

## **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 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 21 such Regional Offices. Sub-regional offices have been set up in important areas of concentrated mining activities away from Regional office. There are five 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 31.12.2008. A statement showing posting of Group 'A' & 'B' officers in DGMS during the year 2008 are given at **Appendix-III**.

DESIGNATION	STRENGTH OF INSPECTING OFFICERS AND SANCTIONED POSTS AS ON 31.12.2008							
	DISCIPLINE							
	MINING		ELECTRICAL		MECHANICAL		O. H	
	S	P	S	P	S	P	S	P
Director General	1	1	-	-	-	-	-	-
Dy. Director General	7	6	1	1	-	-	-	-
Director	29	27	4	4	2	2	-	-
Dy. Director	82	59	18	13	10	4	1	-
Assistant Director	1	-	-	-	-	-	Gr.I: 3 Gr.II: 5	2 1
<b>Total</b>	<b>120</b>	<b>93</b>	<b>23</b>	<b>18</b>	<b>12</b>	<b>6</b>	<b>9</b>	<b>3</b>

**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 -
    - safety education and awareness programme
    - workers' participation in safety management through -
      - o workmen's inspector
      - o safety committee
      - o tripartite reviews
6. Conduct of examinations for grant of competency certificates.

## 1.4 Gazette Notification

Following gazette notifications were issued during the year 2008:

TABLE:2	Notification No. & date	Brief subject
1.	No.A-32012/01/2007-ISH.II dated 4.8.2008	Regarding appointment of Deputy Director-General of Mines Safety (Mining).
2.	S.O. 401(E) dated 28.2.2008	Regarding appointment of Sri Deepak Gupta, Dy. Director-General of Mines Safety as Chief Inspector of Mines from 218.2.2008 to 19.3.2008
3.	S.O.534(E) dated 19.3.2008	Regarding appointment of Sri Deepak Gupta, Dy. Director-General of Mines Safety as Chief Inspector of Mines from 20.3.2008 to 31.3.2008
4.	GSR No.236(E) dated 28.3.2008	Regarding draft of certain regulations further to amend the Metalliferous Mines Regulations, 1961
5.	S.O.837 dated 4.4.2008	Regarding change of name of Shri SK Bagchi, Dy. Director of Mines Safety.
6.	GSR No.65 dated 7.4.2008	Regarding examination bye laws under MMR, 1961
7.	GSR No.66 dated 7.4.2008	Regarding examination bye laws under MMR, 1961
8.	GSR No.99 dated 22.4.2008	Regarding type of emergency escape device and escape line for installation on derrick to be used in Oil Mines.
9.	S.O.1140 dated 14.5.2008	Regarding appointment of Chief Electrical Inspector and Electrical Inspectors
10.	S.O.2035(E) dated 11.8.2008	Regarding constitution of Board of Mining Examination under Metalliferous Mines Regulations,
11.	GSR 160 dated 14.8.2008	Regarding steel supports, roof bolts, cement and resin grouts to be used for the purpose of supporting roof and sides of workings in a mines.
12.	GSR 161 dated 14.8.2008	Regarding chemical dust suppressant including the additives used therein to be used for suppressing dust in mines.
13.	GSR 159 dated 14.8.2008	Regarding fire fighting and fire suppression systems including automatic fire detection and suppression system be used in HEMMs.
14.	S.O.2593 dated 5.9.2008	Regarding appointment of Inspector of Mines subordinate to the Chief Inspector of Mines.
15.	GSR 701(E) dated 30.9.2008	Regarding draft of certain regulations further to amend the MMR, 1961.
16.	GSR 215 dated 25.11.2008	Retarding dust suppression/prevention device in drilling and boring equipment will not be used in coal mines and metal mines unless the same has been approved Chief Inspector.
17.	A-32012/5/2008-ISH.II dated 5.12.2008	Regarding appointment of Shri HK Srivastava to the post of Director of Mines Safety (Mechanical).

## 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.

<b>TABLE:3</b>	<b>NUMBER OF INSPECTIONS AND ENQUIRIES MADE DURING THE YEAR 2008</b>					
Discipline of Inspection Service	Coal Mines		Metal Mines		Oil Mines	
	Inspections	Enquiries	Inspections	Enquiries	Inspections	Enquiries
Mining	3141	727	2589	388	188	23
Electrical	1036	30	141	8	98	-
Mechanical	359	48	68	12	-	1
Occupational Health	78	35	40	9	-	-
<b>TOTAL</b>	<b>4614</b>	<b>840</b>	<b>2838</b>	<b>417</b>	<b>286</b>	<b>24</b>

## 1.7 Improvement Notices & Prohibitory Orders

### 1.7.1 Coal Mines

99 (ninety nine) improvement notices under various provisions of the statutes were issued as a result of inspections of the mines during the year 2008. These improvement notices were issued for various types of serious defects, details of which are given in table:4 below :

<b>TABLE:4 IMPROVEMENT NOTICES ISSUED UNDER SECTIONS 22(1) AND 22A(1) OF THE MINES ACT, 1952 IN COAL MINES DURING 2008</b>		
SL.NO.	NATURE OF DEFECT	NO. OF CASES
1.	High benches in opencast workings	19
2.	Inadequate support	3
3.	Poor ventilation	7
4.	Inadequate coal dust suppression	4
5.	Isolation stopping	1
6.	Improper/ non-provision of travelling road	0
7.	Danger of Inundation	1
8.	Unstable workings	2
9.	Lag in stowing	0
10.	Accumulation of gases	1
11.	Defective Electrical installation	2
12.	Inadequate earth leakage protection	0
13.	Defective winding rope	0
14.	Other defects in winding installation	12
15.	Defective shot-firing practices	0
16.	Others	47
	<b>TOTAL</b>	<b>99</b>

47 (forty-seven) prohibitory orders under Section 22(3), 22A(2) and 22(1A) of the Mines Act, 1952 were issued during the year 2008. These orders were imposed for various dangerous conditions prevailing at the mines, details of which are given in table 5:

<b>TABLE:5 PROHIBITORY ORDERS ISSUED UNDER SECTIONS 22(3) AND 22A(2) AND 22(1A) OF THE MINES ACT,1952 IN COAL MINES DURING 2008</b>		
SL.NO.	NATURE OF DEFECT	NO. OF CASES
1.	High benches in opencast workings	16
2.	Inadequate support	5
3.	Poor ventilation	5
4.	Inadequate coal dust suppression	0
5.	Isolation stopping	0
6.	Improper/ non-provision of travelling road	0
7.	Danger of Inundation	0
8.	Unstable workings	0
9.	Lag in stowing	0
10.	Accumulation of gases	0
11.	Defective Electrical installation	1
12.	Inadequate earth leakage protection	0
13.	Defective winding rope	0
14.	Other defects in winding installation	3
15.	Defective shot-firing practices	1
16.	Others	16
	<b>TOTAL</b>	<b>47</b>

### 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 2008 were 90 (ninety). Prohibitory orders under Sections 22(1A), 22A(2) and 22(3) issued in Metalliferous Mines during the year 2008 were 182 (one hundred eighty two). Details of the improvement notices and prohibitory orders issued during 2008 are given in table: 6 & 7 respectively.

<b>TABLE:6 IMPROVEMENT NOTICES ISSUED UNDER SECTIONS 22(1) AND 22A(1) OF THE MINES ACT,1952 IN METALLIFEROUS MINES DURING 2008</b>		
SL.NO.	NATURE OF DEFECT	No. of cases
1.	Non-appointment of qualified manager and supervisory officials	74
2.	Inadequate benching and sloping in opencast workings	10
3.	Miscellaneous	6
	<b>TOTAL</b>	<b>90</b>

<b>TABLE:7 PROHIBITORY ORDERS ISSUED UNDER SECTIONS 22(3), 22A(2) &amp; 22(1A) OF THE MINES ACT,1952 ISSUED IN METALLIFEROUS MINES DURING 2008</b>		
SL.NO.	NATURE OF DEFECT	No. of cases
1.	Non-appointment of qualified manager and supervisory officials	46
2.	Inadequate benching and sloping in opencast workings	123
3.	Miscellaneous	13
	<b>TOTAL</b>	<b>182</b>

### 1.7.3 Oil Mines

No prohibitory order was issued in oil mines during the year 2008.

## 1.8 Permission, relaxations and exemptions

### 1.8.1 Coal Mines

1036 (one thousand thirty six) permissions/exemptions and relaxations were granted in coalmines during the year 2008. Details of such cases are given in table:8.

<b>TABLE:8 PERMISSIONS, RELAXATIONS &amp; EXEMPTIONS GRANTED IN COAL MINES DURING 2008</b>		
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	17
2.	Extraction of coal by methods other than bord & pillar below surface features	10
3.	Extraction of coal by bord & pillar methods beneath areas free from surface features	184
4.	Extraction of coal by bord & pillar methods beneath surface features	119
5.	Development below surface features including development in contiguous seams/ sections	69
6.	Blasting coal off the solid	48
7.	Development within 60m. of waterlogged workings	10
8.	Workings within 7.5m. / Adjustment of mine boundaries	31
9.	Exemptions from different provisions of regulations	148
10.	Others	400
	<b>TOTAL</b>	<b>1036</b>

**1.8.2 Metalliferous Mines**

1281 (one thousand two hundred eighty-one) permissions/relaxations/exemptions under different provisions of the statutes were granted during the year 2008. Particulars are given in table:9.

<b>TABLE:9 PERMISSION, EXEMPTIONS &amp; RELAXATIONS GRANTED IN METALLIFEROUS MINES DURING 2008</b>		
SL.NO.	Particulars of Permissions, Exemptions & Relaxations	No. of cases
1.	Stoping of blocks	38
2.	Use of HEMM with deep hole blasting	198
3.	Use of ANFO and/or more than one explosive in a shot hole	72
4.	Working under railways and roads	3
5.	Appointment of managers of more than one mine/ permit manager etc.	540
6.	Appointment of surveyor of more than one mine	5
7.	Others	425
	<b>TOTAL</b>	<b>1281</b>

**1.8.3 Oil Mines**

61 (sixty-one) permissions/relaxations/exemptions were granted during the year 2008 under various provisions of the Oil Mines Regulations, 1984. The details of such cases are given in table:10

<b>TABLE:10 PERMISSION, EXEMPTIONS &amp; RELAXATIONS GRANTED IN OIL MINES DURING 2008</b>		
SL.NO.	Particulars of Permissions, Exemptions & Relaxations	No. cases
1.	Well head installations	36
2.	Laying of oil pipe line	25
	<b>TOTAL</b>	<b>61</b>

**1.9 Prosecutions**

8 (eight) prosecutions were instituted in coalmines during the year 2008. In respect of non-coal mines, 38 (thirty eight) prosecutions were launched during 2008. Contraventions of provisions of statute for which these prosecutions were instituted are given in tables: 11 & 12.

**Details of prosecution cases as on 31.12.2008.**

<b>Coal</b>	<b>Non-coal</b>	<b>Pending</b>	<b>Disposed</b>
No. of prosecution launched during the year 2008	No. of prosecution launched during the year 2008	Total pending cases upto 31.12.2008	Total disposed cases upto 31.12.2008
08	38	884	458



<b>TABLE:11 PROSECUTIONS INSTITUTED IN RESPECT OF COAL MINES DURING 2008</b>		
SL.NO.	CONTRAVENTION	NO. OF CASES
1.	Contraventions leading to accidents	8
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	-
6.	Miscellaneous violations	-
	<b>TOTAL</b>	<b>8</b>

<b>TABLE:12 PROSECUTIONS INSTITUTED IN RESPECT OF NON-COAL MINES DURING 2008</b>		
SL NO.	CONTRAVENTION	NO. OF CASES
1.	Contravention leading to accidents	27
2.	Contravention of orders under sections 22(1A), 22(3), Reg. 108 etc.	3
3.	Non-appointment of qualified persons as senior supervisory officials	1
4.	Non-appointment of qualified persons as subordinate supervisory officials	-
5.	Non-provisions of protective equipment	-
6.	Other miscellaneous contraventions	7
	<b>TOTAL</b>	<b>38</b>

## 2.0 Coal Mines

### 2.1 General

Number of operating coalmines during 2008 was 569 as compared to 567 in 2007. Company-wise number of coal mines and production is given in table: 13.

TABLE: 13 COMPANY	Number of Mines during 2008				Production (in million tonnes)
	Underground	Opencast	Both	Total	
Coal India Limited	293	154	30	467	392
Singareni Collieries Company Limited	48	13	10	62	48
Others	10	27	03	40	66
<b>TOTAL</b>	<b>341</b>	<b>194</b>	<b>34</b>	<b>569</b>	<b>506</b>

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	
	2007	2008*
I only	265	249
II only	107	104
III only	15	13
I & II	9	5
I & III	1	-
II & III	3	4
I, II & III	-	-
<b>TOTAL</b>	<b>400</b>	<b>375</b>

\*Provisional

During the year total numbers of working mines have increased from 567 in 2007 to 569 in 2008. Output of coal increased from 481.00 million tonnes in 2007 to 506.00 million tonnes in 2008. Coal mines under M/s.Coal India Limited contributed 392.00 million tonnes of coal during the year 2008. Average daily employment in mines decreased from 379,000 in 2007 to 370,000 in 2008. The output per manshift was increased from 3.95 in 2007 to 4.25 during 2008. Trend in average daily employment and output per manshift in coalmines is given table: 15.

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	106	370	506294	4.25

\*Provisional

## 2.2 Accidents

### 2.2.1 Major Accidents

Two major accidents took place during the year 2008 the details of which are given below:

- 1) Name of Mine : Ledo , Owner : North Eastern Coalfields Ltd.  
 Date of Accident : 05/11/08 , Time : 0530 Hrs., No. of persons killed : 5 (Five)  
 Cause:  
 While 27 persons were engaged in a depillaring panel (being worked by "scrapper-assisted chamber method") of a Degree III gassy seam, also highly susceptible to heating, overhanging roof from adjoining improperly sealed off chambers, measuring about 1000-1200 sq.m, fell from a height of 7.3m , expelling accumulated hot methane/inflammable gas and heated/burning coal particles to cause an explosion, in turn causing burn injuries to 12 persons and minor injuries to 7 other persons. 5 persons succumbed to their injuries whilst undergoing treatment at various hospitals. Eight other persons escaped un-hurt.
  
- 2) Name of Mine : Jayant, Owner : Northern Coalfields Ltd.  
 Date of Accident : 17/12/08 , Time : 1740 Hrs., No. of persons killed : 5 (Five)

Cause:

While 5 persons approached near the toe of an overburden dump in a tipper to start work, a rib at the base of the dump failed initiating a violent, failure of the dump slope in an area measuring about 135m(length) X 6-19m(height) X 70m(width), burying the persons along with the tipper in debris resulting in death of all the persons due to asphyxiation.

### 2.2.2 Accident scenario

During the year 2008 number of fatal accidents as well as fatalities slightly increased as compared to the year 2007. Number of fatal accidents during the year 2008 was 85 and number of fatalities was 98 whereas in the year 2007 number of fatal accidents and fatalities were 77 and 79 respectively.

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

<b>TABLE: 16</b>				
<b>TREND IN FATAL ACCIDENTS AND FATALITY RATES PER 1000 PERSONS EMPLOYED IN COAL MINES (10 YEARLY AVERAGE)</b>				
YEAR	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
2001-2008*	87	0.21	110	0.27

\*Provisional

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

Year	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
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
1992	165	183	0.33	0.11	0.73
1993	156	176	0.32	0.10	0.68
1994	156	241	0.46	0.15	0.90
1995	137	219	0.43	0.14	0.77
1996	131	146	0.29	0.09	0.48
1997	143	165	0.33	0.10	0.52
1998	128	146	0.30	0.10	0.46
1999	127	138	0.29	0.09	0.44
2000	117	144	0.31	0.10	0.43
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*	77	79	0.20	0.06	0.18
2008*	85	98	0.25	0.08	0.23

\* Provisional

In the year 2008 saw number of serious accidents and number of persons seriously injured decreased as compared to the year 2007. Number of serious accidents and number of persons injured were 687 and 710 as compared to 923 and 951 respectively during the year 2007. As far as the serious accident rate is concerned, it has decreased. The serious injury rate per thousand persons employed in 2008 was 1.84 as compared to 2.47 in 2007. The above rate per lakh manshifts worked was also decreased to 0.58 in 2008 from 0.77 in 2007. Similarly, the rate per million tonnes output decreased to 1.65 in 2008 from 2.21 in 2007.

Table 18 gives year-wise number of serious accidents, no. of persons injured and serious injury rate.

<b>TABLE: 18 TREND IN SERIOUS ACCIDENTS AND SERIOUS INJURY RATES IN COAL MINES (YEAR-WISE)</b>					
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
1991	803	854	1.54	0.50	3.59
1992	810	894	1.62	0.53	3.58
1993	854	903	1.65	0.68	3.46
1994	717	775	1.48	0.47	2.90
1995	757	813	1.58	0.51	2.86
1996	677	723	1.43	0.45	2.38
1997	678	726	1.44	0.46	2.29
1998	523	560	1.14	0.37	1.75
1999	595	650	1.37	0.44	2.06
2000	661	707	1.54	0.49	2.11
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	2.47	0.77	2.21
2008*	687	710	1.84	0.58	1.65

\* Provisional

Note : No. of seriously injureds 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 is based on the findings of such enquiry and information submitted by the mine management.

#### 2.2.3A By place

Total 85 fatal accidents involving 98 fatalities occurred during the year 2008 as compared to 77 fatal accidents and 79 fatalities during the year 2007. Overall fatality rate has increased to 0.25 in 2008 from 0.20 during the year 2007. Overall serious injury rate during the year 2008 has decreased to 1.84 in the year 2008 from 2.47 in 2007. 34(40%) fatal accidents occurred in belowground workings with fatality rate of 0.21, 31(36%) in opencast workings with fatality rate of 0.49 and 20(24%) in surface operation with fatality rate of 0.18 during the year 2008. Table 19 gives the trend of fatal and serious accidents with fatality rate in different working places. It may be mentioned that out of 370,000 average daily employment 50% was in belowground workings, 21% was in opencast workings and the remaining 29% was engaged in surface operations. Table 19 gives the trend of fatal and serious accidents with fatality rate in different working places.

YEAR	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
1991	80 (0.26)	25 (0.39)	33 (0.20)	138 (0.26)	577 (1.96)	60 (1.00)	166 (0.98)	803 (1.54)
1992	107 (0.39)	32 (0.52)	26 (0.18)	165 (0.33)	587 (2.14)	49 (0.79)	174 (1.01)	810 (1.62)
1993	101 (0.39)	24 (0.37)	31 (0.19)	156 (0.32)	632 (2.19)	57 (0.83)	165 (1.01)	854 (1.65)
1994	93 (0.59)	39 (0.64)	24 (0.15)	156 (2.08)	560 (2.08)	50 (0.86)	107 (0.67)	717 (1.48)
1995	91 (0.60)	26 (0.38)	20 (0.13)	137 (0.43)	549 (2.07)	69 (1.05)	139 (0.93)	757 (1.58)
1996	75 (0.31)	27 (0.42)	29 (0.19)	131 (0.29)	478 (1.83)	71 (1.10)	128 (0.86)	677 (1.43)
1997	94 (0.41)	27 (0.42)	22 (0.14)	143 (0.33)	440 (1.71)	79 (1.25)	158 (1.05)	677 (1.44)
1998	80 (0.36)	24 (0.35)	24 (0.16)	128 (0.30)	346 (1.41)	72 (1.06)	105 (0.70)	523 (1.14)
1999	74 (0.33)	30 (0.43)	23 (0.16)	127 (0.29)	408 (1.73)	77 (1.19)	110 (0.81)	595 (1.37)
2000	62 (0.30)	38 (0.74)	17 (0.13)	117 (0.31)	444 (1.92)	108 (1.67)	109 (0.82)	661 (1.54)
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)	36 (0.50)	16 (0.14)	77 (0.20)	717 (3.75)	83 (1.16)	123 (1.12)	923 (2.47)
2008*	34 (0.21)	31 (0.49)	20 (0.18)	85 (0.25)	517 (2.74)	74 (1.00)	96 (0.85)	687 (1.84)

\* 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

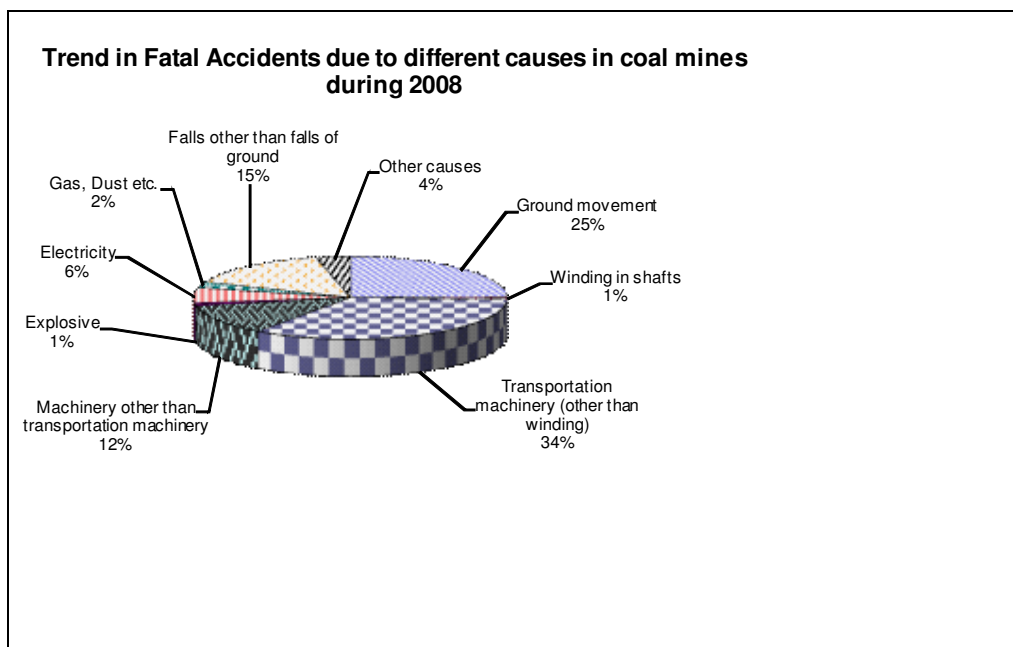
Tables 20 & 21 give the trend in fatal and serious accidents in coal mines due to different causes during the year 2008 compare with last 4 years followed by graphical representation. As can be seen 29(34%) of fatal accidents were caused by transportation machinery (other than winding), 21(25%) due to ground movement, 13(15%) due to falls other than ground movement, 10(12%) due to machinery other than transportation machinery, while electricity contributed 5(6%), gas, dust etc. contributed 2(2%) and explosive 1(1%). 687 serious accidents occurred during the year out of which 351(51%) were caused by falls other than falls of ground, transportation machinery (other than winding) contributed 127(19%), 69(10%)

caused due to ground movement, 40(5%) caused due to machinery other than transportation machinery and 99(14%) due to other causes.

Cause	TREND IN FATAL ACCIDENTS DUE TO DIFFERENT CAUSES IN COAL MINES				
	2004	2005	2006	2007*	2008*
Ground movement	34 (39)	25 (32)	18 (27)	17 (17)	21 (28)
Winding in shafts	-	-	3 (3)	-	1 (1)
Transportation machinery (other than winding)	30 (31)	34 (35)	25 (26)	29 (31)	29 (30)
Machinery other than transportation machinery	7 (7)	15 (15)	8 (8)	13 (13)	10 (10)
Explosive	5 (6)	2 (2)	-	1 (1)	1 (1)
Electricity	4 (4)	4 (4)	3 (3)	4 (4)	5 (6)
Gas, Dust etc.	2 (2)	-	4 (53)	2 (2)	2 (6)
Falls other than fall of ground	3 (3)	14 (14)	12 (12)	9 (9)	13 (13)
Other causes	2 (4)	2 (15)	5 (5)	2 (2)	3 (3)
<b>TOTAL</b>	<b>87 (96)</b>	<b>96 (117)</b>	<b>78 (137)</b>	<b>77 (79)</b>	<b>85 (98)</b>

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

\* Figures are provisional



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

\* Figures are provisional

Place	TREND IN FATAL ACCIDENTS IN DIFFERENT PLACES OF COAL MINES				
	2004	2005	2006	2007*	2008*
Belowground	49 (57)	50 (70)	44 (102)	25 (25)	34 (41)
Opencast	32 (33)	28 (29)	24 (25)	36 (38)	31 (37)
Aboveground	6 (6)	18 (18)	10 (10)	16 (16)	20 (20)
<b>Total</b>	<b>87 (96)</b>	<b>96 (117)</b>	<b>78 (137)</b>	<b>77 (79)</b>	<b>85 (98)</b>



Cause	TREND IN SERIOUS ACCIDENTS DUE TO DIFFERENT CAUSES IN COAL MINES				
	2004	2005	2006	2007*	2008*
Ground movement	112 (124)	84 (102)	56 (70)	70 (78)	69 (73)
Winding in shafts	5 (7)	2 (2)	5 (7)	2 (11)	0 (0)
Transportation machinery (other than winding)	157 (161)	218 (222)	267 (280)	198 (202)	127 (129)
Machinery other than transportation machinery	28 (29)	46 (46)	54 (54)	79 (81)	40 (42)
Explosive	8 (14)	5 (6)	1 (1)	4 (4)	1 (1)
Electricity	4 (5)	5 (12)	5 (5)	3 (6)	0 (0)
Gas, Dust etc.	2 (2)	-	1 (1)	1 (1)	0 (14)
Falls other than fall of ground	493 (495)	550 (552)	375 (376)	456 (458)	351 (352)
Other causes	153 (154)	196 (196)	97 (97)	110 (110)	99 (99)
<b>TOTAL</b>	<b>962(991)</b>	<b>1106(1138)</b>	<b>861 (891)</b>	<b>923 (951)</b>	<b>687 (710)</b>

\* Figures are provisional

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

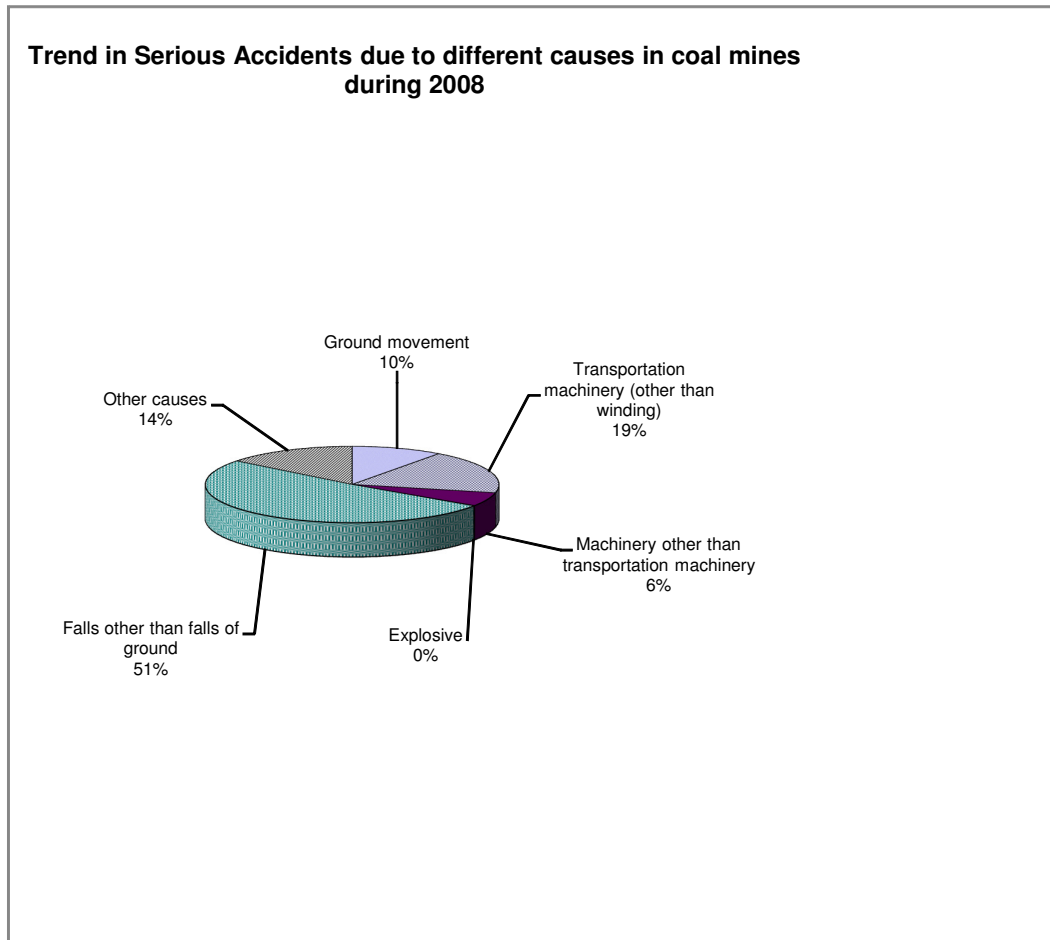


TABLE: 21A	TREND IN SERIOUS ACCIDENTS DUE TO DIFFERENT PLACES IN COAL MINES				
	Place	2004	2005	2006	2007*
Belowground	757 (778)	843 (867)	646 (665)	717 (735)	517 (537)
Opencast	82 (87)	98 (101)	88 (99)	83 (88)	74 (76)
Aboveground	123 (126)	165 (170)	127 (127)	123 (128)	96 (97)
<b>Total</b>	<b>962 (991)</b>	<b>1106 (1138)</b>	<b>861 (891)</b>	<b>923 (951)</b>	<b>687 (710)</b>

\* 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 2008, ground movement accounted for 21(25%) fatal accidents and 69(10%) serious accidents. Further break-up of fatal accidents due to ground movement is given in table 22.

<b>TABLE: 22</b>			
<b>FATAL ACCIDENTS DUE TO GROUND MOVEMENT IN COAL MINES DURING THE YEAR 2008</b>			
Cause	No. of accidents	Persons killed	Persons seriously inj.
1.Fall of roof	14	17	1
2.Fall of side			
(a) belowground	4	4	-
(b) opencast	1	1	-
<b>Sub-Total</b>	<b>5</b>	<b>5</b>	<b>-</b>
3.Others			
(a) bumps	0	0	-
(b) air blast	0	0	-
(c) land slide	1	5	-
(d) collapse of pillar	0	0	-
(e) over hang	1	1	-
<b>Sub-Total</b>	<b>2</b>	<b>6</b>	<b>-</b>
<b>GRAND TOTAL</b>	<b>21</b>	<b>28</b>	<b>1</b>

**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 21 accidents due to ground movement involving 28 fatalities and 01 serious injuries during the year 2008, out of which 14 accidents were due to fall of roof, 5 accidents were due to fall of side and 01 each due to landslide and over hangs. Roof fall accidents accounted for 16.47% of all fatal accidents in coal mines and it contributed 41.18% of all fatal accidents in belowground operations. Further critical analysis of roof fall accidents for the last five years 2004 to 2008 revealed the following:

**I. Physical and Working Condition factors -**

1. **Method of work:** Accident mainly occurred in Bord and Pillar districts. 50% of the fatal accidents occurred in B&P development, 38% in depillaring districts (33% in caving districts and 05% in stowing districts), 2% in longwall stowing and 10% in other places.
2. **Height of working:** 82% of the fatal accidents occurred in gallery height upto 3m, 17% in 3m to 5m.
3. **Width of gallery:** 9% of the fatal accidents occurred in width of galleries between 0 - 3.0m and 4% in width between 3.01 -3.5m, 17% between 3.51-4.00m, 39% between 4.01 -4.50m and 31% occurred in width of galleries above 4.50 m.
4. **Distance from face:** 51% of the accidents occurred within 5m of the working face and 8% each between 5.01 to 10m and 10m to 20m, 14% in above 20m. Thus 59% of the accident occurred within 10m of the freshly exposed roof from the face of working.

5. **Type of support:** 26% of the fatal accidents occurred in areas supported by timber support only, 11% in timber & steel supports, 26% in roof bolts & others, 36% in other supports and in 01% of the cases supports were not provided at all. However, areas supported by timbers were more 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 53% 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 were provided before engaging the persons at work and front line supervisors been attentive for providing adequate supports. It also reveals that in 43% cases accident occurred although adequate support was provided.
7. **Operation at the time of accident:** 20% of the fatal accidents occurred during loading (manual) operation, 10% during supporting, 8% during dressing and 2% during dressing & supporting, thus 40% 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. 12% each of the fatal accidents occurred during withdrawal of support and loading by machine and 25% due to other activities.
8. **Time elapsed after blasting:** 35% 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. 2% of the fatal accidents occurred between ½ - 1 hour, 13% between 1 to 2 hours and 20% of the fatal accidents occurred beyond 2 hours of blasting operation and in 30% of cases no blasting operation was carried out within 4 hours.

## II. Geological factors -

9. **Thickness of seam:** 44% of the fatal accidents occurred in coal seam having thickness upto 3.0 m., 33% in 3 to 6 m. and 10% in seams with thickness between 6-9m. Thus roof fall occurred in all types of coal seams irrespective of their thickness.
10. **Depth of cover:** 43% of the fatal accidents accounted in depth of cover upto 100 m, 33% in 101 to 200m. and 15% between 201 to 300. Practically roof fall accidents occurred at every place irrespective of the depth in proportion to the working plan at various depths except for depth of cover above 401m.
11. **Thickness of fall:** 24% of the fatal accidents occurred having thickness of fallen strata varying between 0 to 0.15m, 31% between 0.16 to 0.3m. Thus 55% of accidents had thickness of fall between 0 to 0.3m. 26% of fatal accident occurred having thickness of fallen strata between 0.31 to 1.0 m thick and 19% 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:** 46% of the fatal accidents occurred due to fall of sand stone roof, 21% due to coal and 18% 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:** 41% of the persons involved in roof fall accidents were loader, 22% timbermen, 9% subordinate supervisory staff, 7% dressers and 5% shotfirer/explosive carrier. 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 24% of the total accidents persons involved were in the age group of 46-50 years, 19% between 41-45 years, 15% between 56-60 years, 14% between 36-40 and 12% between 51-55 years.
15. **Shift of working:** 61% of the fatal accidents took place in 1<sup>st</sup> shift, 18% in 2<sup>nd</sup> shift and 21% 3<sup>rd</sup> 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:** 19% of the roof fall accidents occurred in 3.01 – 4.00 hours of the work, 27% between 4.01 – 5.00 hours, 15% between 5.01 – 6.00 hours and 12% between 6.01 – 7.00 hours. Thus 46% of the roof fall accidents occurred between third and fifth hours of the shift.

