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, upto 12 nautical miles in offshore. 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 meeting of 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 advisability of undertaking legislation for inspection of mines in general and coal mines in particular and for regulation of employment therein of workmen, young persons 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 posses 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 standards of work of DGMS. 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 nexus with all its offices through Internet. A web page on DGMS has also 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 six 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 31.12.2005. A statement showing posting of Group 'A' & 'B' officers in DGMS during the year 2005 are given at **Appendix-III**.

TABLE:1	**STRENGTH OF INSPECTING OFFICERS AND SANCTIONED POSTS AS ON 31.12.2005**							
DESIGNATION	DISCIPLINE							
	MINING		ELECTRICAL		MECHANICAL		O. H	
	S	P	S	P	S	P	S	P
Director General	1	1	-	-	-	-	-	-
Dy. Director General	7	7	1	1	-	-	-	-
Director	29	29	4	4	2	1	-	-
Dy. Director	82	58	18	14	10	7	1	1
Assistant Director	1	-	-	-	-	-	Gr.I: 3 Gr.II: 5	2 3
Total	**120**	**95**	**23**	**19**	**12**	**8**	**9**	**6**

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 inspection
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 -
     - 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 -
       - workmen's inspector
       - safety committee
       - tripartite reviews
6. Conduct of examinations for grant of competency certificates.

1.4 Gazette Notification

Following gazette notifications were issued during the year 2005:

TABLE:2	Notification No. & date	Brief subject
1.	S.O.91(E) dated 25.1.2005	Re-constitution of the Board of Mining Examinations under sub-regulation (1),(2),(3) and (4) of Regulations 11 of the Metalliferous Mines Regulations, 1961.
2.	S.O.1494(E) dated 17.10.2005	Appointment of Dr.P.D. Shenoy, former Secretary, Ministry of Labour and Employment to hold a formal inquiry into the causes and the circumstances attending the accident occurred on 15.6.2005 in the Central Saunda colliery of M/s.Central Coalfields Limited.
3.	S.O.1536(E) dated 26.10.2005	Appointment of Justice Bilal Nazki, Judge, High Court of Andhra Pradesh to hold a formal inquiry into the causes and circumstances attending the accident and to fix responsibility for the causes leading to the accident that occurred on 17.10.03 in the collieries of M/s. Singareni Collieries Co. Ltd.
4.	S.O.1845(E) dated 30.12.2005	The Central Govt. have decided to rescind the certificate issued vide Notification No.S-29014/5/82-MI dated 4.1.1985.

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 fundamentally with the mine management, DGMS has the responsibility to see that the safety statute is kept updated to absorb the technical advancements as well as to make the same comprehensive, practicable,legally sound and also to carry out periodic inspection of mines to oversee compliance of safety laws. The Mines Act and the subordinate legislations framed thereunder is periodically updated for the purpose. Each and every accident involving fatality is enquired into by an officer or a team of officers of DGMS. A few accidents involving serious bodily injury and most of the important dangerous occurrences are also investigated by DGMS Officers. Arising out of inspections and enquiries conducted by DGMS, one or more of the following actions, as appropriate, is taken: -

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

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

1.6 Inspection & Enquiries

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

TABLE:3	**NUMBER OF INSPECTIONS AND ENQUIRIES MADE DURING THE YEAR 2005**					
Discipline of Inspection Service	Coal Mines		Metal Mines		Oil Mines	
	Inspections	Enquiries	Inspections	Enquiries	Inspections	Enquiries
Mining	3228	791	2736	353	123	25
Electrical	1167	46	213	13	143	3
Mechanical	525	76	120	6	14	2
Occupational Health	327	20	38	0	15	0
TOTAL	**5247**	**933**	**3107**	**372**	**295**	**30**

1.7 Improvement Notices & Prohibitory Orders

1.7.1 Coal Mines

208 (two hundred eight) improvement notices under various provisions of the statutes were issued as a result of inspections of the mines during the year 2005. These improvement notices were issued for various types of serious defects, details of which are given in table:4 below :

TABLE:4	**IMPROVEMENT NOTICES ISSUED UNDER SECTIONS 22(1) AND 22A(1) OF THE MINES ACT, 1952 IN COAL MINES DURING 2005**	
SL.NO.	NATURE OF DEFECT	NO. OF CASES
1.	High benches in opencast workings	28
2.	Inadequate support	03
3.	Poor ventilation	05
4.	Inadequate coal dust suppression	06
5.	Isolation stopping	03
6.	Improper/ non-provision of travelling road	01
7.	Danger of Inundation	09
8.	Unstable workings	01
9.	Lag in stowing	-
10.	Accumulation of gases	-
11.	Defective Electrical installation	06
12.	Inadequate earth leakage protection	-
13.	Defective winding rope	1
14.	Other defects in winding installation	4
15.	Defective shotfiring practices	-
16.	Others	141
	TOTAL	**208**

65 (sixty-five) prohibitory orders under Section 22(3), 22A(2) and 22(1A) of the Mines Act, 1952 were issued during the year 2005. These orders were imposed for various dangerous conditions prevailing at the mines, details of which are given in table 5:

TABLE:5	**PROHIBITORY ORDERS ISSUED UNDER SECTIONS 22(3) AND 22A(2) AND 22(1A) OF THE MINES ACT,1952 IN COAL MINES DURING 2005**	
SL.NO.	NATURE OF DEFECT	NO. OF CASES
1.	High benches in opencast workings	08
2.	Inadequate support	10
3.	Poor ventilation	07
4.	Inadequate coal dust suppression	04
5.	Isolation stopping	-
6.	Improper/ non-provision of travelling road	01
7.	Danger of Inundation	08
8.	Unstable workings	02
9.	Lag in stowing	-
10.	Accumulation of gases	-
11.	Defective Electrical installation	-
12.	Inadequate earth leakage protection	-
13.	Defective winding rope	-
14.	Other defects in winding installation	01
15.	Defective shotfiring practices	01
16.	Others	23
	TOTAL	**65**

1.7.2 Metalliferous Mines

In metalliferous mines inadequate benching and slopping 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 2005 were 133 (one hundred thirty three). Prohibitory orders under Sections 22(1A), 22A(2) and 22(3) issued in Metalliferous Mines during the year 2005 were 155 (one hundred fifty five). Details of the improvement notices and prohibitory orders issued during 2005 are given in table: 6 & 7 respectively.

TABLE:6	**IMPROVEMENT NOTICES ISSUED UNDER SECTIONS 22(1) AND 22A(1) OF THE MINES ACT,1952 IN METALLIFEROUS MINES DURING 2005**	
SL.NO.	NATURE OF DEFECT	No. of cases
1.	Non-appointment of qualified manager and supervisory officials	10
2.	Inadequate benching and sloping in opencast workings	113
3.	Miscellaneous	10
	TOTAL	**133**

TABLE:7	**PROHIBITORY ORDERS ISSUED UNDER SECTIONS 22(3), 22A(2) & 22(1)A OF THE MINES ACT,1952 ISSUED IN METALLIFEROUS MINES DURING 2005**	
SL.NO.	NATURE OF DEFECT	No. of cases
1.	Non-appointment of qualified manager and supervisory officials	18
2.	Inadequate benching and sloping in opencast workings	123
3.	Miscellaneous	14
	TOTAL	**155**

1.7.3 Oil Mines

No prohibitory order was issued in oil mines during the year 2005.

1.8 Permission, relaxations and exemptions

1.8.1 Coal Mines

918 (nine hundred eighteen) permissions/ exemptions and relaxations were granted in coalmines during the year 2005. Details of such cases are given in table:8.

TABLE:8	**PERMISSIONS, RELAXATIONS & EXEMPTIONS GRANTED IN COAL MINES DURING 2005**	
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	28
2.	Extraction of coal by methods other than bord & pillar below surface features	14
3.	Extraction of coal by bord & pillar methods beneath areas free from surface features	154
4.	Extraction of coal by bord & pillar methods beneath surface features	65
5.	Development below surface features including development in contiguous seams/ sections	63
6.	Blasting coal off the solid	52
7.	Development within 60m. of waterlogged workings	16
8.	Workings within 7.5m. / Adjustment of mine boundaries	27
9.	Exemptions from different provisions of regulations	105
10.	Others	394
	TOTAL	**918**

1.8.2 Metalliferous Mines

773 (seven hundred seventy three) permissions/relaxations/exemptions under different provisions of the statutes were granted during the year 2005. Particulars are given in table:9.

TABLE:9	PERMISSION, EXEMPTIONS & RELAXATIONS GRANTED IN METALLIFEROUS MINES DURING 2005	
SL.NO.	Particulars of Permissions, Exemptions & Relaxations	No. of cases
1.	Stoping of blocks	22
2.	Use of HEMM with deep hole blasting	116
3.	Use of ANFO and/or more than one explosive in a shothole	28
4.	Working under railways and roads	0
5.	Appointment of managers of more than one mine/ permit manager etc.	322
6.	Appointment of surveyor of more than one mine	04
7.	Others	281
	TOTAL	**773**

1.8.3 Oil Mines

2 (two) permissions/relaxations/exemptions were granted during the year 2005 under various provisions of the Oil Mines Regulations, 1984. The details of such cases are given in table:10

TABLE:10	PERMISSION, EXEMPTIONS & RELAXATIONS GRANTED IN OIL MINES DURING 2005	
SL.NO.	Particulars of Permissions, Exemptions & Relaxations	No. cases
1.	Well head installations	-
2.	Laying of oil pipe line	2
	TOTAL	**2**

1.9 Prosecutions

2 (two) prosecutions were instituted in coalmines during the year 2005. In respect of non-coal mines, 30 (thirty) prosecutions were launched during 2005. Contraventions of provisions of statute for which these prosecutions were instituted are given in tables: 11 & 12.

Details of prosecution cases as on 31.12.2005.

Coal	Non-coal	Pending	Disposed
No. of prosecution launched during the year 2005	No. of prosecution launched during the year 2005	Total pending cases upto 31.12.2005	Total disposed cases upto 31.12.2005
02	30	941	202

TABLE:11	PROSECUTIONS INSTITUTED IN RESPECT OF COAL MINES DURING 2005	
SL.NO.	CONTRAVENTION	NO. OF CASES
1.	Contraventions leading to accidents	02
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	-
	TOTAL	**02**

TABLE:12	PROSECUTIONS INSTITUTED IN RESPECT OF NON-COAL MINES DURING 2005	
SL NO.	CONTRAVENTION	NO. OF CASES
1.	Contravention leading to accidents	26
2.	Contravention of orders under sections 22(1A), 22(3), Reg. 108 etc.	04
3.	Non-appointment of qualified persons as senior supervisory officials	-
4.	Non-appointment of qualified persons as subordinate supervisory officials	-
5.	Non-provisions of protective equipment	-
6.	Other miscellaneous contraventions	-
	TOTAL	**30**

2.0 Coal Mines

2.1 General

Number of operating coalmines during 2005 was 565 as compared to 560 in 2004. Company-wise number of coal mines and production is given in table: 13.

TABLE: 13	Number of Mines during 2005				Production (in million tonnes)
COMPANY	Underground	Opencast	Both	Total	
Coal India Limited	295	138	38	471	343
Singareni Collieries Company Limited	52	10	-	62	36
Others	9	21	2	32	50
TOTAL	**356**	**169**	**40**	**565**	**429**

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

TABLE : 14	UNDERGROUND COAL MINES HAVING GASSY SEAMS OF DIFFERENT DEGREES	
Degree of gassiness	Number of Mines	
	2004	2005*
I only	272	270
II only	102	102
III only	14	14
I & II	7	7
I & III	-	-
II & III	3	3
I, II & III	-	-
TOTAL	**398**	**396**

*Provisional

Though numbers of working mines have decreased, output of coal increased from 409.26 million tonnes in 2004 to 429.00 million tonnes in 2005. Coal mines under M/s.Coal India Limited contributed 343.00 million tonnes of coal during the year 2005. Average daily employment in mines decreased from 404,000 in 2004 to 398,000 in 2005 but there was increase in output per manshift from 3.19 to 3.40. 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*	204	60060	68	368940	126	398	429000	3.40

*Provisional

2.2 Accidents

2.2.1 Major Accidents

Two major accidents took place during the year 2005 which has been described below:

(1) Name of Mine: Central Sounda colliery, M/s.Central Coalfields Limited
Date of accident: 15.06.2005, Time: 0730 Hrs., Number of persons killed - 14
Court of Enquiry has been instituted.

(2) Name of Mine: Busseriya colliery, M/s.Bharat Coking Coal Limited
Date of accident: 22.11.2005, Time: 1330 Hrs., Number of persons killed - 4
While three persons were drilling holes for roof bolting in the roof within 2.6 m to 2.9 m from a coal face under the supervision of a mining sirdar, the coal roof measuring 2.5 m x 2.25 m x 0.15 m to 0.7 m thick, parted from the roof against two intersecting slip planes and fell from a height of about 2.8 m., killing all the four persons on the spot.

Had the presence of workers and the two intersecting slip planes deep inside the roof been detected and adequate temporary supports been erected and

Had the first of the roof bolts been grouted before starting the drilling at next row of holes for roof bolts and

Had the roof been kept secured as per the Systematic Support Rules framed and enforced by the manager, under Regulation 108(1)(bb) of the Coal Mines Regulations, 1957, this accident could have been averted.

2.2.2 Accident scenario

The year 2005 saw an upward trend in the number of fatal accidents as compared to 2004, but numbers of fatalities were less than the previous year. Number of fatal accidents during the year 2005 was 99 and number of fatalities was 120 as compared to 87 accidents and 96 fatalities during the year 2004.

Table: 16 indicate the trend of accidents and rates of fatalities.

TABLE: 16	TREND IN FATAL ACCIDENTS AND FATALITY RATES PER 1000 PERSONS EMPLOYED IN COAL MINES (10 YEARLY AVERAGE)			
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
2001-2004	89	0.21	112	0.27
2001-2005	91	0.22	113	0.27

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

TABLE: 17	TREND IN FATAL ACCIDENTS AND DEATH RATES IN COAL MINES (YEAR-WISE)				
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	0.91	0.32	9.12
1961	222	268	0.65	0.22	4.81
1971	199	231	0.60	0.21	3.05
1981	165	184	0.36	0.12	1.45
1991	138	143	0.26	0.08	0.60
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*	99	120	0.30	0.09	0.29

* Provisional

During the year 2005 saw an upward trend in the number of serious accidents and persons seriously injured. Number of serious accidents was 985 and number of persons injured was 1017 as compared to 962 and 991 respectively during the year 2004. As far as the serious accident rate is concerned, it has increased marginally. The serious injury rate per thousand persons employed in 2005 was 2.51 as compared to 2.45 in 2004. The above rate per lakh manshifts worked increased to 0.79 in 2005 from 0.77 in 2004. The rate per million tonnes output increased to 2.48 in 2005 from 2.42 in 2004. Table: 18 gives year-wise number of serious accidents, no. of persons injured and serious injury rate.

TABLE: 18	TREND IN SERIOUS ACCIDENTS AND SERIOUS INJURY RATES IN COAL MINES (YEAR-WISE)				
Year	No. of serious accidents	No. of persons injured	Serious injury rates		
			Per '000 persons employed	Per 100,000 manshifts worked	Per million tonnes output
1990	893	983	1.79	0.58	4.62
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*	985	1017	2.51	0.79	2.48

* Provisional

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 99 fatal accidents involving 120 persons occurred during the year 2005 when compared to 87 fatal accidents and 96 fatalities during 2004. Fatality rate (overall) has increased to 0.30 in 2005 from 0.24 during the year 2004. Serious injury rate during the year 2005 has increased to 2.51 as compared to 2.45 in 2004 for overall injury rates. 51(51.51%) fatal accidents occurred belowground with a fatality rate of 0.34, 28(28.28%) in opencast workings with fatality rate of 0.41 and 20(20.20%) in surface operation with fatality rate of 0.16 during the year 2005. It may be mentioned that out of 398,000 average daily employment 51.25% was in belowground workings, 17.08% was in opencast workings and the remaining 31.67% was engaged in surface operations. Table 19 gives the trend of fatal and serious accidents with fatality rate in different working places.

TABLE: 19	**TREND IN FATAL & SERIOUS ACCIDENTS AND DEATH & SERIOUS INJURY RATES; (PLACEWISE) - COAL MINES PER THOUSAND PERSONS EMPLOYED**							
YEAR	Fatal accidents & death rates				Serious accidents & ser. injury rates			
	Below ground	Open cast	Above ground	Overall	Below ground	Open cast	Above ground	Overall
1990	91 (0.33)	26 (0.42)	34 (0.20)	151 (0.30)	666 (2.32)	69 (1.13)	158 (0.95)	893 (1.75)
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)
1t992	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*	51 (0.34)	28 (0.41)	20 (0.16)	99 0.30	742 (3.63)	91 (1.34)	152 (1.27)	985 (2.51)

* Provisional – Figures in bracket indicate death/injury rate

2.2.3B By cause

Tables 20 & 21 give the trend in fatal and serious accidents in coalmines due to different causes during the year 2005 compare with last four years followed by graphical representation. As can be seen 25 (25.25%) of fatal accident were caused by ground movement, 35 (35.35%) due to transportation machinery (other than winding), 13 (13.13%) due to machinery other than transportation machinery, and falls other than falls of ground contributed 13 (13.13%) while other causes such as electricity 4 (4.04%) and explosives 2 (2.02%). 985 serious accidents occurred during the year out of which 484 (49.13%) were caused by falls other than falls of ground, transportation machinery (other than winding) contributed 192 (19.49%), ground movement 76 (7.71%) while other causes contributed 183 (18.57%) of all serious accidents.

