

1.0 Introduction

Under the Constitution of India “Regulation of Labour and Safety in Mines and Oilfields” is a central subject (Entry 55 of the Seventh Schedule of Article 246). The matter is regulated by the Mines Act, 1952 and the Rules and Regulations framed thereunder. It extends to whole of India including territorial water i.e. upto 12 nautical miles in the sea measured from appropriate base line. These statutes are administered by Directorate-General of Mines Safety (DGMS) under the Union Ministry of Labour & Employment.

1.1 Historical Background

Although exploitation of minerals has been going on in the country from pre-Christian era, it was only towards the end of 19th Century that attempts were made by the state for regulation of employment and working conditions therein. Following the International Labour Conference in Berlin in 1890, the then Government of UK through the Secretary of State for India asked the Government of India to consider the desirability of undertaking legislation for inspection of mines in general and coal mines in particular and for regulation of employment therein of men, women and children. Accordingly in 1894, Mr. James Grundy was appointed as first ever Inspector of Mines in India within the organization of Geological Survey of India. Mr. Grundy recommended that provisions be made for the minimum age of employment; notice of opening and of accidents, first-aid, management and supervision etc. Major disasters at Kolar Gold Field in 1897 and at Khost Coal Mines, Baluchistan (presently in Pakistan) in 1898 expedited finalisation of the first Mines Act which was enacted on 22nd March, 1901. A Bureau of Mines Inspection was started in Calcutta on 7th January 1902 to administer the provisions of the Mines Act, 1901. The organization was renamed as Department of Mines and its office was shifted to Dhanbad in 1908. In 1960, the organization was renamed as Office of the Chief Inspector of Mines. Again in 1967 the name of the organization was changed to Directorate-General of Mines Safety (DGMS). In 1988 DGMS was declared a Scientific and Technological Organization.

Apart from administering the Mines Act and legislation framed thereunder, DGMS also administers certain allied legislation. A list of legislation administered by DGMS is given at **Appendix-I**.

1.2 Organizational Set-up of DGMS

Directorate-General of Mines Safety is a multi-disciplinary organization with Inspecting Officers from Mining, Mechanical and Electrical engineering and Occupational Health disciplines. Officers appointed to different technical posts in DGMS are selected by U.P.S.C. They are required to have Degree in Mining or Mechanical or Electrical Engineering with several years of experience, varying from seven to ten years of working in responsible capacity in mines or allied industry. Besides, officers of mining cadre possess First Class Mine Manager's Certificate of Competency. The Occupational Health cadre is manned by qualified and experienced medical personnel.

The organization has its headquarters at Dhanbad (Jharkhand) and is headed by the Director-General of Mines Safety. At the headquarters, the Director-General is assisted by specialist staff-officers in mining, electrical and mechanical engineering, occupational health, law, survey, statistics, administration and accounts disciplines. The headquarters has a technical library and S&T laboratory as a back-up support to the organization. Extensive computerization has been done in head office and in the field offices to upgrade the standard of work. The head office and some of the field offices have access to the internet enabling these to place themselves at par with other developed countries of the world so far as the communication with the use of computer is concerned. DGMS has a plan to establish a network for all its offices through Internet. A web page on DGMS has already been launched during the centenary year.

The field organization has a two-tier network of field offices. The area of jurisdiction of DGMS covering the entire country is divided into 8 zones, each under the charge of a Deputy Director-General. There are three to four Regional offices under each zonal office. Each Region is under the charge of a Director of Mines Safety. There are in all 29 such Regional Offices. Sub-regional offices have been set up in important areas of concentrated mining activities away from Regional office. There are 3 such sub-regional offices, each under the charge of a Deputy Director. Each Zone, besides having inspecting officers of mining cadre has officers in electrical, mechanical engineering and occupational health disciplines.

Organization chart of DGMS are at **Appendix-IIA & IIB**. Table - 1 shows the discipline-wise strength of inspecting officers as on 31.12.2011. A statement showing posting of Group 'A' & 'B' officers in DGMS during the year 2011 are given at **Appendix-III**.

DESIGNATION	STRENGTH OF INSPECTING OFFICERS AND SANCTIONED POSTS AS ON 31.12.2011							
	DISCIPLINE							
	MINING		ELECTRICAL		MECHANICAL		O. H	
	S	P	S	P	S	P	S	P
Director General	1	1	-	-	-	-	-	-
Dy. Director General	9	9	1	1	1	1	-	-
Director	50	20	16	10	16	2	-	-
Dy. Director	99	60	34	2	33	1	5	1
Assistant Director	-	-	-	-	-	-	Gr.I-4	2
Total	159	90	51	13	50	4	9	3

S – Sanctioned P - In Position

1.3 Role and Function of DGMS

Enforcement of the provision of the Mines Act, 1952 and Rules, Regulations and Order made thereunder and drafting appropriate legislation to absorb the technical advancement as well as to make the same comprehensive, practicable and legally sound. Setting standards, by overseeing compliance thereof as intensively as the resources permit and through a variety of promotional initiatives and awareness programme, the officers of DGMS exercise preventive as well as educational influence over the mining industry. DGMS is also promoting the concept of 'self-regulation' as well as 'workers' participation in safety management. With changing scenario, attempts are being made to superimpose its traditional role of seeking compliance by legal sanctions and work prohibition optimally, with advisory and other safety promotional initiatives; thereby creating an environment in which safety is given due priority.

Current functions of DGMS broadly include:

1. Development and updating of legislation and issue of guidelines and circulars periodically.
2. Inspection – overseeing compliance of the statutes by the management through sample inspection as and when required
3. Investigation into:
 - (a) accidents
 - (b) dangerous occurrences - emergency response
 - (c) complaints & other matters and
 - (d) taking corrective action and action against delinquents
4. (a) Grant of :
 - (i) statutory permission, exemptions & relaxations
 - (ii) approval of mine safety equipment, material & appliances
 (b) Interactions for development of safety equipment, material and safe work practices
5. Safety promotional initiatives including:
 - (a) Organization of -
 - National Conference on Safety in Mines
 - National Safety Awards
 - Safety Weeks & Campaigns
 - (b) Safety Information Dissemination
 - (c) Preview of project reports & mining plans
 - (d) Promoting -
 - i) safety education and awareness programme
 - ii) workers' participation in safety management through -
 - workmen's inspector
 - safety committee
 - tripartite reviews
6. Conduct of examinations for grant of competency certificates.

1.4 Gazette Notification

Following gazette notifications were issued during the year 2011:

TABLE:2	Notification No. & date	Brief subject
1.	G.S.R. 85 dated 24.1.2011	Uses of all types of lightings, lighting fixtures and system, indicators or signal lights in Mines below ground and oil and gas mines/ fields.
2.	S.O 867 dated 29.3.2011	Appointment of Electrical Inspectors in DGMS.
3.	A-32012/08/2009-ISH-II dated 7.4..2011	Appointment of Dy. Director General of Mines Safety (Mining) in DGMS.
4.	S.O.1082 dated 7.4.2011	Appointment of Inspectors of Mines in DGMS
5.	S.O. 2741 dated 13.9.2011	Notification of Regional Offices for Official Language (Hindi)
6.	S.O.2933 dated 27.9.2011	Appointment of Officers as Inspectors of Mines in DGMS

1.5 Measures to improve safety in mines:

Since mining is beset with many inherent hazards, detailed precautions have been laid down in the Mines Act, Rules and Regulations framed thereunder to guard against dangers in mines and it is the responsibility of the mine management to comply with the same. While the onus of providing for and ensuring safety in mines rests with the mine management, DGMS has the responsibility to see that the safety statute is kept updated to absorb the technical advancements as well as to make the same comprehensive, practicable, legally sound and also to carry out periodic inspection of mines to oversee compliance of safety laws. The Mines Act and the subordinate legislations framed thereunder is periodically updated for the purpose. Each and every accident involving fatality is enquired into by an officer or a team of officers of DGMS. A few accidents involving serious bodily injury and most of the important dangerous occurrences are also investigated by DGMS Officers. Arising out of inspections and enquiries conducted by DGMS, one or more of the following actions, as appropriate, is taken: -

- (a) drawing the attention of the mine management about the contraventions of the statutes etc.;
- (b) withdrawal of statutory permission, approval, relaxation or exemption granted ;
- (c) serving an improvement notice ;
- (d) imposition of a prohibitory order ;
- (e) suspension of statutory certificate of competency held by managerial and supervisory personnel, if found negligent in the discharge of duties;
- (f) prosecution of person(s) held responsible;
- (g) punitive action taken departmentally by mining companies.

Mine management is also addressed to take steps as are considered necessary by the inspecting/enquiry officer to rectify the defects or deficiencies in working condition or system.

1.6 Inspection & Enquiries

Discipline-wise number of inspections and enquiries made by the inspecting officers are given in table:3.

TABLE:3	NUMBER OF INSPECTIONS AND ENQUIRIES MADE DURING THE YEAR 2011					
	Coal Mines		Metal Mines		Oil Mines	
	Inspections	Enquiries	Inspections	Enquiries	Inspections	Enquiries
Discipline of Inspection Service						
Mining	371	24	93	3	59	0
Electrical	209	59	85	7	23	0
Mechanical	2485	833	3508	442	239	68
Occupational Health	151	40	2	0	0	0
TOTAL	3216	956	3688	452	321	68

1.7 Improvement Notices & Prohibitory Orders

1.7.1 Coal Mines

104 (one hundred four) improvement notices under various provisions of the statutes were issued as a result of inspections of the mines during the year 2011. These improvement notices were issued for various types of serious defects, details of which are given in table:4 below :

TABLE:4	IMPROVEMENT NOTICES ISSUED UNDER SECTIONS 22(1) AND 22A(1) OF THE MINES ACT, 1952 IN COAL MINES DURING 2011	
SL.NO.	NATURE OF DEFECT	NO. OF CASES
1.	High benches in opencast workings	19
2.	Inadequate support	1
3.	Poor ventilation	14
4.	Inadequate coal dust suppression	13
5.	Isolation stopping	11
6.	Improper/ non-provision of travelling road	1
7.	Danger of Inundation	1
8.	Unstable workings	0
9.	Lag in stowing	0
10.	Accumulation of gases	0
11.	Defective Electrical installation	2
12.	Inadequate earth leakage protection	4
13.	Defective winding rope	4
14.	Other defects in winding installation	4
15.	Defective shot-firing practices	0
16.	Others	30
	TOTAL	104

43 (forty three) prohibitory orders under Section 22(3), 22A(2) and 22(1A) of the Mines Act, 1952 were issued during the year 2011. These orders were imposed for various dangerous conditions prevailing at the mines, details of which are given in table 5:

TABLE:5 PROHIBITORY ORDERS ISSUED UNDER SECTIONS 22(3) AND 22A(2) AND 22(1A) OF THE MINES ACT,1952 IN COAL MINES DURING 2011		
SL.NO.	NATURE OF DEFECT	NO. OF CASES
1.	High benches in opencast workings	7
2.	Inadequate support	0
3.	Poor ventilation	4
4.	Inadequate coal dust suppression	7
5.	Isolation stopping	0
6.	Improper/ non-provision of travelling road	1
7.	Danger of Inundation	3
8.	Unstable workings	0
9.	Lag in stowing	1
10.	Accumulation of gases	0
11.	Defective Electrical installation	0
12.	Inadequate earth leakage protection	0
13.	Defective winding rope	0
14.	Other defects in winding installation	1
15.	Defective shot-firing practices	0
16.	Others	19
	TOTAL	43

1.7.2 Metalliferous Mines

In metalliferous mines inadequate benching and unstable slope in opencast workings and non-appointment of manager and supervisory officials in the mines were the main reasons for which improvement notices and prohibitory orders were issued. Notices issued under Sections 22(1) & 22A(1) of the Mines Act, 1952 during the year 2011 were 429 (four hundred twenty-nine). Prohibitory orders under Sections 22(1A), 22A(2) and 22(3) issued in Metalliferous Mines during the year 2011 were 528 (five hundred twenty eight). Details of the improvement notices and prohibitory orders issued during 2011 are given in table: 6 & 7 respectively.

TABLE:6 IMPROVEMENT NOTICES ISSUED UNDER SECTIONS 22(1) AND 22A(1) OF THE MINES ACT,1952 IN METALLIFEROUS MINES DURING 2011		
SL.NO.	NATURE OF DEFECT	No. of cases
1.	Non-appointment of qualified manager and supervisory officials	114
2.	Inadequate benching and sloping in opencast workings	27
3.	Miscellaneous	288
	TOTAL	429

TABLE:7 PROHIBITORY ORDERS ISSUED UNDER SECTIONS 22(3), 22A(2) & 22(1A) OF THE MINES ACT,1952 ISSUED IN METALLIFEROUS MINES DURING 2011		
SL.NO.	NATURE OF DEFECT	No. of cases
1.	Non-appointment of qualified manager and supervisory officials	70
2.	Inadequate benching and sloping in opencast workings	95
3.	Miscellaneous	363
	TOTAL	528

1.7.3 Oil Mines

No notices issued under Sections 22(1) & 22A(1) of the Mines Act, 1952 during the year 2011. No prohibitory orders under Sections 22(1A), 22A(2) and 22(3) issued in Oil Mines during the year 2011. Details of the improvement notices and prohibitory orders issued during 2011 are given in table: 6A & 7A respectively.

TABLE:6A	IMPROVEMENT NOTICES ISSUED UNDER SECTIONS 22(1) AND 22A(1) OF THE MINES ACT,1952 IN OIL MINES DURING 2011	
SL.NO.	NATURE OF DEFECT	No. of cases
1.	Non-appointment of qualified manager and supervisory officials	-
2.	Others	-
	TOTAL	-

TABLE:7A	PROHIBITORY ORDERS ISSUED UNDER SECTIONS 22(3), 22A(2) & 22(1A) OF THE MINES ACT,1952 ISSUED IN OIL MINES DURING 2011	
SL.NO.	NATURE OF DEFECT	No. of cases
1.	Non-appointment of qualified manager and supervisory officials	-
2.	Others	-
	TOTAL	-

1.8 Permission, relaxations and exemptions

1.8.1 Coal Mines

821 (eight hundred twenty one) permissions/exemptions and relaxations were granted in coalmines during the year 2011. Details of such cases are given in table:8.

TABLE:8	PERMISSIONS, RELAXATIONS & EXEMPTIONS GRANTED IN COAL MINES DURING 2011	
SL.NO.	Particulars of Permissions, Relaxations & Exemptions	No. of cases
1.	Extraction of coal by methods other than bord & pillar beneath areas free from surface features	34
2.	Extraction of coal by methods other than bord & pillar below surface features	15
3.	Extraction of coal by bord & pillar methods beneath areas free from surface features	112
4.	Extraction of coal by bord & pillar methods beneath surface features	56
5.	Development below surface features including development in contiguous seams/ sections	29
6.	Blasting coal off the solid	37
7.	Development within 60m. of waterlogged workings	7
8.	Workings within 7.5m. / Adjustment of mine boundaries	12
9.	Exemptions from different provisions of regulations	102
10.	Others	417
	TOTAL	821

1.8.2 Metalliferous Mines

1685 (One thousand six hundred eighty five) permissions/relaxations/exemptions under different provisions of the statutes were granted during the year 2011. Particulars are given in table:9.

TABLE:9 PERMISSION, EXEMPTIONS & RELAXATIONS GRANTED IN METALLIFEROUS MINES DURING 2011		
SL.NO.	Particulars of Permissions, Exemptions & Relaxations	No. of cases
1.	Stopping of blocks	37
2.	Use of HEMM with deep hole blasting	318
3.	Use of ANFO and/or more than one explosive in a shot hole	57
4.	Working under railways and roads	0
5.	Appointment of managers of more than one mine/ permit manager etc.	951
6.	Appointment of surveyor of more than one mine	11
7.	Others	311
	TOTAL	1685

1.8.3 Oil Mines

341 (three hundred forty one) permissions/relaxations/exemptions were granted during the year 2011 under various provisions of the Oil Mines Regulations, 1984. The details of such cases are given in table:10

TABLE:10 PERMISSION, EXEMPTIONS & RELAXATIONS GRANTED IN OIL MINES DURING 2011		
SL.NO.	Particulars of Permissions, Exemptions & Relaxations	No. cases
1.	Well head installations	9
2.	Laying of oil pipe line	297
3.	Notices under Regulation 51 for GGS/EPS etc.	35
	TOTAL	341

1.9 Prosecutions

13 (thirteen) prosecutions were instituted in coalmines during the year 2011. In respect of non-coal mines, 25 (twenty five) prosecutions were launched during 2011. Contraventions of provisions of statute for which these prosecutions were instituted are given in tables: 11 & 12.

Details of prosecution cases as on 31.12.2011.

Coal	Non-coal	Pending	Disposed
No. of prosecution launched during the year 2011	No. of prosecution launched during the year 2011	Total cases pending for 2011	Total cases disposed during 2011
13	25	940	513

TABLE:11 PROSECUTIONS INSTITUTED IN RESPECT OF COAL MINES DURING 2011		
SL.NO.	CONTRAVENTION	NO. OF CASES
1.	Contraventions leading to accidents	10
2.	Non-submission or submission of incorrect plans, returns, notices etc.	-
3.	Non-appointment of qualified persons as senior supervisory officials	-
4.	Contraventions under Indian Electricity Act or Rules	-
5.	Other violation of serious nature	2
6.	Miscellaneous violations	1
	TOTAL	13

TABLE:12	PROSECUTIONS INSTITUTED IN RESPECT OF NON-COAL MINES DURING 2011	
SL NO.	CONTRAVENTION	NO. OF CASES
1.	Contravention leading to accidents	19
2.	Contravention of orders under sections 22(1A), 22(3), Reg. 108 etc.	2
3.	Non-appointment of qualified persons as senior supervisory officials	4
4.	Non-appointment of qualified persons as subordinate supervisory officials	-
5.	Non-provisions of protective equipment	-
6.	Other miscellaneous contraventions	-
	TOTAL	25

2.0 Coal Mines

2.1 General

Number of operating coalmines during 2011 was 602 as compared to 592 in 2010. Company-wise number of coal mines and production is given in table: 13.

TABLE: 13 COMPANY	Number of Mines during 2011*				Production (in million tonnes)
	Underground	Opencast	Both	Total	
Coal India Limited	280	160	35	475	466
Singareni Collieries Company Limited	48	19	1	68	65
Others	14	40	5	59	83
TOTAL	342	219	41	602	614

Table-14 shows the number of underground coalmines having gassy seams of different degrees.

TABLE : 14 Degree of gassiness	UNDERGROUND COAL MINES HAVING GASSY SEAMS OF DIFFERENT DEGREES	
	Number of Mines	
	2010	2011*
I only	276	275
II only	74	89
III only	5	7
I & II	10	12
I & III	-	-
II & III	1	2
I, II & III	1	-
TOTAL	367	385

*Figures for 2011 are estimated and provisional.

During the year total numbers of working mines have increased from 592 in 2010 to 602 in 2011. Output of coal increased from 602 million tones in 2010 to 614 million tones in 2011. Coal mines under M/s.Coal India Limited contributed 466 million tones of coal during the year 2011. Average daily employment in mines decreased from 369,000 in 2010 to 367,000 in 2011. The output per manshift was increased from 5.07 in 2010 to 5.23 during 2011. Trend in average daily employment and output per man shift in coalmines is given table- 15. Results for 2011 are estimated and subject to change after final compilation of data.

TABLE: 15		PLACEWISE DISTRIBUTION OF AVERAGE DAILY EMPLOYMENT AND OUTPUT AND PRODUCTIVITY IN COAL MINES						
Year	Belowground		Opencast		Above Ground	Total		Output per manshift
	Employment (in '000 number)	Output (in '000 tonnes)	Employment (in '000 number)	Output (in '000 tonnes)	Employment (in '000 number)	Employment (in '000 number)	Output (in '000 tonnes)	
1951	178	30199	36	4784	138	352	34983	0.35
1961	230	44887	60	10822	121	411	55709	0.45
1971	228	58552	43	17090	111	382	75642	0.67
1981	302	76205	55	51120	156	513	127325	0.81
1991	316	70731	67	167206	171	554	237757	1.40
1992	312	71062	67	178879	173	552	249941	1.47
1993	308	73672	68	186935	170	546	260607	1.53
1994	293	70644	67	196878	164	524	267522	1.63
1995	287	68512	68	216074	158	513	284586	1.80
1996	281	70127	68	233970	157	506	304097	1.91
1997	279	69062	68	247619	156	503	316681	2.01
1998	270	68571	69	251324	152	491	319895	2.09
1999	258	68101	71	247088	147	476	315189	2.12
2000	249	66225	69	268092	140	458	334317	2.34
2001	239	64134	69	277379	130	438	341513	2.51
2002	225	65330	69	297982	129	423	363312	2.75
2003	216	63632	69	315556	132	417	379188	2.91
2004	211	61921	70	347347	124	405	407268	3.19
2005	205	64087	70	356758	124	399	420845	3.35
2006	196	61213	76	369120	114	386	430333	3.50
2007	188	62302	80	418821	111	379	481123	3.95
2008	187	66290	77	440004	105	369	506294	4.25
2009	186	66835	80	491982	108	374	558817	4.67
2010	181	69614	83	531880	105	369	601714	5.07
2011*	179	71702	84	542474	104	367	614176	5.23

*Figures for 2011 are estimated and provisional.

2.2 Accidents

2.2.1 Major Accidents

There was no major accident during the year 2011

2.2.2 Accident scenario

During the year 2011 number of fatal accidents and fatalities was decreased in compared to the year 2010. Number of fatal accidents during the year 2011 was 65 and number of fatalities was 67 whereas in the year 2010 number of fatal accidents and fatalities were 97 and 118 respectively.

Table 16 indicates the trend of accidents and rates of fatalities.

YEAR	TREND IN FATAL ACCIDENTS AND FATALITY RATES PER 1000 PERSONS EMPLOYED IN COAL MINES (10 YEARLY AVERAGE)			
	Av. No. of accidents	Accident rate	Av. No. of fatality	Fatality rate
1901-1910	74	0.77	92	0.94
1911-1920	138	0.94	176	1.29
1921-1930	174	0.99	219	1.24
1931-1940	172	0.98	228	1.33
1941-1950	236	0.87	273	1.01
1951-1960	222	0.61	295	0.82
1961-1970	202	0.48	260	0.62
1971-1980	187	0.46	264	0.55
1981-1990	162	0.30	186	0.35
1991-2000	140	0.27	170	0.33
2001-2010	87	0.22	108	0.27
2011-2011*	65	0.18	67	0.18

*Provisional

Table 17 gives year-wise fatal accidents, fatalities, and death rates in coalmines.

Year	TREND IN FATAL ACCIDENTS AND DEATH RATES IN COAL MINES (YEAR-WISE)				
	No. of fatal accidents	No. of persons killed	Death Rate		
			Per '000 persons employed	Per 100,000 manshifts worked	Per million tonnes output
1951	278	319	0.91	0.32	9.12
1961	222	268	0.65	0.22	4.81
1971	199	231	0.60	0.21	3.05
1981	165	184	0.36	0.12	1.45
1991	138	143	0.26	0.08	0.60
2001	105	141	0.32	0.10	0.41
2002	81	97	0.23	0.07	0.27
2003	83	113	0.27	0.09	0.30
2004	87	96	0.24	0.07	0.23
2005	96	117	0.29	0.09	0.28
2006	78	137	0.36	0.11	0.32
2007	76	78	0.21	0.06	0.16
2008	80	93	0.25	0.08	0.18
2009	83	93	0.25	0.08	0.17
2010	97	118	0.32	0.10	0.20
2011*	65	67	0.18	0.06	0.11

*Provisional

In the year 2011 number of serious accidents increased slightly compared to that of the year 2010. Number of serious accidents and number of persons injured during 2011 were 486 and 508 as compared to 480 and 511 respectively during the year 2010. Serious injury rate per thousand persons employed in 2011 was 1.38 as compared to 1.39 in 2010. The above rate

per lakh man shifts worked was same as 0.43 in 2011 and 2010. The rate per million tonnes output decreased to 0.84 in 2011 from 0.85 in 2010. Table 18 gives year-wise number of serious accidents, no. of persons injured and serious injury rate.

TABLE: 18 TREND IN SERIOUS ACCIDENTS AND SERIOUS INJURY RATES IN COAL MINES (YEAR-WISE)					
Year	No. of serious accidents	No. of persons seriously injured	Serious injury rates		
			Per '000 persons employed	Per 100,000 manshifts worked	Per million tonnes output
2001	667	720	1.64	0.53	2.10
2002	629	665	1.57	0.50	1.83
2003	563	590	1.42	0.45	1.56
2004	962	991	2.45	0.77	2.42
2005	1106	1138	2.85	0.91	2.70
2006	861	891	2.31	0.73	2.07
2007	923	951	2.51	0.78	1.98
2008	686	709	1.92	0.59	1.40
2009*	636	660	1.76	0.55	1.18
2010*	480	511	1.39	0.43	0.85
2011*	486	508	1.38	0.43	0.84

* Provisional

Note : No. of seriously injured of fatal accidents are also considered for computation of no. of persons seriously injured & serious injury rates.