**IV. Management factors -**

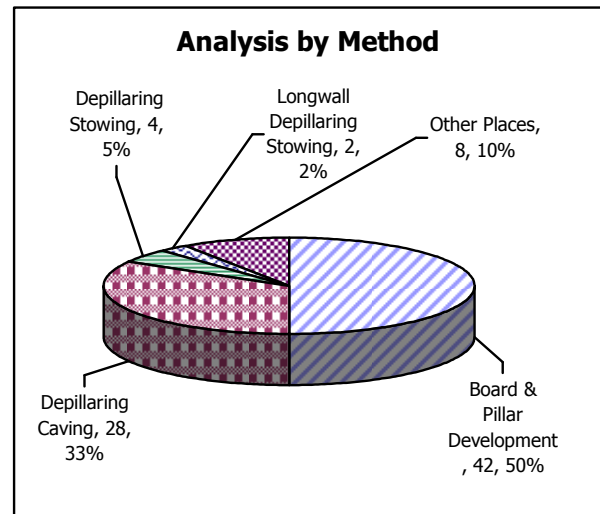
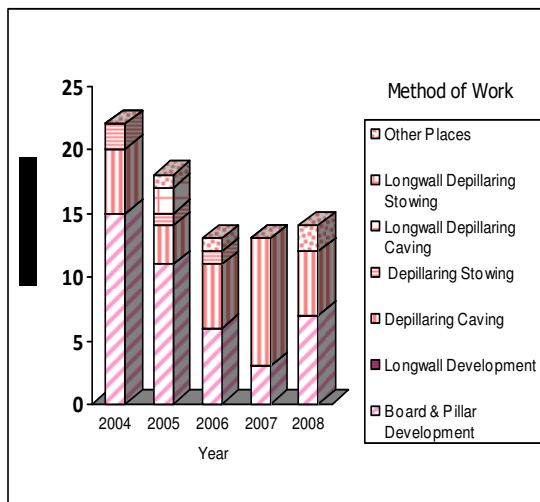
17. **Responsibility:** 39% of the fatal accidents were caused due to fault of management and Subordinate Supervisory Staff; 21% of the fatal accidents due to fault of Subordinate Supervisory Staff alone, 10% due to fault of management and others and in 5% of the cases subordinate supervisory staff and other were held responsible. In 5% of cases deceased was responsible.
18. **Company:** Company-wise analysis indicates that 83% of roof fall accident occurred in CIL whereas 14% occurred in SCCL. CIL subsidiary-wise 22% each of fatal accidents occurred in BCCL and SECL, 15% in ECL, and 13% in WCL and 2% in Tata Steel Co.

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**

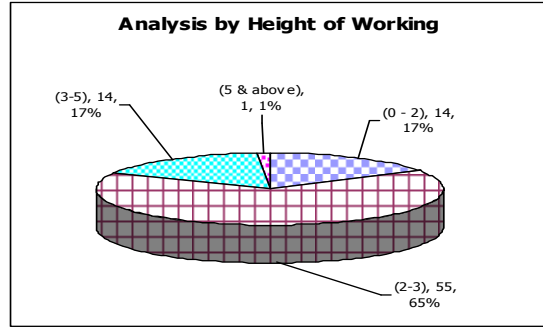
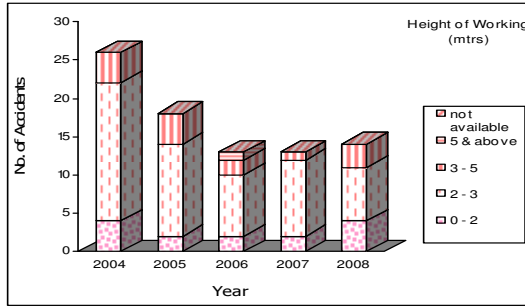
Method of work	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%

Board & Pillar Development	15	58	11	61	6	46	3	23	7	50	<b>42</b>	50
Longwall Development	0	0	0	0	0	0	0	0	0	0	<b>0</b>	0
Depillaring Caving	5	19	3	17	5	38	10	77	5	36	<b>28</b>	33
Stowing	2	8	1	6	1	8	0	0	0	0	<b>4</b>	5
<b>Total Depillaring</b>	<b>7</b>	<b>27</b>	<b>4</b>	<b>23</b>	<b>6</b>	<b>46</b>	<b>10</b>	<b>77</b>	<b>5</b>	<b>36</b>	<b>32</b>	<b>38</b>
<b>Longwall</b>												
Depillaring Caving	0	0	0	0	0	0	0	0	0	0	<b>0</b>	0
Stowing	0	0	2	11	0	0	0	0	0	0	<b>2</b>	2
<b>Total Longwall</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>
Other Places	4	15	1	5	1	8	0	0	2	14	<b>8</b>	10
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>



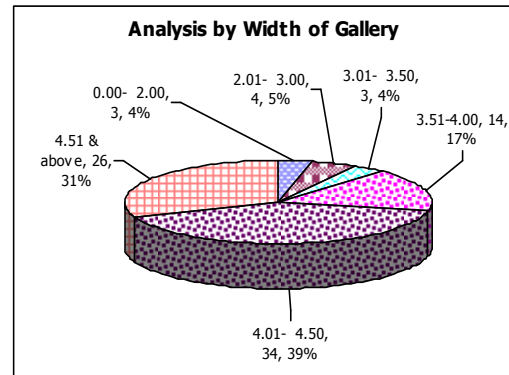
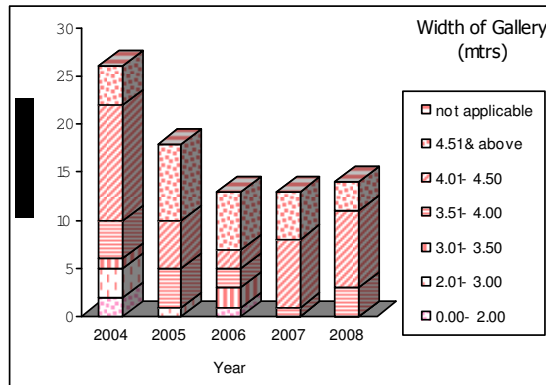
2. Distribution of fatal roof fall accidents by height of working

Height of working (metres)	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
0 - 2	4	15	2	11	2	15	2	15	4	29	14	17
2 - 3	18	70	12	67	8	62	10	77	7	50	55	65
3 - 5	4	15	4	22	2	15	1	8	3	21	14	17
5 & above	0	0	0	0	1	8	0	0	0	0	1	1
not available	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>



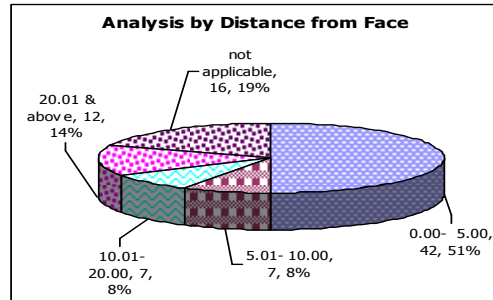
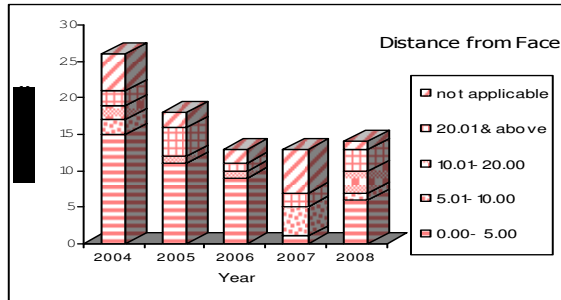
3. Distribution of fatal roof fall accidents by width of gallery

width of gallery (mt.)	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
0.00- 2.00	2	8	0	0	1	8	0	0	0	0	3	4
2.01- 3.00	3	12	1	6	0	0	0	0	0	0	4	5
3.01- 3.50	1	4	0	0	2	15	0	0	0	0	3	4
3.51- 4.00	4	15	4	22	2	15	1	8	3	21	14	17
4.01- 4.50	12	46	5	28	2	15	7	54	8	58	34	39
4.51 & above	4	15	8	44	6	47	5	38	3	21	26	31
not applicable	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>



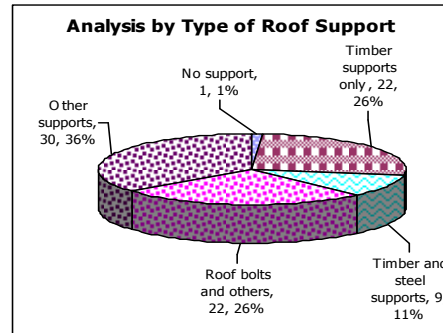
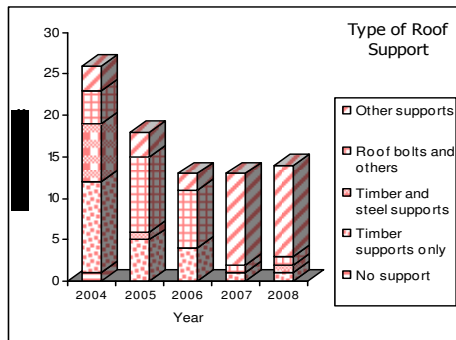
4. Distribution of fatal roof fall accidents by distance from face

Distance from face (metres)	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
0.00- 5.00	15	58	11	61	9	69	1	8	6	44	42	51
5.01- 10.00	2	8	0	0	0	0	4	31	1	7	7	8
10.01- 20.00	2	8	1	6	1	8	0	0	3	21	7	8
20.01 & above	2	8	4	22	1	8	2	15	3	21	12	14
not applicable/available	5	18	2	11	2	15	6	46	1	7	16	19
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>



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

Type of support	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
No support	1	4	0	0	0	0	0	0	0	0	1	1
Timber supports only	11	42	5	28	4	31	1	8	1	7	22	26
Timber and steel supports	7	27	1	6	0	0	0	0	1	7	9	11
Roof bolts and others	4	15	9	50	7	54	1	8	1	7	22	26
Other supports	3	12	3	16	2	15	11	84	11	79	30	36
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>

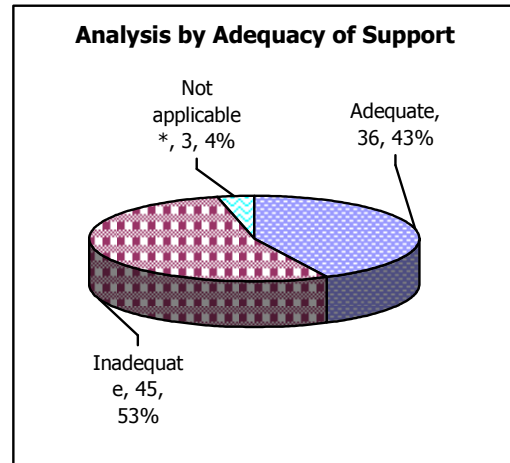
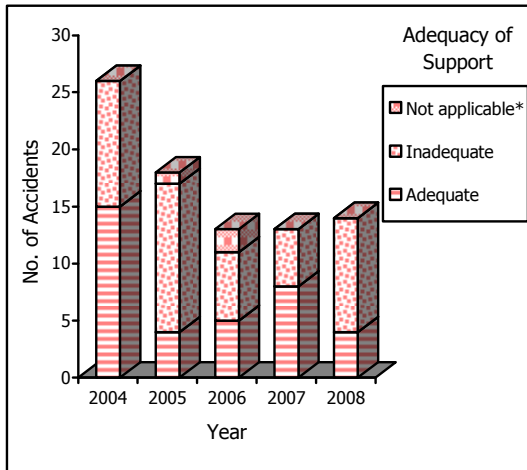


**6. Distribution of fatal roof fall accidents by adequacy of support**

Adequacy of support	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
Adequate	15	58	4	22	5	38	8	62	4	29	36	43
Inadequate	11	42	13	72	6	46	5	38	10	71	45	53
Not applicable*	0	0	1	6	2	16	0	0	0	0	3	4
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>

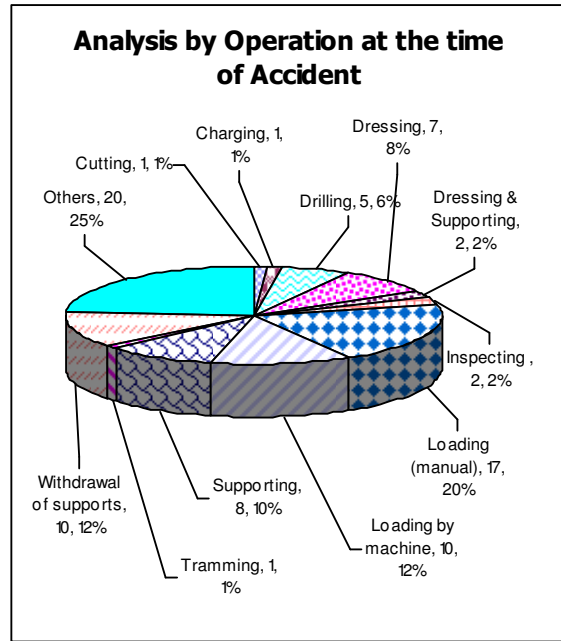
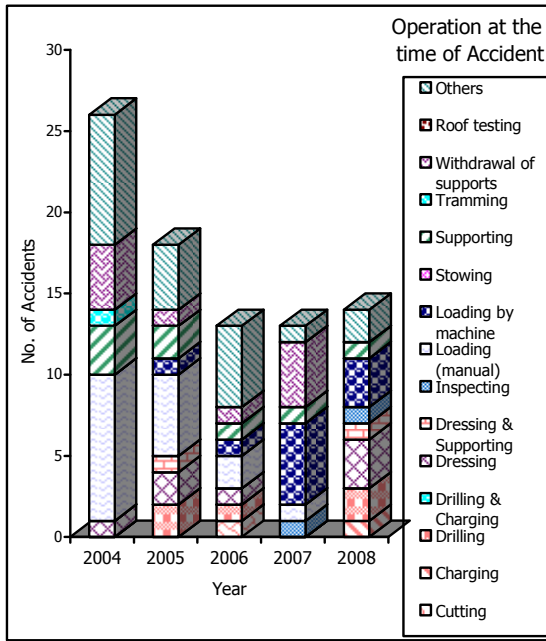
\* Provisional





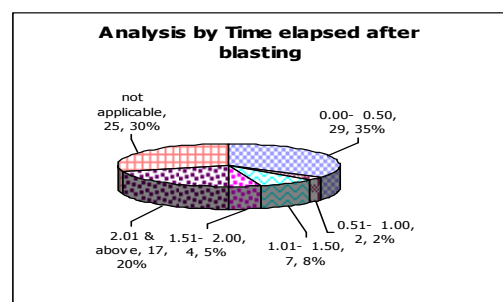
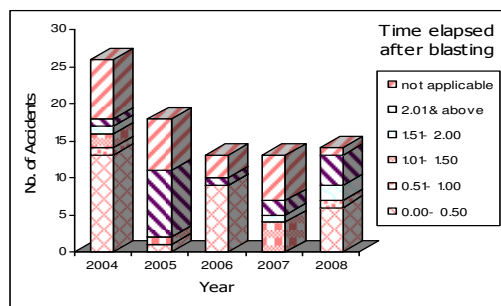
**7. Distribution of fatal roof fall accidents by operation at the time of accident**

operation at the time of accident	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
Cutting	0	0	0	0	1	8	0	0	0	0	1	1
Charging	0	0	0	0	0	0	0	0	1	7	1	1
Drilling	0	0	2	11	1	8	0	0	2	14	5	6
Drilling & Charging	0	0	0	0	0	0	0	0	0	0	0	0
Dressing	1	4	2	11	1	8	0	0	3	22	7	8
Dressing & Supporting	0	0	1	6	0	0	0	0	1	7	2	2
Inspecting	0	0	0	0	0	0	1	8	1	7	2	2
Loading (manual)	9	35	5	27	2	15	1	8	0	0	17	20
Loading by machine	0	0	1	6	1	8	5	38	3	22	10	12
Stowing	0	0	0	0	0	0	0	0	0	0	0	0
Supporting	3	11	2	11	1	8	1	8	1	7	8	10
Tramming	1	4	0	0	0	0	0	0	0	0	1	1
Withdrawal of supports	4	15	1	6	1	8	4	30	0	0	10	12
Roof testing	0	0	0	0	0	0	0	0	0	0	0	0
Others	8	31	4	22	5	37	1	8	2	14	20	25
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>



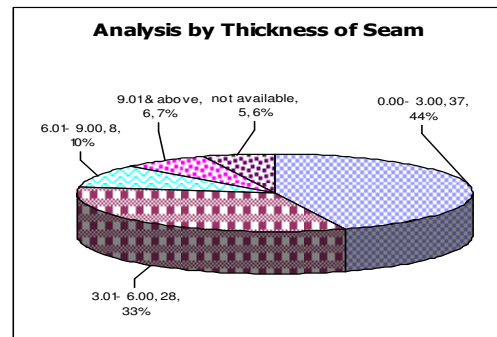
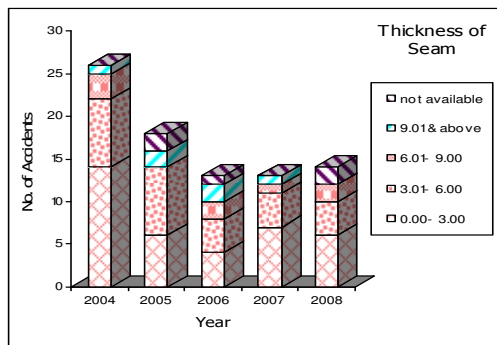
**8. Distribution of fatal roof fall accidents by time elapsed after blasting**

time elapsed after blasting (hours)	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
0.00- 0.50	13	50	1	6	9	69	0	0	6	43	29	35
0.51- 1.00	1	4	0	0	0	0	0	0	1	7	2	2
1.01- 1.50	2	8	1	6	0	0	4	31	0	0	7	8
1.51- 2.00	1	4	0	0	0	0	1	8	2	14	4	5
2.01 & above	1	4	9	50	1	8	2	15	4	29	17	20
not applicable	8	30	7	38	3	23	6	46	1	7	25	30
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>



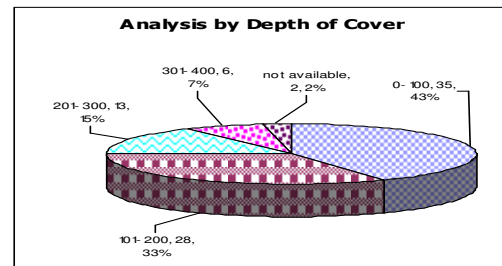
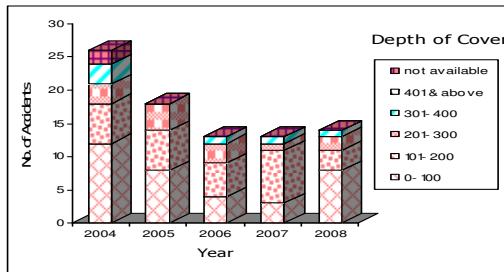
9. Distribution of fatal roof fall accidents by thickness of seam

Seam thickness (metres)	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
0.00- 3.00	14	54	6	33	4	31	7	54	6	43	37	44
3.01- 6.00	8	31	8	45	4	31	4	30	4	29	28	33
6.01- 9.00	3	11	0	0	2	15	1	8	2	14	8	10
9.01 & above	1	4	2	11	2	15	1	8	0	0	6	7
not available	0	0	2	11	1	8	0	0	2	14	5	6
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>



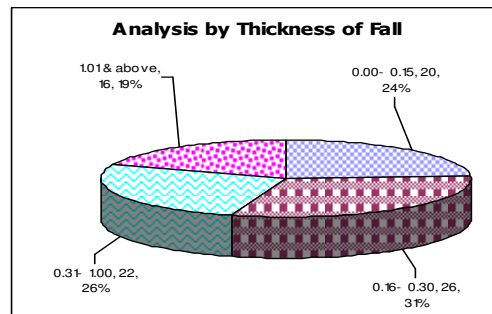
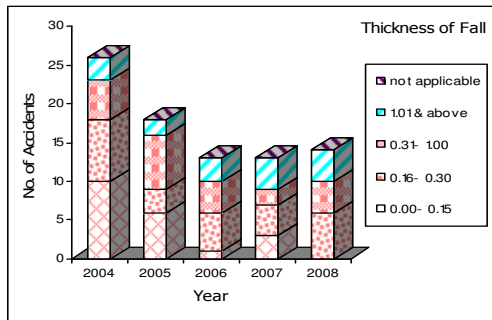
10. Distribution of fatal roof fall accidents by depth of cover

Depth of cover (metres)	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
0- 100	12	46	8	45	4	31	3	23	8	57	35	43
101- 200	6	23	6	33	5	38	8	61	3	22	28	33
201- 300	3	12	4	22	3	23	1	8	2	14	13	15
301- 400	3	12	0	0	1	8	1	8	1	7	6	7
401 & above	0	0	0	0	0	0	0	0	0	0	0	0
not available	2	7	0	0	0	0	0	0	0	0	2	2
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>



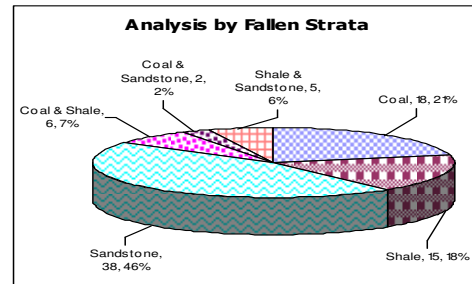
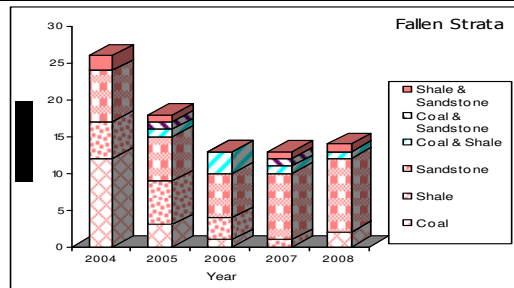
11. Distribution of fatal roof fall accidents by thickness of fall

Thickness of fall (metres)	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
0.00- 0.15	10	38	6	33	1	8	3	23	0	0	20	24
0.16- 0.30	8	31	3	17	5	38	4	31	6	42	26	31
0.31- 1.00	5	19	7	39	4	31	2	15	4	29	22	26
1.01 & above	3	12	2	11	3	23	4	31	4	29	16	19
not applicable	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>



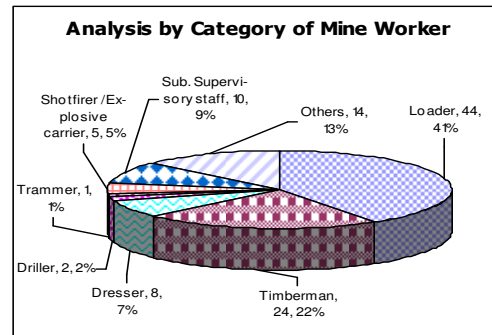
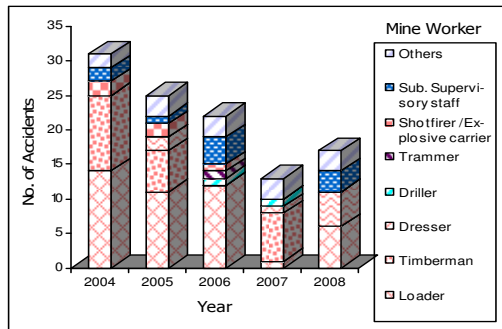
12. Distribution of fatal roof fall accidents by nature of fallen strata

Nature of fallen strata	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
Coal	12	46	3	16	1	8	0	0	2	14	18	21
Shale	5	19	6	33	3	23	1	8	0	0	15	18
Sandstone	7	27	6	33	6	46	9	68	10	72	38	46
Coal & Shale	0	0	1	6	3	23	1	8	1	7	6	7
Coal & Sandstone	0	0	1	6	0	0	1	8	0	0	2	2
Shale & Sandstone	2	8	1	6	0	0	1	8	1	7	5	6
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>



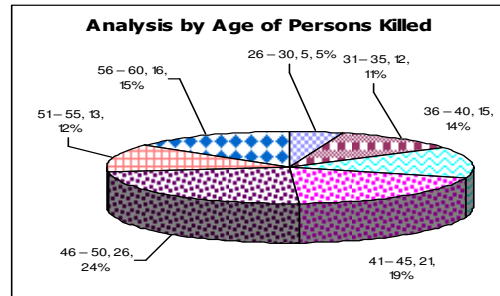
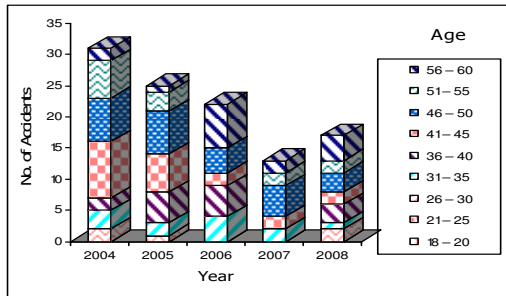
13. Distribution of persons killed in roof fall accidents by designation

Category of mine worker	Number of persons killed											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
Loader	14	46	11	44	12	54	1	8	6	35	44	41
Timberman	11	36	6	24	0	0	7	53	0	0	24	22
Dresser	0	0	2	8	0	0	1	8	5	29	8	7
Driller	0	0	0	0	1	5	1	8	0	0	2	2
Trammer	0	0	0	0	1	5	0	0	0	0	1	1
Shotfirer /Explosive carrier	2	6	2	8	1	5	0	0	0	0	5	5
Sub. Supervisory staff	2	6	1	4	4	18	0	0	3	18	10	9
Others	2	6	3	12	3	13	3	23	3	18	14	13
<b>Total</b>	<b>31</b>	<b>100</b>	<b>25</b>	<b>100</b>	<b>22</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>17</b>	<b>100</b>	<b>108</b>	<b>100</b>



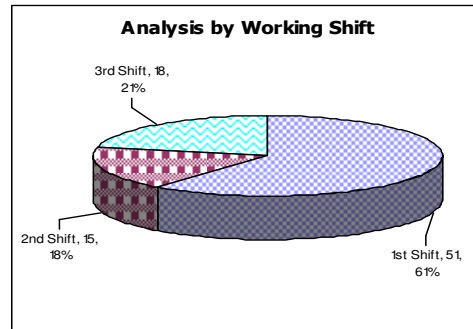
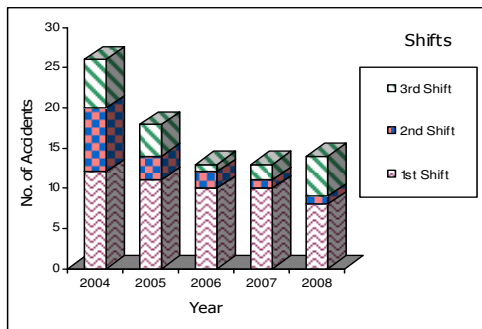
14. Distribution of persons killed in roof fall accidents by age

age	Number of persons killed											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
18 – 20	0	0	0	0	0	0	0	0	0	0	0	0
21 – 25	0	0	0	0	0	0	0	0	0	0	0	0
26 – 30	2	6	1	4	0	0	0	0	2	12	5	5
31 – 35	3	10	2	8	4	18	2	15	1	6	12	11
36 – 40	2	6	5	20	5	23	0	0	3	18	15	14
41 – 45	9	29	6	24	2	9	2	15	2	12	21	19
46 – 50	7	23	7	28	4	18	5	40	3	18	26	24
51 – 55	6	20	3	12	0	0	2	15	2	12	13	12
56 – 60	2	6	1	4	7	32	2	15	4	22	16	15
<b>Total</b>	<b>31</b>	<b>100</b>	<b>25</b>	<b>100</b>	<b>22</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>17</b>	<b>100</b>	<b>108</b>	<b>100</b>



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

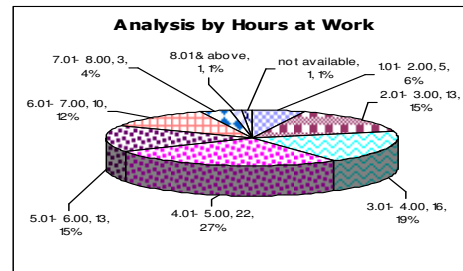
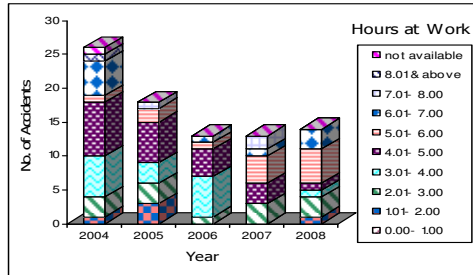
Shift	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
1st (7/8 AM to 3/4 PM)	12	46	11	61	10	77	10	77	8	57	51	61
2nd 3/4 PM to 11/12 M	8	31	3	17	2	15	1	8	1	7	15	18
3rd 11/12M to 7/8 AM	6	23	4	22	1	8	2	15	5	36	18	21
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>





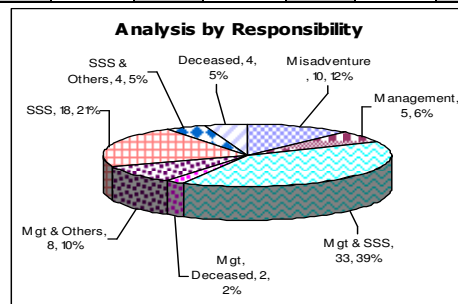
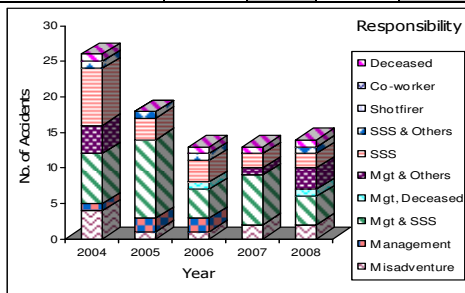
16. Distribution of fatal roof fall accidents by hours spent at work prior to the accident

Hours at Work	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
0.00- 1.00	0	0	0	0	0	0	0	0	0	0	0	0
1.01- 2.00	1	4	3	17	0	0	0	0	1	7	5	6
2.01- 3.00	3	12	3	17	1	8	3	23	3	21	13	15
3.01- 4.00	6	23	3	17	6	46	0	0	1	7	16	19
4.01- 5.00	8	30	6	32	4	30	3	23	1	7	22	27
5.01- 6.00	1	4	2	11	1	8	4	31	5	37	13	15
6.01- 7.00	5	19	0	0	1	8	1	8	3	21	10	12
7.01- 8.00	0	0	1	6	0	0	2	15	0	0	3	4
8.01 & above	1	4	0	0	0	0	0	0	0	0	1	1
not available	1	4	0	0	0	0	0	0	0	0	1	1
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>



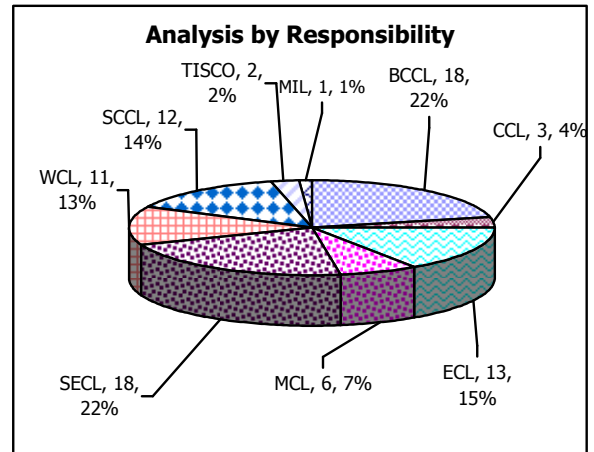
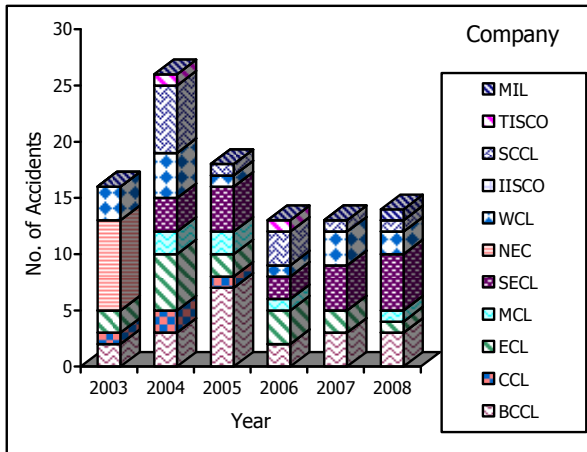
**17. Distribution of fatal roof fall accidents by responsibility**

Responsibility	Number of persons											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
Misadventure	4	15	1	6	1	8	2	15	2	14	10	12
Management	1	4	2	11	2	15	0	0	0	0	5	6
Mgt & SSS	7	27	11	61	4	30	7	54	4	29	33	39
Mgt, Deceased	0	0	0	0	1	8	0	0	1	7	2	2
Mgt & Others	4	15	0	0	0	0	1	8	3	22	8	10
SSS	8	31	3	16	3	23	2	15	2	14	18	21
SSS & Others	1	4	1	6	1	8	0	0	1	7	4	5
Shotfirer	0	0	0	0	0	0	0	0	0	0	0	0
Co-worker	0	0	0	0	0	0	0	0	0	0	0	0
Deceased	1	4	0	0	1	8	1	8	1	7	4	5
<b>Total</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>



18. Distribution of fatal roof fall accidents by company

Company	Number of accidents											
	2004	%	2005	%	2006	%	2007	%	2008	%	total	%
BCCL	3	12	7	38	2	15	3	23	3	22	18	22
CCL	2	8	1	6	0	0	0	0	0	0	3	4
ECL	5	19	2	11	3	23	2	15	1	7	13	15
MCL	2	8	2	11	1	8	0	0	1	7	6	7
SECL	3	12	4	22	2	15	4	31	5	36	18	22
NEC	0	0	0	0	0	0	0	0	0	0	0	0
WCL	4	15	1	6	1	8	3	23	2	14	11	13
<b>CIL: total</b>	<b>19</b>	<b>74</b>	<b>17</b>	<b>94</b>	<b>9</b>	<b>69</b>	<b>12</b>	<b>92</b>	<b>12</b>	<b>86</b>	<b>69</b>	<b>83</b>
IISCO	0	0	0	0	0	0	0	0	0	0	0	0
SCCL	6	22	1	6	3	23	1	8	1	7	12	14
TISCO	1	4	0	0	1	8	0	0	0	0	2	2
MIL	0	0	0	0	0	0	0	0	1	7	1	1
<b>All-India</b>	<b>26</b>	<b>100</b>	<b>18</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>13</b>	<b>100</b>	<b>14</b>	<b>100</b>	<b>84</b>	<b>100</b>



**2.2.3B.3 Side fall and over hangs**

There were 5 (6%) fatal accidents involving 5 fatalities due to fall of sides. All the five accidents took place in belowground workings.

- Accident due to fall of sides accounted for 5% of all fatal accidents in coal mines and 15% of all accidents in belowground workings.

**2.2.3B.4 Air blast**

There was no accident due to this cause during the year 2008.

**2.2.3C Transportation machinery (Winding)**

There was no one fatal accident due to fall out of cage to the shaft bottom receiving serious injury to which he succumbed on the spot.

**2.2.3D Transportation machinery (Other than winding)**

There were 29 fatal accidents due to transportation machinery other than winding reported during the year 2008. A detailed break-up of fatalities under this category are given in the table below:-

<b>TABLE - 23</b>		<b>FATAL ACCIDENTS DUE TO TRANSPORTATION MACHINERY OTHER THAN WINDING IN SHAFTS IN COAL MINES DURING 2008</b>	
<b>Cause</b>	<b>No. of fatal accidents</b>	<b>Persons killed</b>	
1. Rope Haulage	4	4	
2. Mechanical Conveyors	1	1	
3. Dumpers	16	17	
4. Wheeled Trackless(Truck,Tanker etc.)	7	7	
5. Others	1	1	
<b>Total</b>	<b>29</b>	<b>30</b>	

It was seen that the rope haulage, belt conveyors, dumpers and truck-tippers were major contributing causes.

