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**Indian Railways – Safety Performance**

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## **Indian Railways – Safety Performance**

### **Introduction**

Indian Railways is quite unique and distinctive in character, really a microcosm of India. To make it a safe and reliable system is an enormous challenge. The Railways has the most intricate and involved inter-dependencies. Safety on the Railways is the end product of the cohesive fusion of its myriad parts. A single flaw in the 64,600 route kms of track that criss-cross the country, a defect in over 9,500 locos, 55,000 coaches and 2.39 lakh wagons that haul about 23 million passengers and nearly 2.7 million tonnes of freight every day, an incorrect indication on one of the thousands of signals that dot the rail landscape, a mistake or an act of negligence by one of its staff directly associated with train running, even a rash act by one of the millions of road users who daily negotiate around odd level crossing gates spread across the system, an irresponsible act of carrying inflammable goods – any one of these multiple possibilities has the potential to cause a major tragedy. Added to these are the acts of sabotage by misguided elements spanning the whole country. Thus utmost vigil in safety in operations and also security of the traveling public is accorded by the Railways<sup>1</sup>.

### **Train Accidents**

The term ‘accident’ envelopes a wide spectrum of occurrences with or without significant impact on the system. Consequential train accidents include mishaps with serious repercussion in terms of loss of human life or injury, damage to railway property or interruption to rail traffic in excess of laid down threshold levels and values. These consequential train accidents include collisions, derailments, fire in trains, road vehicles colliding with trains at level crossings, and certain specified types of ‘miscellaneous’ train mishaps<sup>2</sup>.

The number of consequential train accidents decreased from 141 during 2010-11

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<sup>1</sup> Ministry of Railways, Outcome and Performance Budget 2013-14, p. 46

<sup>2</sup> Ministry of Railways, Safety Performance 2011-12, p. 38

to 131 during 2011-12. The number of train accidents per million train kilometers, which is a universally accepted safety index, also dropped from 0.15 in 2010-11 to 0.13 in 2011-12.

The continuous reduction in the number of train accidents per million train kilometers which has fallen from 5.5 in 1960-61 to 0.13 in 2011-12, is indicative of sustained improvement in safety performance<sup>3</sup>. A Table showing the trend of train accidents on Indian Railways since 1960-61 is as follows:

**Table 1: Train Accidents on Indian Railways since 1960-61**

Year	Colli-Sions	Derail-ments	Level crossing accidents	Fire in trains	Misc.	Total	Movement of traffic i.e., Train Kms. Run (in Million)	Incidence of train accidents per Million train Kms.
1960-61	130	1415	181	405	--	2131	388.1	5.5
1961-62	124	1433	160	236	--	1953	396.2	4.9
1962-63	98	1316	168	55	--	1637	408.3	4.0
1963-64	93	1300	161	81	--	1635	421.9	3.9
1964-65	81	1035	146	31	--	1293	433.2	3.0
1965-66	74	962	123	42	--	1201	450.8	2.7
1966-67	67	876	104	50	--	1097	451.7	2.4
1967-68	66	892	111	42	--	1111	455.3	2.4
1968-69	47	684	129	48	--	908	460.1	2.0
1969-70	54	751	111	47	--	963	473.0	2.0
1970-71	59	648	121	12	--	840	466.5	1.8
1971-72	57	667	118	22	--	864	474.4	1.8
1972-73	57	598	131	25	--	813	473.1	1.7
1973-74	59	578	125	13	--	782	432.8	1.8
1974-75	66	696	140	23	--	925	430.1	2.2
1975-76	64	768	105	27	--	964	487.4	2.0
1976-77	45	633	86	16	--	780	511.6	1.5
1977-78	54	705	93	14	--	866	526.1	1.6
1978-79	55	778	86	12	--	931	504.1	1.8
1979-80	72	692	115	21	--	900	503.4	1.8
1980-81	69	825	90	29	--	1013	504.5	2.0
1981-82	87	936	84	23	--	1130	516.6	2.2
1982-83	54	653	70	20	--	797	530.9	1.5

<sup>3</sup> *Ibid*

Year	Colli-Sions	Derail-ments	Level crossing accidents	Fire in trains	Misc.	Total	Move-ment of traffic i.e., Train Kms. Run (in Million)	Incidence of train accidents per Million train Kms.
1983-84	48	621	82	17	--	768	541.7	1.4
1984-85	39	678	65	30	--	812	541.1	1.5
1985-86	46	588	62	21	--	717	570.4	1.3
1986-87	28	538	65	13	--	644	582.3	1.1
1987-88	40	490	62	12	--	604	590.2	1.02
1988-89	30	457	55	3	--	545	602.2	0.90
1989-90	34	456	42	8	--	540	618.0	0.87
1990-91	41	446	36	9	--	532	617.1	0.86
1991-92	30	444	47	9	--	530	629.2	0.84
1992-93	50	404	51	9	--	524	632.3	0.83
1993-94	50	401	66	3	--	520	634.2	0.82
1994-95	35	388	73	5	--	501	641.9	0.78
1995-96	29	296	68	5	--	398	655.9	0.61
1996-97	26	286	65	4	--	381	667.6	0.57
1997-98	35	289	66	6	--	396	675.8	0.58
1998-99	24	300	67	6	--	397	686.9	0.58
1999-2000	20	329	93	21	--	463	717.7	0.58
2000-01	20	350	84	17	2	473	723.8	0.65
2001-02	30	280	88	9	8	415	756.4	0.55
2002-03	16	218	96	14	7	351	786.2	0.44
2003-04	9	202	95	14	5	325	790.8	0.41
2004-05	13	138	70	10	3	234	810.14	0.29
2005-06	9	131	75	15	4	234	825.4	0.28
2006-07	8	96	79	4	8	195	847.8	0.23
2007-08	8	100	77	5	4	194	890.5	0.22
2008-09	13	85	69	3	7	177	905.2	0.20
2009-10	9	80	70	2	4	165	997.2	0.17
2010-11	5	80	53	2	1	141	1005.9	0.15
2011-12	9	55	61	4	2	131	1077.0	0.13
2012-13 (upto January 2013 Prov.)	6	40	448	8	0	100	*	*

\*Under compilation. **Source:** Compiled on information provided by M/o Railways as per availability.

Out of 131 train accidents that took place during 2011-2012, 122 took place on the Broad Gauge, 8 on the Metre Gauge and 1 on Narrow Gauge. Freight trains were involved in 36 accidents and passenger trains in 95 accidents<sup>4</sup>.

### Causes of Train Accidents

Of the total of 131 train accidents that occurred on Indian Railways during **2011-12**, 115 (87.78 per cent) were due to human failure, including 52 (36.69 per cent) due to the failure of railway staff and 63 (48.09 per cent) due to the failure of other than railway staff, 5 (3.81 per cent) accidents due to failure of equipments, 6 (4.58 per cent) accidents were caused due to Sabotage, 1 (0.76 per cent) accident was due to combination of factors, 3 (2.29 per cent) accidents were due to incidental factors and 1 (0.76 per cent) accident for which causes could not be established.