2.2.3 Analysis of accidents

All fatal accidents and major serious accidents were inquired into by officers of DGMS. An analysis of accidents enumerated in the following paragraphs based on the findings of such enquiry and information submitted by the mine management.

2.2.3A By place

Total 65 fatal accidents involving 67 fatalities occurred during the year 2011 as compared to 97 fatal accidents and 118 fatalities during the year 2010. Overall fatality rate has decreased in 2011 as compared to the year 2010. Overall serious injury rate during the year 2011 has also decreased to 1.38 from 1.39 in 2010. 23(35%) fatal accidents occurred in belowground workings with fatality rate of 0.13, 29(45%) fatal accident in opencast workings with fatality rate of 0.36 and 13(20%) in surface operation with fatality rate of 0.12 during the year 2011. Table 19 gives the trend of fatal and serious accidents with fatality rate in different working places.

TABLE: 19	TREND IN FATAL & SERIOUS ACCIDENTS AND DEATH & SERIOUS INJURY RATES; (PLACEWISE) - COAL MINES PER THOUSAND PERSONS EMPLOYED							
	Fatal accidents & death rates				Serious accidents & ser. injury rates			
	Below ground	Open cast	Above ground	Overall	Below ground	Open cast	Above ground	Overall
2001	67 (0.43)	26 (0.38)	12 (0.10)	105 (0.32)	464 (2.10)	73 (1.12)	130 (1.07)	667 (1.64)
2002	48 (0.27)	22 (0.32)	11 (0.11)	81 (0.23)	434 (2.07)	92 (1.43)	103 (0.80)	629 (1.57)
2003	46 (0.33)	23 (0.35)	14 (0.13)	83 (0.27)	380 (1.85)	82 (1.30)	101 (0.77)	563 (1.42)
2004	49 (0.27)	32 (0.47)	06 (0.05)	87 (0.24)	757 (3.69)	82 (1.24)	123 (1.02)	962 (2.45)
2005	50 (0.34)	28 (0.42)	18 (0.15)	96 (0.29)	843 (4.23)	98 (1.45)	165 (1.37)	1106 (2.85)
2006	44 (0.52)	24 (0.33)	10 (0.09)	78 (0.36)	646 (3.40)	88 (1.30)	127 (1.11)	861 (2.31)
2007	25 (0.13)	35 (0.46)	16 (0.14)	76 (0.21)	717 (3.91)	83 (1.10)	123 (1.15)	923 (2.51)
2008	32 (0.21)	29 (0.45)	19 (0.18)	80 (0.25)	516 (2.87)	74 (0.98)	96 (0.92)	686 (1.92)
2009*	39 (0.25)	29 (0.40)	15 (0.14)	83 (0.25)	490 (2.72)	50 (0.67)	96 (0.93)	636 (1.76)
2010*	41 (0.33)	40 (0.51)	16 (0.15)	97 (0.32)	348 (2.04)	62 (0.83)	70 (0.68)	480 (1.39)
2011*	23 (0.13)	29 (0.36)	13 (0.12)	65 (0.18)	347 (2.02)	68 (0.87)	71 (0.68)	486 (1.38)

* Provisional

Note : i) Figures in bracket indicate death/injury rate.

ii) No. of seriously injured of fatal accidents are also considered for computation of no. of persons seriously injured & serious injury rates.

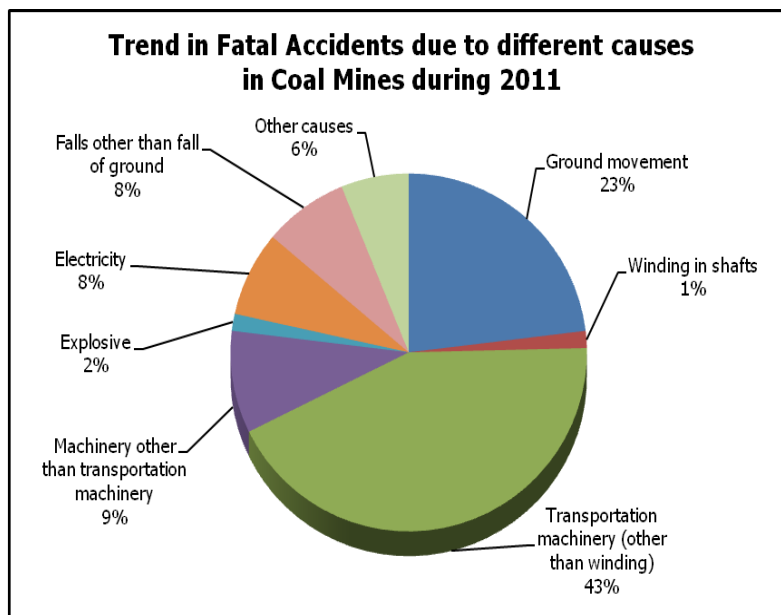
2.2.3B By cause

Tables 20 & 21 give the trend in fatal and serious accidents in coal mines due to different causes during the year 2011 followed by graphical representation. As can be seen 28(43%) of fatal accidents were caused by transportation machinery (other than winding), 15(23%) due to ground movement, 6(9%) due to machinery other than transportation machinery, 5(8%) each due to electricity and falls other than fall due to ground movement, 1(1%) each in winding in shaft and explosives and others contributed 4(6%). 486 serious accidents occurred during the year out of which 224(46%) were caused by falls other than falls of ground.

Cause	TREND IN FATAL ACCIDENTS DUE TO DIFFERENT CAUSES IN COAL MINES				
	2007	2008	2009*	2010*	2011*
Ground movement	17 (17)	21 (28)	26 (32)	22 (26)	15 (16)
Winding in shafts	-	1 (1)	-	-	1 (1)
Transportation machinery (other than winding)	29 (31)	28 (29)	31(31)	41 (44)	28 (29)
Machinery other than transportation machinery	12 (12)	10 (10)	15 (15)	7 (7)	6 (6)
Explosive	1 (1)	1 (1)	-	2 (16)	1 (1)
Electricity	4 (4)	5 (6)	2 (2)	8 (8)	5 (5)
Gas, Dust etc.	2 (2)	2 (6)	2 (4)	1 (1)	-
Falls other than fall of ground	9 (9)	10 (10)	4 (4)	10 (10)	5 (5)
Other causes	2 (2)	2 (2)	3 (5)	6 (6)	4 (4)
TOTAL	76 (78)	80 (93)	83 (93)	97 (118)	65 (67)

Note: Figures in parentheses denote the number of persons killed.

* Figures are provisional



Place	TREND IN FATAL ACCIDENTS IN DIFFERENT PLACES OF COAL MINES				
	2007	2008	2009*	2010*	2011*
Belowground	25 (25)	32 (39)	39 (46)	41 (60)	23 (24)
Opencast	37 (37)	29 (35)	29 (32)	40 (42)	29 (30)
Aboveground	16 (16)	19 (19)	15 (15)	16 (16)	13 (13)
Total	76 (78)	80 (93)	83 (93)	97 (118)	65 (67)

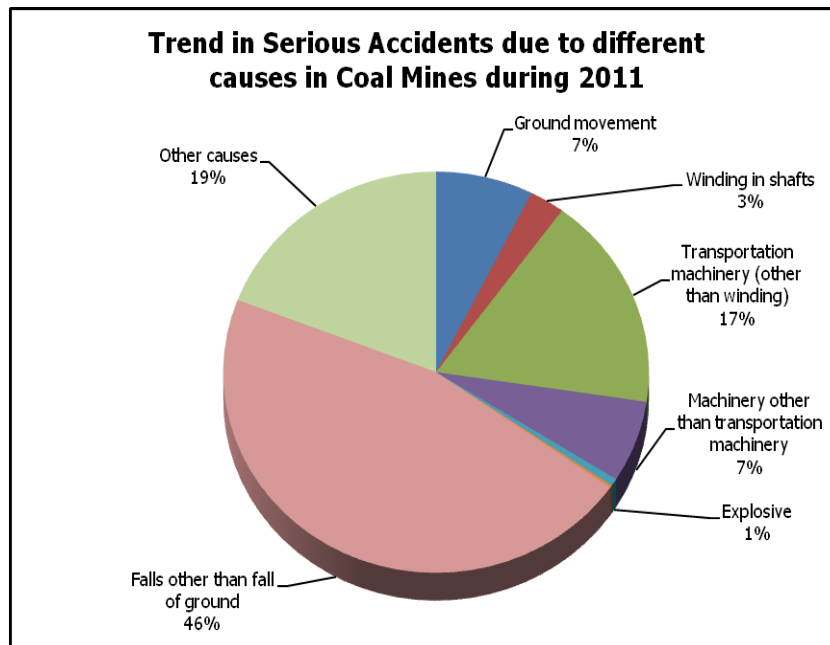
Note: Figures in parentheses denote the number of persons killed.

* Figures are provisional

Cause	TREND IN SERIOUS ACCIDENTS DUE TO DIFFERENT CAUSES IN COAL MINES				
	2007	2008	2009*	2010*	2011*
Ground movement	70 (78)	69 (73)	57 (68)	53 (62)	36 (47)
Winding in shafts	2 (11)	0 (0)	3 (4)	-	13 (18)
Transportation machinery (other than winding)	198 (202)	126 (128)	103 (108)	72 (84)	84 (88)
Machinery other than transportation machinery	79 (81)	40 (42)	36 (37)	24 (24)	32 (32)
Explosive	4 (4)	1 (1)	3 (5)	5 (11)	3 (4)
Electricity	3 (6)	0 (0)	2 (2)	3 (3)	1 (1)
Gas, Dust etc.	1 (1)	0 (14)	1 (2)	-	-
Falls other than fall of ground	456 (458)	351 (352)	309 (312)	221 (223)	224 (225)
Other causes	110 (110)	99 (99)	122 (122)	102 (104)	93 (93)
TOTAL	923 (951)	686 (709)	636 (660)	480 (511)	486 (508)

* Figures are provisional

Note: Figures in parentheses denote the number of persons seriously injured and it includes seriously injured from fatal accidents also.



Place	TREND IN SERIOUS ACCIDENTS DUE TO DIFFERENT PLACES IN COAL MINES				
	2007	2008	2009*	2010*	2011*
Belowground	717 (735)	516 (536)	490 (506)	348 (370)	347 (365)
Opencast	83 (88)	74 (76)	50 (54)	62 (69)	68 (72)
Aboveground	123 (128)	96 (97)	96 (100)	70 (72)	71 (71)
Total	923 (951)	686 (709)	636 (660)	480 (511)	486 (508)

* Figures are provisional

Note: Figures in parentheses denote the number of persons seriously injured and it includes seriously injured from fatal accidents also.

2.2.3B.1 Ground movement

During the year 2011, ground movement accounted for 15(23%) fatal accidents and 36(7%) serious accidents. Further break-up of fatal accidents due to ground movement is given in table 22.

TABLE: 22	FATAL ACCIDENTS DUE TO GROUND MOVEMENT IN COAL MINES DURING THE YEAR 2011		
Cause	No. of accidents	Persons killed	Persons seriously inj.
1.Fall of roof	11	12	06
2.Fall of side			
(a) belowground	2	2	1
(b) opencast	-	-	-
Sub-Total	2	2	1
3.Others			
(a) bumps	-	-	-
(b) air blast	-	-	-
(c) land slide	2	2	1
(d) collapse of pillar	-	-	-
(e) over hang	-	-	-
Sub-Total	2	2	1
GRAND TOTAL	15	16	8

2.2.3B.2 Roof fall

Strata control is a major problem affecting safety and productivity in underground mines. Experience of the past clearly brings out that roof fall is one of the predominant causes of fatalities in belowground coal mines and that trend continues even today. There were 15 accidents due to ground movement involving 16 fatalities and 08 serious injuries during the year 2011, out of which 11 accidents were due to fall of roof, 2 accidents were due to fall of side and 02 due to landslide. Roof fall accidents accounted for 22% of all fatal accidents in coal mines and it contributed 47% of all fatal accidents in belowground operations. Further critical analysis of roof fall accidents for the last five years 2007 to 2011 revealed the following:

I. Physical and Working Condition factors -

1. **Method of work:** Accident mainly occurred in Depillaring districts. 43% (33% in caving district and 10% in stowing district) of the fatal accidents occurred in Depillaring district, 45% in Board & Pillar development and 12% in other places.
2. **Height of working:** 68% of the fatal accidents occurred in gallery height upto 3m, 29% in 3m to 5m and 4%.. above 5m.
3. **Width of gallery:** 1% of the fatal accidents occurred in width of galleries between 0 - 3.0m and 1% between 3.01m – 3.5 m. 12% between 3.51-4.00m, 52% between 4.01 - 4.50m and 29% occurred in width of galleries above 4.50 m.
4. **Distance from face:** 35% of the accidents occurred within 5m of the working face and 20% between 5.01 to 10m, 6% between 10.01 to 20.00m and 18% above 20.01m Thus 55% of the accident occurred within 10m of the freshly exposed roof from the working face.

5. **Type of support:** 14% of the fatal accidents occurred in areas supported by timber support only, 3 % in timber and steel support, 11% in areas supported by roof bolts & others and 72% in other supports. However, areas supported by roof bolts were seems to be prone for roof fall. Steel supports, especially roof bolts, are more stable if they are fixed properly and in time.
6. **Adequacy of support:** Accident analysis revealed that in 61% of cases supports provided was inadequate, which means sufficient number of supports were not provided before engaging persons at work and majority of the accidents could have been averted had proper supports been provided before engaging the persons at work and front line supervisors been attentive for providing adequate supports. It also reveals that in 35% cases accident occurred although adequate support was provided.
7. **Operation at the time of accident:** 13% of the fatal accidents occurred during loading (manual) operation, 12% each during dressing, loading by machine and withdrawal of supports operation and 9% during supporting, Thus 49% of the accidents occurred during primary job of face preparation and manual loading. This can be avoided by adequately training the face workers for paying more attention towards identification of bad roof and testing for its weakness and by providing temporary supports before erecting permanent support. 21% of the fatal accidents occurred due to other activities.
8. **Time elapsed after blasting:** 22% of the roof fall accidents occurred within 30 minutes of blasting operation which correlates with the operation at the time of accident as mentioned above. This also means that sufficient time was not allowed for the roof to settle before engaging persons. 8% of the fatal accidents occurred between ½ - 1 hour, 15% between 1 to 2 hours and 29% of the fatal accidents occurred beyond 2 hours of blasting operation and in 25% of cases no blasting operation was carried out.

II. Geological factors -

9. **Thickness of seam:** 44% of the fatal accidents occurred in coal seam having thickness upto 3.0 m., 23% in 3 to 6 m. and 9% each in seams with thickness between 6-9m and above 9m. Thus roof fall occurred in all types of coal seams irrespective of their thickness.
10. **Depth of cover:** 32% of the fatal accidents accounted in depth of cover 0 to 100m , 29% between 101 to 200m, 21% between 201 to 300m, 9% between 301 to 400m and 4% occurred above 400m.
11. **Thickness of fall:** 13% of the fatal accidents occurred having thickness of fallen strata varying between 0 to 0.15m, 35% between 0.16 to 0.3m. Thus 48% of accidents had thickness of fall between 0 to 0.3m. 31% of fatal accident occurred having thickness of fallen strata between 0.31 to 1.0 m thick and 16% occurred beyond 1.00m thick.

Fall of roof was mainly due to geological reasons such as presence of slicken sides, hidden slip planes, or due to weathering of strata etc. which could have been effectively controlled had adequate and timely supports been provided.

12. **Nature of fallen strata:** 48% of the fatal accidents occurred due to fall of sand stone roof, 25% due to coal and 13% due to shale and rest of the fatal accidents occurred due to combination of any two. It indicates that practically all types of roof are likely to fall in absence of adequate supports.

III. Personal factors -

13. **Designation:** 29% of the persons involved in roof fall accidents were loader, 25% timbermen, 6% of subordinate supervisory staff, 14% dresser, 7% driller and others 14%. Mainly face workers were involved in the accidents as they are first to approach the face and stay beneath the green roof areas for longer duration.
14. **Age:** In 34% of the total accidents persons involved were in the age group of 46-50 years, 17% between 51-55 years, 15% each between 41-45 years and 56-60 years, 7% between 31-35, 6% between 36-40 years and 3% each between 21-25 and 26-30 years.
15. **Shift of working:** 52% of the fatal accidents took place in 1st shift, 26% in 2nd shift and 22% in 3rd shift. Thus it is observed that roof fall occurred mainly in first shift due to more number of persons employed during day time.
16. **Hours at work:** 32% of the roof fall accidents occurred during 2.01 -3.00, 19% between 5.01 – 6.00 hours, 13% in 3.01 – 4.00, 12% between 4.01-5.00 hours and 9% between 6.01-7.00 hours. Thus 51% of the roof fall accidents occurred between third and sixth hours of the shift.

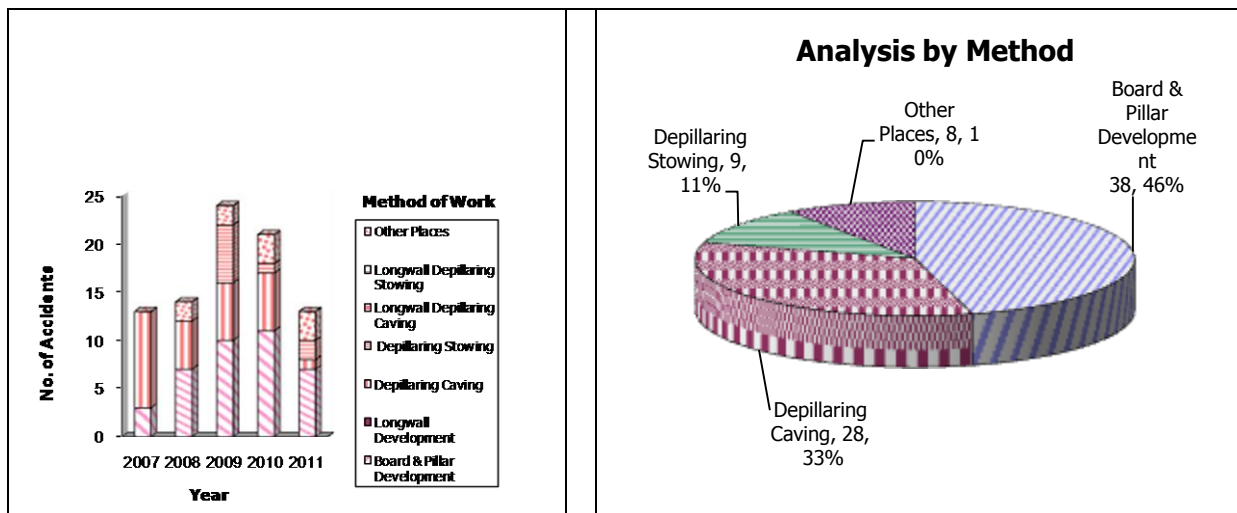
IV. Management factors -

17. **Responsibility:** 45% of the fatal accidents were caused due to fault of management and Subordinate Supervisory Staff; 14% of the fatal accidents due to fault of Subordinate Supervisory Staff alone, 10% due to fault of management,SSS & deceased and 8% of the cases management & others. In 6% of cases deceased was responsible.
18. **Company:** Company-wise analysis indicates that 76% of roof fall accident occurred in CIL whereas 19% occurred in SCCL. CIL subsidiary-wise 29% of fatal accidents occurred in SECL, 18% in WCL, 15% in BCCL, 12% in ECL and 1% each in MCL and CCL.

Detailed statistical analysis of roof fall accidents that occurred during last 5 years are given in tabular as well as graphically in the following tables:

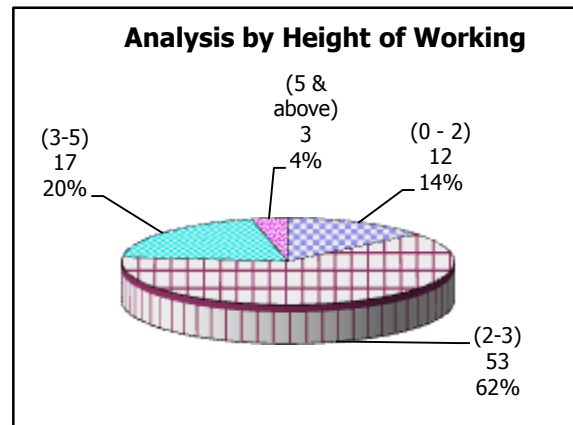
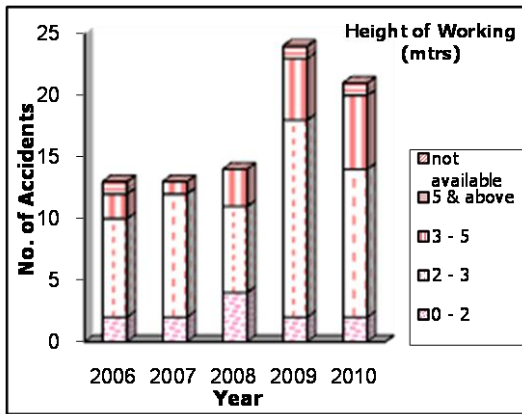
1. Distribution of fatal roof fall accidents by method of work

Method of work	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
Board & Pillar Development	3	23	7	50	10	42	11	52	7	54	38	45
Longwall Development	0	0	0	0	0	0	0	0	0	0	0	0
Depillaring												
Caving	10	77	5	36	6	25	6	29	1	8	28	33
Stowing	0	0	0	0	6	25	1	5	2	15	9	10
Total Depillaring	10	77	5	36	12	50	7	33	3	23	37	43
Longwall Depillaring												
Caving	0	0	0	0	0	0	0	0	0	0	0	0
Stowing	0	0	0	0	0	0	0	0	0	0	0	0
Total Longwall	0	0	0	0	0	0	0	0	0	0	0	0
Other Places	0	0	2	14	2	8	3	14	3	23	10	12
Total	13	100	14	100	24	100	21	100	13	100	85	100



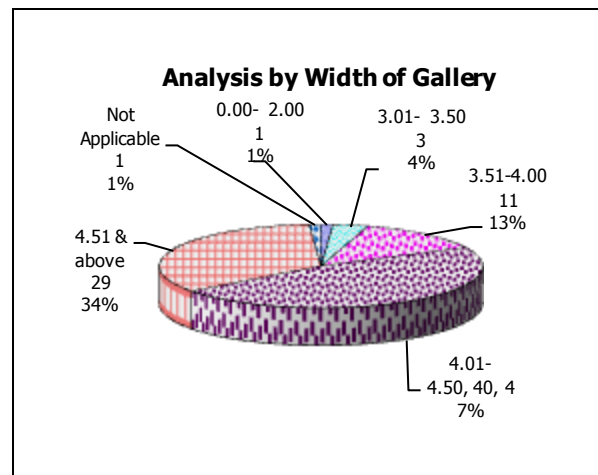
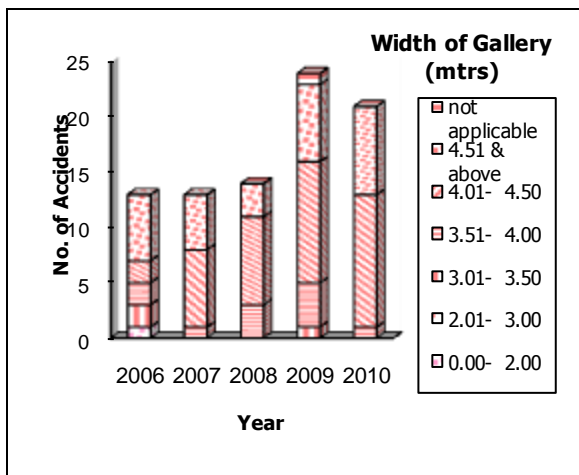
2. Distribution of fatal roof fall accidents by height of working

Height of working (metres)	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
0 – 2	2	15	4	29	2	8	2	9	1	8	11	13
2 – 3	10	77	7	50	16	67	12	57	2	15	47	55
3 – 5	1	8	3	21	5	21	6	29	6	46	21	25
5 & above	0	0	0	0	1	4	1	5	1	8	3	4
not available	0	0	0	0	0	0	0	0	3	23	3	4
Total	13	100	14	100	24	100	21	100	13	100	85	100