**2.2.3D.1 Rope Haulages**

There were 4 fatalities (13.79% of all accidents) caused due to rope haulages during the year 2008. Analysis of causes revealed that:-

- One accident caused due to derailed of tub & pinned the trammer against coal pillar inflicting seriously injured and death.
- One accident caused due to pressed between floor and coal tub.
- Two accidents caused due to uncontrolled tub hit the trammer.

**2.2.3D.2 Mechanical / Belt Conveyors:**

One accident occurred resulting one fatalities by belt conveyor during 2008.

- One accident occurred due to fallen on running belt and got stuck between a discharge plate and moving top conveyor belt.

**2.2.3D.3 Dumpers and tippers:**

There were 16 accidents due to dumper and tipper causing 16 fatalities.

- Four accidents occurred killing 4 persons by dumpers.
- Twelve accidents occurred killing 12 persons by tippers.

The above accident (dumpers and tippers) contributed 55% of all accidents.

The analysis of above accident revealed that –

- One accident occurred due to break failure of tipper dumper run away gradient crossing a drainage ditch. Operator lost control and jump out of dumper and run over by left rear tandem wheels.
- Nine persons died due to ran over by dumper and tippers.
- Two accidents occurred due to uncontrolled movement of dumpers and tippers killing nine persons.
- Three accidents occurred due to hit by another dumper and tippers killing three persons.
- One accident occurred due to collision between two tippers.

**2.2.3D4 Truck & Tankers:**

Seven accidents were occurred causing seven fatalities due to truck & tankers contributing 24.13% of total accident.

- One cases while water tanker rolled back uncontrolled driver received seriously head injuries and death.
- Two case two persons were killed due to truck run over.
- Three persons killed due to hit by truck/tanker.
- One person killed due to failure of brake of tractor-tailor.

**2.2.3D5 Wagon movement**

One person killed during uncoupling of wagon on running.

**2.2.3E Machinery other than transportation machinery:**

There were 10 accidents reported during the year 2008, which were caused due to machinery other than transportation machinery. The analysis of the causes revealed that:-

<b>Table – 24</b>		<b>FATAL ACCIDENTS IN COAL MINES DUE TO MACHINERY OTHER THAN TRANSPORTATION MACHINERY DURING 2008</b>	
<b>Sl.No.</b>	<b>No. of fatal accidents</b>	<b>Persons killed</b>	
1. Drilling m/c	1	1	
2. Loading m/c SDL	1	1	
3. Haulage engine	-	-	
4. Shovels/Draglines etc.	3	3	
5. Crushing & Screening Plant	1	1	
6. Other HEMM	4	4	
7. Other Non-Transportation Machinery	-	-	
<b>Total :</b>	<b>10</b>	<b>10</b>	

Further analysis of the causes revealed that:-

- Boom fall on the supporting mistry due to pit come out between supporting jack and boom.
- SDL machine hit helper during trial.
- One person killed during repair of PH shovel, he slipped and injured.
- One person killed due to fallen of boom of EKG shovel.
- One person killed due to hit of swiveling bucket to operator.
- One person killed due to crane boom hit and pressed against hydraulic tank.
- One person killed due to leg of worker caught between hydraulic tank and LHD.
- One person died due to ran over by dozer.
- One person killed due to uncontrolled movement of dozer.

**2.2.3F Explosives**

There was only one fatality (1% of the total) fatal accident involving one person and there were one serious accidents due to explosives during the year 2008.

**2.2.3G Electricity**

There were 5 (6% of the total) fatal accidents involving six persons and nil serious accident due to electricity during the year 2008.

**2.2.3H Accidents due to Dust, Gas & Fire.**

During the year 2008, there were 2 (2% of the total) fatal accident involving 6 fatalities were occurred due to this cause.

**2.2.3I Falls other than falls of ground**

Falls other than fall of ground caused 13 (15% of the total) fatal accidents involving same number of lives during the year 2008.

**2.2.3J Other causes**

Three cases of fatal accident involving three persons were reported due to miscellaneous causes during the year 2008.

**2.2.4 Responsibility**

Analysis of accidents as per the persons held responsible for the various causes of accidents during the year 2008 has been indicated in table:25.

<b>TABLE:25 RESPONSIBILITY FOR FATAL ACCIDENTS IN COAL MINES DURING THE YEAR 2008</b>		
<b>SL. NO.</b>	<b>Responsibility</b>	<b>No. of accidents</b>
1.	Misadventure	4
2.	Management	9
3.	Management & Subordinate Supervisory Staff (SSS)	15
4.	Management, SSS, co-worker	4
5.	Management, SSS & deceased	6
6.	Management, SSS, co-worker & deceased	-
7.	Management & co-worker	7
8.	Management & Shotfirer	1
9.	Management & deceased	3
10.	Subordinate Supervisory Staff (SSS)	3
11.	SSS & co-worker	5
12.	SSS, co-worker & deceased	5
13.	SSS & deceased	2
14.	SSS & Others	-
15.	Shotfirer	-
16.	Co-worker	8
17.	Co-worker & deceased	5
18.	Deceased	7
19.	Others	1
	<b>TOTAL</b>	<b>85</b>

It can be seen that in 9 (11%) cases management alone and 15 (18%) cases management along with other subordinate staff were responsible. In 3 (4%) of the cases subordinate supervisory staff alone were found responsible. In 7 (8%) cases deceased alone and in 8 (9%) cases the co-worker 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

During the year 2008, 26 (twenty six) dangerous occurrences were reported under the Coal Mines Regulations, 1957. Details of cause of dangerous occurrences are given below in Table: 12

TABLE:26 DANGEROUS OCCURRENCES IN COAL MINES DURING 2008		
Sl.No.	Cause	No. of cases
1.	Spontaneous heating belowground	2
2.	Spontaneous heating in opencast working	-
3.	Spontaneous heating at surface	-
4.	Outbreak of fire underground from spontaneous heating	2
5.	Outbreak of fire underground from causes other than spontaneous heating	4
6.	Outbreak of fire in quarries from causes other than spontaneous heating	1
7.	Outbreak of fire in surface from causes other than spontaneous heating/ dumper/machinery fire	1
8.	Premature collapse of workings or failure of pillars/ benches/major roof fall	1
9.	Influx of noxious gases	-
10.	Ignition or occurrence of inflammable gas	-
11.	Over winding of cages etc.	1
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	7
17.	Explosives	-
18.	Dump slide/Collapse of OB bench	2
19.	Others	2
	<b>TOTAL</b>	<b>26</b>

### A. Spontaneous Heating

In total 4(four) cases of spontaneous heating were reported, 2 were in belowground workings. Two of them resulted into blazing fire. There was no incidence of sp heating in opencast workings. There was one case of sp. heating reported at the end of the isolation stopping in the depillaring panel due to sluggish ventilation .There were three cases of spon. heating resulting due to fallen coal not cleaned . There was a case of blazing fire inside a sealed off stowed goaf area. There was a case of jumping of old fire from isolation stoppings.

There were seven cases of potholes or subsidence causing potholes out of which four were resulted due to workings at shallow depth having less hard cover of 8 to 14m only, two were caused due to heavy rains, one having unstable workings below inhabitate area.



**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.
- Non provision of latest carbon monoxide gas detecting devices.

**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 sectionlization 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.

**B. Other Fires**

There was a case of fire extending inbye of the quarry. One case of catching fire in dumper was also reported due to bursting of high pressure hose pipe carrying hydraulic oil.

Corrective measures:

- Timely action has to be initiated if active fire is known to exist 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.
- Proper code of practice for prevention of fires in HEMM should be framed and implemented.
- Availability of Fire Tender in the mine must be ensured.

**C. Premature collapse of workings or failure of pillars/benches**

There was one case of premature collapse of workings.

There was case of dump slide due to black cotton soil at the bottom and hard sandstone dumped over it.

**D. Influx of Noxious Gases**

There was no case reported.

**E. Ignition or occurrence of inflammable gas**

There was no case of ignition or occurrence of inflammable gas.

**F. Irruption of water / Landslide**

There are one case of irruption of water /land slide reported.

The detailed analysis of the dangerous occurrences during the year 2008 is given in the following table--

**ANALYSIS OF DANGEROUS OCCURRENCES IN COAL MINES DURING 2008**

<u>S.No</u>	<u>Mine, Seam, Date of occurrence.</u>	<u>Company</u>	<u>Occurrence</u>	<u>Characteristic s of coal</u>	<u>Action Taken / Recommendation</u>
<u>1</u>	<u>Mudidih Colliery, No.15 Seam, 26-07-2008.</u>	<u>M/s BCCL</u>	<u>Pot hole occurred over unstable workings</u>		<u>-to ensure vacation of the areas.</u>
<u>2</u>	<u>Gopalichuck colliery, No.14/13 seam, 08-09-2008.</u>	<u>M/s BCCL</u>	<u>Pot hole occurred over No. 14/13 seam workings</u>		<u>Pothole was filled up with sand / Diversion of DB road and vacation of Hutments.</u>
<u>3</u>	<u>Kenduadih Colliery, No.13 Seam, 09-10-2008.</u>	<u>M/s BCCL</u>	<u>Pot hole occurred over shallow depth of cover.</u>		<u>Pothole was filled up with sand / vacation of Hutments.</u>
<u>4</u>	<u>Hindustan Lalpeth Colliery No.1, Lalpeth seam, 14-08-2008.</u>	<u>M/s WCL</u>	<u>Pot hole occurred over shallow depth and soft &amp; weak cover.</u>		<u>Pothole was filled up with Mutty.</u>

<u>5</u>	<u>Kalipahari colliery, 30-11-2008</u>	<u>M/s ECL</u>	<u>Subsidence &amp; Potholing - Caved area subsided due to heavy rain affecting nearby hutments.</u>	<u>i)Unauthorised hutment were vacated and the affected area was filled up.</u>  <u>ii) The area liable to such occurrences should be identified &amp; marked on the surface.</u>
<u>6</u>	<u>Bansdeopur Colliery, 09-07-2008, 19.30 hrs, 13/14 seam, Ekra section</u>	<u>M/s BCCL</u>	<u>Pot Hole-- Working only at shallow cover of 8m in 14 seam.</u>	<u>-Hard cover was less than 30m.</u>  <u>-All shallow cover workings of less than 30m should be stowed or packed solid. Vacation of hutments around the identified area shall be done.</u>
<u>7</u>	<u>Gondudih Khaskusunda Colliery, No.3 seam, 22-03-2008.</u>	<u>M/s BCCL</u>	<u>Inrush of water from No.4 &amp; overlying seams to No.3 Seam.</u>	<u>Area not approachable and water level required to be monitored regularly.</u>
<u>8</u>	<u>Kottadih Colliery, 29-08-2008</u>	<u>M/s ECL</u>	<u>Roof fall of 10m length in the incline.</u>	<u>Fall was cleaned and re-supported.</u>
<u>9</u>	<u>Balgi Mine, G-III Seam, 09-10-2008</u>	<u>M/s SECL</u>	<u>Seepage of water which is not normal to Seam and resultant Pothole formation.</u>	<u>Pothole was filled and area was effectively fenced.</u>

10	<p>Hindustan Lalpeth Colliery No.1, Lalpaeth seam,  29-06-2008, 2.30 PM, Deg I.  Depth – 115m</p>	M/s WCL	<p>Blazing Fire inside the sealed off stowed area.</p>	<p><u>Proximate analy.</u> FC- 38.5% VM- 30% UHV- NA Moisture- 7.5% Ash- 24% C.P – 130<sup>0</sup> I.P - 196<sup>0</sup></p>	<p>Leakage of air through the stoppings from outside to be prevented by strengthening the stoppings.  -Requires strengthening of isolation stoppings  -Ultimate analysis-NA</p>
11	<p>Ballarpur 3&amp;4 pits, Top section, Deg-I, 22-04-2008, 4.00 PM,</p>	M/s WCL	<p>Spontaneous heating at the end of Isolation stopping in the depillaring panel due to sluggish ventilation.</p>	<p><u>Proximate analy.</u> FC- 78.6-81.2% VM- 37-40% UHV- NA Moisture- 6.8-8.6 % Ash-19.6-30.3 % C.P – 124<sup>0</sup> I.P - 198<sup>0</sup></p>	<p>i) Fallen coal not be kept for long time in underground, especially towards any inbye of isolation stoppings.  ii) Fresh proximate &amp; ultimate analysis require to be done for all coal seams in the mine.</p>
12	<p>Mahakali Colliery, Middle section of Mahakali Seam, 15-10-2008, 6.30 PM, Deg-I</p>	M/s WCL	<p>Spontaneous Heating due to fallen coal on inbye side of the panel being depillared.</p>	<p><u>Proximate analy.</u> FC- 57.5% VM- 34% UHV- NA Moisture- 6-8.2%</p>	<p>i) Removal of fallen coal from main return airways and ii) strengthening of ventilation stoppings to prevent any leakage.</p>

				Ash- 15.5%	
				C.P – 139 <sup>0</sup>	
				I.P - 206 <sup>0</sup>	
<u>13</u>	<u>Jambad UG Mine, Kenda Seam, 22-08-2008, III shift.</u>	<u>M/s ECL</u>	<u>Spontaneous heating in fallen coal resulted in blazing fire.</u>	<u>Proximate analy.</u>	<u>i) Fallen coal not be kept for long time in Underground, especially towards any in bye of isolation stoppings.</u>
				<u>FC- 46.1%</u>	
				<u>VM- NA</u>	
				<u>UHV- 5409</u>	
				<u>Moisture- 6.5</u>	<u>ii) Fresh proximate &amp; ultimate analysis require to be done for all coal seams in the mine.</u>
				<u>Ash- 16.2</u>	
				<u>C.P – 119<sup>0</sup></u>	
				<u>I.P - 159<sup>0</sup></u>	
<u>14</u>	<u>Bahula Colliery, outby of 29R/8L Isolation Stopping</u>	<u>M/s ECL</u>	<u>Spontaneous heating followed by blazing fire occurred in the fallen coal out by of 29R/8L Isolation Stopping of stowed goaf.</u>	<u>Proximate analy.</u>	<u>Affected area sealed off and monitoring is continuing.</u>
				<u>FC- 41.7%</u>	
				<u>VM- NA</u>	<u>- Cause Fallen coal not cleaned.</u>
				<u>UHV-5409</u>	
				<u>Moisture- 6.4%</u>	
				<u>Ash- 18.9%</u>	
				<u>C.P – 102<sup>0</sup></u>	
				<u>I.P - 156<sup>0</sup></u>	
<u>15</u>	<u>Lodna Colliery, 11/12 Seam, 16-02-2008, 10.30 PM</u>	<u>M/s BCCL</u>	<u>Fire through inset in intake pit No. 8 (sealed off)</u>		<u>i) Daily monitoring of stoppings along the inset in the shaft.</u>
					<u>ii) Periodic Pressure balancing along the stoppings in the inset area in consultation with the</u>

					<u>scientific body.</u>
<u>17</u>	<u>Tetulmari Colliery, 4 bottom seam, 17-09-2008.</u>	<u>M/s BCCL</u>	<u>Jumping of old fire from isolation stopping</u>	_____	<p>i) Strengthening of isolation stopping required.</p> <p>ii) Regular monitoring of environment behind the sealed off area should have been done.</p>
<u>18</u>	<u>Godhur Colliery, No. 15 quarry, 7 Seam, 30-08-2008.</u>	<u>M/s BCCL</u>	<u>Fire extended inbye of the quarry. Cause of fire not ascertained.</u>	_____	<u>All surface mouth in the quarry should be sealed off to prevent the fire extending inbye of the quarry and UG galleries.</u>
<u>19</u>	<u>Ara Colliery, OB yard, 27-01-2008, 8.30 PM</u>	<u>M/s CCL</u>	<u>Dumper fire due to bursting of high pressure hose pipe carrying hydraulic oil. The oil came in contact with abnormally heated turbo charger-triggered by combustible oil and deposition of fine coal dust on the body of the dumper.</u>	_____	<p>i) Surveyed of HEMM was used.</p> <p>ii) Baffle plates to isolate the turbo charger with that of hydraulic hoses carrying high pressure hydraulic oil were not provided.</p> <p>iii) A fire tender was not available in the mine.</p> <p>iv) Periodic replacement of hydraulic hoses was not being done.</p> <p>v) Fire resistant hydraulic oil suitable for</p>

				<b>dumper should be used.</b>
<b>20</b>	<b>JK Nagar Fire project, 26-03-2008.</b>	<b>M/s ECL</b>	<b>Illegal Mining in opencast open galleries.</b>	<b>-Theft of coal. -Decoaled area should be filled up with incombustible material and OB.</b>
<b>21</b>	<b>Chitra B OCP, 23-12-2008.</b>	<b>M/s ECL</b>	<b>Side collision of two 35 Te dumpers in opencast.</b>	<b>Rash driving should be avoided.</b>
<b>22</b>	<b>Pimpalgaon Open Cast Mine, 10-01-2008.</b>	<b>M/s WCL</b>	<b>Dump Slide due to black cotton soil at the bottom and hard sand stone dumped over it.</b>	<b>Study by Scientific institution should be done.</b>
<b>23</b>	<b>Kesnau Mata Sukh Lignite mine, 23-01-2008.</b>	<b>M/s RSMM Ltd</b>	<b>Collapse of OB bench of size 300m X 240m in a mechanised mine. Mine was traversed by an aquifer.</b>	<b>Proper benching should be done as per slope design by a scientific body.</b>
<b>24</b>	<b>Sasti Opencast Mine, 20-03-2008.</b>	<b>M/s WCL</b>	<b>Breakage of Machine</b>	<b>After repair M/c is put into use ND Test should be done at regular intervals.</b>
<b>25</b>	<b>Lodna Colliery, 31-07-2008</b>	<b>M/s BCCL</b>	<b>Over winding of cage due to defective Regulator &amp; Automatic Contrivance</b>	<b>Maintaining the winder in safe working condition and recommendation for Pit Bottom Buffer.</b>
<b>26</b>	<b>Jamadoba 6 &amp; 7 pits colliery, 11</b>	<b>M/s Tata Steel</b>	<b>Burst of old delivery pipe causing</b>	<b>Periodic inspection of old pipes and its</b>

Seam.,7-7-2008

water to flow back along a dip gallery in 11seam through No.1 drift to dip side of IX seam.

timely replacement is required.

This excludes a case of Explosion occurred at Ledo colliery of M/s NECF, CIL on 4-11-2008 which involved fatalities and whose details are given below-

<u>Ledo colliery, Lachit khani section, 20 feet seam, between -7 &amp; -11 level, Deg-III, 04-11-2008, 5.30 AM</u>	<u>NEC, M/s CIL</u>	Explosion due to accumulated methane gas in depillaring panel No. E-10/20/p-1 of 20 feet seam. Seam being highly susceptible to heating incubation period-3 to 4 months only.	<u>C.P 140° C</u> <u>I.P - 165° C</u>	- i) <u>Continuous environmental monitoring for CH4 &amp; CO from goaf area should have been done.</u>  ii) <u>Overhanging in the goaf should be avoided.</u>  iii) <u>The sub panels should have been isolated effectively.</u>
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## 2.4 Technical Developments

- ❖ During the year 2008, 13.09% of the total production came from underground workings and 86.91% of the total production came from opencast mines. As far as average daily employment was concerned 50% were employed belowground, 21% were employed in opencast workings and the remaining 29% were employed for other surface operations.
- ❖ During the 2008, 1247 Excavators, 4994 dumpers capacity varying from 35T to 170T, 1018 drills of 50 mm to 250 mm, 48 draglines were used in opencast mines.

Year	TREND IN USE OF HEAVY EARTH MOVING MACHINERY IN OPENCAST COAL MINES					
	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	4,470,140

\*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	3	129	6	0	0	0
ECL	1	127	28	1	0	4
CCL	0	20	6	0	0	0
SECL	0	356	82	2	0	0
WCL	0	105	123	2	2	1
MCL	0	23	40	0	0	0
NECL	0	0	0	0	0	9
NLC	0	5	0	0	0	0
TATA	0	33	0	0	0	0
SCCL	6	95	39	2	6	0
SAIL	2	0	0	0	0	2
<b>TOTAL</b>	<b>12</b>	<b>893</b>	<b>324</b>	<b>7</b>	<b>8</b>	<b>16</b>

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

Name of co.	Bucket wheel Excavator	Dragline	Surface Miners	Others	Dumpers					Excavators				Drills		
					170 T	120 T	85 T	50 T	35 T	>20 cum	19-10 cum	9-5 cum	< 5 cum	> 250 m m	249-150 mm	< 150 m m
BCCL	0	2	0	0	0	0	64	2	522	0	8	72	80	0	89	35
ECL	0	1	0	0	5	35	23	24	149	5	11	16	25	15	31	7
CCL	0	0	6	119	0	0	128	44	447	1	14	50	56	35	69	13
SECL	0	9	6	0	0	71	32	85	181	0	18	39	26	63	72	8
WCL	0	4	0	165	0	0	0	232	370	0	0	106	37	20	87	0
NCL	0	19	0	379	16	153	386	0	0	3	68	8	20	93	36	3
MCL	0	6	23	213	0	0	33	274	14	0	3	27	23	25	45	8
NECL	0	0	0	11	0	0	0	0	0	0	0	0	19	0	0	5
GMDC	1	0	0	0	0	0	0	21	257	0	0	5	83	0	0	3
NLC	33	0	0	6	0	0	0	0	38	0	0	0	0	10	19	2
TATA	0	0	0	10	0	0	40	32	0	0	6	10	0	0	15	0
SCCL	0	2	0	0	0	0	147	0	225	0	18	2	53	15	29	0
GIPCL	0	0	0	1	0	0	3	19	105	0	0	2	31	0	0	0
JSMDC	0	0	0	0	0	0	0	0	5	0	0	0	3	0	0	2
RSMM	0	0	0	0	0	0	14	0	65	0	0	5	14	0	9	6
SAIL	0	0	0	5	0	0	0	0	37	0	0	0	12	0	1	5
<b>TOTAL</b>	<b>34</b>	<b>43</b>	<b>35</b>	<b>909</b>	<b>21</b>	<b>259</b>	<b>870</b>	<b>733</b>	<b>2415</b>	<b>9</b>	<b>146</b>	<b>342</b>	<b>482</b>	<b>276</b>	<b>502</b>	<b>97</b>

## 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 2008 IN COAL MINES				
	Name of Company	Initial Medical Examination		Periodical Medical Exam.	
		Required	Provided	Required	Provided
BCCL	-	965	14785	15663	
MCL	776	776	3731	3811	
WCL	1997	1997	18306	14652	
CCL	325	325	11938	13385	
NECL	0	0	394	416	
ECL	1089	1089	18880	14109	
SECL	1104	1104	16389	16408	
NCL	-	83	3535	2767	
SCCL	929	929	12693	12745	
TATA	20	61	1065	1072	
GIPCL	345	345	0	0	
NLC	94	94	5469	11763	
GMDC	816	744	128	124	
JSMDC	4	5	20	25	
RSMM	8	1	220	220	
SAIL	30	30	305	317	

#### (b) Cases of Notified Diseases in Coal Mines:

TABLE: 31	CASES OF NOTIFIED DISEASES IN COAL MINES DURING THE YEAR 2008	
	Mining Companies	Name of Disease
MCL	Pneumoconiosis	05
SCCL	Pneumoconiosis	01
	Carcinoma	03

## 2.6 Vocational Training

Recognizing the need for safety education to enable the mineworkers 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 2008 was reported to be as follows.

TABLE: 32		PROGRESS OF VOCATIONAL TRAINING IN COAL MINES DURING THE YEAR 2008				
Name of the Company.	No. of VT Centers	Basic Training		Refresher Training		Special Training Provided
		Required	Provided	Required	Provided	
BCCL	13	-	1170	9210	12816	1842
MCL	5	2707	2707	2600	2619	1692
WCL	12	4438	4438	8855	8962	1311
CCL	14	850	850	7181	6312	377
NECL	2	-	115	388	365	214
ECL	21	1037	1037	15308	9043	6537
SECL	26	879	879	12186	12197	7530
NCL	9	-	83	2262	2094	5012
TATA	2	309	318	1193	1201	1028
GIPCL	1	365	365	9	9	0
NLC	1	826	826	1304	1339	519
SCCL	8	6688	6688	12630	12630	3599
GMDC	2	997	997	295	291	286
JSMDC	1	4	5	18	20	1
RSMM	1	92	92	90	90	0
SAIL	3	424	424	371	372	392

## 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 2008.

Name of Company	NUMBER OF WORKMEN’S INSPECTOR IN POSITION, SAFETY COMMITTEE, WELFARE OFFICERS IN COAL MINES DURING 2007					
	Welfare Officers		Workmen Inspectors		Safety Committee	
	Required	Provided	Required	Provided	Required	Provided
BCCL	64	64	211	211	64	64
MCL	22	22	66	66	22	22
WCL	78	78	234	234	81	81
CCL	59	56	214	214	59	59
NECL	3	3	18	18	5	5
ECL	77	55	283	292	98	102
SECL	91	91	273	273	90	90
NCL	12	12	31	32	10	10
TATA	6	6	52	52	10	10
GIPCL	1	1	3	3	1	1
NLC	4	4	21	21	10	10
SCCL	50	50	150	150	50	74
GMDC	1	2	12	15	5	5
JSMD	0	0	2	2	0	0
RSMM	1	1	4	4	2	2
SAIL	3	3	9	9	22	22

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

Owner	Year	Fatal Accidents								Death Rate per 1000 persons			
		Below ground		Opencast		Above ground		Total		BG	OC	AG	Total
		Acc.	Killed	Acc.	Killed	Acc.	Killed	Acc.	Killed				
BCCL	2001	9	37	3	3	2	2	14	42	0.99	0.28	0.09	0.60
	2002	4	5	3	3	3	3	10	11	0.14	0.25	0.14	0.16
	2003	7	8	2	2	3	3	12	13	0.23	0.17	0.14	0.19
	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	0.14	0.33	0.12	0.17
	2008	8	8	2	2	1	1	11	11	0.28	0.22	0.06	0.21
CCL	2001	2	2	3	3	0	0	5	5	0.13	0.19	0.00	0.10
	2002	3	3	7	7	1	1	11	11	0.21	0.50	0.06	0.24
	2003	3	3	2	2	1	1	6	6	0.21	0.14	0.06	0.13
	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	0.41	0.20	0.21
	2008	0	0	2	2	2	2	4	4	0.00	0.16	0.13	0.10
ECL	2001	16	17	2	2	0	0	18	19	0.32	0.39	0.00	0.21
	2002	5	5	3	3	1	4	9	12	0.10	0.74	0.14	0.14
	2003	10	10	3	3	0	0	13	13	0.20	0.74	0.00	0.16
	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	0.48	0.00	0.11
	2008	5	5	2	2	4	4	11	11	0.12	0.32	0.16	0.15
MCL	2001	1	1	2	2	1	1	4	4	0.20	0.44	0.16	0.25
	2002	1	1	2	2	0	0	3	3	0.21	0.41	0.00	0.18
	2003	0	0	6	6	1	1	7	7	0.00	1.24	0.15	0.43
	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	0.18	0.25
	2008	1	1	2	2	1	1	4	4	0.24	0.32	0.18	0.25
NCL	2001	0	0	3	3	1	1	4	4	0.00	0.46	0.17	0.32
	2002	0	0	1	1	0	0	1	1	0.00	0.16	0.00	0.08
	2003	0	0	1	1	1	1	2	2	0.00	0.16	0.15	0.15
	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	0.53	0.32	0.43
	2008	0	0	6	10	0	0	6	10	0.00	1.33	0.00	0.72
NEC	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
	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	4.78	2.00	0.00	2.43

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Owner	Year	Fatal Accidents								Death Rate per 1000 persons			
		Below ground		Opencast		Above ground		Total		BG	OC	AG	Total
		Acc.	Killed	Acc.	Killed	Acc.	Killed	Acc.	Killed				
SECL	2001	6	6	4	4	4	5	14	15	0.16	0.66	0.32	0.25
	2002	8	11	2	2	3	3	13	16	0.30	0.30	0.19	0.27
	2003	7	7	0	0	4	4	11	11	0.19	0.00	0.25	0.18
	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	0.14	0.55	0.32	0.24
	2008	6	7	4	4	3	3	13	14	0.20	0.55	0.19	0.24
WCL	2001	9	14	1	1	1	1	11	16	0.53	0.14	0.06	0.32
	2002	11	11	2	2	2	2	15	15	0.45	0.28	0.12	0.32
	2003	4	4	2	2	3	6	9	12	0.16	0.28	0.37	0.25
	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	0.24	0.80	0.07	0.28
	2008	6	8	2	2	3	3	11	13	0.39	0.27	0.20	0.30
CIL	2001	43	77	18	18	9	10	70	105	0.43	0.32	0.09	0.30
	2002	32	36	20	20	10	13	62	69	0.22	0.36	0.11	0.20
	2003	31	32	16	16	13	16	60	64	0.19	0.29	0.14	0.19
	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	0.13	0.49	0.14	0.20
	2008	27	34	21	26	14	14	62	74	0.24	0.46	0.14	0.25
JSMDC	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
DVC	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
GMDC	2001	0	0	1	1	0	0	1	1	0.00	1.09	0.00	0.66
	2002	0	0	1	1	0	0	1	1	0.00	1.34	0.00	0.74
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	1.50	1.47	1.48
IISCO	2001	2	2	0	0	0	0	2	2	0.96	0.00	0.00	0.56
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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

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Owner	Year	Fatal Accidents								Death Rate per 1000 persons			
		Below ground		Opencast		Above ground		Total		BG	OC	AG	Total
		Acc.	Killed	Acc.	Killed	Acc.	Killed	Acc.	Killed				
	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
J&K	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
	NLC	2001	0	0	4	4	1	1	5	5	0.00	1.05	0.28
2002		0	0	1	1	0	0	1	1	0.00	0.26	0.00	0.14
2003		0	0	1	2	0	0	1	2	0.00	0.51	0.00	0.27
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	0.25	0.00	0.19
SCCL	2001	21	21	2	2	2	2	25	25	0.40	0.37	0.29	0.38
	2002	13	22	0	0	1	1	14	23	0.45	0.00	0.14	0.37
	2003	12	37	6	6	1	1	19	44	0.75	1.01	0.14	0.71
	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	6	6	2	2	12	12	0.09	1.00	0.27	0.21
	2008	6	6	5	6	4	4	15	16	0.14	1.00	0.54	0.28
TATA	2001	1	2	0	0	0	0	1	2	0.37	0.00	0.00	0.24
	2002	3	3	0	0	0	0	3	3	0.57	0.00	0.00	0.37
	2003	3	3	0	0	0	0	3	3	0.57	0.00	0.00	0.37
	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	0.19	0.00	0.00	0.12
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
GIPCL	2001	0	0	1	1	0	0	1	1	0.00	4.52	0.00	3.31
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	3.79	0.00	2.84
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
BLAI	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
ICML	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

Owner	Year	Fatal Accidents								Death Rate per 1000 persons			
		Below ground		Opencast		Above ground		Total		BG	OC	AG	Total
		Acc.	Killed	Acc.	Killed	Acc.	Killed	Acc.	Killed				
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
MIL	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	1.02	0.00	0.00	0.97
JNL	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	29.41	18.87
ALL INDIA	2001	67	102	26	26	12	13	105	141	0.43	0.38	0.10	0.32
	2002	48	61	22	22	11	14	81	97	0.27	0.32	0.11	0.23
	2003	46	72	23	24	14	17	83	113	0.32	0.35	0.13	0.27
	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	36	38	16	16	77	79	0.13	0.50	0.14	0.20
	2008	34	41	31	37	20	20	85	98	0.21	0.49	0.18	0.25

Note : Figures for the year 2007 & 2008 are provisional.