TABLE:20	TREND IN FATAL ACCIDENTS DUE TO DIFFERENT CAUSES IN COAL MINES				
Cause	2001	2002	2003	2004	2005*
Ground movement	39 (46)	35 (48)	24 (33)	33 (38)	25 (32)
Winding in shafts	2 (2)	-	1 (1)	-	1 (1)
Transportation machinery (other than winding)	35 (35)	22 (22)	33 (34)	29 (30)	35 (36)
Machinery other than transportation machinery	10 (10)	9 (9)	11 (14)	6 (6)	13 (13)
Explosive	2 (2)	4 (4)	3 (3)	5 (6)	2 (2)
Electricity	4 (4)	4 (4)	1 (1)	4 (4)	4 (4)
Gas, Dust etc.	-	-	2 (3)	2 (2)	-
Falls other than falls of ground	10 (11)	6 (9)	6 (6)	5 (5)	13 (13)
Other causes	3 (31)	1 (1)	2 (18)	3 (5)	6 (19)
TOTAL	**105 (141)**	**81 (97)**	**83 (113)**	**87 (96)**	**99 (120)**

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

Trend in Fatal Accidents due to different causes in coal mines during 2005

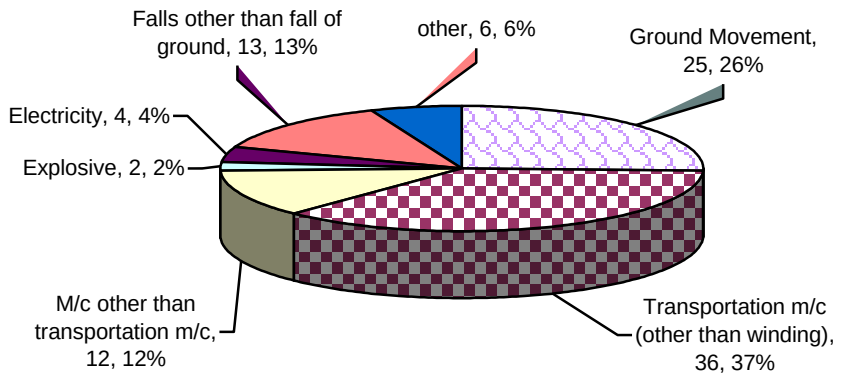


TABLE:20A	TREND IN FATAL ACCIDENTS IN DIFFERENT PLACES OF COAL MINES				
Place	**2001**	**2002**	**2003**	**2004**	**2005***
Belowground	67 (102)	48 (61)	46 (72)	49 (57)	51 (71)
Opencast	26 (26)	22 (22)	23 (24)	32 (33)	28 (29)
Aboveground	12 (13)	11 (14)	14 (17)	6 (6)	20 (20)
Total	**105 (141)**	**81 (97)**	**83 (113)**	**87 (96)**	**99 (120)**

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

TABLE: 21	TREND IN SERIOUS ACCIDENTS DUE TO DIFFERENT CAUSES IN COAL MINES				
Cause	**2001**	**2002**	**2003**	**2004**	**2005***
Ground movement	79 (101)	83 (97)	66 (74)	112 (124)	76 (94)
Winding in shafts	6 (6)	4 (12)	4 (5)	5 (7)	2 (2)
Transportation machinery (other than winding)	171 (181)	132 (137)	134(140)	157 (161)	192 (196)
Machinery other than transportation machinery	34 (34)	39 (41)	43 (47)	28 (29)	41 (41)
Explosive	7 (12)	9 (14)	6 (11)	8 (14)	3 (4)
Electricity	5 (13)	7 (9)	3 (3)	4 (5)	4 (11)
Gas, Dust etc.	-	2 (2)	6 (7)	2 (2)	-
Falls other than falls of ground	285 (293)	258 (258)	245(246)	493 (495)	484 (486)
Other causes	80 (80)	95 (95)	56 (57)	153 (154)	183 (183)
TOTAL	**667 (720)**	**629 (665)**	**563(590)**	**962(991)**	**985(1017)**

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

Trend in Serious Accidents due to different causes in coal mines during 2005

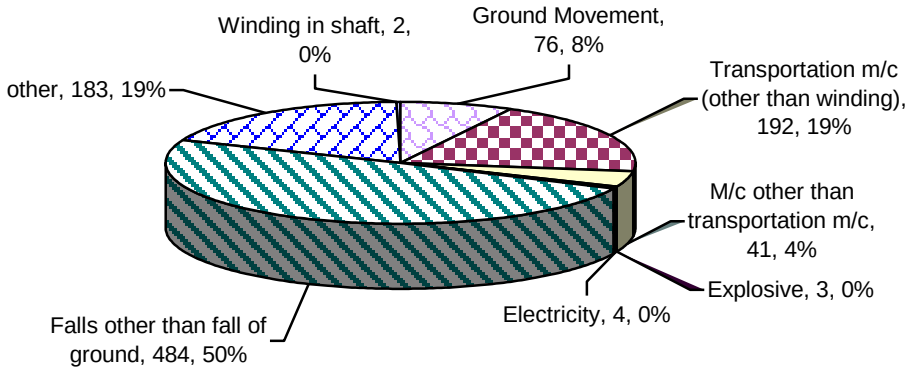


TABLE: 21A	TREND IN SERIOUS ACCIDENTS DUE TO DIFFERENT PLACES IN COAL MINES				
Place	2001	2002	2003	2004	2005*
Belowground	464 (504)	434 (464)	380 (398)	757 (778)	742 (766)
Opencast	73 (77)	92 (98)	82 (90)	82 (87)	91 (94)
Aboveground	130 (139)	103 (103)	101 (102)	123 (126)	152 (157)
Total	**667 (720)**	**629 (665)**	**563 (590)**	**962 (991)**	**985 (1017)**

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

2.2.3B.1 Ground movement

During the year 2005, ground movement accounted for 25 (25.25%) fatal accidents and 76 (7.71%) serious accidents. Further break-up of fatal accidents due to ground movement is given in table: 22.

TABLE: 22	FATAL ACCIDENTS DUE TO GROUND MOVEMENT IN COAL MINES DURING THE YEAR 2005		
Cause	No. of accidents	Persons killed	Persons seriously inj.
1.Fall of roof	18	25	12
2.Fall of side			
(a) belowground	4	4	0
(b) opencast	1	1	0
Sub-Total	**5**	**5**	**0**
3.Others			
(a) bumps	0	0	0
(b) air blast	0	0	0
(c) land slide	0	0	0
(d) collapse of pillar	0	0	0
(e) over hang	2	2	0
Sub-Total	**2**	**2**	**0**
GRAND TOTAL	**25**	**32**	**12**

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 coalmines and that trend continues even today. There were 25 accidents due to ground movement involving 32 fatalities and 12 serious injuries occurred due to this cause during the year 2005, out of which 18 accidents due to fall of roof and 7 due to side fall and over hangs. Roof fall accidents accounted for 18.18% of all fatal accidents in coalmines and it contributed 35.29% of all fatal accidents in belowground operations. Further critical analysis of roof fall accidents for the last five years 2001 to 2005 revealed the following:

I. <u>Physical and Working Condition factors</u> -

1. **Method of work:** Accident mainly occurred in Bord and Pillar districts and equally both in development and depillaring. 56% of the fatal accidents occurred B&P development, 41% in depillaring districts (26% in caving districts and 15% in stowing districts), 4% in longwall faces and 6% in other places.
2. **Height of working:** 82% of the fatal accidents occurred in gallery height upto 3m, 8% in 3m. to 5 m.
3. **Width of gallery:** 8% of the fatal accidents occurred in width of galleries between 0 - 3.0m and 9% in width between 3.01 -3.5m, 20% between 3.51-4.00m, 25% between 4.01 -4.50m and 28% above 4.50 m. Thus higher the width of gallery more the chances of roof fall.
4. **Distance from face:** 58% of the accidents occurred within 5 m. of the working face and 12% between 5.01 to 10 m. 6% between 10.01-20m. Thus 70% of the accident occurred within 10 m. of the freshly exposed roof from the face of working. About 13%

of the accident occurred in other roadways where either roof supports were being replaced or no attention was paid for checking old existing supports.

5. **Type of support:** 40% of the fatal accidents accounted in areas supported by timber support only, 32% in roof bolts & others and in 7% of the cases supports were not provided at all. Areas supported by timbers were more prone for roof fall. Steel supports especially roof bolts are more stable unless they are fixed properly and in time.
6. **Adequacy of support:** Accident analysis revealed that in 57% of cases supports provided was inadequate, which means sufficient number of supports are 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.
7. **Operation at the time of accident:** 26% of the fatal accidents occurred during loading operation, 15% during dressing, 11% during supporting, that is 57% 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 bad roof and testing for its weakness. Providing temporary supports before erecting permanent support 13% of the cases occurred during withdrawal of supports 19 % in other activities.
8. **Time elapsed after blasting:** 28% 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 is not being left for the roof to settle before engaging persons. 3% occurred between ½ - 1 hour, 10% between 1 to 2 hours and 24% of the fatal accidents occurred beyond 2 hours of blasting operation and in 35% of cases no blasting operation was carried out within 4 hours.

II. <u>Geological factors -</u>

9. **Thickness of seam:** 45% of the fatal accidents occurred in coal seam having thickness varying from 0 to 3.0 m., 30% in 3 to 6 m. and 6% 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 varying between in 0 to 100 m, 28% in 101 to 200m. and 13% 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.
11. **Thickness of fall:** 27% of the fatal accidents caused due to thickness of fallen strata varying between 0 to 0.15m, 32% between 0.16 to 30 m. i.e. 59% of the accidents had thickness of fall between 0- 0.3m. 24% between 0.31 to 1.0 m. thick and 14% beyond 1.01m hick. Thickness of fall 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:** 40% of the fatal accidents occurred due to fall of sand stone roof, 29% due to coal and 21% due to shale, remaining due to combination of any two. Practically all types roofs are likely to fall in absence of adequate supports, predominantly so in sand stones.

III. <u>Personal factors -</u>

13. **Designation:** 27% of the persons involved in roof fall accidents were supportmen, 44% loaders, 3% drillers and 7% subordinate supervisory staff. Mainly face workers were involved in the accidents as those persons are first to approach the face and stay at the green roof areas for longer duration.
14. **Age:** 6% of persons involved were in age group of 20-30 years, 15% between 31-40, 31% 41-45 years, 23% between 46-50, 19% 51-55 years and 7% between 56-60 years. Practically all age group persons were involved but more susceptible are between 41-55 years which accounts about 72% of the total.
15. **Shift of working:** 41% of the fatal accidents took place in 1st shift, 30% in 2nd shift and 29% 3rd shift. Thus roof fall occurred equally in all the shifts, but marginally more in first shift due to more number of persons employed during day time.
16. **Hours at work:** 11% of the roof fall accidents occurred in first two hours of the work, 36% between second and forth hour, 24% between 4-5 hours, 23% of the fatal accidents took place during 5-7 hours of the shift and 1% during last hour.

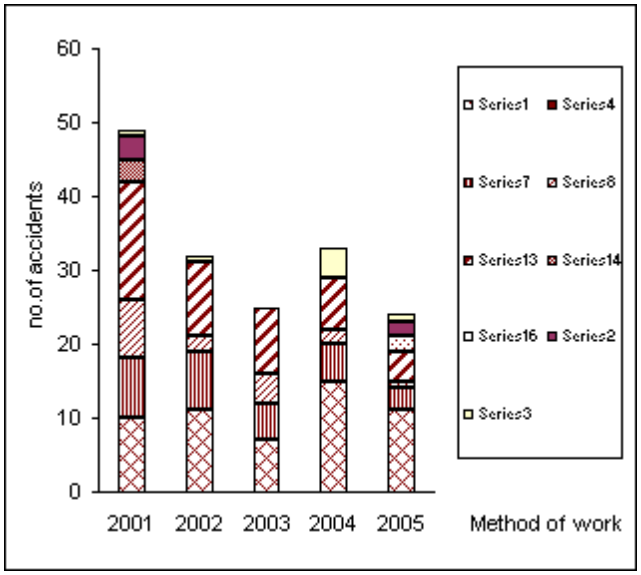
IV. <u>Management factors</u> -

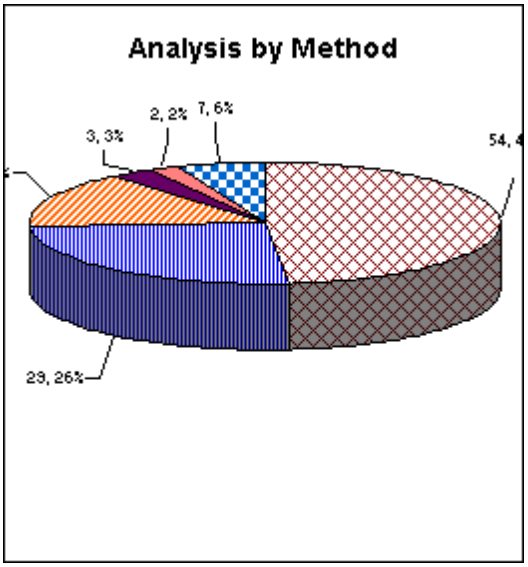
17. **Responsibility:** 38% of the fatal accidents were caused due to fault of management and Subordinate Supervisory Staff; 29% of the fatal accidents due to fault of Subordinate Supervisory Staff alone, in 8% of the cases management alone was responsible and in 15% was declared as misadventure.
18. **Company:** Company-wise analysis indicates that 74% of roof fall accident occurred in CIL, Subsidiary-wise 20% in ECL, 18% in SECL, 13% in WCL, 14% in BCCL, 4% in CCL, 5% in MCL, 22% in SCCL and 3% in TISCO.

Detailed statistical analysis of roof fall accidents that occurred during last 5 years have been represented in tabular and graphically in the following tables:

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

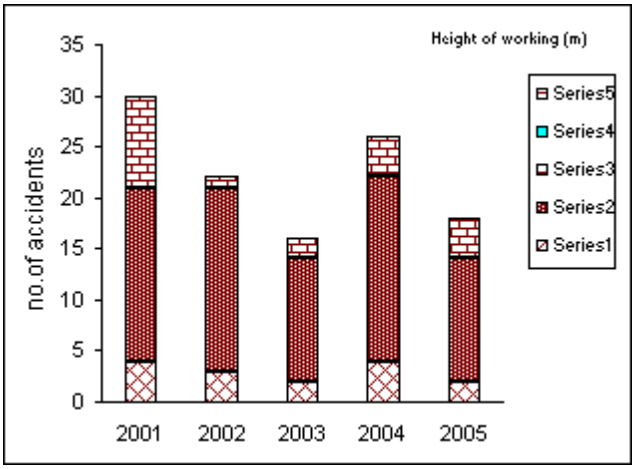
Method of work	Number of accidents											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
Board & Pillar Development	10	33	11	50	7	44	15	58	11	61	**54**	48
Longwall Development	0	0	0	0	0	0	0	0	0	0	**0**	0
Depillaring												
Caving	8	27	8	36	5	31	5	19	3	17	**29**	26
Stowing	8	27	2	9	4	25	2	8	1	6	**17**	15
Total	16	53	10	45	9	56	7	27	4	22	**46**	41
Longwall Depillaring												
Caving	3	10	0	0	0	0	0	0	0	0	**3**	3
Stowing	0	0	0	0	0	0	0	0	2	11	**2**	2
Total	3	10	0	0	0	0	0	0	2	11	**5**	4
Other Places	1	3	1	5	0	0	4	15	1	6	**7**	6
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	**100**	**112**	**100**

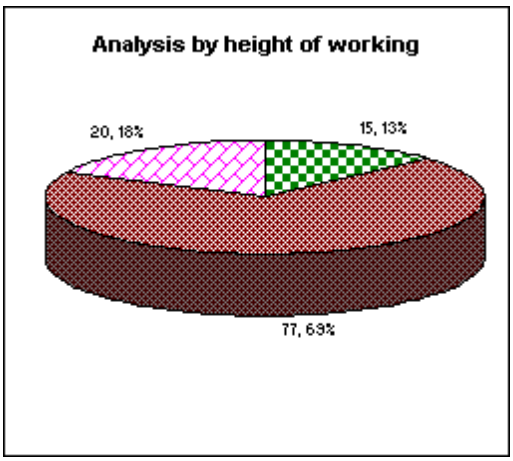




2. Distribution of fatal roof fall accidents by height of working

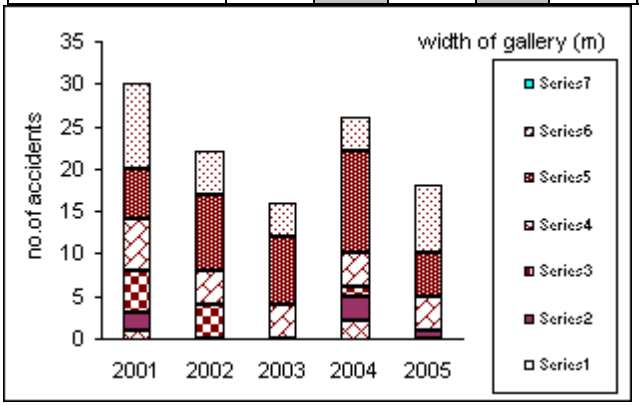
Height of working (metres)	Number of accidents											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
0 - 2	4	13	3	14	2	13	4	15	2	11	**15**	13
2 - 3	17	57	18	82	12	75	18	69	12	67	**77**	69
3 - 5	9	30	1	5	2	13	4	15	4	22	**20**	18
5 & above	0	0	0	0	0	0	0	0	0	0	**0**	0
not available	0	0	0	0	0	0	0	0	0	0	**0**	0
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	100	**112**	**100**