The table below shows the broad causes of train accidents which occurred on Indian Railways since 2000-2001:

**Table 2: Broad Causes of Train Accidents**

	Number of Accidents during												
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-11	2011-12	2012-13 (upto Jan. 2013)
I. Failure of Railway Staff	293 (62)	248 (67)	186 (53)	161 (50)	119 (51)	120 (51)	85 (44)	85 (43.81)	75 (42.37)	63 (38.18)	56 (39.72)	52 (39.69)	37 (37.00)
II. Failure of Persons other than Railway Staff	109	103	118	107	78	86	84	71	75	75 (45.45)	57 (40.43)	63 (48.09)	48 (48.00)
III. Failure of Equipments													
a) Rolling Stock	16	11	6	6	5	1	4	4	--	3	-	-	-
b) Track	17	13	11	9	7	6	5	3	--	3	5	5	2
c) Electrical/S&T	--	--	1	3	2	1	--	2	--	--	-	-	-
IV. Sabotage	19	14	10	18	4	5	8	7	13	14	16	6	3 (3.00)

<sup>4</sup> *Ibid*

											(11.35)	(4.58)	
V. Combination of factors	4	--	2	2	1	--	1	--	4	1	3 (2.13)	1 (0.76)	-
VI. Incidental	11	20	15	17	16	11	7	8	4	4	4 (2.84)	3 (2.29)	7 (7.00)
VII. Causes could not be established	4	5	2	2	2	3	--	1	4	2	-	1 (0.76)	2 (2.00)
VIII. Under investigation	--	1	--	--	--	1	1	3	2	2	-	-	1 (1.00)
<b>Grand Total</b>	<b>473</b>	<b>415</b>	<b>351</b>	<b>325</b>	<b>234</b>	<b>234</b>	<b>195</b>	<b>194</b>	<b>177</b>	<b>165</b>	<b>141</b>	<b>131</b>	<b>100</b>

\* Provisional Figures

Source: Compiled on information provided by M/o Railways as per availability.

## Casualties

The following table indicates the number of passengers killed and/or injured in train accidents. The figures exclude casualties sustained as a result of passengers' own negligence (e.g. footboard travelling, etc.) and casualties involved in case of sabotage.

**Table 3: Casualties**

Year	Number of Passengers		Total Casualties per million passengers carried
	Killed	Injured	
1965-66	41	458	0.24
1970-71	27	309	0.14
1975-76	36	249	0.10
1980-81	117	494	0.17
1985-86	77	297	0.11
1990-91	220	595	0.22
1991-92	98	451	0.13
1992-93	96	467	0.15
1993-94	179	446	0.17
1994-95	84	434	0.13
1995-96	406	681	0.18
1996-97	83	237	0.08
1997-98	171	747	0.21
1998-99	280	615	0.06
1999-2000	341	733	0.07
2000-01	55	286	0.01
2001-02	144	595	0.02
2002-03	157	658	0.03
2003-04	135	302	0.03

2004-05	50	191	0.04
2005-06	315	627	0.165
2006-07	208	402	0.098
2007-08	191	412	0.092
2008-09	209	444	0.094
2009-10	238	397	0.088
2010-11	381	461	0.110
2011-12	319	716	0.126
2012-13 (upto January 2013 (Prov.))	185	317	*

\*Under compilation.

**Source:** Compiled on information provided by M/o Railways as per availability.

### Collisions and Derailments:

The position regarding total number of collisions and derailments and those caused by the failure of railway staff is given below:

**Table 4: Collisions and Derailments**

Year	Number of collisions and derailments	No. of collisions and derailments attributed to failure of railway staff	Percentage
1965-66	1036	688	66
1970-71	707	464	66
1975-76	832	571	69
1980-81	894	573	64
1985-86	634	466	74
1990-91	487	358	74
1991-92	474	371	78
1992-93	454	363	80
1993-94	451	358	79
1994-95	423	351	83
1995-96	325	237	73
1996-97	312	252	81
1997-98	324	247	76
1998-99	324	252	78
1999-2000	349	269	77



Year	Number of collisions and derailments	No. of collisions and derailments attributed to failure of railway staff	Percentage
2000-01	370	280	76
2001-02	310	--	--
2002-03	232	182	78
2003-04	211	143	68
2004-05	151	110	73
2005-06	140	106	78
2006-07	104	75	72
2007-08	108	75	69.44
2008-09	98	64	65.30
2009-10	89	57	64.04
2010-11	85 (5,80)	51 (4,47)	60.00
2011-12	64 (9,55)	45 (8,37)	70.31
2012-13 (upto January 2013 (Prov.))	46 (6,40)	32 (6,26)	69.57

**Source:** Compiled on information provided by M/o Railways as per availability.

There is considerable fall in derailments as revealed by the trends shown in the table below:

**Table 5: Derailments**

Year	Total Accidents	Derailments	Percentage
1965-66	1201	962	80
1970-71	840	648	77
1975-76	964	768	80
1980-81	1013	825	81
1985-86	717	588	82
1990-91	532	446	84
1991-92	530	444	84
1992-93	524	404	77
1993-94	520	401	77
1994-95	501	388	77
1995-96	398	296	74
1996-97	381	286	75

<b>Year</b>	<b>Total Accidents</b>	<b>Derailments</b>	<b>Percentage</b>
1997-98	396	289	73
1998-99	397	300	76
1999-2000	463	329	71
2000-01	473	350	75
2001-02	414	280	68
2002-03	351	216	62
2003-04	325	202	62
2004-05	234	138	59
2005-06	234	131	56
2006-07	195	96	49
2007-08	194	100	51.55
2008-09	177	85	48.02
2009-10	165	80	48.48
2010-11	141	80	56.74
2011-12	131	55	41.98
2012-13 (upto January 2013 (Prov.))	100	40	40.00

**Source:** Compiled on information provided by M/o Railways as per availability.

### **Accidents at Level Crossings**

Unmanned level crossings are another problem area for the Indian Railways, and one of the major causes of accidents. In spite of various measures taken by the Indian Railways, level crossing accidents have continued to occur, that too frequently.

Accidents at Unmanned Level Crossings are caused mainly due to trespassing by road vehicles across these on Railway tracks. Railways have the “Right of Way” across unmanned level crossings. The road vehicle drivers are duty bound under Section 131 of the Motor Vehicles Act, 1988, to “get down from the Vehicle, walk up to the crossing to ensure that no train is approaching from either side before crossing the unmanned level crossing” Thus, the primary cause of the accidents at unmanned level crossings is

negligence by road vehicle users<sup>5</sup>.

There are 14896 unmanned and 17839 manned level crossings on IR as on 1.4.2011. These level crossings contribute to 30 per cent of fatalities in Railway mishap and statistically contribute to about 40 per cent of accidents on IR. Accordingly, Indian Railways Vision – 2020 and Railway Budget Speech documents envisage elimination of all unmanned level crossings<sup>6</sup>.

Presently, the unmanned level crossings are provided with speed breakers and road sign boards on either side of the level crossings to warn road users of any approaching trains. Warning sign-boards are also provided alongside of railway track, at the approach of such unmanned level crossings so that the train driver starts whistling to warn the road users of the approaching trains.

Indian Railways have decided to eliminate all unmanned level crossings (LCs) in next five years as part of Indian Railway Vision 2020. Multi-pronged strategies have been adopted to achieve this end. While some of the LCs would be closed by merging them with the nearby LC by constructing connecting roads, other LCs would be provided with Road under bridge (RUB) or Limited Height Subway (LHS) and also by manning of qualifying unmanned LCs.