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

Owner	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Below ground		Opencast		Above ground		Total		BG	OC	AG	Total
		Acc.	S/Inj	Acc.	S/Inj	Acc.	S/Inj	Acc.	S/Inj.				
BCCL	2001	49	54	8	8	11	11	68	73	1.45	0.74	0.50	1.04
	2002	44	56	16	17	8	8	68	81	1.60	1.44	0.37	1.18
	2003	39	42	9	9	12	12	60	63	1.20	0.76	0.56	0.92
	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	1.31	1.55	0.55	1.12
	2008	29	29	7	7	13	13	49	49	1.02	0.77	0.80	0.91
CCL	2001	7	8	2	2	8	16	17	26	0.51	0.13	0.96	0.54
	2002	9	9	9	11	8	8	26	28	0.62	0.78	0.47	0.61
	2003	11	11	7	9	9	9	27	29	0.75	0.64	0.53	0.63
	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	0.87	0.57	0.33	0.57
	2008	8	8	5	5	5	6	18	19	0.70	0.41	0.40	0.49
ECL	2001	164	174	5	7	30	30	199	211	3.23	1.35	0.98	2.35
	2002	161	162	6	6	24	24	191	192	3.26	1.47	0.81	2.30
	2003	141	147	9	11	21	21	171	179	2.96	2.70	0.71	2.15
	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	2.51	1.29	0.69	1.79
	2008	85	86	8	8	19	19	112	113	2.02	1.29	0.77	1.54
MCL	2001	6	6	3	3	2	2	11	11	1.19	0.66	0.32	0.69
	2002	9	9	6	6	2	2	17	17	1.86	1.24	0.30	1.04
	2003	5	5	4	4	3	3	12	12	1.03	0.83	0.45	0.74
	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	0.96	0.64	0.00	0.50

Owner	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Below ground		Opencast		Above ground		Total		BG	OC	AG	Total
		Acc.	S/Inj	Acc.	S/Inj	Acc.	S/Inj	Acc.	S/Inj.				
	2008	1	1	2	2	2	2	5	5	0.24	0.32	0.35	0.31
NCL	2001	0	0	9	9	7	7	16	16	0.00	1.38	1.19	1.29
	2002	0	0	5	5	4	4	9	9	0.00	0.80	0.59	0.69
	2003	0	0	11	11	7	7	18	18	0.00	1.76	1.04	1.39
	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	1.33	0.48	0.94
	2008	0	0	7	7	1	1	8	8	0.00	0.93	0.16	0.58
NEC	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
	2008	0	14	0	0	0	0	0	14	13.3 7	0.00	0.00	4.85
SECL	2001	80	80	12	12	26	26	118	118	2.10	1.98	1.66	1.97
	2002	78	84	16	18	17	17	111	119	2.26	2.71	1.06	1.99
	2003	64	67	12	13	16	16	92	96	1.80	1.96	1.00	1.60
	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	1.42	1.50	0.96	1.31
	2008	43	43	6	7	5	5	54	55	1.25	0.96	0.32	0.96
WCL	2001	61	70	14	14	25	25	100	109	2.64	1.97	1.51	2.17
	2002	36	38	11	12	13	13	60	63	1.56	1.69	0.81	1.32
	2003	41	43	13	13	13	14	67	70	1.77	1.83	0.87	1.47
	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	1.78	1.46	0.41	1.26
	2008	17	17	8	8	4	4	29	29	0.82	1.06	0.27	0.68
CIL	<b>2001</b>	<b>367</b>	<b>392</b>	<b>53</b>	<b>55</b>	<b>109</b>	<b>117</b>	<b>529</b>	<b>564</b>	<b>2.20</b>	<b>0.98</b>	<b>1.02</b>	<b>1.61</b>

Owner	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Below ground		Opencast		Above ground		Total		BG	OC	AG	Total
		Acc.	S/Inj	Acc.	S/Inj	Acc.	S/Inj	Acc.	S/Inj.				
	2002	337	358	69	75	76	76	482	509	2.14	1.35	0.66	1.51
	2003	301	315	65	70	81	82	447	467	1.88	1.26	0.71	1.38
	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	1.71	1.14	0.55	1.22
	2008	183	198	43	44	49	50	275	292	1.39	0.77	0.50	0.98
JSMDC	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
DVC	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
GMDC	2001	0	0	4	4	2	2	6	6	0.00	4.36	3.31	3.94
	2002	0	0	1	1	1	1	2	2	0.00	1.34	1.66	1.48
	2003	0	0	3	3	0	0	3	3	0.00	4.02	0.00	2.22
	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
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
IISCO	2001	8	9	0	0	1	1	9	10	4.31	0.00	0.86	2.79
	2002	9	9	0	0	0	0	9	9	4.47	0.00	0.00	2.72
	2003	9	9	0	0	3	3	12	12	4.47	0.00	3.19	3.62
	2004	15	15	3	3	0	0	18	18	8.85	6.70	0.00	5.69

Owner	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Below ground		Opencast		Above ground		Total		BG	OC	AG	Total
		Acc.	S/Inj	Acc.	S/Inj	Acc.	S/Inj	Acc.	S/Inj.				
	2005	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	4.13	2.18	1.04	2.89
	2008	4	4	0	0	0	0	4	4	2.36	0.00	0.00	1.29
J&K	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	1	1	0	0	0	0	1	1	1.25	0.00	0.00	0.97
	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	21.9 0	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
NLC	2001	0	0	5	5	1	2	6	7	0.00	1.32	0.56	0.95
	2002	0	0	9	9	2	2	11	11	0.00	2.31	0.59	1.51
	2003	0	0	7	10	1	1	8	11	0.00	2.57	0.29	1.51
	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	0.38	0.00	0.28
SCCL	2001	83	93	8	10	14	14	105	117	1.76	1.84	2.00	1.79
	2002	85	93	12	12	20	20	117	125	1.89	2.01	2.83	2.00
	2003	68	72	7	7	13	13	88	92	1.46	1.17	1.84	1.48
	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	14.3 8	6.47	14.1 9	13.6 3
	2006	444	452	32	32	81	81	557	565	10.1 8	5.31	10.9 6	9.77
	2007	478	482	20	21	68	71	566	574	10.8 6	3.48	9.61	9.93
	2008	328	332	26	26	47	47	401	405	7.48	4.31	6.36	7.01
TISCO	2001	6	10	3	3	3	3	12	16	1.86	2.29	1.67	1.89
	2002	3	4	1	1	4	4	8	9	0.76	0.85	2.37	1.11
	2003	1	1	0	0	3	3	4	4	0.19	0.00	1.78	0.49
	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

Owner	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Below ground		Opencast		Above ground		Total		BG	OC	AG	Total
		Acc.	S/Inj	Acc.	S/Inj	Acc.	S/Inj	Acc.	S/Inj.				
	2007	2	2	0	0	1	1	3	3	0.38	0.00	0.60	0.37
	2008	2	3	2	2	0	0	4	5	0.57	1.49	0.00	0.61
GIPCL	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	3.79	0.00	2.84
BLAI	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
ICML	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
MIL	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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

Owner	Year	Serious Accidents								S/Injury Rate per 1000 persons employed			
		Below ground		Opencast		Above ground		Total		BG	OC	AG	Total
		Acc.	S/Inj	Acc.	S/Inj	Acc.	S/Inj	Acc.	S/Inj.				
JNL	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
<b>ALL</b>	<b>2001</b>	<b>464</b>	<b>504</b>	<b>73</b>	<b>77</b>	<b>130</b>	<b>139</b>	<b>667</b>	<b>720</b>	<b>2.10</b>	<b>1.12</b>	<b>1.07</b>	<b>1.64</b>
<b>INDIA</b>	<b>2002</b>	<b>434</b>	<b>464</b>	<b>92</b>	<b>98</b>	<b>103</b>	<b>103</b>	<b>629</b>	<b>665</b>	<b>2.07</b>	<b>1.43</b>	<b>0.80</b>	<b>1.57</b>
	<b>2003</b>	<b>380</b>	<b>398</b>	<b>82</b>	<b>90</b>	<b>101</b>	<b>102</b>	<b>563</b>	<b>590</b>	<b>1.77</b>	<b>1.31</b>	<b>0.79</b>	<b>1.40</b>
	<b>2004</b>	<b>757</b>	<b>778</b>	<b>82</b>	<b>87</b>	<b>123</b>	<b>126</b>	<b>962</b>	<b>991</b>	<b>3.69</b>	<b>1.24</b>	<b>1.02</b>	<b>2.45</b>
	<b>2005</b>	<b>843</b>	<b>867</b>	<b>98</b>	<b>101</b>	<b>165</b>	<b>170</b>	<b>1106</b>	<b>1138</b>	<b>4.23</b>	<b>1.45</b>	<b>1.37</b>	<b>2.85</b>
	<b>2006</b>	<b>646</b>	<b>665</b>	<b>88</b>	<b>99</b>	<b>127</b>	<b>127</b>	<b>861</b>	<b>891</b>	<b>3.40</b>	<b>1.30</b>	<b>1.11</b>	<b>2.31</b>
	<b>2007</b>	<b>717</b>	<b>735</b>	<b>83</b>	<b>88</b>	<b>123</b>	<b>128</b>	<b>923</b>	<b>951</b>	<b>3.75</b>	<b>1.16</b>	<b>1.12</b>	<b>2.47</b>
	<b>2008</b>	<b>517</b>	<b>537</b>	<b>74</b>	<b>76</b>	<b>96</b>	<b>97</b>	<b>687</b>	<b>710</b>	<b>2.74</b>	<b>1.00</b>	<b>0.85</b>	<b>1.84</b>

Note : Figures for the year 2007 & 2008 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 6000 out of which 1972 non-coal mines including 51 oil mines submitted returns at the end of the year.

Average daily employment in non-coal mines during the year 2008 was 169,230 as compared to 153,830 in 2007. Average daily employment in workings belowground, opencast and aboveground during the year 2008 was 9,436, 97,046 & 62,748 as compared to 7,690; 84,84685 & 61,455 respectively during the year 2007. The average daily employment in various minerals is depicted in the table below:

<b>TABLE: 34 Average daily employment and output in non-coal mines during 2008</b>						
<b>Mineral</b>	<b>No. of Mine Submitted return</b>	<b>Average daily employment</b>				<b>Output ('000 tonnes)</b>
		<b>U / G</b>	<b>O/C</b>	<b>Surface</b>	<b>Total</b>	
Bauxite	87	-	4712	771	5483	16485
Copper	5	1637	237	738	2612	7749
Gold	4	1456	-	1604	3060	774
Granites	195	-	6127	1952	8079	1383
Lime Stone	434	-	21470	6269	27739	268868
Iron-ore	294	-	25970	18860	44830	235763
Manganese	126	2585	7038	3845	13468	4124
Marble	16	-	1020	380	1400	1863
Stone	183	-	5000	2009	7009	31551
Galena & sphalarite	11	1100	661	1609	3370	7022
Others	566	2658	24811	12432	39901	-
Oil & Natural Gas	51	-	-	12279	12279	14703 \$ 10419 (Gas)
<b>Total Non-Coal</b>	<b>1972</b>	<b>9436</b>	<b>97046</b>	<b>62748</b>	<b>169230</b>	<b>-</b>

Note: Figures are provisional  
\$ Production of Natural Gas (Expressed in Million Cu Meter)

### 3.2 Accidents

There was one major accident in Non-coal mines during the year 2008 details of which is given below:

1. Name of mine: SMS Infrastructure Ltd. Stone  
Owner: M/S S.M.S. Infrastructure Ltd.  
Date of accident: 12/05/2008, Time: 1115 Hrs., No. of persons killed : 09 (Nine)  
Cause:  
While a person was cooking food inside a thatched shed behind camp office of a crusher, the bamboo matting of the shed caught fire and spread rapidly engulfing boxes of explosives and 25 detonators kept nearby, the detonators exploded in the intense heat and in turn initiated about 150 kgs explosives causing complete destruction of the shed and camp office and instantaneous death of 09 persons and serious bodily injuries to 20 others.

#### 3.2.1 Accident scenario

There had been rise in fatal accidents in the year 2008 wherein 64 fatal accidents involving 86 fatalities and 83 serious accidents as compared to 57 fatal accidents involving 69 fatalities and 79 serious accidents during 2007. Table: 35 & 36 given below shows trend in fatal accidents death rates, serious accident & injury rate in non-coal mines.



<b>TABLE: 35 TREND IN FATAL ACCIDENTS &amp; DEATH RATES IN NON-COAL MINES</b>							
Year	Number of accidents			Death rate per 1000 persons employed			
	Fatal	Persons killed	Persons ser. injured	Below ground	Open-cast	Above ground	Overall
1991	84	102	27	0.42	0.45	0.41	0.43
1992	68	78	24	0.52	0.39	0.20	0.33
1993	58	73	9	0.44	0.37	0.22	0.31
1994	61	86	17	1.46	0.32	0.21	0.38
1995	66	74	5	0.35	0.39	0.26	0.33
1996	72	83	14	0.42	0.54	0.23	0.40
1997	70	77	13	0.42	0.47	0.28	0.38
1998	56	65	15	0.33	0.43	0.23	0.33
1999	61	72	13	0.49	0.55	0.19	0.39
2000	51	55	2	0.49	0.37	0.19	0.30
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*	57	69	15	0.38	0.58	0.25	0.44
2008*	64	86	36	0.51	0.56	0.53	0.55

\* Provisional

Table: 36 indicate trend in serious accidents and serious injury rates in non-coal mines.

<b>TABLE:36 TREND IN SERIOUS ACCIDENTS AND SERIOUS INJURY RATES IN NON-COAL MINES</b>						
YEAR	Number of		Serious injury rate per 1000 persons employed			
	Serious accidents	Persons seriously injured	Below ground	Open cast	Above ground	Overall
1991	291	295	5.71	0.40	1.46	1.37
1992	282	285	4.98	0.49	1.40	1.29
1993	315	321	6.06	0.49	1.45	1.42
1994	246	249	5.46	0.39	1.16	1.18
1995	268	274	3.93	0.60	1.45	1.25
1996	263	269	4.78	0.59	1.48	1.35
1997	265	272	5.57	0.42	1.60	1.42
1998	254	258	5.07	0.60	1.52	1.40
1999	230	238	6.16	0.45	1.42	1.37
2000	187	192	4.65	0.46	1.14	1.08
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	3.84	0.34	0.77	0.68
2008*	83	85	2.05	0.35	1.22	0.77

\* Provisional

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 2004-2008.

TABLE:37	TREND IN FATAL ACCIDENTS DUE TO DIFFERENT CAUSES IN NON-COAL MINES				
	2004	2005	2006	2007*	2008*
Cause					
Ground movement	14 (17)	6 (7)	9 (17)	10 (21)	16 (26)
Winding in shafts	-	-	-	-	-
Transportation machinery (other than winding)	21 (22)	13 (14)	19 (20)	25 (25)	16 (16)
Machinery other than transportation machinery	5 (6)	9 (10)	5 (5)	7 (7)	5 (7)
Explosive	3 (4)	4 (5)	3 (3)	2 (2)	2 (10)
Electricity	2 (3)	-	-	-	2 (3)
Gas, Dust etc.	-	-	-	-	2 (3)
Falls other than fall of ground	10 (10)	15 (15)	22 (26)	11 (12)	12 (12)
Other causes	2 (2)	1 (1)	-	2 (2)	9 (9)
<b>TOTAL</b>	<b>57 (64)</b>	<b>48 (52)</b>	<b>58 (71)</b>	<b>57 (69)</b>	<b>64 (86)</b>

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

\* Figures are provisional

**Trend in Fatal Accidents due to different causes in Non-Coal Mines during 2008**

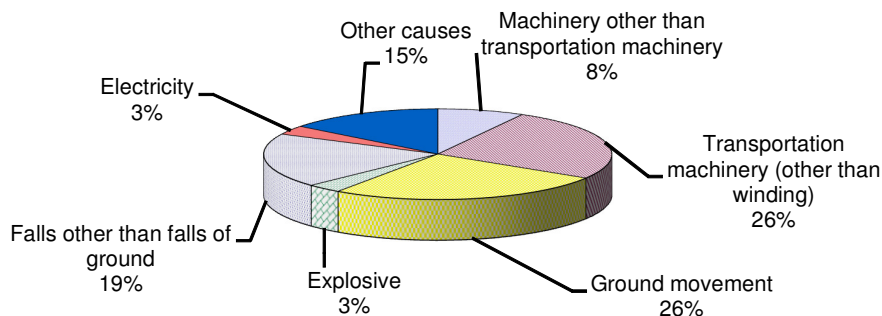


TABLE:37A	TREND IN FATAL ACCIDENTS IN DIFFERENT PLACES OF NON-COAL MINES				
	2004	2005	2006	2007*	2008*
Place					
Belowground	5 (5)	3 (3)	3 (3)	3 (3)	3 (4)
Opencast	36 (42)	34 (38)	42 (55)	39 (51)	40 (50)
Aboveground	16 (17)	11 (11)	13 (13)	15 (15)	21 (32)
<b>Total</b>	<b>57 (64)</b>	<b>48 (52)</b>	<b>58 (71)</b>	<b>57 (69)</b>	<b>64 (86)</b>

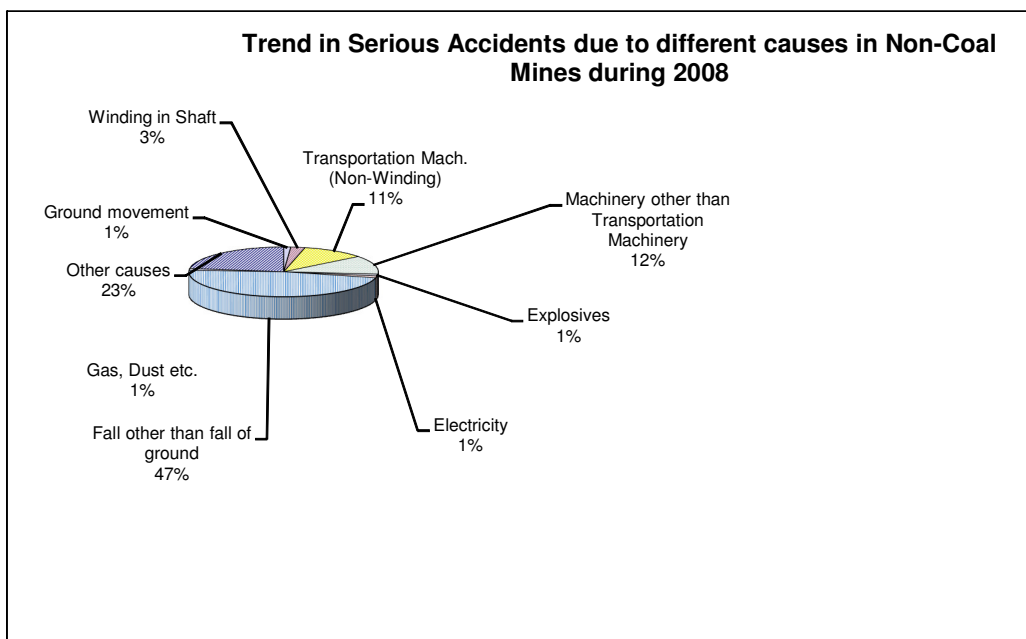
Note: Figures in parentheses denote the number of persons killed.

\* Figures are provisional

Cause	TREND IN SERIOUS ACCIDENTS DUE TO DIFFERENT CAUSES IN NON-COAL MINES				
	2004	2005	2006	2007*	2008*
Ground movement	5 (12)	2 (3)	2 (5)	4 (8)	1 (9)
Winding in shafts	-	-	1 (2)	2 (13)	2 (3)
Transportation machinery (other than winding)	13 (18)	14 (16)	12 (16)	10 (17)	9 (12)
Machinery other than transportation machinery	22 (22)	15 (15)	9 (9)	17 (21)	10 (12)
Explosive	-	1 (2)	-	1 (2)	1 (21)
Electricity	0 (1)	-	1 (1)	1 (1)	1 (3)
Gas, Dust etc.	-	3 (4)	-	1 (1)	1 (1)
Falls other than fall of ground	80 (81)	44 (44)	38 (40)	23 (24)	39 (39)
Other causes	68 (69)	29 (29)	15 (15)	20 (20)	19 (21)
<b>TOTAL</b>	<b>188 (203)</b>	<b>108 (113)</b>	<b>78 (88)</b>	<b>79 (107)</b>	<b>83 (121)</b>

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				
	2004	2005	2006	2007*	2008*
Belowground	54 (54)	27 (27)	24 (26)	19 (30)	15 (16)
Opencast	34 (46)	22 (27)	13 (21)	14 (30)	20 (31)
Aboveground	100 (103)	59 (59)	41 (41)	46 (47)	48 (74)
<b>Total</b>	<b>188 (203)</b>	<b>108 (113)</b>	<b>78 (88)</b>	<b>79 (107)</b>	<b>83 (121)</b>

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 2004-2008.

Mineral	FATAL AND SERIOUS ACCIDENTS MINERAL-WISE IN NON-COAL MINES DURING 2004-2008									
	Fatal accidents					Serious accidents				
	2004	2005	2006	2007*	2008*	2004	2005	2006	2007*	2008*
Copper	-	-	-	-	1	1	4	-	1	3
Gold	-	-	1	1	-	35	10	9	6	9
Galena & sphalerite	3	1	1	1	2	30	24	12	14	21
Manganese ore	3	-	2	1	4	9	5	7	5	2
Iron-ore	12	15	15	14	13	45	34	21	22	19
Lime stone	12	7	12	9	10	14	9	6	7	3
Granite	2	6	6	4	6	-	1	-	-	1
Marble	6	3	4	11	7	-	-	-	-	-
Stone	8	8	4	8	6	2	-	-	-	-
Oil	2	1	4	3	8	38	15	15	16	20
Others	9	7	9	5	7	14	6	8	8	5
<b>TOTAL</b>	<b>57</b>	<b>48</b>	<b>58</b>	<b>57</b>	<b>64</b>	<b>188</b>	<b>108</b>	<b>78</b>	<b>79</b>	<b>83</b>

\*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 wavy 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 16 (25% of the total) fatal accidents due to ground movement in the year 2008 as compared to 10 (18% of the total) fatal accidents due to ground movement in the year 2007.

##### 3.2.2.1A Roof fall Accidents

There was 3 (4.7% of total accident) fatal accident due to roof fall during the year 2008 in non-coal mines.

##### 3.2.2.1B Side fall Accidents

There were 13 (20% of total accident) fatal accidents due to side fall during the year 2008.

##### 3.2.2.2 Transportation machinery (Winding)

There was no accident reported due to transportation machinery (winding) during the year, 2008.

**3.2.2.3 Transportation machinery (other than winding)**

There were altogether 16 (25% of all fatal accidents) accidents involving 16 fatalities due to transportation machinery (other than winding) during the year 2008.

The cause-wise details may be seen from the following table:-

<b>TABLE-40 FATAL ACCIDENTS DUE TO TRANSPORTATION MACHINERY IN NON COAL MINES IN YEAR 2008</b>			
Sl. No.	Causes	Fatal	Persons Killed
1.	Rope Haulages	-	-
2.	Conveyors	2	2
3	Dumpers	12	12
4	Wheeled Trackless (Truck, Tanker etc.)	1	1
5.	Others	1	1
	<b>Total</b>	<b>16</b>	<b>16</b>

The analysis of causes revealed the following:

- One person killed due to entanglement with running conveyor while examine of belt, he lost balance and seriously injured.
- One person was killed in one accident while reversing the dumper.
- Two persons were killed in two different accidents due to run over by tipper while moving backward.
- Four persons killed in four different accidents due to uncontrolled rolling back of the dumper/tipper.
- One person killed due to hitting by flying stone from over loaded dumper.
- Two persons killed in two accidents due to pressed between two tippers.
- Two persons where killed while a moving dumper was uncontrolled and dashed against each others.
- Two persons killed in two different accidents while tippers lost control.
- One accident occurred due to rolling back of dumper.

**3.2.2.5 Accidents due to machinery other than transportation machinery.**

TABLE-41	<b>BREAK UP OF SERIOUS &amp; FATAL ACCIDENTS DUE TO MACHINERY OTHER THAN TRANSPORTATION MACHINERY IN NON COAL MINES DURING 2008</b>			
	FATAL		SERIOUS	
Causes	Surface	Underground	Surface	Underground
1. Drills	1	-	-	1
2. Shovels etc.	2	-	1	-
3. Crane	-	-	-	-
4. Crushing Plant	-	-	-	-
5. Other HEMM	1	-	5	-
6. Others Non-Transportation Machinery	1	-	3	-
<b>Total</b>	<b>5</b>	<b>0</b>	<b>9</b>	<b>1</b>

It is seen that most accident due to transportation machinery and other machinery were caused due to operator's negligence, indiscipline and lack of supervisions. Improved

standards of training and education of workers are necessary to control such accidents. Some cases the equipment failure was observed due to poor maintenance and called for higher standard of maintenance of machinery in the opencast sector.

Table: 42 - Detail break-up of serious accidents due to this cause during 2008.

Cause	Number of serious accidents			
	Belowground	Opencast	Aboveground	Total
Drills	1	-	-	1
Shovels, draglines, excavators etc.	-	1	-	1
Crushing & screening plants	-	-	-	-
Other HEMM	-	4	1	5
Others	-	1	2	3
<b>TOTAL</b>	<b>1</b>	<b>6</b>	<b>3</b>	<b>10</b>

#### 3.2.2.5 Explosives

There were 2 (3% of the total) fatal accidents involving 10 persons and one serious accident involving 21 persons in 2008 as compared to 2 fatal accidents and 1 serious accident in 2007.

#### 3.2.2.6 Electricity

There were 2 (3% of the total) fatal accidents involving 3 persons and one serious accident due to electricity during the year 2008.

#### 3.2.2.7 Dust, Gas & other combustible material

There were 2(3% of the total) fatal accidents involving 3 persons and one serious accident due to this cause during the year 2008.

#### 3.2.2.8 Falls other than falls of ground

There were 12 (19% of the total)) fatal accidents involving 12 persons and 39 serious accidents occurred due to this cause during the year 2008, while 11 fatal accidents and 23 serious accidents during the year 2007.

#### 3.2.2.9 Other causes

There was 9 (14% of the total) fatal accidents involving 9 persons and 19 serious accidents occurred due to miscellaneous causes during the year 2008.

### 3.3 Responsibility

The responsibilities fixed as a result of fatal accident enquiry conducted by officers of DGMS in the year 2008 is indicated in the table below:

<b>TABLE:43 RESPONSIBILITY FOR FATAL ACCIDENTS IN NON-COAL MINES DURING THE YEAR 2008</b>		
SL. NO.	Responsibility	No. of accidents
1.	Misadventure	3
2.	Management	25
3.	Management & Subordinate Supervisory Staff (SSS)	12
4.	Management, SSS & Co-Worker	-
5.	Management, SSS & Deceased	2
6.	Management & Co-worker	3
7.	Management, Co-worker & Deceased	1
8.	Management & Deceased	2
9.	Subordinate Supervisory Staff (SSS)	4
10.	SSS & Co-worker	-
11.	SSS, Co-worker & Deceased	-
12.	SSS & deceased	1
13.	Shotfirer & Co-worker	1
14.	Co-worker	6
15.	Co-worker & Deceased	-
16.	Deceased	3
17.	Others	1
	<b>TOTAL</b>	<b>64</b>

### 3.4 Dangerous Occurrence

The table indicated below gives dangerous occurrences reported during the year 2008 under various causes:

<b>TABLE:44 DANGEROUS OCCURRENCES IN NON-COAL MINES DURING 2008</b>		
Sl.No.	Cause	No. of cases
1.	Over-winding of cages etc.	-
2.	Outbreak of fire belowground	-
3.	Outbreak of fire at surface	-
4.	Premature collapse of workings or failure of pillars	-
5.	Breakage of winding rope	-
6.	Breakdown of winding engine, crank shaft, bearing etc.	1
7.	Ignition or occurrence of inflammable gas	-
8.	Breakage, fracture etc of essential parts of machinery or apparatus whereby safety of persons was endangered	1
9.	Irruption of water	-
10.	Rock burst	-
11.	Bursting of equipment under high pressure	-
12.	Oil well blowout without fire	1
13.	Fire in pipeline/well heads	1
14.	Others	-
	<b>TOTAL</b>	<b>4</b>

### 3.5 Technical Developments

Total numbers of mines working by deploying HEMM is 703. 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 1990.

Year	No. of mines	TREND IN USE OF HEMM IN NON-COAL OPENCAST MINES						
		Shovels			Dumper	Others	Machinery	
		Elec.	Diesel	Total			Total No.	Total HP
1990	300	80	474	554	2263	1253	4070	833780
1991	368	92	553	645	2744	1357	4746	979076
1992	397	99	566	665	3067	1457	5189	1060897
1993	438	92	697	789	3221	1505	5515	1111029
1994	479	103	720	823	3416	1597	5836	1185407
1995	448	97	753	850	2814	1354	5018	1034650
1996	457	68	841	909	3409	1261	5579	1197829
1997	470	60	851	911	3704	1442	6057	1142679
1998	534	44	939	983	4286	1433	6702	1215549
1999	539	63	965	1028	3662	1513	6203	1232870
2000	589	76	1055	1131	4038	1585	6754	1413520
2001	542	86	1026	1112	3696	1763	6571	1337737
2002	577	95	1107	1202	3928	1741	6871	1351329
2003	589	76	1246	1322	4364	1692	7439	1471559
2004	613	68	1313	1381	5174	1868	8502	1644411
2005	653	52	1452	1504	5509	1745	8832	1784635
2006	591	58	1577	1635	5543	2324	9426	1789531
2007	614	92	1626	1718	4926	2057	8701	1834838
2008*	703	61	1871	1932	6467	2463	10862	2087715

\*Provisional

Following table shows the various types and quality of explosives used in non-coal and quality in mines since 1990.

YEAR	TREND IN USE OF EXPLOSIVES IN NON-COAL MINES							
	Consumption of explosives in tonnes							
	NG Based	ANFO	LOX	Slurry large dia	Slurry small dia	Booster	Gun powder	Total
1990	4650	7912	1786	15703	1554	44	71	31720
1991	5793	10272	1148	20690	2262	44	63	40272
1992	4293	11868	648	23831	3309	51	59	44059
1993	3765	14087	244	22264	3601	37	60	44058
1994	3065	13448	260	22400	4015	29	68	43285
1995	3766	13767	171	23781	4546	42	105	46178
1996	3429	14520	124	23993	5053	30	93	47243
1997	1020	17964	39	15182	7256	42	113	43356
1998	1713	18719	154	17199	9126	52	111	47074
1999	1826	22151	153	18353	7159	30	86	49760
2000	1227	21071	148	24611	9632	94	116	56899
2001	1021	21476	140	24303	7879	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	662	116	95146
2007	566	31179	457	57122	7940	437	73	97769
2008*	637	40011	1089	44843	10061	1164	111	97916

\*Provisional



### 3.6 Occupational Health & Environments

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

TABLE: 47	PROGRESS OF INITIAL & PERIODICAL MEDICAL EXAMINATION DURING 2008 IN NON-COAL MINES				
	Name of Company	Initial Medical Examination		Periodical Medical Exam.	
		Required	Provided	Required	Provided
OIL	-	272	1016	925	
MOIL	657	1006	1172	1018	
TATA	285	285	224	223	
SAIL	25	25	819	640	
IREL	5	5	546	782	
UCIL	397	397	812	806	
HGMCL	1	51	853	857	
NMDC	414	414	851	814	
NALCO	36	36	188	188	
BALCO	4	4	200	243	
HCL	1325	1234	558	426	
HZL	2130	2130	972	1068	
ACC	911	911	243	271	
MML	532	375	1052	892	
GMDC	780	780	60	51	
OMC	3114	3270	3365	3633	
APMDC	-	-	-	-	

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

TABLE: 48	NUMBER OF NOTIFIED DISEASES DURING 2008 IN NON-COAL MINES		
	Mining Companies	Name of disease	Number of cases
	HZL	Silicosis	1

### 3.7 Vocational Training

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

<b>TABLE: 49</b>						
<b>PROGRESS OF VOCATIONAL TRAINING IN NON-COAL MINES DURING THE YEAR 2008</b>						
Cos.	No. of VT Centers	Basic Training		Refresher Training		Special Training Provided
		Required	Provided	Required	Provided	
OIL	4	580	593	440	457	686
MOIL	1	508	757	1139	1124	1069
TATA	1	648	648	127	127	438
SAIL	10	94	94	657	528	513
IREL	1	4	4	272	314	498
UCIL	6	552	527	392	422	533
HGMCL	3	-	97	513	493	30
NMDC	4	544	544	676	600	1237
NALCO	1	47	47	55	51	-
BALCO	1	-	-	200	150	-
HCL	4	1467	1487	432	599	221
HZL	3	2063	2063	768	824	484
ACC	9	895	897	207	218	163
MML	3	494	272	1046	516	144
GMDC	2	784	26	87	33	26
OMC	8	550	186	715	692	55
APMDC	-	-	-	-	-	-

### 3.8 Workmen's Inspector, Welfare Officer & Safety Committee

<b>TABLE: 50</b>						
<b>NUMBER OF WORKMEN'S INSPECTOR IN POSITION, SAFETY COMMITTEE, WELFARE OFFICERS IN NON-COAL MINES DURING 2008</b>						
Name of Company	Welfare Officers		Workmen Inspectors		Safety Committee	
	Required	Provided	Required	Provided	Required	Provided
OIL	6	6	18	18	6	17
MOIL	8	9	27	27	9	9
TATA	1	1	3	3	1	1
SAIL	10	10	35	36	10	10
IREL	3	3	9	11	3	3
UCIL	3	4	11	14	19	49
HGMCL	4	4	4	5	3	3
NMDC	4	4	16	15	4	4
NALCO	1	1	3	6	1	1
BALCO	2	2	2	2	1	1
HCL	4	4	12	15	7	7
HZL	3	3	11	11	11	11
ACC	2	2	10	13	11	13
MML	2	2	1	1	8	8
GMDC	1	1	1	1	1	1
OMC	6	8	17	17	17	49
APMDC	-	-	-	-	-	-

**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
		Acc	Killed	Acc	Killed	Acc	Killed	Acc	Killed				
Oil	2001	0	0	0	0	9	9	9	9	0.00	0.00	0.37	0.37
	2002	0	0	0	0	2	2	2	2	0.00	0.00	0.09	0.09
	2003	0	0	0	0	1	1	1	1	0.00	0.00	0.05	0.05
	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	0.22	0.22
	2008	0	0	0	0	8	9	8	9	0.00	0.00	0.65	0.65
Apatite & Rock Phosphate	2001	0	0	1	1	0	0	1	1	0.00	1.37	0.00	0.51
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	1	1	1	1	0.00	0.00	1.09	0.49
	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
Asbestos	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	2	2	0	0	2	2	0.00	46.51	0.00	7.94
	2003	0	0	0	0	1	1	1	1	0.00	0.00	27.78	4.24
	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	N.A.	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
Barytes	2001	1	1	0	0	0	0	1	1	41.67	0.00	0.00	2.20
	2002	0	0	0	0	1	1	1	1	0.00	0.00	3.79	2.24
	2003	0	0	1	2	0	0	1	2	0.00	12.66	0.00	5.21
	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
Bauxite	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	2	2	0	0	2	2	0.00	0.53	0.00	0.44
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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

Mineral	Year	Fatal Accidents								Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Acc	Killed	Acc	Killed	Acc	Killed	Acc	Killed				
China Clay,Clay,White-clay	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	1	2	0	0	1	2	0.00	0.96	0.00	0.57
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	0.56	0.00	0.31
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Chromite	2001	0	0	1	1	1	1	2	2	0.00	0.25	0.49	0.31
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	1.50	0.61	0.33	0.57
	2008	0	0	1	1	0	0	1	1	0.00	0.31	0.00	0.14
Copper	2001	1	1	0	0	0	0	1	1	0.38	0.00	0.00	0.25
	2002	1	1	0	0	0	0	1	1	0.46	0.00	0.00	0.30
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	1.57	0.51
Dolomite	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	1	1	1	1	0.00	0.00	1.43	0.41
	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
Felspar	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
Galena & Sphalarite	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	1	1	0	0	0	0	1	1	0.50	0.00	0.00	0.22

Mineral	Year	Fatal Accidents								Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Acc	Killed	Acc	Killed	Acc	Killed	Acc	Killed				
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	0.85	0.00	0.00	0.31
	2008	1	1	0	0	1	3	2	4	0.85	0.00	1.71	1.22
Gold	2001	1	1	0	0	0	0	1	1	0.54	0.00	0.00	0.28
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	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	0.63	0.00	0.00	0.32
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Granite	2001	0	0	7	7	2	2	9	9	0.00	1.70	1.05	1.50
	2002	0	0	2	2	1	1	3	3	0.00	0.44	0.69	0.50
	2003	1	1	4	5	2	2	7	8	0.00	1.03	1.46	1.29
	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	0.73	0.00	0.54
	2008	0	0	6	8	0	0	6	8	0.00	1.46	0.00	1.08
Graphite	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
Gypsum	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
Iron	2001	0	0	7	7	4	5	11	12	0.00	0.38	0.36	0.37
	2002	0	0	5	5	5	5	10	10	0.00	0.24	0.38	0.30
	2003	0	0	5	5	8	9	13	14	0.00	0.25	0.57	0.39
	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

Mineral	Year	Fatal Accidents								Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Acc	Killed	Acc	Killed	Acc	Killed	Acc	Killed				
	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	0.30	0.39	0.34
	2008	0	0	7	7	6	6	13	13	0.00	0.30	0.34	0.31
Limestone	2001	0	0	8	8	3	3	11	11	0.00	0.44	0.50	0.45
	2002	0	0	8	11	2	2	10	13	0.00	0.58	0.32	0.52
	2003	0	0	6	8	0	0	6	8	0.00	0.43	0.00	0.33
	2004	0	0	11	12	1	1	12	13	0.00	0.63	0.34	0.57
	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	0.55	0.35	0.51
	2008	0	0	8	8	2	2	10	10	0.00	0.40	0.35	0.39
Magnesite	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Manganese	2001	1	1	0	0	0	0	1	1	0.40	0.00	0.00	0.07
	2002	1	1	1	1	2	2	4	4	0.39	0.13	0.54	0.29
	2003	1	1	0	0	0	0	1	1	0.41	0.00	0.00	0.08
	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	0.27	0.08
	2008	1	2	2	2	1	1	4	5	0.78	0.29	0.27	0.38
Marble	2001	0	0	7	11	0	0	7	11	0.00	9.07	0.00	6.54
	2002	0	0	2	3	0	0	2	3	0.00	2.58	0.00	1.95
	2003	1	2	5	5	0	0	6	7	0.00	4.46	0.00	4.64
	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	8.84	0.00	7.03
	2008	0	0	7	10	0	0	7	10	0.00	6.32	0.00	5.02
Mica	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	1	1	0	0	0	0	1	1	2.31	0.00	0.00	1.60
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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

Mineral	Year	Fatal Accidents								Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Acc	Killed	Acc	Killed	Acc	Killed	Acc	Killed				
Quartz	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	1	1	1	1	0.00	0.00	17.86	1.29
	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
Sandstone	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	3.24	0.00	2.88
Silica	2001	0	0	0	0	1	1	1	1	0.00	0.00	1.68	0.39
	2002	0	0	2	2	0	0	2	2	0.00	0.93	0.00	0.71
	2003	0	0	1	1	1	1	2	2	0.00	0.47	1.46	0.71
	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
Sillimanite	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	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	0.56	0.35
Slate	2001	0	0	1	1	0	0	1	1	0.00	4.42	0.00	3.77
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
Steatite	2001	1	1	3	5	0	0	4	6	3.27	1.50	0.00	1.39
	2002	0	0	2	2	0	0	2	2	0.00	0.62	0.00	0.48
	2003	0	0	3	3	2	3	5	6	0.00	0.99	4.46	1.54

Mineral	Year	Fatal Accidents								Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Acc	Killed	Acc	Killed	Acc	Killed	Acc	Killed				
	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	4.37	1.23	0.00	1.21
Stone	2001	0	0	9	9	1	4	10	13	0.00	2.14	1.93	2.07
	2002	0	0	6	13	1	1	7	14	0.00	2.70	0.34	1.79
	2003	0	0	6	9	0	0	6	9	0.00	1.82	0.00	1.13
	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	7	12	1	1	8	13	0.00	2.59	0.52	1.99
	2008	0	0	5	9	1	9	6	18	0.00	1.94	4.72	2.75
Atomic Mineral	2001	0	0	1	1	0	0	1	1	N.A.	N.A.	N.A.	N.A.
	2002	1	1	0	0	0	0	1	1	N.A.	N.A.	N.A.	N.A.
	2003	0	0	0	0	0	0	0	0	N.A.	N.A.	N.A.	N.A.
	2004	0	0	0	0	0	0	0	0	N.A.	N.A.	N.A.	N.A.
	2005	3	3	0	0	0	0	3	3	N.A.	N.A.	N.A.	N.A.
	2006	0	0	0	0	0	0	0	0	N.A.	N.A.	N.A.	N.A.
	2007	0	0	0	0	0	0	0	0	N.A.	N.A.	N.A.	N.A.
	2008	0	0	0	0	0	0	0	0	N.A.	N.A.	N.A.	N.A.
All India	2001	5	5	45	51	21	25	71	81	0.52	0.72	0.38	0.55
	2002	5	5	33	45	14	14	52	64	0.49	0.54	0.21	0.40
	2003	3	4	31	38	18	20	52	62	0.39	0.46	0.31	0.40
	2004	5	5	36	42	16	17	57	64	0.62	0.48	0.27	0.41
	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	39	51	15	15	57	69	0.38	0.58	0.25	0.44
	2008	3	4	40	50	21	32	64	86	0.51	0.56	0.53	0.55

Note : Figures for the year 2007 & 2008 are provisional.  
N.A. = Employment Figures not Available.



