad Nadeem Siddiqui
(ii)	Operating	Full Duration	Vacant*(Looked after by OSD/Safety Indu Rani Dubey)
(iii)	Electric Traction	01.04.21 to 21.04.21	Shalabh Tyagi
		22.04.21 to 31.03.22	Vacant*(Looked after by OSD/Safety Shalabh Tyagi)
(iv)	Signal &Telecom	Full Duration	B S Yadav

1.5.4 Deputy Commissioners in Circle Offices

Deputy Commissioner (Signaling & Telecommunication)			
S.No.	**Circle office**	**Period**	**Name (Shri/Smt.)**

(i)	CRS-EC	Full Duration	Sitaram Nandi
(ii)	CRS-WC	Full Duration	Avinash Sangoley
(iii)	CRS-NFC	Full Duration	S. Chattopadhyay
(iv)	CRS-NC	Full Duration	Vacant
(v)	CRS-NEC	Full Duration	Vacant
Deputy Commissioner (Civil Engg.)			
(vi)	CRS-SEC	Full Duration	B S K Subudhi
(vii)	CRS-SCC	Full Duration	G Srinivas Rao
(viii)	CRS-SC	01.04.21 to 16.06.21	E Srinivas
		17.06.21 to 10.02.22	Vacant
		11.02.22 to 31.03.22	Nitish Ranjan
Deputy Commissioner (Electric Traction)			
(ix)	CRS-CC	01.04.21 to 30.04.21	G P Garg
		01.05.21 to 31.03.22	Vacant
Deputy Commissioner of Metro Railway Safety			
(ix)	CMRS	Full Duration	Vacant

1.6 JURISDICTIONS OF CIRCLES OFFICES-

1.6.1 As on 31st March, 2022, total Route kilometers (RKM) of Indian Railways under different circles were as under:-

Circle Office	Head Quarter	Route Kms	Railway Administration
CRS-CC	Mumbai	8183.53	CR, WCR & KR
CRS-EC	Kolkata	7029.89	ER & ECR
CRS-NC	New Delhi	7364.16	NR
CRS-NEC	Lucknow	7025.16	NER & NCR
CRS-NFC	Kolkata	4163.13	NFR & MR
CRS-SC	Bengaluru	9488.12	SR & SWR
CRS-SCC	Secunderabad	6311.97	SCR
CRS-SEC	Kolkata	10586.941	SER, SECR & ECoR
CRS-WC	Mumbai	12177.66	WR & NWR
Total Route Kms		**72609.56**	

1.6.2 As on 31st March, 2022, **total Route Kilometers** of Metro Railways under different circles were as under:-

Name of Circle Office	Head Quarter	Route Kms	Metro Railway Administrations
CMRS-New Delhi	New Delhi	371.96	DMRC
		12.89	RMGL
	Nagpur	17.98	NMRC
	Hyderabad	46.53	HMRL

	Kanpur	8.66	UPMRC
	Lucknow	23.68	UPMRC
CRS/CMRS-SC	Bengaluru	56.45	BMRCL
	Kochi	25.20	KMRCL
	Chennai	57.27	CMRL
CRS/CMRS-WC	Mumbai	38.06	MMRC
	Gujarat	6.12	GMRC
	Jaipur	11.64	JMRC
Total Route Kms		**683.37**	

1.7 DUTIES &FUNCTIONS OF THE COMMISSIONERS OF RAILWAY SAFETY:

1.7.1 As detailed in Section 6, Chapter-III of The Railways Act 1989, the duties of Commissioner of Railway Safety (CRS) are as under:-,

(a) To inspect new railways with a view to determine whether they are fit to be opened for the public carriage of passengers and to report thereon, to the Central Government as required by or under this Act;

(b) To make such periodical or other inspections of any railway or of any rolling stock used thereon as the Central Government may direct;

(c) To make inquiry under this Act into the cause of any accident on a Railway; and

(d) To discharge such other duties as are conferred on him by or under this Act.

1.7.2 Functions of the Commissioner of Railway Safety:-

(a) Authorization for opening of new railway lines:

In terms of Railway Act, 1989, under Section 6, Metro Railway Act, 2002 and the Rules for Opening, 2000, Indian Railways / Metro Railways approach to the respective Commissioner along with their application/proposal seeking sanction of respective CRS for opening of new railway lines, doubling of existing lines, gauge conversion works, electrification of Railway lines etc.

Rules for Opening stipulates that while making a reference to the commissioner for inspection, the concerned Railway shall furnish all the relevant documents to the commissioner one month before the date on which a railway line or a section of a railway line is proposed for opening by the railway.

On receipt of the application, the CRS scrutinizes the application and if everything is in order then a date of inspection is fixed and intimated to the Railway. On the schedule date the CRS conducts the inspection with his team of officers accompanied by Zonal

Railway Headquarter and Divisional officers led by DRM of the respective Division.
After inspection, if CRS is satisfied with its fitness with respect to safety of the passengers; he issues authorization /sanction for opening of the subject work with certain stipulations and also forwards the inspection report of the same to the Central Government through CCRS.

If CRS is not satisfied with its fitness with respect to safety of the passengers; he issues the inspection report of the same to the Railway indicating the various deficiencies in the work to be attended to ensure safety of the passengers. It is the discretion of CRS to re-inspect the section after attending all the deficiencies by the Railway before opening the same for public carriage of passengers or else authorizes the Central Government to open the subject section after attending the deficiencies.

(b) Sanctions for execution of minor works:

Structural works affecting the safety of trains on running lines, such as provision of additional bridges, rebuilding or re-girdering of existing bridges, re-modeling of station yards, modification to signaling etc. are carried out by the Railways only after obtaining the sanction of the CRS.
In terms of above provisions, Zonal Railways submits the applications of different works along with all enclosures like **Joint Safety Certificate, Track Certificate, Bridge Certificate, OHE Certificate, RDSO Speed Certificate, Railway Board's first sanction, Condonation of Board for infringement to the Schedule of Dimensions etc.** After receipt of such applications, CRS examines them as per the provision of various manuals and if found in order, gives the sanction for the same.

(c) Introduction of new rolling stock and increase in the speed of existing rolling stock:

Prior to 1st October 2018, as per the rule, the CRS after examining the proposal sent the report, with his recommendations to the CCRS. CCRS after examining the proposal, if found in order, forwarded the same with or without stipulations, to the Ministry of Railways for sanction of running of new rolling stock or increasing the speed of existing rolling stock.

Now, Ministry of Railways, vide **Gazette notification no. 698 dated 01 October 2018,** has amended the Railways Opening for Public Carriage of Passenger Rules,2000 and revised this procedure. As per present procedure, (Rule 28) RDSO applies to CCRS for both;

a) sanctioning speed of new designs of rolling stock
b) increasing the speed of existing rolling stock

CCRS after examining the proposal, if found in order, recommend the same, with or without stipulations, to the Ministry of Railways for sanction of running of new rolling stock or increasing the speed of existing rolling stock.

(d) Railway Board has issued the Schedule of Dimensions (revised 2004), Maximum, and Minimum& Recommended Dimensions to be observed on all 1676mm Gauge on IR.
These dimensions given in Schedule-1 of Indian Railway Schedule of Dimensions (IRSOD) (revised 2004) have been classified into two heads; for existing works and for new works. These Dimensions are to be observed on all 1676mm Gauge on Indian Railway unless prior sanction has been obtained from the Railway Board through CRS/CCRS to execute the new work which would infringe the IRSOD.

Before 01st October 2018, the proposal for any infringement to the Schedule of Dimension used to be submitted to CRS. It was then scrutinized by CRS from safety point of view. After examining, CRS was required to send the proposal for condonation of infringement to CCRS. Again in CCRS office the proposal was examined and then forwarded to Railway board. Based on the recommendation of CCRS, Railway Board used to grant sanction for the condonation of infringement.

However, **Ministry of Railways, vide Gazette notification no. 698 dated 01 October 2018**, has amended the Railways Opening for Public Carriage of Passenger Rules,2000 and revised this procedure as per Rule 22A. As per present procedure, proposal for any infringement to the Schedule of Dimension is submitted to CRS which is then scrutinized by CRS from safety point of view. After examining the proposal, if CRS is satisfied that infringement is safe for train operation, he sanctions the condonation of infringement with or without stipulations. If the proposed infringement is beyond the limits defined in the Schedule-II of IRSOD then procedure prior to this amendment of Opening Rules i.e. 1 October 2018, as mentioned in preceding para, is followed.

(e) Any consignment which does not adhere to IRSOD, 2004 is treated as an over dimensioned consignment (ODC). For movement of ODC on Indian Railway, separate sanction of the competent authority is required. Railway submits the application for movement of ODC to the concerned CRS, if it requires CRS

sanction. The same is examined in the office of the CRS and when found in order, sanction is granted by the CRS for movement of ODC in the concerned zonal Railway.

(f) Inspection of running lines to keep themselves familiar with Railway working; and

(g) Investigation into Serious Railway Accidents and review of reports of other train accidents, inquired by Railways.

1.7.3 Functions of the Chief Commissioner of Railway Safety:

CCRS advises Central Government in all matters relating to Railway Safety, recruitment of officers, postings and promotions, budget and expenditure etc. CCRS deals with:-

(a) Reports of inspections of new lines, doubling of existing line, gauge conversion works and electrification of railway line done by the Commissioners of Railway Safety are forwarded to Railway Board through CCRS office for obtaining the sanction of the Central Government.

(b) The first three reports of statutory inquiries (both preliminary and final) into accidents, conducted by newly appointed Commissioners are to be sent to CCRS for scrutiny before forwarding it to Railway Board.

(c) Scrutiny of Railway's proposals, if any, regarding condonation of infringements to IRSOD received from CRS's office and if found in order then the same is forwarded to Railway Board with suitable stipulations.

(d) Scrutiny of Railway's proposals regarding introduction of new rolling stock or increase in the speed of existing rolling stock received from RDSO and if found in order then the same is forwarded to Railway Board with/without suitable stipulations.

(e) Similarly any condonation of infringement to IRSOD in case of Rolling stock is also sanctioned by Railway Board on recommendation of CCRS

(f) Examination of Railway Board's proposals for amendments to General Rules, Railway Rules for Opening, Schedule of Dimensions etc. in consultation with the Commissioners and convey the views of the Commission to Railway Board, whenever so referred; and

(g) Preparation of the Annual Report on the activities of Commission of Railway safety.

(h) Any other work/duty assigned by Central Government with respect to Railway safety.

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CHAPTER-II

ACTIVITIES OF COMMISSIONERS OF RAILWAY SAFETY

2.1 Section 22 of Railway Act, 1989, prescribes that Central Government shall, before giving its sanction to opening of a railway, obtain a report from the Commissioner about fitness of the line for public carriage of passengers.

Section 14 & 15 of Metro Railways (O&M) Act, 2002 prescribes that the Metro Railway in the National Capital Region, metropolitan city and metropolitan area shall not be opened for the public carriage of passengers except with the previous sanction of the Central Government. The Central Government before giving its sanction shall obtain a report from the Commissioner regarding fitness of the line for public carriage of passengers.

2.2 ACHEIVEMENTS OF THE COMMISSIONER OF METRO RAILWAY SAFETY:

In 2021-2022, activities of Metro Railway inspections carried out by Commissioners of Metro Railway Safety are summarized below:-

	Metro Railways	(In Kilometers)
(a)	Kolkata Metro	2.33
(b)	Bengaluru Metro	7.46
(c)	Mumbai Metro	26.83
(d)	Kanpur Metro	8.66
(e)	Chennai Metro	0.33
	Total	**45.61**

2.3 Details of the lines on which Commissioners under powers delegated to them by Central Government authorized public carriage of passengers, are given in Appendix-II.

2.4 NEW MINOR WORKS:

2.4.1 Structural works affecting the safety of trains on running lines, such as provision of additional bridges, rebuilding or re-girdering of existing bridges, re-modeling of station yards, modification to signaling etc can be carried out by Railways only after obtaining the sanction of the CRS. Such works, after being authorized by the Commissioner, are executed by the Railway Administration and

opened to traffic under safety certificate signed by concerned railway officers, unless the Commissioner of Railway Safety decides to inspect them before these being brought into use.

During year 2021-22, the Commissioners of Railway Safety have given sanctions for execution of **7209** minor works by Railway Administration.

2.5 WORKS INVOLVING INFRINGEMENTS OF STANDARD DIMENSIONS:

2.5.1 Certain minimum and maximum dimensions, for location of structures near railway lines and in respect of rolling stock have been prescribed and are laid down in "Schedule of Dimensions (SOD)". Railway administrations are required to execute all works confirming to the SOD. In case of any deviation from the S.O.D, as per present procedure, the proposal for any infringement to the Schedule of Dimension is submitted to CRS which is then scrutinized by CRS from safety point of view. After examining the proposal, if CRS is satisfied that infringement is safe for train operation, he sanctions the condonation of infringement with or without stipulations.

If the proposed infringement is beyond the limits defined in the Schedule-II of IRSOD then procedure prior to this amendment of Opening Rules i.e. 01 October 2018, as mentioned in preceding paras, is followed.

2.5.2 In 2021-22, 258 such proposal/application for Condonation of infringements to SOD were sanctioned by the Commissioners of Railway Safety.

2.6 MOVEMENT OF OVER-DIMENSIONED CONSIGNMENTS:

2.6.1 Sometimes, Railways have to transport Over-Dimensioned Consignments. These consignments are categorized into different classes for which approval of competent authority is required for movement on Indian Railways. The movement of a category of consignment requiring sanction of CRS is forwarded to the concerned CRS who, after examining the proposal from safety point of view, accords sanction.