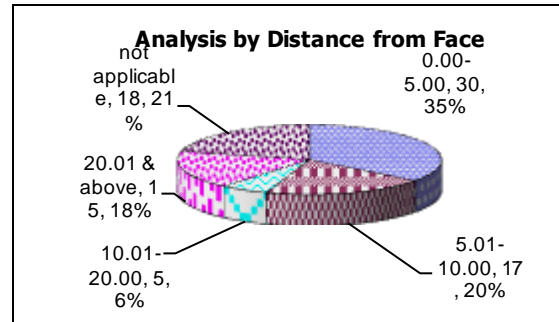
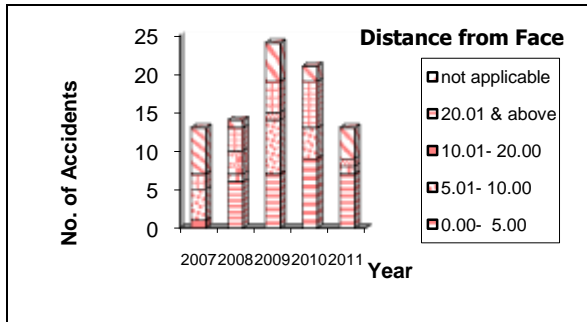
3. Distribution of fatal roof fall accidents by width of gallery

Width of Gallery (metres)	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
0.00- 2.00	0	0	0	0	0	0	0	0	1	8	1	1
2.01- 3.00	0	0	0	0	0	0	0	0	0	0	0	0
3.01- 3.50	0	0	0	0	1	4	0	0	0	0	1	1
3.51- 4.00	1	8	3	21	4	17	1	5	1	8	10	12
4.01- 4.50	7	54	8	58	11	46	12	57	6	46	44	52
4.51 & above	5	38	3	21	7	29	8	38	2	15	25	29
not applicable	0	0	0	0	1	4	0	0	3	23	4	5
Total	13	100	14	100	24	100	21	100	13	100	85	100



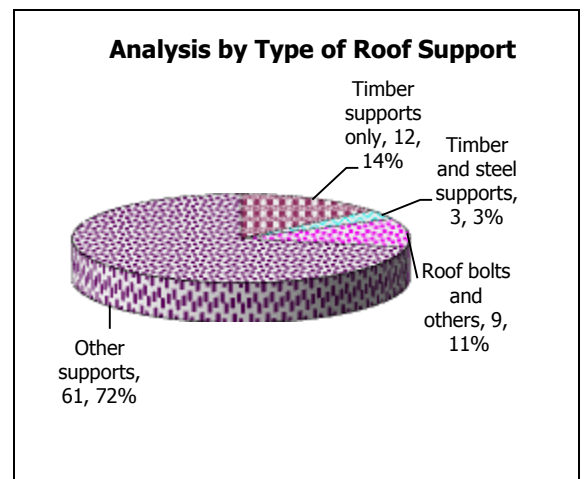
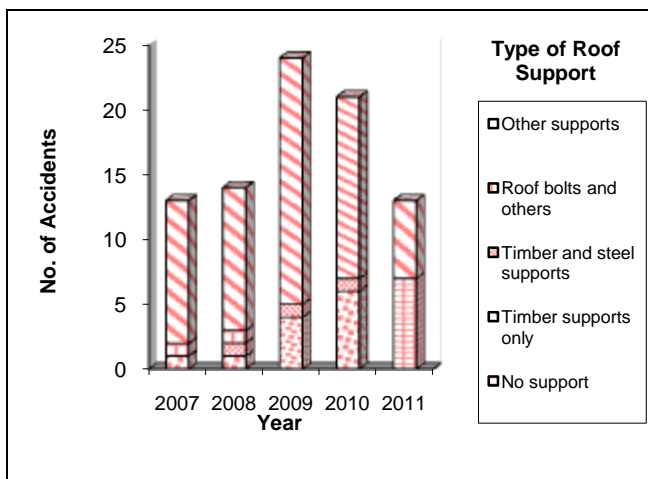
4. Distribution of fatal roof fall accidents by distance from face

Distance from face (metres)	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
0.00- 5.00	1	8	6	44	7	29	9	43	7	53	30	35
5.01- 10.00	4	31	1	7	7	29	4	19	1	8	17	20
10.01- 20.00	0	0	3	21	1	4	0	0	1	8	5	6
20.01 & above	2	15	3	21	4	17	6	29	0	0	15	18
not applicable/ available	6	46	1	7	5	21	2	9	4	31	18	21
Total	13	100	14	100	24	100	21	100	13	100	85	100



5. Distribution of fatal roof fall accidents by type of roof support

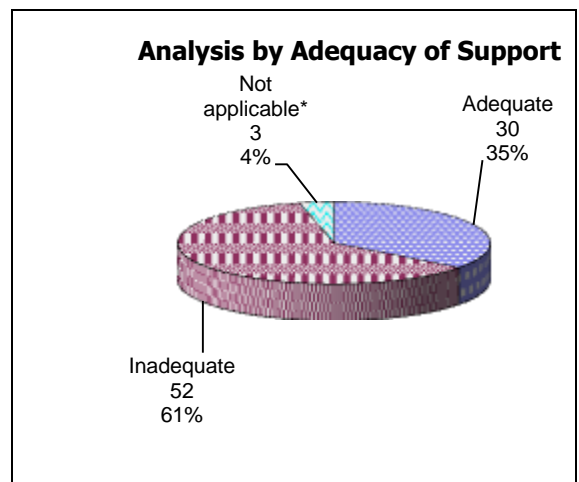
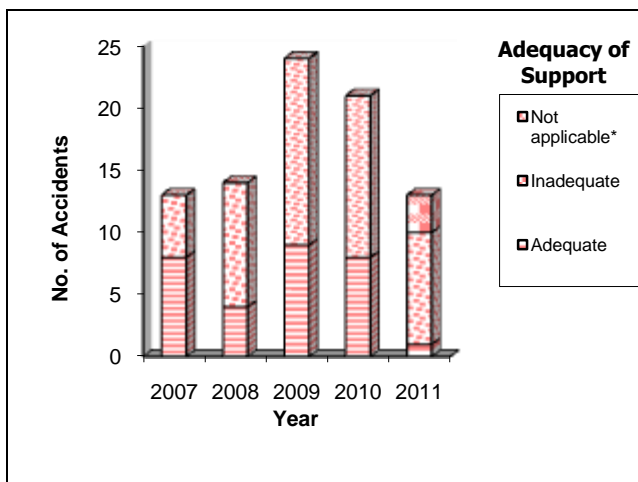
Type of support	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
No support	0	0	0	0	0	0	0	0	0	0	0	0
Timber supports only	1	8	1	7	4	17	6	29	0	0	12	14
Timber and steel supports	0	0	1	7	1	4	1	5	0	0	3	3
Roof bolts and others	1	8	1	7	0	0	0	0	7	54	9	11
Other supports	11	84	11	79	19	79	14	66	6	46	61	72
Total	13	100	14	100	24	100	21	100	13	100	85	100



6. Distribution of fatal roof fall accidents by adequacy of support

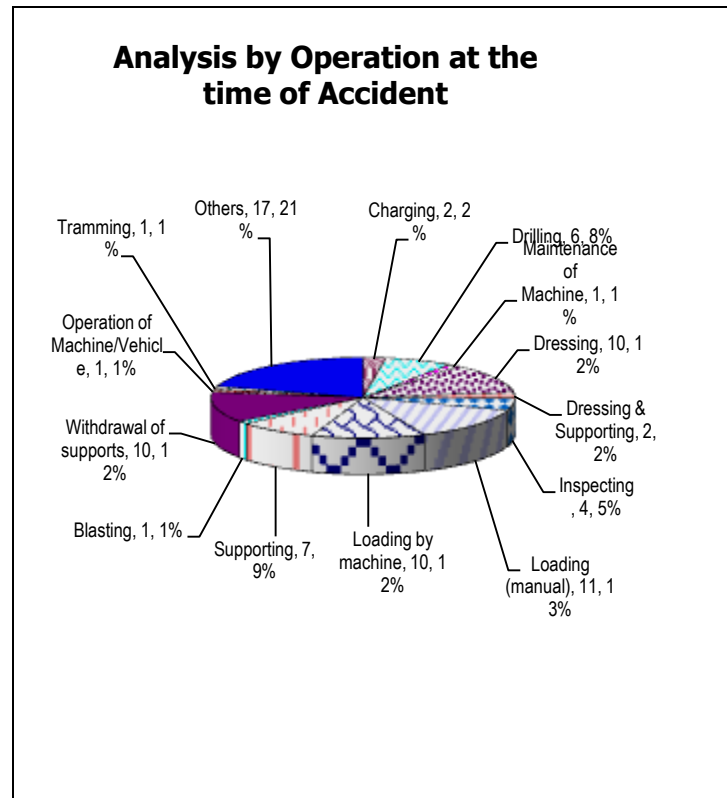
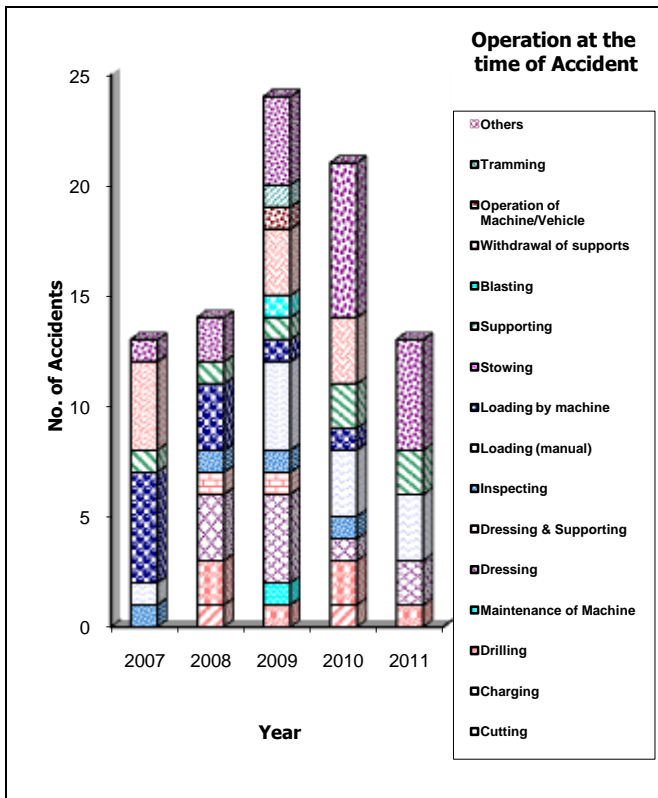
Adequacy of support	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
Adequate	8	62	4	29	9	37	8	38	1	8	30	35
Inadequate	5	38	10	71	15	63	13	62	9	69	52	61
Not applicable*	0	0	0	0	0	0	0	0	3	23	3	4
Total	13	100	14	100	24	100	21	100	13	100	85	100

* Provisional



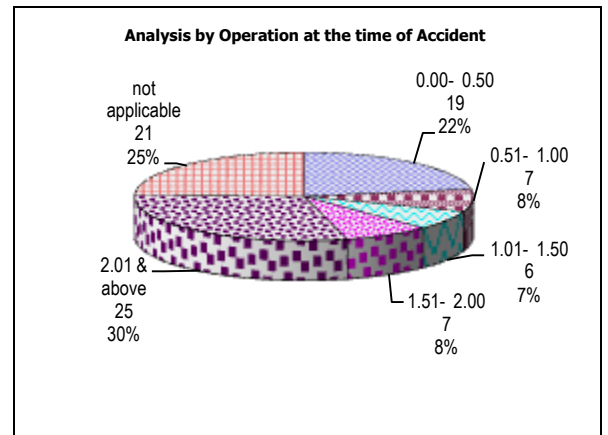
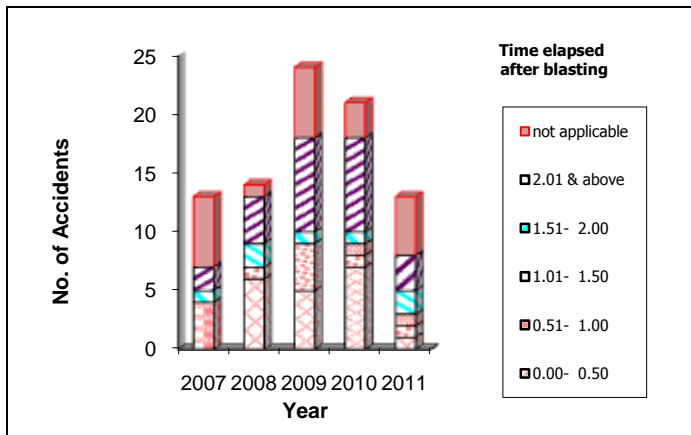
7. Distribution of fatal roof fall accidents by operation at the time of accident

operation at the time of accident	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
Cutting	0	0	0	0	0	0	0	0	0	0	0	0
Charging	0	0	1	7	0	0	1	5	0	0	2	2
Drilling	0	0	2	14	1	4	2	10	1	8	6	8
Maintenance of Machine	0	0	0	0	1	4	0	0	0	0	1	1
Dressing	0	0	3	22	4	17	1	5	2	15	10	12
Dressing & Supporting	0	0	1	7	1	4	0	0	0	0	2	2
Inspecting	1	8	1	7	1	4	1	5	0	0	4	5
Loading (manual)	1	8	0	0	4	17	3	14	3	23	11	13
Loading by machine	5	38	3	22	1	4	1	5	0	0	10	12
Stowing	0	0	0	0	0	0	0	0	0	0	0	0
Supporting	1	8	1	7	1	4	2	10	2	15	7	9
Blasting	0	0	0	0	1	4	0	0	0	0	1	1
Withdrawal of supports	4	30	0	0	3	13	3	14	0	0	10	12
Operation of Machine/Vehicle	0	0	0	0	1	4	0	0	0	0	1	1
Tramming	0	0	0	0	1	4	0	0	0	0	1	1
Others	1	8	2	14	4	17	7	32	5	39	19	21
Total	13	100	14	100	24	100	21	100	13	100	85	100



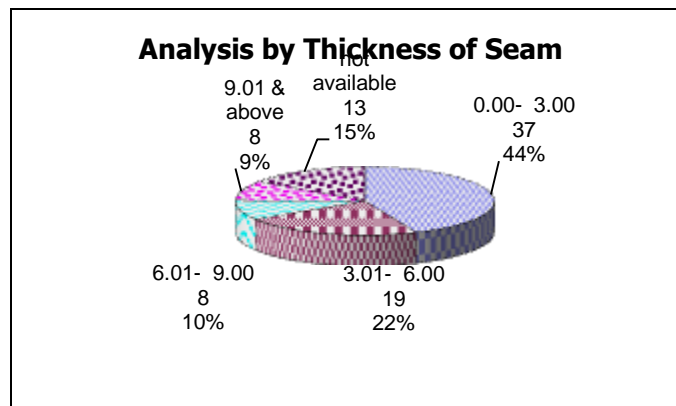
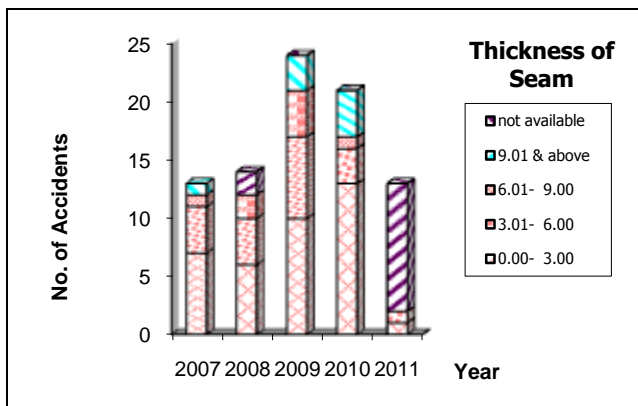
8. Distribution of fatal roof fall accidents by Time elapsed after blasting

Time elapsed after blasting (hours)	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
0.00- 0.50	0	0	6	43	5	21	7	33	1	8	19	22
0.51- 1.00	0	0	1	7	4	17	1	5	1	8	7	8
1.01- 1.50	4	31	0	0	0	0	1	5	1	8	6	7
1.51- 2.00	1	8	2	14	1	4	1	5	2	15	7	8
2.01 & above	2	15	4	29	8	33	8	38	3	23	25	29
not applicable	6	46	1	7	6	25	3	14	5	38	21	25
Total	13	100	14	100	24	100	21	100	13	100	85	99



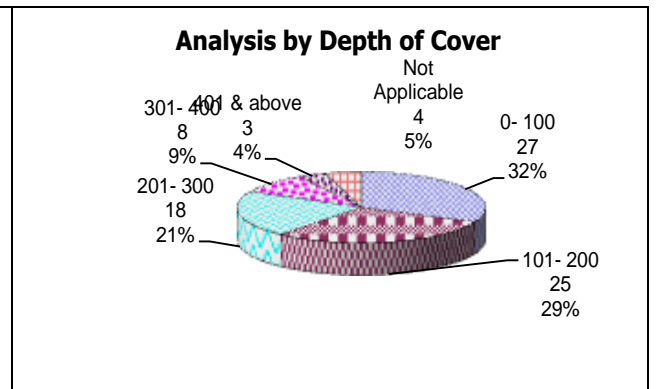
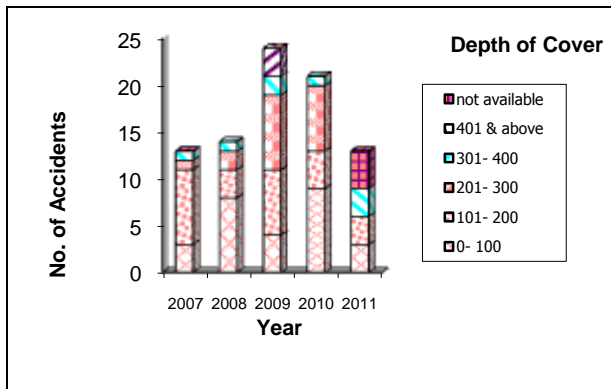
9. Distribution of fatal roof fall accidents by thickness of seam

Seam thickness (metres)	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
0.00- 3.00	7	54	6	43	10	42	13	62	1	8	37	44
3.01- 6.00	4	30	4	29	7	29	3	14	1	8	19	23
6.01- 9.00	1	8	2	14	4	17	1	5	0	0	8	9
9.01 & above	1	8	0	0	3	12	4	19	0	0	8	9
not available	0	0	2	14	0	0	0	0	11	84	13	15
Total	13	100	14	100	24	100	21	100	13	100	85	100



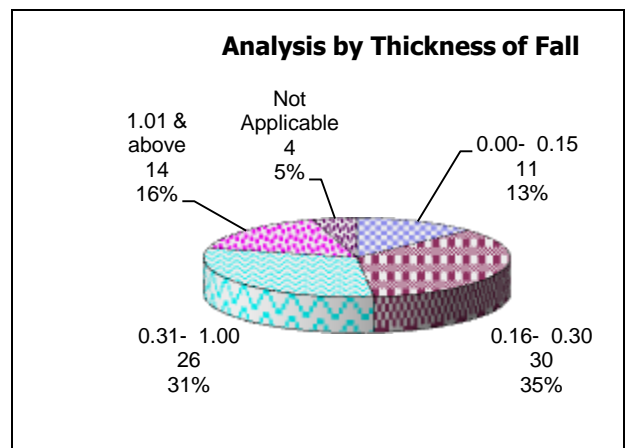
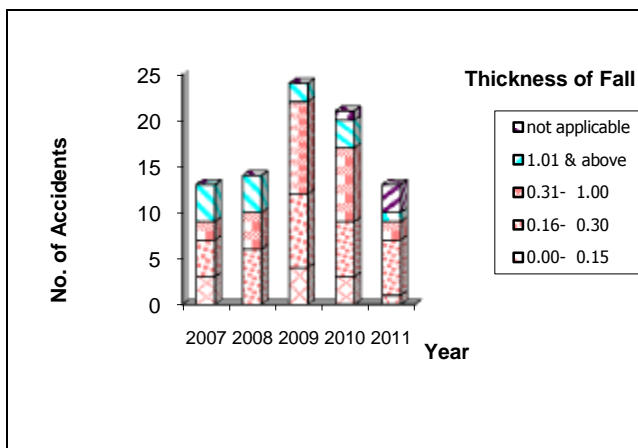
10. Distribution of fatal roof fall accidents by depth of cover

Depth of cover (metres)	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
0- 100	3	23	8	57	4	17	9	43	3	23	27	32
101- 200	8	61	3	22	7	29	4	19	3	23	25	29
201- 300	1	8	2	14	8	33	7	33	0	0	18	21
301- 400	1	8	1	7	2	8	1	5	3	23	8	9
401 & above	0	0	0	0	3	13	0	0	0	0	3	4
not available	0	0	0	0	0	0	0	0	4	31	4	5
Total	13	100	14	100	24	100	21	100	13	100	85	100



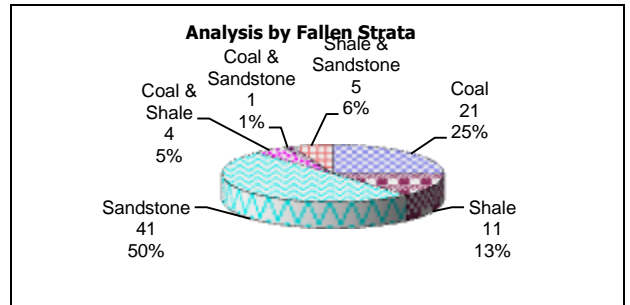
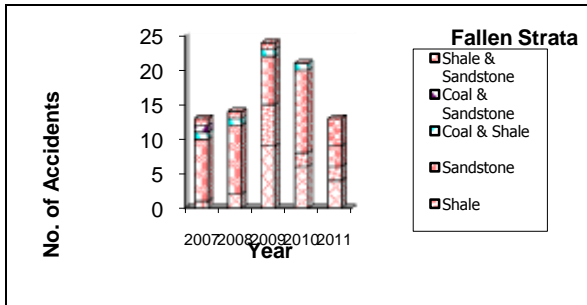
11. Distribution of fatal roof fall accidents by thickness of fall

Thickness of fall (metres)	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
0.00- 0.15	3	23	0	0	4	17	3	14	1	8	11	13
0.16- 0.30	4	31	6	42	8	33	6	29	6	46	30	35
0.31- 1.00	2	15	4	29	10	42	8	38	2	15	26	31
1.01 & above	4	31	4	29	2	8	3	14	1	8	14	16
Not applicable	0	0	0	0	0	0	1	5	3	23	4	5
Total	13	100	14	100	24	100	21	100	13	100	85	100



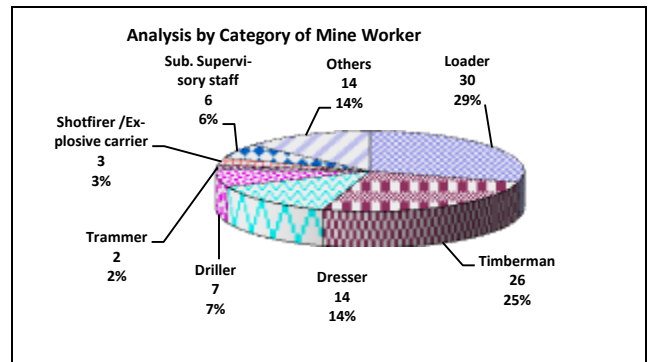
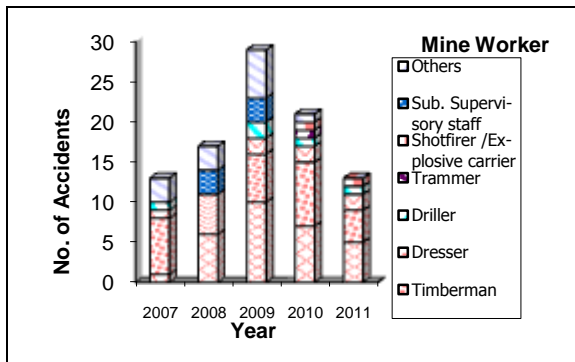
12. Distribution of fatal roof fall accidents by nature of fallen strata

Nature of fallen strata	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
Coal	0	0	2	14	9	38	6	29	4	31	21	25
Shale	1	8	0	0	6	25	2	9	2	15	11	13
Sandstone	9	68	10	72	7	29	12	57	3	23	41	48
Coal & Shale	1	8	1	7	1	4	1	5	0	0	4	5
Coal & Sandstone	1	8	0	0	0	0	0	0	0	0	1	1
Shale & Sandstone	1	8	1	7	1	4	0	0	4	31	7	8
Total	13	100	14	100	24	100	21	100	13	100	85	100