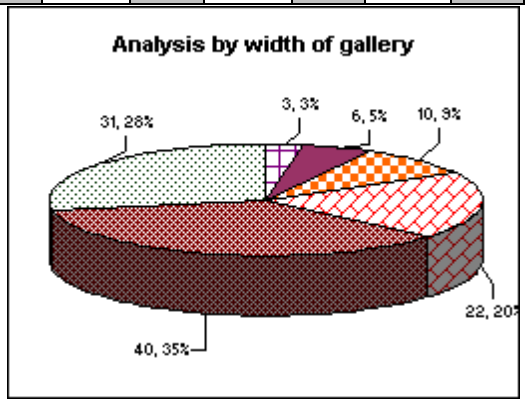




3. Distribution of fatal roof fall accidents by width of gallery

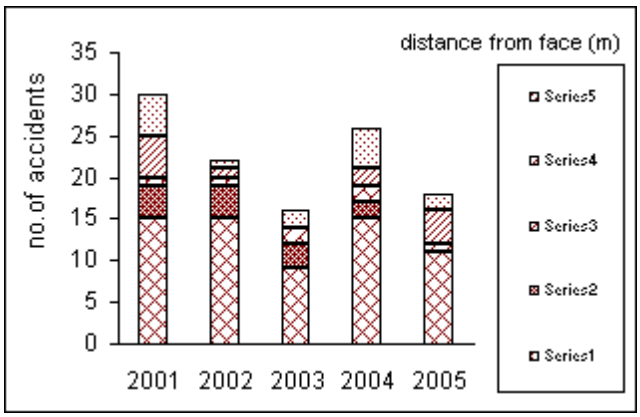
Width of Gallery (metres)	Number of accidents											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
0.00- 2.00	1	3	0	0	0	0	2	8	0	0	**3**	3
2.01- 3.00	2	7	0	0	0	0	3	12	1	6	**6**	5
3.01- 3.50	5	17	4	18	0	0	1	4	0	0	**10**	9
3.51- 4.00	6	20	4	18	4	25	4	15	4	22	**22**	20
4.01- 4.50	6	20	9	41	8	50	12	46	5	28	**40**	35
4.51 & above	10	33	5	23	4	25	4	15	8	44	**31**	28
not applicable	0	0	0	0	0	0	0	0	0	0	**0**	0
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	100	**112**	**100**

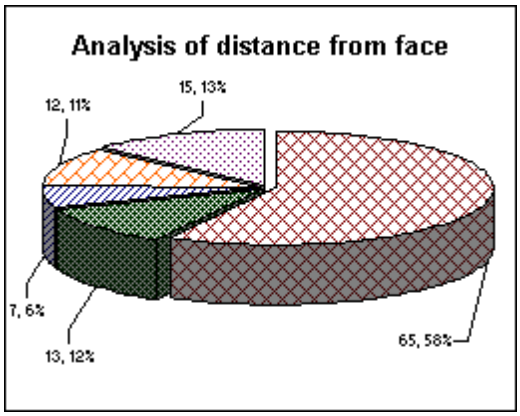




4. **Distribution of fatal roof fall accidents by distance from face**

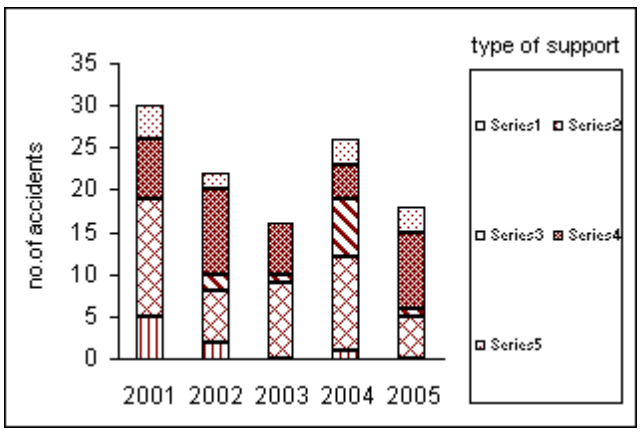
Distance from Face (metres)	Number of accidents											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
0.00- 5.00	15	50	15	68	9	56	15	58	11	61	**65**	58
5.01- 10.00	4	13	4	18	3	19	2	8	0	0	**13**	12
10.01- 20.00	1	3	1	5	2	13	2	8	1	6	**7**	6
20.01 & above	5	17	1	5	0	0	2	8	4	22	**12**	11
not applicable	5	17	1	5	2	13	5	19	2	11	**15**	13
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	100	**112**	**100**

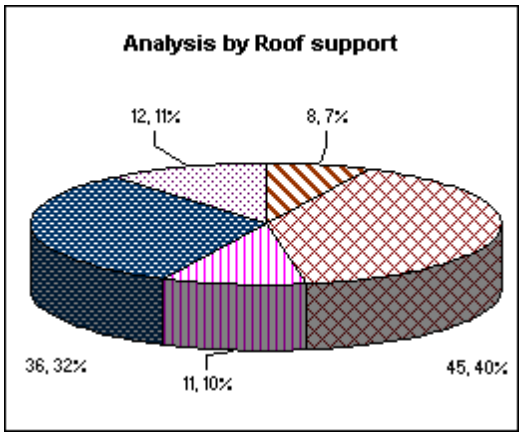




5. **Distribution of fatal roof fall accidents by type of roof support**

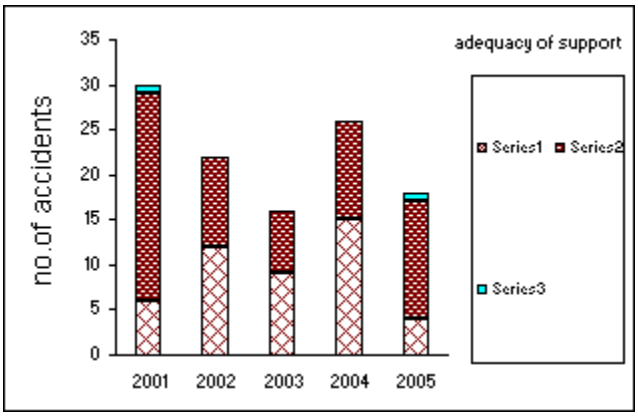
Type of support	Number of accidents											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
No support	5	17	2	9	0	0	1	4	0	0	**8**	7
Timber supports only	14	47	6	27	9	56	11	42	5	28	**45**	40
Timber and steel supports	0	0	2	9	1	6	7	27	1	6	**11**	10
Roof bolts and others	7	23	10	45	6	38	4	15	9	50	**36**	32
Other supports	4	13	2	9	0	0	3	12	3	17	**12**	11
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	**100**	**112**	**100**

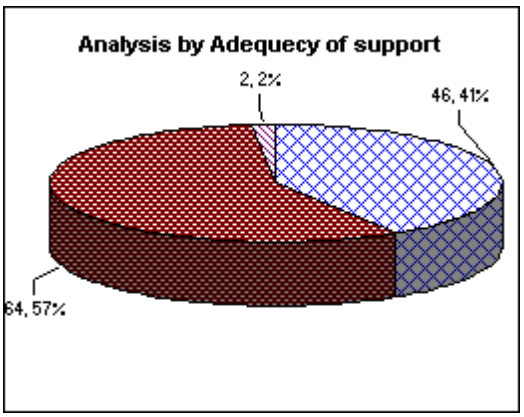




6. Distribution of fatal roof fall accidents by adequacy of support

Adequacy of support	Number of accidents											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
Adequate	6	20	12	55	9	56	15	58	4	22	**46**	41
Inadequate	23	70	10	45	7	44	11	42	13	72	**64**	57
Not applicable*	1	10	0	0	0	0	0	0	1	6	**2**	2
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	**100**	**112**	**100**





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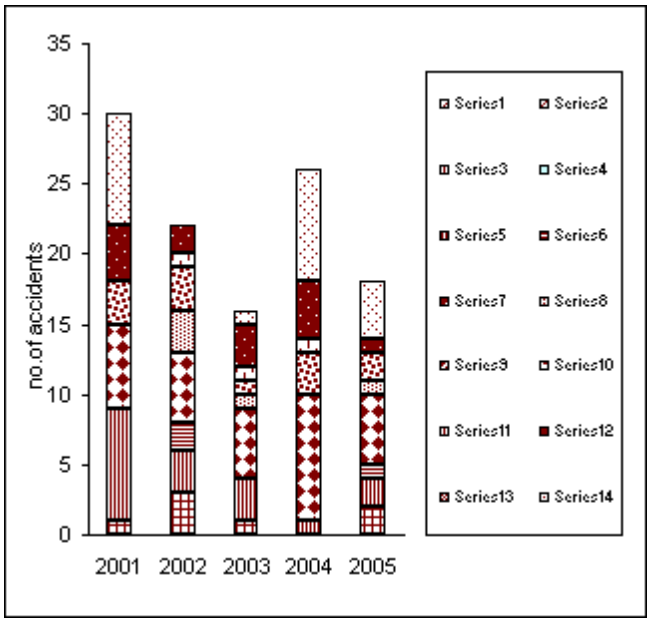
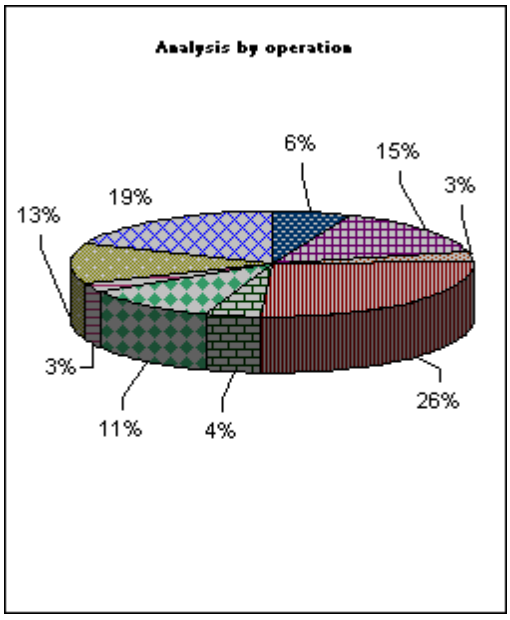
7. Distribution of fatal roof fall accidents by operation at the time of accident

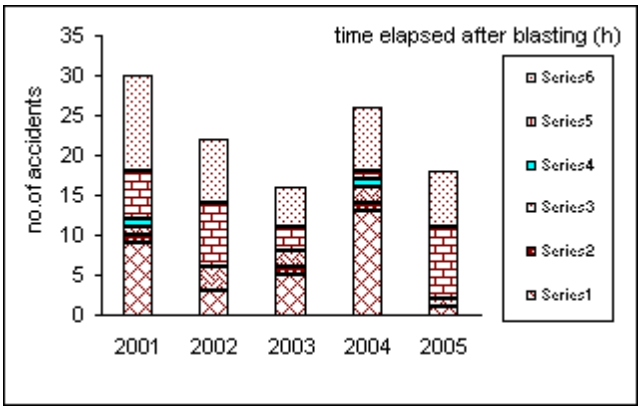
Operation at the time of accident	Number of accidents											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
Cutting	0	0	0	0	0	0	0	0	0	0	**0**	0
Charging	0	0	0	0	0	0	0	0	0	0	**0**	0
Drilling	1	3	3	14	1	6	0	0	2	11	**7**	6
Drilling & Charging	0	0	0	0	0	0	0	0	0	0	**0**	0
Dressing	8	27	3	14	3	19	1	4	2	11	**17**	15
Dressing & Supporting	0	0	2	9	0	0	0	0	1	6	**3**	3
Loading (manual)	6	20	5	23	5	31	9	35	5	28	**30**	26
Loading by machine	0	0	3	14	1	6	0	0	1	6	**5**	4
Stowing	0	0	0	0	0	0	0	0	0	0	**0**	0
Supporting	3	10	3	14	1	6	3	12	2	11	**12**	11
Tramming	0	0	1	5	1	6	1	4	0	0	**3**	3
Withdrawal of supports	4	13	2	9	3	19	4	15	1	6	**14**	13
Roof testing	0	0	0	0	0	0	0	0	0	0	**0**	0
Others	8	27	0	0	1	6	8	31	4	22	**21**	19
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	**100**	**112**	**100**

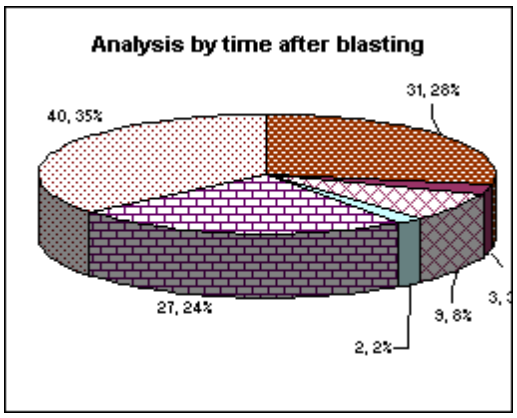




8. Distribution of fatal roof fall accidents by time elapsed after blasting

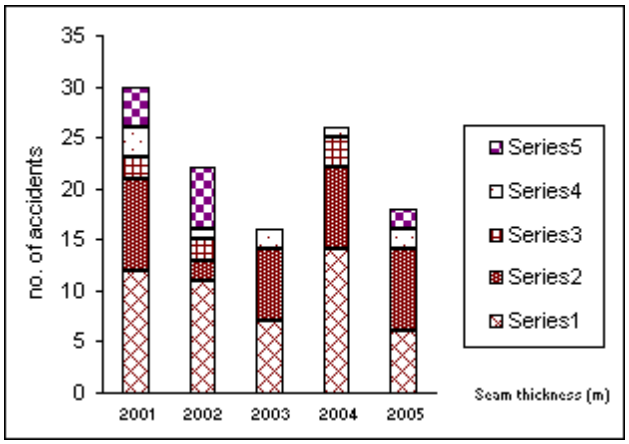
Time elapsed after blasting (hours)	Number of accidents											
	2001	%	2002		2003	%	2004	%	2005	%	total	%
0.00- 0.50	9	30	3	14	5	31	13	50	1	6	**31**	28
0.51- 1.00	1	3	0	0	1	6	1	4	0	0	**3**	3
1.01- 1.50	1	3	3	14	2	13	2	8	1	6	**9**	8
1.51- 2.00	1	3	0	0	0	0	1	4	0	0	**2**	2
2.01 & above	6	20	8	36	3	19	1	4	9	50	**27**	24
not applicable	12	40	8	36	5	31	8	31	7	39	**40**	35
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	100	**112**	**100**

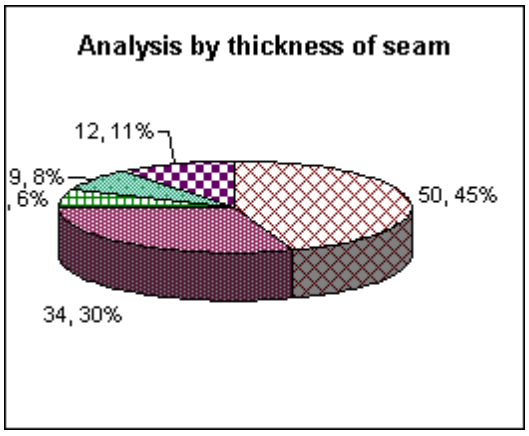




9. Distribution of fatal roof fall accidents by thickness of seam

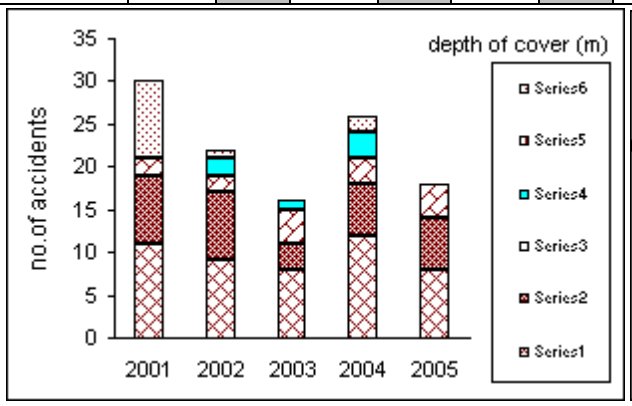
Seam thickness (metres)		Number of accidents										
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
0.00- 3.00	12	40	11	50	7	44	14	54	6	33	**50**	45
3.01- 6.00	9	30	2	9	7	44	8	31	8	44	**34**	30
6.01- 9.00	2	7	2	9	0	0	3	12	0	0	**7**	6
9.01 & above	3	10	1	5	2	13	1	4	2	11	**9**	8
not available	4	13	6	27	0	0	0	0	2	11	**12**	11
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	100	**112**	**100**