2.6.2 In 2021-22, no proposal/application for movement of movements of over-dimensioned consignments was received by the Commissioners of Railway Safety from Railways.

2.7 NEW TYPES OF LOCOMOTIVES AND ROLLING STOCK:

2.7.1 Section 27 of Railways Act, 1989, prescribes that new rolling stock can be introduced only after prior sanction by the Central Government (CG) and before sanctioning, Central Government shall obtain a report from the Commission of Railway Safety.

During 2021-22, **51** numbers of new types of rolling stock were recommended by the Commission for sanction by the Central Government

2.8 INSPECTIONS OF RAILWAY LINES:

During 2021-22, Commissioners carried out inspections of **5145 Km**. of Govt. Railways either on their own or in the company of General Managers. Significant defects and deficiencies noticed during inspections were discussed with Railway Officers during such inspections and reports were sent to the General Managers for compliance.

2.9 Activities of Commissioners in respect of inquiries into Accidents are given in Chapter-III.

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CHAPTER –III

ACTIVITIES OF INVESTIGATION INTO ACCIDENTS

3.1 Commissioners of Railway Safety (CRS) investigate Serious Railway accidents. Other train accidents are investigated by the Committee of Railway Officers. Reports of these inquiries are sent by Railways for review by the concerned CRS. However, if the Commissioner desires, he can ask the Zonal Railway to enhance the scale of inquiry and/or send it back to Railways for re-inquiry after review.

3.2 Train Accident is an accident that involves a train.

3.2.1 Indian Railways has classified Accidents under following heads;

i) Train accidents
ii) Yard accidents
iii) Indicative accidents
iv) Equipment Failures and
v) Unusual incidents

3.2.2 Train Accidents are further classified into the following categories as:

A) Consequential train accident

Consequential train accidents include train accidents having serious repercussions in terms of loss of human life, human injury and loss to railway property or interruption to Rail traffic. Train accidents under the following classification will be termed as consequential train accidents:

- Collision
- Fire
- Level crossing
- Derailment
- Miscellaneous.

B) Other train accidents:

All other accidents which are not covered under the definition of the consequential train accidents are to be treated as other train accidents".

3.3 RULES FOR INQUIRIES BY COMMISSIONERS (CRS):-

Rules for holding Inquiries into railway accidents are contained in 'Statutory Investigation into Railway Accidents Rules -1998' notified by the Ministry of Civil Aviation in the Gazette vide G.S.R. No. 257 dated 26.12.98 and G.S.R. No. 63, dated 06.03.99. Gist of some rules and procedures for statutory investigations by the CRS are given below:-

3.3.1 When should a Statutory Inquiry be held?

Inquiry by the CRS is obligatory in every accident to a passenger carrying train, which is attended with loss of human life, or with grievous hurt as defined in the Indian Penal Code, to a passenger or passengers travelling

inside the train or with damage to railway property of a value exceeding Rs. 2 Crores. Workmen's trains and ballast trains carrying workmen are passenger trains for this purpose and in the event of a workman getting killed or grievously hurt as a result of an accident to such train, inquiry is obligatory.

However the following type of accidents shall be excluded:

Cases of trespassers run over and injured or killed through their own carelessness or of passengers injured or killed through their own carelessness, and; Cases involving persons being Railway employee or holding valid passes /tickets or otherwise who are killed or grievously injured while traveling outside the rolling stock of a passenger train such as on foot board or roof or buffer but excluding the inside of vestibules between coaches, or run over at a Level Crossing or elsewhere on the Railway track by a train, and Level crossing accident where no passenger or Railway employee is killed or grievously hurt; **unless the Chief Commissioner of Railway Safety or Commissioner of Railway Safety is of the opinion that the accident requires the holding of an inquiry by the Commissioner of Railway Safety.**

As per this Para, any accident which is attended with loss of life is considered to be serious accident. There are provisions in this para which are qualified by certain conditions which may necessitate statutory inquiry by the Commissioner even if a simple reading of it implies otherwise for example, cases of **trespassers run over and injured or killed through their own carelessness** are not covered under the definition of Serious Accidents where statutory inquiry is obligatory. However a simple interpretation of this Para is that not all cases of trespassers are exempted from being considered as serious accidents because if it is so, simply **"trespassers run over and injured or killed"** would have been written without qualifying **"through their own carelessness**".

A logical corollary to this interpretation would be that cases of trespassers run over, or injured, or killed because of carelessness of Railway employees are **not exempted** and very much covered within the classification of "serious accidents". However, this can only be ascertained after an inquiry whether people got killed or injured because of carelessness of Railway employees or not. Under this provision, even accidents involving death which prima facie appear to be excluded from the purview of CRS inquiry may qualify as one and therefore, many such accidents are inquired into by the Commissioners from time to time.

3.3.2 When shall the Commissioner stop or discontinue his inquiry?

Whenever the Central Government appoints a Commission of inquiry under the Commission of Inquiries Act, the CRS shall discontinue his inquiry.

3.3.3 Procedure when Commissioner is unable to hold an inquiry:-

When a CRS is unable to take up an inquiry, he is required to inform CCRS of the reasons as to why the inquiry cannot be done by him. In

such a case, CCRS can himself conduct the inquiry or direct another CRS to inquire into the accident or the inquiry can be entrusted to the Railway itself, which will then appoint a Committee of Railway Officers to inquire into the accident. The Committee's inquiry report is submitted to the CRS, who scrutinizes it and in case he agrees with findings, forwards it to the CCRS. In case CRS disagrees with the findings, he returns the enquiry report with his observations to Railways for review.

3.3.4 Procedure for conducting a Statutory Inquiry:-

On receipt of the intimation of occurrence of a serious accident from the concerned Railway, CRS notifies his intention to hold an inquiry and at the same time, fixes and communicates the schedule date, time and place of inquiry. A formal notice of inquiry is sent to the concerned Railway with copy to the CCRS, Railway Board and the Secretary, Civil Aviation. He also asked the concerned railway to make arrangement for his visit to the accident site at the earliest possible time. Notice of inquiry is also published in Newspapers to invite public to give evidence in the inquiry in person or through written communication to the CRS. Officers of the local Magistracy and police are also notified of the dates, time and place of the inquiry. Accordingly, the CRS inspects the accident site along with the Railway Officers and thereafter conducts the statutory inquiry.

3.3.5 Scope: -

CRS holds inquiries into the accidents with a view to ascertain the causes of the accident. Investigations are also carried out into the question, whether prompt and adequate steps were taken by the railway administration for relief measures such as provision of first aid, medical treatment and refreshments to passengers, evacuation of injured passengers and other facilities like arrangements for trans-shipment of passengers for completion of their journey to destination by running of duplicate trains etc.

Based on his inquiry, the CRS makes recommendations:

- to prevent the recurrence of such accidents,
- to lay down new rules or modifying existing rules of working for safe working,
- to improve standards of signaling for safe train operation,
- to improve standards of maintenance of signaling, track, bridges, rolling stock etc,
- for speedy restoration of traffic,
- for prompt relief measures and other passenger amenities etc.

He also comments on matters, observed by him during the course of his inquiry, which may not have any direct bearing on the cause of the accident under investigation, but which may, in some cases, affect the safe working of the railway and lead to accidents.

3.4 INQUIRIES OF SERIOUS TRAIN ACCIDENTS IN 2020-21

3.4.1 During the year 2021-22, only 02 serious accidents (on Indian Railways) were inquired by the Commissioners.

Brief details of these 02 accident inquiries entrusted to commissioners in 2020-21 is given in Appendix - I. 14 recommendations were made in these 02 inquiry report of the accident of 2020-21. The two accidents are as follows:-

(a) Para 1 of Appendix-I Derailment of Good Train No. N/NTPB UP at Km. 841/37 on Joint line between Venkatnagar & Nigaura Stations on Bilaspur - Shahdol section of Bilaspur Division of South East Central Railway on **09.07.2021.**
No passenger casualty/injury occurred as a result of the accident.

(b) Para 2 of Appendix-I Derailment of Train no. 15633 (Bikaner - Guwahati Exp) in Alipurduar Div of Northeast Frontier Railway on **13.01.22.**
As a result of the accident 10 persons were killed, 22 were grievously injured & 23 sustained Simple Injuries.

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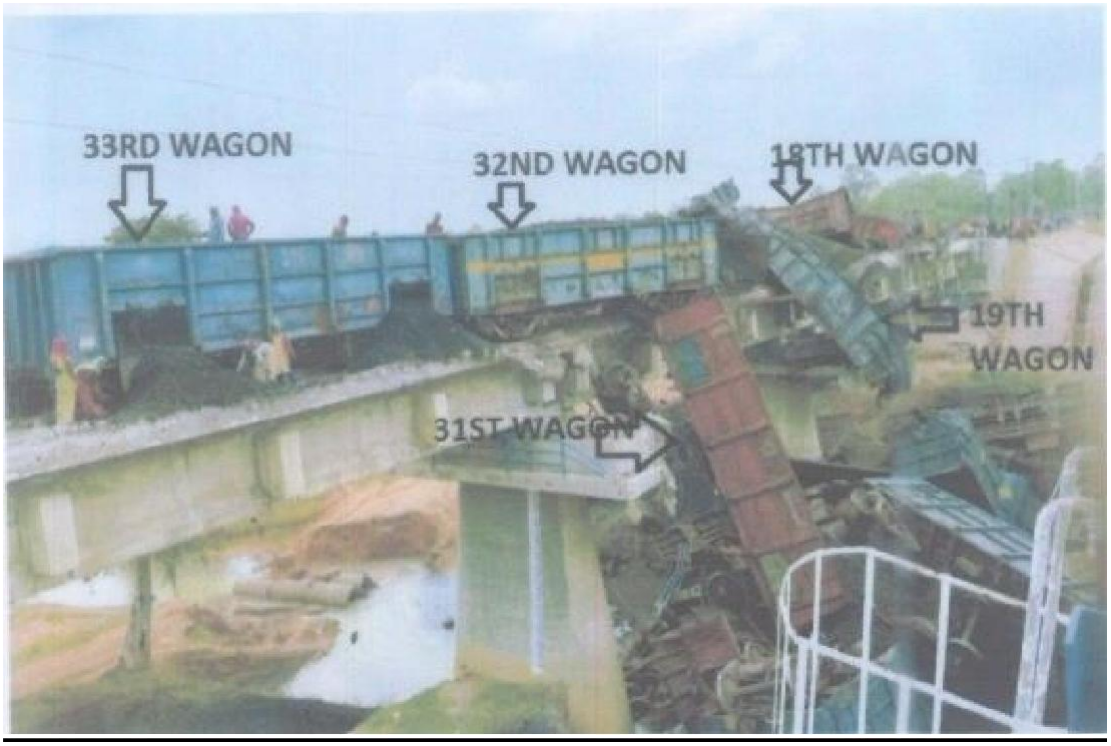
Derailment of Good Train No. N/NTPB UP at Km. 841/37 on Joint line between Venkatnagar & Nigaura Stations on Bilaspur-Shahdol section of Bilaspur Division of South East Central Railway on 09.07.2021.



Derailment of Train no. 15633 (Bikaner - Guwahati Exp) in Alipurduar Div of Northeast Frontier Railway on 13.01.22.

CHAPTER-IV

ANALYSIS OF TRENDS OF ACCIDENTS

4.1 ACCIDENTS:

The term 'accident' means an accident for which a notice is required to be issued by Railway administration under section 113 of The Railways Act, 1989. Relevant part of section 113 is reproduced below:-

"(1) Where, in the course of working a railway,-

(a) any accident attended with loss of human life, or with grievous hurt, as defined in the Indian Penal code(45 of 1860), or with such serious injury to property as may be prescribed; or

(b) any collision between trains of which one is a train carrying passengers; or

(c) the derailment of any train carrying passengers, or any part of such train; or

(d) any accident of a description usually attended with loss of human life or with such grievous hurt as aforesaid or with serious injury to property; or

(e) any accident of any other description which the Central Government may notify in this behalf in the Official Gazette.

occurs, the station master of the station nearest to the place at which the accident occurs or where there is no station master, the railway servant in charge of the section of the railway on which the accident occurs, shall, without delay, give notice of the accident to the District Magistrate and Superintendent of Police, within whose jurisdiction the accident occurs, the officer in charge of the police station within the local limits of which the accident occurs and to such other Magistrate or police officer as may be appointed in this behalf by the Central Government.

(2) The railway administration within whose jurisdiction the accident occurs, as also the railway administration to whom the train involved in the accident belongs, shall without delay, give notice of the accident to the State Government and the Commissioner having jurisdiction over the place of the accident."

Train Accidents, under section 113 of the Act, and as per Explanation in Rule (3) of Railway(Notices of and Inquiries into Accidents)Rules,1998, include those railway accidents, which occur in the course of working of a Railway and usually attended with loss

of human life (such as accidents to passenger trains involving collisions, derailments, train wrecking, or attempted train wrecking, cases of running over obstructions placed on line, of passengers falling out of trains or of fires in trains), or grievous hurt as defined in the Indian Penal Code or serious injury to Railway property of the value exceeding two crore rupees which have not actually occurred but which by the nature of the accident might reasonably have been expected to occur; and also cases of land slides or of breach by rain or flood which cause the interruption of any important through line of communication for at least 24 hours.