The position, as it obtains over Indian Railways with respect to various steps being undertaken for eliminating the unmanned level crossings, has been indicated in the ensuing table<sup>7</sup>.

<b>Action Plan for elimination of unmanned level Crossing gates in five years (2010-15)</b>	<b>Nos. of level crossings to be eliminated</b>
Construction of Normal Height Subway	35
Construction of Limited Height Subway	1526
Construction of Road Over Bridge	210
Construction of diversion road to another level crossings, ROB, RUB etc	986

<sup>5</sup> Lok Sabha Secretariat, Standing Committee on Railways 10<sup>th</sup> Report, 2011, pp. 49-50

<sup>6</sup> Executive Summary, Working Group Report for 12<sup>th</sup> Plan – Railways Sector, pp.17, 51 ([www.planningcommission.nic.in](http://www.planningcommission.nic.in))

<sup>7</sup> *op.cit.*, Standing Committee on Railways 10<sup>th</sup> Report, 2011, p. 50

Closure of one unmanned LC by manning nearby unmanned level crossings	412
Closure of unmanned level crossings having low Train Vehicle Units	1860
Closure by manning of unmanned level crossing	6792
Total nos. of LCs planned for elimination in five years above by scheme.	11821

Note: Unmanned level crossing of narrow gauge, rail bus routes, meter gauge, cattle and canal crossings have not been planned due to low train vehicle units and low speed of trains.

Elimination of all these Level Crossings is a gigantic task and involves lot of manpower, resources and budgetary support. It is a continuous process and is done as per need, inter-se priority of works, availability of funds and co-operation of State Government, particularly, in getting consent of closure of level crossing and undertaking to maintain road and drainage in future for subways. The details of railway accidents occurred at Unmanned Level Crossings (ULCs) from the year 2002-03 and onwards are given below<sup>8,9</sup>:

**Table 6: Accidents at Unmanned Level Crossings**

Year	Number of railway accidents
2002-03	82
2003-04	86
2004-05	65
2005-06	65
2006-07	72
2007-08	65
2008-09	62
2009-10	65
2010-11	48
2011-12	54
2012-13 (upto Nov 2012)	36

Indian Railways carry out intensive social awareness campaigns, on a regular basis, to educate road users. This includes publicity campaigns through various media like newspapers, TV, Radio etc., distribution of posters, leaflets, various short duration films/advertisements etc. Even in local languages have been prepared by the Zonal Railways for educating the road users about the precautions to be taken while negotiating the unmanned level crossings. There is a need to educate people at Village

<sup>8</sup> Rajya Sabha Unstarred Question No. 1667 dated 7.12.2012

<sup>9</sup> *op.cit.*, Standing Committee on Railways, 10<sup>th</sup> Report, 2011, p. 50

Panchayats, schools, weekly markets in rural areas and also carry out ambush checks at unmanned level crossings<sup>10</sup>.

### Damage to Railway Property

Details of the damage to railway property and interruption to communications caused by train accidents are given below:

**Table 7: Damage to Railway Property**

Year	Cost of Damage (Rs. in lakhs)		Interruption to through communication (in hours)
	Rolling Stock	Permanent Way	
1965-66	61.0	39.3	6,640
1970-71	134.7	79.7	6,741
1975-76	255.0	198.6	10,275
1980-81	705.0	657.4	14,035
1985-86	835.9	291.3	5,075
1990-91	3818.2	710.5	6,156
1991-92	1896.2	462.8	5,291
1992-93	4227.5	1365.7	5,117
1993-94	2547.6	1427.4	4,546
1994-95	3110.0	1005.0	4,218
1995-96	4219.5	2067.7	4,404
1996-97	2983.5	1896.9	4,048
1997-98	3235.0	2027.0	3,939
1998-99	4519.0	2005.0	3,492
1999-2000	7255.0	1909.0	4,100
2000-01	3693.0	1831.0	4,045
2001-02	3234.6	1647.0	3,224
2002-03	3158.4	617.3	2,388
2003-04	4348.6	826.0	2,806
2004-05	2225.0	497.1	1,691
2005-06	2443.4	941.5	1,904
2006-07	2321.7	871.3	1,148
2007-08	2970	1085.4	4380.52
2008-09	5011.9	1052.9	1420.08
2009-10	4216.48	1244.99	1105.01
2010-11	4584.52	1311.37	1455.05
2011-12	8210.49	771.99	1041.16
2012-13 (upto Jan.2013 (Prov.))	*	*	*

\* under compilation **Source:** Compiled on information provided by M/o Railways as per availability.

### Accident Compensation

<sup>10</sup> Press Information Bureau (PIB) Press Release dated 6.6.2012

**Liability:** The liability of the railway administration in the event of consequential train accident attended with casualties has been defined in Section 124 of the Railways Act, 1989 as under:-

*“When in the course of working a railway, an accident occurs, being either a collision between trains of which one is a train carrying passengers or the derailment of or other accident to a train or any part of a train carrying passengers, then whether or not there has been any wrongful act, neglect or default on the part of the railway administration such as would entitle a passenger who has been injured or has suffered a loss to maintain an action and recover damages in respect thereof the railway administration shall, notwithstanding anything contained in any other law, be liable to pay compensation to such extent as may be prescribed and to that extent only for loss occasioned by the death of a passenger dying as a result of such accident, and for personal injury and loss, destruction, damage or deterioration of goods owned by the passenger and accompanying him in his compartment or on the train, sustained as a result of such accident”<sup>11</sup>.*

With effect from 01.08.1994 under Section 124-A of the Railways Act, 1989, the railway administration has also become liable to pay compensation for loss of life or injury to bonafide rail passengers who become victims of untoward incidents such as terrorist acts, violent attack, robbery, dacoity, rioting, shoot-out or arson by any person in or on any train carrying passengers, waiting hall, cloak room, reservation or booking office, platform, any place within the precincts of a railway station or the accidental falling of any passenger from a train carrying passengers. Section 124-A of the Railways Act, 1989 reads as under:-

*“When in the course of working a railway an untoward incident occurs, then whether or not there has been any wrongful act, neglect or default on the part of the railway administration such as would entitle a passenger who has been*

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<sup>11</sup> *op.cit.*, Safety Performance, p. 41

*injured or the dependent of a passenger who has been killed to maintain an action and recover damages in respect thereof, the railway administration shall, notwithstanding anything contained in any other law, be liable to pay compensation to such extent as may be prescribed, and to that extent only for loss occasioned by the death of, or injury to, a passenger as a result of such untoward incident:*

*Provided that no compensation shall be payable under this section by the railway administration if the passenger dies or suffers injury due to:-*

- (a) suicide or attempted suicide by him;*
- (b) self-inflicted injury;*
- (c) his own criminal act;*
- (d) any act committed by him in state of intoxication or insanity;*
- (e) any natural cause or disease or medical or surgical treatment unless such treatment becomes necessary due to injury caused by the said untoward incident”<sup>12</sup>.*

**Explanation:** For the purpose of this section, "passenger" includes

- (i) a railway servant on duty ; and
- (ii) a person who has purchased a valid ticket for travelling by a train carrying passengers on any date or a valid platform ticket and becomes a victim of an untoward incident.