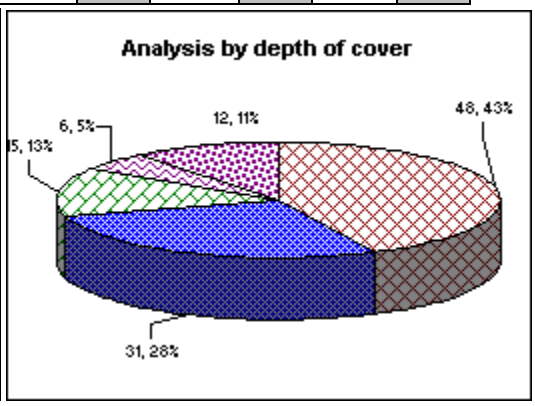




10. Distribution of fatal roof fall accidents by depth of cover

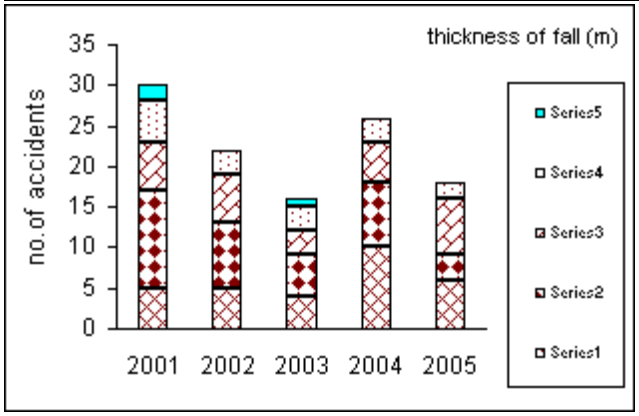
Depth of cover (metres)	Number of accidents											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
0- 100	11	37	9	41	8	50	12	46	8	44	**48**	43
101- 200	8	27	8	36	3	19	6	23	6	33	**31**	28
201- 300	2	7	2	9	4	25	3	12	4	22	**15**	13
301- 400	0	0	2	9	1	6	3	12	0	0	**6**	5
401 & above	0	0	0	0	0	0	0	0	0	0	**0**	0
not available	9	30	1	5	0	0	2	8	0	0	**12**	11
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	100	**112**	**100**

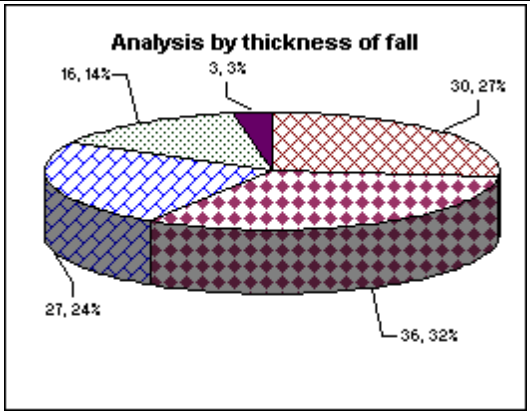




11. Distribution of fatal roof fall accidents by thickness of fall

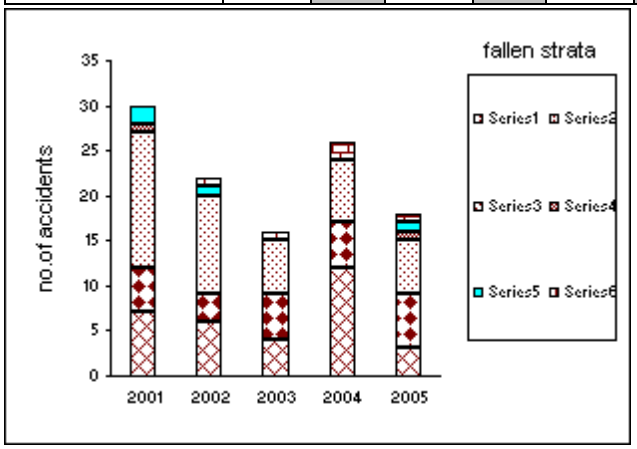
Thickness of fall (metres)	Number of accidents											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
0.00- 0.15	5	17	5	23	4	25	10	38	6	33	**30**	27
0.16- 0.30	12	40	8	36	5	31	8	31	3	17	**36**	32
0.31- 1.00	6	20	6	27	3	19	5	19	7	39	**27**	24
1.01 & above	5	17	3	14	3	19	3	12	2	11	**16**	14
not applicable	2	7	0	0	1	6	0	0	0	0	**3**	3
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	100	**112**	**100**

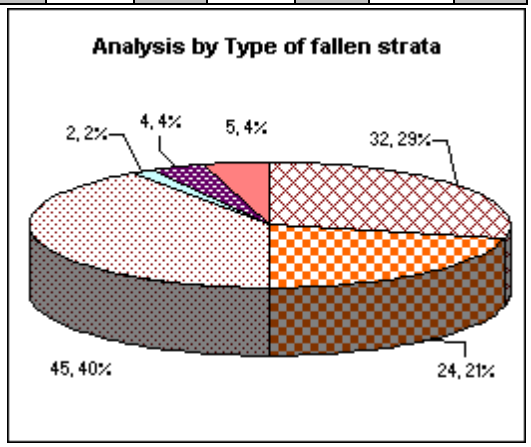




12. Distribution of fatal roof fall accidents by nature of fallen strata

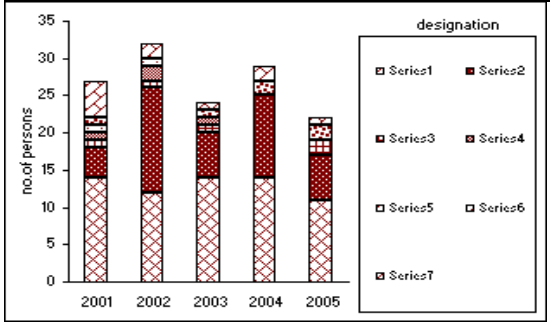
Nature of fallen strata	Number of accidents											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
Coal	7	23	6	27	4	25	12	46	3	17	**32**	29
Shale	5	17	3	14	5	31	5	19	6	33	**24**	21
Sandstone	15	50	11	50	6	38	7	27	6	33	**45**	40
Coal & Shale	1	3	0	0	0	0	0	0	1	6	**2**	2
Coal & Sandstone	2	7	1	5	0	0	0	0	1	6	**4**	4
Shale & Sandstone	0	0	1	5	1	6	2	8	1	6	**5**	4
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	100	**112**	**100**

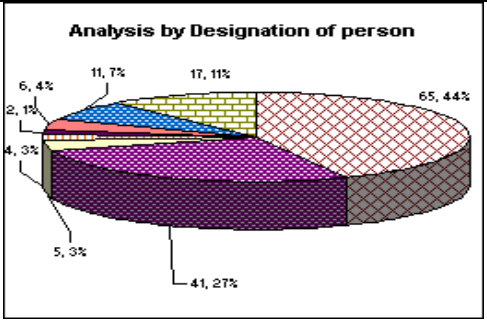




13. Distribution of persons killed in roof fall accidents by designation

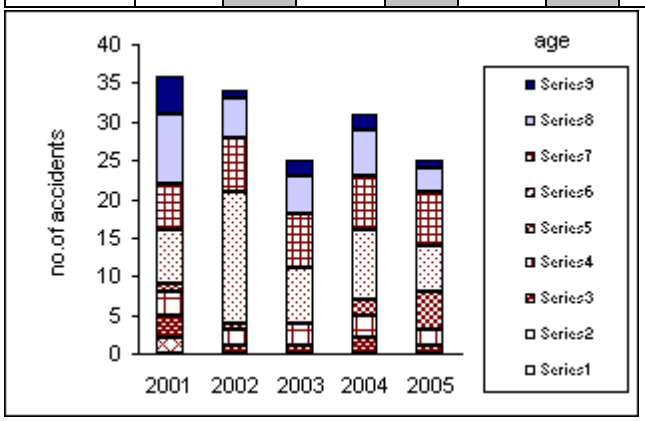
Category of mine worker		Number of persons killed										
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
Loader	14	39	12	35	14	56	14	45	11	44	**65**	44
Timberman	4	11	14	41	6	24	11	35	6	24	**41**	27
Dresser	1	3	1	3	1	4	0	0	2	8	**5**	3
Driller	1	3	2	6	1	4	0	0	0	0	**4**	3
Trammer	1	3	1	3	0	0	0	0	0	0	**2**	1
Shotfirer /Ex-plosive carrier	1	3	0	0	1	4	2	6	2	8	**6**	4
Sub. Supervi-sory staff	5	14	2	6	1	4	2	6	1	4	**11**	7
Others	9	25	2	6	1	4	2	6	3	12	**17**	11
Total	**36**	**100**	**34**	**100**	**25**	**100**	**31**	**100**	**25**	**100**	**151**	**100**

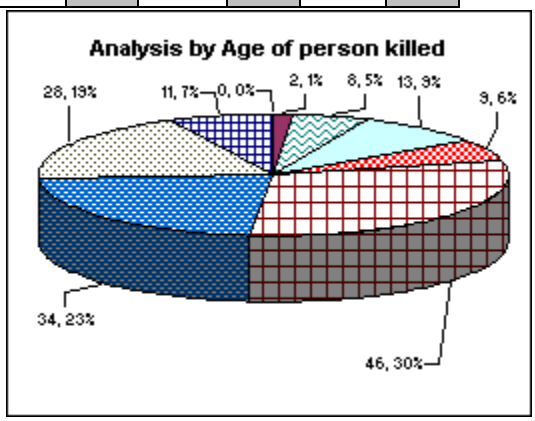




14. Distribution of persons killed in roof fall accidents by age

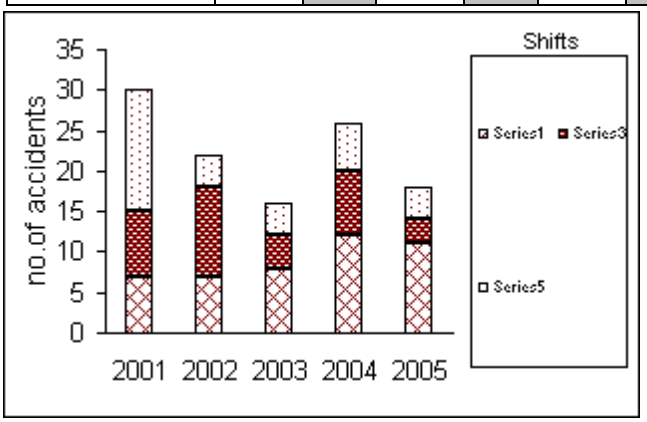
Age	Number of persons killed											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
18 – 20	0	0	0	0	0	0	0	0	0	0	**0**	0
21 – 25	2	6	0	0	0	0	0	0	0	0	**2**	1
26 – 30	3	8	1	3	1	4	2	6	1	4	**8**	5
31 – 35	3	8	2	6	3	12	3	10	2	8	**13**	9
36 – 40	1	3	1	3	0	0	2	6	5	20	**9**	6
41 – 45	7	19	17	50	7	28	9	29	6	24	**46**	30
46 – 50	6	17	7	21	7	28	7	23	7	28	**34**	23
51 – 55	9	25	5	15	5	20	6	19	3	12	**28**	19
56 – 60	5	14	1	3	2	8	2	6	1	4	**11**	7
Total	**36**	**100**	**34**	**100**	**25**	**100**	**31**	**100**	**25**	**100**	**151**	**100**

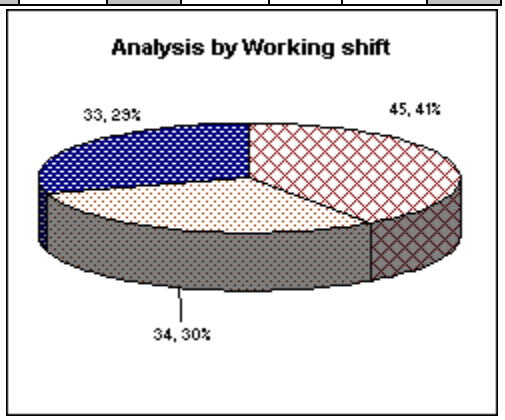




15. Distribution of fatal roof fall accidents by shift during which accident occurred

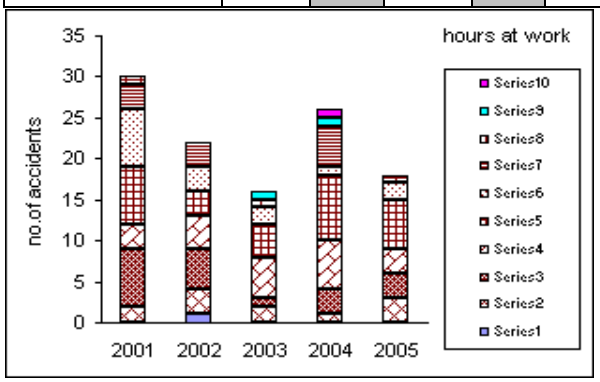
Shift	Number of accidents											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
1st (7/8 AM to 3/4 PM)	7	23	7	32	8	50	12	46	11	61	**45**	41
2nd 3/4 PM to 11/12 M	8	27	11	50	4	25	8	31	3	17	**34**	30
3rd 11/12M to 7/8 AM	15	50	4	18	4	25	6	23	4	22	**33**	29
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	**100**	**112**	**100**

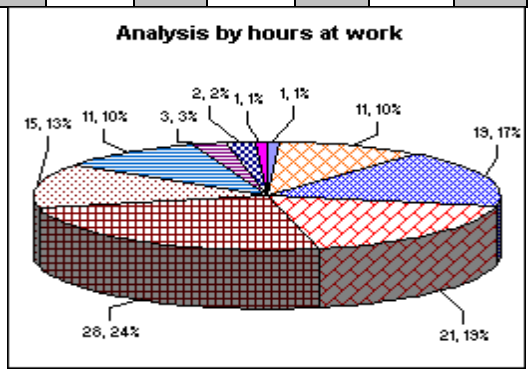




16. Distribution of fatal roof fall accidents by hours spent at work prior to the accident

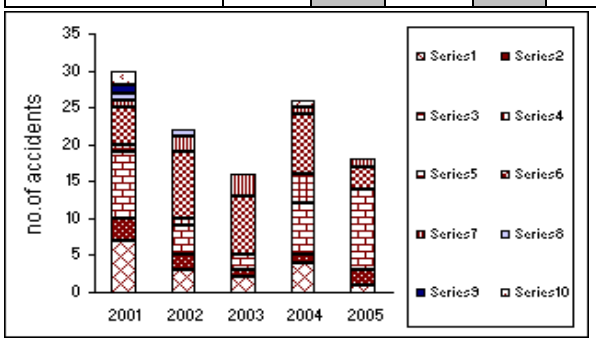
Hours at work	Number of accidents											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
0.00- 1.00	0	0	1	5	0	0	0	0	0	0	**1**	1
1.01- 2.00	2	7	3	14	2	13	1	4	3	17	**11**	10
2.01- 3.00	7	23	5	23	1	6	3	12	3	17	**19**	17
3.01- 4.00	3	10	4	18	5	31	6	23	3	17	**21**	19
4.01- 5.00	7	23	3	14	4	25	8	31	6	33	**28**	24
5.01- 6.00	7	23	3	14	2	13	1	4	2	11	**15**	13
6.01- 7.00	3	10	3	14	0	0	5	19	0	0	**11**	10
7.01- 8.00	1	3	0	0	1	6	0	0	1	6	**3**	3
8.01 & above	0	0	0	0	1	6	1	4	0	0	**2**	2
not available	**0**	0	0	0	**0**	0	1	4	0	0	**1**	1
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	100	**112**	**100**

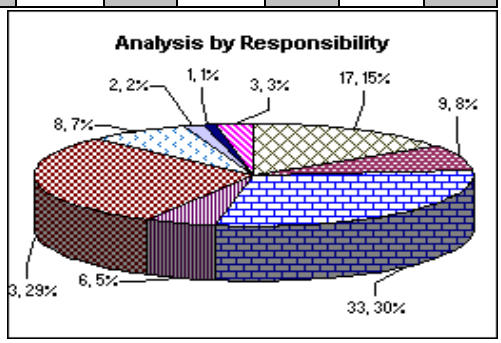




17. Distribution of fatal roof fall accidents by responsibility

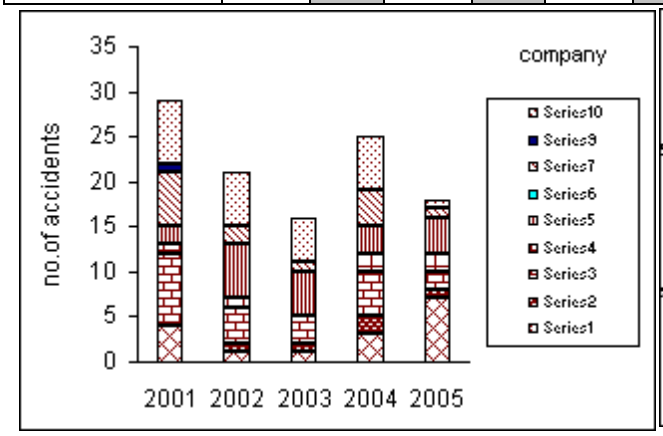
Responsibility	Number of persons											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
Misadventure	7	23	3	14	2	13	4	15	1	6	**17**	15
Management	3	10	2	9	1	6	1	4	2	11	**9**	8
Mgt & SSS	9	30	4	18	2	13	7	27	11	61	**33**	30
Mgt, Deceased	0	0	0	0	0	0	0	0	0	0	**0**	0
Mgt & Others	1	3	1	5	0	0	4	15	0	0	**6**	5
SSS	5	17	9	41	8	50	8	31	3	17	**33**	29
SSS & Others	1	3	2	9	3	19	1	4	1	6	**8**	7
Shotfirer	1	3	1	5	0	0	0	0	0	0	**2**	2
Co-worker	1	3	0	0	0	0	0	0	0	0	**1**	1
Deceased	2	7	0	0	0	0	1	4	0	0	**3**	3
Total	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	**100**	**112**	**100**

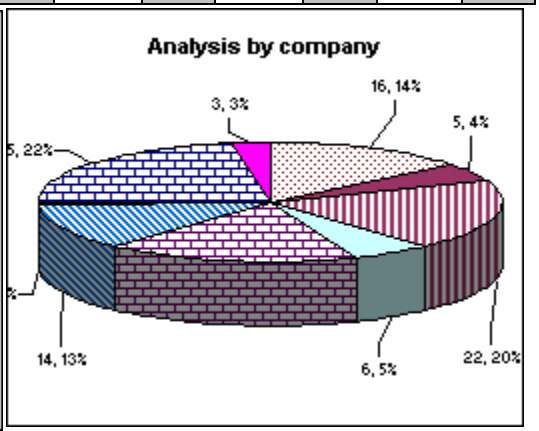




18. Distribution of fatal roof fall accidents by company

Company	Number of accidents											
	2001	%	2002	%	2003	%	2004	%	2005	%	total	%
BCCL	4	13	1	5	1	6	3	12	7	39	**16**	14
CCL	0	0	1	5	1	6	2	8	1	6	**5**	4
ECL	8	27	4	18	3	19	5	19	2	11	**22**	20
MCL	1	3	1	5	0	0	2	8	2	11	**6**	5
SECL	2	7	6	27	5	31	3	12	4	22	**20**	18
NEC	0	0	0	0	0	0	0	0	0	0	**0**	0
WCL	6	20	2	9	1	6	4	15	1	6	**14**	13
CIL: total	**21**	**70**	**15**	**68**	**11**	**69**	**19**	**73**	**17**	**94**	**83**	**74**
IISCO	1	3	0	0	0	0	0	0	0	0	**1**	1
SCCL	7	23	6	27	5	31	6	23	1	6	**25**	22
TISCO	1	3	1	5	0	0	1	4	0	0	**3**	3
All-India	**30**	**100**	**22**	**100**	**16**	**100**	**26**	**100**	**18**	**100**	**112**	**100**





2.2.3B.3 Side fall and over hangs

There were 5 (5.05%) fatal accidents involving as many casualties due to fall of sides out of which four accidents took place in belowground workings and one in opencast. Out of four belowground accidents, in one case side fall occurred in a development face while an electrician was walking along the tramming roadway. In second case accident occurred while a dresser was dressing a side of a pillar in a depillaring district and in two cases while a loader was carrying coal basket side fall occurred.