4.2 SERIOUS TRAIN ACCIDENTS

Accidents, referred to in Section 114 of the Railways Act 1989, are investigated by Commissioner of Railway Safety. This section is reproduced below:

"(1) On the receipt of a notice under Section 113 of the occurrence of an accident to a train carrying passengers resulting in loss of human life or grievous hurt causing total or partial disablement of permanent nature to a passenger or serious damage to railway property, the Commissioner shall, as soon as may be, notify the railway administration in whose jurisdiction the accident occurred of his intention to hold an inquiry into the causes that led to the accident and shall at the same time fix and communicate the date, time and place of inquiry : Provided that it shall be open to the Commissioner to hold an inquiry into any other accident which, in his opinion, requires the holding of such an inquiry.

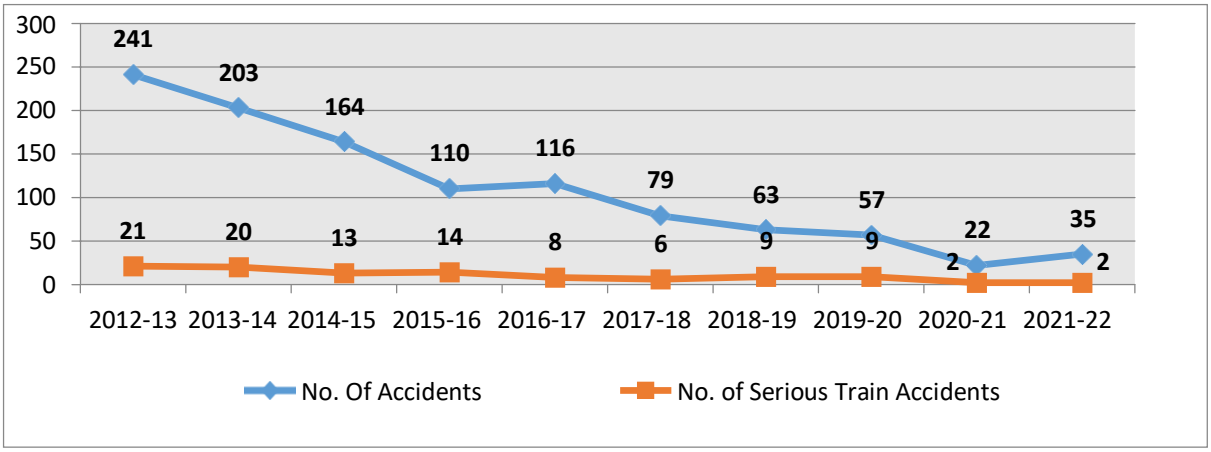
(2) If for any reason, the Commissioner is not able to hold any inquiry as soon as may be after the occurrence of the accident, he shall notify the railway administration accordingly."

In such a situation the inquiry shall be conducted as per the provision laid down under Section 115 of the Railway Act.

4.3 TREND OF TRAIN ACCIDENTS

4.3.1 Total Nos. of train accidents and serious train accidents on Indian Railways investigated by CRS in last ten years is shown in Figure-1.

Figure-1Nos. of Accidents



In the year 2020-21 there was complete suspension of all passenger carrying trains from 22nd March 2020 due to lockdown imposed because of COVID-19 pandemic. There was only partial resumption of some 230 pairs of trains from May-2020 but overall traffic was very low resulting in fewer accidents. The year 2021-22 was also affected by COVID-19 pandemic but unlike previous year there was no complete lockdown. Hence the railway services were not completely suspended. Appreciation of the above graph indicates that:-

- total number of train accidents was increased to 35 in the year 2021-22 as against 22 during the pandemic year 2020-21.
- number of serious train accidents remained same i.e. 02 accidents each in 2020-21 & 2021-22.

4.3.2 The Commission vide its letter no. S.13011/1/2020-RS dated 29.08.2022 sent the statistics of train accidents reported under section 113 for the year 2021-22 to the Railway Board for reconciliation of the figures.

4.3.3 Breakup of passenger and goods train accidents in 2021-22 and 2020-21 is shown in Table 1.

TABLE 1

SN	Description	**2020-21**	**2021-22**
1.	No. of Train Accidents	22	35
2.	No. of Passenger train Accidents	13	21
3.	No. of Goods Train Accidents	09	14
4.	No. of accidents Per million train-Kilometers (Million train-Kilometers as per Ministry of Railways Annual Statistical report)	0.01	0.01

4.4 RAILWAY-WISE TREND OF ACCIDENTS

(a) Number of accidents, which occurred in each zonal railway in the years 2020-21and 2021-22, are shown in Table 2 below:

TABLE 2

SN	Railway	Total number of Train Accidents					
		2020-21			**2021-22**		
		Pass.	Goods	Total	Pass.	Goods	Total
1.	Central	3	1	4	2	1	3
2.	Eastern	0	0	0	1	0	1
3.	East Central	1	0	1	1	2	3
4.	East Coast	0	1	1	1	3	4
5.	Northern	3	0	3	4	1	5
6.	North Central	0	2	2	1	2	3
7.	North Eastern	0	0	0	1	0	1
8.	Northeast Frontier	1	0	1	3	1	4
9.	North Western	0	1	1	1	1	2
10.	Southern	1	0	1	0	0	0
11.	South Central	0	1	1	0	0	0
12.	South East Central	0	0	0	0	2	2
13.	South Eastern	0	1	1	1	1	2
14.	South Western	1	0	1	3	0	3
15.	Western	2	1	3	1	0	1
16.	West Central	1	0	1	0	0	0
17.	Konkan Railway	0	1	1	1	0	1
TOTAL		13	09	22	21	14	35

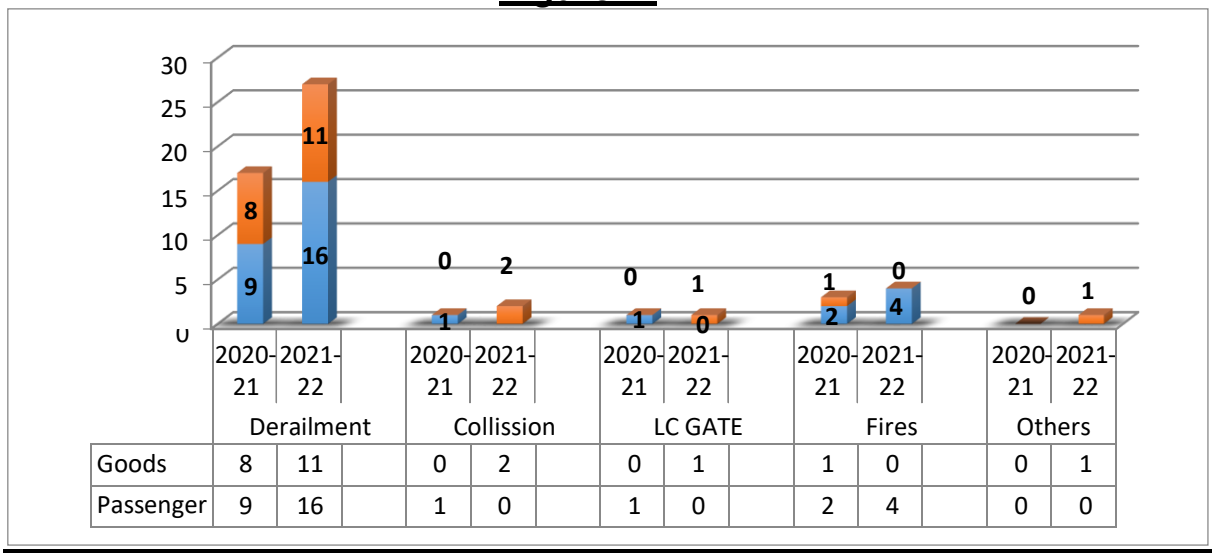
Appreciation of above reveals that:-

- Number of accidents either **reduced or remained same in 05 railway zones** namely Southern, South Central, Western, West Central & Konkan Railway
- Number of accidents **increased in remaining 12 railway zones namely,** Eastern, Northern, North Central, Northeast Frontier, Central, East Central, East Coast, North Eastern, North Western, South Eastern, South East Central & South Western.
- The Number of passenger train accidents increased to 21 in 2021-22 as against 13 in 2020-21.
- The Number of Goods train accidents increased to 14 in 2021-22 as against 09 in 2020-21.

4.5 ANALYSIS OF TRAIN ACCIDENTS

Various types of accidents (on account of derailment, level crossings, collision, fire, other causes) for passenger trains and goods trains for the year 2020-21 and 2021-22 is shown in the form of Bar Chart in Figure-2.

Figure-2.



	Derailment			Collission			LC GATE			Fires			Others	
	2020-21	2021-22		2020-21	2021-22		2020-21	2021-22		2020-21	2021-22		2020-21	2021-22
Goods	8	11		0	2		0	1		1	0		0	1
Passenger	9	16		1	0		1	0		2	4		0	0

Derailments continued to be biggest chunk of train accidents, 77.14% against (27 accidents) in 2021-22 against 77.27% (18 accidents). Number of Fire accidents in 2021-22 were 04 (i.e. 11.42%) while it was 03 in 2020-21 (i.e. 13.63%).

Two accidents occurred due to Collision in 2021-22 which was 5.71% of total accidents while in 2020-21 only 01 accident occurred due to collision (i.e. 4.54% of total accidents). 01 accident was caused on Level Crossing (in both years) which was 2.86% of total accidents in 2021-22 compared to 4.54% in 2020-21.

The year 2021-22 had 01 accident in other category which is 2.86% of total accidents. No accident occurred in this category in the year 2020-21.

4.6 CAUSE-WISE ANALYSIS OF VARIOUS TYPES OF TRAIN ACCIDENTS

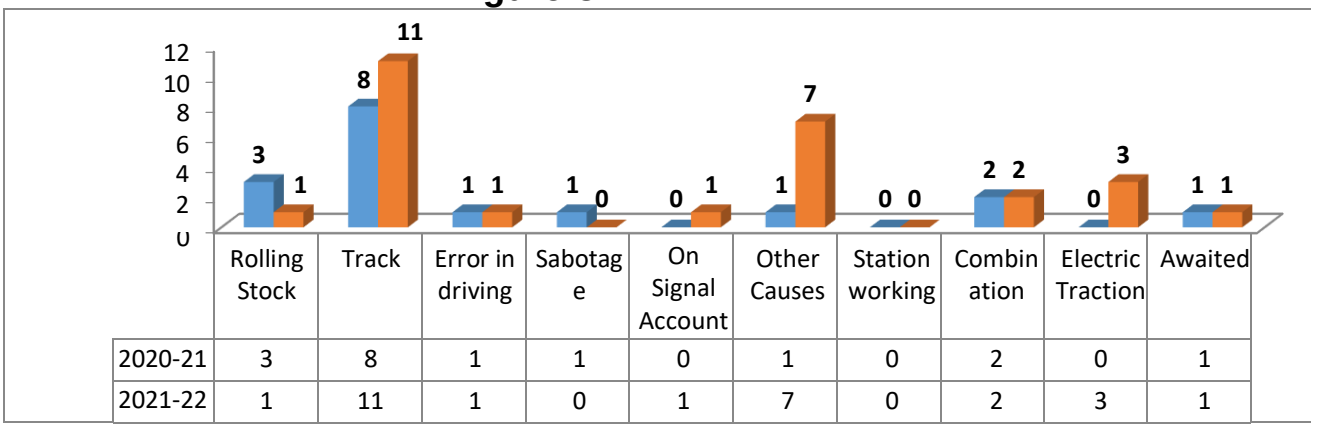
4.6.1 DERAILMENTS

Numbers of derailments were as follows:-

2021-2022 27 (Passenger-16, Goods-11)
2020-2021 17 (Passenger-09, Goods-08)

Cause-wise analysis of derailments in the years 2021-22and 2020-21 is shown in Fig.3

Figure-3



	Rolling Stock	Track	Error in driving	Sabotage	On Signal Account	Other Causes	Station working	Combination	Electric Traction	Awaited
2020-21	3	8	1	1	0	1	0	2	0	1
2021-22	1	11	1	0	1	7	0	2	3	1

There were total 27 derailments, in notified train accidents. The cause wise analysis/break up of derailments is as follows:

- 11 derailment were due to Track/P. Way defects.
- 7 derailments occurred due to other causes.
- 3 derailments occurred due to Electric Traction relates issues.
- 2 derailments occurred due to combination of errors.
- 1 derailment, each occurred due to Rolling Stock, error in driving, error in Signalling & cause of 01 derailment is still awaited

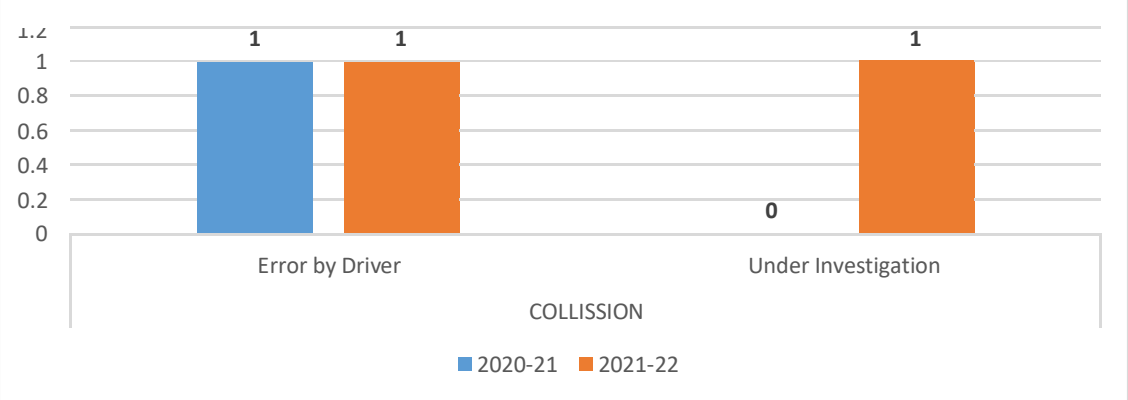
4.6.2 COLLISIONS

Numbers of collisions was as follows:-

2021-2022 02 (Passenger-00, Goods-02)
2020-2021 01 (Passenger-01, Goods-00)

Figure 4 shows cause-wise analysis of collisions during 2021-22 and 2020-21

Figure-4



02 accidents occurred due to collision out of which 01 is under investigation while another was caused due to error by driver.