**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			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
Oil	2001	0	0	0	0	21	22	21	22	0.00	0.00	0.90	0.90
	2002	0	0	0	0	31	31	31	31	0.00	0.00	1.39	1.39
	2003	0	0	0	0	21	22	21	22	0.00	0.00	1.13	1.13
	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	1.15	1.15
	2008	0	0	0	0	20	22	20	22	0.00	0.00	1.58	1.58
Apatite & Rock Phosphate	2001	0	0	0	0	1	1	1	1	0.00	0.00	1.06	0.51
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	2.24	0.00	1.09
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Asbestos	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
Barytes	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	1	1	1	1	0.00	0.00	3.79	2.24
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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

Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons			
		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	0	0	0	0	0	0.00	0.00	0.00	0.00
Bauxite	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	2	2	2	2	0.00	0.00	2.80	0.41
	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	0.20
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
China Clay, Clay, White-clay	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	1	0	0	0	1	0.00	0.48	0.00	0.28
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	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
Chromite	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	1	1	1	1	0.00	0.00	0.41	0.14
	2003	0	0	1	1	0	0	1	1	0.00	0.28	0.00	0.15
	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	0.61	0.33	0.43
	2008	0	0	0	1	0	0	0	1	0.00	0.31	0.00	0.14
Copper	2001	1	3	2	2	5	5	8	10	1.15	7.63	4.45	2.50
	2002	2	2	2	3	1	1	5	6	0.92	11.90	1.09	1.79
	2003	0	0	2	2	2	2	4	4	0.00	8.40	1.77	1.58
	2004	0	0	0	0	1	1	1	1	0.00	0.00	1.50	0.49

Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
	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	0.96	0.00	0.00	0.51
	2008	1	1	1	1	1	3	3	5	0.96	3.64	4.70	2.56
Diamond	2001	0	0	0	0	4	4	4	4	0.00	0.00	19.1 4	15.63
	2002	0	0	2	2	0	0	2	2	0.00	40.0 0	0.00	9.71
	2003	0	0	0	0	1	1	1	1	0.00	0.00	5.65	4.41
	2004	0	0	1	1	0	0	1	1	0.00	20.0 0	0.00	4.76
	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
Dolomite	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	1	1	1	1	0.00	0.00	1.35	0.45
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	1.37	0.39
	2008	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Felspar	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
Fluorite	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	1	1	0	0	1	1	0.00	7.69	0.00	6.71
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00

Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
	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
Galena & Sphalarite	2001	26	26	1	1	17	17	44	44	11.5 5	3.24	6.41	8.44
	2002	9	9	2	2	12	12	23	23	4.46	7.07	5.46	5.12
	2003	11	11	1	1	10	10	22	22	8.16	1.66	6.34	6.24
	2004	21	21	2	2	7	7	30	30	18.8 5	3.26	3.42	7.94
	2005	14	14	0	0	10	10	24	24	13.4 6	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	5.92	0.00	4.00	4.27
	2008	8	9	5	5	8	9	21	23	7.61	14.6 2	5.14	7.02
Garnet	2001	0	0	0	0	1	1	1	1	0.00	0.00	2.04	0.39
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
Gold	2001	25	25	0	0	7	7	32	32	13.5 7	0.00	4.16	8.84
	2002	27	27	0	0	13	13	40	40	15.6 3	0.00	8.52	11.97
	2003	34	34	0	0	11	11	45	45	26.6 7	0.00	7.79	16.38
	2004	22	22	0	0	13	13	35	35	16.7 3	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	4.39	0.00	1.30	3.19
	2007	4	15	0	0	2	2	6	17	9.42	0.00	1.30	5.42
	2008	5	5	1	1	3	3	9	9	3.14	0.00	1.94	2.87
Granite	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	1	1	1	1	0.00	0.00	0.69	0.17

Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
	2003	0	0	0	1	0	1	0	2	0.00	0.21	0.73	0.32
	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	0.18	0.00	0.13
	2008	0	0	1	5	0	0	1	5	0.00	0.91	0.00	0.67
Graphite	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
Gypsum	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
Iron	2001	0	0	27	28	27	27	54	55	0.00	1.51	1.95	1.70
	2002	0	0	24	24	36	36	60	60	0.00	1.17	2.73	1.78
	2003	0	0	14	17	23	25	37	42	0.00	0.84	1.59	1.17
	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	0.55	0.73	0.65
	2008	0	0	9	10	10	11	19	21	0.00	0.42	0.62	0.51
Limestone	2001	0	0	6	6	8	8	14	14	0.00	0.33	1.34	0.58

Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
	2002	0	0	4	4	4	4	8	8	0.00	0.21	0.64	0.32
	2003	0	0	5	5	8	8	13	13	0.00	0.27	1.38	0.54
	2004	0	0	6	7	8	8	14	15	0.00	0.37	1.55	0.65
	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	0.25	0.70	0.35
	2008	0	0	2	3	1	1	3	4	0.00	0.15	0.18	0.16
Magnesite	2001	0	0	1	1	0	0	1	1	0.00	0.40	0.00	0.35
	2002	0	0	2	2	2	2	4	4	0.00	1.04	5.97	1.78
	2003	0	0	1	1	0	0	1	1	0.00	0.59	0.00	0.47
	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
Manganese	2001	2	2	0	0	4	4	6	6	0.80	0.00	1.00	0.44
	2002	5	5	2	2	7	7	14	14	1.96	0.27	1.88	1.02
	2003	4	4	1	1	6	6	11	11	1.63	0.14	1.75	0.83
	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	1.57	0.00	0.27	0.38
	2008	0	0	0	0	2	2	2	2	0.00	0.00	0.53	0.15
Marble	2001	0	0	0	1	0	0	0	1	0.00	0.82	0.00	0.59
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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	2.53	0.00	2.01
	2008	0	0	0	1	0	0	0	1	0.00	0.63	0.00	0.50

Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
Mica	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
Quartz	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
Sandstone	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
Silica	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	2	0	2	0	4	0.00	0.94	2.92	1.42
	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

Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
	2008	0	0	0	0	1	1	1	1	0.00	0.00	1.27	0.35
Sillimanite	2001	0	0	0	0	2	2	2	2	0.00	0.00	1.46	1.21
	2002	0	0	0	0	1	1	1	1	0.00	0.00	0.79	0.65
	2003	0	0	0	0	1	1	1	1	0.00	0.00	0.54	0.29
	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	1.13	0.70
	2008	0	0	1	1	1	1	2	2	0.00	0.93	0.56	0.70
Slate	2001	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
Steatite	2001	0	0	0	2	0	0	0	2	0.00	0.60	0.00	0.46
	2002	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	2003	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00
	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
	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	0.92	0.00	0.73
Stone	2001	0	0	0	2	0	0	0	2	0.00	0.48	0.00	0.32
	2002	0	0	1	3	0	0	1	3	0.00	0.62	0.00	0.38
	2003	0	0	0	5	0	0	0	5	0.00	1.01	0.00	0.63
	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



Mineral	Year	Serious Accidents								S/Injury Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOTAL
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
	2007	0	0	0	3	0	0	0	3	0.00	0.65	0.00	0.46
	2008	0	0	0	0	0	20	0	20	0.00	0.00	10.48	3.05
Atomic Mineral	2001	5	5	0	0	6	6	11	11	N.A.	N.A.	N.A.	N.A.
	2002	9	9	0	0	2	2	11	11	N.A.	N.A.	N.A.	N.A.
	2003	8	8	0	0	1	1	9	9	N.A.	N.A.	N.A.	N.A.
	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.
	All India	2001	59	61	37	43	103	104	199	208	6.28	0.61	1.57
2002		52	52	40	44	113	113	205	209	5.06	0.53	1.72	1.31
2003		57	57	25	36	86	92	168	185	7.36	0.43	1.43	1.18
2004		54	54	34	46	100	103	188	203	6.70	0.52	1.59	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	3.20	0.25	0.67	0.56
2007		19	30	14	30	46	47	79	107	3.84	0.34	0.77	0.68
2008		15	16	20	31	48	74	83	121	2.05	0.35	1.22	0.77

N.A. = Employment Figures not Available.

Note : i) Figures for the year 2007 & 2008 are provisional.

ii) 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 2008.

<b>Equipment, appliances, materials and machinery approved during the year 2008</b>		
Sl. No.	Equipment/appliances/materials/ machinery	No. of approvals granted/renewed/ extended during the year
1.	Methanometer	00
2.	Helmet	10
3.	Cap Lamp	06
4.	Footwear	17
5.	Gas Detector/Monitor	12
6.	Cap Lamp Bulb	00
7.	Fire-resistant brattice cloth	04
8.	Ventilation ducting	03
9.	Personal dust sampler	00
10.	Co detector tubes/aspirator	01
11.	Environmental monitoring system	01
12.	Safety goggles	03
13.	Ear plug	02
14.	Visibility harness	02
15.	Accreditation of Test House	00
16.	Dust Respirator (Mask)	05
17.	Full Body Harness/Safety Belt	03
18.	Flame Safety Lamp	00
19.	Noise Dosi Meter	01
20.	Chemical Dust Suppression	05
21.	Self-rescuers	04
22.	Breathing apparatus	02
23.	Resuscitator/Reviving Apparatus	02
24.	Hydraulic props	01
25.	Powered support & its components	03
26.	STDA Legs	00
27.	Explosives	22
28.	Exploders	03
29.	Detonators	14
30.	Flame proof equipment - motor, switches, circuit breakers etc	98
31.	Intrinsically safe apparatus	01
32.	Equipment for use in hazardous area	100
33.	Cables	24
34.	Cage suspension gears	35
35.	Fire resistant conveyor belting	06
36.	Automatic contrivance	06
37.	Man riding system	09
38.	Fire resistant hydraulic fluid	07
39.	High pressure hose	05
40.	Chair lift system	12
41.	Tail rope attachment	04
42.	Pit Bottom Buffer	01
	<b>TOTAL</b>	<b>434</b>

## 5.0 Coal & Metalliferous Mining Examinations during 2008

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

M.M. Sharma	Director General of Mines Safety
Ashok Kumar Singh	Chairman & Managing Director, M/s. Central Mine Planning & Design Institute Ltd.
Mukti Pada Dixit	Chairman & Managing Director, M/s. S.E.C.L.
Dr. Ashish Bhattacharjee	Prof. & Head of Department, Department of Mining Engineering, IIT, Kharagpur
Shree Ramji Upadhyay	Chairman & Managing Director M/s. Mahanadi Coalfields Ltd.
J.V. Duttatreylu	Director (Operations), M/s. Singareni Collieries, Co. Ltd.

### (ii) (a) Board of Mining Examinations under the MMR, 1961 (Upto 11.08.2008)

M.M. Sharma	Director General of Mines Safety
Dr. S.B. Srivastava	Prof. & HOD, Indian School of Mining University
B. Ramesh Kumar	Chairman & Managing Director (Rtd.), M/s. National Mineral Development Corporation
Ramendra Gupta	Chairman & Managing Director, M/s. UCIL
P M. Reddy	Chairman & Managing Director (Retd.), M/s. MOIL
V.K. Mitra	Vice President (Mines), M/s. J.K. Laxmi Cement Ltd.

### (b) Board of Mining Examinations under the MMR, 1961 (After 11.08.2008)

M.M. Sharma	Director General of Mines Safety
Dr. Upendra Kumar	Head & Deptt. Of Mining Engineering, Indian School of Mines University, Dhanbad
Shri V.K. Agrawal	Sr. Vice President, Indian Metals & Ferro Alloys , IMFA Building, Jaipur Road
Dr. B.K. Shrivastava	Prof. & Coordinator, Centre of Advanced Studies, Deptt. of Mining Engg., Banaras Hindu University, Varanasi.
Shri D. Acharya	Director (Tech), M/s. UCIL, P.O. Narwapahar, Singhbhum
Shri Akhilesh Joshi	Chief Operation Officer, M/s. HZL, Udaipur

### Examiners for Certificates of Competency

#### Coal Mining Examinations

- (a) Following were the Examiners for Manager's Certificates of Competency Examinations held in 2008.

Subject	First Class manager's Certificate	Second Class Manager's Certificate
Mine Management, Legislation & General Safety	S. Puri	Rahul Guha
Winning & Working	R. Sinha	Ch. Diwakar
Mine Ventilation	B.K. Saxena	J.S. Prasad
Mining Machinery	N. Das	Om Prakash
Mine Surveying	S.P. Chand	M. Shishu Kr. Reddy

- (b) Following were the Examiners for Surveyor's Certificate of Competency Examinations held in 2008.

Surveying Paper-I	B.P. Ahuja
Surveying Paper-II	R.S. Mantri

**Metal Mining Examinations**

- (a) Following were the Examiners for Manager's Certificates of Competency Examinations held in 2008.

Subject	Ist Class manager's Certificate (Un-Restricted)	IInd Class Manager's Certificate (Un-Restricted)
Mine Management, Legislation & General Safety	S. Puri	R.B. Chakraborty
Winning & Working	V.K. Agrawal	R.R. Kumar
Mine Ventilation, Explosion, Fires & Inundation	D. Acharya	A.K. Sen
Mining Machinery	Akhilesh Joshi	P.K. Gautam
Mine Surveying	Kabir Ghosh	S.C. Bhowmik

Subject	Ist Class manager's Certificate (Restricted)	IInd Class Manager's Certificate (Restricted)
Mine Management, Legislation & General Safety	Rahul Guha	D. Sengupta
Winning & Working	L.S. Rathore	V.S. Mathur
Mining Machinery	K.Y.P. Kulkarni	Y.S. Reddy
Mine Surveying	B.S. Mohan	A.C. Basak

- (b) Following were the Examiners for Surveyor's Certificate of Competency Examinations held in 2008

Surveyor's Certificate Restricted to Opencast Mines	A.K. Bhowmik
Surveyor's Certificate (Un-restricted) Part – I	A.K. Meghraj
Part – II	A.K. Lal

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 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 years 2004, 2005 & 2006 were given away on 6<sup>th</sup> May, 2008 at New Delhi by the Hon'ble 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 2<sup>nd</sup> in July, 1966, the 3<sup>rd</sup> in 1973, the 4<sup>th</sup> in 1978, the 5<sup>th</sup> in 1980, the 6<sup>th</sup> in 1986, the 7<sup>th</sup> in 1988, the 8<sup>th</sup> in 1993, the 9<sup>th</sup> in 2000 and the 10<sup>th</sup> Conference was held on 26<sup>th</sup> & 27<sup>th</sup> November, 2007 in 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 11<sup>th</sup> 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, 2006 and compilation of Annual Report for the year 2007.
- Publication of Standard Note on DGMS as on 1.1.2008
- 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), 2007
  - Statistics of Mines in India, Vol.II(Non-Coal), 2007
  - Monthly Review of Accidents and
  - Report on Monthly Inspection Analysis
- National Safety Awards (Mines) for the contestant years 2004, 2005 and 2006 were given away.

**(1) 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 519 coal mines and 10 lignite mines of the country during the periods 2004-2008 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				
	2004	2005	2006	2007	2008
ECL	11	9	8	6	7
BCCL	10	8	6	8	7
SECL	10	8	6	8	5
MCL	4	3	1	1	2
WCL	9	9	8	7	7
CCL	6	7	4	6	2
NCL	2	1	1	1	1
NECL	1	0	0	1	1
SCCL	9	10	5	6	4
TISCO	2	2	1	1	2
IISCO	0	0	1	1	1
<b>Total</b>	<b>64</b>	<b>57</b>	<b>41</b>	<b>46</b>	<b>39</b>
<b>LIGNITE</b>	<b>3</b>	<b>-</b>	<b>1</b>	<b>3</b>	<b>3</b>



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.

**(2) Development of Software:**

In pursuance of the above objectives Indian Mines Safety Information System (IMSIS) was developed under a joint project of the Ministry of Labour & Employment and US Department of Labour. It has been made operational in the Central Zone, Eastern Zone, South Eastern Zone, Western Zone and Southern Zone.

The overall objective of the project is to standardize the inspection forms and assessment parameters relating to coal mine safety and create a knowledgebase of all the information collected during such inspections for enlarging the scope of regulatory compliance monitoring and enabling detailed analysis of the data. It is specifically aimed at improving the quality and efficiency of statutory safety inspections carried out by DGMS officials to save the lives of miners and prevent the loss of property particularly coal reserves.

IMSIS Application Software currently provides for:

- Standardized inspection forms and regulatory compliance assessment parameters in accordance with all the concerned Acts, Rules and Circulars and include the contextual reference to the relevant regulations inside the forms alongside the concerned assessment field.
- A single integrated database of all the data collected by DGMS officials during different types of inspections as well as the detailed inspection notes and supporting documents submitted by them in their reports with unique identification of each and every data/record for easy storage, quick retrieval and automated analysis.
- Automated generation of inspection reports from the data collected and entered into the database.
- Automated generation of violation reports from out of the data collected and entered into the database.
- Automated tracking of violations and the actions taken against these from out of the data collected and entered into the database.

**(3) Wireless connectivity (WIFY) system has been installed in Headquarters.**

(4) Total stations, scanning and plotting devices with allied software were procured in the recent past. A digital storage device for storage of digitized Abandoned Mine Plan (AMP) was also procured. Work on use of above equipment has been started and like to pick up speed as the experience is gained. In the year 2008, 200 AMP were digitized. Total station was used to carry out survey work in 7 mines.

**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.

During the year 2008, the following activities were undertaken by S&T wing:-

Activity	Achievement
<b>(A) Augmentation of S&amp;T Capabilities:</b>	
1. Mine Environment surveys	29
2. Occupational Health Review, Survey & Medical exam	08
3. Ground Control.	08
4. Mine Mechanization	Nil
5. Additional job: Gas analysis	04
6. Additional job: FRHF	34
<b>(B) Development of Mines Rescue Services:</b>	
1. Testing of self rescuers	08
2. Testing of Self-contained Self Rescuer	Nil
3. Rescue competition	04
4. Field Visits	Nil
5. Organization of conference on Rescue/Recovery Experience	Nil
6. Monitoring of First Aid Competition	03
7. Creation of Rescue Databases on Rescue facilities	Nil
8. Creation of Rescue Databases on actual Rescue/Recoveries	Nil
9. Issue of technical circulars	Nil
<b>(C) Human Resource Development</b>	
1. Conduct of training programs:-	
(a) DGMS Officers	--
(b) Key personnel from mining industry	51
(c) Workmen's Inspectors	06

**(2) SSEX Component of the Scheme**

1.	Procurement of computers & peripherals	Continued
2.	Procurement of Office equipment	Continued
3.	Furnishing of offices	Continued
4.	Establishing exam section at Nagpur	Continued
5.	System Study	Under study
6.	System review	Under review
7.	Application software development	In progress
8.	Testing and implementation of software	In progress
9.	Training	In progress
10.	Design & development of the web content of the examination-specific web pages	In progress
11.	Design & development of online application form.	In progress
12.	Development of other internet- enabled services with enterprise-wide WAN connectivity.	In progress

**(3) PIF Component:**

1.	Modular furnishing of conference hall at Sitarampur	Under progress
2.	Providing and fixing of 100 KVA DG set at Sitarampur	Under progress
3.	Const. of boundary wall around the DGMS plot at Bilaspur	Under progress
4.	Providing and construction of pavement in front of office and main gate Bellary	Under progress
5.	Providing, placing and fixing of PVC tank with separate water pipe line for drinking water and utility at DGMS colony at Ajmer	Completed
6.	Renovation of toilets in office bldg of DGMS at Ajmer	Completed
8.	Construction of office and residential buildings of DGMS at Goa	Under progress
9.	Construction of office and residential buildings of DGMS at Jabalpur	Under progress

**APPENDIX-I**

**SAFETY, HEALTH & WELFARE  
LEGISLATION FOR MINES**

**ADMINISTERED BY DGMS**

□ **The Mines Act, 1952**

- The Coal Mines Regulations, 1957
- The Metalliferous Mines Regulations, 1961
- The Oil Mines Regulations, 1984
- The Mines Rules, 1955
- The Mines Vocational Training Rules, 1966
- The Mines Rescue Rules, 1985
- The Mines Crèche Rules, 1966
- Coal Mines Pit Head Bath Rules, 1959

□ **Electricity Act, 2003**

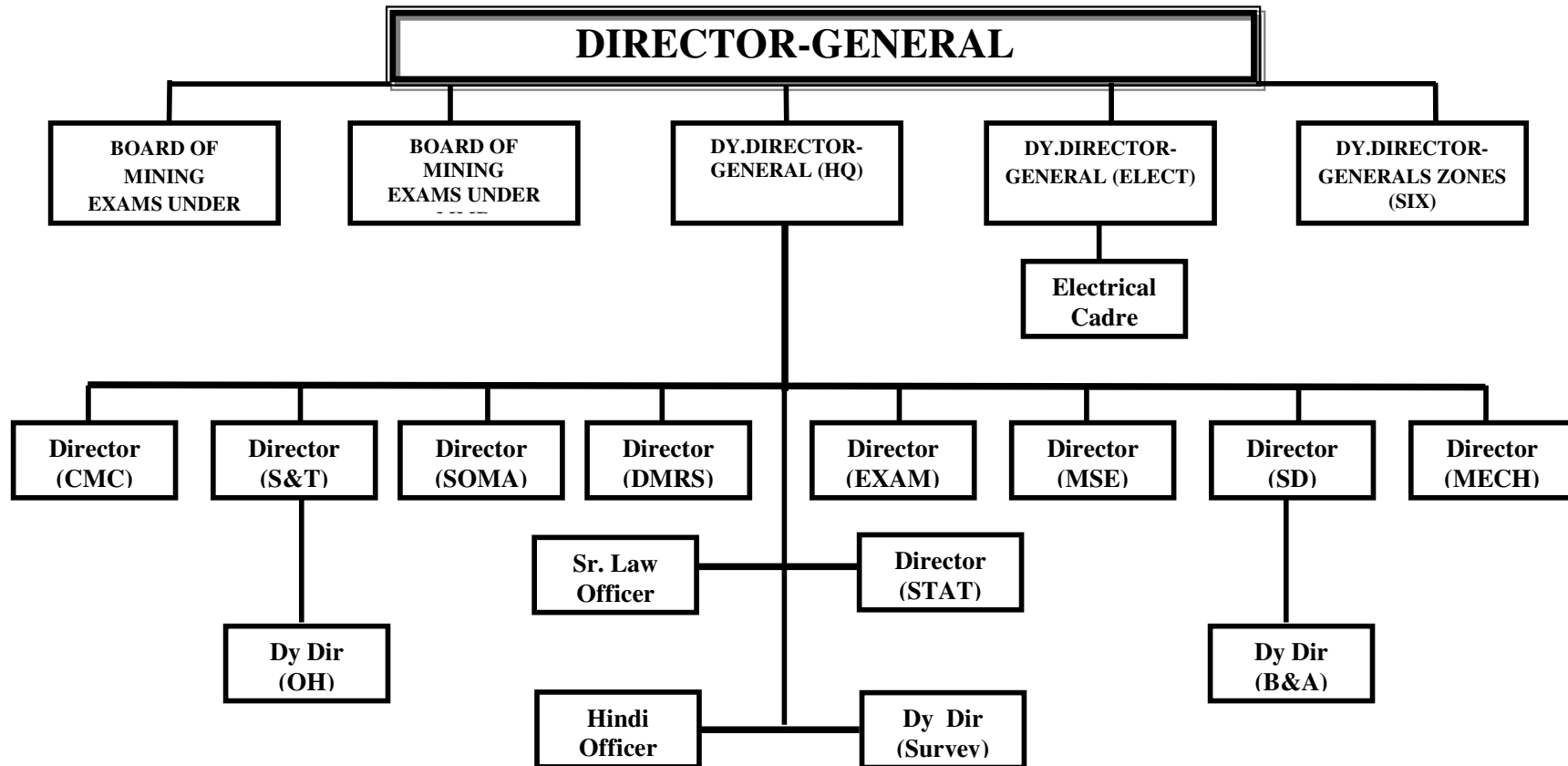
- Indian Electricity Rules, 1956

□ **Allied Legislation**

- Factories Act, 1948 – Chapter III & IV
- Manufacture, Storage & Import of Hazardous Chemicals Rules,1989 - under  
Environmental (Protection) Act, 1986
- Land Acquisition (Mines) Act, 1885
- Coal Mines Conservation & Development Act, 1974

ANNEXURE-IIA

**ORGANISATION STRUCTURE  
DIRECTORATE-GENERAL OF MINES SAFETY  
HEAD QUARTERS, DHANBAD**



**Field Organisation of  
Directorate General of Mines Safety**

<b>D I R E C T O R A T E  G E N E R A L</b>	<b>Zone</b>	<b>Region</b>	<b>Sub-Region</b>
	<b><u>Eastern Zone</u></b> Sitarampur West Bengal	<b>Region No.I</b> <b>Region No.II</b> <b>Region No.III</b>	<b>Digboi</b>
	<b><u>Central Zone</u></b> Dhanbad Jharkhand	<b>Region No.I</b> <b>Region No.II</b> <b>Region No.III</b>	
	<b><u>South Eastern Zone</u></b> Ranchi Jharkhand	Ranchi <b>Bhubaneshwar</b> <b>Chaibasa</b> Koderma	Ramgarh
	<b><u>Northern Zone</u></b> Ajmer Rajasthan	Ajmer <b>Udaipur</b> <b>Ghazibad</b>	
	<b><u>Southern Zone</u></b> Hyderabad Andhra Pradesh	Hyderabad Reg.No.I Hyderabad Reg.No.II <b>Chennai</b> Goa	Nellore <b>Bellary</b>
	<b><u>Western Zone</u></b> Nagpur Maharashtra	<b>Nagpur-I</b> <b>Nagpur-II</b> <b>Jabalpur</b> <b>Bilaspur</b>	Parasia



**APPENDIX-III**

**STATEMENT SHOWING THE NAMES OF OFFICERS GROUP (A&B)  
OF DIFFERENT DISCIPLINES AS ON 31.12.2008**

<b>Sl.No</b>	<b>Designation</b>	<b>Name of Officers</b>	<b>Place of Posting</b>	<b>Date of Posting</b>
1.	Director General of Mines Safety	Man Mohan Sharma	Dhanbad	03.04.2007
2.	Deputy Director- General of Mines Safety (Mining)	Surinder Jit Sibal Rahul Guha Satish Puri SI Hussain Rash Behari Chakravorty D Sengupta	Dhanbad(HQ) Nagpur Hyderabad Sitarampur Dhanbad(CZ) Ranchi	28.05.2008 27.12.2006 30.04.2008 03.06.2008 07.11.2007 01.12.2007
3.	Director of Mines Safety (Mining)	Utpal Saha Akhilesh Kumar Kuldip Kumar Sharma Prasanta Kumar Sarkar Narendra Kumar Kherada Ashim Kumar Sinha Ashok Kumar Megharaj Rakesh Kulsrestha Swapan Kumar Dutta Prem Chand Rajak P. Ranganatheeswar Anup Biswas A. Bhattacharyya Ashfaq Waheed Munna Tandi Dileep kumar Saxena Arun Kumar Jain Mohan Singh Bisham Pratap Ahuja Koneru Nageshwara Rao Vallala Lakshminarayana S Krishnamurthy Suraj Mal Suthar BP Singh Narayan Rajak Sahadeo Soren DK Mallick	MSE, Dhanbad Examination Udaipur Region SOMA, Dhanbad Bhubaneswar Reg Ghaziabad Goa Sitarampur Reg-II Sitarampur,Re.-III Hyderabad Hyderabad Reg.I Ranchi Jabalpur Region Dhanbad (DMRS) Chaibasa Nagpur, Region-I Sitarampur, Region-I Ghaziabad Region Chennai Region Nagpur Region-II Hyderabad, Reg.II Koderma Region Dhanbad, Reg. S&T, Dhanbad Dhanbad Reg.I Dhanbad Reg.II SD, Dhanbad	29.05.2007 08.05.2007 31.05.2007 23.05.2007 31.05.2007 30.05.2007 24.05.2007 26.07.2007 28.05.2007 23.05.2008 28.05.2007 18.06.2007 10.02.2003 27.05.2008 24.05.2007 18.08.2003 26.07.2007 08.03.2004 17.05.2004 07.05.2007 13.06.2005 28.06.2005 01.08.2005 29.05.2007 15.11.2007 08.11.2007 05.12.2007
4.	Dy. Director of Mines Safety (Mining)	Narendra Murawat Satish Kumar Chabra Umesh Kumar Sharma Mani Ram Mandve Manindra Satyamurty Harish Chandra Yadav Shbhro Bagchi RamMadhabBhattacharjee Ujjwal Tah Rafique Syed Satish Kumar Cherukuri Ramesh Kumar S.K. Gangopadhyay Subhashis Roy Chandra Bhanu Prasad	Sitarampur-I Dhanbad Ramgarh Dhanbad Reg.I New Delhi deputation Nagpur, Region-II Sitarampur-II Nagpur Chaibasa Dhanbad, Region-III Jabalpur Nagpur Region No.II Chennai Sitarampur Reg.III Hyderabad Reg.II	28.11.2006 - 28.05.2007 05.06.2007 08.09.2001 16.05.2007 17.05.2007 22.05.2008 29.05.2007 01.06.2007 05.06.2007 14.05.2007 11.07.2007 30.05.2007 29.05.2007

		Ram Avtar Mal Pareakh	HQ, Dhanbad	21.05.2007
		Vidyapathi	Nagpur Reg.I	05.09.2007
		Gubba Vijay Kumar	Nellore	30.05.2008
		Sheo Shankar Mishra	Goa	28.05.2007
		Bhagwan Lal Meena	Udaipur	28.05.2007
		Arvind kumar	Koderma	31.05.2007
		Prabhat Kumar Kundu	Chaibasa	21.05.2007
		Ashok Kumar Porwal	Ghaziabad	29.07.2008
		Ravindra Tulshi Mandekar	Chennai	25.05.2007
		SatishDigamberChiddarwar	Bilaspur	07.06.2008
		Subrat Halder	Dhanbad	19.05.2008
		Uttam Kumar Saha	Dhanbad	26.05.2008
		Tapan Kanti Mondal	Dhanbad	21.05.2008
		Burgula Papa Rao	Hyderabad	21.05.2008
		Mihir Choudhary	Ranchi	27.05.2008
		Manish Eknath Murkute	Parasia	15.05.2008
		Umesh Prasad Singh	Hyderabad, Region-II	07.05.2004
		Ram Abhilash	Bilaspur	07.07.2008
		Durga Das Saha	Bellary	11.05.2004
		Rajagopalan Subramanian	Hyderabad, Region-I	13.05.2004
		Niranjan Sharma	Ghaziabad	28.05.2007
		Jainendra Kumar Roy	Dhanbad (SOMA)	17.05.2004
		Malay Tikader	Udaipur	18.05.2004
		Measala Narsaiah	Digboi	11.06.2007
		Prabhat Kumar	Dhanbad	12.05.2008
		Susanta Kumar Mandal	Sitarampur, Reg-III	21.05.2004
		Kamlesh Shrama	Jabalpur	28.05.2004
		P. K. Maheshwari	Sitarampur, Reg-II	01.06.2004
		Dinesh Kumar Sahu	Bilaspur	16.06.2004
		Sanjibon Ray	Udaipur	19.06.2004
		Prabir Kumar Palit	Dhanbad, Region-I	29.06.2004
		Asok Kumar Sur	Dhanbad, Region-II	29.06.2004
		Elpula Jayakumar	Ajmer	01.10.2004
		Samiran Kumar Das	Ghaziabad	08.07.2005
		Bhusan Pd. Singh	CZ Dhanbad	16.05.2007
		Deo Kumar	Ranchi	30.11.2007
		Rajeev Paul	Sitarampur	25.05.2007
		S.S. Prasad	Bhubaneswar	03.09.2007
		Manoranjan Dole	Dhanbad	29.05.2007
		BB Satiyar	Ajmer	22.05.2007
		Ramawatar Meena	Ajmer	13.06.2008
		KK Sharma	Bhubaneswar	10.08.2007
		Vir Pratap	Dhanbad	31.10.2008
		Pramanand Kr. Singh	Sitarampur	30.12.2008
5.	Dy. Director General of Mines Safety (Elect.)	R. Ramchandiran	Dhanbad (HQ)	13.09.2007
6.	Director of Mines Safety (Elect.)	Dharmendra Kumar Bijay Kumar Panigrahi Birendra Nath Mishra S K Talukdar	Hyderabad Sitarampur Nagpur Dhanbad	20.09.2004 20.09.2004 05.10.2004 17.07.2007
7.	Dy. Director of Mines Safety (Elect.)	Birendra Kumar Lama Gunti Prasad Rao Milan Kanti Das Karuna Moy Ghosh Mahesh Kumar Malviya Radhey Shyam Upendra Nath Pandey	Nagpur Sitarampur Dhanbad Ranchi Nagpur Ajmer HQ, Dhanbad	12.05.2007 18.05.2007 16.04.2001 21.05.2007 19.05.2008 15.07.2003 22.08.2007