In opencast working while two dumper operators were sitting very close to the sides of an overburden bench the side collapsed fatally injured one of them.

All the above accidents in belowground mines could have been avoided had the sides been properly dressed before engaging the persons and had the supportman and supervisor been more careful while undertaking such jobs.

- Accident due to fall of sides and overhang accounted for 5.05% of all fatal accidents in coal mines and 7.84% of all accidents in belowground workings.

2.2.3B.3 Air blast

There was no accident due to this cause during the year 2005.

2.2.3C Transportation machinery (Winding)

There was only one fatal accident at winding installation during the year 2005 while a Manila rope tied to a used winding rope to uncoil from the drum and Manila rope snapped and the workman fell into winding engine pit.

2.2.3D Transportation machinery (Other than winding)

There were 35 fatal accidents (35.35%) of the accidents due to transportation machinery other than winding reported during the year 2005. A detailed break–up of fatalities under this category are given in the table below:-

TABLE - 23	**FATAL ACCIDENTS DUE TO TRANSPORTATION MACHINERY OTHER THAN WINDING IN SHAFTS IN COAL MINES DURING 2005**	
Cause	**No. of fatal accidents**	**Persons killed**
1. Rope Haulage	12	12
2. Mechanical Conveyors	02	02
3. Dumpers	17	18
4. Wagon movement	01	01
5. Truck & tankers	03	03
Total	**35**	**36**

It was seen that dumpers, rope haulages and truck/tankers were major contributing causes under fatalities due to transportation machinery other than winding.

2.2.3D.1 Rope Haulages

There were 12 fatalities (10% of all fatalities) caused due to rope haulages during the year 2005. Analysis of causes revealed that:-

- One accident caused due to snapping of haulage rope and consequent run away of tubs uncontrolled and hit a workman.
- Six accidents were occurred due to hit by moving tubs.
- One accident occurred while trying to re-railed the derailed tubs workperson crushed between two tubs.
- One accident occurred while rope got entangled with a pulley and suddenly got released and dislodged a prop which hit a workman.
- Four accidents occurred due to derailment of tubs.

2.2.3D.2 Mechanical / Belt Conveyors:

Two accidents resulting in two fatalities were caused by belt conveyors during 2005.

- One accident occurred by chain conveyor of a longwall district as drive head was not properly anchored which got lifted and swiveled hitting a person as soon as it was started.
- One accident occurred due to entangled of hand in return rolled while cleaning debris at moving conveyor.

2.2.3D.3 Dumpers and tippers:

Seventeen accidents occurred due to dumpers and tipper causing eighteen fatalities.

- Thirteen accidents occurred killing 14 persons by dumpers.
- Four accidents occurred killing 4 persons by Tippers.

The above causes (Dumpers & Tippers) contributed 17(17.17%) of all accidents. Analysis of above causes revealed that-

- At one case while trying of ride on moving dumper, slipped and run over by near wheel.
- In three cases persons were hit or run over by dumper being operated carelessly.
- In two cases persons were run over while crossing a reversing dumper.
- In two cases persons was run over while near reversing tipper.
- In three cases persons were run over by dumper while negligently sleeping at work place.
- In one case dumper fell off from height killing the operator.
- In three cases the accident occurred due to collision while driving.
- In two cases while persons walking on road run over by running tipper.

2.2.3D4 Truck & Tankers:

Three accidents occurred causing three fatalities due to truck and tankers contributing 3.03% of total accident.

- Two cases while reversing the truck without confirming presence of workman.
- One case due to falling from height.

2.2.3D5 Wagon movement:

One accident occurred due to wagon movement while empty wagon was being pushed by a pay loader a persons run over by wagon.

2.2.3E Machinery other than transportation machinery:

There were 13 accidents reported during the year 2005, which were caused due to machinery other than transportation machinery. The analysis of the causes revealed that:-

Table – 24	**FATAL ACCIDENTS IN COAL MINES DUE TO MACHINERY OTHER THAN TRANSPORTATION MACHINERY DURING 2005**		
S.No.	**Cause**	**Number of accidents**	**Persons killed**
1.	Drilling m/c	01	01
2.	Loading m/c	05	05
3.	Shovels/Draglines	02	02
4.	Other HEMM	05	05
	Total :	**13**	**13**

Further analysis of the causes revealed that:-

- One accident occurred while a drill machine was marching reverse, helper of the machine was run over.
- One accident occurred while an operator was getting down from his dozer by stepping over the traction chain, the gear got inadvertently engaged and the operator was thrown in front of traction chain and run over.
- Three accidents occurred due to run over by pay loader causing three death.
- One accident occurred while an untrained operator operating an old hydraulic excavator its boom fell on cabin killing the operator.
- One accident occurred as the ripper dozer fell on to the underlying bench.
- One accident occurred while pulling the track chain of a shovel for repairing by a dozer, the attachment broke and hit a person.
- One accident occurred while a LHD operator released the parking brake of the LHD (standing at gradient of 1:6) without occupying operator seat.
- Two accidents occurred due to run over by crane while marching.
- One accident occurred while LHD was moving forward it knocked a person & run over.
- One accident occurred while the helper was sleeping in workplace was run over by dozer.

2.2.3F Explosives

There were 2 (2.02% of the total) fatal accidents involving 2 persons and 3(0.30% of the total) serious accidents due to explosives during the year 2005.

2.2.3G Electricity

There were 4 (4.04% of the total) fatal accidents and 4 (0.40% of the total) serious accidents due to electricity during the year 2005.

2.2.3H Accidents due to Dust, Gas & Fire.

There was no fatal accident due to this cause.

2.2.3I Falls other than falls of ground

Falls other than fall of ground caused 13 (13.13% of the total) fatal accidents and 484 (49.13%) serious accidents during the year 2005.

2.2.3J Other causes.

Six cases of fatal accident were reported during miscellaneous causes during the year.

2.2.4 Responsibility

Analysis of accidents as per the persons held responsible for the various causes of accidents during the year 2005 has been indicated in table:25.

TABLE:25	RESPONSIBILITY FOR FATAL ACCIDENTS IN COAL MINES DURING THE YEAR 2005	
SL. NO.	Responsibility	No. of accidents
1.	Misadventure	5
2.	Management	5
3.	Management & Subordinate Supervisory Staff (SSS)	19
4.	Management, SSS, co-worker	3
5.	Management, SSS & deceased	1
6.	Management, SSS, co-worker & deceased	1
7.	Management & co-worker	5
8.	Management, co-worker & deceased	1
9.	Management & deceased	0
10.	Subordinate Supervisory Staff (SSS)	13
11.	SSS & co-worker	5
12.	SSS & deceased	2
13.	Shotfirer	1
14.	Co-worker	13
15.	Co-worker & deceased	8
16.	Deceased	9
17.	Others	8
	TOTAL	**99**

It can be seen that in 24(24.24%) cases management along with others subordinate staff was responsible. In 13(13.13%) of the cases subordinate supervisory staff alone was found responsible. In 13(13.13%) cases coworker alone and in 9(9.09%) cases the deceased alone was 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 2005, 29 (twenty-nine) dangerous occurrences were reported under the Coal Mines Regulations, 1957. Details of dangerous occurrences are given in table: 26.

TABLE:26	DANGEROUS OCCURRENCES IN COAL MINES DURING 2005	
Sl.No.	**Cause**	**No. of cases**
1.	Spontaneous heating belowground	13
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	1
6.	Outbreak of fire in quarries from causes other than spontaneous heating	2
7.	Outbreak of fire in surface from causes other than spontaneous heating	2
8.	Premature collapse of workings or failure of pillars/ benches/major roof fall	2
9.	Influx of noxious gases	-
10.	Ignition or occurrence of inflammable gas	1
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	-
15.	Irruption of water	1
16.	Subsidence/potholing	-
17.	Explosives	-
18.	Others	4
	TOTAL	**29**

A. Spontaneous Heating

- 13 cases of spontaneous heating were reported, all from belowground workings, out of which 6 were in active working areas, 2 in return airways and 5 in old workings.

Contributory factors for spontaneous heating:

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

- Not workings the mines in panel system.
- Not sectionalizing of the old workings.
- Not cleaning the old galleries and return airways off fallen coal and not treated 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.
- Not making and maintaining the isolation stoppings as prescribed.

- Delayed detection of spontaneous heating.
- Non provision of latest carbon monoxide gas detecting devises.
- Most of the laboratories were not provided with Graham Lawrence apparatus to analyze carbon monoxide gas in the earlier stages.

The prime contributory factors which lead to fires in opencast equipment were:

- Not maintaining the electrical circuits of HEMM in proper working order.
- Not providing and maintaining the automatic fire fighting systems in HEMM, specially in dumpers.
- Not framing and implementing code of practice to prevent fires in opencast mines.
- Not maintaining the general fire fighting systems or improper training in fire fighting systems.

B. Mine fires:

- 7 cases of fires have been reported from mines out of which three cases of fire occurred in crushed and loose coal in development district. In one case fire traveled from an underground gallery into an opencast quarry. There were two cases of fires reported in various HEMM deployed in opencast mines and one in SDL of underground mine.
- In one of the case a fire was broke out in a hydraulic excavator due to short circuit of cable connecting between battery relay to self-starter which further spread the fire into the fuel tank and thereby causing damage to the excavator.
- In another case fire occurred in hydraulic hoses of RECP drill machine while drilling near the fiery coal seam.
- In one case the fire was engulfed and the damaged the SDL in an underground colliery.

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

There were two cases of premature collapse of benches, one occurred in overburden bench and second in waste dump. In one case failure of five overburden benches occurred in an active mining area having a depth of about 140 mt. While removal of overburden and extraction of coal was in progress five overburden benches from top started sliding in a parabolic shape to the bed of the quarry. Failure of benches occurred due to presence of loose strata in a basin shaped cavity existing since its formation stage possibly due to river or deep nallah course. Presence of waste dump near the edge of the bench in black cotton soil saturated with water triggered the sliding phenomena. In another case premature collapse occurred in an waste dump where height of dump was exceeding the statutory limits and compacting of overburden was not being done.

D. Influx of noxious gases

There was no case due to influx of noxious gases.

E. Ignition or occurrence of inflammable gas

In one case inflammable gas was liberated in a sealed off area of a depillaring district with caving as a result of which three isolation stoppings were blown out.

F. Irruption of water

Irruption of water occurred in a development district of an underground colliery where water was being accumulated behind the brick wall for storage purpose. The brick wall breached suddenly and water got inundated into the working district. This incidence occurred in night shift and no persons were involved.

The accident could have been averted had the accumulation of water behind the wall been avoided by regularly draining out and had the adequate thickness of brick wall been constructed according to the head of water to be stored behind the seal.

H. Subsidence/Potholing

There was no case due to subsidence/potholing.

I. Overwinding, Breakage of winding engine and crankshaft, etc.

While a set of coal tub were hauled in the cages in a 90 m. deep pit by an electric winder, power tripped and the winder stopped with cages in midway of the pit. The west cage with loaded tubs gradually gained momentum and east cage which was loaded with empty tubs got overwind.

The incident occurred mainly due to non-effective functioning of the braking system of the winder.

J. Miscellaneous

- While an operator was operating a dozer near the edge of the overburden bench the dozer slided to the lower coal bench the operator jumped out of the driver's seat and escaped unhurt.
- In another case 400T capacity concrete bunker collapsed.
- In third case while operating an excavator for loading overburden into a dumper, welded portion of collar on inner side of foot bracket failed causing removal of footpin from the bracket and failure of the boom.
- In another case while attending the breakdown of EKG shovel the boom failed and the foot bracket fell on operator's cabin.

2.4 Technical Developments

- During the year 2005, 14% of the total production came from underground workings and 86% of the total production came from opencast mines. As far as average daily employment was concerned 51.25% were employed belowground, 17.08% were employed in opencast workings and the remaining 31.67% were employed for other surface operations.

- In underground workings, longwall faces contributed 7.2% to the total underground production. There were 14 longwall faces operative during the year 2005. In opencast operations, total production was obtained from fully mechanized operation.

- In opencast workings during 2005, there is increase in use of HEMM in comparison to 2004. Table 27 presents the trend in use of HEMM in opencast coalmines.

- During the 2005, 1165 Excavators, 4560 dumpers capacity varying from 35T to 120T, 985 drills of 50 mm to 250 mm, 45 draglines and 27 surface miners were used in opencast mines. As a result of improved mechanization 24 road headers, 970 SDLs, 251 LHDs, 3 continuous miners and 3 coal hauler were used in belowground coal mines.

TABLE:27	TREND IN USE OF HEAVY EARTH MOVING MACHINERY IN OPENCAST COAL MINES					
Year	Shovels	Draglines	Drills	Dumpers	Others	HP of the machinery
1990	787	41	703	3663	1885	2,711,279
1991	864	41	703	3846	1746	2,972,990
1992	892	47	829	4223	2112	3,227,528
1993	910	44	802	4385	1952	3,409,140
1994	946	43	822	4437	1946	3,448,234
1995	956	42	871	4291	2116	3,639,816
1996	961	59	864	4038	1856	3,436,437
1997	1017	42	913	4399	2177	3,703,276
1998	1106	41	918	4520	2279	3,826,094
1999	1216	49	962	4776	2372	4,058,489
2000	1143	43	969	4602	2333	3,938,986
2001	1172	42	977	4666	2304	3,965,541
2002	1159	41	972	4721	2136	3,864,244
2003	1136	39	1003	4576	2163	4,095,742
2004	1135	45	998	4516	2367	3,995,550
2005*	1145	45	985	4560	2370	4,195,327

* Provisional

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

Table-28	Number of machines used in underground coal mines during 2005					
Name of Company	Road header/ Dint header	SDL	LHD	Continuous Miners	Coal haulers	Other
BCCL	1	147	6	1	0	0
ECL	5	93	25	0	0	2
CCL	0	22	13	0	0	0
SECL	4	398	50	1	2	0
WCL	0	162	92	1	1	1
NCL	0	0	0	0	0	0
MCL	0	23	28	0	0	0
NECL	0	0	0	0	0	0
GMDC	0	0	0	0	0	0
NLC	0	0	0	0	0	0
TISCO	1	32	0	0	0	0
SCCL	13	93	37	0	0	0
GIPCL	0	0	0	0	0	0
JSMDC	0	0	0	0	0	0
RSMM	0	0	0	0	0	0
TOTAL	**24**	**970**	**251**	**3**	**3**	**3**

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

TABLE-29	Number of machines used in opencast mines during 2005																
Name of co.					Dumpers					Excavators				Drills		
	Bucket wheel Excavator	Dragline	Surface Miners	Others	170 T	120 T	85 T	50 T	35 T	>20 cum	19-10 cum	9-5 cum	< 5 cum	> 250 mm	249-150 mm	< 150 mm
BCCL	0	2	0	0	0	0	53	8	527	0	8	69	86	37	84	111
ECL	0	1	0	0	16	24	34	19	201	5	9	18	44	13	36	15
CCL	0	0	3	0	0	0	117	64	385	1	14	44	56	54	61	19
SECL	0	9	2	0	0	94	30	78	176	0	20	32	72	51	70	5
WCL	0	4	0	166	0	0	0	186	496	0	0	43	82	22	93	0
NCL	0	19	0	0	24	158	359	0	0	3	68	9	31	10	133	3
MCL	0	6	21	122	0	0	38	261	50	0	3	31	49	24	47	17
NECL	0	0	0	4	0	0	0	0	147	0	0	0	22	0	0	13
GMDC	2	0	0	0	0	0	0	0	1173	0	0	0	51	0	0	0
NLC	22	0	0	334	0	0	0	0	23	0	0	0	22	9	19	2
TISCO	0	0	0	0	0	0	42	62	0	0	3	13	1	0	20	0
SCCL	0	2	1	0	0	0	157	0	204	0	22	0	48	23	25	0
GIPCL	0	0	0	1	0	0	0	35	89	0	0	2	22	0	0	0
JSMDC	0	0	0	0	0	0	0	0	19	0	0	0	5	0	0	2
RSMM	0	0	0	0	0	0	0	0	18	0	0	0	17	0	0	0
TOTAL	**24**	**43**	**27**	**627**	**40**	**276**	**830**	**713**	**3508**	**9**	**147**	**261**	**608**	**243**	**588**	**187**

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 2005 IN COAL MINES**			
Name of Company	Initial Medical Examination		Periodical Medical Exam.	
	Required	Provided	Required	Provided
BCCL	0	0	25079	12376
MCL	385	385	3402	3535
WCL	666	666	14953	14733
CCL	280	280	8888	7819
NECL	0	0	543	567
ECL	462	462	20917	19366
SECL	461	461	17434	17231
NCL	98	98	2858	2759
SCCL	0	0	13849	15047
TISCO	91	91	1171	1195
GIPCL	445	445	4	4
NLC	153	153	1673	1084
GMDC	96	95	521	525
JSMDC	5	5	20	25
RSMM	86	86	66	180

(b) Cases of Notified Diseases in Coal Mines:

TABLE: 31	**CASES OF NOTIFIED DISEASES IN COAL MINES DURING THE YEAR 2005**	
Mining Companies	Name of Disease	Number of cases
BCCL	CWP	1
CCL	-	3

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 2005 was reported to be as follows.