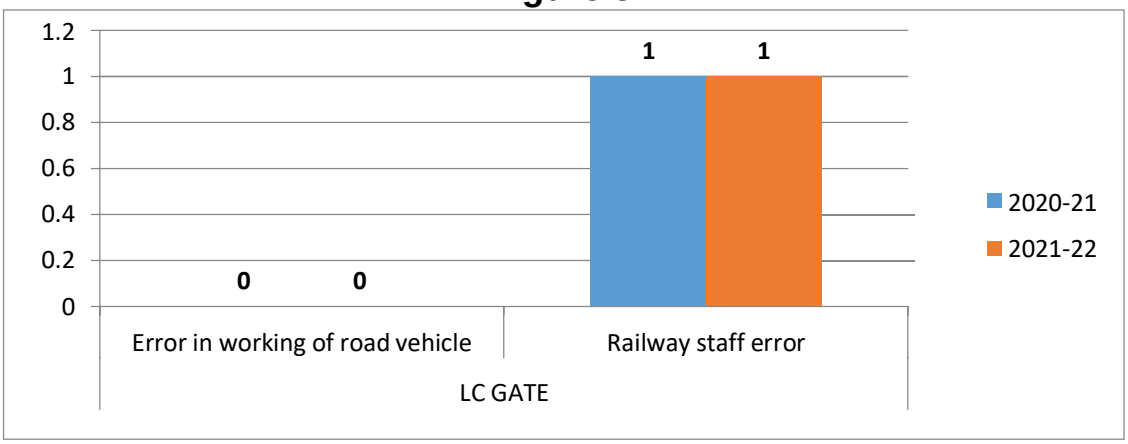
4.6.3 ACCIDENTS AT LEVEL CROSSINGS

Numbers of level crossing accidents were as follows:-

2021-2022 01 (Passenger-00, Goods-01)
2020-2021 01 (Passenger-01, Goods-00)

Cause-wise analysis of train accidents at level crossings in the years 2020-21 & 2021-22 is shown below.

Figure 5



Only 01 Level Crossing Accidents was notified during the year which occurred on Level Crossings due error by Railway Staff

4.6.4 FIRES IN TRAINS

Numbers of Fire cases are as follows:-

2021-2022 04 (Passenger-04, Goods-00)
2020-2021 03 (Passenger-02, Goods-01)

Figure 6 shows cause-wise analysis of fire accidents in trains during 2021-22 and 2020-21

Figure 6

This year 04 accidents of fire occurred in the train which were caused due to Error by Passenger/outsiders.

4.7 TRAIN ACCIDENTS DUE TO HUMAN ERROR

4.7.1 No. of train accidents and contribution of human error (by Railway staff as well as other than Railway Staff) during the year 2021-22and2020-21 is shown in Table 4:-

TABLE – 4

SN	Item	2020-21	2021-22
1.	No. of train accidents	22	35
2.	No. of train accidents due to error in working of Railway Staff.	13	15
3.	No. of train accidents due to error in working by persons other than Railway Staff.	03	4
4.	No. of train accidents due to error in working by persons (2+3)	16	19
5.	% of train accidents due to error in working of Railway Staff (2÷1)	59.09%	42.86%
6.	% of train accidents due to human error (Both Railway and other than Railway Staff) (4÷1)	72.72%	54.28%

4.7.2 Percentage of train accidents, attributable to error in working by Railway Staff is 42.86% in the year 2021-22 against 59.09% in the year 2020-21. The error caused due to human failure, comprising both Railway Staff as well as other than Railway Staff such as road users, passengers, miscreants etc. was responsible for 54.28% of train accidents for the year 2021-22 against 72.72% of train accidents in the year 2020-21.

4.8 TREND OF SERIOUS TRAIN ACCIDENTS.

4.8.1 Total number of train accidents, serious train accidents including those resulting in fatalities of passengers (including Railway Staff), travelling in trains (as distinct from other fatalities, such as, those occurring among trespassers, Level Crossing Road users etc) for last 5 years are compared in Table 5 below:

TABLE 5

SN	Year	No. of accidents	No. of serious accidents	No. of accidents resulting in passenger fatalities	No. of fatalities including railway crew & outsiders
1	2017-18	79	06	03	26
2	2018-19	63	09	08	25
3	2019-20	57	10	00	12
4	2020-21	22	02	00	04
5	2021-22	35	02	02	17
Average for 5 years		**51.2**	**5.8**	**13**	**16.8**

4.8.2 Number of accidents resulting in passenger (& other) fatalities has come down in this period of five years from 2017-18. In the year 2021-22, 17 person died which includes passenger, railway staff and outsiders.

4.8.3 Total numbers of serious train accidents inquired by the Commission was same i.e. 02 accidents in both 2021-22 and2020-21. In 2021-22, number of fatalities increased slightly to 17 as against 04 in the year 2020-21.

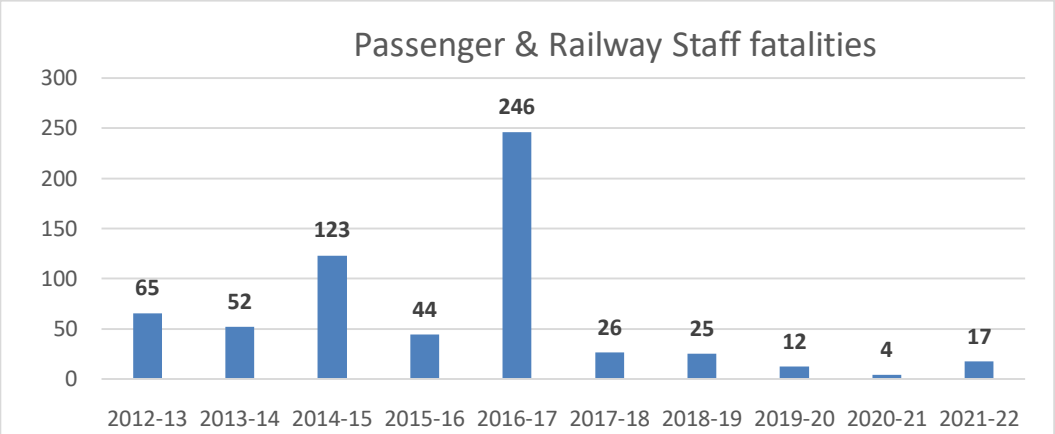
4.8.4 Number of accidents has increased slightly to 35 in the year 2021-22 as against 22 during the year 2020-21. The number of serious train accidents has remained same (02 accidents) in the year2021-22 and 2020-21.

4.9 FATALITIES IN TRAIN ACCIDENTS

Nos. of fatalities in train accidents in last ten years are shown in figure-7.

Figure – 7

Passenger fatalities, including Railway Crew, outsiders etc. in Train Accidents



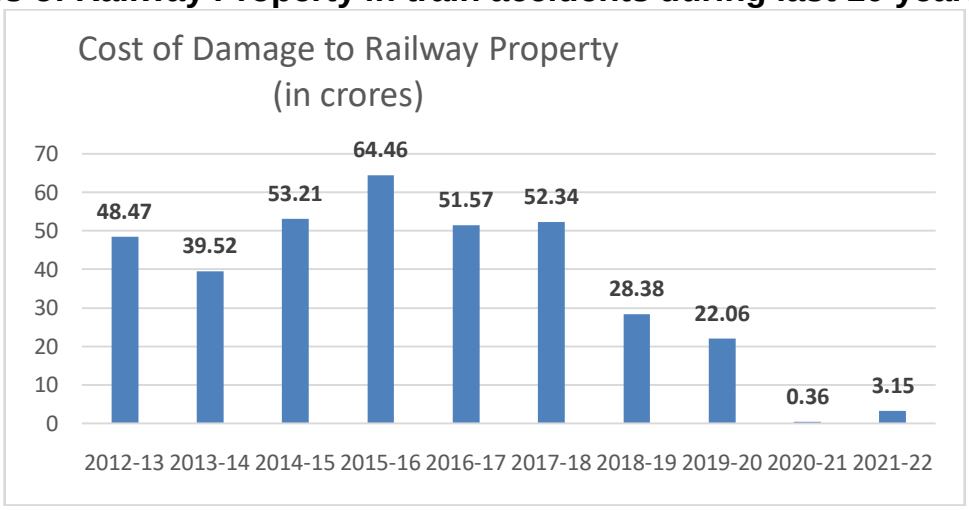
In 2021-22, the number of fatalities in train accidents increased to 17 against 04 during the year 2020-21.

4.10 LOSS OF RAILWAY PROPERTY IN ACCIDENTS

Estimated cost of damages to Railway property resulting from train accidents during last ten years are given in Figure-8.

Figure – 8

Loss of Railway Property in train accidents during last 10 years



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CHAPTER – V

STATUS OF RAILWAYS' RESPONSE ON ACCIDENT INQUIRY REPORTS

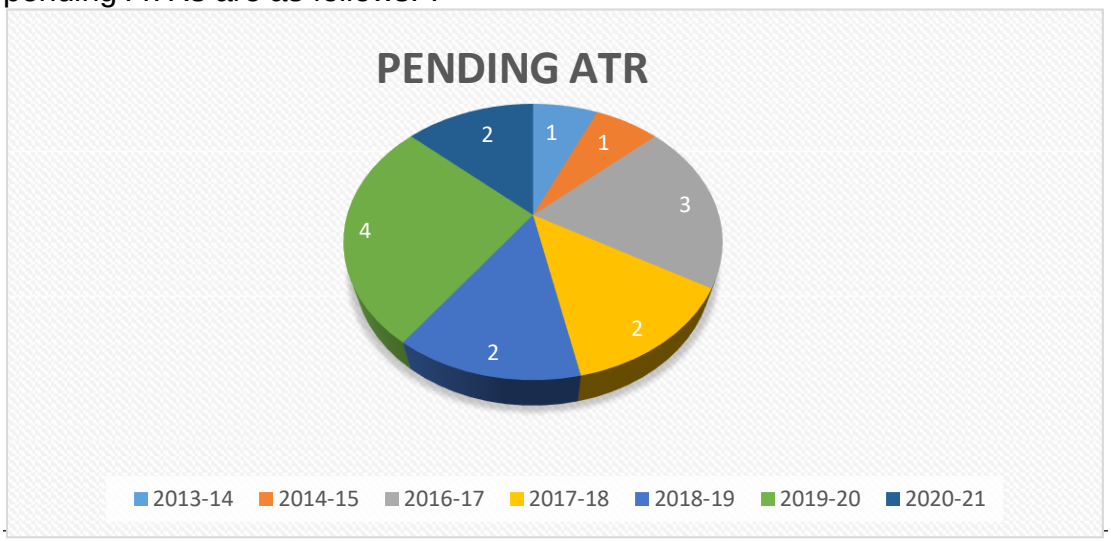
At the end of year 2021-22, 14 Action Taken Report from Ministry of Railway was received and response was awaited on balance **fifteen** reports. The oldest such inquiry report is of an accident which occurred in the year 2013-14 which is long overdue. The breakup of these pending reports (from year 2013-14 and till the end of 2020-21 are as follows:

Table 6

Accident occurring in the Year	No. of Accident Inquiry reports whose ATR*is received from Railway Board		No. of Accident Inquiry reports of that year whose ATR is Pending
	Received	No. of Recommendations	
2013-14	Nil	Nil	1
2014-15	Nil	Nil	1
2015-16	2	11	0
2016-17	3	42	3
2017-18	1	12	2
2018-19	4	41	2
2019-20	4	37	4
2020-21	Nil	Nil	2
Total			**15**

*Action Taken Report by Ministry of Railway on accident inquiry report submitted by CsRS.

There is generally delay in communication of ATR by Ministry of Railways on the recommendation made by CRS in their inquiry reports. The report of the oldest accident of 2013-14 was submitted to Railway Board in December-2014. However, the same is still pending. The year wise details of pending ATRs are as follows:-.



Based on their inquiry into various aspects of the accidents, Commissioners have made a total of 135 recommendations in their final Accident Inquiry Reports which are still pending with the Railway Board.

During the year 2021-22, two (02) accident enquiries were entrusted to the Commissioners. However, the final inquiry report of these two accidents are still in process of completion. Apart from that, 01 accident inquiry reports of the accident occurred in the year 2020-21was also forwarded to Railway Board in this year (viz. 2021-22). Nine (09) recommendations were made in this inquiry report. There is always some backlog in receipt of 'Action Taken Report' from the Ministry of Railways. The issue of non reporting of ATR/status of the recommendations to the commission has been raised regularly during the coordination meetings. Ministry of Railways has mentioned that administration/implementation of the provisions connected with the Safety of train operation requires deliberation at various levels, hence the delay.

Some of the important recommendation which were not accepted by the Railways in the ATRs received in the year 2021-22 are as follows:-

In the Incident of falling of passengers from train no. 40518 up EMU of Chennai division of Southern Railway on 23.02.2017, following recommendations were not accepted by railway:-

a) Provision of signals with gantry arrangement can be thought of as a long term solution for the signals between 'A' and 'B' lines.

b) Automatic door closing system with proper air flow may be provided in EMU coaches in future

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CHAPTER VI

SOME ISSUE CONCERNING SAFETY ON INDIAN RAILWAY

Indian Railways has given huge impetus for improvement in Railway Infrastructure like substantial increase in track renewal, introduction of modern coaches, making corridor blocks mandatory besides improvement in signaling. As a result of these activities, there has been substantial reduction in reported accidents during last five.