**Quantum of Compensation:** Payment of compensation is governed by the Railway Accidents and Untoward Incidents (Compensation) Amendment Rules, 1997. Under these Rules, the amount of compensation payable in case of death is Rs.4 lakhs. For injuries, the amount varies from Rs. 32,000/- to Rs.4,00,000/- depending on the nature of injury sustained.

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<sup>12</sup> *Ibid*, pp. 41-42

**Ex-gratia:** Ex-gratia relief is given by the Railway Administration soon after an accident to meet the immediate expenses of the victims. Upto 01.08.2012, the rate of ex-gratia in case of death was Rs.15,000/- payable to the next of kin of the deceased. In case of grievous injury, the ex-gratia was paid at the rate of Rs. 5,000/- for upto 30 days of hospitalization. If the injured victim required indoor treatment for more than 30 days, additional ex-gratia was paid at the rate of Rs.1000/- per week or part thereof for further six months and if further indoor treatment was required, additional payment of Rs.500/- per week or part thereof was made for another period of six months. Ex-gratia relief in case of simple injury was Rs. 500/-. With effect from 1 August, 2012, the rate of ex-gratia has since been revised. In case of train accident as defined under Section 124 of the Railways Act, 1989, rate of ex-gratia in case of death is Rs. 50,000/- payable to the next of kin of the deceased passenger, Rs 25,000/- to the passengers who sustained grievous injury and Rs.5,000/- to the passengers who suffered simple injuries. The rate of ex-gratia for death/injury in untoward incident, as defined under Section 124-A of the Railways Act, 1989, remains the same as earlier. i.e., Rs. 15,000/- in case of death, Rs. 5,000/- in case of grievous injury and Rs. 500/- in case of simple injury. The relief of ex-gratia is not taken into at the time of final settlement of compensation claims. In case of serious or exceptional circumstances, enhanced ex-gratia is also announced by the Ministry of Railways<sup>13</sup>.

As regards accidents occurring at manned level crossings, prima facie due to the negligence of railway staff, ex-gratia payment is made to the victims by the Railway if actions is tenable against the Railways under the Law of Torts and an award is actually granted by a Court of Law. Upto 1.8.2012, the rate of ex-gratia in such cases Was Rs. 6000/- in case of death, Rs. 2500/- in case of grievous injury and 'Nil' in case of simple injury. with effect form 1.8.2012, the revised rates are as under:

- |                                 |              |
|---------------------------------|--------------|
| (i) In case of death            | Rs. 50,000/- |
| (ii) In case of grievous injury | Rs. 25,000/- |
| (iii) In case of simple injury  | Rs. 5000/-   |

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<sup>13</sup> *Ibid*, pp. 41-42



The above ex-gratia amount is counted towards the amount of compensation payable<sup>14</sup>.

Compensation paid by the Railways since 1985-86 is shown in the following table:

**Table 8: Compensation paid by Railways<sup>@</sup>**

<b>Year</b>	<b>Compensation Paid (Rs. in lakhs)</b>
1985-86	220.88
1986-87	168.6
1987-88	149.9
1988-89	191.33
1989-90	53.88
1990-91	228.95
1991-92	275.94
1992-93	237.16
1993-94	178.01
1994-95	176.69
1995-96	535.95
1996-97	709.31
1997-98	240.89
1998-99	489.65
1999-2000	1095.64
2000-01	886.12
2001-02	482.46
2002-03	489.19
2003-04	757.07
2004-05	513.16
2005-06	221.63
2006-07	500.89

<sup>14</sup> *Ibid*, p. 44

2007-08	121.37
2008-09	218.94
2009-10	265.81
2010-11	585.79
2011-12	49772
2012-13 (upto January 2013 (Prov.))	*

@ The amount of compensation paid during the year relates to the number of cases settled and payment made during that year and not the accidents that occurred during the year

\* under compilation **Source:** Compiled on information provided by M/o Railways as per availability.

## Safety Measures

Keeping in view the fact that the Railways will have to lift more originating traffic during the coming years, there is a growing emphasis on strengthening of infrastructure in the Railways. This is a continuous process and the investments made and strategies adopted in the past have vindicated this by way or reduction in the number of consequential train accidents over the years<sup>15</sup>.

### General:

- Safety Action Plans were continually executed to reduce accidents caused by human errors. A multi-pronged approach with focus on introduction of newer technologies, mechanization of maintenance, early detection of flaws, etc. to reduce human dependence in the first place, alongwith upgrading the skills of the human resources were the prime drivers for accident prevention.
- Periodical safety audits of different Divisions by multidisciplinary teams of Zonal Railways as well as inter-railway safety audits were conducted on regular basis. During 2011-12, 80 internal safety audits and 30 inter-railway safety audits were carried out.
- Training facilities for drivers, guards and staff connected with train operation have been upgraded. Disaster Management Modules have also been upgraded. During 2011-12, 98,891 safety category employees attended refresher training<sup>16</sup>.

### Measures to avoid collisions:

<sup>15</sup> *Ibid*, p. 47

<sup>16</sup> Ministry of Railways, Annual Report 2011-12, p. 41

- Anti Collision Device (ACD) developed by Konkan Railway Corporation Limited (KRCL) has been provided as a pilot project on 1,736 route kilometres of Northeast Frontier Railway. This was a single/double line non electrified Broad Gauge section. Trials with modified ACD, with improved efficacy, reliability and availability, were carried out on electrified multiple-line and automatic signalling section of Southern Railway. Complex operational and technical issues observed during both the trials are being attended to by KRCL in an improved version of ACD. Further, proliferation of ACD shall be possible only after these problems are resolved comprehensively by KRCL. Action has also been taken to develop Train Collision Avoidance System (TCAS) through multiple vendors, in order to prevent signal passing at danger as well as collisions.
- Fouling Mark to Fouling Mark track circuiting on the entire 'A', 'B', 'C', 'D', 'D Special' and 'E Special' routes, where permissible speed is more than 75 kilometres per hour, was completed. Further, Fouling Mark to Block Section Limit (straight) track circuiting was completed on 'A' and 'C' routes. Track circuiting has been completed upto 99.3% on 'A', 'B' and 'C' routes.
- Pilot projects on Train Protection Warning System (TPWS) to prevent over speeding/Signal Passing at Danger (SPAD) is in use since May 2008 on 50 route kilometres of Southern Railway. Service trials are in progress for the second pilot project on 200 route kilometres of Delhi-Agra Section. TPWS has also been approved on Dum Dum – New Garia section of Kolkata Metro (25 route kilometres) where the track side and on-board installation work is presently in progress. TPWS have been approved for 3,330 route kilometres covering Automatic Block Signalling/High Density routes of IR.
- Vigilance Control Device (VCD) is a system where if the driver does not perform a certain set of actions over a period of time, sound alarms, flashing light and brake systems start operating automatically. On-board VCD has been provided on all 6000-Horse Power electric locomotives, 265 conventional tap changer electric locomotives and 2,342 diesel locomotives. It has been decided to install this device on the remaining electric and diesel locomotives in a phased manner.
- Auxiliary Warning System (AWS) : IR's experience of Train Protection Systems has been so far largely limited to the AWS provided on Suburban sections of Mumbai on Western and Central Railways in 1980s. This system is working satisfactorily.
- Block Proving Axle Counters (BPAC) : In order to enhance safety by automatic verification of complete arrival of train, BPAC is being provided at stations having centralized operation of points and signals. BPAC has been commissioned in 3,580 Block Sections up to 31.08.2012<sup>17</sup>.