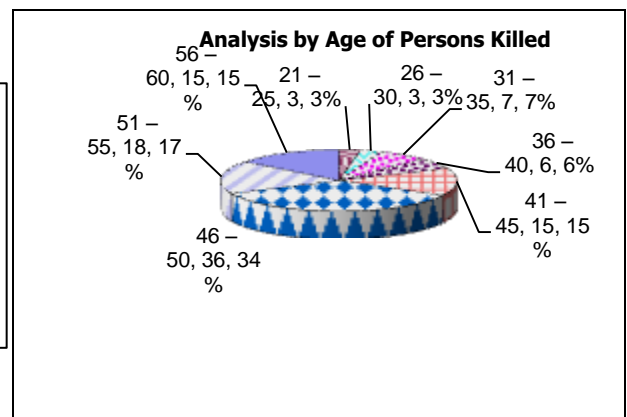
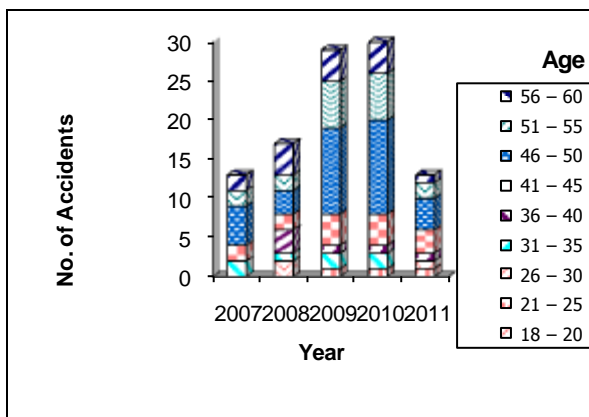
13. Distribution of persons killed in roof fall accidents by designation

Category of mine worker	Number of persons killed											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
Loader	1	8	6	35	10	34	7	33	5	38	30	29
Suppor Personnel/ Timberman	7	53	0	0	6	21	8	38	4	31	26	25
Dresser	1	8	5	29	2	7	2	9	2	15	14	14
Driller	1	8	0	0	2	7	1	5	1	8	7	7
Trammer	0	0	0	0	0	0	1	5	0	0	2	2
Shotfirer /Explosive carrier	0	0	0	0	0	0	1	5	1	8	3	3
Sub. Supervisory staff	0	0	3	18	3	10	0	0	0	0	6	6
Others	3	23	3	18	6	21	1	5	0	0	14	14
Total	13	100	17	100	29	100	21	100	13	100	102	100



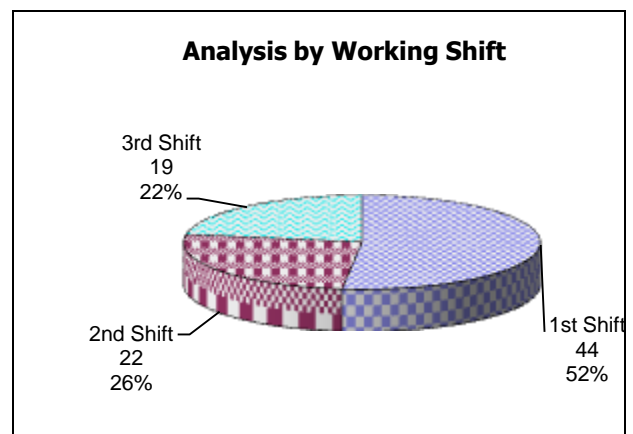
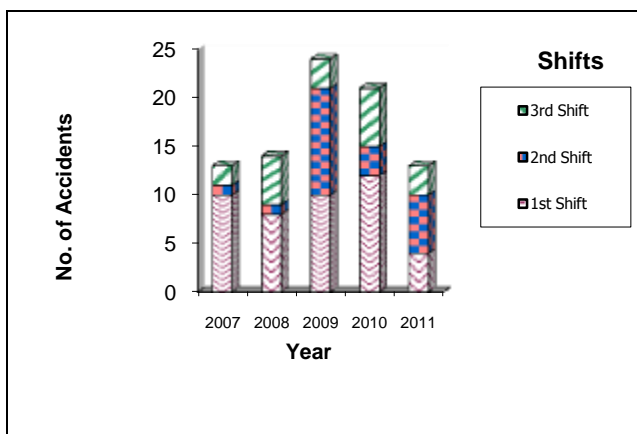
14. Distribution of persons killed in roof fall accidents by age

Age	Number of persons killed											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
18 – 20	0	0	0	0	0	0	0	0	0	0	0	0
21 – 25	0	0	0	0	1	3	1	3	1	8	3	3
26 – 30	0	0	2	12	0	0	0	0	1	8	3	3
31 – 35	2	15	1	6	2	7	2	7	0	0	7	7
36 – 40	0	0	3	18	1	3	1	3	1	8	6	6
41 – 45	2	15	2	12	4	14	4	14	3	22	15	15
46 – 50	5	40	3	18	12	38	12	40	4	31	36	34
51 – 55	2	15	2	12	6	21	6	20	2	15	18	17
56 – 60	2	15	4	22	4	14	4	13	1	8	15	15
Total	13	100	17	100	29	100	30	100	13	100	102	100



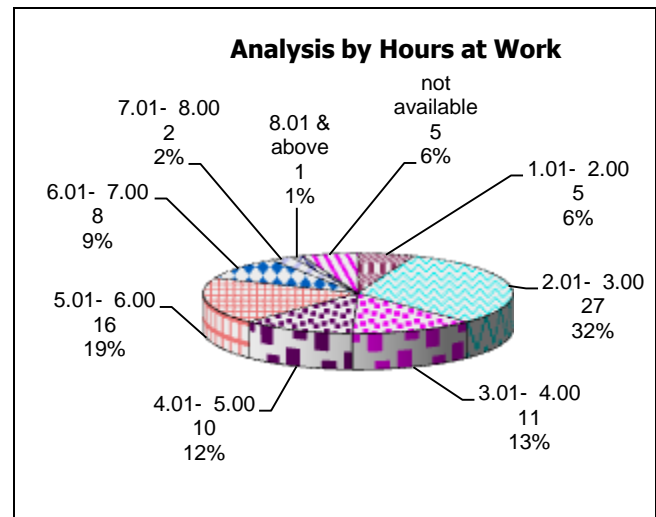
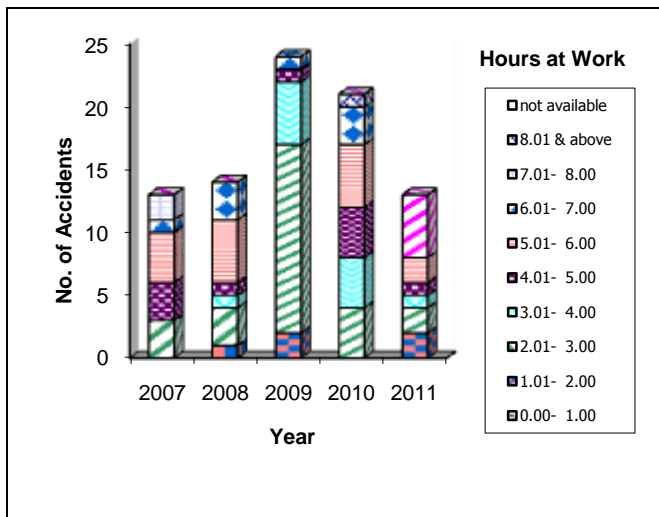
15. Distribution of fatal roof fall accidents by shift during which accident occurred

Shift	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
1st (7/8 AM to 3/4 PM)	10	77	8	57	10	42	12	57	4	31	44	52
2nd 3/4 PM to 11/12 M	1	8	1	7	11	46	3	14	6	46	22	26
3rd 11/12M to 7/8 AM	2	15	5	36	3	12	6	29	3	23	19	22
Total	13	100	14	100	24	100	21	100	13	100	85	100



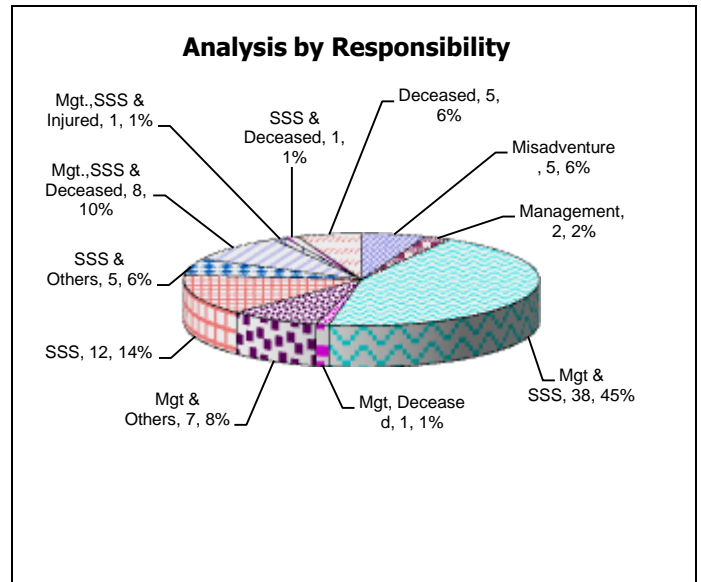
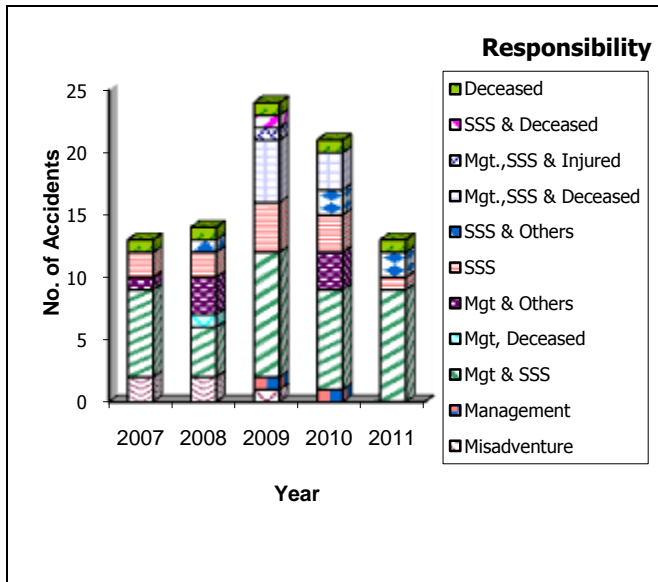
16. Distribution of fatal roof fall accidents by hours spent at work prior to the accident

Hours at Work	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
0.00- 1.00	0	0	0	0	0	0	0	0	0	0	0	0
1.01- 2.00	0	0	1	7	2	8	0	0	2	15	5	6
2.01- 3.00	3	23	3	21	15	63	4	19	2	15	27	32
3.01- 4.00	0	0	1	7	5	21	4	19	1	8	11	13
4.01- 5.00	3	23	1	7	1	4	4	19	1	8	10	12
5.01- 6.00	4	31	5	37	0	0	5	24	2	15	16	19
6.01- 7.00	1	8	3	21	1	4	3	14	0	0	8	9
7.01- 8.00	2	15	0	0	0	0	0	0	0	0	2	2
8.01 & above	0	0	0	0	0	0	1	5	0	0	1	1
not available	0	0	0	0	0	0	0	0	5	39	5	6
Total	13	100	14	100	24	100	21	100	13	100	85	100



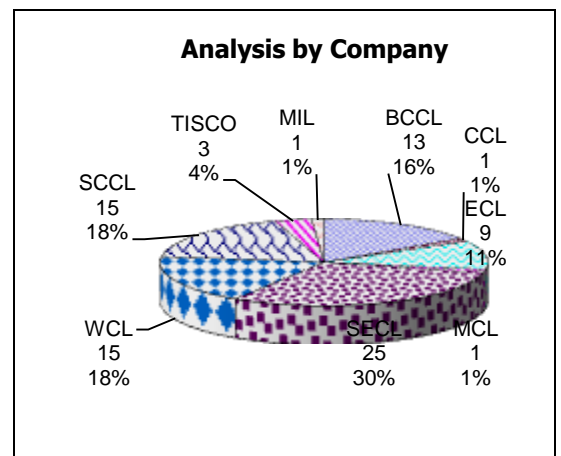
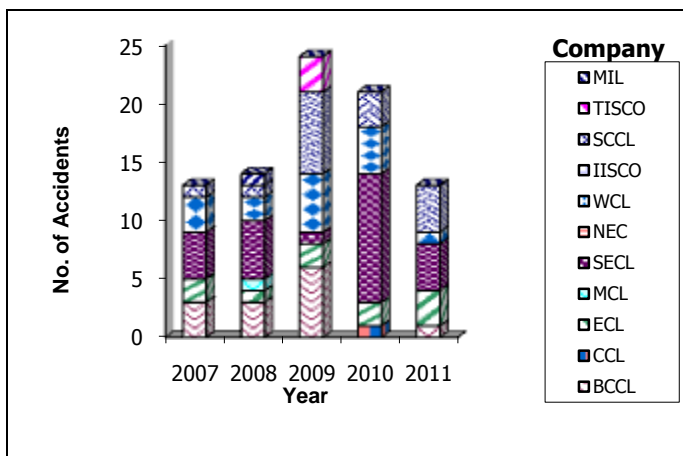
17. Distribution of fatal roof fall accidents by responsibility

Responsibility	Number of persons											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
Misadventure	2	15	2	14	1	4	0	0	0	0	5	6
Management	0	0	0	0	1	4	1	5	0	0	2	2
Management & Sub-ordinate Supervisory Staff(SSS)	7	54	4	29	10	42	8	38	9	69	38	45
Management & Deceased	0	0	1	7	0	0	0	0	0	0	1	1
Management & Others	1	8	3	22	0	0	3	14	0	0	7	8
Sub-ordinate Supervisory Staff(SSS)	2	15	2	14	4	17	3	14	1	8	12	14
SSS & Others	0	0	1	7	0	0	2	10	2	15	5	6
Management, SSS & Deceased	0	0	0	0	5	21	3	14	0	0	8	10
Management,SSS & Injured	0	0	0	0	1	4	0	0	0	0	1	1
SSS & Deceased	0	0	0	0	1	4	0	0	0	0	1	1
Deceased	1	8	1	7	1	4	1	5	1	8	5	6
Total	13	100	14	100	24	100	21	100	13	100	85	100



18. Distribution of fatal roof fall accidents by company

Company	Number of accidents											
	2007	%	2008	%	2009	%	2010	%	2011	%	Total	%
BCCL	3	23	3	22	6	25	0	0	1	8	13	15
CCL	0	0	0	0	0	0	1	5	0	0	1	1
ECL	2	15	1	7	2	8	2	10	3	22	10	12
MCL	0	0	1	7	0	0	0	0	0	0	1	1
SECL	4	31	5	36	1	4	11	52	4	31	25	29
NEC	0	0	0	0	0	0	0	0	0	0	0	0
WCL	3	23	2	14	5	21	4	19	1	8	15	18
CIL: total	12	92	12	86	14	58	18	86	09	69	65	76
IISCO	0	0	0	0	0	0	0	0	0	0	0	0
SCCL	1	8	1	7	7	29	3	14	4	31	16	19
TISCO	0	0	0	0	3	13	0	0	0	0	3	4
MIL	0	0	1	7	0	0	0	0	0	0	1	1
All-India	13	100	14	100	24	100	21	100	13	100	85	100



2.2.3B.3 Side fall and over hangs

There were 2 (3%) fatal accidents involving 2 fatalities due to fall of sides. All the accidents took place in belowground workings.

2.2.3B.4 Air blast

There was no accident due to this cause during the year 2011.

2.2.3C Transportation machinery (Winding)

One accident reported due to transportation machinery (Winding) during the year 2011.

2.2.3D Transportation machinery (Other than winding)

There were 28 fatal accident occurred due to transportation machinery other than winding engine involving 29 fatality reported during the year 2011. A detail break up of fatalities under this category is given in the table below.

Cause	FATAL ACCIDENTS DUE TO TRANSPORTATION MACHINERY OTHER THAN WINDING IN SHAFTS IN COAL MINES DURING 2011	
	No. of fatal accidents	Persons killed
1. Rope Haulage	03	03
2. Mechanical Conveyor	02	02
3. Dumpers / Tipper	19	19
4. Tankers/Trucks	4	5
5. Others (Wagon)	0	0
Total	28	29

From the above it is seen that dumpers/tippers is the main contributory factor to fatal accidents in opencast coal mines.

2.2.3D.1 Rope Haulages

There were 3 accidents (10.71% of all accidents) caused due to rope haulages during the year, 2011.

2.2.3D.2 Mechanical Conveyors:

Two accidents (7.14% of all accidents) resulting in two fatalities were caused by belt conveyors during 2011

2.2.3D.3 Dumpers and tippers:

There were 19 accidents due to machineries occurred resulting (67.85% of all fatalities) to dumpers and tippers during the year 2011

2.2.3D4 Truck & Tankers:

4 accidents occurred causing 5 fatality due to truck & tankers contributing (14.28%) of total accident.

2.2.3E Machinery other than transportation machinery:

There were 06 accidents reported during the year, 2011, which were caused due to machinery other than transportation machinery. The analysis of the caused revealed that -

TABLE – 24		FATAL ACCIDENTS DUE TO MACHINERY OTHER THAN TRANSPORTATION MACHINERY DURING 2011.	
Cause	No. of fatal accidents	Persons killed	
1. Drilling Machine	00	00	
2. Loading Machine SDL	04	04	
3. Haulage engine	00	00	
4. Shovels/Draglins	00	00	
5. Crushing & Screening Plant	00	00	
6. Other Heavy Earth Moving Machineries	02	02	
7. Other non-transportation machinery	00	00	
Total	06	06	

2.2.3F Explosives;

There was 1 fatal accident involving 1 fatality and 3 serious accidents occurred due to explosives during the year 2011.

2.2.3G Electricity;

There were 5 (7% of the total) fatal accidents involving 5 persons and one serious accident due to electricity during the year 2011.

2.2.3H Accidents due to Dust, Gas & Fire;

No fatal accident occurred due to dust,gas & fire during the year 2011

2.2.3I Falls other than falls of ground;

Falls other than fall of ground caused 5 (7% of the total) fatal accidents involving same number of lives during the year 2011.

2.2.3J Other causes;

4 fatal accidents involving 4 persons were reported due to other cases during the year 2011.

2.2.4 Responsibility

Analysis of accidents as per the persons held responsible for the various causes of accidents during the year 2011 has been indicated in table:25.

TABLE:25 RESPONSIBILITY FOR FATAL ACCIDENTS IN COAL MINES DURING THE YEAR 2011		
SL. NO.	Responsibility	No. of accidents
1.	Misadventure	3
2.	Management	6
3.	Management & Subordinate Supervisory Staff (SSS)	18
4.	Management, SSS & Co-worker	3
5.	Management, SSS, Co-worker & Deceased	-
6.	Management, SSS, Co-worker, Deceased & injured	-
7.	Management, SSS & Deceased	2
8.	Management, SSS & Injured	-
9.	Management & Shotfirer	-
10.	Management & Co-worker	2
11.	Management, Coworker & Deceased	2
12.	Management & Deceased	2
13.	Subordinate Supervisory Staff(SSS)	3
14.	SSS, Shotfirer, Coworker & Deceased	1
15.	SSS & Co-worker	1
16.	SSS, Co-worker & Deceased	5
17.	Coworker	6
18.	Co-worker & Deceased	5
19.	Deceased	3
20.	Others	3
	TOTAL	65

It can be seen that in 6 (9%) cases management alone and 18 (27%) cases management along with other subordinate staff were responsible. In 3 (4%) of the cases subordinate supervisory staff alone were found responsible. In 3(4%) cases deceased alone and in 6 (8%) cases the co-workers alone were responsible. These revelations draw the attention towards better planning and implementation of safety status by the management, strict and disciplined supervision by the subordinate supervisory staff and knowledge based effective training for the workers.

2.3 Dangerous occurrences

40 (Forty) dangerous occurrences were reported under the Coal Mines Regulations, 1957 during the year 2011. Details of cause of dangerous occurrences are given below in Table: 26

TABLE:26 DANGEROUS OCCURRENCES IN COAL MINES DURING 2011		
Sl. No.	Cause	No. of cases
1.	Spontaneous heating belowground	10
2.	Spontaneous heating in opencast working	1
3.	Spontaneous heating at surface	-
4.	Outbreak of fire underground from spontaneous heating	
5.	Outbreak of fire underground from causes other than spontaneous heating	2
6.	Outbreak of fire in quarries from causes other than spontaneous heating	-
7.	Outbreak of fire in surface from causes other than spontaneous heating	
8.	Premature collapse of workings or failure of pillars/benches/major roof fall	3+5(Dump Failure)
9.	Influx of noxious gases	5
10.	Ignition or occurrence of inflammable gas	-
11.	Over winding of cages etc.	-
12.	Breakage of winding rope	-
13.	Breakdown of winding engine, crank shaft, bearing etc.	-
14.	Breakage, fracture etc of essential parts of machinery or apparatus whereby safety of persons was endangered	2
15.	Irruption of water	1
16.	Subsidence/potholing	6
17.	Explosives	-
18.	Others	5
	TOTAL	40

A. Spontaneous Heating:

In total 11(Eleven) cases of spontaneous heating were reported. Out of 11 cases, 10 were in belowground workings and 1 in opencast workings.

Spontaneous heating in belowground was controlled & confined by sealing those panels by isolation stoppings & in extreme cases either the seam as a whole or the mine as whole was sealed off from surface and nitrogen flushing into the affected area was continued. In one case heating in sealed off panel was controlled by injecting inert gas "Nitrogen". Spontaneous heating and fire in opencast working was due to the presence of old & disused underground workings standing on pillars. Fire was controlled by spreading incombustible material (stone dust) in the galleries & over pillars and sealing off the galleries by

- i) isolation stoppings
- ii) injecting water into the affected area of underground workings.
- iii) injecting inert gases where ever required.

Contributory factors for spontaneous heating:

The primary contributory factors which lead to spontaneous heating and thereby fires:

- Non-sectionlization / improper sectionlization of old workings.
- Not cleaning the old galleries and return airways off fallen coal and not treating thoroughly with stone dust.
- Sluggish ventilation in old workings and depillaring areas.
- Working the depillaring panel beyond the incubation period.
- Not filling up the surface cracks formed due to subsidence and causing leakage of air into the sealed off areas and old workings.
- Not making and maintaining the isolation stoppings as prescribed.
- Stowing Lag in depillaring panel.

- Unavailability of CO detecting instruments & negligency in taking CO samples on routine basis.
- Negligency in monitoring the status of gas samples behind the isolation stoppings.

Corrective measures:

- Rate of extraction has to be made faster by deploying well maintained loading machines and loss of coal in the goaf has to be minimized.
- Isolation and sectionization stoppings have to be regularly inspected as per statute to detect early stage of spontaneous heating.
- Strengthening of old stoppings.
- Fallen loose coal has to be cleaned off regularly.
- Surface area above the goved out panels shall be filled up to avoid breathing of air.
- All the galleries exposed on the side of entries to the belowground workings in the seam shall be covered effectively to avoid breathing of air through those galleries.
- Rib of coal left as barrier between opencast working and belowground working need to be covered to prevent formation of return circuit through the cracks/fissures developed at the surface.
- There should not be stowing lag in the goaf of depillaring panel.
- Boreholes and subsidence areas, if any should be kept plugged and cracked should be filled up completely.
- Provision of Pressure balancing in the concerned areas.
- Telemonitoring devices should be installed for round the clock monitoring of any emission of noxious/inflammable gases.

B. Other Fires:

There was a case of fire in hydraulic excavator. While marching a hydraulic excavator, suddenly fire broke out and damaged the machine. Fire was controlled by using the fire extinguishers.

Corrective measures:

- Proper care should be taken during refueling diesel. A code of practice shall be drawn up for dealing with fires at different location in opencast mines, including HEMM. Arrangements for fighting fire should be provided on all heavy earth moving machineries. Such arrangements should, if possible, operate automatically on appearance of fire.
- Timely action has to be initiated if active fire is known to be existed behind the stoppings.
- Reinforcement of stoppings and cleaning of return airway to prevent choking shall be done.
- Adequate precautions shall be taken as per statute while using flame or electric welding or repairing apparatus belowground.
- Availability of Fire Tender in the mine must be ensured.

C. Premature collapse of workings or failure of pillars/ benches/major roof fall:

There was one case of premature collapse of depillaring working due to unsystematic working.

There were also two cases of roof fall in a depillaring panel due to roof not supported adequately.

There were five cases of overburden dump failure. The reasons of dump failure were due to

- i. leaching of the dump terrace at the bottom.
- ii. presence of water,
- iii. unwanted activities by miscreants in the bottom of the dump,
- iv. stagnant water in and around the spoil bank,
- v. overburden dump not properly sloped,
- vi. increased dump height

vii. not proper maintaining the drainage around the dump.

Corrective measures:

- Height and Width of the benches shall be fixed and maintained as per scientific study and size of the HEMM would be moving on the benches.
- Over burden dump shall not be made close to the edge of the Top Bench.
- Vertical coincident of pillars in contiguous seams shall strictly be maintained.
- Dump shall not be made on back filled area and no road shall also be made at the foot of the dump.
- Continuous monitoring is to be done to check for movement of dump.
- A study from scientific institution for dump stability, type of material to be dumped, water drainage system of dumps and hydrostatic & hydro-geological study of places where mining, dumping and pumping is being done is recommended.