6.1 Safety is accorded the highest priority by Indian Railways and all possible steps are undertaken on a continual basis which includes up-gradation of technology to aid safe running of trains. A well-established safety management system is existing which identifies Safety hazards and unsafe practices in the railway operation so that corrective action can be initiated much before occurrence of a disaster. Instructions have been issued from time to time to inculcate safety habits amongst all railway employees.

The trend of accidents over Indian Railways shows a decline but the rising graph of Passenger carrying train derailment is a cause of concern. The Commission of Railway Safety has communicated to the Ministry of Railways certain focus areas which require urgent attention to improve overall health of Railway safety. These include replacement of over-aged assets, elimination of manned level crossings, adoption of suitable technologies for up-gradation and maintenance of track, rolling stock, signaling and interlocking systems, safety drives, greater emphasis on training of officials and inspections at regular intervals to monitor and educate staff for observance of safe practices.

These issues were highlighted to the Ministry of Railways through:

a. Recommendations of the Commission of Railway Safety based on inquiry of serious accidents. Some important Recommendations are covered in Chapter-IV.
b. Suggestions given from time to time regarding critical safety issues based on the observations made during various inspections.
c. Inspection Reports of newly opened Railway Lines, Electrification of existing Railways Line and introduction of new rolling stock.
d. Coordination Meetings with Railway Board.

Some of the Safety Issues are discussed in detail in the subsequent paragraphs.

6.2 Safety Issues highlighted by the Commission during various interactions with Railways:

PROPER LAYING IMPROVED SEJ (RDSO-T/6902) WITH SINGLE GAP

Improved SEJ with Single Gap (RD -T/6902), are now being laid at maximum locations on Indian Railways. During inspections, it was observed that tongue rail is laid in the facing direction of the traffic irrespective of the side of availability of LWR as per the present directives. Normally, SEJs are inserted just outside the top point of the yard or on approach of bridges and LWR is available only on one side of SEJ while the other side is SWR due to points and crossing or bridge. In such cases also Railways are providing tongue rail on the SWR side as per direction of traffic. Under such scenarios, adjustment for elongation of LWR due to temperature variation is not possible as stock rail is available on LWR side. Elongation and contraction of LWR, in such cases, may lead to buckling of LWR on of stock rail side or tongue rail coming out of chair seat. To overcome this problem, it is suggested to Railway Board that

while laying Improved SEJ with single Gap (RDS0=1/6902), tongue rail must be kept invariably on the LWR side irrespective of direction of traffic. However, in case of LWR on both the sides of SEJ, the existing practice of laying tongue rail in facing direction may be continued. Commission has already suggested to issue necessary instruction in this regard vide letter dated 09.08.2021.

CONSTRUCTION OF NEW BRIDGE DURING DOUBLING

During inspection it was noticed that single line bridge is constructed for new double line. It results in reverse curves & extra earth work due to large track center. Many existing bridges are also not suitable for higher axle load. Railways should plan temporary diversion (fit for 75kmph) for existing bridge location. Thereafter, double line bridge should be constructed suitable for 25T axle load at same place after dismantle existing bridge.

Cost of double line bridge is 40-50% less than two single line bridges. With such arrangement, alignment of the track will remain same without any reverse curves and less earth work will be required as track center remain same throughout

INSTALLATION OF TRACK LEAD JUNCTION BOX IN STATION YARD

During statutory inspections, it has been observed that for track circuiting in yard, Track Lead Junction Box (TLJB) have been provided in station yards at random height & distance and without foundation. Such TLJBs are prone to failure of track circuit during monsoon seasons due to short circuiting in water logged area. In addition, it affects the working of Ballast Cleaning Machine (BCM) in yard. Many times, TLJB and hidden bond wires are damaged during BCM working due to close proximity with the track. On straight track, the ballast for a minimum width of 5.35m Is provided on BG route of IR. Cutter bar of sizes 1900 mm and 2150 mm are used in BCM for achieving cutting width of 4030 mm and 4280 mm. Hence for effective working of BCM in station yards, TLJB should be provided clear of ballast.

As per Drg no. 17-D1 of IRSEM 2021, TLJB to be provided at 1500mm from the nearest track. There is no mention of foundation and height of TLJB with reference to rail level. Such TLJB are susceptible to track circuit failure as detailed above. Commission is of opinion that TLJBs should therefore be provided at 2.3m from nearest track and erected 100mm above rail level with proper foundation upto rail level to avoid track circuit failure during monsoon, protect signal cable during machine working and ease in disconnection / reconnection of bond wires during machine working.

FABRICATION OF STEEL BRIDGE GIRDERS BY BRIDGE WORKSHOPS

During various statutory inspections of Railway projects, it has been observed that the fabrication quality of steel bridge girders fabricated by bridge workshops of Railway is far better than the quality of bridge girders being fabricated through trade. Understandably, the reason could be long experience of bridge workshops in fabrication of Railway bridge girders.

It is understood that Railway Board has already issued instructions to preferably opt for fabrication of bridge girders from Railway workshops only. Since, fabrication of Railway steel bridge girders is still being outsourced, Commission is of opinion that it would be in fitness of things, if unambiguous instructions in this regard are reiterated / reinforced to all CAO/C(s) and MD(s) / RVNL / IRCON.

AMs COMMITTEE ACCEPTANCE OF SUGGESTIONS BY COMMISSION

CCRS was invited by the then Hon'ble MR to present the views of the Commission regarding Safety improvements required in various fields in the Railway system. Based on the suggestions given by CCRS, Hon'ble MR directed to form a committee of Additional Members to examine the recommendations and their implementation. It is satisfying to note that almost all suggestions given by CCRS have been accepted by AM's Committee.

IMPROVED STANDARD YARD LAYOUT DESIGN WITH MID LINE AS COMMON LOOP

Guidelines for Standard yard layout design have been issued by Planning and Signal Directorates for different stations on single & double line sections of IR. Similarly, standard layout for longer loops has also been circulated for guidance of zonal railways. However, in all such layouts, the issue of 15 kmph speed limit for trains for safely negotiating second or subsequent loops or 2nd crossover for common loop on double line section is a persistent limitation hampering high speed potential on all such routes. In order to overcome this handicap, it is suggested to issue directive for sandwich type common loop layout at stations wherever common loop is required on sections going for doubling or multiple line works in future. The advantages of this layout are as follows:

1. **No criss-cross movement** for reception of trains on Common loop.
2. **30 kmph speed potential** on all loops including the Common loop.
3. **Saving of 20-22 minutes** by avoiding cross movement for reception of trains on common loops.
4. **Improved safety** due to movement of trains negotiating fewer points.
5. **Enhanced sectional capacity** without additional input.
6. Common loop can be converted into long loop for handling long haul trains.
7. Operational flexibility & improved train handling capacity etc.

Such a layout design with common loop sandwiched between the two Main Lines will provide improved train handling capacity without any additional cost and it does not have any detrimental effects on safety because cut across movement is avoided. Simultaneous movements of trains will become possible without any safety hazards. It is also pointed out that the slight curve required on one Main line to accommodate such a loop between the two Main lines will not cause any negative impact on speed potential of through running trains. Moreover, at the time of doubling, such a layout will facilitate continued utilization of existing platforms on the single line section stations thereby reducing expenditure on such projects considerably. Other lines like sidings etc. may be added by Railways as per requirements.

In view of the above advantages with improved safety scenario, Commission advocates for implementation of yard layout with sandwich type common loop at all feasible locations in doubling projects under sanction.

MEASURES TO IMPROVE SAFETY AND RELIABILITY IN TUNNELS:-

A. Track Structure in Tunnels

The construction of Jiribam — Imphal new line project is under way in Northeast Frontier Railway. The total length of project is 110.625 Km out of which 62.80 Km (56.8%) is in tunnels. The longest tunnel is tunnel no 12 which is 10275m long. NF railway has now decided to provide ballasted track in the tunnels.

The maintenance of ballasted track in Jiribam — Imphal project inside tunnels will impose serious challenges on maintenance of track not only due to limited work space but also adverse environment condition inside the tunnel and ingress of water, which will result in faster deterioration in track parameters and track components viz the rubber pad and ERC with serious consequence to safety. Some of the periodical maintenance activities such as deep screening of ballast will not be feasible and will require suspension of traffic for long duration which is unworkable and impractical. The packing of track and retentivity will also be affected on account of ingress of water in ballast. Therefore, Commission has suggested Railway Board that the decision to provide ballasted track in tunnels should be reviewed and all tunnels should be provided with ballastless track on maintainability and safety considerations.

B. Rigid Overhead Catenary system (ROCS) in the tunnels

During expansion of Railway Network, long tunnels are required to be made for laying of track. As now all lines will be electrified railway line, required tunnel size is more due to provision of OHE (over head equipment) for electric traction. Commission has suggested that feasibility of provided Rigid Overhead Catenary system (ROCS) as provided in the tunnels of DMRC and other underground metros may be studied. Advantage of ROCS over conventional flexible OHE are as under –

- Lesser tunnel diameter as there is no separate catenary and no need for encumbrance.
- Less manpower requirement for maintenance as almost maintenance free system
- More contact wire wear permitted without risk of breaking-off as mechanical stress in the contact line is almost nil
- Higher current carrying capacity
- Much Higher reliability
- Less commissioning time
- Side pathway for passenger evacuation and maintenance staff
- Designs are available for speeds upto 140 kmph

Some of the photograph of ROCS are shown below:-



Although initial cost of ROCS is higher than the conventional Flexible OHE system, but saving in construction of tunnel and maintenance substantially higher than the initial cost.

OTHER MEASURES TO IMPROVE SAFETY:-

(a) Distributed Architecture EI:

Electronic Interlocking with distributed architecture should be provided at stations irrespective of number of routes. It has many advantages like

- saving of copper cable,
- system availability due to redundancy,
- reduced Electromagnetic Interference (EMI) due to OFC cable and
- reduction in maintenance effort, cable meggering & theft of copper cable.

(b) Axle Counters with Clamp type arrangement:

Axle counters having clamp arrangement with rail should be provided which has many advantages like:

- No need of drilling hole in the Rail.
- Wheel sensor size is very compact
- Separate cable not required for Trans and Receive.
- Same quad for both functions.
- 5m/15m molded cable
- No earthing at site is required
- Height is adjustable w.r.t. Rail Head
- Reliable as no electronics at site

(c) Provision of Gantry Signal:

This is an important item for safety in train operation. In area where visibility of signal is restricted due to any reason like multiple lines, or less center track distance etc., Gantry type signalling as per GR must be designed and provided as more and more number of 3rd and 4th lines will be commissioned in near future.

(d) Reduction in variants of various wagons running over IR

At present, about 3.46 lac wagons are running over IR, DFC & Konkan Railway out of which 2.98 lacs are owned by IR while the rest are privately owned or used by Ministry of Defence, Ministry of Power etc. Presently, there are about 85 variants of different type of wagons taken all together.

Such large number of wagon variants cause various problems in field both from maintenance as well as operation point of view. The depots and workshops are required to stock more no of items, depending upon the types of wagons being maintained, leading to high inventory cost. ***Further, due to very high inventory of same items with different characteristics, there are chances of intermixing or wrong fitting of items which may create unsafe running***. On the other hand, when different types of wagons of the same category having different speed potential form a rake, its speed is determined by the wagon having lowest speed potential causing underutilization of the wagons having higher speed potential. ***In case one or***

two such low speed wagons are inadvertently ignored by Railway staff, then such wagons may have serious repercussion when run at higher speed.

C**ommission is of the opinion that that following measures should be taken by Railways immediately:**

(i) RDSO/Board to identify the **"Best in Class"** wagon in each category based on maximum axle load & speed potential in empty/loaded condition. Once identified, only these wagons shall be manufactured in future for use by all stakeholders. For example **BOXNHL & BLCM** wagons fulfill the "Best in Class" criteria for Open & Container wagon category respectively.

(ii) All the wagons having lower axle load/speed potential may be upgraded by optimizing suspension or changing bogie during POH.

(iii) Zonal Railways should run only "**pure rakes**" i.e rakes having all the wagon with same axle load & speed potential with **twin pipe braking system** to utilized the available infrastructure in a best possible manner.

(iv) Introduction of new type of Wagons should be introduced only with cogent commercial justification.

(e) Fire Safety Concerns in trains running in IR system.

Cases of fire in Railways still remains an area of concern needing focused attention of all concerned. Recent case of fire incident in a coach of Dehradun-Delhi Shatabdi Express in Moradabad Division of Northern Railway on 13th March 2021 is a grave reminder of existing vulnerability of the system.

A serious area of concern regarding Fire safety is ***non availability of Fire Detection and Suppression system in MEMU, EMU trains*** over Indian railway. In Mumbai suburban system, EMU trains are handling super dense passenger load of about 75 lakh passengers per day. Moreover, MEMU services are growing rapidly due to replacement of erstwhile passenger trains with the fast pace of Railway electrification. In this light, the concern regarding fire safety of passenger gets critical when the non-availability of any Fire Alarm cum Suppression system in EMU, MEMU rakes gets combined with the fact that the speed of MEMU trains is now being sanctioned at higher speed of 110 kmph unlike the earlier slow speed of passenger trains.