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<sup>17</sup> *Ibid*, pp. 42-43

**Measures to reduce derailments:**

- Upgradation of Track Structure consisting of Pre-stressed concrete (PSC) sleepers, 52 Kg/60 Kg high strength (90 kg/square mm ultimate tensile strength) rails on concrete sleepers, fanshaped layout on PSC sleepers, Steel Channel Sleepers on girder bridges has been adopted on most of the routes.
- Track structure is being standardized with 60 kg rails and PSC sleepers on all the Broad Gauge routes, especially on high density routes to reduce fatigue of rails under higher axle-load traffic. New track construction and replacement of over-aged tracks is being done by PSC sleepers only.
- To improve maintenance and reliability of assets, efforts to eliminate fish-plated joints by welding single rails into long welded rails were continued. During relaying/construction of new lines/gauge conversion, long welded rails are laid on concrete sleepers. Long rail panels of 260 M/130 M length are being manufactured at the steel plants to minimize number of welded joints. Turnouts are also being improved systematically.
- There is progressive shifting to flash butt welding which is superior in quality as compared to Alumino Thermic (AT) welding.
- All rails and welds are ultrasonically tested as per laid down periodicity. Self Propelled Ultrasonic Rail Testing (SPURT) Cars are being used for Rail flaw detection.
- There has been progressive use of Tie Tamping and ballast cleaning machines for track maintenance. Also, sophisticated Track Recording Cars, Oscillograph Cars and Portable Accelerometers are being used progressively.
- Two Rail Grinding Machines are being procured. Rail Grinding and rail lubrication for enhanced rail life and reliability has been recently introduced.
- Electronic monitoring of track geometry is carried out to detect defects and plan maintenance.
- Modern bridge inspection and management system has been adopted, which includes non-destructive testing techniques, under water inspections, fiber composite wrapping, mapping unknown foundations and integrity testing, etc.
- Based on threat perceptions due to adverse weather conditions or external interference, patrolling of railway tracks including night patrolling as well as intensified patrolling during foggy weather is carried out at vulnerable locations regularly.

- Progressive fitment of tight lock Central Buffer Coupler (CBC) in lieu of screw coupling in new design coaches by ICF has been carried out to prevent the coaches from climbing over each other in unfortunate event of an accident.
- Design of passenger coaches with features of crashworthiness to absorb most of the impact energy, leaving the passenger area unaffected has been developed and coaches are being manufactured accordingly.
- For enhancing safety and reliability of passenger coaches, the suspension systems are being re-designed 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 EMU and DMU coaches for suburban trains. Air springs have now been developed for mainline coaches as well and manufacture of such coaches has already been commenced.
- Wheel Impact Load Detector (WILD) are being deployed in a phased manner<sup>18</sup>.

#### **Measures to curb Unmanned Level Crossing Accidents:**

- Since most of the Unmanned Level Crossing Accidents are caused due to negligence of road vehicle users, publicity campaigns are periodically launched through different media like quickies on television, cinema slides, SMSs, posters, radio, newspapers, street plays, etc.
- Joint ambush checks with civil authorities are conducted to nab erring road vehicle drivers under the provisions of the Motor Vehicles Act, 1988 and the Indian Railways Act, 1989.
- As a special measure, powers have been delegated to the Zonal Railways to sanction new works of Road Over Bridges and Road Under Bridges and Subways costing upto Rs. 2.50 crore in each case.
- Construction of 226 ROBs and 653 RUBs was completed during 2011-12.
- 481 unmanned level crossings were closed by elimination, merger/diversion to the nearby level crossing and construction of Subways.
- Criteria for manning has also been revised to make more number of unmanned level crossings eligible for manning. During 2011-12, 777 unmanned level crossings were manned<sup>19</sup>.

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<sup>18</sup> *Ibid*, pp. 43-44

<sup>19</sup> *Ibid*, pp. 44-45

**Measures to reduce incidents of fire in trains:**

- IR have always endeavoured to enhance fire worthiness of coaches by using more fire retardant furnishing materials such as Compreg Board/PVC for coach flooring, laminated sheets for roof, ceiling wall & partition panelling, rexene and cushioning material for seats and berths, FRP windows and UIC vestibules etc. Specifications for such furnishing materials have been periodically upgraded to incorporate the fire retardant parameters in line with UIC/other international norms. All new manufacture of coaches/periodical overhauling of existing coaches is being carried out with fire retardant specifications of the furnishing materials.
- With a view to improve fire safety in running trains, a pilot project for provision of Comprehensive Fire and Smoke Detection System has been taken up in one rake of Rajdhani Express on East Coast Railway. Similar automatic fire alarm system in 20 more rakes for extended field trials has also been decided.
- Guard-cum-Brake Van, AC coaches and Pantry Cars in all trains are provided with portable fire extinguishers to cater for emergencies due to fire accidents.
- Improved materials for electrical fittings and fixtures such as MCB, light fittings, terminal boards, connectors, etc., are being used progressively.
- Detailed instructions have been issued to Zonal Railways for observance of safe practices in handling of pantry cars and for ensuring periodical inspection of electrical and LPG fittings in the pantry cars.
- Intensive publicity campaigns to prevent the travelling public from carrying inflammable goods are regularly undertaken.
- Measures have also been taken to prevent fire due to electrical short circuits in coaches, which include three levels of protection in non AC coaches in case of short circuits. Failure of 1st level fuse protection will cause fuse at 2nd level and 3rd level to protect the coach from short circuit.
- To enhance electrical safety of coaches, only halogen free, fire retardant, low smoke e-beam irradiated cable is being provided in new coaches.
- Two separate Fire Safety Audit Teams have been constituted recently to plan fire safety audits<sup>20</sup>.

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<sup>20</sup> *Ibid*, pp. 45-46

### **The Commission of Railway Safety**

Section 113 of the Railways Act, 1989 required intimation of serious accidents to be sent to the Commissioner of Railway Safety. Under the Statutory Investigation into Railway Accidents Rules, 1998 issued by the Ministry of Civil Aviation, a statutory inquiry by the Commissioner of Railway Safety is obligatory in every serious accident to a train carrying passengers which is attended with loss of human life, or with grievous hurt, as defined in the Indian Penal Code, to a passenger or passengers in the train or with serious damage to railway property of the value exceeding Rs. 2 crore in each case. While holding statutory inquiry, the Commission not only examines affected passengers but also invites members of the public to give evidence in person during the inquiry or to write to the Commission. Some of the serious accidents at manned or unmanned level crossings attended with loss of life or with grievous injury to persons travelling in road vehicles are also inquired into by the Commissioner of Railway Safety<sup>21</sup>.