D. Influx of Noxious Gases:

There were 2 cases of occurrences of CO gas in underground workings. The locations of CO was on outside of an old worked out panel developed in two sections and in depillaring panel where stowing was in progress. CO was controlled & confined by repairing of all the isolation stoppings with application of sealant (**Colatech**), making pressure balancing chamber around the sealed-off area and removal of carbonaceous materials lying in the galleries.

In another one case the emission of gas/smoke was found near bustee resulting danger to residential structures and human lives. Management have taken action and also asked the residents to evacuate the affected area.

E. Ignition or occurrence of inflammable gas:

There was no case of occurrence of inflammable gas.

F. Breakage, fracture etc. of essential parts of machinery or apparatus whereby safety of persons was endangered

There was one case of hard landing of cage which happened due to breakage of coupling bolts.

In another case there was breakage of coupling links between two man riding cars.

In both cases, root causes were enquired into & necessary action as desired.

G. Irruption of water / Landslide:

There was one case of inrush of surface water from opencast workings into goafed out underground panels of different seams. There was another case of sudden rise of water level in the sumps. The reason might be sudden release of water due to failure of old isolation stoppings. Root cause of inrush of water was enquired into and necessary action taken.

H. Subsidence / Potholing:

There were six cases of subsidence and pot holing due to shallow depth of cover, presence of old working, accumulation of heavy rain water on low lying areas, presence of fault plane. Pot holes were filled up and the affected area was stabilized properly. At some places the areas have been declared unsafe and suitable action taken.

Corrective Measures:-

- The low lying area should be filled up to avoid accumulation of water.
- Water drainage network of the area should be made effective so that no accumulation of water take place during continuous rain.
- Scientific study should be done to know the status of exact underground working in different seam.

- The low cover working area should be demarcated on the surface & surface drains should be made around so that the phenomenon of pot holing should be avoided in future.

I. Other:

There was one case of electrocution where a contract Labour inadvertently came in contact with 25KV live overhead line.

There was another case, while carrying out hydro testing of two joined pipes; suddenly pipe got burst due to failure of its welding parts.

There was one case of toppling of 100tonne capacity dumper. Provision of speed retarder was stressed upon.

There were three cases of blown out in Oil mines in which gas along with mud, water, and debris ejected out from the wells in uncontrolled way.

2.4 Technical Developments

- ❖ During the year 2011, 11.67% of the total production came from underground workings and 88.33% of the total production came from opencast mines. As far as average daily employment was concerned 49% were employed belowground, 23% were employed in opencast workings and the remaining 28% were employed for other surface operations.
- ❖ During the 2011, 1564 Excavators, 5601 dumpers capacity varying from 35T to 170T, 981 drills of 50 mm to 250 mm, 40 draglines were used in opencast mines.

Year	Shovels	Draglines	Drills	Dumpers	Others	HP of the machinery
1990	787	41	703	3663	1885	2,711,279
1991	864	41	703	3846	1746	2,972,990
1992	892	47	829	4223	2112	3,227,528
1993	910	44	802	4385	1952	3,409,140
1994	946	43	822	4437	1946	3,448,234
1995	956	42	871	4291	2116	3,639,816
1996	961	59	864	4038	1856	3,436,437
1997	1017	42	913	4399	2177	3,703,276
1998	1106	41	918	4520	2279	3,826,094
1999	1216	49	962	4776	2372	4,058,489
2000	1143	43	969	4602	2333	3,938,986
2001	1172	42	977	4666	2304	3,965,541
2002	1159	41	972	4721	2136	3,864,244
2003	1136	39	1003	4576	2163	4,095,742
2004	1135	45	978	4516	2367	3,995,550
2005	1073	34	922	4553	2085	4,035,171
2006	1088	28	861	4391	2006	3,798,259
2007	1188	33	1023	4634	2569	4,249,869
2008	1247	48	1018	4994	2779	4,479,969
2009	1320	40	920	5324	2750	4,588,696
2010	1490	42	975	5396	2879	4,394,578
2011*	1564	40	981	5601	3022	4,730,205

*Figures for 2011 are estimated and provisional.

(a) Number of machines used in underground coal mines of different coal companies are as follows:

Name of Company	Road header/ Dint header	SDL	LHD	Continuous Miners	Coal haulers	Other
BCCL	4	180	1	0	0	0
ECL	1	128	39	2	0	3
CCL	0	24	6	0	0	0
MCL	0	23	30	0	0	0
SECL	0	224	147	2	0	1
WCL	0	90	115	2	2	1
NECL	0	0	0	0	0	4
TATA	0	33	5	0	0	0
SCCL	7	144	34	2	0	44
NCL	0	0	0	0	0	0
GIPCL	0	0	0	0	0	0
NLC	0	0	0	0	0	0
JSMDC	0	0	0	0	0	0
GMDC	0	0	0	0	0	0
SAIL	2	0	0	0	0	2
RSMM	0	0	0	0	0	0
Total	14	846	377	8	2	55

(b) Number of machines used in opencast coal mines of different coal companies are as follows:

TABLE-29		Number of machines used in opencast mines during 2011														
Name of co.	Bucket wheel Excavator	Dragline	Surface Miners	Others	Dumpers					Excavators				Drills		
					170 T	120 T	85 T	50 T	35 T	>20 cu m	19-10 cu m	9-5 cu m	< 5 cu m	> 250 m m	249-150 mm	< 150 m m
BCCL	0	2	0	0	0	0	62	135	395	0	8	76	78	19	63	40
ECL	0	1	0	0	14	23	17	13	115	5	11	8	37	14	21	6
CCL	0	0	5	1	0	24	161	40	367	1	10	51	52	28	76	13
MCL	0	5	25	183	0	49	164	201	11	0	3	40	31	34	32	5
SECL	0	9	6	0	17	132	23	72	167	1	19	41	19	64	67	6
WCL	0	2	0	160	0	0	0	315	259	0	0	40	112	20	86	0
NECL	0	0	0	0	0	0	0	0	99	0	0	0	22	0	0	8
TATA	0	0	0	0	0	0	41	42	11	0	5	12	3	0	17	1
SCCL	0	2	0	0	0	122	59	0	232	0	23	12	47	22	35	0
NCL	0	19	0	0	0	287	254	0	0	6	63	13	21	13	80	3
GIPCL	0	0	0	0	0	0	1	15	136	0	0	2	39	0	0	0
NLC	34	0	0	530	0	0	0	0	42	0	0	0	83	26	19	1
JSMDC	0	0	0	0	0	0	0	0	16	0	0	0	4	0	0	2
GMDC	0	0	0	0	0	0	0	23	290	0	0	5	109	0	0	1
SAIL	0	0	0	0	0	0	0	0	36	0	0	0	11	0	1	5
RSMM	0	0	0	0	0	0	0	5	65	0	0	0	21	0	0	0
Total	34	40	36	874	31	637	782	861	2241	13	142	300	689	240	497	91

2.5 Occupational Health

Medical Examination by Appellate Medical Board

Initial and periodical medical examination under Rule 29B of the Mines Rules, 1955 are conducted by management and medical re-examination by Appellate Medical Board constituted by Central Government under Rule 29K.

(a) Progress of Medical Examination in Coal Mines:

TABLE: 30	PROGRESS OF INITIAL & PERIODICAL MEDICAL EXAMINATION DURING 2011 IN COAL MINES				
	Name of Company	Initial Medical Examination		Periodical Medical Exam.	
		Required	Provided	Required	Provided
BCCL	0	779	23166	19107	
ECL	783	783	15916	15439	
CCL	1218	1218	10541	8693	
MCL	0	973	3987	4020	
SECL	297	297	24024	21355	
WCL	3270	3270	17100	17148	
NECL	0	0	503	494	
TATA	42	42	1489	1556	
SCCL	1324	1324	16668	14510	
NCL	721	905	3603	3640	
GIPCL	528	528	41	41	
NLC	266	266	2320	2761	
JSMDC	5	5	12	15	
GMDC	11	2	490	436	
SAIL	0	0	338	352	
RSMM	15	15	3	0	
Total	8480	3045	120201	109567	

(b) Cases of Notified Diseases in Coal Mines:

TABLE: 31		CASES OF NOTIFIED DISEASES IN COAL MINES DURING THE YEAR 2011	
Mining Companies	Name of Disease	Number of cases	
SCCL	Carcinoma Lung	7	
	Kidney	2	
	Carcinoma Stomach	1	
	Carcinoma Gastro Esophageal junction	1	

2.6 Vocational Training

Recognizing the need for safety education to enable the mine workers to prepare them to face the challenges of mining, the Mines Vocational Training Rules were framed in 1966. These rules provide the provision for construction of mine vocational training centers, initial, refresher and special training to mine workers, appointment of training officers, instructors, proper training aids and equipments. It also provides for payment to trainees during the training period. Progress of vocational training in coalmines during the year 2011 was reported to be as follows.

TABLE: 32		PROGRESS OF VOCATIONAL TRAINING IN COAL MINES DURING THE YEAR 2011				
Name of the Company.	No. of VT Centers	Basic Training		Refresher Training		Special Training Provided
		Required	Provided	Required	Provided	
BCCL	12	400	1555	10019	10290	4265
ECL	21	988	988	12523	9731	5865
CCL	14	1715	1715	5625	5615	389
MCL	5	0	2837	2342	2933	1374
SECL	25	0	3870	11876	13252	4806
WCL	12	3254	3254	8365	8917	1428
NECL	2	0	357	454	472	311
TATA	3	687	686	1632	1547	1325
SCCL	11	3299	3299	9110	10002	2416
NCL	10	2539	3969	1674	2396	7718
GIPCL	1	437	437	0	0	4
NLC	1	2374	2374	4018	5310	555
JSMDC	1	15	15	40	40	10
GMDC	1	762	762	88	127	104
SAIL	3	333	333	605	615	351
RSMM	2	110	110	10	10	0
Total	124	16913	26561	68381	71257	30921

2.7 Workmen’s Inspector, Safety Committee & Welfare Officers

Much greater strides in safety can be achieved by participation of workmen in safety programme, the twin institutions of ‘Safety Committee & ‘Workmen’s Inspector’ have been conceived and given the statutory backing. DGMS is also associated with training of Workmen’s Inspectors to make them effective in discharge of their duties. In coal mines almost all the eligible mines had Workmen’s Inspector and Safety Committee. The table below shows the status of appointment of Welfare Officer, Workmen’s Inspector and formation of Safety Committees during the year 2011.

Name of Company	NUMBER OF WORKMEN’S INSPECTOR IN POSITION, SAFETY COMMITTEE, WELFARE OFFICERS IN COAL MINES DURING 2011					
	Welfare Officers		Workmen Inspectors		Safety Committee	
	Required	Provided	Required	Provided	Required	Provided
BCCL	40	136	120	120	40	40
ECL	87	75	249	281	96	100
CCL	58	58	174	174	58	58
MCL	23	23	92	92	23	23
SECL	91	91	273	273	91	91
WCL	72	72	216	216	72	72
NECL	3	3	12	12	4	4
TATA	7	7	36	36	7	7
SCCL	45	45	294	294	65	65
NCL	15	17	39	38	40	40
GIPCL	1	1	6	6	2	2
NLC	5	7	24	26	10	11
JSMDC	0	0	2	2	1	1
GMDC	0	0	15	15	5	5
SAIL	3	3	9	9	3	3
RSMM	0	0	6	6	2	2
Total	450	538	1567	1600	519	524

2.8 Company wise consolidated fatal accident statistics for last 8(Eight) years in coal mines

Owner	Year	Fatal Accidents								Death Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Accident	Killed	Accident	Killed	Accident	Killed	Accident	Killed				
BCCL	2004	7	8	3	3	1	1	11	12	0.25	0.31	0.05	0.20
	2005	10	15	1	1	3	3	14	19	0.50	0.10	0.17	0.33
	2006	7	56	5	5	0	0	12	61	1.98	0.55	0.00	1.14
	2007	4	4	3	3	2	2	9	9	0.15	0.35	0.13	0.18
	2008	8	8	2	2	1	1	11	11	0.32	0.25	0.07	0.23
	2009	6	8	4	6	4	4	14	18	0.30	0.68	0.29	0.36
	2010	1	1	6	6	0	0	7	7	0.04	0.69	0.00	0.15
	2011	3	4	3	3	0	0	6	7	0.18	0.35	0.00	0.15
CCL	2004	5	5	5	5	0	0	10	10	0.37	0.41	0.00	0.24
	2005	3	16	4	5	0	0	7	21	1.21	0.43	0.00	0.52
	2006	2	2	1	1	2	2	5	5	0.17	0.08	0.13	0.13
	2007	0	0	4	5	3	3	7	8	0.00	0.39	0.21	0.21
	2008	0	0	2	2	2	2	4	4	0.00	0.17	0.14	0.11
	2009	1	1	3	3	2	2	6	6	0.11	0.26	0.16	0.18
	2010	1	2	5	6	2	2	8	10	0.24	0.55	0.17	0.33
	2011	1	1	3	3	2	2	6	6	0.12	0.28	0.17	0.20
ECL	2004	10	11	5	5	1	1	16	17	0.24	1.09	0.04	0.22
	2005	9	10	3	3	4	4	16	17	0.22	0.62	0.15	0.22
	2006	7	12	1	1	0	0	8	13	0.28	0.16	0.00	0.18
	2007	5	5	2	3	0	0	7	8	0.12	0.47	0.00	0.11
	2008	5	5	2	2	4	4	11	11	0.12	0.35	0.18	0.16
	2009	6	7	2	2	0	0	8	9	0.17	0.45	0.00	0.13
	2010	5	5	4	4	4	4	13	13	0.13	0.97	0.19	0.20
	2011	4	4	4	4	0	0	8	8	0.10	0.97	0.00	0.13
MCL	2004	2	2	2	2	0	0	4	4	0.39	0.39	0.00	0.23
	2005	3	3	4	4	3	3	10	10	0.67	0.60	0.50	0.58
	2006	1	1	1	1	0	0	2	2	0.24	0.16	0.00	0.12
	2007	0	0	3	3	1	1	4	4	0.00	0.48	0.17	0.24
	2008	1	1	2	2	1	1	4	4	0.25	0.30	0.18	0.25
	2009	0	0	1	1	2	2	3	3	0.00	0.13	0.33	0.17
	2010	0	0	2	2	0	0	2	2	0.00	0.24	0.00	0.11
	2011	0	0	1	1	3	3	4	4	0.00	0.12	0.52	0.22
NCL	2004	0	0	3	4	0	0	3	4	0.00	0.59	0.00	0.31
	2005	0	0	1	1	2	2	3	3	0.00	0.15	0.31	0.22
	2006	0	0	3	4	1	1	4	5	0.00	0.53	0.16	0.36
	2007	0	0	4	4	2	2	6	6	0.00	0.40	0.33	0.37
	2008	0	0	5	9	0	0	5	9	0.00	0.84	0.00	0.54
	2009	0	0	4	4	0	0	4	4	0.00	0.44	0.00	0.23
	2010	0	0	9	9	3	3	12	12	0.00	0.86	0.45	0.70
	2011	0	0	3	3	2	2	5	5	0.00	0.29	0.30	0.29
NEC	2004	1	1	1	1	0	0	2	2	0.86	1.39	0.00	0.74
	2005	1	1	0	0	0	0	1	1	0.88	0.00	0.00	0.36

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Owner	Year	Fatal Accidents								Death Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Accident	Killed	Accident	Killed	Accident	Killed	Accident	Killed				
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	1	5	1	2	0	0	2	7	4.63	2.80	0.00	2.89
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	1	1	0	0	1	1	0.00	1.16	0.00	0.47
	2011	0	0	2	2	0	0	2	2	0.00	2.31	0.00	0.95
SECL	2004	5	6	1	1	1	1	7	8	0.17	0.15	0.06	0.14
	2005	7	8	5	5	2	2	14	15	0.23	0.71	0.13	0.26
	2006	3	3	3	3	1	1	7	7	0.09	0.41	0.06	0.12
	2007	5	5	4	4	5	5	14	14	0.15	0.56	0.36	0.26
	2008	6	7	3	3	2	2	11	12	0.22	0.42	0.15	0.23
	2009	4	4	5	5	0	0	9	9	0.13	0.77	0.00	0.18
	2010	15	29	1	1	3	3	19	33	0.96	0.18	0.22	0.67
	2011	6	6	3	3	2	2	11	11	0.20	2.53	0.15	0.22
WCL	2004	6	6	5	5	2	2	13	13	0.26	0.60	0.13	0.27
	2005	6	6	4	4	1	1	11	11	0.27	0.56	0.07	0.25
	2006	7	7	1	1	5	5	13	13	0.34	0.13	0.34	0.30
	2007	5	5	6	6	1	1	12	12	0.25	0.83	0.07	0.29
	2008	6	8	2	2	3	3	11	13	0.39	0.30	0.22	0.32
	2009	8	9	1	2	2	2	11	13	0.46	0.30	0.14	0.32
	2010	5	8	6	6	2	2	13	16	0.42	0.94	0.16	0.42
	2011	3	3	2	3	3	3	8	9	0.16	0.47	0.24	0.24
CIL	2004	36	39	25	26	5	5	66	70	0.25	0.48	0.05	0.22
	2005	39	59	22	23	15	15	76	97	0.39	0.42	0.14	0.31
	2006	27	81	15	16	9	9	51	106	0.57	0.28	0.09	0.35
	2007	19	19	26	28	14	14	59	61	0.14	0.47	0.15	0.21
	2008	27	34	19	24	13	13	59	71	0.25	0.42	0.14	0.25
	2009	25	29	20	23	10	10	55	62	0.22	0.41	0.11	0.22
	2010	27	45	34	35	14	14	75	94	0.36	0.63	0.16	0.35
2011	17	18	21	22	12	12	50	52	0.15	0.40	0.14	0.20	
JSMDC	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	1	1	0	0	1	1	0.00	7.94	0.00	4.98
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
DVC	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	1	1	0	0	1	1	0.00	9.26	0.00	4.33
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

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Owner	Year	Fatal Accidents								Death Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Accident	Killed	Accident	Killed	Accident	Killed	Accident	Killed				
GMDC	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	1	1	0	0	1	1	0.00	1.36	0.00	0.69
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	1	1	1	1	2	2	0.00	1.27	1.47	1.37
	2009	0	0	1	1	0	0	1	1	0.00	1.01	0.00	0.59
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
IISCO	2004	0	0	2	2	0	0	2	2	0.00	4.46	0.00	0.63
	2005	1	1	0	0	0	0	1	1	0.59	0.00	0.00	0.32
	2006	2	2	0	0	0	0	2	2	1.18	0.00	0.00	0.64
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	2	2	1	1	0	0	3	3	1.50	1.75	0.00	1.16
	2011	0	0	1	1	0	0	1	1	0.00	1.75	0.00	0.39
NLC	2004	0	0	2	2	1	1	3	3	0.00	0.32	0.28	0.31
	2005	0	0	1	1	0	0	1	1	0.00	0.20	0.00	0.08
	2006	0	0	5	5	0	0	5	5	0.00	0.63	0.00	0.47
	2007	0	0	2	2	0	0	2	2	0.00	0.25	0.00	0.19
	2008	0	0	2	2	0	0	2	2	0.00	0.31	0.00	0.19
	2009	0	0	2	2	1	1	3	3	0.00	0.30	0.24	0.28
	2010	0	0	2	2	1	1	3	3	0.00	0.31	0.21	0.26
	2011	0	0	2	2	0	0	2	2	0.00	0.31	0.00	0.18
SCCL	2004	10	13	1	1	0	0	11	14	0.28	0.17	0.00	0.23
	2005	8	8	2	2	1	1	11	11	0.17	0.37	0.14	0.19
	2006	13	16	3	3	0	0	16	19	0.36	0.50	0.00	0.33
	2007	4	4	5	5	2	2	11	11	0.10	0.72	0.28	0.20
	2008	4	4	5	6	4	4	13	14	0.09	0.74	0.55	0.24
	2009	11	14	6	6	0	0	17	20	0.33	0.51	0.00	0.32
	2010	8	9	2	3	1	1	11	13	0.19	0.24	0.10	0.19
	2011	5	5	2	2	1	1	8	8	0.11	0.16	0.10	0.11
TISCO	2004	3	5	0	0	0	0	3	5	1.01	0.00	0.00	0.63
	2005	2	2	0	0	0	0	2	2	0.38	0.00	0.00	0.24
	2006	2	3	0	0	1	1	3	4	0.57	0.00	0.60	0.49
	2007	1	1	0	0	0	0	1	1	0.20	0.00	0.00	0.10
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	3	3	0	0	0	0	3	3	0.51	0.00	0.00	0.37
	2010	4	4	0	0	0	0	4	4	0.71	0.00	0.00	0.51
	2011	1	1	2	2	0	0	3	3	0.18	1.38	0.00	0.38
APMDC	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	1	1	1	1	0.00	0.00	2.92	2.78

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Owner	Year	Fatal Accidents								Death Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Accident	Killed	Accident	Killed	Accident	Killed	Accident	Killed				
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
GIPCL	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	1	1	0	0	1	1	0.00	3.95	0.00	2.99
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	GHCL	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00
2005		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2006		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2007		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2008		0	0	1	1	0	0	1	1	0.00	27.03	0.00	25.00
2009		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2010		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2011		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
BLAI	2004	0	0	1	1	0	0	1	1	0.00	10.87	0.00	5.71
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
ICML	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	1	1	0	0	1	1	0.00	1.59	0.00	1.12
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	1	1	0	0	1	1	0.00	1.13	0.00	0.82
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
MIL	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	2	2	2	2	0.00	0.00	33.90	6.62
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	1	1	0	0	0	0	1	1	1.02	0.00	0.00	0.97
	2008	1	1	0	0	0	0	1	1	0.70	0.00	0.00	0.61
	2009	0	0	0	0	1	1	1	1	0.00	0.00	4.52	0.61
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
JNL	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

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Owner	Year	Fatal Accidents								Death Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Accident	Killed	Accident	Killed	Accident	Killed	Accident	Killed				
	2008	0	0	0	0	1	1	1	1	0.00	0.00	43.48	5.81
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
KECML	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	1	1	0	0	1	1	0.00	3.42	0.00	3.18
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
JPL	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	1	1	1	1	0.00	0.00	2.48	0.54
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	1	1	0	0	0	0	1	1	4.39	0.00	0.00	3.94
ALL INDIA	2004	49	57	32	33	6	6	87	96	0.27	0.47	0.05	0.24
	2005	50	70	28	29	18	18	96	117	0.34	0.42	0.15	0.29
	2006	44	102	24	25	10	10	78	137	0.52	0.33	0.09	0.36
	2007	25	25	35	37	16	16	76	78	0.13	0.46	0.14	0.21
	2008	32	39	29	35	19	19	80	93	0.21	0.45	0.18	0.25
	2009	39	46	29	32	15	15	83	93	0.25	0.40	0.14	0.25
	2010	41	60	40	42	16	16	97	118	0.33	0.51	0.15	0.32
	2011	23	24	29	30	13	13	65	67	0.13	0.36	0.12	0.18

BG- Belowground

OC-Opencast

AG-Aboveground

Note : Figures for the year 2011 are provisional.