In order to address the Fire safety concerns in Trains, particularly in EMU/MEMU trains, Commission would like to make following observations/recommendations for the attention and implementation of the Ministry of Railways to ensure safety of public travelling in these trains on IR :

(i) MEMU as well EMUs are <u>NOT</u> equipped with any Heat & Smoke detectors in passenger area. These need to be installed with interface with MCP (Main Control Panel) which should get 'switched Off' on detection of smoke thereby disconnecting power supply instantly to avoid spread of short circuit fire etc.

(ii) Smoke cum Heat detectors are not also installed in critical locations like 'Electrical cubicles/Panel rooms' in EMU/MEMU trains which are susceptible to fire. Use of

Optical Fiber based Linear heat detector in electrical cubicle and other vulnerable areas can be of immense help in overcoming incident of fires in such locations.

(iii) Fire Load (Fire Heat Release Rate) of MEMU/EMU coaches needs to be critically examined as per NFPA norms. FHRR aims at use of materials in passenger coaches with minimum possible heat release rate.

(iv) Adequacy of electrical cabling and of existing materials being used needs to be confirmed for its compliance to Fire retardant norms. Use of **fire survival cables** in critical circuits needs to be ensured in new as well as old stock.

(v) EN 45545 provides for Fire Detection cum Suppression system in rail based Mass Rapid Transit Systems. In view of likely danger during fire in MEMU/EMU coaches having large number of daily commuters, it is considered essential to equip all trains with Automatic Fire Suppression system to not only help in timely detection of fire at incipient stage but also to ensure prompt control/suppression of fire without human interface thereby saving precious lives.

(vi) It is noted that Fire extinguishers are available only in the motorman/guard cabs at both ends. Moreover, the efficacy of fire extinguisher is limited as it normally gets exhausted within 45 seconds so there is need of strengthen the protection system. Till such time Fire Suppression system is provided, there is urgent need to provide Fire extinguishers @ two per passenger car in MEMU/EMU trains with suitable caution boards for direction to public regarding its use in case of emergency.

(vii) Similar to Metro system dealing with mass transit, passenger egress study needs to be conducted to ensure safe evacuation of passengers in minimum time from affected coaches.

(viii) It is recommended that Fire Safety Audit of EMU/MEMU trains and Mail/Express trains on sampling basis in IR system should be done to identify weak areas and suggest remedial measures with a view to avoid occurrence of any serious fire incident in future.

(ix) CCTV cameras with recording facility should be provided in all coaches in all trains. Storage Device for such recordings should be made like Blackbox of Airplane so that these are not damaged in case of Fire etc. Location of these storage devices may be suitably placed in under frame which is rarely damaged in fir cases.

(f) Engineering Solutions to overcome restricted headroom constraints in RE works:

There are number of ROBs situated within station limits which have residual life balance but have constraints of adequacy of Headroom clearances needed for 25 KV new RE works. Proposal seeking condonation is submitted by railway to Commission with interim measures which are at times not adequately safety compliant. Raising of ROB is time consuming exercise as well. To enable completion of RE works as per targets, concept of 'Insulated cantilever arrangement' was experimented at Ajmer pulia ROB near Jaipur station of North Western railway on suggestion of Commission. The special arrangement planned were technically got validated from RDSO after lab test. The arrangement has proven successful and is in operation for the last 1.5 years

and working satisfactorily thus enabling timely completion of Re works and obviating requirement of ROB raising.

Likewise, second solution has been formulated by using 'Half Neutral Sections with bypassed catenary' for such ROBs which are situated in mid-section and have constraints of Head room clearances. This is being adopted as part of temp condonation in ADI division in RE works duly technically validated by RDSO.

(g) Safety enhancement steps for preventing Trespassing in Mumbai suburban:

To minimise Trespassing cases and to save precious lives in suburban network of Mumbai, Commission has persuaded & stressed upon railway to launch 'Mission Zero Death' , identify key works including Social campaigns and complete the same trespassing prone areas on priority mode by sharing periodical position with Commission also. The item was discussed/reviewed by Commission in every Coordination meeting with GM. Railway has responded and taken needful measures on priority.

As a result of such drive, there has been around 35% reduction in trespassing cases over WR in suburban portion in year 2021-22.

(h) Concept of Double discharge platform in Mumbai suburban:

To overcome peak hours public rush constraints, system of 'Double discharge' in Mumbai suburban has been introduced on new FOBs. This enables entry/evacuation of public at double the rate than normal FOBs and thus help in avoiding over-crowding/stampede like situation.

(i) Precautions advised for Double stack container running in windy season:

During review, some cases of wagons of Double stack containers falling on run in windy season particularly at curve locations came to light. NW Railway was followed up by Commission for expediting action such as securing of ATL, periodical checks by zonal team at loading points, imposing SR in heavy winds etc. During the last one year, no case has been reported after these measures and enhanced monitoring started on persuasion of Commission

(j) Unsafe working reported by Commission at Gandhidham station :

A potentially unsafe/unmanned level crossing was noticed during CRS inspection at 'Gandhidham' station yard in ADI division of WR. This unsafe practice was going on unnoticed in system. Railway was stressed upon to take immediate action for either closing it or converting it into manned LC gate for public safety. After follow up, Railway has taken action and this gate has finally been converted into Interlocked gate now thereby resulting in enhanced safety of road user.

(k) Streamline procedure for 'Road vehicles movement cutting across Railway lines' inside Sheds/workshops :

On advice by Commission after incident of hitting of tanker with Light engine inside one loco shed, WR was advised to launch special drive to formulate and streamline procedure for *'Movement of Road vehicles movement crossing Railway lines inside Sheds/workshops'* with safety. This drive has resulted in significant improvement of staff safety inside workshop/shed premises and no unsafe incident has been reported in last one year after the drive.

(l) Revival of system of Mock drills for ensuring use of POMKA in accidents:

It was noticed during CRS inspections that ARME-II or POMKA kept at way side stations on platforms since old era were practically not used and have rarely been used in any accident though doctor is posted in Health units at that station who can carry it by raod.

It was felt that these portable Medical Boxes can reach the accident site by road earlier as compared to ARME Scale-I and help in better rescue operation till ARME reaches the site from divisional Hq. On advice of Commission, railway has re-started mock drills to ensure healthy condition of POMKA kits and also Portable Trolleys have been purchased for quick transportation of POMKA to site at par with Civil ambulances and optimally use stationary ARME Scale-II/POMKA at accident site using road vehicles.

(m) Streamlining procedure to effect proper function of Automatic fire detection & alarm system (AFDAS) in Relay rooms :

Ensuring adequate sensitivity of Sensitivity of Automatic fire detection & alarm system (AFDAS) was an issue and most of the time; it was difficult to test the functionality of Smoke/fire detectors. Railway was stressed by Commission to formulate a standard testing procedure for confirming effectiveness of Smoke/Heat detectors. Accordingly NWR made reference to RDSO and in turn RDSO has issued on 22.12.21 Procedure Order defining testing procedure for smoke/heat detectors duly indicating prescribed limits.

Some of the measures adopted by Indian Railways to bring about overall improvement in safety are as follows:

MEASURES TO IMPROVE SAFETY:-

- **Safety Focus** - to reduce accidents caused by human errors, a multi-pronged approach with focus on introduction of newer technologies, mechanization of maintenance, early detection of flaws, etc. to reduce human dependence in the first place, alongwith upgrading the skills of the human resources were the prime drivers for accident prevention.
- To enhance efficiency and to enhance safety in train operations, **Modern Signaling Systems** comprising of Panel Interlocking/Route Relay interlocking/Electronic Interlocking (PI/RRI/EI) with Multi Aspect Colour Light Signals are being progressively provided. So for 6236 stations (covering about 97% of interlocked Broad Gauge stations) on Indian Railways have been provided with such systems, replacing the obsolete Multi Cabin Mechanical

Signaling System, thus optimizing operational cost involved in its operation as well as enhancing safety by reducing human intervention. Total 366 station have been provided with EI during the financial year 2021-22.

MEASURES TO AVOID COLLISIONS:-

- **Complete Track Circuiting: -**To ensure track occupation verification, Track Circuiting has been completed at about 34668 locations up to 31.03.2022 covering 'A', 'B', 'C', D Special' and 'E Special' route. Total 6319 stations have been provided with complete track circuiting.
- **Block Proving Axle Counter (BPAC):-** To enhance safety, automatic verification of complete arrival of train at a station, Block Proving by Axle Counter (BPAC) is being provided at stations having centralized operation of points and signals. As on 31.03.2022, Block Proving by Axle Counters (BPAC) has been provided on 6003 block sections.
- **Intermediate Block Signaling**: - Provision of Intermediate Block Signaling (IBS) has proved very useful in enhancing line capacity without extra recurring revenue expenditure in form of operating manpower and amenities required while developing and operating a block station. As on 31.03.2022, Intermediate Block Signaling has been provided in 666 block sections on Indian Railways.
- **Automatic Block Signaling**:- For augmenting Line Capacity and reducing headway on existing High Density Routes on Indian Railways, Signaling provides a low cost solution by provision of Automatic Block Signaling. As on 31.03.2022, Automatic Block Signaling has been provided on 3549 Route Km.
- **KAVACH**(Earlier named as TCAS):-Indigenous technology has been developed by RDSO and three Indian manufacturers. Successful trials have been completed on 250 Route Km. Works are in progress on 1200 Route km of section on South Central Railway. It has now been decided to adopt KAVACH as National ATP for implementation on Indian Railways. It shall be provided on High Density Network (HDN) & freight dense Highly Utilized Network (HUN) routes on priority in next 4-5 years. KAVACH has been approved for speed upto 160 kmph. It is also being upgraded to work with Automatic Signalling and Central Traffic Control (CTC) System, thus objectives of line capacity enhancement can also be met.

MEASURES TO IMPROVE SAFETY AT LEVEL CROSSING GATES:-

Level crossings are meant to facilitate the smooth running of traffic in regulated manner governed by specific rules & conditions, Status of level crossings on IR as on 01.04.2022 is as under:

Total Number of level crossings (All Manned) : 18746

Indian Railway has decided to progressively eliminate the level crossings for the safety of Road users and train passengers. During the year 2021-22, 867 Nos. of manned level crossings have been eliminated. All unmanned Level Crossings on Broad Gauge have already been eliminated on 31.01.2019.

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

- **Interlocking of Level Crossing Gates: -**Indian Railways have provided interlocking with Signals at 10854 Level Crossing Gates as on 31.03.2022, to enhance the safety at Level Crossings.

- **Sliding Boom at LC Gate:** - Provision of Interlocked Sliding Boom has become very effective in minimizing disruption to train services when Level Crossing Gates get damaged by road vehicles especially in suburban areas. With provision of Sliding Boom Interlocking, Signalling System continues to function normally with minimum effect on train operation. 6523 Nos. of busy interlocked gates have been provided with Sliding Booms as on 31.03.2022 in addition to lifting barriers and further busy gates are also being progressively covered.
- **Removal of Level Crossing Gates by Road Over/Under Bridges:**
  To improve safety of train operations and reduce inconvenience to road users, level crossings are being replaced by Road Over/Under Bridges/Subways (ROBs/RUBs) in a phased manner based on the quantum of traffic.
  During the year 2021-22, 184 ROBs and 810 RUBs/subway have been constructed under cost sharing, railway cost/accommodation works, Deposit/BOT term and by NHAI over Indian Railway.

BRIDGES – INSPECTION AND MANAGEMENT SYSTEM:-

Modern Bridge Inspection techniques have been adopted, which includes testing by non-destructive testing equipments, under water inspections, monitoring the water level with the help of water level system etc.

As on 01.04.2022, Indian Railway has a total number of 155025 Bridges, out of which 619 bridges are important, 12459 bridges are major and 141875bridges are minor.

During the year 2021-22, a total number of 1541 Bridges are strengthened/Rehabilitated/Rebuilt.

MEASURES TO REDUCE DERAILMENTS:-

- Modern track structure consisting of 60kg, 90 Ultimate Tensile Strength (UTS) rails, Pre-stressed Concrete Sleeper (PSC) Normal/Wide base sleepers with elastic fastening, fan-shaped layout turnout on PSC sleepers, Steel Channel/H-beam Sleepers on girder bridges is used, while carrying out primary track renewals.
- Long rail panels of 260 M/130M length are being manufactured at the steel plant to minimize number of Alumino-Thermit joints in the track.
- Provision of Thick Web Switches (TWS) is planned for all important routes of IR. To expedite provision of TWS, procurement of Thick Web Switches has been decentralized to zonal railways.
- Ultrasonic Flaw Detection (USFD) testing of rails to detect flaws and timely removal of defective rails. Vehicular USFD system has been introduced on Northern Railway, North Central Railway, West Central Railway and Western Railway.
- GPS trackers are being provided on keyman & patrolmen to monitor their movement & to report any unsafe condition noticed by them instantaneously.
- Track management system has been introduced on Indian Railways for development of database and decision support system and to decide rationalize maintenance requirement and optimize inputs.

MEASURES TO IMPROVE SAFETY OF COACHES:-

Indian Railways is taking following steps to further strengthen the safety and reliability of Railway Coaches.

- **Introduction of Automatic Fire and Smoke Detection system in AC Coaches:-**
  To improve fire safety in running trains, Automatic Fire and Smoke Detection System are being provided in AC coaches. The specifications have been upgraded integrating the air brake system in the coaches with the fire and smoke detection system. At present in nearly 9729 AC coaches, this system has been fitted.

- **Fire detection suppression system in Pantry cars and Power cars:-**
  Automatic Fire Detection and Suppression system are being provided in Power cars and Pantry cars. At present 1637 Power cars and 607 Pantry cars are fitted with this system. The work of retro fitment is being carried out progressively. Further, instructions have been issued that the system should be provided in all newly manufactured LHB Power cars and LHB Pantry cars by the Production Units (PUs).