TABLE: 32 **PROGRESS OF VOCATIONAL TRAINING IN COAL MINES DURING THE YEAR 2005**

Name of the Company.	No. of VT Centers	Basic Training		Refresher Training		Special Training Provided
		Required	Provided	Required	Provided	
BCCL	13	0	63	12099	10485	2910
MCL	5	2157	2157	3169	3132	1219
WCL	12	610	610	8906	9128	1348
CCL	12	280	280	8888	8652	248
NECL	3	0	0	759	759	337
ECL	21	413	413	11567	11567	3216
SECL	26	326	326	8132	10004	1398
NCL	8	98	98	2151	2187	3024
TISCO	3	555	555	2500	2529	7557
GIPCL	1	149	149	34	34	0
NLC	1	64	64	1280	1212	142
SCCL	8	636	636	9833	12407	8414
GMDC	1	1291	1779	421	177	50
JSMDC	1	5	5	20	25	5
RSMM	1	113	113	6	95	0

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 a Workmen's Inspector and a Safety Committee. The table below shows the status of appointment of Workmen's Inspector, Safety Committees and Welfare Officers during 2005.

TABLE: 33	**NUMBER OF WORKMEN'S INSPECTOR IN POSITION, SAFETY COMMITTEE, WELFARE OFFICERS IN COAL MINES DURING 2005**					
Name of Company	Welfare Officers		Workmen Inspectors		Safety Committee	
	Required	Provided	Required	Provided	Required	Provided
BCCL	70	70	215	215	71	71
MCL	21	22	63	63	21	21
WCL	81	81	232	232	81	81
CCL	63	63	164	164	63	63
NECL	5	4	15	15	5	5
ECL	107	90	303	303	101	101
SECL	87	87	273	273	85	85
NCL	8	8	29	29	8	8
TISCO	6	6	42	51	8	9
GIPCL	1	1	4	4	1	1
NLC	4	4	15	15	2	2
SCCL	57	57	177	177	59	59
GMDC	2	2	10	11	4	4
JSMDC	1	0	2	2	1	1
RSMM	0	0	1	1	1	1

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			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Acc	Killed	Acc	Killed	Acc	Killed	Acc	Killed				
BCCL	1998	21	22	4	4	0	0	25	26	0.48	0.34	0	0.3
	1999	20	22	3	3	3	3	26	28	0.52	0.27	0.11	0.35
	2000	12	16	2	2	1	1	15	19	0.41	0.18	0.04	0.25
	2001	9	37	3	3	2	2	14	42	0.99	0.28	0.09	0.6
	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	0.24	0.20	0.15	0.21
	2004	7	8	3	3	1	1	11	12	0.25	0.31	0.05	0.20
	2005	11	16	1	1	3	3	15	20	0.50	0.10	0.16	0.33
CCL	1998	3	7	0	0	4	4	7	11	0.39	0	0.2	0.2
	1999	2	2	3	3	1	1	6	6	0.11	0.18	0.05	0.11
	2000	1	2	8	11	3	3	12	16	0.12	0.7	0.17	0.32
	2001	2	2	3	3	0	0	5	5	0.13	0.19	0	0.1
	2002	3	3	7	7	1	1	11	11	0.21	0.5	0.06	0.24
	2003	3	3	2	2	1	1	6	6	0.21	0.14	0.06	0.14
	2004	5	5	5	5	0	0	10	10	0.37	0.41	0	0.24
	2005	4	17	4	5	0	0	8	22	1.27	0.41	0	0.53
ECL	1998	15	17	2	2	6	6	23	25	0.26	0.37	0.16	0.23
	1999	13	17	3	3	5	5	21	25	0.29	0.56	0.15	0.25
	2000	10	11	2	2	3	3	15	16	0.2	0.39	0.09	0.17
	2001	16	17	2	2	0	0	18	19	0.32	0.39	0	0.21
	2002	5	5	3	3	1	4	9	12	0.1	0.74	0.14	0.14
	2003	10	10	3	3	0	0	13	13	0.21	0.66	0	0.16
	2004	10	11	5	5	1	1	16	17	0.24	1.09	0.04	0.22
	2005	9	10	3	3	5	5	17	18	0.22	0.66	0.18	0.23
MCL	1998	1	3	1	1	3	4	5	8	0.52	0.23	0.63	0.48
	1999	1	1	3	3	3	3	7	7	0.18	0.56	0.43	0.39
	2000	0	0	1	1	1	1	2	2	0	0.19	0.14	0.11
	2001	1	1	2	2	1	1	4	4	0.2	0.44	0.16	0.25
	2002	1	1	2	2	0	0	3	3	0.21	0.41	0	0.18
	2003	0	0	6	6	1	1	7	7	0	0.92	0.13	0.38
	2004	2	2	2	2	0	0	4	4	0.39	0.39	0	0.23
	2005	3	3	4	4	3	3	10	10	0.58	0.78	0.41	0.57
NCL	1998	0	0	3	3	2	2	5	5	0	0.46	0.34	0.4
	1999	0	0	3	3	0	0	3	3	0	0.43	0	0.23
	2000	0	0	5	5	1	1	6	6	0	0.74	0.16	0.46
	2001	0	0	3	3	1	1	4	4	0	0.46	0.17	0.32
	2002	0	0	1	1	0	0	1	1	0	0.16	0	0.08
	2003	0	0	1	1	1	1	2	2	0	0.16	0.15	0.15
	2004	0	0	3	4	0	0	3	4	0	0.59	0	0.31
	2005	0	0	1	1	2	2	3	3	0	0.15	0.33	0.23

Owner	Year	Fatal Accidents								Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Acc	Killed	Acc	Killed	Acc	Killed	Acc	Killed				
NEC	1998	1	1	1	1	0	0	2	2	0.61	4.69	0	0.7
	1999	0	0	1	1	0	0	1	1	0	2.34	0	0.33
	2000	1	1	0	0	0	0	1	1	0.64	0	0	0.33
	2004	1	1	1	1	0	0	2	2	0.86	1.39	0	0.74
	2005	1	1	0	0	0	0	1	1	0.86	0	0	0.37
SECL	1998	4	6	3	3	3	3	10	12	0.15	0.53	0.17	0.19
	1999	9	12	4	4	5	5	18	21	0.29	0.68	0.29	0.33
	2000	10	11	3	3	2	2	15	16	0.27	0.5	0.12	0.25
	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	0.3	0.3	0.19	0.27
	2003	7	7	0	0	4	4	11	11	0.19	0	0.24	0.19
	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	0.22	0.77	0.12	0.25
WCL	1998	10	11	4	4	0	0	14	15	0.36	0.59	0	0.27
	1999	6	6	3	3	2	2	11	11	0.21	0.43	0.12	0.21
	2000	8	9	5	14	1	1	14	24	0.31	2.02	0.06	0.45
	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	0.17	0.24	0.35	0.24
	2004	6	6	5	5	2	2	13	13	0.26	0.60	0.13	0.27
	2005	5	5	4	4	1	1	10	10	0.22	0.48	0.06	0.21
CIL	**1998**	**55**	**67**	**18**	**18**	**18**	**19**	**91**	**104**	**0.32**	**0.31**	**0.14**	**0.26**
	1999	**51**	**60**	**23**	**23**	**19**	**19**	**93**	**102**	**0.31**	**0.39**	**0.15**	**0.27**
	2000	**42**	**50**	**26**	**38**	**12**	**12**	**80**	**100**	**0.27**	**0.66**	**0.1**	**0.27**
	2001	**43**	**77**	**18**	**18**	**9**	**10**	**70**	**105**	**0.44**	**0.32**	**0.09**	**0.3**
	2002	**32**	**36**	**20**	**20**	**10**	**13**	**62**	**69**	**0.22**	**0.36**	**0.11**	**0.21**
	2003	**31**	**32**	**16**	**16**	**13**	**16**	**60**	**64**	**0.20**	**0.29**	**0.14**	**0.19**
	2004	**36**	**39**	**25**	**26**	**5**	**5**	**66**	**70**	**0.25**	**0.48**	**0.05**	**0.22**
	2005	40	60	22	23	16	16	78	99	0.38	0.43	0.15	0.31
DVC	2005	0	0	1	1	0	0	1	1	0	8.55	0	3.77
GMDC	1998	0	0	1	1	0	0	1	1	0	1.25	0	0.71
	2000	0	0	1	1	0	0	1	1	0	1.27	0	0.7
	2001	0	0	1	1	0	0	1	1	0	1.09	0	0.66
	2002	0	0	1	1	0	0	1	1	0	1.34	0	0.74
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	1	1	0	0	1	1	0	1.53	0	0.80
IISCO	1998	1	1	0	0	0	0	1	1	0.55	0	0	0.29
	1999	1	1	0	0	0	0	1	1	0.52	0	0	0.28
	2001	2	2	0	0	0	0	2	2	0.96	0	0	0.56
	2004	0	0	2	2	0	0	2	2	0	4.46	0	0.63
	2005	1	1	0	0	0	0	1	1	0.59	0	0	0.32

Owner	Year	Fatal Accidents								Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	Total
		Acc	Killed	Acc	Killed	Acc	Killed	Acc	Killed				
J&K	1999	1	1	0	0	0	0	1	1	1.9	0	0	1.56
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
NLC	1998	0	0	0	0	1	1	1	1	0	0	0.25	0.14
	1999	0	0	1	1	1	1	2	2	0	0.31	0.24	0.27
	2000	0	0	2	2	1	1	3	3	0	0.67	0.24	0.42
	2001	0	0	4	4	1	1	5	5	0	1.05	0.28	0.68
	2002	0	0	1	1	0	0	1	1	0	0.26	0	0.14
	2003	0	0	1	2	0	0	1	2	0	0.47	0	0.22
	2004	0	0	2	2	1	1	3	3	0	0.32	0.28	0.31
	2005	0	0	1	1	0	0	1	1	0	0.16	0	0.10
SCCL	1998	24	29	3	3	5	5	32	37	0.53	0.62	0.56	0.54
	1999	17	18	5	6	3	3	25	27	0.33	1.12	0.33	0.39
	2000	18	23	8	9	1	2	27	34	0.43	1.59	0.25	0.51
	2001	21	21	2	2	2	2	25	25	0.4	0.37	0.29	0.38
	2002	13	22	0	0	1	1	14	23	0.45	0	0.14	0.37
	2003	12	37	6	6	1	1	19	44	0.80	1.04	0.12	0.73
	2004	10	13	1	1	0	0	11	14	0.28	0.17	0	0.23
	2005	8	8	2	2	2	2	12	12	0.17	0.34	0.27	0.20
TISCO	1998	0	0	1	1	0	0	1	1	0	0.85	0	0.11
	1999	4	4	1	1	0	0	5	5	0.68	0.91	0	0.56
	2000	2	2	0	0	2	2	4	4	0.38	0	1.08	0.49
	2001	1	2	0	0	0	0	1	2	0.37	0	0	0.24
	2002	3	3	0	0	0	0	3	3	0.57	0	0	0.37
	2003	3	3	0	0	0	0	3	3	0.58	0	0	0.33
	2004	3	5	0	0	0	0	3	5	1.01	0	0	0.63
	2005	2	2	0	0	0	0	2	2	0.40	0	0	0.25
GIPCL	1998	0	0	1	1	0	0	1	1	0	4.08	0	3.45
	2001	0	0	1	1	0	0	1	1	0	4.52	0	3.31
JINDAL	2000	0	0	0	0	1	1	1	1	0	0	14.08	3.82
BECML	2000	0	0	1	1	0	0	1	1	0	3.32	0	2.91
	2004	0	0	1	1	0	0	1	1	0	2.92	0	2.26
BLAI	2004	0	0	1	1	0	0	1	1	0	10.87	0	5.71
ICML	2005	0	0	1	1	0	0	1	1	0	1.83	0	1.23
MIL	2005	0	0	1	1	0	0	1	1	0	8.55	0	3.77
ALL INDIA	**1998**	**80**	**97**	**24**	**24**	**24**	**25**	**128**	**146**	**0.36**	**0.35**	**0.16**	**0.30**
	1999	**74**	**84**	**30**	**31**	**23**	**23**	**127**	**138**	**0.33**	**0.43**	**0.16**	**0.29**
	2000	**62**	**75**	**38**	**51**	**17**	**18**	**117**	**144**	**0.3**	**0.74**	**0.13**	**0.31**
	2001	**67**	**102**	**26**	**26**	**12**	**13**	**105**	**141**	**0.43**	**0.38**	**0.1**	**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**	**0.33**	**0.35**	**0.13**	**0.27**
	2004	**49**	**57**	**32**	**33**	**6**	**6**	**87**	**96**	**0.27**	**0.47**	**0.05**	**0.24**
	2005	**51**	**71**	**28**	**29**	**20**	**20**	**99**	**120**	**0.34**	**0.41**	**0.16**	**0.30**

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

Owner	Year	Serious Accidents								Serious 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				
BCCL	1998	57	63	15	15	18	18	90	96	1.39	1.28	0.61	1.11
	1999	46	51	14	16	11	13	71	80	1.22	1.41	0.48	1
	2000	53	58	12	12	17	17	82	87	1.48	1.06	0.7	1.16
	2001	49	54	8	8	11	11	68	73	1.45	0.74	0.5	1.04
	2002	44	56	16	17	8	8	68	81	1.6	1.44	0.37	1.18
	2003	39	42	9	9	12	12	60	63	1.27	0.91	0.61	1.00
	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	0.98	1.15	0.65	0.90
CCL	1998	12	13	7	8	10	10	29	31	0.73	0.47	0.5	0.56
	1999	22	23	7	10	7	7	36	40	1.31	0.59	0.36	0.75
	2000	12	14	16	22	7	8	35	44	0.84	1.41	0.44	0.87
	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	0.79	0.64	0.58	0.67
	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	0.52	0.91	0.45	0.61
ECL	1998	107	113	8	8	23	25	138	146	1.75	1.48	0.67	1.37
	1999	173	182	9	9	35	36	217	227	3.08	1.67	1.05	2.3
	2000	155	164	12	12	30	30	197	206	2.98	2.36	0.92	2.22
	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	2.3
	2003	141	147	9	11	21	21	171	179	3.06	2.41	0.72	2.19
	2004	148	151	14	15	24	24	186	190	3.25	3.28	0.86	2.41
	2005	44	46	7	7	11	11	62	64	0.99	1.53	0.39	0.81
MCL	1998	12	12	3	3	2	2	17	17	2.06	0.68	0.31	1.02
	1999	9	10	2	2	5	5	16	17	1.85	0.37	0.72	0.96
	2000	9	9	7	7	1	2	17	18	1.69	1.36	0.28	1.02
	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	0.3	1.04
	2003	5	5	4	4	3	3	12	12	1.11	0.61	0.40	0.65
	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	1.16	0.97	0.41	0.78
NCL	1998	0	0	10	10	11	11	21	21	0	1.52	1.89	1.69
	1999	0	0	11	12	8	9	19	21	0	1.71	1.46	1.59
	2000	0	0	9	10	1	1	10	11	0	1.47	0.16	0.85
	2001	0	0	9	9	7	7	16	16	0	1.38	1.19	1.29
	2002	0	0	5	5	4	4	9	9	0	0.8	0.59	0.69
	2003	0	0	11	11	7	7	18	18	0	1.76	1.05	1.39
	2004	0	0	5	5	4	5	9	10	0	0.74	0.81	0.77
	2005	0	0	10	11	3	3	13	14	0	1.62	0.48	1.08