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		K Satyanarayana Yadav G. Lakshmi Kanta Rao Subir Kumar Thakur Balbir Singh Nim Mukesh Srivastava Madhukar Sahay	Hyderabad Dhanbad CZ Ranchi Sitarampur CZ Sitarampur	09.07.2007 06.05.2004 06.05.2004 21.05.2004 15.05.2008 28.06.2004
8.	Director of Mines Safety, (Mech.)	GN Venkatesh H K srivastava	Dhanbad (HQ) Sitarampur	30.10.2008 31.10.2008
9.	Dy. Director of Mines Safety, (Mech.)	Dinesh Pandey Bhageshwar Naik Dhore Raj Narayan Singh S. Venkataraman	Hyderabad Nagpur Dhanbad, CZ Dhanbad	28.05.2007 08.05.2007 28.05.2008 26.08.2002
10.				
11.	AD(OH)Gr.I	Akul Kumar Sen George John	Sitarampur HQ	08.05.1998 30.05.2008
12.	AD(OH)Gr.II	Kaushik Sarkar	Hyderabad	16.11.2000
13.	Dir./Jt. Director (Stat.)	PK Mahapatra Tarak Chandra Patra	Dhanbad Dhanbad	29.06.2007 30.07.2008
14.	Dy. Director (Stat.)	Prabodh Saxena	Dhanbad	25.08.2008
13.	Sr. Law Officer	Tapan Kumar Barman	Dhanbad	27.03.2007
14.	Law Officer, Gr.I	Anand Swarup Singh	Dhanbad	07.08.2007
15.	Law Officer, Gr.II	Jai Prakash Jha Ritu Srivastava	Dhanbad Dhanbad	28.01.2002 15.05.2008
16.	Asstt. Director(OL)	Sita Ram Sharma Monika Tudu	Dhanbad Dhanbad, CZ	01.07.1997 25.01.2002
17.	Sr.Private Secretary	Kalyan Mandal	Dhanbad	01.04.2005
18.	Administrative Officer	AK Bhattacharjee Dipak Mukherjee	Sitarampur Dhanbad	01.08.2007 24.09.2008
19.	Private Secretary	V. Mahadeora Wagh Jagannath Ram RP Rjak S Nandi RP Ghosh K D Hasda Damodar Prasad	Nagpur Ranchi Dhanbad Sitarampur Dhanbad NZ Dhanbad	23.04.1990 26.10.2005 01.02.2007 01.08.2008 08.01.2008 08.01.2008 24.11.2008
21.	Jr.Scientific Officer	Krishna Kant Banerjee	Dhanbad (S&T)	29.06.1992
22.	Sr.Accounts Officer	Ram Lalit Kannaujia	Dhanbad	25.11.1997
23.	Statistical Investigator, Gr.I	Bijay Kumar Srivastava Pramod Chandra Netheti Venkata Rao Birendra Kumar Mishra Daya Shankar Singh Qasim Khan	Dhanbad Dhanbad Hyderabad Dhanbad Dhanbad Dhanbad	20.05.1998 25.09.2000 01.04.2004 01.04.2004 26.07.2004 11.07.2005

**APPENDIX-III A**

**LIST OF GROUP A & B OFFICERS OF DGMS ON DEPUTATION  
DURING 2008**

<b>Sl. No.</b>	<b>Name</b>	<b>Place of posting</b>	<b>Period of deputation</b>	<b>Date of commencement</b>
1.	M Satyamurthy, Dy. Director of Mines Safety(Mining)	Ministry of Agro & rural Ind, New Delhi & Presently he is on deputation in planning commission a Joint Advisor(Coal) from 17.10.2003 in New Delhi	5 Years	08.09.2001

**APPENDIX-III B**

**OFFICERS OF DGMS ON TRAINING / VISITS ABROAD IN 2008**

<b>Sl. No</b>	<b>Name</b>	<b>Country visited</b>	<b>Scheme under which the visit took place</b>	<b>Dates</b>
1.	RB Chakraborty, DDG	Russia	Studying difference ore and coal mines	16.07.2008 to 23.07.2008
2.	AK Sur, DD			
3.	BP Singh, Director	USA	Introduction of Continuous Miner Technology in GDK 11A Project	03.11.2008 to 14.11.2008
4.	V Laxminarayana, Director			

**APPENDIX-III C**

**OFFICERS OF DGMS ON TRAINING IN INDIA DURING 2008**

<b>S.N</b>	<b>Name</b>	<b>Name of course</b>	<b>Venue</b>	<b>Dates</b>
1.	G P Rao, DD(Elect)	Training Course on Inspection of Electrical installation under IE Rules, 1956	Bangalore	21.01.2008 to 25.01.2008
2.	GL Kanta Rao, D(Elect)			
3.	UN Pandey, DD(Elect)			
4.	N. Rajak, Director	MDP on corporate stress & Health Management	NITIE, Mumbai	19.05.2008 to 23.05.2008
5.	A Kumar, Director			
6.	D K Mallick, Director			
7.	Dr. George John, AD(OH)			
8.	V Laxminarayan Director	Short term Course on "Trends in Strata Techniques and instrumentation for enhancing safety in coalmines.	NIT, Rourkela	28.07.2008 to 31.07.2008
9.	B P Singh, Director			
10.	S K Mondal, Dy Director			

**A-COAL MINES REGULATIONS, 1957**  
**STATEMENT NO. IA**  
**Result of Examinations, 2008.**

**1. Issue of Certificate:**

S.No.	Type of Examinations	2008		Remarks
		Appeared	Passed	
<b>I.</b>	<b>Exchange Certificate</b>			
(a)	First Class Manager's Exchange Certificate in Lieu of British Certificates	-	-	
(b)	First Class Manager's Certificate Metal to Coal	3	3	
(c)	First Class Manager's Certificate Coal to Metal	-	-	
(d)	Second Class Manager's Certificate Metal to Coal	-	-	
(e)	Second Class Manager's Certificate Coal to Metal	-	-	
(f)	Surveyor's Certificate Metal to Coal	-	-	
(g)	Foreman to Overman	-	-	
(h)	Mate's (UR) to Sirdar	-	-	
<b>II</b>	<b>Regular Examination</b>			Result declared on
(a)	First Class Manager's Certificate	2236	363	03.07.2008
(b)	Second Class Manager's Certificate	1597	186	03.07.2008
(c)	Surveyor's Certificate	279	13	03.07.2008
(d)	Overman's Certificate	1237	176	03.07.2008
(e)	Sirdar's Certificate	319	87	
(f)	Shotfirer's Certificate	-	-	
(g)	Gas-testing Certificate	1308	525	
(i)	Winding Engine Driver's Certificate			
	(a) I Class	48	32	
	(b) II Class	51	32	

**STATEMENT NO.IB**

Certificate without examination (Exempted Categories)

S.No.	Type of Examination	2008		Remarks
		Appeared	Issued	
(a)	First Class Manager's Certificate	-	-	
(b)	Second Class Manager's Certificate	123	84	
(c)	Surveyor's Certificate	34	34	
(d)	Overman's Certificate	269	224	

**2. Medical Examination:**

Five Year Medical Examination under Regulation 27(1)

S.No.	Type of Examination	2008		Remarks
		Appeared	Passed	
I	Overman's Certificate	481	441	
II	Sirdar's Certificate	572	537	
III	Shotfirer's Certificate	15	14	
IV	Winding Engine Driver's Certificate			
	(a) First Class	130	110	
	(b) Second Class	62	54	

**3. Senior Medical Examination Board Under Regulation 28:**

S.No.	Type of Examination	2008		Remarks
		Appeared	Passed	
I	First Class Manager's Certificate	82	62	
II	Second Class Manager's Certificate	35	20	
III	Surveyor's Certificate	18	13	

**4. Junior Medical Examination Board under Regulation 28:**

S.No.	Type of Examination	2008		Remarks
		Appeared	Passed	
I	Overman's Certificate	82	65	
II	Sirdar's Certificate	104	76	
III	Shotfirer's Certificate	-	-	
IV	Winding Engine Driver's Certificate			
	(c) First Class	08	07	
	(d) Second Class	-	-	

**STATEMENT NO. II**

Suspension of Certificates under the Coal Mines Regulations, 1957  
for the Year 2008

S.No.	Type of Certificate	No. of Certificates Suspended	Duration of Suspension
NIL			

**STATEMENT NO. III**

Debarment from appearing in Examination under the Coal Mines Regulations, 1957  
for the Year 2008

S.No.	Name	Type of Certificate	Period of debarment
NIL			

**STATEMENT NO. IV**

Duplicate Certificate issued under Coal Mines Regulations, 1957 during the Year 2008.

S.No.	Name	Type of Certificate	No. of Certificate	Date of issue
1.	Shri Kamlesh Sahaya	Overman	5094	04.01.08
2.	Shri Babban Yadav	Second Class	9815	11.01.2008
3.	Shri S.K. Lekhande	First Class	2561	08.04.2008
4.	Shri Ashok Kr. Patel	Overman	9646	15.05.2008
5.	Shri Gupteshwar Mishra	Overman	OVR/1639/4128/ 86	03.07.2008
6.	Shri Malay Mangal	Overman	1145/222	22.07.2008
7.	Shri Braj Bhushan Kumar	Overman	9992	03.10.2008
8.	Shri Surendra Jeet Sibal	First Class	2074	23.10.2008
9.	Shri Balendra Kr. Shukla	Overman	6645	26.11.2008
10.	Shri Ashish Ghosh	Overman	3198	05.12.2008
11.	Shri V. Rayamallu	Mining Sirdar	48690	14.05.2008
12.	Shri Sunil Kr. Sinha	Mining Sirdar	50422	03.06.2008
13.	Abdul Azeez Mansuri	Mining Sirdar	45272	03.07.2008
14.	Shri Vasdev Gope	Mining Sirdar	40815	23.10.2008
15.	Shri Manish Kr. Pathak	Mining Sirdar	51586	05.12.2008
16.	Shri Tapan Kr. Chakarborty	Mining Sirdar	49914	05.12.2008
17.	Shri Gariganti Virayya	Shot Firer	9818	02.06.2008
18.	Shri J.J. Reddy	Shot Firer	10949	03.07.2008

**DUPLICATE CERTIFICATES (GAS-TESTING) ISSUED UNDER COAL MINES  
REGULATIONS, 1957 DURING THE YEAR 2008**

S.No.	Name	Type of Certificate	No. of Certificate	Date of issue
1.	Shri Ramesh Kumar Paswan	Gas Testing	72030	
2.	Shri V. Rayamallu	Gas Testing	45744	14.05.2008
4.	Shri Raman Mishra	Gas Testing	40161	15.05.2008
5.	Shri Ashok Kr. Patel	Gas Testing	70967	15.05.2008
7.	Shri Tirupati Rangayya	Gas Testing	48771	03.06.2008
8.	Shri Dilip Kr. Sahu	Gas Testing	73053	03.06.2008
9.	Shri Suryakant Mishra	Gas Testing	71284	08.07.2007
10.	Shri Malay Mangal	Gas Testing	42768	22.07.2008
11.	Shri Dinesh Pd. Pandey	Gas testing	67751	29.07.2008
12.	Shri Asit Mandal	Gas Testing	71857	29.07.2008
13.	Shri D. Shashi Dhar	Gas Testing	3826	15.09.2008
14.	Shri Braj Bhushan Kumar	Gas Testing	72815	03.10.2008
15.	Shri Vishun Dev Yadav	Gas Testing	33363	14.11.2008
16.	Shri Banwari Mandal	Gas Testing	26580	14.11.2008
17.	Shri Govinda Das Sinha	Gas Testing	47222	12.02.2008

**B – METALLIFEROUS MINES REGULATIONS, 1961**

**STATEMENT NO. 1A**

**Result of Examinations, 2008**

**1. Issue of Certificate:**

S.No.	Type of Examinations	2008		Remarks
		Appeared	Passed	
<b>1.</b>	<b>Exchange Certificate</b>			
(a)	First Class Manager's Certificate Coal to Metal	10	5	
(b)	Second Class Manager's Certificate Coal to Metal	-	-	
(c)	Surveyor's Certificate Coal to Metal	-	-	
(d)	Overman to Foreman	-	-	
(e)	Sirdar to Mate	-	-	
<b>A.</b>	<b>Regular Examination (Un-Restricted)</b>			
(a)	First Class Manager's Certificate	150	42	
(b)	Second Class Manager's Certificate	118	28	
(c)	Surveyor's Certificate	04	02	
(d)	Foreman's Certificate	17	02	
(e)	Mining Mate	66	17	
(f)	Blaster	21	03	
<b>B.</b>	<b>Regular Examination (Restricted)</b>			Result Declared on
(a)	First Class Manager's Certificate	1105	231	
(b)	Second Class Manager's Certificate	846	53	
(c)	Surveyor's Certificate	32	08	
(d)	Foreman's Certificate	235	36	
(e)	Mining Mate	317	93	
(f)	Blaster	193	87	
<b>C.</b>	<b>Regular Certificate Other than above</b>			
(a)	Winding Engine Driver's Certificate (a) I Class (b) II Class			

**STATEMENT NO.II**

**SUSPENSION OF CERTIFICATES UNDER THE METALLIFEROUS MINES REGULATIONS, 1961 FOR THE YEAR 2002**

S.No.	Type of Certificate	No. of Certificates Suspended	Duration of Suspension
NIL			



**STATEMENT NO.III**

*Debarment from appearing in Examination under the Metalliferous Mines Regulations, 1961*

S.No.	Name	Type of Certificate	Period of debarment
NIL			

**STATEMENT NO.IV A**

**CERTIFICATE WITHOUT EXAMINATION (EXEMPTED CATEGORIES)**

S.No.	Type of Certificates	2008				Remarks
		Un-restricted		Restricted		
		Applied	Issued	Applied	Issued	
(a)	I Class Manager's Certificate					
(b)	II Class Manager's Certificate	23	17	187	148	
(c)	Surveyor's Certificate	03	03	21	19	
(d)	Foreman's Certificate	19	08	161	106	

**STATEMENT NO.IV B**

S.No.	Type of Examination	2008		Remarks
		Appeared	Passed	
<b>A</b>	<b>Five Yearly Medical Examination Under Regulation 30(1):</b>			
I	Foreman's Certificate	522	487	
II	Mining Mate's Certificate	341	318	
III	Blaster's Certificate	05	05	
IV	Winding Engine Driver's Certificate (c) First Class (d) Second Class			
<b>B</b>	<b>Yearly Medical Examination Under Regulations 31:</b>			
I	First Class Manager's Certificate	43	40	
II	Second Class Manager's Certificate	32	27	
III	Surveyor's Certificate	07	07	
<b>C</b>	<b>Yearly Medical Examination Under Regulations 31:</b>			
I	Foreman's Certificate	57	49	
II	Mining Mate's Certificate	41	35	
III	Blaster's Certificate	23	18	
IV	Winding Engine Driver's Certificate (a) First Class (b) Second Class			

**STATEMENT NO.V**

**DUPLICATE CERTIFICATES ISSUED UNDER METALLIFEROUS MINES REGULATIONS,  
1961 DURING THE YEAR 2009.**

S.No.	Name	Type of Certificate	No. of Certificate	Date of issue
1.	Shri J. Murali	Foreman	1936	23.01.2008
2.	Shri V.S. Nedungadi	Foreman	1006	05.03.2008
3.	Shri G.V.G. Bhagwan	Foreman	1452/362	29.02.2008
4.	Shri Rameshwar Pd. Singh	Foreman	1465	
5.	Shri Arun Kr. Basu	First Class	104	24.03.2008
6.	Shri Jang Bahadur Singh	Blaster	2239	10.04.2008
8.	Shri Durjan Singh Chauhan	Foreman	1486	03.06.2008
9.	Shri Vinod Kr. Singh	Foreman	Exam/Exemp/ 789/R/132-39/91	03.07.2008
11.	Shri Vinod Kr. Sharma	Foreman	29.07.2008	
12.	Shri Mithilesh Kr. Pandey	Mate	6930	29.07.2008
13.	Shri Dinesh Pd. Pandey	Mate	4698	29.07.2008
14.	Shri D. Shashi Dhar	Foreman	FM/UR/788/32	15.09.2008
15.	Shri Shiv Kumar Bhagat	Blaster	2963	21.10.2008
16.	Shri B.Hri Sri Hari Rao	Mate	4359	26.11.2008
17.	Shri Sameer Mandal	Mate	9511	03.12.2008
18.	Abu Sheikh	Blaster	4129	02.12.2008
19.	Shri Dev Yogesh Kumar	Blaster	2987	12.02.2008

**DUPLICATE CERTIFICATES (GAS-TESTING) ISSUED UNDER METALLIFEROUS MINES  
REGULATIONS, 1961 DURING THE YEAR 2008.**

S.No.	Name	Type of Certificate	No. of Certificate	Date of issue
1.	NIL			

**1. List of Mines Safety Equipment and Material required to be approved by DGMS under Coal & Metalliferous Mines Regulations.**

Equipment/Material	Provision of Regulation	
	CMR, 1957	MMR,1961
1. Flame Safety Lamp	2(2)	2(2)
2. Cap Lamps	2(2)	2(2)
3. Permitted Explosives	2(23)	2(23)
4. Tub Couplings	89(1)(c)	97(1)(c)
5. CO Detector	113(3)(c) ) 118A(3)(a)(i) 119(1)(b),121 125(3)(b) 142(5)	116(3)(c) ) 120(1)(b) 120(2)(c) 122, 126(3)(b) 141(5)
6. CO <sub>2</sub> Detector	119(2)(d)(ii)	-
7. Dust Extractor	123(3)(b)	124(2)(b)
8. Stone Dust Barrier	123(c)(2)	-
9. Methanometers	145(1)(a) )	-
10. Glass of Flame Safety Lamp	157(4)	151(4)
11. Cap Lamp Bulbs	157(4)	151(4)
12. Oil for Flame Safety Lamp	157(5)	151(5)
13. Mechanically propelled vehicle for transport of explosive	164(A)(2)(a)	-
14. Exploders	174	165(3)
15. Protective Footwear	191	182
16. Helmet	191-A	182-A
17. Self-Rescuers	191D	-
18. Fire-resistant brattices including plastic sheeting and ventilation ducting	181(3)	-
19. Safety belt	181(3)	-
20. Friction Props & Props setting devices	181(3)	-
21. Hydraulic roof supports	181(3)	-
22. Link Bars	181(3)	-
23. Powered Supports	181(3)	-
24. Fire resistant hydraulic fluid	181(3)	-
25. Man-riding haulage system	181(3)	-
26. Detaching hook	181(3)	-
27. Cage suspension gear including bridle chains	181(3)	-
28. Winding Rope	181(3)	-

29. Balance Rope	181(3)	-
30. Haulage rope for man-riding	181(3)	-

Equipment/Material	Provision of Regulation	
	CMR, 1957	MMR,1961
31. Conveyor belting	181(3)	-
32. Locomotive	181(3)	-
33. Internal combustion engine	181(3)	-
34. Flame proof & intrinsically safe electrical equipment	181(3)	-
35. Cables	181(3)	-
36. Automatic Contrivance	181(3)	-
37. Power Brake	181(3)	-
38. Automatic speed chart recorder	181(3)	-
39. Water ampoules/gel ampoules for stemming explosive charges	181(3)	-

**2. List of equipment required to be approved by DGMS under Mines Rescue Rules, 1985**

Equipment	Provision of Mines Rescue Rules, 1985
1. Breathing apparatus	Rules 11(5)
2. Smoke helmets & apparatus	Rules 11(5)
3. Reviving apparatus	Rules 11(5)
4. Electric Safety Lamps & Flame Safety Lamps	Rules 11(5)
5. Gas Detectors	Rules 11(5)
6. Self-Rescuers	Rules 11(5)

**3. List of equipment and material required to be approved under Oil Mines egulations, 1984.**

Equipment/Material	Provision of Regulation
1. Safety belt and life line	27
2. Petroleum storage tanks (specification approval)	55
3. Pipe lines and fittings (specification approval is not as per ISS)	62
4. Electrical lighting apparatus	84
5. Protective footwear	87
6. Protective helmet	88
7. Electrical equipment for use in hazardous area (Zone 1 and 2)	73

**NOTIFICATIONS & CIRCULARS**

**Notifications – 2008**

**New Delhi, the 4<sup>th</sup> January, 2008**

No.A-32012/01/2007-ISH.II – The President is pleased to appointing the following officers to the post of Deputy Director-General of Mines Safety (Mining) in the pay scale of Rs.18,400-500-22400/- in the Directorate-General of Mines Safety, Dhanbad with effect from the date shown against their names and until further orders:

<b>SN</b>	<b>Name of Officer</b>	<b>Date of appointment in the Grade of Deputy Director-General of Mines Safety (Mining)</b>
<b>1.</b>	<b>Shri SI Hussain</b>	<b>6.11.2007(F/N)</b>
<b>2.</b>	<b>Shri RB Chakraborty</b>	<b>7.11.2007 (F/N)</b>
<b>3.</b>	<b>Shri Debasish Sengupta</b>	<b>1.12.2007 (F/N)</b>

M.S. Azad, Under Secretary

**New Delhi, the 28<sup>th</sup> February, 2008**

S.O.40(E) – In exercise of the powers conferred by sub-section(1) of Section 5 of the Mines Act, 1952 (35 of 1952), the Central Government hereby appoints Shri Deepak Gupta, Deputy Director-General of Mines Safety, in the Directorate-General of Mines Safety Organization to be the Chief Inspector of Mines for all the territories to which the said Act extends with immediate effect from 18.2.2008 to 19.3.2008 as per the extent Rules.

[F.No.Z-16025/96/2006-ISH.II]  
S.K. Srivastava, Joint Secretary

**New Delhi, the 19<sup>th</sup> March, 2008**

S.O.534(E) – In exercise of the powers conferred by sub-section(1) of Section 5 of the Mines Act, 1952 (35 of 1952), the Central Government hereby appoints Shri Deepak Gupta, Deputy Director-General of Mines Safety, in the Directorate-General of Mines Safety Organization to be the Chief Inspector of Mines for all the territories to which the said Act extends with immediate effect from 20.3.2008 to 31.3.2008 as per the extent Rules.

[F.No.Z-16025/96/2006-ISH.II]  
S.K. Srivastava, Joint Secretary

**New Delhi, the 28<sup>th</sup> March, 2008**

G.S.R. 236(E) – The following draft of certain regulations further to amend the Metalliferous Mines Regulations, 1961, which the Central Government proposes to make on the recommendation of the Committee constituted under Section 12 of the Mines Act, 1952 (35 of 1952) and in exercise of the powers conferred by Section 57 of the said Act, is hereby published as required by sub-section (1) of Section 59 of the said Act, for information of all persons likely to be affected thereby and notice is hereby given that the said draft regulations will be taken into consideration after expiry of a period of three months from the date on which copies of the Official Gazette in which this notification is published, as made available to public;

Any objection or suggestion, which may be received from any person in respect of the said draft regulations within the period specified above, will be considered by the Central Government; The objections and suggestions, if any, may be addressed to Shri Subhash chand, Under Secretary, Ministry of Labour & Employment, Shram Shakti Bhawan, Rafi Marg, New Delhi – 110001.

**Draft Regulations**

- (1) These regulations may be called the Metalliferous Mines (Amendment) Regulations, 2008.
- (2) They shall come into force on the date of their final publication in the Official Gazette.
- (3) In regulation 124 of the Metalliferous Mines Regulations, 1961, in sub-regulation (2), for clause (ii), the following clause shall be substituted, namely:-

“in case of respirable asbestos fibres, exceeds one fibre per milliliter of air sampled by an open membrane filter and measured by a phase contrast optical microscope of a type approved by an in accordance with the procedure as specified by the Chief Inspector by a general or special order”.

[F.N.H-11012/03/2006-ISH.II]  
S.K. Srivastava, Joint Secretary.

New Delhi, the 4<sup>th</sup> April, 2008

S.O.837 – In the Notification S.O. No.3833 in English and S.O. No.3822 in Hindi published in the Gazette of India Part-II, Section 3(ii) dated 7<sup>th</sup> December, 2002, the name of Shri S.K. Bagchi, DDMS (Mining) of Sl. No.30 may be read as “Shri S. Bagchi”.

[F.N.S-29025/5/2002-ISH.II (Part File)]  
Subhash Chand, Under Secretary.

Dhanbad, dated the 7<sup>th</sup> April, 2008

G.S.R.65 – In pursuance of the provisions of Regulations 13(4) of the Metalliferous Mines Regulations, 1961 the bye-laws for the conduct of examination and grant of certificate of Competency so far as they related to penalty for misconduct are hereby amended as follows:

<b><u>SN</u></b>	<b><u>Certificate of Competency</u></b>	<b><u>Bye-law No.</u></b>	<b><u>Existing bye-law</u></b>	<b><u>Amended bye-law</u></b>
<b><u>(1)</u></b>	<b><u>Manager’s Certificate</u></b>	<b><u>11</u></b>	<b><u>Penalty for misconducts:</u></b>	<b><u>Penalty for misconducts:</u></b>
<b><u>(2)</u></b>	<b><u>Mine Surveyor’s Certificate</u></b>	<b><u>9</u></b>	<b><u>Any candidate who submits a false certificate or counterfeits</u></b>	<b><u>Any candidate who submits a false certificate or counterfeits</u></b>
<b><u>(3)</u></b>	<b><u>Mine Surveyor’s Certificate Restricted to mines having opencast workings only.</u></b>	<b><u>9</u></b>	<b><u>certificate or makes a false declaration or adapts unfair means during the examination, may be disqualified by the Board and also debarred from appearing at any subsequent examination for a specified period not exceeding three</u></b>	<b><u>certificate or makes a false declaration or adapts unfair means during the examination, may be disqualified by the Board and also debarred from appearing at any subsequent examination for a specified period depending upon</u></b>
<b><u>(4)</u></b>	<b><u>Mine Foreman’s Certificate</u></b>	<b><u>9</u></b>		
<b><u>(5)</u></b>	<b><u>Mining Mate’s Certificate</u></b>	<b><u>3</u></b>		
<b><u>(6)</u></b>	<b><u>Blaster’s Certificate</u></b>	<b><u>1(5)</u></b>		
<b><u>(7)</u></b>	<b><u>Blaster’s Certificate Restricted to mines having</u></b>	<b><u>1(4)</u></b>		

<u>opencast working only.</u>	<u>years depending upon the facts of the case.</u>	<u>the facts of the case.</u>
<b>(8) Winding Engineman's 1<sup>st</sup> Class and 2<sup>nd</sup> Class Certificate</b>	<b>5(2)</b>	
<b>(9) Gas Testing Certificate</b>	<b>9(1)</b>	

[No.Board/Metal/1123/2008]

M.M. Sharma, Director General of Mines Safety & Chairman.  
Dhanbad, dated the 7<sup>th</sup> April, 2008

G.S.R.66 – In pursuance of the provisions of Regulations 13(4) of the Coal Mines Regulations, 1957 the bye-laws for the conduct of examination and grant of certificate of Competency so far as they related to penalty for misconduct are hereby amended as follows:

<u>SN</u>	<u>Certificate of Competency</u>	<u>Bye-law No.</u>	<u>Existing bye-law</u>	<u>Amended bye-law</u>
<b>(1)</b>	<b>Manager's Certificate</b>	<b>11</b>	<b>Penalty for misconducts:</b>	<b>Penalty for misconducts:</b>
<b>(2)</b>	<b>Mine Surveyor's Certificate</b>	<b>9</b>	<b>Any candidate who submits a false certificate or counterfeits</b>	<b>Any candidate who submits a false certificate or counterfeits</b>
<b>(3)</b>	<b>Overman's Certificate</b>	<b>11</b>	<b>certificate or makes a false declaration or adapts unfair means during the examination, may be disqualified by the Board and also debarred from appearing at any subsequent examination for a specified period not exceeding three years depending upon the facts of the case.</b>	<b>certificate or makes a false declaration or adapts unfair means during the examination, may be disqualified by the Board and also debarred from appearing at any subsequent examination for a specified period depending upon the facts of the case.</b>
<b>(4)</b>	<b>Mining Sardar's Certificate</b>	<b>11</b>		
<b>(5)</b>	<b>Shot-firer's Certificate</b>	<b>11</b>		
<b>(6)</b>	<b>Winding Engineman's 1<sup>st</sup> Class and 2<sup>nd</sup> Class Certificate</b>	<b>10</b>		
<b>(7)</b>	<b>Gas Testing Certificate</b>	<b>9</b>		

[No.Board/Coal/1124/2008]

M.M. Sharma, Director General of Mines Safety & Chairman

**Dhanbad, dated 22<sup>nd</sup> April, 2008**

G.S.R.99 – In exercise of the powers conferred on me under Sub-regulation (1) of Regulation 73 of Oil Mines Regulations 1984, I, M.M. Sharma, Chief Inspector of Mines also designated as Director-General of Mines Safety hereby declare 1<sup>st</sup> June, 2008 as date from which all type of Emergency Escape Device and Escape Line for installation on derrick to be used in Oil Mines will be of such type standard and make as approved by me by a general or special order in writing.

[No.16(38)79-Genl/1104]

M.M. Sharma, Director General of Mines Safety

New Delhi, the 14<sup>th</sup> May, 2008

S.O. 1140 – In exercise of powers conferred by sub-section (1) of Section 162 of the Electricity Act, 2003 (36 of 2003) read with Rule 4(A) of the Indian Electricity Rules, 1956 and in supersession of Government of India, Ministry of Power Notification No.S.O.464 dated 24<sup>th</sup> January, 2003, the Central Government hereby appoints the following officers of the Directorate-General of Mines Safety as Chief Electrical Inspector and Electrical Inspectors for the said purpose of the said Act, who shall exercise the powers and perform the functions of a Chief Electrical Inspector and an Electrical Inspector in relation to a mine, within the local limits of their respective jurisdiction except the State of J&K.

Chief Electrical Inspector:

1. Shri R. Ramchandiran, Deputy Director-General of Mines Safety (Electrical)

Electrical Inspectors:

1. Shri BN Mishra, Director of Mines Safety (Electrical)
2. Shri Dharmendra Kumar, Director of Mines Safety (Electrical)
3. Shri BK Panigrahi, Director of Mines Safety (Electrical)
4. Shri SK Talukdar, Director of Mines Safety (Electrical)
5. Shri BK Lama, Deputy Director of Mines Safety (Electrical)
6. Shri MK Das, Deputy Director of Mines Safety (Electrical)
7. Shri KM Ghosh, Deputy Director of Mines Safety (Electrical)
8. Shri Mukesh Srivastava, Deputy Director of Mines Safety (Electrical)
9. Shri GP Rao, Deputy Director of Mines Safety (Electrical)
10. Shri UN Pandey, Deputy Director of Mines Safety (Electrical)
11. Shri GL Kanta Rao, Deputy Director of Mines Safety (Electrical)
12. Shri SK Thakur, Deputy Director of Mines Safety (Electrical)
13. Shri Radheshyam, Deputy Director of Mines Safety (Electrical)
14. Shri BS Nim, Deputy Director of Mines Safety (Electrical)
15. Shri KS Yadav, Deputy Director of Mines Safety (Electrical)
16. SHRI MK Malviya, Deputy Director of Mines Safety (Electrical)
17. Shri M. Sahay, Deputy Director of Mines Safety (Electrical)

[F.No.42/4/2001-R&R]  
I.C.P. Keshri, Joint Secretary.

New Delhi, the 11<sup>th</sup> August, 2008

S.O. 2035(E) – In exercise of the powers conferred by sub-regulations (1), (2), (3) & (4) of Regulation 11 of Metalliferous Mines Regulations, 1961 and in supersession of the notification of the Government of India in the Ministry of Labour and Employment number S.O. 91(E) dated 25.1.2005 and S.O. 1204(E) dated 24.7.2007, the Central Government hereby constitutes the Board of Mining Examination and appoint the following persons as members of the Board for a period of three years from date of publication of this notification, namely:

- |                  |  |                 |
|------------------|--|-----------------|
| <b><u>1.</u></b> | <b>Director General of Mines Safety</b>  | <b>Chairman</b> |
| <b><u>2.</u></b> | <b>Dr. Bal Krishna Srivastava, Coordinator, Centre of Advanced Studies, Department of Mining Engineering, Institute of Technology, Baranas Hindu University, Varanasi-221005</b> | <b>Member</b>   |
| <b><u>3.</u></b> | <b>Shri Akhilesh Joshi, Vice President, Rampura Agucha Mines, Hindustan Zinc Ltd., P.O. Agucha-311029 District: Bhilwara (Rajasthan)</b>   | <b>Member</b>   |



- 4. Shri Diwakar Acharya, Director (Technical), Member**  
**Uranium Corporation of India Limited, P.O.**  
**Narwapahar Mines Singhbhum (East),**  
**Jharkhand-832107**
- 5. Shri Vinay Kumar Agarwal, Sr. Vice Member**  
**President, Indian Metals and Ferro Alloys,**  
**IMFA Building, Near Police Station, At Chorda**  
**Chhak, P.O. Jajpur Road-755019**
- 6. Shri Upendra Kumar Singh, Member**  
**Professor and Head, Department of Mining**  
**Engineering, Indian School of Mines**  
**University, Dhanbad-826001**

[F.No.S-66012/1/2004-ISH.II]  
S.K. Srivastava, Joint Secretary.

New Delhi, the 14<sup>th</sup> August, 2008

G.S.R. 159 – In exercise of the power conferred on the Chief Inspector of Mines also designated as Director-General of Mines Safety under sub-regulation (3) of Regulation 181 of the Coal Mines Regulations, 1957, as well as sub-regulation (1) of regulation 73 of the Oil Mines Regulations, 1984, I hereby, declare 1<sup>st</sup> November, 2008 as date from which all types of fire fighting and fire suppression systems including automatic fire detection and suppression systems to be used in HEMMs, materials and chemicals to be used in fire fighting or suppression systems in mines both on surface and below ground including oil and gas mines/field will be of such type, standard and make as approved by a general or special order in writing.

[No.DGMS/S&T/FFS/696]  
M.M. Sharma, Director-General of Mines Safety

New Delhi, 14<sup>th</sup> August, 2008

G.S.R.160 – In exercise of the power conferred on the Chief Inspector of Mines also designated as Director-General of Mines Safety under sub-regulation (3) of Regulation 181 of the Coal Mines Regulations, 1957, I hereby declare 1<sup>st</sup> November, 2008 as the date from which all types of steel supports, roof bolts, cement and resin grouts to be used for the purpose of supporting roof and sides of the workings in a mines, shall be of such type, standard and make as approved by me by a general or special order in writing.

[No.DGMS/S&T/SS/702]  
M.M. Sharma, Director-General of Mines Safety

New Delhi, the 14<sup>th</sup> August, 2008

G.S.R. 161 – In exercise of the power conferred on the Chief Inspector of Mines also designated as Director-General of Mines Safety under sub-regulation (3) of Regulation 181 of the Coal Mines Regulations, 1957, I hereby declare 1<sup>st</sup> November, 2008 as the date from which all types of Chemical Dust Suppressant including the additives used therein, to be used for suppressing dust in mines, shall be of such type, standard and make approved by me by a general or special order in writing.