- **Improving fire Retardancy in Coaches:-**
  Coaches are being provided with fire retardant furnishing materials such as Fire retardant curtains, partition paneling, roof ceiling, flooring, seat and berths along with cushioning material and seat covers, Windows and UIC Vestibules etc. The specifications of these items are being upgraded from time to time as a part of continual improvement. In the specification of major furnishing items, now a new parameter related to fire retardancy (i.e. heat release rate) has been introduced as per international norms.

- **Provision of Fire Extinguishers:-**
  Dry chemical powder type fire extinguishers are provided in all Air-conditioned coaches, Second class- cum-guard and luggage van and Pantry cars. Instructions have been issued to Production Units to provide fire extinguishers in all newly manufactured non-AC coaches as well. Provision in existing coaches is also being carried out by Zonal Railways.

- **Large scale proliferation of LHB coaches:-**
  Ministry of Railways has decided for large scale proliferation of LHB coaches which are technologically superior with features like Anti climbing arrangement, Air Suspension (Secondary) with failure indication system and less corrosive shell. These coaches have better riding and aesthetics as compared to the conventional ICF coaches. The Production units of Indian Railways are now producing only LHB coaches from April 2018 onwards. The production of LHB coaches are continually increased during the years. 1469 coaches in 2016-17, 2480 coaches in 2017-18, 4429 coaches in 2018-19, 6277 coaches in 2019-20, 2871 in 2020-21&& 6291 in 2021-22.

- **Progressive use of Air Springs:-**
  For enhancing safety and reliability of passenger coaches, the suspension systems are being redesigned with air springs at secondary stage capable to maintain constant height at variable loads. Air springs have been developed and are being fitted on all the newly built EMUs & DMUs coaches for sub-urban trains. Air springs have now been developed for mainline coaches as well and have been fitted in large scale in newly manufactured coaches. Production Units have been advised to use Air springs in all newly manufacture LHB coaches.

- **Provision of Automatic door closure mechanism in coaches:-**
  Provision of Automatic door closure mechanism has been planned on coaches to prevent accidental falling of passengers from running trains.

- **Provision of Double Acting doors in coaches:-**
  Double Acting door in coaches are two way swing AC compartment doors for easy evacuation of passengers. Such doors need to be provided in the AC coaches so as to improve the fire worthiness and enable passengers to quickly evacuate from the coach in the event of fire.Sanction under the Rolling Stock Programme (RSP) exists for the provision of Double Acting doors in 6500 coaches and the work is being carried out in a phased manner in 4231nos. Of coaches it has been provided. In addition to this instructions have been issued to Production Units that all newly manufactured AC coaches shall be provided with Double Acting doors

OTHER ADMINISTRATIVE MEASURES:-

- **Constant Review of Safety Performance at Board's apex level** - Safety performance is invariably reviewed as a first item on Agenda of Board Meeting at the apex level. All accidents are analyzed in detail so that remedial measures can be initiated.
- **Safety Review meeting with Zonal Railways –** Chairman and Board members have conducted Safety Review Meetings with General Managers and PHODs of zonal railways during their visits as well as through video conference.
- **Intensive Footplate Night Inspections -** Intensive Footplate Inspections including night inspections have been conducted at the level of SAG, branch officers and supervisors in the field.
- **Regular Safety Drives & awareness campaigns –** Safety drives and awareness campaigns have been launched from time to time, covering the lessons learnt from recent train accidents so as to prevent similar accidents in future.

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APPENDIX-I

DETAILS OF SERIOUS RAILWAY ACCIDENTS INQUIRED INTO BY COMMISSIONERS OF RAILWAY SAFETY DURING THE YEAR 2021-22

1. Derailment of Good Train No. N/NTPB UP at Km. 841/37 on Joint line between Venkatnagar&Nigaura Stations on Bilaspur-Shahdol section of Bilaspur Division of South East Central Railway on **09.07.2021.**

A)	CAUSE	:	FAILURE OF EQUIPMENT (Track)
B)	CASUALTIES (Passengers)		
	KILLED	:	00
	GRIEVOUS INJURY	:	00
	SIMPLE INJURY	:	01
C)	COST OF DAMAGES TO RAILWAY PROPERTY	:	43,639,930/=
D)	NO. OF RECOMMENDATIONS MADE BY THE COMMISSIONER	:	10

2. Derailment of Train no. 15633 (Bikaner Guwahati Exp) in Alipurduar Div of NF Railway on 13.01.22.

A)	CAUSE	:	FAILURE OF EQUIPMENT (Locomotive)
B)	CASUALTIES		
	KILLED	:	10
	GRIEVOUS INJURY	:	22
	SIMPLE INJURY	:	23
C)	COST OF DAMAGES TO RAILWAY PROPERTY	:	Rs 7,15,50,000/-
D)	NO. OF RECOMMENDATIONS MADE BY THE COMMISSIONER	:	10

APPENDIX-II

DETAILS OF ACTIVITIES OF THE COMMISSION OF RAILWAY SAFETY DURING 2021-22

A- NEW LINES

SN	Date of Authorization/Inspection	Section/Line Opened	Circle/Railway	KMs
1.	30.04.2021	Piplai-Gangapur City	WC	24.74
2.	02.08.2021	Jhansi-Babina	NEC	24.18
3.	31.12.2021	Joynagar-Indo Nepal Border	EC	2.89
4.	27.10.2021	Bhalwani-Washimbe	CC	26.33
5.	29.10.2021	Dhansiri-Shokhuvi	NF	16.2
6.	31.12.2021	Solaput-Ashti	CC	30.64
7.	24.12.2021	Asanpur-Kupha-Nirmali	EC	6.56
8.	18.12.2021	Bilasipra-Abhayapuri	NFC	47.72
9.	28.02.2022	Gajwel-Kodakandla	SCC	12.24
10.	08.03.2022	Millavittan-Melamarudu	SC	17.15
11.	13.03.2022	Talkal-Sangnal	SC	21.15
12.	28.03.2022	Akanapet-Medak	SCC	17.75
13.	28.03.2022	Maganur-Makthal	SCC	13.3
14.	25.03.2022	Mahipur-Naugaon	SEC	13.00
15.	26.03.2022	Gharghoda-Bhalumoda	SEC	14.00
			TOTAL	**285**

B- ADDITIONAL LINES (DOUBLE AND MULTIPLE LINES):-

SN	Date of Authorization/Inspection	Section/Line Opened	Circle/ Railway	KMs
1.	09.04.2021	Bhonra-Bijora	CC	25.7
2.	15.04.2021	Pharprakund-Magardaha	EC	6.81
3.	11.06.21	Jalgaon – Bhadli	CC	11.51
4.	13.06.21	Bina Malkhedi – Khurai	CC	17.97
5.	13.06.21	Orr-Ashoknagar	CC	13.04
6.	14.06.21	Rithi – Hardua	CC	15.13
7.	14.06.21	New Katni–KatangiKhurd	CC	4.86
8.	22.06.21	Ambale – Rajevadi	CC	4.72
9.	26.06.21	Roha – Veer	CC	46.77
10.	21.06.21	Takari – Kirloskarwadi	CC	8.46
11.	29.06.2021	Jais-Fursatganj-Rupamau	NC	19.91
12.	28.06.2021	Sadhoogarh-Sirhind	NC	2.74
13.	26.06.2021	Dabpal-Gidam	SCC	10.98
14.	21.07.2021	Umdanagar-Shadnagar	SCC	29.76

15.	22.07.2021	Vijayawada-Uppaluru	SCC	17.01
16.	08.07.2021	Arang-Mahanadi-Belsonda	SEC	9.18
17.	26.07.2021	Bartola-Darekasa	SEC	7.64
18.	04.08.2021	Ranchi Road-Bhurkunda	EC	16.18
19.	16.08.2021	Tattapparai-Milavittan	SC	7.47
20.	05.08.2021	Lakholi-Arangmahanadi	SEC	5.77
21.	19.08.2021	Bisra-Bondamunda	SEC	2.78
22.	25.08.2021	Jujomura-Charmal-	SEC	31.92
23.	07.09.2021	Deoragram-Majhauli	CC	8.28
24.	08.09.2021	Kaima-Sakariya	CC	6.36
25.	09.09.2021	Jang Bahadur Ganj-Neri	NC	24.8
26.	21.09.2021	Rupamau-Raebareli-Gangaganj	NC	15.34
27.	17.09.2021	Rajpura-Kauli-Daunkalan	NC	17.85
28.	28.09.2021	Chaurah-Malasha	NE	19
29.	25.09.2021	Sanvordem-Madgaon	SC	14.76
30.	28.09.2021	Kurichedu-Donakonda	SCC	12.52
31.	28.09.2021	Chandisar-Bhildi	WC	31.97
32.	27.10.2021	Bhattanagar-Baltikuri	EC	2.7
33.	04.10.2021	Aunihar-Dhobhi	NEC	22.89
34.	18.10.2021	Srirampur Assam-New Bongaigaon	NF	68
35.	10.10.2021	Kalluru-Gooty	SCC	26.38
36.	28.10.2021	Balsiring-Lodhma	SEC	9.91
37.	25.10.2021	Daladi-Wankaner	WC	10.39
38.	27.10.2021	Borawar-Degana	WC	39.93
39.	24.11.2021	Sitapur-Parsendi	NEC	22.27
40.	02.11.2021	Kamakhya-Guwahati	NF	6.32
41.	03.11.2021	Dharamtul-Kampur	NF	32.46
42.	26.11.2021	Hombal-Hole Alur	SC	35.31
43.	14.11.2021	Manikgarh-Wirur	SCC	19.16
44.	24.12.2021	Bina-Kanjiya	CC	19.87
45.	18.12.2021	Thane-Diva	CC	9.44
46.	17.12.2021	Whydhamganj-Mahuriya	EC	10.43
47.	23.12.2021	Garhwa Road-Garwha	EC	9.00
48.	28.12.2021	Kursela-Kosi	EC	4.45
49.	23.12.2021	Nandkhas-Parauna	NEC	32.00
50.	15.12.2021	Devarapalle-Hindipur	SC	10.67
51.	26.12.2021	Talamanchi-Sri Venkateswarapalem	SCC	24.77
52.	03.12.2021	Chatriput-Jeypore	SEC	7.08
53.	22.12.2021	Wadharva-MaliyaMiyana	WC	4.49

54.	24.12.2021	Degana-Merta Road	WC	44.00
55.	29.01.2022	Kirloskarwadi-Bhilwadi	CC	13.46
56.	11.01.222	SahdeiBuzurg-Shahpur	EC	12.41
57.	28.01.2022	Jamalpur-Ratanpur	EC	6.35
58.	17.01.2022	Rosa-Bartara	NC	6.55
59.	31.01.2022	Alamnagar-Transport	NC	9.09
60.	28.01.2022	Jhargram-Chakulla	SEC	29.2
61.	14.02.2022	Ankai-AnkaiKilla	CC	4.49
62.	13.02.2022	Salhana-Khanna Banjari	CC	21.33
63.	24.02.2022	MotipuraChauki-Ruthiyai	CC	17.47
64.	25.02.2022	Sonegaon-Hinganghat	CC	16.17
65.	11.02.2022	Singrauli-Mahadiya	EC	5.93
66.	17.02.2022	Karaila-Singrauli	EC	13.00
67.	23.02.2022	Dumribhar-Danea	EC	10.99
68.	28.02.2022	Kaulseri-Dhuri&Dhrui-Alal-Sekha	NC	28.44
69.	15.02.2022	Dholpur-Bhandai	NE	45.54
70.	28.02.2022	PNVT-DDNI	NFC	28.14
71.	16.02.2022	Nittur-Banasandra	SC	22.35
72.	10.02.22	Mahbubnagar-Divitipalli	SCC	10.45
73.	12.02.22	Edduladoddi-Maddikera	SCC	22.54
74.	22.02.22	Bhimavaram-Narasapur	SCC	29.72
75.	22.02.22	Bhimavaram Town-	SCC	13.51
76.	01.03.2022	Kalunga-Rajgangpur	SEC	16.57
77.	25.02.2022	Merta Road-	WC	26.19
78.	26.02.2022	Palanpur-Chandisar	WC	11.88
79.	03.03.2022	Lonand-Salpa-Adarki	CC	16.96
80.	13.03.2022	Bijora-Baran	CC	13.01
81.	14.03.2022	ORR-Pipraigaon	CC	14.41
82.	15.03.2022	Katni-Singrauli	CC	7.80
83.	17.03.2022	Katol-Kohli	CC	24.57
84.	04.03.2022	Patliputra-Pahleza	EC	11.63
85.	10.03.2022	Karnasubrana-Khagraghat	EC	10.83
86.	24.03.2022	Hajipur-Akshaiwatrai	EC	10.98
87.	25.03.2022	Sathi-Narkatiaganj	EC	10.72
88.	15.03.2022	Kathua-Madhopur	NC	7.00
89.	31.03.2022	Naini-Cheoki	NE	2.37
90.	19.03.2022	Sahatwar-Ballia	NE	16.9
91.	14.03.2022	Jagi Road-Dhramtul	NFR	18.66
92.	13.03.2022	Gadag-Hombal	SC	12.69
93.	15.03.2022	Padil-Jokatte	SC	2.18
94.	24.03.2022	Tulukapatti-Kovilpatti	SC	32.86