Owner	Year	Serious Accidents								Serious 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				
NEC	1998	1	1	0	0	0	0	1	1	0.61	0	0	0.35
	1999	2	2	0	0	0	0	2	2	1.23	0	0	0.65
	2000	1	1	0	0	0	0	1	1	0.64	0	0	0.33
	2004	1	1	0	0	0	0	1	1	0.86	0	0	0.37
SECL	1998	27	37	2	2	4	4	33	43	0.91	0.35	0.23	0.68
	1999	29	33	6	7	18	21	53	61	0.81	1.19	1.23	0.96
	2000	70	78	15	15	22	22	107	115	1.93	2.52	1.33	1.83
	2001	80	80	12	12	26	26	118	118	2.1	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	1.83	2.49	0.95	1.64
	2004	73	74	13	13	22	22	108	109	2.05	2.00	1.35	1.85
	2005	66	70	9	9	18	19	93	98	1.94	1.38	1.16	1.66
WCL	1998	38	44	11	11	17	17	66	72	1.43	1.63	0.94	1.3
	1999	36	37	9	9	8	8	53	54	1.29	1.29	0.47	1.02
	2000	65	66	20	20	13	15	98	101	2.27	2.88	0.85	1.88
	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	1.83	1.56	0.81	1.42
	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	1.35	0.84	0.31	0.91
CIL	**1998**	**254**	**283**	**56**	**57**	**85**	**87**	**395**	**427**	**1.37**	**0.99**	**0.64**	**1.07**
	1999	**317**	**338**	**58**	**65**	**92**	**99**	**467**	**502**	**1.73**	**1.09**	**0.77**	**1.31**
	2000	**365**	**390**	**91**	**98**	**91**	**95**	**547**	**583**	**2.08**	**1.71**	**0.77**	**1.58**
	2001	**367**	**392**	**53**	**55**	**109**	**117**	**529**	**564**	**2.22**	**0.99**	**1.03**	**1.63**
	2002	**337**	**358**	**69**	**75**	**76**	**76**	**482**	**509**	**2.16**	**1.37**	**0.67**	**1.52**
	2003	**301**	**315**	**65**	**70**	**81**	**82**	**447**	**467**	**1.96**	**1.26**	**0.72**	**1.42**
	2004	**338**	**350**	**65**	**69**	**88**	**89**	**491**	**508**	**2.23**	**1.28**	**0.82**	**1.59**
	2005	173	192	59	61	57	60	289	313	1.22	1.14	0.55	0.98
DVC	2005	0	0	1	1	0	0	1	1	0	8.55	0	3.77
GMDC	1998	0	0	2	2	2	2	4	4	0	2.51	3.27	2.84
	1999	0	0	1	1	2	2	3	3	0	0.93	2.31	1.55
	2000	0	0	2	2	2	2	4	4	0	2.54	3.13	2.8
	2001	0	0	4	4	2	2	6	6	0	4.36	3.31	3.94
	2002	0	0	1	1	1	1	2	2	0	1.34	1.66	1.48
	2003	0	0	3	3	0	0	3	3	0	4.18	0	2.16
	2004	0	0	0	0	2	2	2	2	0	0	3.34	1.60
	2005	0	0	1	1	0	0	1	1	0	1.53	0	0.80
IISCO	1998	7	7	0	0	1	1	8	8	3.85	0	0.74	2.36
	1999	8	8	0	0	2	2	10	10	4.18	0	1.49	2.83
	2000	4	4	1	1	2	2	7	7	1.97	3.83	1.9	2.09
	2001	8	9	0	0	1	1	9	10	4.31	0	0.86	2.79
	2002	9	9	0	0	0	0	9	9	4.47	0	0	2.72
	2003	9	9	0	0	3	3	12	12	4.15	0	2.55	3.29

Owner	Year	Serious Accidents								Serious 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	15	15	3	3	0	0	18	18	8.85	6.70	0	5.69
J&K	1999	0	0	0	0	0	0	0	0	0	0	0	0
	2000	1	1	0	0	0	0	1	1	1.37	0	0	1.09
	2003	1	1	0	0	0	0	1	1	1.24	0	0	0.99
	2004	3	3	0	0	0	0	3	3	3.36	0	0	2.92
	2005	0	0	0	0	1	3	1	3	0	0	22.39	2.92
NLC	1998	0	0	1	1	0	0	1	1	0	0.33	0	0.14
	1999	0	0	2	2	3	3	5	5	0	0.62	0.71	0.67
	2000	0	0	2	2	0	0	2	2	0	0.67	0	0.28
	2001	0	0	5	5	1	2	6	7	0	1.32	0.56	0.95
	2002	0	0	9	9	2	2	11	11	0	2.31	0.59	1.51
	2003	0	0	7	10	1	1	8	11	0	2.33	0.21	1.21
	2004	0	0	1	1	2	2	3	3	0	0.16	0.56	0.31
	2005	0	0	2	3	0	0	2	3	0	0.48	0	0.31
SCCL	1998	77	81	12	12	14	14	103	107	1.48	2.46	1.57	1.56
	1999	72	87	13	14	9	11	94	112	1.6	2.61	1.22	1.63
	2000	63	69	11	11	11	11	85	91	1.29	1.94	1.36	1.35
	2001	83	93	8	10	14	14	105	117	1.76	1.84	2	1.79
	2002	85	93	12	12	20	20	117	125	1.89	2.01	2.83	2
	2003	68	72	7	7	13	13	88	92	1.55	1.21	1.56	1.52
	2004	396	405	12	12	29	30	437	447	8.70	2.04	4.10	7.48
	2005	567	572	28	28	94	94	689	694	12.29	4.76	12.84	11.62
TISCO	1998	8	9	1	1	3	3	12	13	1.45	0.85	1.43	1.37
	1999	11	13	2	2	2	2	15	17	2.2	1.81	1.02	1.89
	2000	11	13	1	1	2	2	14	16	2.48	0.89	1.08	1.95
	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	1.07	0.44
	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	0.40	0	0	0.25
RSMDC	1999	0	0	1	1	0	0	1	1	0	7.75	0	5.85
GIPCL	2000	0	0	0	0	1	1	1	1	0	0	1.5	1.45
JINDAL	2000	0	0	0	0	0	2	0	2	0	0	28.17	7.63
BECM	**2004**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**2.92**	**0**	**2.26**
ALL INDIA	**1998**	**346**	**380**	**72**	**73**	**105**	**107**	**523**	**560**	**1.41**	**1.06**	**0.7**	**1.14**
	1999	**408**	**446**	**77**	**85**	**110**	**119**	**595**	**650**	**1.73**	**1.19**	**0.81**	**1.37**
	2000	**444**	**477**	**108**	**115**	**109**	**115**	**661**	**707**	**1.92**	**1.67**	**0.82**	**1.54**
	2001	**464**	**504**	**73**	**77**	**130**	**139**	**667**	**720**	**2.1**	**1.12**	**1.07**	**1.64**
	2002	**434**	**464**	**92**	**98**	**103**	**103**	**629**	**665**	**2.07**	**1.43**	**0.8**	**1.57**
	2003	**380**	**398**	**82**	**90**	**101**	**102**	**563**	**590**	**1.85**	**1.30**	**0.77**	**1.42**
	2004	**757**	**778**	**82**	**87**	**123**	**126**	**962**	**991**	**3.69**	**1.24**	**1.02**	**2.45**
	2005	**742**	**766**	**91**	**94**	**152**	**157**	**985**	**1017**	**3.63**	**1.34**	**1.27**	**2.51**

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 number of working non-coal mines are over about 6000 out of which 2160 non-coal mines including 50 oil projects submitted returns at the end of the year.

Average daily employment in non-coal mines during the year 2005 was 156,582 as compared to 153,305 in 2004. Average daily employment in workings belowground, opencast and aboveground during the year 2005 was 9,874; 83,811 & 62,897 as compared to 11,244; 79,205 & 62,856 respectively during the year 2004. The average daily employment in various minerals is depicted in the table below:

TABLE: 34	**Average daily employment and output in non-coal mines during 2005**					
Mineral	**No. of mine**	**Average daily employment**				**Output ('000 tonnes)**
		U / G	**O/C**	**Surface**	**Total**	
Bauxite	108	-	3747	810	4557	8915
Copper	8	2424	252	919	3595	3196
Gold	4	1700	80	1526	3306	135
Granites	170	-	4492	1437	5929	353
Lime Stone	455	-	18760	6317	25077	224312
Iron-ore	228	-	20360	13130	33490	97912
Manganese	121	2560	7120	3680	13360	1917
Marble	20	-	1150	390	1540	1611
Stone	234	-	4770	2970	7740	20630
Galena & sphalarite	12	1750	280	2030	4060	2035
Others	750	1440	22800	10400	34640	93613
Oil Natural Gas	50	-	0	19288	19288	6575
Total Non-Coal	**2160**	**9874**	**83811**	**62897**	**156582**	

* Figures are provisional

3.2 Accidents

There was no major accident involving four or more persons in non-coal mines during the year

3.2.1 Accident scenario

There were 48 fatal accidents involving 52 fatalities and 108 serious accidents during the year 2005 as compared to 57 fatal accidents involving 64 fatalities and 188 serious accidents during 2004. Table: 35 below shows trend in fatal accidents and death rates in non-coal mines.

TABLE: 35	TREND IN FATAL ACCIDENTS & DEATH RATES IN NON-COAL MINES						
Year	Number of accidents			Death rate per 1000 persons employed			
	Fatal	Persons killed	Persons ser. injured	Below ground	Open-cast	Above ground	Overall
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	0.54
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	0.26	0.39
2005*	48	52	4	0.37	0.43	0.16	0.32

* Provisional

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

TABLE:36	TREND IN SERIOUS ACCIDENTS AND SERIOUS INJURY RATES IN NON-COAL MINES					
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	1.57	1.25
2005*	108	109	3.35	0.30	0.90	0.69

* Provisional

Table: 37 depicts trend in accidents due to different cause group for the years 2000-2004.

TABLE:37	TREND IN FATAL ACCIDENTS DUE TO DIFFERENT CAUSES IN NON-COAL MINES				
Cause	2001	2002	2003	2004	2005
Ground movement	10 (14)	11 (19)	8 (13)	14 (17)	6 (7)
Winding in shafts	-	-	-	-	-
Transportation machinery (other than winding)	26 (26)	13 (13)	15 (16)	21 (22)	13 (14)
Machinery other than transportation machinery	7 (8)	6 (7)	6 (7)	5 (6)	10 (11)
Explosive	6 (6)	8 (11)	5 (6)	3 (4)	4 (5)
Electricity	1 (1)	1 (1)	3 (3)	2 (3)	-
Gas, Dust etc.	3 (6)	-	1 (2)	-	-
Falls other than falls of ground	15 (17)	12 (12)	14 (15)	10 (10)	15 (15)
Other causes	3 (3)	1 (1)	-	2 (2)	-
TOTAL	**71 (81)**	**52 (64)**	**52 (62)**	**57 (64)**	**48 (52)**

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

Trend in Fatal Accidents due to different causes in Non-Coal mines during 2005

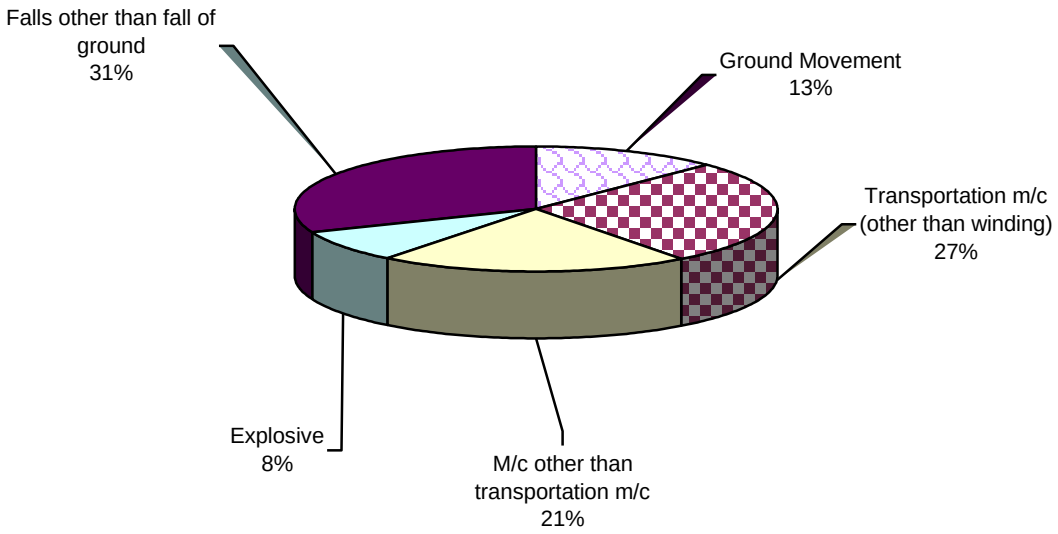


TABLE:37A	TREND IN FATAL ACCIDENTS IN DIFFERENT PLACES OF NON-COAL MINES				
Place	**2001**	**2002**	**2003**	**2004**	**2005**
Belowground	5 (5)	5 (5)	3 (4)	5 (5)	3 (3)
Opencast	45 (51)	33 (45)	31 (38)	36 (42)	38 (38)
Aboveground	21 (25)	14 (14)	18 (20)	16 (17)	11 (11)
Total	**71 (81)**	**52 (64)**	**52 (62)**	**57 (64)**	**48 (52)**

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

TABLE: 38	TREND IN SERIOUS ACCIDENTS DUE TO DIFFERENT CAUSES IN NON-COAL MINES				
Cause	**2001**	**2002**	**2003**	**2004**	**2005**
Ground movement	1 (4)	2 (5)	2 (9)	5 (12)	2 (3)
Winding in shafts	1 (1)	1 (1)	-	-	-
Transportation machinery (other than winding)	21 (22)	18 (19)	19 (22)	13 (18)	14 (16)
Machinery other than transportation machinery	23 (24)	23 (23)	25 (27)	22 (22)	15 (15)
Explosive	0 (3)	2 (2)	1 (4)	-	1 (2)
Electricity	1 (1)	4 (4)	1 (1)	0 (1)	-
Gas, Dust etc.	-	-	-	-	3 (4)
Falls other than falls of ground	100 (101)	89 (89)	68 (69)	80 (81)	44 (44)
Other causes	52 (52)	66 (66)	52 (53)	68 (69)	29 (29)
TOTAL	**199 (208)**	**205 (209)**	**168(185)**	**188 (203)**	**108 (113)**

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

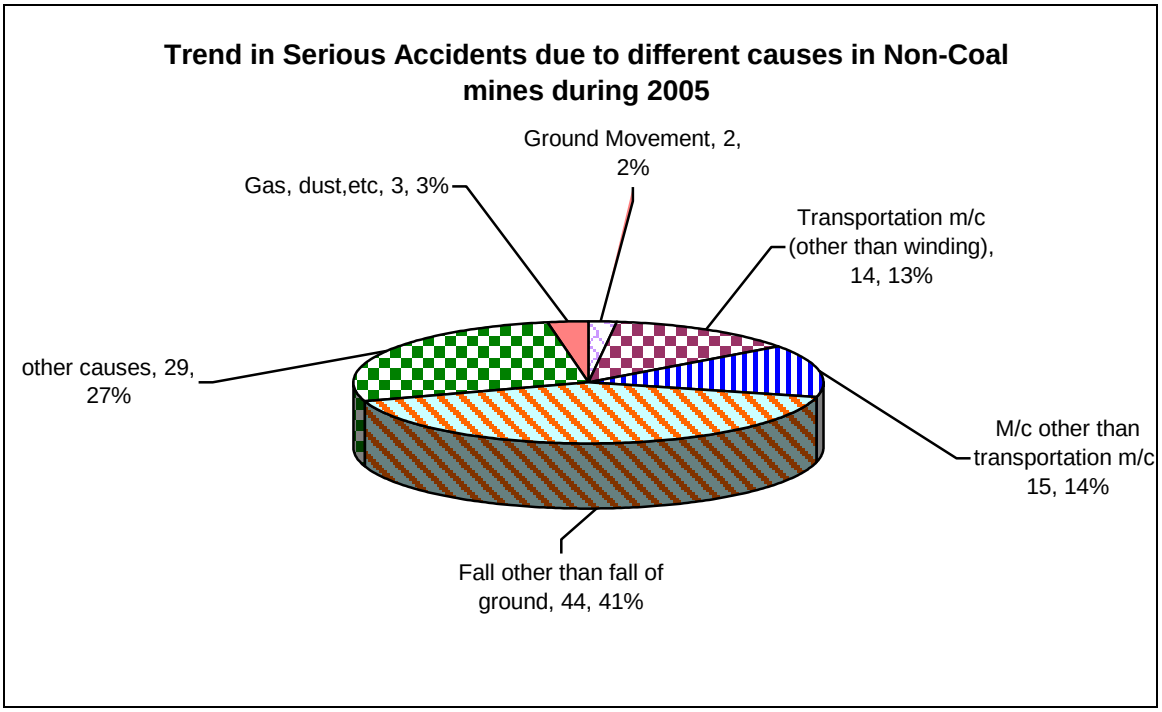


TABLE: 38A	TREND IN SERIOUS ACCIDENTS IN DIFFERENT PLACES OF NON-COAL MINES				
Place	**2001**	**2002**	**2003**	**2004**	**2005**
Belowground	59 (61)	52 (52)	57 (57)	54 (54)	27 (27)
Opencast	37 (43)	40 (44)	25 (36)	34 (46)	22 (27)
Aboveground	103 (104	113 (113)	86 (92)	100 (103)	59 (59)
Total	**199 (208)**	**205 (209)**	**168 (185)**	**188 (203)**	**108 (113)**

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

Table: 39 shows fatal and serious accidents mineral-wise for the year 2000-2005.