[No.DGMS/S&T/DSS/699]  
M.M. Sharma, Director-General of Mines Safety

New Delhi, the 5<sup>th</sup> September, 2008

S.O.2593 – In exercise of the powers conferred by sub-section (1) of Section 5 of the Mines Act, 1952 (35 of 1952), the Central Government hereby appoints the following officers as Inspector of Mines subordinate to the Chief Inspector of Mines, until further order:

1. Shri Bhushan Prasad Singh
2. Shri Deo Kumar
3. Shri Shyam Sunder Prasad
4. Shri Rajib Pal
5. Shri Bipul Bihari Satiar
6. Shri Kamal Kumar Sharma
7. Shri Ramwatar Meena
8. Shri Monoranjan Doley

[F.No.S-29025/1/2008-ISH.II]  
Subhash Chand, Under Secretary.

New Delhi, the 30<sup>th</sup> September, 2008

G.S.R.701(E) – Whereas the draft of certain regulations further to amend the Metalliferous Mines Regulations, 1961, which the Central Government proposes to make on the recommendation of the Committee constituted under Section 12, of the Mines, 1952 (35 of 1952) was published as required by sub-section (1) of section 59 of the said Act in the Gazette of India, Extraordinary, Part II, section-3, sub-section (i), dated the 28<sup>th</sup> March, 2008 under the notification of the Government of India in the Ministry of Labour and Employment No.G.S.R.236(E), dated the 28<sup>th</sup> March, 2008, inviting objections and suggestions from all persons likely to be affected thereby, till the expiry of a period of three months from the date of publication of the said notification in the Official Gazette.

And whereas the copies of the said Gazette were made available to the public on 28<sup>th</sup> March, 2008.

And whereas no objection or suggestion has been received from the public on the said draft.

Now, therefore, in exercise of the powers conferred by Section 57 of the Act, the Central Government, after referring the said draft to the Committee constituted under the said Act and after giving it a reasonable opportunity of reporting as to the expediency of amending of the said Regulations and as to the suitability thereof, as required by sub-section (4) of Section 59 of the said Act, hereby makes the following regulations, further to amend the Metalliferous Mines Regulations, 1961, namely:-

1. (1) These regulations may called the Metalliferous Mines (Amendment) Regulations, 2008.  
(2) They shall come into force on the date of their publication in the Official Gazette.
2. In regulation 124 of the Metalliferous Mines Regulations, 1961, in sub-regulation (2), for clause (ii), the following clause shall be substituted, namely:-

“(ii) in case of respirable asbestos fibres, exceeds one fibre per milliliter of air sampled by an open membrane filter and measured by a phase contrast optical microscope of a type approved by and in accordance with the procedure as specified by the Chief Inspector by a general or special order.”.

[F.No.H-110/3/2006/ISH.II]  
S.K. Srivastava, Jt. Secretary.

Dhanbad, the 25<sup>th</sup> November, 2008

G.S.R. 215 – In exercise of the powers conferred on me under sub-regulation 123(6)(b)(ii) of Coal Mines Regulations, 1957 and regulation 124(6)(b)(ii) of Metalliferous Mines Regulations, 1961, I, M.M. Sharma, Chief Inspector of Mines also designated as Director-General of Mines Safety hereby declare 31<sup>st</sup> December, 2008 as date from which following

item will not be used in Coal Mines and Metalliferous Mines unless the same has been approved by me by a general or special order in writing:

1. Dust Suppression/Prevention device in drilling and boring equipment.

[No.16(38)79-Genl-6095]

M.M. Sharma, Director-General of Mines Safety.

New Delhi, 5<sup>th</sup> December, 2008

No.A-32012/5/2008-ISH.II – The President is pleased to appoint Shri HK Srivastava to the post of Director of Mines Safety (Mechanical) in the Directorate-General of Mines Safety, Dhanbad in the pre-revised pay scale of Rs.14,300-400-18,300/-, with effect from 1.11.2008 (F/N) and until further orders.

Subhash Chand, Under Secretary.

## Circulars – 2008

**No. DGMS(Approval)Circular No./01    Dhanbad    Dated the 12th Feb. 2008**

To

Owner / Agent / Manager of all Coal Mines

Sub. : Calibration & maintenance of Oldham make Gas Detectors, Environmental Monitoring Systems type CGA etc.

M/s industrial Scientific Corporation, USA has taken over M/s Oldham France, SA including all liabilities as informed to DGMS vide their letter dated 28.6.2007. M/s Industrial Scientific Corporation, USA has further informed that they have appointed M/s Respo Products, Agra as their authorized agent in India in respect of supply of spare parts, maintenance and calibration of Gas Detection equipments like digital oxymeter, explosimeter, digital toximeter, multi gas detector and Environmental Monitoring system, type CGA. They have also informed that M/s Respo Products, Agra has full fledged office at Dhanbad, Asansol and Nagpur employing Oldham trained personnel capable of executing any support at the site.

You may therefore, like to make use the facilities rendered by M/s Respo Products in respect of all gas detection equipments manufactured by the then M/s Oldham France, SA.

**No. DGMS(Approval)Circular No./02    Dhanbad Dated the 22<sup>nd</sup> April, 2008**

To

Owner / Agent / Manager of all Oil Mines

Sub. : Emergency Escape Device & Escape Line

It is mandatory under Reg 28(1) of Oil Mines Regulation 1984 that on every derrick there shall be installed and maintained an Emergency Escape Device along with properly secured escape line so that persons can come down safely from monkey board to ground level in an emergency situation. It should be of adequate strength and safe to travel.

A Notification NO. 16(38)79-Genl/1104 dated 22<sup>nd</sup> April, 2008 had been forwarded to publish in the Gazette of India is reproduced below for information and taking necessary step to comply with the requirement of the same.

“In exercise of the powers conferred on me under sub-regulation (i) of Regulation 73 of Oil Mine Regulation 1984, I, M M Sharma, Chief Inspector of Mines also designated as Director General of mines Safety hereby declare 1st June 2008 as date from which all type of Emergency Escape Device and Escape Line for installation on derrick to be used in Oil Mines will be of such type standard and make as approved by me by a general of special order in writing.”

You are being informed in advance to take necessary action to see that it is implemented.

**No. DGMS(Approval)Circular No./03     Dhanbad Dated the 22<sup>nd</sup> July 2008**

To

Owner / Agent / Manager of all Oil Mines

Sub. : Emergency Escape Device & Escape Line

It is mandatory under Reg 29(1) of Oil Mines Regulation 1984 that on every derrick there shall be installed and maintained an Emergency Escape Device along with properly secured escape line so that persons can come down safely from monkey board to ground level in an emergency situation. It should be of adequate strength and safe to travel.

This circular is issued in continuation of our earlier circular No. DGMS (Approval) circular No. 2 dated 22<sup>nd</sup> April 2008.

A Notification NO. 16(38)79-Genl/1104 dated 22<sup>nd</sup> April, 2008 published in the Gazette of India Part II Sec 3 (i) on 17.5.2008 is reproduced below for information and taking necessary step to comply with the requirement of the same.

“In exercise of the powers conferred on me under sub-regulation (i) of Regulation 73 of Oil Mine Regulation 1984, I, M M Sharma, Chief Inspector of Mines also designated as Director General of mines Safety hereby declare 1st June 2008 as date from which all type of Emergency Escape Device and Escape Line for installation on derrick to be used in Oil Mines will be of such type standard and make as approved by me by a general of special order in writing.”

A copy of Gazette notification is enclosed herewith.

**No. DGMS(Approval)Circular No./04     Dhanbad Dated the 22<sup>nd</sup> July 2008**

To

Owner / Agent / Manager of all Coal and Metal Mines

Sub. : Audio Visual Alarm for surface transportation Machineries & other Heavy earth Moving Machineries.

A no. of accidents had occurred during reversing of surface transportation machineries like dumpers, truck, tippers and other HEMM like payloaders, shovels etc. Attention to mining industries was drawn vide circular no. 7 of 1977, circular no. 12 of 1999, DGMS(Tech)Circular No. 9 of 2003 recommending specifications of Audio-Visual – alarm but it revealed during inspection that in most of the machineries Audio-visual-Alarm have not been provided and where ever provided most of them were non functioning.

Hence, it has been decided that to have a better quality products in mines the Audio visual-alarm should be of approved type and make.

A Notification No. 16(38)79-Genl/1973 Dated 22<sup>nd</sup> July 2008 had been forwarded to publish in the Gazette of India is reproduced below for information and taking necessary step to comply with the requirement of the same.

“In exercise of the powers conferred on me under sub-regulation 3 of Regulation 181 of Coal Mines Regulation, 1957, I, M M Sharma, Chief Inspector of Mines also designated as Director General of mines Safety hereby declare 1st September 2008 as date from which “Audio Visual Alarm” for reversing of surface transportation machineries & other Heavy Earth Moving Machineries will not be used in mines unless the same has been approved by me by a general or special order in writing.”

You are being informed in advance to take necessary action to see that it is implemented.

**No. DGMS(Approval)Circular No./05      Dhanbad Dated the 25. 11. 2008**

To

Owner / Agent / Manager of all Coal and Metal Mines

Sub. : Approval of Dust Suppression/Prevention system in Drilling Machines used in mines.

During any operation of drilling or boring on surface or underground a device shall be provided for dust suppression / prevention in equipments and kept in operation to prevent liberation and accumulation of air borne dust in the atmosphere.

During the inspections it was observed that the devices used for Dust Suppression / Prevention Systems dose not function effectively and properly.

Hence, it has been decided that to have a better quality products in mines the Dust Suppression/Prevention System in Drilling and boring machines use in mines should be of approved type and make.

A Notification No. 16(38)79-Genl/6095 dated 25.11.2008 had been forwarded to publish in Gazette of India is reproduced below for information and taking necessary step to comply with the requirement of the same.

GSR ..... In exercise of the powers conferred on me under Regulation 123(6)(b)(ii) of Coal Mines Regulation, 1957 and Regulation 124(6)(b)(ii) of Metialliferous Mines Regulation 1961, I, M M Sharma, Chief Inspector of Mines also designated as Director General of mines Safety hereby declare 31<sup>st</sup> December 2008 as date from which following item will not be used in Coal Mines and Metalliferous Mines unless the same has been approved by me by a general or special order in writing.

1. Dust Suppression / Prevention device in drilling and boring equipment.

You are being informed in advance to take necessary action to see that it is implemented.

**No. DGMS(Legis.)Circular No.1 of 2008      Dhanbad Dated the 12.02. 2008**

To

Owner / Agent / Manger of all Coal Mines

Sub. : Approval of Safety Goggles, Reusable Earplug, Visibility Harness and Dust Respirator.

Notification no. 16(38)79-Genl/5102 dated 14.11.2007, published in the Gazette of India, Part-II Sec 3(i) on 01.12.2007 vide GSR-261 is reproduced below for information and taking necessary steps to comply with the requirements of the same.

“In exercise of the powers conferred on me under Regulation 191(B) of the Coal Mines Regulations, 1957, I. M M Sharma, Chief Inspector of Mines also designated as Director General of mines Safety hereby declare the following safety items to be used in coal mines to protect the persons employed therein from undue hazardous conditions like noise, dust, visibility and for proper identification of persons with visibility harness, with immediate effect, in a kit form for easy carrying”.

1. Safety Goggles.
2. Reusable Earplug.
3. Visibility Harness and
4. Dust Respirator.

**No. DGMS(Legis.)Circular No.2 of 2008     Dhanbad Dated the 12.02. 2008**

To

Owner / Agent / Manger of all Metalliferous Mines

Sub. : Approval of Safety Goggles, Reusable Earplug, Visibility Harness and Dust Respirator.

Notification no. 16(38)79-Genl/5102 dated 14.11.2007, published in the Gazette of India, Part-II Sec 3(i) on 01.12.2007 vide GSR-260 is reproduced below for information and taking necessary steps to comply with the requirements of the same.

“In exercise of the powers conferred on me under Regulation 182(B) of the Metalliferous Mines Regulations, 1961, I. M M Sharma, Chief Inspector of Mines also designated as Director General of mines Safety hereby declare the following safety items to be used in coal mines to protect the persons employed therein from undue hazardous conditions like noise, dust, visibility and for proper identification of persons with visibility harness, with immediate effect, in a kit form for easy carrying”.

1. Safety Goggles.
2. Reusable Earplug.
3. Visibility Harness and
4. Dust Respirator.

**DGMS (Tech)(SOMA) Circular No.1 of 2008     Dhanbad, dated 4.1.2008**

To,

The Owner, Agent and Managers,  
of all mines.

Sub:     Recommendations of 10<sup>th</sup> National Conference on Safety in Mines held on 26<sup>th</sup> & 27<sup>th</sup> December 2007 at New Delhi.

You may be aware that the 10<sup>th</sup> National Conference on Safety in Mines held on 26<sup>th</sup> & 27<sup>th</sup> December 2007 at New Delhi. Besides reviewing the status of implementation of the recommendations of Ninth Conference on Safety in Mines, the conference had deliberated upon and had made valuable recommendations on the following subjects:

1. Contractor Work Vis-à-vis Safety.
2. Safety Issues in Mines in Unorganized Sector.
3. Occupational Health Surveillance & Notified Diseases.
4. Mechanization with a view to Phase-out Manual loading & to improve Safety Standards.
5. Reduction of Risk from Roof and Side Falls in Coal Mines.
6. Safety of contractor’s workers and Implementation of “Cold Work Permit” in Oil Mines.
7. Belowground Communication and Tracking System.
8. “Safety Management System” Strategies for Implementation and Path Forward.
9. Implementation of ILO Convention No. 176 in Mines.

The recommendations of the conference are hereby being brought to your attention for information and necessary action.

**RECOMMENDATIONS OF THE TENTH CONFERENCE ON SAFETY IN MINES HELD ON 26<sup>th</sup> AND 27<sup>th</sup> November 2007, AT NEW DELHI.**

- 1.0 Review of Status of Implementation of Recommendation of the 9<sup>th</sup> Conference on Safety in Mines:
- 1.1 Necessary facilities for monitoring the environmental parameters in respect of Methane & Carbon Monoxide should be provided at mines. Facilities of continuous type monitoring should be installed within two years in all degree III gassy coal mines and in such other mines having active underground fire. Indigenous manufacturers should be encouraged to manufacture necessary equipments. Time bound programme is to be made, which should be decided in a tripartite committee at company level.
- 1.2 In mines where long or arduous travel is involved, arrangement for transport of men should be made. Time bound programme is to be made, which should be decided in a tripartite committee at company level.
- 1.3 In respect of small-mechanized mines, which are operating in non-coal sector, it may not be feasible for a small organization to create a special department on Occupational Health Services. For such small mines, it is suggested that an Association of small mines operators creates common facilities and infrastructure for occupational health services. Creation of such facilities is specially needed for asbestos, manganese and mica mines.

Simultaneously with creation of facilities for occupational health services, it is also necessary to improve quality of life of employees working in mining industry by provision of well planned housing colonies provided with all modern facilities such as good drinking water, good sanitation, drainage and recreational facilities. DGMS should collect complete information as adequate feed back has not been received.

- 1.4 Development of a portable instrument for detecting the hidden slips in the roof of coalmines should be taken up on priority by R&D organizations. The instrument should be developed by a S&T project which should be guided by a committee consisting of an officer from DGMS and others from Coal Industry and Research Organizations.
- 1.5 All front-line supervisory officials like Sirdars / Mates, Overmen /Foremen, Surveyors, Electrical/ Mechanical supervisors/Chargemen / Foremen as well as persons supervising other surface operations should be imparted structured training in safety management, for at least two weeks, once in every five years, covering about 20% strength every year.
- 1.6 The recommendations of DGMS (Tech) Circular No.18 of 1975 shall be implemented forthwith. (Protection of workers against Noise & Vibration in Working Environment.)
- 1.7 Audiometry should be introduced, as a part of mandatory medical examination, for persons seeking employment in mines and for persons engaged in operations/areas where noise level exceeds 90 dB(A).
- 1.8 (a) Before the valid gate pass is issued for entry of trucks and other vehicles not belonging to management into the mine, the mine engineer should check the road-worthiness of such vehicles.
- (b) In order to check entry of unauthorized vehicles in mine premises, each mine should establish properly manned check gate(s) at the entrance(s) where record of entry and exit of each such vehicle should be maintained.



- 1.9 Persons engaged in surface operations and, in particular, the contractors' workers, who incidentally are often inexperienced and least informed about job-safety matters, need closer and more competent supervision. To minimize accidents due to surface operations it would be ensured that:
- (a) All persons engaged at any work within the mine premises through the contractors have received relevant training and other job-related briefings and that the drivers of vehicles belonging to contractors entering the mine premises have additionally been explained the salient provisions of "traffic rules".
  - (b) Each mining company should draw up appropriate training schedules and modalities in this regard and implement the same.
  - (c) In case of smaller mines, such arrangement may be made by association of mine operators.

#### 1.10 Preventing Mine Disasters from Inundation

##### 1.10.1 Recommendations of 6th Conference on Safety in Mines –

- (a) to evolve suitable cadre structure for mine surveyors and up gradation of their skill by availing facilities at various institutions, appointment of qualified surveyors.
- (b) providing infrastructure including computerized facility at area level to oversee survey work of the mine etc. may be implemented.

1.10.2 R&D efforts should be continued to develop a system for construction of water-tight chamber as last refuge below ground in case of inundation.

#### **1.11 Preventing Mine Disasters from Fire, and Effective Emergency Response**

1.11.1 Considering the risk of fire, all coal mine companies shall rank its coalmines on a uniform scale according to its risk from fire on scientific basis. Guidelines may be framed by DGMS and circulated to all mining companies.

1.11.2 Each mining company shall formulate and implement structured training programme for development of awareness and increasing effectiveness of emergency response in case of fire amongst work persons, officials and management.

#### **1.12 Quality Control for Improving Safety**

1.12.1 Each large mining company may setup quality control cell or strengthen where the same exist, identify critical items which require testing for quality assurance at the time of procurement and during use and arrange testing of the same. Testing facilities may be setup wherever feasible

1.12.2 Any defect or failure of approved items or those having BIS certification may be promptly brought to the notice of the appropriate authority for further action.

**1.13 Safety in Oil mines – Blowout and Fire hazards**

**1.13.1 Precautions Against Blowout:**

Each oil company shall frame an action plan to provide following safety devices in all the drilling rigs:

(a) Pit level indicator registering increase or reduction in the drilling mud volume with an audio-visual warning device near the driller's stand,

(b) A gas detector or explosimeter at the primary shale shaker with audio-visual warning device near the driller's stand,

(c) A device to accurately measure the mud required to keep well filled at all the time, and

(d) A device to ensure filling of the well with mud when string is being pulled out.

**1.13.2 Precautions Against Fire**

Plans of pipe lines of flowing wells connected with group gathering stations shall be up-dated showing villages, surface features, location of valves etc. and copy of such plans shall be displayed at every group gathering station.

**1.14 Occupational Health Surveillance in Mining Industry**

1.14.1 All chest radiographs of Initial and Periodical Medical Examinations in private mines shall be classified for detection, diagnosis and documentation of pneumoconiosis in accordance with ILO classification for pneumoconiosis.

1.14.2 The PME Medical Officer in every PME centre of private mines shall be trained in occupational health and use of ILO classification for pneumoconiosis.

1.14.3 Each mining company operating mechanized mines shall set up an Occupational Diseases Board consisting of one occupational Health Physician, one radiologist and one general physician

**1.15 Increasing Effectiveness of Worker's Participation in Safety Management**

1.15.1 All private mechanized mines and mines using heavy earth moving machinery for exploitation of minerals, where 100 (hundred) or more number of workers are employed, should appoint Workmen's Inspectors.

1.15.2 In large mines sectional/departmental safety committees under the main safety committee may be constituted for specific area of operation.

**2.0 Contractor work vis-a-vis Safety**

**2.1 Employer's responsibilities**

- (a) Incorporate suitable clauses (in consistence with risk of the work allotted) shall be included in tender document (including NITs) stating how the risk arising to men & material from the mining operation / operations to be done by the contractors shall be managed.**
- (b) Ensure that contractors are familiar with the relevant parts of the statute, health and safety management system and are provided with copies of such documents prior to commencing work.**
- (c) Ensure that contractor's arrangements for health and safety management are consistent with those for the mine owner. All the rules, regulations and bye-laws as applicable to the mine owner are also applicable to the contractor. Details of the contractors' workmen should be maintained in the owner's Form-B Register. Whereas, C, D & E Registers for contractor men may be maintained independently by the owner. All the above Registers shall be kept in the mine office of the manager.**
- (d) Ensure that contracts should preferably be of longer period (three years), so that there is adequate scope of management of safety by the contractor.**
- (e) Ensure that contractor's provide the machinery, operator and other staff with written safe work procedures for the work to be carried out, stating clearly the risk involved and how it is to be managed.**
- (f) Monitor all activities of the contractors to ensure that contractors are complying with all the requirements of statute and the system related to safety. If found non-compliant of safety laws directing the contractor to take action to comply with the requirements, and for further non-compliance, the contractor may be suitably penalized. Clause to this affect may be a part of the agreement between the employer and the contractor.**
- (g) Where a risk to health or safety of a person arises because of a non-compliance directing the contractor to cease work until the non-compliance is corrected.**

**2.2 Contractor's responsibilities**

- (a) Prepare written Safe Operating Procedure (SOP) for the work to be carried out, including an assessment of risk, wherever possible and safe methods to deal with it/them.**
- (b) Provide a copy of the SOP to the person designated by the mine owner who shall be supervising the contractor's work.**
- (c) Keep an up to date SOP and provide a copy of changes to a person designated by the mine owner.**
- (d) Ensure that all work is carried out in accordance with the Statute and SOP and for the purpose he may deploy adequate qualified and competent personnel for the purpose of carrying out the job in a safe manner.**
- (e) For work of a specified scope/nature, develop and provide to the mine owner a site specific code of practice.**

- (f) **Ensure that all sub-contractors hired by him comply with the same requirement as the contractor himself and shall be liable for ensuring compliance all safety laws by the sub or sub-sub contractors.**
- (g) **All persons deployed by the contractor for working in a mine must undergo vocational training, initial medical examination, PME. They should be issued cards stating the name of the contractor and the work and its validity period, indicating status of VT & IME.**
- (h) **Every person deployed by the contractor in a mine must wear safety gadgets to be provided by the contractor. If contractor is unable to provide, owner/agent/manger of the mine shall provide the same.**
- (i) **The contractor shall submit to DGMS returns indicating – Name of his firm, Registration number, Name and address of person heading the firm, Nature of work, type of deployment of work persons, Number of work persons deployed, how many work persons hold VT Certificate, how many work persons undergone IME and type of medical coverage given to the work persons. The return shall be submitted quarterly (by 10th of April, July, October & January) for contracts of more than one year. However, for contracts of less than one year, returns shall be submitted monthly.**

### **2.3 Employee's responsibilities**

- (a) **An employee must, while at work, take reasonable care for the health and safety of people who are at the employee's place of work and who may be affected by the employee's act or omissions at work.**
- (b) **An employee must, while at work, cooperate with his or her employer or other persons so far as is necessary to enable compliance with any requirement under the act or the regulations that is imposed in the interest of health, safety and welfare of the employee or any other person.**

### **3.0 Safety Issues in mines in unorganized sector**

- 3.1 **The States in general may grant mining/quarrying leases of a size not less than ten hectares each for an appropriate period, depending on technical feasibility, so that the lessee can make medium to long-term plan for investment in infrastructure and work the mines in a safe and scientific manner. In case smaller lease needs to be granted, it should be ensured that the Central Laws, including the Mines Act are complied with.**
- 3.2 **In case of stone quarries on hillocks, whole of the hillock should be given out as a single lease so that necessary development could be done from top-downwards after making approach road to reach to top of the hillock before starting extraction of stone. A condition to this effect may be incorporated before granting such leases.**
- 3.3 **In the lease document, reference should be made to the Mines Act and the Rules and Regulations made there under for compliance. The DGMS may prepare, in consultation with Ministry of Mines a model document for grant of leases by the state governments so that the conditions of leases are such that there is a uniformity and compliance with central laws.**
- 3.4 **A copy of the lease document should be sent to the DGMS and lessees explicitly asked to send notice of opening of mine to DGMS in accordance to the Provisions of the Mines Act.**

- 3.5 The Conference has noted that there have been instances where leases have been granted in some States in close proximity of inhabited area and within 45 m of Railway acquired land and land acquired for National and State highways, public works without consulting the appropriate statutory authority. The conference recommends that the States may grant mining leases in conformity of Central Laws.
- 3.6 DGMS should organize Orientation Programmes for officers of State Mines and Geology Departments to inform them about safety laws.

**4.0 Occupational Health Surveillance and Notified Diseases.**

4.1 Noise mapping should be made mandatory of various work places in the mine premises based on the various machines being used in concerned mines along with personal noise dosimetry of individual workmen exposed to noise level above 85 dbA.

4.2 Vibration studies of various mining machinery required to be done before their introduction in mining operations as per ISO standards. .

4.3 Ergonomical assessment of all latest machines, before their introduction into mining operation as per ISO standards. Ergonomical assessment should include:

\* Assessment of work process.

\* Assessment of working Aids/tools

\* Assessment of working posture

- 4.4 Potability test of drinking water supplied to the mine employees, to be made mandatory once in a year irrespective of its source, preferably after Rainy seasons, the sample of water should be collected from the points of consumption
- 4.5 Initial medical examination is shall be made mandatory for all mining employees whether permanent, temporary or contractual, before they are engaged in any mining job.
- 4.6 The frequency of periodic medical examinations should be brought down from existing five years to three years for the mining employees above 45 years of age. This should be implemented in three years.
- 4.7 Standards of medical examinations for both Initial and Periodic should be modified as mentioned below in order to ensure early diagnosis of more diseases caused or get aggravated due to employment in mines.
- (a) In addition to measurement of blood pressure detailed cardiovascular assessment of employees should be done. This should include 12 leads electrocardiogram and complete lipid profile.
  - (b) Detailed neurological examinations including testing of all major superficial and deep reflexes and assessment of peripheral circulation to diagnose vibrational syndromes.
  - (c) In addition to routine urine, fasting and post-parandial blood sugar should be included for early diagnosis of diabetes mellitus.
  - (d) Serum Urea and Creatinine should be included for assessment of Renal function.
  - (e) Haematological tests like Total count, Differential count, Haemoglobin% and Erythrocyte Sedimentation Rate should be included to diagnose Blood Dyscrasias.

- 4.8 Special tests should be included in the PME for employees exposed to specific health hazard;
- a. For employees exposed to manganese, special emphasis should be given to behavioral and neurological disturbances such as speech defect, tremor, impairment of equilibrium, adiadochokinesia H2S and emotional changes.
  - b. For persons exposed to lead, PME should include blood lead analysis and delta aminolevulinic acid in urine, at least once in a year.
  - c. Employees engaged in food handling and preparation and handling of stemming material activities should undergo routine stool examination once in every six months and sputum for AFB and chest radiograph once in a year.
  - d. Employees engaged in driving/ HEMM operation jobs should undergo eye refraction test at least once in a year.
  - e. Employees exposed to ionizing radiation should undergo Blood count at least once in a year.
- 4.9 It is proposed to include following diseases in the list of Notified diseases under Section 25 (1) of Mines Act, 1952.
- (a) All other types of Pneumoconiosis excluding Coal workers pneumoconiosis, Silicosis and Asbestosis. This includes Siderosis & Berillysis.
  - (b) Noise induced hearing loss.
  - (c) Contact Dermatitis caused by direct contact with chemicals.
  - (d) Pathological manifestations due to radium or radioactive substances.
- 4.10 For smaller mines where PME facilities are not existing, medical examinations can be done through other competent agencies.

**5.0 Mechanization with a view to phase-out manual loading & to improve safety standards.**

- 5.1 Keeping in view the objective of phasing out manual loading, all coal companies shall identify appropriate technology suitable for the prevailing geo-mining conditions and introduce the same in such a manner so as to phase out manual loading operations completely within a period of five years in coal seams with gradient of 1 in 5 or less, and within a period of seven years in coal seams with gradient steeper than 1 in 5.
- 5.2 While formulating the strategies for face mechanization in underground workings, it shall be ensured that back up facilities like coal evacuation, support system, ventilation arrangements etc. are compatible with face mechanization
- 5.3 The scheme of face mechanization shall be based on proper scientific investigation. The scheme shall also include arrangements for monitoring strata behavior and environmental conditions
- 5.4 Possibility of deployment of multi-skilled miners in the face shall be explored to reduce the exposure at hazardous area without affecting employment

- 5.5. Suitable training for efficient & safe operation of machinery shall be imparted to all concerned.
- 5.6 While planning for face mechanization, due considerations shall be given for long term sustainability of the technology
- 5.7 **A policy document shall be framed by each coal mining company within a period of six months for addressing the implementation issues. It shall also be ensured that all safety features are inbuilt into the system.**

**6.0 Reduction of risk from roof and side falls in coal mines**

- 6.1 In every coal mining company, STRATA CONTROL CELL shall be established at corporate and area levels within a period of one year, to assist mine managers, for formulation of Systematic Support Rules, monitoring strata control measures in a scientific way to ensure efficacy of support system and for procurement/supply of quality supporting materials. Such cell shall be manned by adequate number of technical personnel headed by a senior official not below the rank of General Manager at Corporate level and Dy. General Manager at Area level.
- 6.2 Roof bolting shall be used as a primary means of support for freshly exposed roof in development as well as depillaring districts. For the roof category "Poor", having value of RMR of 40 or less, or where there is excessive seepage of water from the roof strata, roof bolts exclusively with resin capsules shall be used to ensure adequate & immediate reinforcement of the strata
- 6.3 Due emphasis shall be given to support the sides of galleries while framing Systematic Support Rules.
- 6.4 Suitable steps shall be taken by the mining companies to inculcate a culture of "no work at face" other than supporting work, till the roof is supported by roof bolts up to at least 0.6 meter from the face.
- 6.5 To ensure proper drilling for roof bolting in all types of roof strata, suitable fit-for-use roof bolting machines shall be introduced in all mines within a period of one year. Such machines shall be capable of being operated from a distance or be provided with suitable canopy to protect the supporting personnel during drilling or bolting operations.
- 6.6 Risk assessment exercise shall be carried out in the mines for assessing the risk from the hazards of roof & side falls and identifying the control mechanism with specific responsibility for implementation. This exercise shall be reviewed at regular intervals not exceeding a year
- 6.7 Each company shall take steps to impart structured training to officers, supervisors and support personnel on roof bolting

**7.0 Safety of Contractor Workers and Implementation of "Cold Work Permit" in Oil mines.**

**7.1 Contractor workers:**

- (a) Before the commencement of the work by the contractor the job shall be thoroughly assessed for potential hazards and risks to the contractor worker and appropriate measures shall be taken to mitigate them.
- (b) Adequate supervision by the management shall be provided for the work to be carried out by the contractor.
- (c) Frequent change of contractual employee shall not be allowed.

## 7.2 Issue of cold work permit

- (a) Where the risk arising from the work to be performed under given circumstances at the installation, demands a stringent system of control to ensure safety of work persons, the management shall ensure that such work is carried out only by issuing a cold work permit.
- (b) The cold work permit shall be in a standardized format specifying place, time, date, duration of such work, the precautions to be taken and other relevant details.
- (c) Relevant training shall be imparted to all concerned for successful implementation of cold work permit

**Definition:** “Cold work” means any work which is of non-routine nature so identified by the manager.

## 8.0 Belowground Communication and Tracking System

- 8.1 All belowground mines shall be provided with efficient voice communication from the working districts/places to the surface,
- 8.2 Mining companies in collaboration with research institutions/ equipment manufacturers shall initiate and fund for, suitable research initiatives for establishment of appropriate communication system for below ground mines including to locate the trapped miners,
- 8.3 Mine management in collaboration with equipment manufacturers shall evolve a system of proximity warning device in HEMM and initiate measures for its implementation,

All the recommendations should be complied within a period of four years.

## 9.0 “Safety Management System”: Strategies for Implementation and Path Forward

- 9.1 Every mine should employ a sound risk analysis process, should conduct a risk assessment, and should develop a safety management plan to address the significant hazards identified by the analysis/ assessment.
- 9.2 The managements of every mining company should adopt the process of safety management system and commit itself for proper formulation and implementation of the same in totality. Necessary resources should be allocated for implementation of the control measures identified by the risk assessment process.
- 9.3 Necessary training of all employees of mining companies should be organized with the help of experts, both national and international, for optimal adoption of the safety management system.

## 10.0 Implementation of ILO Convention No.176 in mines

The Committee decided that a separate discussion be held by the Govt. of India in a tripartite forum to deliberate on the implications arising out of ILO Convention No.176.



**DGMS (Tech)(SOMA) Circular No.02**

**Dhanbad, Dated 12th Feb. 2008**

To,  
The Owner, Agent and Managers of all mines.

Sub: - Corrigendum to DGMS (Tech)(SOMA) Circular No. 1 dated 04.01.2008 on Recommendations of 10th National Conference on Safety in Mines held at New Delhi.

The recommendations of 10th National Conference on Safety in Mines held at New Delhi were circulated vide above Circular. However due to oversight, the dates of the conference were wrongly mentioned. The dates of the conference should be read as 26th & 27th November, 2007 instead of 26th & 27th December, 2007 both in the subject as well as in the body of the circular.

It is once again requested to ensure the compliance of the Recommendations at the earliest.

**No. DGMS(Tech.) (S&T)/Circular No.1/697 Dhanbad, dated the 14.08. 2008.**

To  
The Owner, Agent & Manager of Coal and Oil Mines

Sub: Fire Suppression and Control System to be used in Mines.

Sir,

As we all are aware that Underground or surface fires, spontaneous heating or combustion in coal Mines as well as fires in machinery, plants and other installations pose not only serious threats to the life and property of the mines but also disrupts the normal operation of the mine resulting in immense loss to the organization. Adequate statutory provisions regarding precautions against spontaneous heating and fires have been made in the Coal Mines Regulations, 1957, Oil Mines Regulations 1984 including the Mines Rescue Rules, 1985.

Based on various accidents and dangerous occurrences in mines both belowground as well as on surface, a number of technical circulars have been issued from this Directorate to guard against dangers due to spontaneous heating and fire. During the recent past, the use of heavy earth moving machineries (HEMMs), in large numbers and capacities, for excavating, loading and transport of minerals including coal has exponentially increased resulting in increase in number of accidents due to fires in HEMMs in opencast mines. Various types of fire fighting arrangements and equipments are being used in mines in accordance with the provisions of regulations.

The fire fighting technologies and fire suppression systems have advanced further which are more fast and effective to deal with fires either on surface or belowground including heavy earth moving machinery. A few of such technology is backpacked and handheld High Pressure Water Mist cum CAFs based fire fighting system which is applicable to quench not only oil fires but even electrical fires upto 36 KV line. Automatic Fire Detection and suppression system based on Fall of Pressure principle of detection and actuation is also a fail safe system. Similarly, Nitrogen mixed aqueous foam at pressure is applicable to quench both active and passive fires belowground as well as surface. Similar technologies are being used for various purposes.

The use of improved diesel engines with efficient and effective fuel injection system integrated with modern electronic or electro mechanical control systems in the vehicles and also different types of motors used as drives in machinery and plants have made the system more complex. In order to detect fire at initial stages, various techniques of automatic fire detection and suppression system have been developed and being used in the mines, machinery and plants. However the proper functioning of such fire detection and suppression system is not ensured due to which a number a accidents have been reported resulting in loss of human lives and property. A number of circulars have also been issued

from this Directorate to provide automatic fire detection and suppression system in every earth moving machinery and plants. This subject was also deliberated and discussed during 8<sup>th</sup> and 9<sup>th</sup> Conference on Safety in Mines. However the compliance has been reported to be not encouraging.