While, the Railway Board in the Ministry of Railway are the safety controlling authority and are responsible for laying down and enforcing safety standards for the Indian Railways, the main task of the Commission is to direct, advise and caution the railway executives through its inspectional, investigatory and advisory functions and thereby assist them in ensuring that all stipulated measures are taken in regard to the soundness of rail construction and safety in train operation<sup>22</sup>.

The Commissioners carry out the duties/functions assigned to them under the Railways Act, 1989, rules framed thereunder and instructions issued from time to time. A gist of main-functions are as follows:

- (i) To inspect new lines with a view to determining whether they are fit to be opened for the public carriage of passengers, and to sanction their opening after inspection on behalf of the Central Government.

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<sup>21</sup> *op.cit.*, Safety Performance, p. 44-45

<sup>22</sup> Ministry of Civil Aviation, Annual Report 2011-12, pp. 93-94

- (ii) To sanction the execution of all new works and installations on the running track affecting the safety of the travelling public such as rebuilding of bridges, remodeling of station yards, line capacity works, re-signalling works, etc.
- (iii) To conduct statutory inquiries into serious railway accidents and suggest safeguards.
- (iv) To make periodical inspections of railways and report to the Central Government on any condition which may endanger the safety of the travelling public and make recommendations.
- (v) To examine the technical aspects of new rolling stock, advise on their introduction on open lines and to sanction their running on other section(s) and increase in speeds.
- (vi) To authorize the carriage of oversized consignments stipulating the conditions for their movements.
- (vii) To recommend and sanction infringements to the schedule of dimensions prescribed by the Government of India.
- (viii) To grant dispensation from general rules under approved special instructions subject to stipulated safeguards.
- (ix) To oversee the accidents prevention efficacy of the zonal railway administrations by reviewing the reports of departmental enquiries into less serious accidents.

The Chief Commissioner submits an annual report on the activities of the Commission in the preceding financial year as required under Section 10 of the Railways Act, 1989 which is laid on the table of both the Houses of Parliament<sup>23</sup>.

Number of train accidents including untoward incidents which the Commission of Railway Safety inquired into during the last three years and the current year (April to August, 2012) are as under<sup>24</sup>:

<b>Year</b>	<b>No. of Inquiries Conducted by CRS</b>
2009-10	23
2010-11	15

<sup>23</sup> *Ibid*

<sup>24</sup> Lok Sabha Unstarred Question No. 4364 dated 6.9.2012



2011-12	35
2012-13 (April to Aug.' 12)	12

### **Corporate Safety Plan (2003-2013)**

In pursuance of recommendations of Railway Safety Review Committee (RSRC), 1998 under the Chairmanship of Justice H.R. Khanna, Corporate Safety Plan (2003-13) was formulated. The Corporate Safety Plan envisages the following areas to be covered to enhance safety on Indian Railways:

- (a) Passenger Safety
- (b) Road users safety
- (c) Quantitative reduction in accidents
- (d) Improving asset reliability
- (e) Prompt rescue and relief operations.

The broad objectives of the Corporate Safety Plan include reduction in rate of accidents and passenger fatality, development of manpower, safety on all fronts of train operations and maintenance and adoption of fail-proof environment, etc<sup>25</sup>.

The Corporate Safety Plan of the Indian railways (2003-2013) also envisages a safety action plan directed towards continuous reduction in risk level to its customers, implementation of suggested system reforms, imbibing better safety culture, enhancement of asset reliability etc. This covers continuous rehabilitation and modernization of assets, qualitative changes in men and machines, induction of appropriate technologies in support of human efforts etc<sup>26</sup>.

The plan, aimed at achieving higher level of safety in train operations, involves a total outlay of Rs. 31,385 crore which will come from the Special Railway Safety Fund (Rs. 13,103 crore), the Railway Safety Fund (Rs. 8,911 crore), the Capital Fund (Rs.

<sup>25</sup> *op.cit.*, Safety Performance, p. 48

<sup>26</sup> [www.indianrailways.gov.in](http://www.indianrailways.gov.in) (Corporate Safety Plan 2003-2013)

4,205 crore), the Development Fund (Rs. 4,661 crore) and the Depreciation Reserve Fund (Rs. 955 crore)<sup>27</sup>.

The implementation of recommendations is reviewed periodically to further improve safety and the present status is as following:

- (i) Accidents per million train kms has already reduced to 0.15 in the year 2010-11 from 0.44 in 2002-03.
- (ii) As a result of various measures initiated in upgrading rolling stock, track and signalling systems, the chances of passenger fatality have come down.
- (iii) There is an overall reduction in consequential number of accidents from 161 (2003-04) to 56 (2010-11) attributable to human failure. However, human failure still continues to be one of the major causes of accidents. Development of manpower, regular training and improvement in working conditions is a continuous process and it is being pursued by Indian Railways with all seriousness.
- (iv) By conducting Safety workshops, seminars, counseling, regular training of staff, etc. there is substantial improvement in safety culture at all places.
- (v) There is a reduction in number of consequential train accidents attributable to equipment failures from 18 (2003-04) to 5 (2010-2011) due to adoption of 'fail-proof' systems philosophy.
- (vi) Priority to safety related projects is always given in planning and implementation.
- (vii) 217 RSRC recommendations have been implemented out of the total 236 number of recommendations accepted.

Targets of Corporate Safety Plan are given utmost importance in all the planning and implementation processes. Its progress is monitored on continuous basis and corrective steps are taken wherever required. Railways will concentrate to strive to achieve all the targets of Corporate Safety Plan before the end of the plan in 2013<sup>28</sup>.

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<sup>27</sup> Business Standard, New Delhi, dated 20 August 2003

<sup>28</sup> Rajya Sabha Unstarred Question No. 1967, dated 30.3.2012

## Modernisation of Disaster Management

A high level committee was constituted in September, 2002 to review Disaster Management system over Indian Railways and to give recommendations for its strengthening and streamlining. The committee had given 111 recommendations, all of which have been accepted for implementation. 99 recommendations have since been implemented as on 31.03.2012 and the balance recommendations are at the various stages of implementation. Disaster Management Review Committee was constituted on 27.02.2007 under the chairmanship of Shri Gajendra Narayan, former Director General (Police), and the committee submitted its report in December, 2008. Out of a total of 108 recommendations of the Committee, 41 recommendations have been accepted, out of which 36 have already been implemented and the balance 5 recommendations are under implementation, 67 recommendations of the Committee were not accepted due to various reasons<sup>29</sup>.

Corporate Safety Plan (2003-2013), Ministry of Railways, *inter alia*, suggested for modernization of Disaster Management (DM) on Indian Railways. The main focus area are - faster response, better facilities and equipment, expanding resources to meet requirements in major accidents, better customer focus and training and preparedness, etc. For modernization of DM, 18 (eighteen) strategies have been suggested in the Corporate Safety Plan, out of these, 13 (thirteen) have so far been implemented as on 31.10.2011 on Indian Railways. For implementing the strategies for modernization of Disaster Management, following measures have already been taken:-

- Disaster Management (DM) Plans have been made at Corporate Level, Zonal and Divisional Level and dovetailed with State/District DM Plans.
- Tie-up with reputed private/civil hospitals.
- Provision of rescue ambulances and Collapsible coffins in each Divisional hospital.
- Taking assistance of armed forces including Air-Force for assistance whenever required during disasters.