2.9 Company-wise consolidated serious accident statistics for last 8 (eight) years in coal mines

Owner	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Accident	S/Inj	Accident	S/Inj	Accident	S/Inj	Accident	S/Inj				
BCCL	2004	58	60	8	8	11	11	77	79	1.89	0.84	0.60	1.32
	2005	20	31	11	11	10	12	41	54	1.03	1.15	0.69	0.95
	2006	19	20	11	13	4	4	34	37	0.71	1.44	0.25	0.69
	2007	36	37	14	14	9	9	59	60	1.38	1.64	0.57	1.17
	2008	28	28	7	7	13	13	48	48	1.11	0.88	0.93	1.02
	2009	20	21	12	14	9	9	41	44	0.79	1.60	0.65	0.89
	2010	21	21	1	4	3	4	25	29	0.93	0.46	0.28	0.64
	2011	24	30	3	3	9	9	36	42	1.33	0.35	0.64	0.93
CCL	2004	15	18	7	9	5	5	27	32	1.34	0.75	0.32	0.78
	2005	7	7	11	11	7	7	25	25	0.53	0.95	0.44	0.62
	2006	8	8	8	8	3	3	19	19	0.70	0.65	0.20	0.49
	2007	10	10	7	7	4	5	21	22	0.85	0.55	0.35	0.57
	2008	8	8	5	5	5	6	18	19	0.83	0.43	0.43	0.54
	2009	1	1	1	1	4	6	6	8	0.11	0.09	0.48	0.24
	2010	1	1	3	4	4	4	8	9	0.12	0.37	0.34	0.29
	2011	7	7	8	8	1	1	16	16	0.85	0.73	0.09	0.52
ECL	2004	148	151	14	15	24	24	186	190	3.25	3.28	0.86	2.41
	2005	54	56	7	7	14	14	75	77	1.24	1.44	0.51	1.00
	2006	83	86	5	5	9	9	97	100	2.02	0.81	0.36	1.36
	2007	95	107	8	8	17	17	120	132	2.59	1.24	0.70	1.83
	2008	85	86	8	8	19	19	112	113	2.04	1.40	0.85	1.61
	2009	82	84	9	9	19	19	110	112	2.01	2.00	0.85	1.64
	2010	44	44	4	4	9	9	57	57	1.12	0.97	0.44	0.89
	2011	28	31	2	2	7	7	37	40	0.79	0.49	0.34	0.63
MCL	2004	5	5	7	7	5	5	17	17	0.96	1.36	0.68	0.96
	2005	6	6	5	5	3	3	14	14	1.34	0.75	0.50	0.81
	2006	6	6	3	11	3	3	12	20	1.44	1.76	0.53	1.24
	2007	4	4	4	4	0	0	8	8	0.94	0.64	0.00	0.49
	2008	1	1	2	2	2	2	5	5	0.25	0.30	0.37	0.31
	2009	4	4	2	2	0	0	6	6	0.98	0.25	0.00	0.33
	2010	2	2	3	3	1	1	6	6	0.44	0.36	0.17	0.32
	2011	6	6	4	4	0	0	10	10	1.33	0.48	0.00	0.54
NCL	2004	0	0	5	5	4	5	9	10	0.00	0.74	0.81	0.77
	2005	0	0	10	11	3	3	13	14	0.00	1.61	0.46	1.05
	2006	0	0	7	7	6	6	13	13	0.00	0.93	0.95	0.94
	2007	0	0	10	10	2	3	12	13	0.00	1.00	0.50	0.81
	2008	0	0	7	7	1	1	8	8	0.00	0.66	0.16	0.48
	2009	0	0	2	2	0	0	2	2	0.00	0.22	0.00	0.12
	2010	0	0	9	9	1	1	10	10	0.00	0.86	0.15	0.58
	2011	0	0	5	6	0	0	5	6	0.00	0.58	0.00	0.35
NEC	2004	1	1	0	0	0	0	1	1	0.86	0.00	0.00	0.37
	2005	0	1	0	0	0	0	0	1	0.88	0.00	0.00	0.36
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

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Owner	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Accident	S/Inj	Accident	S/Inj	Accident	S/Inj	Accident	S/Inj				
	2008	0	14	0	0	0	0	0	14	12.96	0.00	0.00	5.78
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
SECL	2004	73	74	13	13	22	22	108	109	2.05	2.00	1.35	1.85
	2005	68	72	9	9	18	19	95	100	2.06	1.28	1.20	1.73
	2006	53	56	10	10	6	6	69	72	1.62	1.37	0.38	1.25
	2007	48	49	8	11	15	15	71	75	1.49	1.55	1.07	1.39
	2008	43	43	6	7	5	5	54	55	1.35	0.98	0.36	1.04
	2009	38	42	1	2	7	7	46	51	1.36	0.31	0.56	1.02
	2010	35	43	6	8	2	2	43	53	1.43	1.42	0.15	1.07
	2011	25	26	11	11	5	5	41	42	0.86	1.95	0.37	0.85
WCL	2004	38	41	11	12	17	17	66	70	1.79	1.43	1.06	1.48
	2005	30	31	6	7	5	5	41	43	1.40	0.98	0.34	0.98
	2006	29	32	7	8	10	10	46	50	1.54	1.06	0.68	1.16
	2007	37	37	10	11	6	6	53	54	1.84	1.53	0.43	1.31
	2008	17	17	8	8	4	4	29	29	0.84	1.20	0.29	0.71
	2009	29	30	3	3	6	6	38	39	1.52	0.45	0.43	0.97
	2010	22	25	12	13	6	6	40	44	1.32	2.04	0.47	1.16
	2011	20	24	11	13	11	11	42	48	1.27	2.04	0.87	1.26
CIL	2004	338	350	65	69	88	89	491	508	2.23	1.28	0.82	1.59
	2005	185	204	59	61	60	63	304	328	1.35	1.12	0.60	1.06
	2006	198	208	51	62	41	41	290	311	1.46	1.09	0.41	1.04
	2007	230	244	61	65	53	55	344	364	1.77	1.10	0.58	1.25
	2008	182	197	43	44	49	50	274	291	1.47	0.77	0.56	1.03
	2009	174	182	30	33	45	47	249	262	1.38	0.59	0.52	0.94
	2010	125	136	38	45	26	27	189	208	1.10	0.81	0.31	0.78
	2011	110	124	44	47	33	33	187	2.4	1.00	0.85	0.38	0.77
DVC	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	1	1	0	0	1	1	0.00	9.26	0.00	4.33
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
GMDC	2004	0	0	0	0	2	2	2	2	0.00	0.00	3.34	1.60
	2005	0	0	1	1	0	0	1	1	0.00	1.36	0.00	0.69
	2006	0	0	1	1	0	0	1	1	0.00	1.50	0.00	0.74
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
IISCO	2004	15	15	3	3	0	0	18	18	8.85	6.70	0.00	5.69
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

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Owner	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Accident	S/Inj	Accident	S/Inj	Accident	S/Inj	Accident	S/Inj				
	2006	4	5	0	0	3	3	7	8	2.95	0.00	3.13	2.57
	2007	7	7	1	1	1	1	9	9	4.33	1.78	1.09	300.00
	2008	4	4	0	0	0	0	4	4	2.78	0.00	0.00	1.41
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	4	4	0	0	0	0	4	4	3.00	0.00	0.00	1.54
	2011	2	2	0	1	0	0	2	3	1.50	1.75	0.00	1.16
J&K	2004	3	3	0	0	0	0	3	3	3.36	0.00	0.00	2.92
	2005	0	0	0	0	1	3	1	3	0.00	0.00	21.90	3.08
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
NLC	2004	0	0	1	1	2	2	3	3	0.00	0.16	0.56	0.31
	2005	0	0	2	3	0	0	2	3	0.00	0.59	0.00	0.25
	2006	0	0	3	3	1	1	4	4	0.00	0.38	0.38	0.38
	2007	0	0	1	1	0	0	1	1	0.00	0.13	0.00	0.09
	2008	0	0	2	3	0	0	2	3	0.00	0.46	0.00	0.28
	2009	0	0	5	5	3	4	8	9	0.00	0.74	0.97	0.83
	2010	0	0	3	3	2	3	5	6	0.00	0.46	0.62	0.53
	2011	0	0	2	2	2	2	4	4	0.00	0.31	0.42	0.35
SCCL	2004	396	405	12	12	29	30	437	447	8.70	2.04	4.10	7.48
	2005	656	661	35	35	104	104	795	800	14.38	6.47	14.19	13.63
	2006	444	452	32	32	81	81	557	565	10.18	5.31	10.96	9.77
	2007	478	482	20	21	68	71	566	574	11.56	3.02	9.79	10.27
	2008	328	332	26	26	47	47	401	405	7.81	3.20	6.42	6.99
	2009	313	321	15	16	47	47	375	384	7.50	1.37	5.60	6.11
	2010	219	230	20	20	42	42	281	292	4.86	1.58	4.31	4.19
	2011	235	239	22	22	36	36	293	297	5.05	1.74	3.69	4.26
TISCO	2004	5	5	1	1	2	3	8	9	1.01	0.77	1.84	1.14
	2005	2	2	0	0	0	0	2	2	0.38	0.00	0.00	0.24
	2006	0	0	1	1	0	0	1	1	0.00	0.75	0.00	0.12
	2007	2	2	0	0	1	1	3	3	0.40	0.00	0.34	0.31
	2008	2	3	2	2	0	0	4	5	0.58	1.49	0.00	0.70
	2009	1	1	0	0	1	1	2	2	0.17	0.00	1.17	0.25
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
PIL	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	1	1	0	0	1	1	0.00	9.35	0.00	6.99
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

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Owner	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Accident	S/Inj	Accident	S/Inj	Accident	S/Inj	Accident	S/Inj				
GIPCL	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	1	1	0	0	1	1	0.00	6.54	0.00	4.78
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
MIL	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	1	1	1	1	0.00	0.00	21.74	0.97
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	1	1	0	0	0	0	1	1	0.70	0.00	0.00	0.61
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
JNL	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	1	1	0	0	0	0	1	1	2.32	0.00	0.00	1.54
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
ALL INDIA	2004	757	778	82	87	123	126	962	991	3.69	1.24	1.02	2.45
	2005	843	867	98	101	165	170	1106	1138	4.23	1.45	1.37	2.85
	2006	646	665	88	99	127	127	861	891	3.40	1.30	1.11	2.31
	2007	717	735	83	88	123	128	923	951	3.91	1.10	1.15	2.51
	2008	516	536	74	76	96	97	686	709	2.87	0.98	0.92	1.92
	2009	490	506	50	54	96	100	636	660	2.72	6.67	0.93	1.76
	2010	348	370	62	69	70	72	480	511	2.04	0.83	0.68	1.39
	2011	347	365	68	72	71	71	486	508	2.02	0.87	0.68	1.38

BG- Belowground

OC-Opencast

AG-Aboveground

Note : Figures for the year 2011 are provisional.

Serious injury includes seriously injured from fatal accidents also.

3.0 Non-Coal Mines

3.1 General

Information presented in the following paragraphs relates to non-coal mines coming under the purview of the Mines Act, 1952.

Estimated numbers of notified working non-coal mines are over about 8000 out of which 2049 non-coal mines including 82 oil mines submitted returns for the year 2011.

Average daily employment in non-coal mines during the year 2011 was 192246 as compared to 199773 in 2010. Average daily employment in workings belowground, opencast and aboveground during the year 2011 was 11376, 97335 & 83535 as compared to 11,821 101146 & 86,806 respectively during the year 2010. **Results for 2011 are estimated and subject to change after final compilation of data.** The average daily employment in various minerals is depicted in the table below:

TABLE: 34 Average daily employment and output in non-coal mines during 2011						
Mineral	No. of Mine Submitted return	Average daily employment				Output ('000 tonnes)
		U / G	O/C	Surface	Total	
Bauxite	93	0	5766	876	6642	13385
Copper	5	1692	243	964	2899	3540
Gold	4	1536	--	1500	3036	624
Granites	206	0	7275	2020	9295	2148
Lime Stone	463	0	22051	6222	28273	346244
Iron-ore	327	12	26803	20496	47311	237682
Manganese	126	2185	7373	4313	13871	4280
Marble	20	-	1517	361	1878	3016
Stone	178	0	4994	2186	7180	37592
Galena & sphalarite	11	1298	484	1702	3484	11760
Others	534	4653	22829	13452	38934	98085
Oil & Natural Gas	82	-	-	29443	29443	22817(OIL) 154499(GAS)
Total Non-Coal	2049	11376	97335	83535	192246	781173

Production of Natural Gas (Expressed in Million Cu Meter)

*Figures for 2011 are under compilation.

3.2 Accidents

3.2.1 Accidents

There was no major accident in Non-coal mines during the year 2011.

There had been decrease in fatal accidents in the year 2011 wherein 47 fatal accidents involving 53 fatalities and 80 serious accidents as compared to 54 fatal accidents involving 91 fatalities and 61 serious accidents during 2010. Table: 35 & 36 given below shows trend in fatal accidents death rates, serious accident & injury rate in non-coal mines.

Year	Number of accidents			Death rate per 1000 persons employed			
	Fatal	Persons killed	Persons ser. injured	Below ground	Open-cast	Above ground	Overall
2001	71	81	8	0.52	0.72	0.38	0.55
2002	52	64	3	0.49	0.54	0.21	0.40
2003	52	62	16	0.39	0.46	0.31	0.40
2004	57	64	9	0.62	0.47	0.27	0.41
2005	48	52	4	0.38	0.43	0.17	0.32
2006	58	71	9	0.38	0.62	0.21	0.45
2007	56	64	13	0.35	0.48	0.22	0.37
2008	54	73	35	0.44	0.43	0.37	0.41
2009	36	44	3	0.60	0.32	0.09	0.24
2010	54	91	5	3.35	0.71	0.18	0.47
2011*	47	53	9	0.37	0.72	0.27	0.48

*Provisional

YEAR	Number of		Serious injury rate per 1000 persons employed			
	Serious accidents	Persons seriously injured#	Below ground	Open cast	Above ground	Overall
2001	199	200	6.28	0.61	1.57	1.42
2002	205	206	5.06	0.53	1.72	1.31
2003	168	169	7.36	0.43	1.43	1.18
2004	188	194	6.70	0.52	1.59	1.25
2005	108	109	3.41	0.30	0.93	0.71
2006	78	79	3.20	0.25	0.67	0.56
2007	79	92	3.51	0.29	0.70	0.61
2008	83	85	1.87	0.32	1.10	0.70
2009	94	101	4.34	0.19	0.64	0.56
2010	61	63	0.79	0.27	0.39	0.35
2011*	80	82	2.10	0.36	0.32	0.43

* Provisional

includes seriously injured from serious accidents only

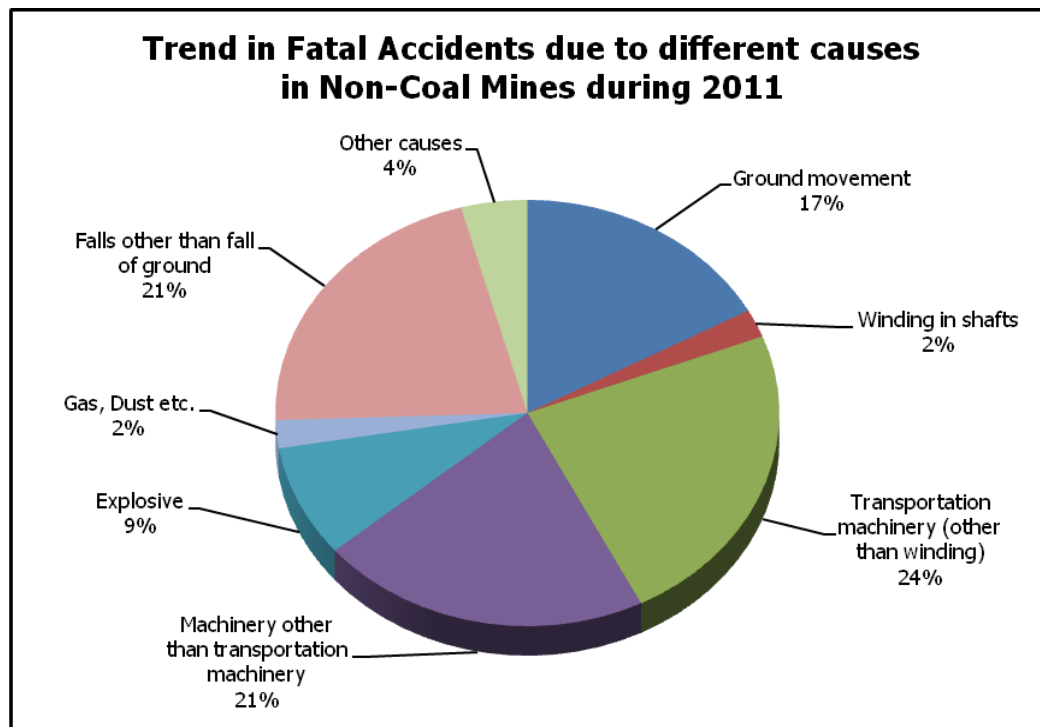
Note: Seriously injured from fatal accidents are also considered for computation of serious injury rate.

Table: 37 depicts trend in accidents due to different cause group for the years 2007-2011.

Cause	TREND IN FATAL ACCIDENTS DUE TO DIFFERENT CAUSES IN NON-COAL MINES				
	2007	2008	2009	2010	2011*
Ground movement	9 (16)	13 (20)	14 (20)	14(48)	8(10)
Winding in shafts	-	-	-	-	1(1)
Transportation machinery (other than winding)	25 (25)	15 (15)	9 (9)	12(13)	11(12)
Machinery other than transportation machinery	7 (7)	4 (6)	3(3)	5(5)	10(10)
Explosive	2 (2)	2 (10)	1 (3)	3 (3)	4(7)
Electricity	-	2 (3)	-	1 (1)	-
Gas, Dust etc.	-	2 (3)	1 (1)	-	1(1)
Falls other than fall of ground	11 (12)	11 (11)	8 (8)	15(17)	10(10)
Other causes	2 (2)	5 (5)	-	4 (4)	2(2)
TOTAL	56 (64)	54 (73)	36(44)	54(91)	47(53)

Note: Figures in parentheses denote the number of persons killed.

* Figures are provisional



Place	TREND IN FATAL ACCIDENTS IN DIFFERENT PLACES OF NON-COAL MINES				
	2007	2008	2009	2010	2011*
Belowground	3(3)	3(4)	4(5)	4(4)	3(3)
Opencast	38(46)	35(42)	25(32)	35(72)	32(36)
Aboveground	15(15)	16(27)	7(7)	15(15)	12(14)
Total	56(64)	54(73)	36(44)	54(91)	47(53)

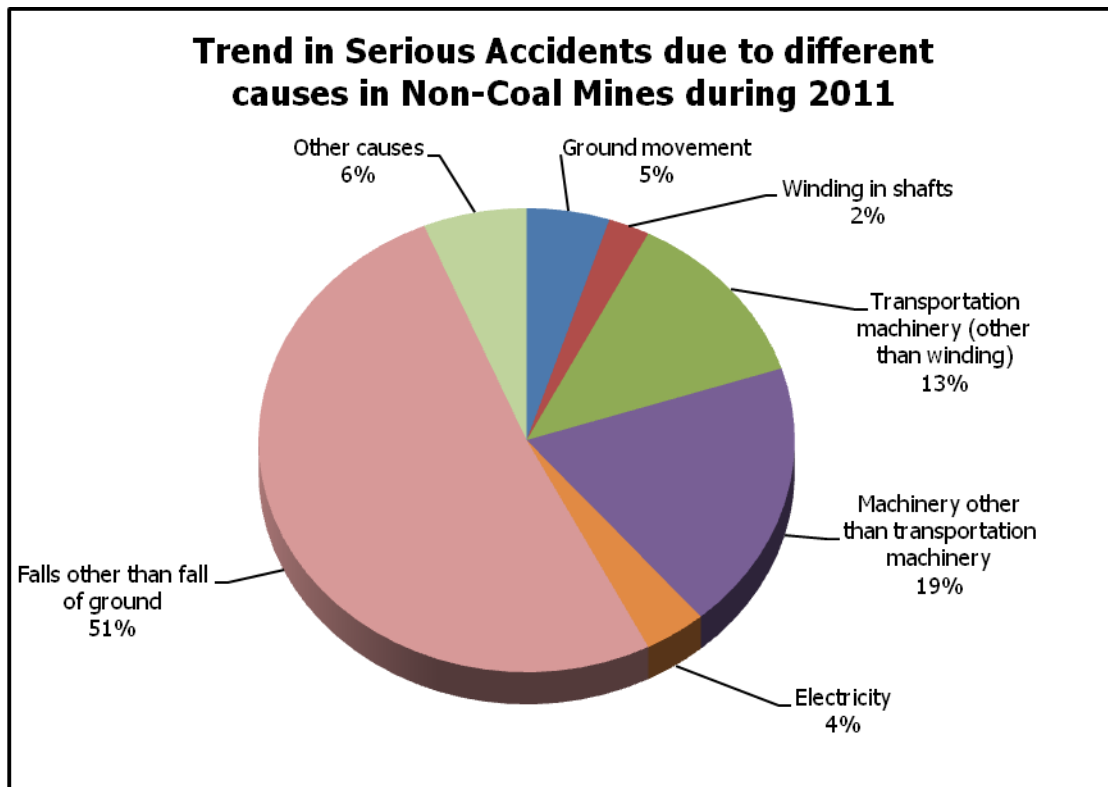
Note: Figures in parentheses denote the number of persons killed.

*Figures are provisional

Cause	TREND IN SERIOUS ACCIDENTS DUE TO DIFFERENT CAUSES IN NON-COAL MINES				
	2007	2008	2009	2010	2011*
Ground movement	4 (6)	1 (8)	1 (4)	1 (4)	4(5)
Winding in shafts	2 (13)	2 (3)	3 (6)	2 (2)	2(3)
Transportation machinery (other than winding)	10 (17)	9 (12)	11 (14)	5 (5)	10(14)
Machinery other than transportation machinery	17 (21)	10 (12)	13 (14)	10 (10)	15(15)
Explosive	1 (2)	1 (21)	1(1)	1 (3)	0(4)
Electricity	1 (1)	1 (3)	3 (3)	2 (2)	3(4)
Gas, Dust etc.	1 (1)	1 (1)	-	2 (2)	-
Falls other than fall of ground	23 (24)	39 (39)	39 (39)	31 (33)	41(41)
Other causes	20 (20)	19 (21)	23 (23)	7 (7)	5(5)
TOTAL	79 (105)	83 (120)	94 (104)	61 (68)	80(91)

Note: Figures in parentheses denote the number of persons seriously injured. This also includes serious injury out of fatal accidents.

* Figures are provisional



Place	TREND IN SERIOUS ACCIDENTS IN DIFFERENT PLACES OF NON-COAL MINES				
	2007	2008	2009	2010	2011*
Belowground	19 (30)	14(15)	33(36)	8(9)	20(21)
Opencast	14 (28)	13(23)	13(19)	22(27)	35(39)
Aboveground	46 (47)	56(82)	48(49)	31(32)	25(31)
Total	79 (105)	83(120)	94(104)	61(68)	80(91)

Note: Figures in parentheses denote the number of persons seriously injured.

* Figures are provisional

Table: 39 shows fatal and serious accidents mineral-wise for the year 2007-2011

Mineral	FATAL AND SERIOUS ACCIDENTS MINERAL-WISE IN NON-COAL MINES DURING 2007-2011									
	Fatal accidents					Serious accidents				
	2007	2008	2009	2010	2011*	2007	2008	2009	2010	2011*
Copper	-	1	1	-	1	1	3	5	3	8
Galena & sphalerite	1	2	-	1	3	14	21	24	7	15
Gold	1	-	1	-	-	6	9	15	11	-
Granite	4	6	3	8	9	-	1	-	4	2
Iron-ore	14	11	8	9	4	22	19	20	9	19
Lime stone	9	9	2	4	4	7	3	4	3	5
Manganese ore	1	3	-	2	4	5	2	2	-	1
Marble	11	5	4	10	8	-	-	-	-	-
Oil	3	5	3	4	5	16	20	18	16	16
Stone	7	5	5	3	6	-	-	-	-	-
Others	5	7	9	13	3	8	5	6	8	14
TOTAL	56	54	36	54	47	79	83	94	61	80

* provisional.

3.2.2 Analysis of Accidents

The analysis of accidents presented below is based on the findings of enquiries into fatal accidents conducted by officers of DGMS and information regarding serious accidents received from the mine management.

3.2.2.1 Ground Movement

Number of accidents and fatalities due to ground movement shows a matter of concern of the trend in the last five years indicating that it is the high time for the mine management to think and execute an effective plan to reduce fatal accidents due this cause. Percentage wise there were 8 (16% of the total) fatal accidents due to ground movement in the year 2011 as compared to 14 (38% of the total) fatal accidents due to ground movement in the year 2010.

3.2.2.1A Roof fall Accidents

There was no fatal accident occurred due to roof fall during the year 2011 in non-coal mines.

3.2.2.1B Side fall Accidents

There were no fatal accidents occurred due to side fall during the year 2011 in non-coal mines.

3.2.2.2 Transportation machinery (Winding)

One accident reported due to transportation machinery (winding) due to hit by cage during the year, 2011.

3.2.2.3 Transportation machinery (other than winding)

There were altogether 11 accident involving 12 fatalities due to transportation machinery (other than winding) during the year, 2011.

The cause wise details are given below.

TABLE – 40	FATAL ACCIDENTS DUE TO TRANSPORTATION MACHINERY IN NON COAL MINES in the year 2011.	
Cause	No. of fatal accidents	Persons killed
1. Rope Haulage	00	00
2. Conveyors	00	00
3. Dumpers /Tipper	09	10
4. Truck & Tanker	02	02
5. Other (Wagon)	00	00
Total	11	12

Rope Haulage:

No accident occurred due to rope haulage.

Conveyor:

No accident occurred due to Conveyor.

Dumpers/Tipper;

Nine accidents occurred causing ten fatalities due to truck & tanker contributing 81.81% of total accidents. Main causes were-

- Ran over of Dumper / Tipper.
- Hit by Dumper / tipper..
- Due to lost control
- Uncontrolled movement of Dumper/Tippers.

Truck & Tanker :

Two accidents occurred causing two fatalities due to truck & tanker contributing 18.18% of total accident.

Other (Wagon):

No accident occurred due to this cause.