It has also been reported that a number of toxic and non biodegradable chemicals are being used as ingredients in the fire fighting and suppression systems by various companies which are not only dangerous to human lives but also harmful to soil, water, flora and fauna in and around the mining areas. In view of the above, it is required that the use of fire fighting and suppression systems should be checked and controlled before being allowed to be used in the mines, Oil and Gas Fields.

It is, therefore decided that all the fire fighting and fire suppression systems including automatic fire detection and suppression systems to be used in HEMMS, materials and chemicals to be used in fire fighting or suppression systems in mines both on surface and belowground including oil and gas mines/fields should be of a type and make approved in writing from this Directorate.

A Notification No. DGMS/S&T/FFS/696 dated 14<sup>th</sup> August 2008 in this regard has been forwarded to be published in the Gazette of India and the subject matter thereof is reproduced below for information and taking necessary actions to comply with the requirement.

“In exercise of the power conferred on the Chief Inspector of Mines also designated as Director General of Mines Safety under sub-regulation (3) of Regulation of 181 of the Coal Mines Regulation, 1957 as well as sub regulation (1) of regulation 73 of the Oil Mines Regulations 1984, I hereby declare 1<sup>st</sup> November, 2008 as the date from which all types of fire fighting and fire suppression systems including automatic fire detection and suppression systems to be used in HEMMs, materials and chemicals to be used in fire fighting or suppression systems in mines both on surface as well as belowground including oil and gas mines/fields, will be of such type, standard and make as approved by me by a general or special order in writing.”

You are being informed in advance to take necessary steps in this regard and requested to ensure that it is implemented and complied with.

**DGMS(Tech.) (S&T)/Circular No.2/700 Dhanbad, dated 14.08.2008**

To

The Owner, Agent & Manager of Coal Mines

Sub: Use of Chemical Additives for Dust Suppression in Coal Mines

Sir,

Dust in coal mines is the primary cause of concern due to its being not only hazardous to human health but also dangerous due to being catalyst for ignition and explosion in coal mines. Coal Workers Pneumoconiosis as well as Silicosis is the two major occupational diseases notified under the Mines Act, 1952. the exposure of workers to airborne respirable dust leads to such diseases. A number of statutory provisions against dangers from airborne respirable dust have been made in the Coal Mines Regulations, 1957. medical examination of workers as well as study of personal exposure to dust profiles is normally carried out to a certain the conditions of health of workers exposed to airborne respirable dusty environment.

To prevent dust getting airborne and dangerous to persons working in the mines, many companies have developed chemical additives to be used as dust suppressant. Such chemical additives were tried in India also for dust suppressing in mines. However, it is reported that some toxic and hazards chemicals are being used in such dust suppressant materials.

In order to prevent use of such type of hazardous chemicals in mines, Ministry of Environment and Forest, Government of India, constituted a committee to examine environmental issues pertaining to the use of chemical additives for suppression of dust in coal mines. The recommendations of the committee

were forwarded to the Ministry of Coal, Ministry of Labour and Employment and other concerned. Thereafter, it was decided by the Ministry of Environment and Forest that the Director General of Mines Safety would be the nodal agency to issue national certification/technical certificate to the industry regarding toxic effect of chemicals. The Ministry further recommended that the manufacturers of chemicals used in suppression of dust in coal mines would apply to the Director General of Mines Safety in the prescribed format, along with a copy of test report to be obtained from the identified national laboratories on the chemical composition of additives. Manufacturers are therefore required to seek approval of the Director General of Mines Safety before their products are use in mining areas. This matter was referred to this Directorate vide letter No. Z-16011/2/2000-CPA dated 30.05.2001 enclosing therewith a copy of the committee's report. The silent points of observations and recommendations of the committee are reproduced below:

Places and operations where dust is generated in open-cast mines are mainly drilling and blasting operations, working faces, shovel loading, dragline operations, coal transportation corridor, loading and transfer points, coal handling plants, coal stockpiles, overburden dumps and coal crushing. In underground mines, the places where dust is generated are extraction faces, transfer points, belt conveyors, drilling and blasting operations.

Most difficult and important areas of dust control are the haul roads in open cast mines. The influencing factors are vehicle speed, concentration of traffic, weight and pay load of trucks, type of material transported, weather conditions and also the condition of the haul roads.

Construction, repair and maintenance of the haul roads in opencast mines are extremely important for dust control. Paving of haul roads can prevent dust generation to a great extent. Water spraying is the most common method of dust control. However, this not so effective in case of coal dust, which is hydrophobic in nature. To reduce the requirement of water and for better dust suppression, chemical additives in water solution could be used for spraying purposes.

Some chemicals are simple wetting agents that enhance water penetration into the soil and increase water retention time, which helps in better dust control whereas some organic chemical form a bond by cementing the loose particles together which helps in suppressing the dust raised along the haul roads.

Some wetting agents are blend of surfactants that can enhance water's ability to 'wet' and suppress the road dust. In most of the coal producing countries such as in Europe, Australia and USA biodegradable and non-toxic substances are permitted for the purpose.

Other set of chemicals are emulsion of semi-liquid resins (60%) and wetting solutions (40%). When mixed with water and applied to dust/soil, forms a strong attachment, which is resistant to leaching or percolation. Such formulations are marketed under various trade names, such as-Penn Suppress EC, Top Sheild, Environkleen, Coherex etc.

The chemicals when sprayed lead to polymeric dust control by forming chains of polymer molecules that are cross-linked in grid-like patters, cementing loose particles together.

Recently, some chemicals extracted from orange peels have made their place in the market. These citrus-based dust control agents are used in water solution and they reduce the surface tension and penetrate deeper into the road surface. They also have humic properties to promote retention of water in the treated material.

Chloride based dust control chemicals are not recommended due to corrosion potential. Waste oil based dust suppressants have been banned in the US and European countries. In Europe, phenol based chemicals have been banned for its harmful effects to human being.

In India, untreated water is most commonly used for suppression of dust in coal mines. Some chemicals are also being marketed, the efficacy of which has not been fully established. Since composition of these chemicals is not disclosed, their side effects, if any, on human being and on the soil as well as ground water are not evaluated before application.

Aspects other than the use of chemical additives to control fugitive dust emissions like compactness of all the roads should also be looked into by the coal mines to reduce the concentration of SPM in coal mines. Some coal mines have carried trials with water chemicals for dust suppression.

The recommendations of the Committee with regards to the specific terms of reference are as follows:

- (1) Environmental issues pertaining to the use of chemical additives for dust suppression

The toxic and hazardous chemical additives can adversely affect the environmental quality and their exposure can be harmful to the human beings if inhaled. Such chemical additives can also affect the surface and ground water quality. Hence, it is essential that only environment friendly chemical additives are used. This will promote water conservation and enhance the efficiency of dust suppression, the use of chemical additives for dust suppression in coal mines may be permitted provided the chemicals are properly tested and certified.

- (2) Testing procedure of chemicals and to identify institutions for testing

At present, there is no laid out procedure for granting certification to the manufacturers for the use of dust suppression chemical additives. In order to streamline the procedure for testing and certification of such chemicals, the Committee recommends the following measures:

- (i) The Director General of Mines Safety should serve (DGMS) as the nodal agency to issue necessary certification;
- (ii) The manufacturers may be advised to apply to the DGMS in the prescribed form, along with a copy of the test report on the chemical characteristics of the additives;
- (iii) The test report should indicate the concentration of all the elements, required as per limit prescribed in the RCRA (Resource Conservation and Recovery Act) of USA or equivalent recognized standards till national standards are developed.

The manufacturers/suppliers should be responsible to provide test reports on compliance of RCRA limits. The testing should be done in any of the following institutions:

- National Chemical Laboratory, Pune
- Industrial Toxicology Research Centre, Lucknow
- Indian School of Mines, Dhanbad
- Central Institute of Mining & Fuel Research, Dhanbad

- (iv) The manufacturer/supplier of the chemical additives should provide the following characteristics of their products for seeking clearance from DGMS:

- Specification details like appearance, specific gravity, solid contents etc (sp. Gravity-1.10 to 1.40)
- Solubility-(100% soluble in normal water of pH ranging from 6.5 to 8.0 at NTP)
- Wetting-(The chemical and its admixed form on application at surface body should have minimum of 70% water holding capacity up to 24 hours of applications at N.T.P.)
- Agglomeration-(The chemical or its admixed form on application should be capable for developing agglomeration on the surface bed with minimum of 2mm layer after three consecutive applications.)
- Methods of application including mixing ratio and frequency
- Hazardous and toxic ingredients-(As per R.C.R.A norms, The US environmental Protection Agency (USEPA) under the Resource Conservation & Recovery Act(RCRA), 1976) governs land

deposals of solid wastes which generally required testing for 8 elements of concern (Arsenic, Barium, Cadmiums, Chromium, Lead, Mercury, Selenium, Silver etc.)

- Precaution for use and personal safety
- Safety measures for storage, transportation, handling of spills, container disposal, fire/explosion hazards
- Contact Telephone nos. and address for other information etc.

According to EPA guidelines, a waste is categorized possessing toxic or hazardous characteristics, if it produces a leachate that contains any of the above elements in concentration more than 100 times the primary drinking water standards.

The RCRA limits (mg. per liter) are given below:-

Arsenic (As)	:	5
Barium (Ba)	:	100
Cadmium (Cd)	:	1
Chromium (Cr)	:	5
Lead (Pb)	:	5
Mercury (Hg)	:	0.2
Selenium (Se)	:	1
Silver (Ag)	:	1
Ph Value	:	Should be within the range of 6.5 to 8.0 pH
Flash Point	:	Should be more than 175 <sup>o</sup> C
Self Life	:	Minimum 6 months.
Air Permeability	:	(For underground used only)

As per BIS Specification No. 4335/19678 under Clause 3.2.9.3 test for Air/Gas permeability for Product characteristics of Air/Gas absorption which is 1.5 m

Chemical Additives material for dust suppression should have ionizing property as defined in the "Principal of Operation" of DGMS Tech. Circular No. 8, 1997.

(3) Remedial measures to avoid adverse impacts on the environment

In view of the fact that opencast mining is increasing almost by six to seven percent per year, the measures for dust control deserve serious attention.

- (i) To prevent and mitigate adverse impacts on the environment, that above stated measures as recommended by the Committee require strict compliance.
- (ii) As a preventive measure, the haul roads should be paved, to the extent possible, for minimizing the generation of dust.
- (iii) The chemical additives (including chloride based chemicals, water oil and phenol based chemicals) which are banned in other countries should be permitted for use in India.
- (iv) The coal companies should commission systematic studies to assess the effectiveness of chemical additives in reducing the SPM levels and water consumption. Studies should also be commissioned to determine the environmental and health effects. If any, due to use of chemical additives.

In the light of the above, the Directorate General of Mines Safety is issuing no-objection certificate to the manufacturers who apply for certification to their products for use in mines. This is being adopted due to the reason that there does not exist any statutory provision regarding approval of such item in the manifold

in the country and more and more number of large capacity loading and transport machinery are being deployed in the mines causing problems of dust hazards. Therefore, it is essential to have a statutory provision for approval of chemical additives to be used in dust suppressant materials.

In view of the above, it is decided to bring this material under the ambit of approval to be granted by the Chief Inspector of Mines before use in the mines in accordance with the provisions contained under regulation 181(3) of the Coal Mines Regulations, 1957.

A Notification No. DGMS/S&T/DSS/699 dated 14<sup>th</sup> August 2008 in this regard has been forwarded to be published in the Gazette of India and the subject matter thereof is reproduced below for information and taking necessary actions to comply with the requirement.

“In exercise of the power conferred on the Chief Inspector of Mines also designated as Director General of Mines Safety under sub-regulation (3) of Regulation 181 of the Coal Mines Regulations, 1957, I hereby declare 1<sup>st</sup> November, 2008 as the date from which all types of Chemical Dust Suppressant including the additives used therein to be used for suppressing dust in mines, shall be of such type, standard and make as approved by me by a general or special order in writing.”

You are being informed advance to take necessary steps in this regard and requested to ensure that it is implemented and complied with.

**DGMS(Tech.) (S&T)/Circular No.3/703 Dhanbad, dated the 14.08.2008**

To  
The Owner, Agent & Manager of Coal Mines

Subject: Approval of Steel Supports, Roof Bolts, Cement and Resin Grouts to be used in Mines.  
Sir,

In any underground excavations, the stability of roof and sides, not only depends on the nature of rocks but also on the system of supports used therein. Most of the underground accidents especially in coal mines occur due to fall of roof and sides. Almost thirty five to forty percent of the underground fatal accidents occur due to fall of roof and sides. Now a day, timber supports are being replaced by steel supports in the form of props and cogs/chocks in addition to roof bolts with cement or resin grouts.

As per the statutory provisions made in the Coal Mines Regulations, 1957 as well as the Metalliferous Mines Regulation, 1961, the systematic support rules are to be framed by the manager of the mines and the requirement as well as the system of support is to be planned and specified in the SSRs. A number of technical circulars regarding type of supports, code of practices for setting of support, testing, examination and withdrawal of supports have been issued from this Directorate from time to time. However, the fatal accidents due to fall of roof and sides are still recurring of and on in most of the underground coal mines in the country. During the course of inspections as well as enquiries into the accidents due to fall of roof and sides, it has been observed that :-

- Either the required support is not being provided at the working places or the quality of support including support materials such as type of steels used in props/chocks/cogs were not of required strengths and dimensions.
- The welding done to join the cogging members of the cock/cog was not of required standard resulting in failure of cogs/chock at lower loads during use.
- The quality of steel used in the roof bolts was not of required strengths and dimensions. The threading done on the roof bolt was also not treated properly resulting weakness in the rock bolt causing failure from threads during loads.
- Cement Grout is being used in watery strata without assessing the water quality and compatibility with cement grouts in respect of its strength variation with respect to time. In number of cases, the roof falls had occurred along with roof bolts and after testing of the installed bolts in the area it was observed that the bolts were failing at loads varying from 2 to 6 Tonnes.

- The quality of cement grouts used for grouting of the roof bolts was also not checked for required strength and thereby the roof bolts have reportedly failed at less than the required load. In most of the cases, the failure occurred either in the cement steel contact or cement rock contact or at thread of the rock bolt. It has also further been observed that proper pull tests were not being carried out in the mine to ascertain the quality of roof bolts and the grouts before putting in use in the mine. A number of fatal accidents have occurred due to failure of the roof bolts in the working places.
- In some cases, itching and irritations have also been reported due to cement grout solution falling on to the body or into the eyes of the roof bolts grouting crews.
- It is also observed during the course of inspection and enquiry at the mines that no quality checks and procedures are being followed to ensure good quality roof bolts, cement and resin grouts as well as steel cogs and props.
- Resin is also now being used for grouting the roof bolts which provides fast support at the working places especially in the green roof areas. Various types of resins including slow and fast setting types are being used in roof bolting. Since this is a quick setting type of supports suitable for green roof area, it is desired that the quality of the roof bolts and the resins should be ensured to have an effectiveness support in active working areas/places. Short encapsulation pull test is to be conducted to ascertain the load bearing capacity of the support before use of every lot of resin capsules. During the course of inspection and testing of resin bolts, it has been found that-
  - I. The roof bolts has failed from their threads.
  - II. The roof bolts were pulled at very low load due to non setting of the resin.
  - III. The resin grouts had weathered and crumbled into powder form after elapse of 2 to 3 months thereby making the roof bolts ineffective.
  - IV. The Shelf Life of the resin capsule was less than the specified period.
  - V. Expired resin capsules were being used in roof bolting resulting in improper grouting thereby reducing the strength of the roof bolts.

This reveals that a good quality control measures is required to ensure the quality of resin as well as its strength characteristic profile with respect to time.

In order to standardize the system of supports, it is essential to have uniform scale and standard for type of steels to be used for steel props, chocks and cogs including roof bolts. The similar standards would also be required to ensure the quality of cement as well as resin to be used as grouting materials for the support system. Non-toxic and biodegradable chemicals can only be used grouting materials.

It is therefore, decided to include all types of steel supports, roof bolts, cement and resin grouts under item to be approved from this Directorate before use in mines.

A Notification No. DGMS/S&T/SS/702 dated 14<sup>th</sup> August 2008 in this regard has been forwarded to be published in the Gazette of India and the subject matter thereof is reproduced below for information and taking necessary actions to comply with the requirement.

“In exercise of the power conferred on the Chief Inspector of Mines also designated as Director General of Mines Safety under sub-regulation (3) of Regulation 181 of the Coal Mines Regulations, 1957, I hereby declare 1<sup>st</sup> November, 2008 as the date from which all types of steel supports, roof bolts, cement and resin grouts to be used for the purpose of supporting roof and sides of workings in a mine, shall be of such type, standard and make as approved by me by a general or special order in writing.”

You are being informed in advance to take necessary steps in this regard and requested to ensure that it is implemented and complied with.

**DGMS(Tech.) Circular No.6**

**Dhanbad, dated the 26.09.2008.**

To

The Owner, Agent & Manager of Open Cast Coal and Non Coal Mines

Subject: Separate road for Light Motor Vehicles in the Mine Premises of Mechanized Open Cast Coal and Non Coal Mines.

Sir,

It has been observed that a considerable number of fatal accidents occurred in the mine premises of Mechanized Open Cast Mines when Dumpers of high capacity ran over Light Motor Vehicles on the haul roads.

Enquiry into the above accidents revealed that while Light Motor Vehicles plying on the haul roads, enter into the blind zone of the moving Dumpers and the Dumper Drivers unable to spot the Light Motor Vehicles and as a result Dumpers run over the Light Motor Vehicles. Range of Blind zone of the Dumpers varies with the height of Driver's cabin.

Front line Supervisors and Executives traveling in the Light Motor Vehicles along with their drivers are fatally injured in the accidents occurred due to run over of Light Motor Vehicles by the Dumpers on the haul roads.

Not only that, Dumpers are left hand driven whereas Light Motor Vehicles are right hand driven and this create lot of confusions between the Drivers and lead to accidents.

Enquiry also revealed that these accidents could have been averted if the Light Motor Vehicles would not have been allowed to ply on the haul roads and a separate road for Light Motor Vehicles would have been provided and maintained in the mines premises.

Therefore, in the interest of the safety of the persons employed in mines, I request you to provide and maintain a separate road in the mine premises for the Light Motor Vehicles used for inspection and transportation. This road will not cross the Haul Road at any place in the Mine premises.

This is for strict compliance in all Mechanized Open Cast mines where dumpers of capacity 35 tonne or more are used for transportation of mineral and removal of over burden in the mines.

**DGMS(Tech.) Circular No.7**

**Dhanbad, dated the 27.10.2008**

To

The Owner, Agent & Manager of Coal Mines, Metal Mines & Oil Mines/Oil Fields

Subject: Advanced Early Steamer Emission Type Lightning Protection System.

Sir,

You are aware that existing Mines operations are minimally equipped to take care of man/machine against Lightning/Surges.

Places which are high thunder prone do not have adequate facilities for protection.

Therefore, it is advised that protection be implemented in Oil Mines/Oil Fields, Open Cast Mines, CHP's & workshops for Lightning/Surges with advances Early Steamer Emission type Lightning Protection to take care of an area by aerial radial method, where by a very large area can be covered. The system should work without support of any Electrical Power.



The down conductor to be used should be of High Voltage Shielded cable having insulation resistance at 20 Degree of 1830 Meg Ohm/cm and thermal short circuit current (I Sec) should be 7.15 KA.

The earth pit should be of maintenance free type & with CPRI tested certificates.

**DGMS(Tech.) Circular No.08**

**Dhanbad, dated the 27.10.2008.**

To

The Owner, Agent & Managers of all Coal Mines,  
Manufacturers/Suppliers of Approved type of Self Contained Self Rescuers,  
All Inspecting Officers of the Directorate.

Subject: Protocol on use, care, maintenance, sampling & testing of Self Contained Self Rescuer (SCSR) under Regulation 191D (2) & (3) of the Coal Mines Regulations, 1957.

Sir,

In view of the limitations of the Filter Self Rescuer as an escape device and in pursuance to the recommendation of the ninth conference on safety in mines as well as the New Kenda Court of Enquiry, a meeting of users, regulators, scientific Institutions, academicians and manufactures/suppliers was held on 16<sup>th</sup> March, 2004 to consider mode of introduction of SCSR in Indian mines.

The committee recommended “use of Self Contained or Oxygen type Self Rescuer (SCSR) in all degree III & degree II gassy mines and in all fiery mines to be enforced with immediate effect. “Based on the recommendation of the said committee a Statutory Order under Regulation 191D of the Coal Mines Regulations, 1957 was issued on 5<sup>th</sup> January, 2007.

Thereafter, a working group was constituted to formulate a comprehensive protocol to ensure proper quality of supply, efficient use & care, maintenance, sampling & testing of SCSR. The protocol in detail as mentioned below shall be implemented by all concern.

This protocol supersedes the previous protocol issued vide DGMS (Tech) Circular No. 2 of 2007 dated 23.03.2007.

**A. USE, CARE & MAINTENANCE:**

1. The owner, Agent and Manger of all belowground mines having travel time up to one hour, shall ensure that the rated duration of the Self Contained Self Recuer (SCSR), provided to any person, is not less than one hour. However, in respect of workings with more than one hour travel time adequate number of SCSR (not less than the maximum attendance of the largest shift) shall be placed at suitably designed “Safe Haven” or “Refuse Chambers” located at convenient point(s).
2. Contrary to the above, use of SCSR of rated duration less than 60 minutes and up to 30 minutes for a specific district or panel of the mine or mine may be permitted, on request of the Owner/Agent/Manager of the mine in writing, by the concerned Regional Inspector of Mines.
3. Every person required to go down the mine shall be provided with a belt/harness of suitable design to enable him to carry the SCSR as well as other gadgets conveniently on his body.
4. Special racks of suitable design shall be provided for storage. The storage area should be away from source of heat. Every unit of SCSR shall be cleaned regularly with wet cloth and in no case organic solvents shall be used for cleaning of the SCSR.
5. Every unit in use shall be subjected to “daily visual check” for the seals (intact or not), leakage indicator (change in colour), clamps (for any damage), belt loop (for any damage) and container (for any damaged or dent). Unit’s of SCSR found O. K. in visual check shall only be

issued and used. Damaged/defective units shall be immediately withdrawn from use and be kept separately.

6. Every SCSR on roll of the mine shall be subjected to “Leak Tightness Test”, at least once in a quarter by a competent person duly authorized by the manager for the purpose, in the manner as prescribed in the IS: 15803-2008 (Annexure E&F). The apparatus should have a suitable leak tightness indicator.
7. Test result in respect of “daily visual check” and “Leak Tightness Test” with regard to each & every unit shall be recorded in a bound-paged register kept for the purpose. Every entry shall be signed by the person who has conducted the test and shall also be countersigned by the Manager or any other official authorized by him in this regard.
8. The Manager shall prepare a code of practice for storage, use, care and maintenance of the SCSR based on the model code provided by the Owner.
9. Only one type of SCSR shall be preferred in a particular mine.

**B. SAMPLING & TESTING**

- 1.1 Before a batch of SCSR is put into service, Fifteen samples for a batch size of 150 and Twenty samples for a batch size of 151 and above for every batch of supply shall be drawn at random for testing by a joint sampling team comprising of representatives from Manufacturer/supplier and users.
- 1.2 Fifty percent (50%) of the above drawn sample (subject to minimum of six units) shall be sent to any of the approved/accredited laboratories for full bench test as per IS 15803-2008 and rest of the sample units shall be subjected to practical performances test as per IS: 15803-2008 for the rated duration and the users comfort at the nearest rescue station.
- 1.3 The batch of supply for which all the test results of the samples (100%) are found satisfactory shall only be put into service. In case of unsatisfactory test result even of a single sample, either at the laboratory or in the practical performances test, the entire batch of supply shall not be accepted for use.
- 1.4 Result of the above stated laboratory test as well as practical performances test, duly countersigned by the mine owner or any other person authorized by him for this purpose shall be kept at owner’s office. A copy of the said test result shall also be kept at the mine office and shall be made available for inspection. Up to the shelf life of the apparatus. All test results with unsatisfactory performance of a sample, whether in the laboratory or in the practical performance test, shall also be forwarded by the concerned mine owner and the concerned manufacturer to the Chief Inspector of Mines (also designate as Director General of Mines Safety).
- 2.0 Functional Ability:
  - 2.1 One percent of the total units of a particular make and type of SCSR under service shall be drawn randomly every year for tests subjects to a minimum of one unit of each make and type for functional ability.
  - 2.2 The sample thus collected shall be tested at any of the approved/accredited laboratories for the following parameters as per the IS: 15803:2008 (at 35 liter/min. during the rated duration):-

<b>Parameter</b>	<b>Acceptance Level</b>
<b>Rated duration(as per label)</b>	<b>Not less than 90% of specified duration</b>

<b>Inhalation Oxygen concentration</b>	<b>Not less than 21*</b>
<b>(% by vol.)</b>	
<b>Inhalation Carbon Dioxide concentration (% by vol.)</b>	<b>Not more than 1.5◇</b>
<b>Maximum inhalation air temperature dry bulb</b>	<b>Not more than 55<sup>0</sup> C</b>
<b>Inhalation breathing resistance</b>	<b>Not more than 10 mbar</b>
<b>Exhalation breathing resistance</b>	<b>Not more than 10 mbar</b>

\* A short term deviation to a level of not less than 17% for a period of not more than two minutes at the beginning of the test is permissible.

◇ Through out the rated duration of the apparatus the carbon dioxide concentration of the inhaled air shall not exceed an average value of 1.5% (by volume) and at no time shall exceed 3.0% (by volume)

3. Results of the above stated functional ability test, duly countersigned by the mine manager, shall be recorded at the mine office and shall be made available for inspection, up to two years of reporting.
4. In case of unsatisfactory test result(s), during the above functional ability test, all SCSRs of the batch whose sample had failed shall be immediately withdrawn from the use under intimation by the Owner. Agent of Manager to the Regional as well as Chief Inspector of Mines. Immediate steps shall also be taken to meet the shortage of SCSRs, if any, resulted due to such withdrawal.

**C. TRAINING**

1. Every worker required to work in belowground workings shall undergo an initial training on SCSR covering following aspects:
  - i. Role of SCSR as an escape apparatus in emergency;
  - ii. Theory of working of a SCSR;
  - iii. Construction details of a SCSR;
  - iv. Way to use SCSR;
  - v. Limitations while using SCSR like its duration, inhalation and body temperature during use and
  - vi. Hands on training on donning of SCSR in poor visibility
2. A team of trainers shall be created from V. T. O., Safety Officer, Ventilation Officer, Asstt. Manager, Engineer, Workman Inspector and Rescue Trained Persons to impart weekly Pit-top/Incline-mouth training/re-training of workers.
3. Video Clippings, audios & posters on use of SCSR and sufficient number of dummies, subject to a minimum of 5% of the average daily underground attendance, shall be provided to every mine with belowground workings.
4. The training module for initial and refresher training of miners, at the VTC, shall be suitably modified to incorporate training on need, importance and use of SCSR.
5. A part from training to users, the trainers and persons required to issue and maintain SCSRs shall also be trained for their respective work.
6. A competition on SCSR during Safety Week and Rescue Competitions shall be organized to promote awareness of workers in this regard.

**DGMS(Tech.) Circular No.08A                      Dhanbad, dated the 18<sup>th</sup> Dec.,2008.**

To

The Owner, Agent & Managers of all Coal Mines,  
Manufacturers/Suppliers of Approved type of Self Contained Self Rescuers,  
All Inspecting Officers of the Directorate.

Sub: Protocol on provision and use of Self Contained Self Rescuer (SCSR) under Regulation 191D (2) & (3) of the Coal Mines Regulations, 1957-modifications thereof.

Sir,

In view of the expected difficulties in carrying and keeping the SCSR of one hour duration on a person's body and to clarify other confusions the sub-clause 1.0 of clause A of the protocol issued vide DGMS (Tech.) Circular No. 08 of 2008 dated 27.10.2008 is modified as under:-

**A. USE, CARE & MAINTENANCE:**

- 1.0 In the 6<sup>th</sup> line of point 1.0 of the protocol issued vide DGMS (Tech.) Circular No. 08 of 2008 dated 27.10.2008 the word "Refuse Chambers" shall read as "Refuge Chambers".
- 2.0 The Owner, Agent and Manager of a mine, with travel time of more than 30 minutes in below ground workings, shall ensure that adequate number (not less than the maximum attendance of the largest shift) of Self Contained Self Rescuer (SCSR) with the rated duration of one hour shall be placed at suitably designed "Safe Haven" or "Refuge Chambers" located at convenient points(s). Whenever a person is required to work, supervise or visit below ground workings he shall be provided and carry with him a SCSR of 30 minutes duration on his belt wherever he goes or works.
- 3.0 The mine management may construct "Safe Haven" or "Refuge Chambers" at convenient location(s) in below ground with prior approval of the Director General of Mines Safety. A copy of application, for such approval, with complete detail shall also be forwarded to the concerned Director of Mines Safety and the Dy. Director General of Mines Safety.
- 4.0 All other provisions of the "Protocol" issued vide DGMS (Tech.) Circular No. 08 of 2008 dated 27.10.2008 shall remain unaltered.

**DGMS(Tech.) Circular No.09                      Dhanbad, dated the 02.12.2008.**

To

The Owners of All  
Coal and Metalliferous Mines.

Sub:        Modified standard condition stipulated under regulation 98 of Coal Mines Regulation-1957 and regulation 106 of Metalliferous Regulation 1961 for using HEMM in Open Cast Mines.

Sir,

The condition for adopting a system of deep-hope blasting and or working opencast mines with the help of heavy machinery for digging, excavation and removal of ore etc. under Reg. 106 (2)(b) of MMR 1961 and regulation 98 of Coal Mines Regulation-1957 were issued vide circular No. 36 of 1972 and 17 of 1977. These were framed way back in seventies where the capacities of dumpers were limited. With changing scenario and introduction higher capacity equipment this needs review.

Number of incidence and accidents has taken place due to-

1. Head on collision of dumper on haul road due to poor clear view.
2. Front and rear collision of dumpers on haul road.
3. In advertent movement of steering wheel among with tyre while maintenance of dumper where engine is ON.
4. Due to work person crossing the blind space in and around.
5. Dumper getting off haul road due to inadequate parapet wall/embankment.
6. While dumper being reversed.

In order to prevent accident the standard condition are modified. These are addition to be standard condition issued earlier and not the substitute.

1. HEIGHT AND WIDTH OF HAUL ROAD

- a. No road shall be of width less than three time plus 5m width of the largest Vehicle playing on road.
- b. All corner and bends shall be made in such a way that operator of vehicle have clear view of distance of not less than 3 times the breaking distance of largest HEMM working at 40 Km/hour.
- c. Where it is not possible to ensure a visibility for a distance as mention in (b) there shall be provided with two roads of width not less than 2 times plus 3m of largest vehicle plying on the road with a strong road divider at centre with adequate lighting and reflector along the divider.
- d. Where any road existing above level of surrounding area it shall be provided with strong parapet wall/embankment of following dimensions.
  - i. Width at top-not less than 1 m.
  - ii. Width at bottom-not less than 2.5m
  - iii. The height not less than diameter of tyre of largest vehicle plying on road

It may be noted that just dumping of mud or OB shall not treated as strong parapet wall.

- e. No road shall have gradient more than 1 in 16. Ramps with 1 in 10 gradients should not be more than 10m at one stretch and permission shall be obtained from Directorate.

2. DUMPER : The following Safety feature shall be provided in dumper.

- i. Mechanical steering locking to prevent untoward movement of steering wheel and tyre work persons working below the cabin while engine is running.
- ii. Blind spot mirror apart from rear view mirror to enable operator to have clear visibility of blind spot in and around dumpers.
- iii. Mechanical type Anti collision device to avoid head to tail collision on haul road such as tail gate, bumper extension or any other strong device.
- iv. Fire resistant hydraulic hoses in place of ordinary hoses to decrease the change of fire. All the sleeves and conducts where cable/wire are passed shall be fire resistant.
- v. Seat belt for operator.
- vi. The maximum speed of vehicle shall be restricted to 30Km/hours by blocking higher gear or any other automatic means.
- vii. Proper shaft guard.
- viii. Proximity working device.

3. Excavators : The following safety feature shall be provided

- i. All functions cut off switch
- ii. Swing Motor Brake
- iii. Fire resistant hydraulic hoses in place of ordinary hoses to decrease the chance of Fire. All the sleeves and conducts where cable/wire are passed shall be fire resistant.
- iv. Turbo charge Guard
- v. Seat belt
- vi. Vent valve on top of hydraulic tank should be able to be removed without any tool

- vii. A baffle plate between cold zone and hot zone.
  - viii. Provision for Limiting of hydraulic cylinders-Stoppers.
4. DRILLS : The following Safety feature shall be provided
- 1) Approved type of dust prevention or suppression system
  - 2) Each moving parts of the machinery shall be guarded/fenced and also ensure its effectiveness all the time.
  - 3) i) Emergency of push bottom in
    - a) Operator's cabin
    - b) Main frame.
    - c) Propeller pendent
    - d) Rear endii) Tripping device to trip the field switch.
  - 4) Thermostat motor protection relay in winding temperature and other related parts.
  - 5) Explosive vent in transformer.
  - 6) Propel interlock (an electric interlock between drilling and propeller operation)
  - 7) High air discharge temperature switch
  - 8) Low lube oil pressure switch
  - 9) Oil stop valve (electric solenoid valve in compressor lubrication line.
  - 10) No pump circuit
  - 11) Tower lock and lock check valve
  - 12) Propel joystick-spring loaded type to return to neutral (dead man safety)
  - 13) Disk-brake and brake valve and its testing parameters.
  - 14) Lock check valve for preventing creeping in drill
  - 15) Seat belt
  - 16) Fire resistant hydraulic hoses and wiring near hot zone
  - 17) Turbo charge guard
  - 18) Cabin for the operator
5. DOZERS
- 1) Roll over protection
  - 2) Turbo charge guard
  - 3) Fire resistant hydraulic hoses and wiring near hot zone
  - 4) Seat belt
6. GENERAL
- 1) The approved type of audio visual alarm shall be provided in all equipment
  - 2) The approved type of fire suppression system shall be provided in all equipment
  - 3) The stability of HEMM shall be carried out at least in year and after every major over haul by an independent agency
  - 4) The crane and overhead crane shall be subject to proof load test and NDT test once in a year from a competent authority
  - 5) The pressure vessel receiver are subjected to hydraulic and NDT test and shall be carried out by a competent authority
  - 6) In case of any defect in equipment such as brake, steering, and safety device the equipment shall be immediately taken out of use and a record shall be kept
  - 7) The code of practice for installation operation and maintenance of all equipment shall be prepared and implemented before putting the equipment to use in mine.
  - 8) The safety feature recommend in equipments shall be a part of notice inviting tender for new procurement and the design and drawing shall be obtained from OEM for fitting the same in old equipment.

9) The lay out of the workshop shall be required DG Circular No. 8 of 2003.  
I am of the opinion that the above modified condition may help in reducing incidence and accidents in mines. Hence the recommendation may be strictly complied in the interest of safety.

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