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<sup>29</sup> *op.cit.*, Safety Performance 2011-12, pp.48-49

- Provision of emergency escape route and emergency automatic lights in all coaches.
- Delegation of adequate financial powers to concerned officers for quick rescue operations.
- Minimum one 140 Tonne breakdown crane have been provided in each Broad Gauge division and all Accident Relief Trains (ARTs) have been provided with Air-brake stock.

The financial implication for modernization of DM on Indian Railways as per the Corporate Safety Plan is approximately Rs 400 crore. Figures of expenditure are available on all India basis and an amount of Rs 100.79 crore has been spent to the end of financial year 2010-11.

Pending recommendations like manufacturing of Self Propelled Accident Relief Trains (SPARTs) amounting to Rs 235 crores, Emergency Rail cum Road Vehicle, Setting up of Railway Disaster Management Institutes, etc., are long lead recommendations requiring R&D and policy related work before they are implemented at the field level. The Railways have periodically been reviewing the implementation and the targets stipulated in the Corporate Safety Plan. Out of pending 5(five) strategies, one each is targeted for implementation in 2012-13 and 2013-14 and the remaining three by 2015-16<sup>30</sup>.

### **Special Railway Safety Fund (SRSF)**

Since the early nineties, the Railways have not been able to provide fully for the depreciation needs due to severe financial constraints. The steep increase in the working expenses of the Railways resulted, in an erosion of the Railways' capacity to generate investible surpluses. The railways had to even resort to drawing down from the balances of the Depreciation Reserve Fund (DRF) to enable minimal plan outlays. Consequently, there was an accumulation of over-aged assets awaiting renewals. In the wake of this, the Railway Safety Review Committee recommended the grant of Rs.

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<sup>30</sup> Lok Sabha Starred Question No. 53 dated 24.11.2011

15000 crores to the Railways for wiping out the accumulated arrears of the replacement and renewals of the safety related assets.

Railway Safety Review Committee (RSRC) – 1998, in Part - I, of their report, identified the following arrears of asset of renewal as on 1.4.1999:

Arrears of Track Renewals (BG)	-	12,260 Kms.
Distressed Bridges	-	262 Nos.
Overaged Signalling Gears	-	1,560 Stations
Overaged Coaches (BG)	-	1,322 Vehicle Units
Overaged Wagons (BG)	-	34,000 (in terms of 4-wheeler units)

On the basis of RSRC's recommendation, a one time grant for renewal of these overaged assets was sought by the Ministry of Railways, on account of its inability to provide such a large quantum of funds from within its own resources. A non-lapsable Special Railway Safety Fund of Rs. 17,000 crore was created to expedite the works of renewal/replacement of overaged safety related assets within a time frame of six fiscal years. It was decided that this fund would be financed through two sources *viz.* (i) Railways' contribution through the levy of 'safety surcharge' on passenger traffic and (ii) through additional financial assistance to be given by the Ministry of Finance. The amounts so provided would be Rs. 5000 crore and Rs. 12,000 crore, respectively. The surcharge has been in place since 1.10.2001<sup>31</sup>.

The currency of the Special Railway Safety Fund had already come to an end on 31.3.2008. An amount of Rs. 16,318 crores has been spent out of total projected amount of Rs. 17,000 crores under SRSF upto 31.3.2008. To complete the ongoing works spilled over in year 2008-09, Rs. 590.36 crores has been credited to Depreciation Reserve Fund<sup>32</sup>.

<sup>31</sup> *op.cit.*, Standing Committee on Railways (14<sup>th</sup> Lok Sabha), 5<sup>th</sup> Report, 2004, pp.29-30

<sup>32</sup> Rajya Sabha Unstarred Question No. 2129 dated 19.8.2011

## Railway Security

Security has been identified as one of the priority areas for upgradation and strengthening over Indian Railways. Railway Protection Force (RPF), which functions under the Ministry of Railways, has been entrusted with the responsibility of protection and security of passengers, passenger area and matters connected therewith. After studying the problems of railway security, Integrated Security System was proposed for 202 important railway stations in the entire railway network.

The philosophy was to have different layers of checking/surveillance so that any nefarious activity is immediately noticed and the required action is taken within the 'golden hour' – the first hour after the accident. Ministry of Railways has accordingly approved the installation of the 'Integrated Security System' at important stations after detailed deliberations<sup>33</sup>. The system will comprise of the following components:

- (i) Internet Protocol based Close Circuit Television (CCTV) surveillance system with video analytics and recording facility.
- (ii) Access control
- (iii) Personal and baggage screening system
- (iv) Bomb Detection and Disposal System

Implementation of the Integrated Security System is under process over zonal railways. The System has been envisaged to have a multiple checking, starting from entry to the station premises and continuing till the boarding of the train by passengers. Area to be covered under the above System include entry/exit points, circulating area, concourse, platforms, parcel area, foot over bridge, washing line, vehicle entry point etc.

Automatic vehicle scanners are being provided at entry gates from where vehicles enter into the station premises. For baggage screening, X-ray baggage scanner is being provided. For explosive detection, provision of explosive vapour detector and sniffer dogs is being made at nominated railway stations. The System is

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<sup>33</sup> Press Information Bureau (PIB) Press Release dated 10.4.2012

being implemented at an approved cost of 353 crores for which budgetary allocation has been provided in Works Programme.

At present, a three tier security system is prevailing over Indian Railways<sup>34</sup> :

- (i) District Police: Security of tracks, bridges and tunnels.
- (ii) Government Railway Police (GRP): GRPs are a wing of the State Police exclusively for prevention and detection of crime and maintenance of law and order in station premises/circulating areas and trains. 50% of the cost of Government Railway Police is borne by the Railways and the balance is paid by the State Governments concerned.
- (iii) Railway Protection Force (RPF): Railway Protection Force functions under the Ministry of Railways. The Force has been entrusted with the responsibility of protection and security of Railway Property, passenger area and passengers and for matters connected therewith.

Security of passengers has been identified as one of the priority areas by Railways for strengthening and upgradation. Efforts made to strengthen railway security in recent past include escorting of important Mail/Express trains, regular coordination with GRP/ Civil Police, nomination of 202 stations for installation of Integrated Security System, procurement of modern security related equipment, setting up on an All India Security Help Line, networking of RPF Posts and Security Control Rooms, setting up of a commando training center, establishment of new RPSF Battalions etc<sup>35</sup>.

### **Railway Safety Review Committee**

Ministry of Railways has earlier constituted the Khanna Committee 1998, the Sikri Committee 1978, Wanchoo Committee 1968 and Kunzru Committee 1962<sup>36</sup>.

Railway Safety Review Committee (Khanna Committee) was set up in 1998 under the Chairmanship of Justice H.R. Khanna, a retired Supreme Court Judge. The Committee, *inter alia*, reviewed the recommendations of earlier Committees and

<sup>34</sup> Lok Sabha Starred Question No. 372 dated 6.9.2012

<sup>35</sup> Lok Sabha Unstarred Question No. 3630 dated 26.4.2012

<sup>36</sup> Ministry of Railways, Report of High Level Safety Review Committee 2012, p. 2

suggested measures for further improvement in the safe running of trains. The Committee submitted its report in two parts. Part-I was submitted in August, 1999, while its part II was submitted in February, 2001. Both the parts of the report have been placed on the Table of Lok Sabha as well as Rajya Sabha. The Committee made a total of 278 recommendations in its Report (150 in Part-I and 128 in Part-II)<sup>37</sup>.