3.2.2.5 Accidents due to machinery other than transportation machinery.

TABLE – 41	FATAL ACCIDENTS DUE TO MACHINERY OTHER THAN TRANSPORTATION MACHINERY DURING 2011	
Cause	No. of fatal accidents	Persons killed
1. Drill	1	1
2. Excavator/Loader	1	1
3. Crane	2	2
4. Crushing Plant	0	0
5. Transport machinery	2	2
6. War saw cutting machine	0	0
7. HEMM	4	4
Total	10	10

It is seen that most of the accident due to machinery and other machinery were causing due to operator's negligence, indiscipline and lack of supervisions . Improved standard of training and education of workers are necessary to control such accidents . Some cases the equipment failure were observed due to poor maintenance. Higher standard of maintenance of machinery in the opencast sector are required to be stressed upon.

Table: 42 - Detail break-up of serious accidents due to this cause during 2011.

Cause	Number of serious accidents			
	Belowground	Opencast	Aboveground	Total
	Drilling Machines	1	2	2
Cutting Machines	1	-	-	1
Loading Machines	1	-	-	1
Shovels, draglines, excavators etc.	1	1	-	2
Crushing & screening plants	-	-	-	-
Other HEMM	1	-	-	1
Others	2	2	1	5
TOTAL	7	5	3	15

3.2.2.5 Explosives

There were 4 (8% of the total) fatal accidents occurred involving 7 fatalities due to explosive during the year 2011.

3.2.2.6 Electricity

There was no fatal accident occurred due to electricity but three serious accidents were occurred due to electricity during the year 2011.

3.2.2.7 Dust, Gas & other combustible material

There was one fatal accident occurred and no serious accidents occurred due to this cause during the year 2011.

3.2.2.8 Falls other than falls of ground

There were 10 (20% of the total) fatal accidents involving 10 persons and 41 serious accidents occurred due to this cause during the year 2011,

3.2.2.9 Other causes

There was 2 (3% of the total) fatal accidents involving 2 fatalities and 5 serious accidents occurred due to miscellaneous causes during the year 2011.

3.3 Responsibility

The responsibilities fixed as a result of fatal accident enquiry conducted by officers of DGMS in the year 2011 is indicated in the table below:

TABLE:43 RESPONSIBILITY FOR FATAL ACCIDENTS IN NON-COAL MINES DURING THE YEAR 2011		
SL. NO.	Responsibility	No. of accidents
1.	Misadventure	3
2.	Management	17
3.	Management, Subordinate Supervisory Staff (SSS)	3
4.	Management, SSS & Co-worker	3
5.	Management, SSS & Shotfirer	-
6.	Management, SSS & Deceased	4
7.	Management & Co-worker	3
8.	Management & Deceased	4
9.	Subordinate Supervisory Staff (SSS)	3
10.	Subordinate Supervisory Staff (SSS) & Co-worker	-
11.	Co-Worker	2
12.	Co-Worker & Deceased	1
13.	Deceased	3
14.	Others	1
	TOTAL	47

3.3 Dangerous Occurrence

The table indicated below gives dangerous occurrences reported during the year 2011 under various causes:

TABLE:44 DANGEROUS OCCURRENCES IN NON-COAL MINES DURING 2011		
Sl.No.	Cause	No. of cases
1.	Overwinding of cages etc.	-
2.	Outbreak of fire belowground	-
3.	Outbreak of fire at surface	1
4.	Premature collapse of workings or failure of pillars	-
5.	Breakage of winding rope	-
6.	Breakdown of winding engine, crank shaft, bearing etc.	-
7.	Ignition or occurrence of inflammable gas	-
8.	Breakage, fracture etc of essential parts of machinery or apparatus whereby safety of persons was endangered	-
9.	Irruption of water	-
10.	Rock burst	1
11.	Bursting of equipment under high pressure	-
12.	Oil well blowout without fire	-
13.	Fire in pipeline/well heads	-
14.	Others	4
	TOTAL	6

3.4 Technical Developments

Total numbers of mines working by deploying HEMM is 817. Total number of machines and capacity of shovels and dumpers used in mines have been increased. The following table shows the different types of machines deployed in mines since 2001. Figures for the year 2011 are under compilation.

Year	No. of mines	Shovels			Dumper	Others	Machinery	
		Elec.	Diesel	Total			Total No.	Total HP
2002	577	95	1107	1202	3928	1741	6871	1351329
2003	560	90	1020	1010	3945	1630	6485	1310221
2004	561	91	1025	1116	3960	1670	6746	1313450
2005	653	52	1452	1504	5509	1819	8832	1784635
2006	591	58	1577	1635	5543	2248	9426	1789531
2007	614	92	1626	1718	4926	2057	8701	1834838
2008	705	67	1885	1952	6514	2460	10926	2109638
2009	773	93	2164	2257	7549	2580	12166	2554576
2010	817	88	2258	2346	8427	2452	13225	2712475

Following table shows the various types and quality of explosives used in non-coal and quality in mines since 2001.

YEAR	Consumption of explosives in tones							
	NG Based	ANFO	LOX	Slurry large dia	Slurry small dia	Booster	Gun powder	Total
2001	1021	21476	140	24303	7877	81	92	55809
2002	1092	21111	368	26186	6640	128	88	55613
2003	1005	20471	238	36473	5279	176	88	63729
2004	1323	24547	168	36883	7300	253	111	70584
2005	1382	28085	168	40538	9892	501	130	80700
2006	608	33757	-	53240	6766	622	116	95146
2007	566	31179	457	57122	9940	437	73	97769
2008	655	38438	457	63282	7096	691	111	120866
2009	471	36843	282	56607	7103	338	92	101736
2010	470	32249	268	54621	8550	359	105	96622

3.6 Occupational Health & Environments

(a) Progress of Medical Examination in Non-Coal Mines:

TABLE: 47	PROGRESS OF INITIAL & PERIODICAL MEDICAL EXAMINATION DURING 2011 IN NON-COAL MINES				
	Name of Company	Initial Medical Examination		Periodical Medical Exam.	
		Required	Provided	Required	Provided
OIL	365	365	1884	1788	
MOIL	733	1076	1242	1361	
TATA	1214	1214	717	709	
SAIL	84	84	1302	958	
IREL	435	435	961	757	
UCIL	649	649	1002	1116	
HGMCL	0	271	480	418	
NMDC	860	847	769	774	
NALCO	272	272	173	173	
BALCO	69	69	417	417	
HCL	627	627	289	341	
CCIL	5	5	15	15	
ACC	163	163	214	374	
MML	176	245	761	338	
OMC	342	278	2503	670	
RSMM	56	56	102	150	
GMDC	325	325	85	77	
Total	6375	6981	12916	10436	

(b) Cases of Notified Diseases in non-coal mines:

TABLE: 48	NUMBER OF NOTIFIED DISEASES DURING 2011 IN NON-COAL MINES	
	Mining Companies	Name of disease
-	-	-

3.7 Vocational Training

Progress of vocational training imparted during the year in major non-coal mining companies has been reported in table below:

TABLE: 49						
PROGRESS OF VOCATIONAL TRAINING IN NON-COAL MINES DURING THE YEAR 2011						
Cos.	No. of VT Centers	Basic Training		Refresher Training		Special Training Provided
		Required	Provided	Required	Provided	
OIL	1	0	616	0	374	58
MOIL	1	876	1036	1183	1296	0
TATA	5	3860	6748	492	423	4217
SAIL	1	352	352	729	657	238
IREL	3	430	472	398	302	77
UCIL	11	705	705	980	599	417
HGMCL	1	0	271	480	418	48
NMDC	4	866	866	798	777	1147
NALCO	1	272	272	52	52	0
BALCO	2	165	142	300	345	16
HCL	4	765	765	742	727	299
CCIL	2	5	10	8	8	8
ACC	8	369	369	330	344	317
MML	2	218	237	714	455	59
OMC	10	451	260	844	664	14
RSMM	12	29	29	34	34	5
GMDC	1	325	205	31	31	3
Total	69	9688	13355	8115	7506	6923

3.8 Workmen's Inspector, Welfare Officer & Safety Committee

TABLE: 50						
NUMBER OF WORKMEN'S INSPECTOR IN POSITION, SAFETY COMMITTEE, WELFARE OFFICERS IN NON-COAL MINES DURING 2011						
Name of Company	Welfare Officers		Workmen Inspectors		Safety Committee	
	Required	Provided	Required	Provided	Required	Provided
OIL	6	6	15	15	6	20
MOIL	10	10	27	27	9	9
TATA	3	3	18	18	4	4
SAIL	9	9	30	37	10	10
IREL	3	3	9	10	3	3
UCIL	5	5	23	26	8	8
HGMCL	3	3	6	6	1	3
NMDC	4	4	18	18	4	4
NALCO	1	1	3	4	1	1
BALCO	3	3	4	4	2	2
HCL	4	4	13	13	8	8
CCIL	2	2	2	2	22	22
ACC	0	0	14	17	8	12
MML	1	1	2	2	2	0
OMC	14	13	20	19	8	8
RSMM	1	1	2	2	2	2
GMDC	0	0	4	4	2	2
Total	69	68	210	224	100	118

3.9 Mineral wise consolidated fatal accident statistics for the last 8 (eight) years in non-coal mines

Mineral	Year	Fatal Accidents								Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Accident	Killed	Accident	Killed	Accident	Killed	Accident	Killed				
Oil	2004	0	0	0	0	2	2	2	2	0.00	0.00	0.10	0.10
	2005	0	0	0	0	1	1	1	1	0.00	0.00	0.05	0.05
	2006	0	0	0	0	4	4	4	4	0.00	0.00	0.29	0.29
	2007	0	0	0	0	3	3	3	3	0.00	0.00	0.16	0.16
	2008	0	0	0	0	5	6	5	6	0.00	0.00	0.25	0.25
	2009	0	0	0	0	3	3	3	3	0.00	0.00	0.12	0.12
	2010	0	0	0	0	4	4	4	4	0.00	0.00	0.14	0.14
	2011	0	0	0	0	5	5	5	5	0.00	0.00	0.25	0.25
Apatite & Rock Phosphate	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	1	1	0	0	1	1	0.00	1.12	0.00	0.54
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	1	1	0	0	1	1	0.00	1.02	0.00	0.52
	2010	0	0	0	0	1	1	1	1	0.00	0.00	1.36	0.50
	2011	0	0	1	1	0	0	1	1	0.00	0.88	0.00	0.62
Asbestos	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	1	1	0	0	1	1	0.00	43.48	0.00	4.83
	2006	0	0	1	2	0	0	1	2	0.00	0.00	0.00	166.67
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Barytes	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	1	1	0	0	1	1	0.00	3.18	0.00	1.89
Bauxite	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	1	1	0	0	1	1	0.00	0.23	0.00	0.20
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	1	1	0	0	1	1	0.00	0.23	0.00	0.20
China Clay, Clay, White-clay	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	1	1	0	0	1	1	0.00	0.57	0.00	0.32
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

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Mineral	Year	Fatal Accidents								Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Accident	Killed	Accident	Killed	Accident	Killed	Accident	Killed				
China Clay, Clay, White-clay	2010	0	0	1	1	0	0	1	1	0.00	0.68	0.00	0.36
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Chromite	2004	1	1	0	0	0	0	1	1	1.73	0.00	0.00	0.13
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	1	1	0	0	0	0	1	1	1.50	0.00	0.00	0.14
	2007	1	1	2	2	1	1	4	4	1.41	0.57	0.31	0.54
	2008	0	0	1	1	0	0	1	1	0.00	0.29	0.00	0.12
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	1	1	1	1	2	2	0.00	0.27	0.28	0.23
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	Copper	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00
2005		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2006		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2007		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2008		0	0	0	0	1	1	1	1	0.00	0.00	1.36	0.38
2009		1	1	0	0	0	0	1	1	0.53	0.00	0.00	0.33
2010		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2011		0	0	0	0	1	1	1	1	0.00	0.00	1.26	0.41
Dolomite	2004	0	0	1	1	0	0	1	1	0.00	0.56	0.00	0.44
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	1	1	0	0	1	1	0.00	0.51	0.00	0.34
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Felspar	2004	0	0	1	1	0	0	1	1	0.00	7.19	0.00	5.85
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	1	4	0	0	1	4	0.00	24.10	0.00	21.39
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Galena & Sphalarite	2004	2	2	0	0	1	1	3	3	1.80	0.00	0.49	0.79
	2005	0	0	0	0	1	1	1	1	0.00	0.00	0.68	0.31
	2006	1	1	0	0	0	0	1	1	0.85	0.00	0.00	0.31
	2007	1	1	0	0	0	0	1	1	0.87	0.00	0.00	0.30
	2008	1	1	0	0	1	3	2	4	0.83	0.00	1.86	1.22
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	1	1	1	1	0.00	0.00	0.59	0.29
	2011	0	0	1	1	2	3	3	4	0.00	0.00	9.80	4.84
Garnet	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	1	5	0	0	1	5	0.00	4.39	0.00	4.17
	2011	0	0	8	9	1	1	9	10	0.00	2.76	1.59	2.58
Gold	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

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Mineral	Year	Fatal Accidents								Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Accident	Killed	Accident	Killed	Accident	Killed	Accident	Killed				
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	1	1	0	0	0	0	1	1	0.63	0.00	0.00	0.32
	2007	1	1	0	0	0	0	1	1	0.66	0.00	0.00	0.33
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	1	1	1	1	0.00	0.00	0.65	0.49
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Granite	2004	0	0	1	1	1	1	2	2	0.00	0.20	0.61	0.30
	2005	0	0	6	7	0	0	6	7	0.00	1.28	0.00	0.98
	2006	0	0	6	9	0	0	6	9	0.00	1.64	0.00	1.21
	2007	0	0	4	4	0	0	4	4	0.00	0.64	0.00	0.49
	2008	0	0	6	8	0	0	6	8	0.00	1.29	0.00	0.98
	2009	0	0	3	3	0	0	3	3	0.00	0.46	0.00	0.35
	2010	0	0	7	20	1	1	8	21	0.00	2.75	0.50	2.26
2011	0	0	8	9	1	1	9	10	0.00	2.76	1.59	2.58	
Graphite	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	1	1	0	0	1	1	0.00	2.92	0.00	2.70
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	
Gypsum	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	1	1	0	0	1	1	0.00	4.72	0.00	3.62
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	
Iron	2004	0	0	5	5	7	8	12	13	0.00	0.22	0.50	0.34
	2005	0	0	7	8	8	8	15	16	0.00	0.36	0.53	0.43
	2006	0	0	10	16	5	5	15	21	0.00	0.68	0.28	0.51
	2007	0	0	7	7	7	7	14	14	0.00	0.29	0.39	0.34
	2008	0	0	7	7	4	4	11	11	0.00	0.27	0.21	0.25
	2009	0	0	6	6	2	2	8	8	0.00	0.22	0.10	0.17
	2010	0	0	7	9	2	2	9	11	0.00	0.34	0.10	0.23
2011	0	0	3	3	1	1	4	4	0.00	0.23	0.08	0.16	
Limestone	2004	0	0	11	12	1	1	12	13	0.00	0.63	0.17	0.52
	2005	0	0	6	6	1	1	7	7	0.00	0.30	0.17	0.27
	2006	0	0	10	13	2	2	12	15	0.00	0.65	0.35	0.59
	2007	0	0	7	11	2	2	9	13	0.00	0.51	0.32	0.47
	2008	0	0	7	7	2	2	9	9	0.00	0.32	0.31	0.32
	2009	0	0	2	2	0	0	2	2	0.00	0.09	0.00	0.07
	2010	0	0	4	5	0	0	4	5	0.00	0.23	0.00	0.18
2011	0	0	3	3	1	1	4	4	0.00	0.24	0.25	0.24	
Magnesite	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	2	2	2	2	0.00	0.00	12.74	1.20
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

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Mineral	Year	Fatal Accidents								Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Accident	Killed	Accident	Killed	Accident	Killed	Accident	Killed				
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Manganese	2004	1	1	1	1	1	1	3	3	0.33	0.13	0.26	0.21
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	2	2	0	0	2	2	0.00	0.29	0.00	0.15
	2007	0	0	0	0	1	1	1	1	0.00	0.00	0.25	0.07
	2008	1	2	1	1	1	1	3	4	0.77	0.14	0.26	0.30
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	2	2	0	0	0	0	2	2	0.92	0.00	0.00	0.14
	2011	3	3	1	1	0	0	4	4	2.27	0.22	0.00	0.45
Marble	2004	0	0	6	9	1	1	7	10	0.00	7.85	2.60	6.53
	2005	0	0	3	3	0	0	3	3	0.00	2.51	0.00	1.85
	2006	0	0	4	4	0	0	4	4	0.00	2.53	0.00	2.01
	2007	0	0	11	14	0	0	11	14	0.00	9.05	0.00	7.16
	2008	0	0	5	7	0	0	5	7	0.00	4.12	0.00	3.25
	2009	0	0	4	5	0	0	4	5	0.00	3.47	0.00	2.67
	2010	0	0	9	16	1	1	10	17	0.00	10.55	2.77	9.05
	2011	0	0	8	8	0	0	8	8	0.00	6.96	0.00	5.63
Mica	2004	1	1	0	0	0	0	1	1	2.39	0.00	0.00	1.58
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Quartz	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	1	2	0	0	1	2	0.00	2.62	0.00	2.39
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	2	2	0	0	2	2	0.00	2.34	0.00	1.94
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Sandstone	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	1	1	0	0	1	1	0.00	3.66	0.00	3.13
	2009	0	0	0	0	1	1	1	1	0.00	0.00	1.17	0.89
	2010	0	0	0	0	2	2	2	2	0.00	0.00	5.17	2.74
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Silica	2004	0	0	1	2	1	1	2	3	0.00	0.90	1.22	0.98
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

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Mineral	Year	Fatal Accidents								Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Accident	Killed	Accident	Killed	Accident	Killed	Accident	Killed				
Sillimanite	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2004	0	0	0	0	1	1	1	1	0.00	0.00	0.55	0.33
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	1	1	1	1	0.00	0.00	0.55	0.27
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	1	1	1	1	0.00	0.00	0.57	0.28
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Steatite	2004	0	0	1	1	0	0	1	1	0.00	0.31	0.00	0.25
	2005	0	0	2	2	0	0	2	2	0.00	0.63	0.00	0.49
	2006	0	0	1	1	0	0	1	1	0.00	0.31	0.00	0.24
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	1	1	3	4	0	0	4	5	4.20	1.08	0.00	1.03
	2009	1	2	1	1	0	0	2	3	4.30	0.28	0.00	0.61
	2010	0	0	1	8	0	0	1	8	0.00	2.09	0.00	1.57
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Stone	2004	0	0	8	9	0	0	8	9	0.00	1.78	0.00	1.13
	2005	0	0	8	9	0	0	8	9	0.00	1.83	0.00	1.28
	2006	0	0	4	4	0	0	4	4	0.00	0.86	0.00	0.61
	2007	0	0	6	7	1	1	7	8	0.00	1.05	0.46	0.91
	2008	0	0	4	6	1	9	5	15	0.00	1.20	4.48	2.14
	2009	0	0	5	11	0	0	5	11	0.00	2.20	0.00	1.52
	2010	0	0	2	2	1	1	3	3	0.00	0.40	0.46	0.42
	2011	0	0	5	8	1	2	6	10	0.00	7.31	2.56	5.33
Vermiculite	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	1	1	0	0	1	1	0.00	30.30	0.00	24.39
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Atomic Mineral	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	2	2	0	0	0	0	2	2	0.85	0.00	0.00	0.71
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
All India	2004	5	5	36	42	16	17	57	64	0.62	0.47	0.26	0.39
	2005	3	3	34	38	11	11	48	52	0.38	0.43	0.17	0.32
	2006	3	3	42	55	13	13	58	71	0.38	0.62	0.21	0.45
	2007	3	3	38	46	15	15	56	64	0.35	0.48	0.22	0.37
	2008	3	4	35	42	16	27	54	73	0.44	0.43	0.37	0.41
	2009	4	5	25	32	7	7	36	44	0.60	0.32	0.09	0.24
	2010	4	4	35	72	15	15	54	91	0.35	0.71	0.18	0.47
	2011	3	3	32	36	12	14	47	53	0.37	0.72	0.27	0.48

BG – Belowground

OC- Opencast

AG- Aboveground

3.10 Mineral wise consolidated serious accident statistics for the last 8 (eight) years in non-coal mines

Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
Oil	2004	0	0	0	0	38	40	38	40	0.00	0.00	2.09	2.09
	2005	0	0	0	0	15	15	15	15	0.00	0.00	0.78	0.78
	2006	0	0	0	0	15	15	15	15	0.00	0.00	1.08	1.08
	2007	0	0	0	0	16	16	16	16	0.00	0.00	0.83	0.83
	2008	0	0	0	0	20	22	20	22	0.00	0.00	0.93	0.93
	2009	0	0	0	0	18	18	18	18	0.00	0.00	0.72	0.72
	2010	0	0	0	0	16	17	16	17	0.00	0.00	0.58	0.58
	2011	0	0	0	0	16	16	16	16	0.00	0.00	0.55	0.55
Apatite & Rock Phosphate	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	1	2	0	0	1	2	0.00	1.90	0.00	1.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	1	1	0	0	1	1	0.00	0.84	0.00	0.50
	2011	0	0	3	3	1	1	4	4	0.00	2.65	2.06	2.48
Asbestos	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	1	0	0	0	1	0.00	43.48	0.00	4.83
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Barytes	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	1	1	0	0	1	1	0.00	0.17	0.00	0.15
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Bauxite	2004	0	0	0	0	1	1	1	1	0.00	0.00	1.58	0.17
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	1	1	1	1	0.00	0.00	1.71	0.20
	2007	1	1	0	0	0	0	1	1	0.00	0.00	0.00	0.18
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	1	1	0	0	1	1	0.00	0.20	0.00	0.18
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
China Clay, Clay,	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

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Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
White-clay	2005	0	0	1	1	0	0	1	1	0.00	0.54	0.00	0.31
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Chromite	2004	1	1	0	0	0	0	1	1	1.73	0.00	0.00	0.13
	2005	0	0	0	0	1	1	1	1	0.00	0.00	0.33	0.14
	2006	0	0	0	0	1	1	1	1	0.00	0.00	0.33	0.14
	2007	0	0	1	2	1	1	2	3	0.00	0.57	0.31	0.40
	2008	0	0	0	1	0	0	0	1	0.00	0.29	0.00	0.12
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	1	1	1	1	0	0	2	2	1.07	0.67	0.00	0.41
Copper	2004	0	0	0	0	1	1	1	1	0.00	0.00	1.50	0.49
	2005	0	0	4	4	0	0	4	4	0.00	12.9 0	0.00	2.07
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	1	1	0	0	0	0	1	1	0.62	0.00	0.00	0.41
	2008	1	1	0	0	2	4	3	5	0.61	0.00	5.42	1.91
	2009	4	4	1	4	0	0	5	8	2.11	15.6 9	0.00	2.61
	2010	3	3	0	0	0	0	3	3	1.77	0.00	0.00	1.03
	2011	7	7	0	0	1	1	8	8	5.06	0.00	1.26	3.30
	Diamond	2004	0	0	1	1	0	0	1	1	0.00	20.0 0	0.00
2005		0	0	0	0	1	1	1	1	0.00	0.00	6.76	5.13
2006		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2007		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2008		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2009		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2010		0	0	1	1	0	0	1	1	0.00	28.5 7	0.00	8.26
2011		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Dolomite	2004	0	0	1	1	1	1	2	2	0.00	0.56	2.20	0.89
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	1	1	1	1	0.00	0.00	1.36	0.37
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	1	1	1	1	0.00	0.00	0.94	0.33
	2010	0	0	1	1	0	0	1	1	0.00	0.51	0.00	0.34
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Felspar	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

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Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
Felspar	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Galena & Sphalarite	2004	21	21	2	2	7	7	30	30	18.85	3.26	3.42	7.94
	2005	14	14	0	0	10	10	24	24	13.46	0.00	6.75	7.43
	2006	7	7	3	3	2	2	12	12	5.92	8.77	1.14	3.66
	2007	7	7	0	0	7	7	14	14	6.10	0.00	3.95	4.24
	2008	7	8	0	0	14	15	21	23	6.66	0.00	9.32	7.03
	2009	15	18	1	1	8	9	24	28	14.14	2.07	5.60	8.33
	2010	2	2	3	3	2	2	7	7	1.54	6.20	1.18	2.01
	2011	7	7	3	3	5	10	15	20	13.44	0.00	32.68	24.18
Garnet	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Gold	2004	22	22	0	0	13	13	35	35	16.73	0.00	9.57	12.83
	2005	9	9	0	0	1	1	10	10	5.83	0.00	0.64	3.21
	2006	7	8	0	0	2	2	9	10	5.02	0.00	1.30	3.19
	2007	4	15	0	0	2	2	6	17	9.91	0.00	1.29	5.55
	2008	5	5	0	0	4	4	9	9	3.43	0.00	2.49	2.94
	2009	11	11	0	0	4	4	15	15	22.04	0.00	2.62	7.40
	2010	2	2	4	4	5	5	11	11	1.30	0.00	3.33	3.62
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Granite	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	1	2	0	0	1	2	0.00	0.37	0.00	0.28
	2006	0	0	0	1	0	0	0	1	0.00	0.18	0.00	0.13
	2007	0	0	0	1	0	0	0	1	0.00	0.16	0.00	0.12
	2008	0	0	1	5	0	0	1	5	0.00	0.80	0.00	0.61
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	4	5	0	0	4	5	0.00	0.69	0.00	0.54
	2011	0	0	2	2	0	0	2	2	0.00	0.61	0.00	0.52
Graphite	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	1	0	0	0	1	0.00	2.92	0.00	2.70
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	1	1	0	0	1	1	0.00	7.69	0.00	6.80