95.	26.03.2022	Hindupur-Penukonda	SC	37.45
96.	27.03.2022	Savanur-Yalvigi	SC	8.02
97	27.03.2022	Haveri-Savanur	SC	19.9
98	27.03.2022	Yalvigi-Saunshi	SC	22.95
99	14.03.2022	Kavali-Sri VenkateswaraPalem	SCC	12.23
100	30.03.2022	Gollapalli-Divitipalli	SCC	15.25
101	16.03.2022	Nigaura-Anuppur	SEC	22.5
102	14.03.2022	Rupaund-Jhalwara	SEC	11.91
103	16.03.2022	Robertson-Kharsia	SEC	14.22
104	18.03.2022	Dongargarh-Paniajob	SEC	7.93
105	18.03.2022	Bamara-Tangarmunda	SEC	8.5
106	19.03.2022	Bhandara Road-Tumsar Road	SEC	19.82
107	24.03.2022	Argul-Haripurgram	SEC	4.01
108	29.03.2022	Tangarmunda-Bamra	SEC	8.39
109	31.03.2022	Lodhma-Karra	SEC	13.07
110	15.03.2022	Kuchaman City-Borawar	WC	19.83
111	14.03.2022	Nimbahera-Bisalwaskalan	WC	19.62
			TOTAL	**1983.05**

C- GAUGE CONVERSION:-

SN	Date of Authorization/Inspection	Section/Line Opened	Circle/Railway	KMs
1.	04.08.2021	Sehbaznagar-	NEC	83
2.	22.10.2021	Tambaram-	SC	11.27
3.	25.11.21	Lalitgarh-Saraygarh	NC	20
4.	31.12.2021	Mailani-Shahgarh	NE	42.75
5.	10.02.2022	Barharakothi-Biharganj	EC	11.67
6.	22.02.2022	Tamuria-Niramali	EC	23.68
7.	08.02.2022	Lothal Bhurki-Botad	WC	80.68
8.	12.02.2022	Mavli-Bari Sadri	WC	82.55
9.	16.02.2022	Sabarmati Cabin-Lothal Burkhi	WC	85.06
10.	31.03.2022	Andipatti-Teni	SC	17.21
11.	12.03.2022	Bhoma-Seoni	SEC	19.21
12.	12.03.2022	Seoni-Chourai	SEC	30.88
13.	23.03.2022	Jay Samand Road-	WC	53.12
14.	10.03.2022	Dhasa-Lunidhar	WC	48.69
			TOTAL	**636.26**

D- ELECTRIFICATION OF RAILWAY LINES:-

SN	Date of Authorization/Inspection	Section/ Line Opened	Circle/ Railway	KMs
1.	31.03.21	Srinagar-Jalindri	NC	21.9
2.	19.06.21	Hotgi – Dudhani	CC	51.22
3.	21.06.21	Takari – Kirloskarwadi	CC	7.08
4.	23.06.2021	Alandi – Shindwane	CC	7.95
5.	30.06.2021	Jalpaiguri Road-New Domohani	NF	4.92
6.	28.06.2021	Bichhupali-Balangir	SEC	14.13
7.	08.06.2021	Anand-Kambhat	WC	52
8.	02.07.2021	Betgara-Kolaigram	NF	22.53
9.	12.07.2021	Balaghat-Katangi	SEC	45.5
10.	09.07.2021	Tirodi Yard	SEC	1.73
11.	15.07.2021	Katangi-Tirodi	SEC	14.92
12.	30.07.2021	Jaipur Yard	WC	3.54
13.	01.08.2021	Alnavar-Londa	SC	33.16
14.	27.08.2021	Umdanagar-Gollapalli	SCC	60.23
15.	02.08.2021	Mahoba-Khajuraho	NEC	64
16.	16.08.2021	Mau-Ajamgarh	NEC	43
17.	22.09.2021	Pollachi-Podanur	SC	41.22
18.	30.09.2021	Uri Mode-Birla Nagar	NE	101
19.	24.09.2021	Anand Nagar-Nautanwa	NE	39.68
20.	Under issue	Barahat-Dumka	EC	77.87
21.	01.10.2021	Birlanagar-Uri Mode	NEC	104
22.	06.10.2021	Koligram-Gumanihat	NF	24.14
23.	28.10.2021	Chikjajur-Chitradurga	SC	33.89
24.	29.10.21	Yesvantpur-Tumkuru	SC	64.1
25.	29.10.2021	Ajmer-Daurai & Beawar-Guriya	WC	50.16
26.	25.11.2021	Lakhimpur-Bankeyganj	NEC	44.75
27.	19.11.2021	Palakkodu-Sivadi	SC	29.96
28.	22.11.2021	Kudgi-Wandal	SC	19.91
29.	09.11.2021	Madar-Adarsh Nagar	WC	6.11
30.	12.11.2021	Surendranagar-Muliroad	WC	20.93
31.	12.11.2021	Viramgam-Jatpipli	WC	36.47
32.	28.11.2021	Nohar-Hanumangarh	WC	72.51

33.	29.11.2021	Churu-Ratangarh	WC	43.4
34.	15.12.2021	Solapur-Hotgi	CC	14.96
35.	13.12.2021	Roha-Veer	CC	47.00
36.	14.12.2021	Kurduwadi-Pangri	CC	55.56
37.	08.12.2021	Sitamarhi-Raxaul	EC	79.31
38.	31.12.2021	Sultanpur-Ayodhya-	NC	119.00
39.	31.12.2021	Shikohabad-Mainpuri	NEC	50.00
40.	14.12.2021	Baiyyappanahalli-	SC	3.9
41.	07.12.2021	Maduari-Manamadurai	SC	47.54
42.	18.12.2021	Hulkoti-Unkal	SC	47.00
43.	31.12.2021	Salem-Attur	SC	56.00
44.	31.12.2021	Attur-Vriddachalam	SC	80.00
45.	22.12.2021	Raichur-Gadwal	SCC	57.7
46.	21.12.2021	Balod-Dallirajhara	SEC	24.00
47.	05.12.2021	Bhatinda-Hanumangarh	WC	92.00
48.	30.12.2021	Suratgarh-Birdhwal	WC	22.00
49.	31.12.2021	Bodeli-Chhota-Udepur	WC	34.58
50.	30.12.2021	Palanpur-Jasali-Mitha	WC	80.34
51.	31.01.2022	Jejuri-Adarki	CC	50.52
52.	31.01.2022	Ambale-Rajewadi	CC	5.26
53.	31.01.2022	Ajamgarh-Shahgarh	NE	54.00
54.	22.01.2022	Gonda-Bahraich	NEC	60.11
55.	31.01.2022	Manamadurai-Ramanathapuram	SC	56.00
56.	20.01.2022	Kohir-Khanapur	SCC	60.40
57.	20.01.2022	Pimpalkhuti-Kosao	SCC	44.3
58.	28.01.2022	Sikri-Titlagarh	SEC	5.88
59.	10.01.2022	Aunlajhori-Badampahar	SEC	33.13
60.	20.01.2022	Mahesana-Patan	WC	42.00
61.	06.01.2022	Ringus-Sikar-Jhunjhunu	WC	119.95
62.	23.02.2022	Karwar-Verna	CC	72.04
63.	23.02.2022	Verna-Thivim	CC	32.33
64.	10.02.2022	Saharsa-Garhbaruari	EC	15.00
65.	25.02.2022	Jasidih-Deoghar-Banka	EC	70.78
66.	25.02.2022	Shamli-Tapri	NC	63.00
67.	26.02.2022	Sonipat-Gohana	NC	35.53
68.	26.02.2022	New Jalpaiguri-Siliguri	NF	8.00
69.	28.02.2022	Guwahati-Jagiroad	NFC	56.78
70.	17.02.2022	Tiruchchirappalli-	SC	89.13
71.	28.02.2022	Lohagad -Washim	SCC	45.30

72.	28.02.2022	Nizamabad-Mortad	SCC	45.10
73.	10.02.2022	Bhanjpur-Bangriposi	SEC	33.98
74.	28.02.2022	Chhindwara-Chaurai	SEC	33.02
75.	09.02.2022	Bhatiya-Okha	WC	70.08
76.	27.02.2022	Mitha-Radhanpur	WC	34.41
77.	09.03.2022	Lonand-Phaltan	CC	26.00
78.	09.03.2022	Adarki-Satara	CC	37.66
79.	09.03.2022	Satara-Shenoli	CC	68.44
80.	28.03.2022	Ratnagiri-Thivim	CC	191.00
81.	28.03.2022	Mohol-Solapur	CC	29.60
82.	14.03.2022	Bangaon-Petrapole	EC	4.16
83.	17.03.2022	Deoghar-Dumka	EC	63.65
84.	29.03.2022	Dauram-Madhepura-Banmankhi	EC	43.36
85.	25.03.2022	Ghoswar-Vaishali	EC	30.22
86.	30.03.2022	Raxual-Narkatiaganj	EC	40.14
87.	01.04.2022	BOKO-AZRA	EC	34.00
88.	22.03.2022	Raja kaSahaspur-Sambhal-Hatim Sarai	NC	22.00
89.	22.03.2022	Chandausi-Harduaganj	NC	85.00
90.	24.03.2022	Nakodar-Philaur-Jalandhar-Lohiankhas	NC	98.00
91.	26.03.2022	Budgam-Baramulla	NC	45.00
92.	30.03.22	Barabanki-AyodhyaCantt.	NC	99.00
93.	10.03.2022	Etawah-Mainpuri	NEC	107.47
94.	21.03.2022	Khajuraho-Ishanagar	NEC	56.75
95.	23.03.2022	Barhan-Etah	NEC	56.00
96.	26.03.2022	Bhojipura-Lalkuna	NEC	65.07
97.	28.03.2022	Anandnagar-Sohratgrah	NEC	87.26
98.	30.03.2022	Rampur-Lalkuna	NEC	66.01
99.	25.03.2022	Manamadurai-	SC	63.22
100.	25.03.2022	Pollachi-Palakkad Town	SC	54.00
101.	25.03.2022	Palani-Pollachi-	SC	62.40
102.	21.03.2022	Yelahanka-Devanahalli-Chikkaballapur	SC	44.90
103.	21.03.2022	Tumkuru-Nittur	SC	27.00
104.	21.03.2022	Sivadi-Omalur	SC	44.67
105.	31.03.2022	Kollam-Punalur	SC	44.00
106.	28.03.2022	Chikjajuru-Hosadurga	SC	29.32
107.	28.03.2022	Alnawar-Ambewadi	SC	25.42
108.	31.03.2022	Gadag-Hole Alur	SC	48.77

109.	28.03.2022	Londa-Tinaighat	SC	11.50
110.	31.03.2022	Ghataprabha-Kudachi	SC	48.18
111.	20.03.2022	Pakala-Kalikiri	SCC	55.8
112.	20.03.2022	Kadiri-Tummanamgunta	SCC	53.40
113.	20.03.2022	Dhone-Kurnool City	SCC	54.20
114.	22.03.2022	Bhimavaram Town-Aravalli-Narsapur	SCC	45.53
115.	29.03.2022	Ankai-Rotegaon	SCC	37.15
116.	29.03.2022	Nandyal-Yerraguntl	SCC	119.70
117.	31.03.2022	Gollapalli-Mahbubnagar	SCC	25.54
118.	31.03.2022	Nizamabad-Bodhan	SCC	25.85
119.	25.03.2022	Nayagarh Town-Nuagaon	SEC	24.03
120.	12.03.2022	Jatpipli-Chuli	WC	40.57
121.	22.03.2022	Kanalus-Wansjaliya	WC	73.00
122.	23.03.2022	Patan-Bhildi	WC	47.49
123.	25.03.2022	Hisar-Suratpura	WC	63.35
124.	31.03.2022	Marwar-Luni	WC	70.50
125.	28.03.2022	Jodhpur-BGKT-Luni	WC	33.24
126.	27.03.2022	Jhunjhunu-Loharu	WC	56.00
127.	26.03.2022	Ratangarh-Sardar Sahar	WC	46.92
128.	26.03.2022	Ratangarh-Benisar	WC	74.76
129.	31.03.2022	Dhola-Sihor-Palitana	WC	56.94
130.	31.03.2022	Radhanpur-Vaghpura	WC	25.33
131.	31.03.2022	Padampur-Samkhiyali	WC	39.81
132.	31.03.2022	Lakhpat-Padampur	WC	23.55
			TOTAL	**6366.19**

METRO PROJECTS:-

A- <u>Mumbai Metro:-</u>

SN	Date of Authorization/Inspection	Section	Metro Railway	KMs
1.	06.08.2021	Sitabuldi-Kasturchand Park	Mumbai	0.97
2.	24.03.2022	Ovaripada-Aarey	Mumbai	10.9
3.	24.03.2022	Dahanukarwadi-Dahisar East	Mumbai	9.82
4.	29.03.2022	Central Park-Pendhar	CIDCO	5.14
			TOTAL	26.83

B- <u>Bangalore Metro Rail Corporation Ltd. (BMRCL):-</u>

SN	Date of Authorization	Section	Metro Railway	KMs
1.	16.08.202	Mysore Road-Kengeri	BMRCL	7.46
			TOTAL	**7.46**

C- Chennai Metro Rail (CMRL):-

SN	Date of Authorization	Section	Metro Railway	KMs
1.	23.02.2022	Wimco Nagar-Wimco Nagar	CMRL	0.33

D- Kolkata Metro:-

SN	Date of Authorization	Section	Metro Railway	KMs
1.	24.03.2022	Sealdah-Phoolbagan	Kolkata Metro	2.33

E- Kanpur Metro:-

SN	Date of Authorization	Section	Metro Railway	KMs
1.	23.12.2021	IIT Kanpur-Motijheel	Kanpur Metro	8.66

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