In its report it had *inter alia* recommended that in the interest of safety of the travelling public, the Central Government should provide a one time grant to the Railways so that arrears in the renewal of vital safety equipment are wiped out within a fixed time frame of 5 to 7 years-The Committee had also recommended that one time grant of Rs. 15000 cr be given by the Central Government to the Railways to wipe out arrears of replacement of over aged assets<sup>38</sup>.

### **High Level Safety Review Committee**

In view of the extreme demand on the Indian Railways' system, both in respect of infrastructure as also skilled manpower directly connected with safety on the railways arising out of the aspirations of the general public and public representatives and with a view to ensure that safety is given overriding priority and no aspect connected with safety escapes attention, the need was felt for an objective assessment and validation of time tested systems and protocols in vogue on Railway system. In pursuance of these objectives, a High Level Safety Review Committee has been constituted by the Ministry of Railways<sup>39</sup> on 16.09.2011 under the Chairmanship of Dr. Anil Kakodkar, former Chairman, Atomic Energy Commission. It dealt with all technical and technology related aspects in connection with safe running of train services in the country.

The Committee has submitted its Report to Ministry of Railways on 17.02.2012. It has made 106 recommendations in their Report covering the following aspects: General Safety Matters, Organizational structure, Empowerment at Working Level, Safety related works and issues, Vacancies in critical safety categories and Manpower

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<sup>37</sup> [www.indianrailways.gov.in](http://www.indianrailways.gov.in) (Railway Safety Review Committee)

<sup>38</sup> Press Information Bureau (PIB) Press Release dated 29.8.2001

<sup>39</sup> *Ibid*, dated 16.9.2011



Planning issues, Shortage of Critical Safety Spares, External Interferences – Encroachment and Sabotage, Signaling, Telecommunication and Train Protection, Rolling Stock, Track, Bridges, Level Crossings, Human Resource Development with emphasis on Education and Training, Training Institutes on Indian Railways (IR) and Eco-System on Indian Railways and Safety Architectures on IR. The recommendations of the Committee are under examination<sup>40</sup>.

The High Level Safety Review Committee has proposed for an investment of Rs. 1,00,000 Crore over a five year period<sup>41</sup>.

### **12<sup>th</sup> Plan Perspective**

Following key areas related to safety need to be addressed and funded during 12<sup>th</sup> Plan period<sup>42</sup>.

- Development of proven and reliable on-board train protection system by monitoring and executing works of Train protection & Warning System (TPWS) and Anti Collision Device (ACD)/Train Collision Avoidance systems (TCAS). This would minimize human dependence in train operations and enhance the level of safety.
- Provision of improved safety systems with audio visual warning to road users in advance of approaching trains. The system is expected to significantly reduce accidents at level crossing gates.
- For moving towards a fault tolerant zero defect regime, computerized real time monitoring of assets and use of condition based in predictive maintenance systems shall be necessary. This will improve reliability of signalling system and reduce lifecycle cost of maintenance. There will be greater use of these concept to achieve overall corporate objective.
- A complete switchover to system and equipment of higher reliability and level of safety with built-in design redundancy using electronic interlocking, multi section digital axle counters.
- Development of “crashworthy” structural design capable of absorbing high impact loads in unfortunate case of collision/accidents.

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<sup>40</sup> Lok Sabha Unstarred Question No. 173 dated 22.11.2012

<sup>41</sup> Lok Sabha Unstarred Question No. 3074 dated 30.8.2012

<sup>42</sup> *op.cit.*, Working Group Report for 12<sup>th</sup> Plan – Railways Sector, pp. 24-25

- All the furnishing materials in the coaches to have superior fire retardant properties in line with international norms.
- Mobile Communication footprint to be extended substantially as secure mobile communication has significant operational, safety and maintenance benefits. As per the recommendation of RSRC, Board has accepted provision of on Board and mid section communication facilities with a commitment to complete this work on A,B & C routes of IR. Train Radio Communication (MTRC) is proposed for A,B & C routes in the 12<sup>th</sup> Plan on 15000RKms. An outlay of 1100 Cr. is required for providing MTRCV on identified sections of A, B & C routes in 12th Plan (Plan head 33).
- There are 2000 Kms of overhead alignment which is an outdated technology for block and control working. The communication media provided on overhead alignment is noisy and prone to failures. This needs to be replaced at the earliest. It is planned to replace the entire overhead alignment in 12<sup>th</sup> five year plan at a cost of Rs. 125 Cr.
- Provision of Biometric VCD (Driver's Vigilance Telemetry Control System).
- Provision of Intelligent fire surveillance & Extinguishing system of locos.
- Provision of GPS based Fog safe device

## Conclusion

Most accidents happen because of procedural failures. The most important systems in the Railways that demand urgent attention are signalling and route-relay interlocking (RRI), both of which have become outdated and are malfunctioning. The RRI systems have a life of 16 lakh operations or 20 years, whichever comes earlier. In most places in India, the RRI system has passed this age<sup>43</sup>.

At present, the total permanent personnel number is 13.62 lakh. This, despite the fact that the number of trains has increased nearly fourfold since 1991. The speed of the trains has also doubled in the past two decades. At present, at least 17,000 positions of loco pilots and one lakh positions of safety employees are lying vacant.

Machine failures at level crossings (manned and unmanned) have also resulted in many accidents. With the rise in the number of trains, tracks are overburdened at

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<sup>43</sup> Mahaprashasta, A.A., *Ailing Behemoth*, Frontline, Vol. 29 – Issue18, September 8-21, 2012

least one train passes each track every four minutes on an average. This hardly leaves any time for track personnel to conduct a thorough check.

Safety has come to be recognized as the key issue for the railways and one of its special attributes. No railway system can survive by ignoring this vital aspect as safe and timely transit is not only significant for passenger traffic but also for transportation of materials, in today's highly competitive environment<sup>44</sup>.

In recent years, safety of railways is becoming over arching concern in major countries like USA, England, Australia and those governed by the European Commission. In the working of railways system in these countries, the trend is to statutorily ensure that safety is accorded highest priority.

Thus, the above scenario presents a strong case for immediate steps to bolster safety orientation of Indian Railways along with inculcating a culture of zero tolerance of accidents<sup>45</sup>. The constant endeavour of the Indian Railways is to become the leader in the nation's transportation sector by providing modern, reliable, safe, customer-led and customer-focused services to the nation. Safety is an ethos that should pervade all activities of railway operations and maintenance. This ethos has to be instilled and nurtured. The concern for safety has to be all pervasive in the functioning of the Indian Railways<sup>46</sup>.

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<sup>44</sup> [www.interrailsafety.com/perth/press/sharma-paper.pdf](http://www.interrailsafety.com/perth/press/sharma-paper.pdf)

<sup>45</sup> *op.cit.*, High Level Safety Review Committee 2012, p. 93

<sup>46</sup> [www.indianrailways.gov.in](http://www.indianrailways.gov.in) (Corporate Safety Plan)