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Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
Gypsum	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Iron	2004	0	0	21	23	24	25	45	48	0.00	1.02	1.55	1.24
	2005	0	0	10	12	24	24	34	36	0.00	0.54	1.58	0.96
	2006	0	0	9	10	12	12	21	22	0.00	0.42	0.67	0.53
	2007	1	1	9	13	12	13	22	27	0.00	0.54	0.73	0.65
	2008	0	0	9	10	10	11	19	21	0.00	0.39	0.58	0.47
	2009	0	0	7	7	13	13	20	20	0.00	0.25	0.67	0.42
	2010	0	0	4	4	5	5	9	9	0.00	0.15	0.24	0.19
	2011	0	0	14	14	5	5	19	19	0.00	1.08	0.41	0.76
Limestone	2004	0	0	6	7	8	8	14	15	0.00	0.37	1.38	0.61
	2005	0	0	5	5	4	4	9	9	0.00	0.25	0.69	0.35
	2006	0	0	1	2	5	5	6	7	0.00	0.10	0.88	0.27
	2007	0	0	3	5	4	4	7	9	0.00	0.23	0.65	0.32
	2008	0	0	2	2	1	1	3	3	0.00	0.09	0.16	0.11
	2009	0	0	3	3	1	1	4	4	0.00	0.14	0.15	0.14
	2010	0	0	2	3	1	1	3	4	0.00	0.14	0.16	0.14
	2011	1	1	3	3	1	1	5	5	0.00	0.24	0.25	0.30
Magnesite	2004	0	0	0	0	1	1	1	1	0.00	0.00	3.70	0.58
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	1	1	1	1	0.00	0.00	6.33	0.42
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	1	1	0	0	1	1	0.00	2.25	0.00	1.79
Manganese	2004	6	6	0	0	3	3	9	9	1.99	0.00	0.77	0.62
	2005	2	2	1	1	2	2	5	5	0.71	0.13	0.50	0.34
	2006	6	7	0	3	1	1	7	11	2.75	0.44	0.27	0.84
	2007	4	4	0	0	1	1	5	5	1.51	0.00	0.25	0.37
	2008	0	0	0	0	2	2	2	2	0.00	0.00	0.52	0.15
	2009	1	1	0	0	1	1	2	2	0.44	0.00	0.27	0.15
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	1	2	0	0	0	0	1	2	1.52	0.00	0.00	0.23
Marble	2004	0	0	0	1	0	0	0	1	0.00	0.87	0.00	0.65
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	4	0	0	0	4	0.00	2.59	0.00	2.05
	2008	0	0	0	1	0	0	0	1	0.00	0.59	0.00	0.46

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Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
Marble	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	1	0	0	0	1	0.00	0.66	0.00	0.53
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Mica	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	Quartz	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00
2005		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2006		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2007		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2008		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2009		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2010		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
2011		0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Sandstone	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	1	1	0	0	1	1	0.00	3.75	0.00	1.55
Silica	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	1	1	1	1	0.00	0.00	1.30	0.34
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Sillimanite	2004	0	0	0	0	2	2	2	2	0.00	0.00	1.10	0.66
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	2	2	2	2	0.00	0.00	1.13	0.70
	2007	0	0	0	0	2	2	2	2	0.00	0.00	1.12	0.55
	2008	0	0	1	1	1	1	2	2	0.00	0.54	0.55	0.55
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	2	2	2	2	0.00	0.00	1.14	0.55
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Steatite	2004	0	0	1	1	0	0	1	1	0.00	0.31	0.00	0.25
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

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Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	3	0	0	0	3	0.00	0.81	0.00	0.62
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	1	2	0	0	1	2	0.00	1.04	0.00	0.83
Stone	2004	0	0	2	10	0	0	2	10	0.00	1.98	0.00	1.26
	2005	0	0	0	1	0	0	0	1	0.00	0.20	0.00	0.14
	2006	0	0	0	1	0	0	0	1	0.00	0.22	0.00	0.15
	2007	0	0	0	1	0	0	0	1	0.00	0.15	0.00	0.11
	2008	0	0	0	0	0	20	0	20	0.00	0.00	9.96	2.85
	2009	0	0	0	3	0	0	0	3	0.00	0.60	0.00	0.41
	2010	0	0	0	2	0	0	0	2	0.00	0.40	0.00	0.28
	2011	0	0	0	3	0	1	0	4	0.00	2.74	1.28	2.13
Vermiculite	2004	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2006	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2007	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2009	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2010	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2011	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Atomic Mineral	2004	4	4	0	0	1	1	5	5	N.A.	N.A.	N.A.	N.A.
	2005	2	2	0	0	1	1	3	3	N.A.	N.A.	N.A.	N.A.
	2006	4	4	0	0	0	0	4	4	N.A.	N.A.	N.A.	N.A.
	2007	1	1	0	0	0	0	1	1	N.A.	N.A.	N.A.	N.A.
	2008	1	1	0	0	1	1	2	2	N.A.	N.A.	N.A.	N.A.
	2009	2	2	0	0	1	1	3	3	N.A.	N.A.	N.A.	N.A.
	2010	1	2	1	1	1	1	3	4	N.A.	N.A.	N.A.	N.A.
	2011	3	3	1	1	0	0	4	4	N.A.	N.A.	N.A.	N.A.
All India	2004	54	54	34	46	100	103	188	203	6.70	0.52	1.57	1.25
	2005	27	27	22	27	59	59	108	113	3.41	0.30	0.93	0.71
	2006	24	26	13	21	41	41	78	88	3.33	0.24	0.67	0.56
	2007	19	30	14	28	46	47	79	105	3.51	0.29	0.70	0.61
	2008	14	15	13	23	56	82	83	120	1.65	0.24	1.12	0.67
	2009	33	36	13	19	48	49	94	104	4.34	0.19	0.64	0.56
	2010	8	9	22	27	31	32	61	68	0.79	0.27	0.39	0.35
	2011	19	20	35	39	25	31	80	91	2.21	0.39	0.38	0.47

BG- Belowground

OC- Opencast

AG- Aboveground

N.A. = Employment Figures not Available.

Note :i) Seriously injured from fatal accidents are also considered for computation of no. of serious injury as well as for serious injury rate.

4.0 Approval of Equipment, Appliances, Material and Machinery

Several equipments, appliances, materials and machineries meant for use in mines are required to be approved by DGMS; a list of such equipments is given at Appendix-V. Table below shows particulars of items approved during the year 2011.

Equipment, appliances, materials and machinery approved during the year 2011		
Sl. No.	Equipment/appliances/materials/ machinery	No. of approvals granted/renewed/ extended during the year
1.	Methanometer	1
2.	Helmet	2
3.	Cap Lamp	2
4.	Footwear	4
5.	Gas Detector/Monitor	3
6.	Cap Lamp Bulb	1
7.	Ventilation ducting	1
8.	Safety goggles	1
9.	Ear plug	2
10.	Visibility harness	2
11.	Dust Respirator (Mask)	3
12.	Full Body Harness/Safety Belt	0
13.	Flame Safety Lamp	1
14.	Noise Dosi-Meter	0
15.	Brattice Cloth	2
16.	Self-rescuers	3
17.	Breathing Apparatus	0
18.	Resuscitator/Reviving Apparatus	2
19.	Hydraulic props	0
20.	Powered support & its components	1
21.	STDA Legs	3
22.	Explosives	12
23.	Exploders	1
24.	Detonators	22
25.	Flame proof equipment - motor, switches, circuit breakers etc	99
26.	Intrinsically safe apparatus	25
27.	Equipment for use in hazardous area	0
28.	Cables	19
29.	Gas Detector and Monitor	1
30.	Cage suspension gears	7
31.	Fire resistant conveyer belting	0
32.	Automatic contrivance/Power break & emergency stock valve	3
33.	Man riding system	4
34.	Fire resistant hydraulic fluid	7
35.	High pressure hose	4
36.	Accreditation of Test House	1
37.	Automatic Recording Speed Indicator	1
44.	Man riding chair lift system	4
45.	Dust control system	3
	TOTAL	247

5.0 Coal & Metalliferous Mining Examinations during 2011

(i) Board of Mining Examinations under the CMR, 1957

Shri S Puri	Director General of Mines Safety
Shri J.V. Duttatreylu	Director (Operations), M/s. Singareni Collieries Co. Ltd.
Shri Vinay Kumar Singh	Chairman-cum-Managing Director, M/s Northern Coalfields Limited
Prof. Durga Charan Panigrahi	Prof. & Head of Department, Department of Mining Engineering, Indian School of Mines, Dhanbad.
Shri Nagendra Kumar	Director (Technical), M/s Eastern Coalfields Limited
Shri Pradip Kumar Roy Chowdhury,	Director (Technical) Operations, M/s South Eastern Coalfields Limited,

(ii) Board of Mining Examinations under the MMR, 1961

Shri S Puri	Director General of Mines Safety
Dr. Bal Krishna Shrivastva,	Professor & Coordinator, Centre of Advanced Studies, Department Of Mining Engineering, Institute of Technology, Banaras Hindu University,
Shri Diwakar Acharya,	Shri Diwakar Acharya, Chairman & Managing Director M/s. Uranium Corporation of India Ltd.,
Dr. Upendra Kumar Singh,	Dr. Upendra Kumar Singh, Professor, Department of Mining Engineering, Indian School of Mines University,
Shri Narendra Kumar Nanda	Shri Narendra Kumar Nanda, Director (Technical) NMDC Limited.
Shri Avijit Ghosh	Shri Avijit Ghosh, Director(Mining) Hindustan Copper Limited, Tamra Bhavan,

Examiners for Certificates of Competency

Coal Mining Examinations

- (a) Following were the Examiners for Manager's Certificates of Competency Examinations held in 2011.

Subject	First Class manager's Certificate	Second Class Manager's Certificate
Mine Management, Legislation & General Safety	Shri R B Chakraborty	Shri D Sengupta
Winning & Working	Shri Omprakash	Shri CH Diwakar
Mine Ventilation	Shri A K Debnath	Shri S K Jagnania
Mining Machinery & Electricity	Shri J P Singh	Shri C B Sood
Mine Surveying	Shri Suresh	Shri V Devanandam

- (b) Following were the Examiners for Surveyor's Certificate of Competency Examinations held in 2011.

Surveying Paper-I	Shri G V Kumar
Surveying Paper-II	Shri M S K Reddy

- (c) Following were the Examiners for Overman's Certificate of Competency Examinations held in 2011.

Paper-I	Shri P. Ranganatheswar
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Metal Mining Examinations

- (a) Following were the Examiners for Manager's Certificates of Competency Examinations held in 2011.

Subject	Ist Class manager's Certificate (Un-Restricted)	IInd Class Manager's Certificate (Un-Restricted)
Mine Management, Legislation & General Safety	Shri Rahul Guha	Shri B P Ahuja
Winning & Working	Shri Kabir Ghosh	Shri A Ghade
Mine Ventilation, Explosion, Fires & Inundation	Shri R R Kumar	Shri A K Lal
Mining Machinery	Shri P K Jain	Shri M Kundu
Mine Surveying	Shri S C Bhowmick	Shri A K Bhowmick

Subject	Ist Class manager's Certificate (Restricted)	IInd Class Manager's Certificate (Restricted)
Mine Management, Legislation & General Safety	Shri D Sengupta	Shri A Biswas
Winning & Working	Shri S Bose	Shri S Chakraborty
Mining Machinery	Shri H S Rathore	Shri L N Mathur
Mine Surveying	Shri S K Bhattacharya	Shri A C Basak

- (b) Following were the Examiners for Surveyor's Certificate of Competency Examinations held in 2011

Subject	Un-Restricted	Restricted
Paper-I	Shri G V Kumar	Shri P. Kumar
Paper-II	Shri A K Sahay	

- (c) Following were the Examiners for Foreman's Certificate of Competency Examinations held in 2011.

Subject	Un-Restricted	Restricted
Paper-I	Dr A K Sinha	Shri P Ranganatheswar

Following were the Examiners for Exchange Certificate of Competency Examinations held in 2011.

Examination	Examiner
First Class Metal(Coal to Metal)	Shri S I Hussain, DDG,SCZ
First Class Coal(Metal to Coal)	Shri U Saha, DDG,EZ
Mine Mate (unrestricted)	S/shri Sanjibon Ray,DDMS, Manoj Kumar & S K Verma, Manager

Other particulars regarding various examinations held are given in **Appendix-IV**.

6.0 National Safety Awards (Mines)

6.1 Introduction

During the post-independence era, the mineral industry in India has achieved tremendous growth and also imbibed the latest mining technologies. Along with this growth, there has been corresponding awareness of the need to protect the health and lives of workers. The Constitution of India casts an obligation on all of us to ensure just and humane conditions of work. To give due recognition to outstanding safety performance at the national level, the Ministry of Labour, Government of India, instituted the National Safety Awards (Mines) in 1983 for the contest year 1982.

6.2 Scope

The scheme is applicable to all mines, which come under the purview of the Mines Act, 1952. Such mines have been classified into 7 groups as given below:

- i. Coal mines - Below ground with difficult mining conditions
- ii. Coal mines - Belowground (others)
- iii. Coal mines - Opencast
- iv. Metal mines - Mechanized opencast
- v. Metal mines - Manual opencast
- vi. Metal mines - Belowground
- vii. Oil mines

6.3 Schemes

Among different indices available, the following two have been accepted as indicator of safety performance:

1. Longest accident free period (LAFP) in terms of manshifts worked during three consecutive years ending with the contest year.
2. Lowest injury frequency rate (LIFR) during three consecutive years ending with the contest year.

It is expected that every mine shall endeavour to improve its safety performance. A bad mine has a high injury frequency rate. After obtaining a breakthrough, its next attempt should be to achieve longest accident-free period in terms of manshifts worked.

6.4 Awards Committee

The awards committee is constituted by the Ministry of Labour & Employment with Director-General of Mines Safety as its Chairman, eight representatives of mine managements, eight representatives of trade unions as member and an officer of DGMS as its Member-Secretary.

6.5 Mode of operation

An advertisement is released through DAVP in English, Hindi and other regional languages inviting applications in prescribed proforma for National Safety Awards (Mines). An entry fee of Rs.100/- per application is charged through a crossed IPO drawn in favour of the Administrative Officer/DDO, DGMS and payable at Dhanbad Post Office. The prescribed application form is jointly signed by the mine management and a workers' representative.

6.6 Presentation of awards

National Safety Awards (Mines) for the contest year 2007 was given away on 23rd October 2009 at New Delhi by the Hon'ble Vice President of India.

7.0 Conference on Safety in Mines

The Conference on Safety in Mines is a tripartite forum at the national level in which the employers' representatives, the trade unions' representatives, the Government represented by Ministry of Labour & Employment, DGMS, various administrative ministries/departments and State Governments and associated institutions, professional bodies, service associations, etc. take part. They review status of the safety in mining industry and the adequacy of existing measures in a spirit of mutual cooperation. The conference also suggests measures for further improvement in safety, welfare and health of mine workers. The first such Conference was held in the year 1958 followed by the 2nd in July, 1966, the 3rd in 1973, the 4th in 1978, the 5th in 1980, the 6th in 1986, the 7th in 1988, the 8th in 1993, the 9th in 2000 and the 10th Conference was held on 26th & 27th November, 2007 in New Delhi. 11th Conference on Safety in Mines has been decided to organized on 4th & 5th July, 2013 at New Delhi.

8.0 Plan Schemes

In order to provide in-house technical support to field offices, DGMS is implementing following Plan Schemes namely:

Ongoing schemes:

- (1) "Mine Accident Analysis and Modernization of Information Database (MAMID)"
- (2) "Strengthening of Core Functions of DGMS (SOCFOD)"

8.1 "Mine Accident Analysis and Modernization of Information Database (MAMID)"

This is the restructured plan scheme after merging of the two Plan Schemes of Tenth Plan (2002-07) namely (i) Study of Mines Accidents and Development of Mines Safety Information System (SOMA) and (ii) Modernization of Information Database in DGMS (MID) as per the Report of Working Group on Occupational Safety & Health for 11th Five Year Plan 2007-12 of Ministry of Labour and Employment, Government of India. - Oct 2006. Keeping the objective of integration in view, these schemes were merged into one scheme "Mine Accident Analysis and Modernization of Information Database (MAMID)"

Objective of the Scheme:

(A) Mine Accident Analysis and Information Database

- ✓ **To eliminate risk of disasters and accidents in mines through detailed analysis of accidents and dangerous occurrences using risk assessment and risk management techniques;**
- ✓ **Development of standard Safe Operating Procedures (SOPs) and Code of Safe Practices (COPs);**
- ✓ **Identification of mines having potential of accidents/disasters through detailed investigation into the operating systems and environment in the mine;**
- ✓ **Development of mine data acquisition system and analysis through computerized databases and processing system;**
- ✓ **Dissemination of mine information system through various reports, technical instructions/guidelines, circulars on electronic as well as other conventional media;**
- ✓ **Identification of mines having high accident potential and formulation of risk elimination/management plan;**

(B) Computerized Mine Safety Information System

- ✓ **Computerization of process and procedures on Mine Safety Information in DGMS;**
- ✓ **Establishment of Communication Network using LAN and WAN in DGMS;**

The major activities taken up during the year included –

- Publication of Annual Report, 2009 and compilation of Annual Report for the year 2010.
- Publication of Standard Note on DGMS as on 1.1.2011
- Analysis of data for Identification of accident-prone mines in respect of coal & lignite mines.
- Compilation of statistics and preparation of manuscript for –

- Statistics of Mines in India, Vol.I (Coal), 2008
- Statistics of Mines in India, Vol.II(Non-Coal), 2008
- Monthly Review of Accidents and
- Report on Monthly Inspection Analysis
- Applications of National Safety Awards (Mines) for the contestant years 2010 has been scrutinised.
- Training on “Inspection & Enquiry Procedures” to DDMS in Mining, Electrical & Mechanical disciplines were conducted in two batches on 17th, 18th, 24th & 25th November, 2011 at DGMS, Dhanbad. 33 numbers of inspecting officers of different disciplines attended the above mentioned training programme.

Accident Prone Mines:

A modified approach for identification of accident-prone mines was adopted; data from all the mines of eleven coal companies were collected. In-depth analysis of all fatal and serious accidents that occurred in all 512 coal mines and 10 lignite mines of the country during the periods 2006-2010 were made and based on the outcome of the study, the accident-prone mines were identified. This was done with a view to identify hazard potential of such mines and draw up action programmes for formulation of mitigating measures through collective efforts of Mine Management, Trade Unions and the Government.

The following table shows the number of accident-prone mines identified in different coal companies in last five years.

Name of company	Number of mines identified as accident prone				
	2006	2007	2008	2009	2010
ECL	8	6	7	7	3
BCCL	6	8	7	12	8
SECL	6	8	5	8	6
MCL	1	1	2	5	1
WCL	8	7	7	8	14
CCL	4	6	2	7	5
NCL	1	1	1	3	2
NECL	0	1	1	1	2
SCCL	5	6	4	7	10
TISCO	1	1	2	1	1
IISCO	1	1	1	1	1
Total	41	46	39	60	53
LIGNITE	1	3	3	2	0

The respective companies were advised to take suitable steps from technical and management point of view to identify the potential risk of the respective mines and to device suitable corrective measures and implement the same in a time bound period so that the accidents are reduced.

Reports of enquiry into all fatal accidents were scrutinized. Finalized causes and circumstances leading to these accidents were compiled for inclusion in DGMS Annual Report.

8.2 "Strengthening of Core Functions of DGMS (SOCFOD)"

This is a continuing plan scheme. The scheme had been formulated by merging three on-going plan schemes of DGMS, namely (1) "Augmentation of S&T Capabilities, Mine Rescue Services and Human Resource Development (S&T)(1975)", (2) "Strengthening of Machinery for Conduct of Statutory Examinations (SSEX)(2000-01)" and (3) "Improving Efficiency by Providing Infra Structure Facilities in DGMS (PIF)" along with components like Occupational Safety and Health Surveillance, promotional initiatives and Emergency Response system.

Objectives of the Scheme:

The objectives of the scheme are:

- To render scientific and technological support to the enforcement wing of DGMS in proper fulfillment and discharge of its statutory duties, responsibilities and advisory role.

- To develop, improve and update need based rescue and emergency response services to the mining industry & to help field offices of DGMS in the form of technical support while taking up rescue and emergencies of specific nature.
- To establish Mine Safety & Health Academy with institutes at different offices of DGMS for imparting structured training to DGMS officers and key personnel of the mining industry.
- Strengthening of Machinery for Conduct of Statutory Examinations
- To develop a structured mechanism for Occupational Health Surveillance & Disease Control in Mining Industry.
- To establish a National Council for Mines Safety with a view to generate safety and health awareness among miners and address their training issues.
- To improve the efficiency of DGMS by providing better infrastructure facilities which include providing own office buildings and residential complexes to the officers and staff members, providing better communication facilities and office equipment and furnishing of offices.

The overall activities are broadly divided into three components:

(1) Science & Technology (S&T) Component:

The Studies and Investigations, Research & Development, Monitoring and Assessment of Hazards that were undertaken and still continuing, are given below:

- Studies and Investigations into the existing methodology and techniques of exploration and exploitation of various types of minerals for improvement in the standards of Safety and Occupational Risks associated therewith
- Studies and Investigations into the new methodology and techniques of exploration and exploitation of various types of minerals for improvement in the standards of Safety and Occupational Risks associated therewith
- Development, Updation and advancement of methods, techniques, processes and materials through interactions, investigations, training etc.
- Standardization of prototype tests and accreditation of testing laboratories /test houses
- Guidelines for accreditation of testing laboratories/test houses
- Guideline for testing steel chocks , Propos, Powered Supports, and other support materials
- Standardization of Ultrasonic Testing Technique and formulation of Acceptance & Rejection Norms for components and vital parts of the machinery & equipment including winding ropes and guides.
- Technical Direction and Guide Lines on various subjects to support the Inspection wings of DGMS as well as to the industry.
- Special Investigations and Studies on :-
 - i) Strata Control and Rock Mechanics
 - ii) Development of Hidden Slip Detector FOR COAL MINES
 - (iii) Explosives and Blasting Techniques for improving efficiency and reducing blasting hazards

- (iv) Mines Gases, Fires & Explosions for control and monitoring to ensure safety against dangers associated therewith.
- (v) Classification of Coal Seam/Mine Prone to Spontaneous Combustion and Fire on Scientific Basis.

- Development of Mine Disaster Control Plan & Emergency Response Mechanism
- Modernization and furnishing of DMRS Laboratories with latest testing instruments and equipments including training
- Medical Examinations, Surveillance and control of Silicosis, Pneumoconiosis, Manganese Poisoning and other occupational disease and disorders in mines.
- Development and furnishing of OSH Laboratories in HQ and other field Offices.
- Establishing a fully equipped Central Mines Safety and Health Academy with Institutes at Dhanbad and Nagpur and creating a core team of well-trained faculty members to train DGMS officers and key personnel in mining industry.
- To develop basic training aids and safety manuals/monographs for use at the institutes and also at in-house training centers in mining companies.

Details of achievement during January to December, 2011:

SN	Activity	Achievement
A. S&T Cell		
1.	Mine Environment & Fire	20
2.	Occupational Health Review, Survey & Medical Exam. Etc.	07
3.	Ground Control	11
4.	Mine Mechanization	-
5.	Additional Job: Gas Analysis	-
6.	Testing of FRHF (Fire Resistant Hydraulic Fluid)	-
B. Development of Mines Rescue Services		
1.	Testing of Filter Self-Rescuer	-
2.	Testing of Self-contained Self-rescuer (SCSR)	-
3.	Rescue competition	05
4.	Field visits	-
5.	Organization of conference on Rescue/Recovery experience	-
6.	Monitoring of First aid competition	05
7.	Creation of Rescue Databases on Rescue facilities	-
8.	Creation of Rescue Databases on actual Rescue/Recoveries	-
9.	Issue of technical circulars	-
C. Human Resource Development		
i.	Conduct of training Programmes:	
	i. DGMS Officers	68
	ii. Key Personnel from mining industry	182
	iii. Workmen's Inspectors	41

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