TABLE: 39	FATAL AND SERIOUS ACCIDENTS MINERAL-WISE IN NON-COAL MINES DURING 2001-2005									
Mineral	**Fatal accidents**					**Serious accidents**				
	2001	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**
Copper	1	1	-	-	-	8	5	4	1	4
Gold	1	-	-	-	-	32	40	45	35	10
Galena & sphalerite	-	1	-	3	1	44	23	22	30	24
Manganese ore	1	4	1	3	-	6	14	11	9	5
Iron-ore	11	10	13	12	15	54	60	37	45	34
Lime stone	11	10	6	12	7	14	8	13	14	9
Granite	9	3	7	2	6	-	1	-	-	1
Marble	7	1	6	6	3		-	-	-	-
Stone	10	7	6	8	8	-	1	-	2	-
Oil	9	2	1	2	1	21	31	21	38	15
Others	11	13	12	9	7	20	22	15	14	6
TOTAL	**71**	**52**	**52**	**57**	**48**	**199**	**205**	**168**	**188**	**108**

Note: Data for 2005 are 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

There were 6(12.50% of the total) fatal accidents due to ground movement in the year 2005 as compared to 14(24.56% of the total) fatal accidents due to ground movement in the year 2004.

3.2.2.1A Roof fall Accidents

Out of 6 fatal accidents due to ground movement in the year 2005 only one accident occurred due to roof fall in a stope while a CAVO loader helper was assisting his operator suddenly a huge mass of rock measuring about 30 x 6 x 4 mt. fell with the support and helper was fatally trapped.

3.2.2.1B Side fall Accidents

There were 5 (10.41% of total accident) fatal accidents due to side fall during the year 2005 involving 6 persons when compared to 14 involving 16 persons during previous year.

Out of five accidents, one occurred in belowground mine and rest in opencast workings. In most of the cases proper benches and/or sloping of sides was not done, height of the benches varied from 3.0 -41.0., sides of the benches were not properly dressed and secured before employing the persons and in few cases workings were not placed under the charge of mining mate and duly qualified manager was not appointed.

3.2.2.2 Transportation machinery (Winding)

There was no accident due to transportation machinery (winding) during the year 2005.

3.2.2.3 Transportation machinery (other than winding)

There were altogether 13 (27.08% of all fatal accidents) accidents involving 14 fatalities due to transportation machinery (other than winding) during the year 2005.

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

TABLE-40	**FATAL & SERIOUS ACCIDENTS DUE TO TRANSPORTATION MACHINERY IN NON COAL MINES IN YEAR 2005**		
Sl. No.	Causes	No. of fatal accidents	Persons killed
1.	Rope Haulages	-	-
2.	Conveyors	01	01
3.	Dumpers	11	12
4.	Truck & Tankers	01	01
5.	Other	-	-
	Total	**13**	**14**

The analysis of causes revealed the following:

- One person killed due to entanglement with return roller of running conveyor while cleaning.
- Four persons were killed in four different accidents while reversing the dumper.
- Two persons were killed in two different accidents due to run-over by dumper while moving forward.
- Two persons killed in two different accidents due to uncontrolled rolling back of the dumper.
- One person killed due to hitting by flying stone from over loaded dumper.
- Two persons were killed while a moving truck was uncontrolled and dashed against a tree.
- One accident occurred at other machinery its causes not finalized.

3.2.2.5 Accidents due to other machinery.

TABLE-41	**BREAK UP OF SERIOUS & FATAL ACCIDENTS DUE TO OTHER MACHINERY IN NON COAL MINES DURING 2005**			
	FATAL		SERIOUS	
Causes	Surface	Underground	Surface	Underground
1. Drills	0	0	0	0
2. Shovel/LHD	0	0	0	0
3. Crane	0	0	0	0
4. Crushing Plant	2	0	2	0
5. Tractors	0	0	0	0
6. Wiresaw cutting machine	1	0	0	0
7. Others	6	1	3	4
Total	**9**	**1**	**5**	4

It is seen that most accidents due to transportation machinery and other machinery were caused due to operators' negligence, indiscipline and lack of supervisions. Improved standards of training and education of workers are necessary to control such accidents. Some cases of equipment failure were observed due to poor maintenance and call for higher standard of maintenance of machinery in the opencast sector.

Table: 42 Detail break-up of serious accidents due to this cause during 2005.

TABLE : 42	**BREAK-UP OF SERIOUS ACCIDENTS DUE TO MACHINERY OTHER THAN TRANSPORTATION MACHINERY IN NON-COAL MINES DURING 2005**			
Cause	**Number of serious accidents**			
	Belowground	Opencast	Aboveground	Total
Drills	0	2	0	2
Shovels, draglines, excavators etc.	0	0	0	0
Crushing & screening plants	0	0	2	2
Others	4	4	3	11
TOTAL	**4**	**6**	**5**	**15**

3.2.2.5 Explosives

There were 4 (7.01% of the total) fatal accidents involving 5 persons and one serious accident in 2005 as compared to 3 fatal accidents nil serious accident in 2004. Accident enquiry revealed that:

Three accidents involving four persons occurred due to flying fragments ejected from the blast hole.

- In one case a while three persons were checking the continuity of a charged hole with a meggar, the hole got connected and shots were fired injuring two of them due to flying fragments ejecting from the hole.
- In another case a flying fragment was ejected due to blasting and hit the blaster helper at a distance of about 25 mt. from the site of blasting.
- In third case the flying fragment was ejected and traveled a distance of about 150 mt. and hit a General Mazdoor in a granite quarry.
- In the fourth case accident occurred due to unauthorized blasting, while a blasting assistant was connecting a detonator to a igniter cord of a charged hole at the bottom of a granite bench, suddenly another row of charged shot hole in the same block was fired by an unauthorized person resulting separation and spitting of granite block and the blasting assistant was trapped and fatally injured.

3.2.2.6 Electricity

There is no fatal accident and no serious accident due to electricity during the year 2005 as compared to 2 fatal and nil serious accident in 2004.

3.2.2.7 Dust, Gas & other combustible material

There was nil fatal and 3 serious accident due to this cause during the year 2005.

3.2.2.8 Falls other than falls of ground

Fall other than falls of ground are classified as below:

SN	Cause	Number of accidents
1.	Fall of persons from height into depth	11
2.	Fall of persons on the same level	2
3.	Fall of object including rolling of object	2
	Total	**15**

15 (31.25%) fatal accidents and 44 serious accidents occurred due to this cause during the year 2005, while 10 fatal accidents and 80 serious accidents during the year 2004.

Analysis of accident revealed that –

- In two cases persons lost the grip of the rope through which they were climbing on the side of the bench and fell down.
- In four cases persons lost the balance and fell down to lower bench at a depth.
- In one case the guard standing at the top of the bench ran towards the valley side and fell to a depth of 100 mt. on seeing some boulder falling from the edge of the bench.
- In one case a person who was dressing the side of a bench crowbar slipped and fell down to a height of 7 mt.
- In another case a person was slipped and fell down from a height of 17.7 mt. in a new ball mill erection site.
- While a driller sitting near edge of the bench lost balance and fell down to a depth of 4.65 mt. over the sharp edges of granite block.
- In another case a dumper operator slipped and fell down while getting down from the ladder of the dumper operator's cabin.
- Two persons were fatally injured due to fall on the same level.
- Two cases of fatal accidents were reported due to rolling of objects.

3.2.2.9 Other cases

There was no accident occurred due to miscellaneous causes.

3.3 Responsibility

The responsibilities fixed as a result of fatal accident enquiry conducted by officers of DGMS in the year 2005 is indicated in the table below:

TABLE:43	RESPONSIBILITY FOR FATAL ACCIDENTS IN NON-COAL MINES DURING THE YEAR 2005	
SL. NO.	Responsibility	No. of accidents
1.	Misadventure	4
2.	Management	14
3.	Management & Subordinate Supervisory Staff (SSS)	1
4.	Management, SSS & Co-worker	1
5.	Management & Co-worker	5
6.	Management, Co-worker & Deceased	1
7.	Management & Deceased	2
8.	Subordinate Supervisory Staff (SSS)	4
9.	SSS & deceased	3
10.	Shotfirer	1
11.	Co-worker	3
12.	Co-worker & Deceased	2
13.	Deceased	6
14.	Others	1
	TOTAL	**48**

3.4 Dangerous Occurrence

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

TABLE:44	DANGEROUS OCCURRENCES IN NON-COAL MINES DURING 2005	
Sl.No.	Cause	No. of cases
1.	Overwinding of cages etc.	0
2.	Outbreak of fire belowground	1
3.	Outbreak of fire at surface	3
4.	Premature collapse of workings or failure of pillars	0
5.	Breakage of winding rope	0
6.	Breakdown of winding engine, crank shaft, bearing etc.	0
7.	Ignition or occurrence of inflammable gas	1
8.	Breakage, fracture etc of essential parts of machinery or apparatus whereby safety of persons was endangered	2
9.	Irruption of water	1
10.	Rock burst	1
11.	Bursting of equipment under high pressure	0
12.	Oil well blowout without fire	1
13.	Fire in pipeline/well heads	0
14.	Others	9
	TOTAL	**19**

3.5 Technical Developments

Total numbers of mines working by deploying HEMM is 561. Total number of machines and capacity of shovels and dumpers used is mines have been increased. The following table shows the different types of machines deployed in mines since 1990.

TABLE: 45	TREND IN USE OF HEMM IN NON-COAL OPENCAST MINES							
Year	No. of 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	1753	7439	1471559
2004	613	68	1313	1381	5174	1947	8502	1644411
2005*	610	69	1314	1383	5210	2010	8603	1655000

*Provisional

Following table shows the various types of explosives and quality in mines since 1990.

TABLE:46	TREND IN USE OF EXPLOSIVES IN NON-COAL MINES							
YEAR	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	2047	238	36473	5279	176	88	63729
2004	1323	24547	168	36883	7300	253	111	70585
2005*	1330	24650	169	36988	7305	259	119	70820

*Provisional

3.6 Occupational Health & Environments

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

TABLE: 47	PROGRESS OF INITIAL & PERIODICAL MEDICAL EXAMINATION DURING 2005 IN NON-COAL MINES			
Name of Company	Initial Medical Examination		Periodical Medical Exam.	
	Required	Provided	Required	Provided
OIL	30	30	1350	1292
MOIL	168	233	1128	1036
HGMCL	66	66	823	823
TISCO	682	682	321	321
KIOCL	328	328	300	381
UCIL	276	276	322	397
NMDC	164	164	634	803
NALCO	26	26	96	96
BALCO	527	328	250	250
HCL	125	156	322	279
HZL	203	630	476	510
ACC	55	55	184	246
MML	1342	1342	1289	1162
IREL	4	4	404	590

(b) Progress of Medical Examination in Coal Mines:

TABLE: 48	NUMBER OF NOTIFIED DISEASES DURING 2005 IN NON-COAL MINES	
Mining Companies	Name of disease	Number of cases
HGMCL	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:

TABLE: 49	PROGRESS OF VOCATIONAL TRAINING IN NON-COAL MINES DURING THE YEAR 2005					
Cos.	No. of VT Centers	Basic Training		Refresher Training		Special Training Provided
		Required	Provided	Required	Provided	
OIL	4	700	700	275	253	1914
MOIL	7	243	247	885	927	636
HGMCL	1	106	106	327	327	87
TISCO	5	1768	1772	351	305	682
KIOCL	2	38	38	200	260	122
UCIL	2	481	481	315	315	412
NMDC	4	101	101	648	669	96
NALCO	1	76	76	55	48	-
BALCO	1	250	200	225	72	30
HCL	3	257	257	349	328	188
HZL	3	11	179	354	346	674
ACC	10	110	110	197	205	326
MML	8	1266	1277	1289	864	23
IREL	3	1104	889	263	247	1282

3.8 Workmen's Inspector, Welfare Officers & Safety Committee

TABLE: 50	NUMBER OF WORKMEN'S INSPECTOR IN POSITION, SAFETY COMMITTEE, WELFARE OFFICERS IN NON-COAL MINES DURING 2005					
Name of Company	Welfare Officers		Workmen Inspectors		Safety Committee	
	Required	Provided	Required	Provided	Required	Provided
OIL	5	5	13	13	5	16
MOIL	7	8	27	27	9	9
HGMCL	2	2	5	5	11	37
TISCO	2	3	10	17	4	13
KIOCL	4	4	9	9	3	3
UCIL	2	2	12	12	6	6
NMDC	5	5	15	15	5	5
NALCO	1	1	3	6	1	1
BALCO	1	1	3	3	2	2
HCL	3	3	9	11	3	3
HZL	3	3	11	11	10	10
ACC	-	1	-	17	9	14
MML	2	2	1	1	4	4
IREL	3	3	7	10	3	5

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

Mineral	Fatal Accidents									Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOT
	YEAR	Acc	Kill	Acc	Kill	Acc	Kill	Acc	Kill				
Oil	1998	0	0	0	0	6	7	6	7	0	0	0.24	0.24
	1999	0	0	0	0	2	2	2	2	0	0	0.08	0.08
	2000	0	0	0	0	1	1	1	1	0	0	0.04	0.04
	2001	0	0	0	0	9	9	9	9	0	0	0.37	0.37
	2002	0	0	0	0	2	2	2	2	0	0	0.09	0.09
	2003	0	0	0	0	1	1	1	1	0	0	0.05	0.05
	2004	0	0	0	0	2	2	2	2	0	0	0.10	0.10
	2005	0	0	0	0	1	1	1	1	0	0	0.05	0.05
Apatite	1998	1	1	0	0	0	0	1	1	1.26	0	0	0.33
	1999	0	0	0	0	1	1	1	1	0	0	0.84	0.37
	2000	0	0	0	0	0	0	0	0	0	0	0	0
	2001	0	0	1	1	0	0	1	1	0	1.37	0	0.51
	2003	0	0	0	0	1	1	1	1	0	0	1.09	0.49
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Asbestos	2002	0	0	2	2	0	0	2	2	0	46.51	0	7.94
	2003	0	0	0	0	1	1	1	1	0	0	27.78	4.24
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	1	1	0	0	1	1	0	40.00	0	4.57
Barytes	1999	0	0	0	0	1	1	1	1	0	0	1.92	1.17
	2000	1	1	0	0	0	0	1	1	35.71	0	0	1.2
	2001	1	1	0	0	0	0	1	1	41.67	0	0	2.2
	2002	0	0	0	0	1	1	1	1	0	0	3.79	2.24
	2003	0	0	1	2	0	0	1	2	0	12.66	0	5.21
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Bauxite	1999	0	0	0	0	1	1	1	1	0	0	0.84	0.17
	2002	0	0	2	2	0	0	2	2	0	0.53	0	0.44
	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Chine clay	1999	0	0	2	3	1	1	3	4	0	1.28	0.56	0.97
	2000	0	0	0	0	0	0	0	0	0	0	0	0
	2002	0	0	1	2	0	0	1	2	0	0.96	0	0.57
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Chromite	1998	0	0	0	0	0	0	0	0	0	0	0	0
	1999	1	1	0	0	0	0	1	1	1.18	0	0	0.12
	2000	1	1	0	0	1	1	2	2	3.02	0	0.44	0.29
	2001	0	0	1	1	1	1	2	2	0	0.25	0.49	0.31
	2002	0	0	0	0	0	0	0	0	0	0	0	0
	2003	0	0	0	0	0	0	0	0	0	0	0	0

Mineral	Fatal Accidents									Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOT
	YEAR	Acc	Kill	Acc	Kill	Acc	Kill	Acc	Kill				
	2004	1	1	0	0	0	0	1	1	1.73	0	0	0.13
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Copper	1998	1	1	0	0	0	0	1	1	0.18	0	0	0.11
	1999	0	0	0	0	0	0	0	0	0	0	0	0
	2000	1	1	0	0	0	0	1	1	0.24	0	0	0.15
	2001	1	1	0	0	0	0	1	1	0.38	0	0	0.25
	2002	1	1	0	0	0	0	1	1	0.46	0	0	0.3
	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Diamond	1999	0	0	1	2	0	0	1	2	0	22.73	0	5.15
	2000	0	0	0	0	0	0	0	0	0	0	0	0
	2001	0	0	0	0	0	0	0	0	0	0	0	0
	2002	0	0	0	0	0	0	0	0	0	0	0	0
	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Dolomite	1998	0	0	0	0	0	0	0	0	0	0	0	0
	1999	0	0	2	2	0	0	2	2	0	0.86	0	0.66
	2000	0	0	1	1	0	0	1	1	0	0.47	0	0.36
	2002	0	0	0	0	0	0	0	0	0	0	0	0
	2003	0	0	0	0	1	1	1	1	0	0	1.43	0.41
	2004	0	0	1	1	0	0	1	1	0	0.56	0	0.44
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Felspar	2004	0	0	1	1	0	0	1	1	0	7.19	0	5.85
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Fluorite	1998	0	0	0	0	0	0	0	0	0	0	0	0
	2002	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Galena & Sphalarite	1998	1	1	0	0	1	1	2	2	0.36	0	0.37	0.36
	1999	0	0	0	0	1	1	1	1	0	0	0.36	0.18
	2000	0	0	0	0	0	0	0	0	0	0	0	0
	2001	0	0	0	0	0	0	0	0	0	0	0	0
	2002	1	1	0	0	0	0	1	1	0.50	0	0	0.22
	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	2	2	0	0	1	1	3	3	1.80	0	0.49	0.79
	2005	0	0	0	0	1	1	1	1	0	0	0.49	0.26
Garnet	2001	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Gold	1998	2	2	0	0	0	0	2	2	0.56	0	0	0.33
	1999	1	3	0	0	1	1	2	4	0.84	0	0.45	0.68
	2000	0	0	0	0	0	0	0	0	0	0	0	0

Mineral	Fatal Accidents									Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOT
	YEAR	Acc	Kill	Acc	Kill	Acc	Kill	Acc	Kill				
	2001	1	1	0	0	0	0	1	1	0.54	0	0	0.28
	2002	0	0	0	0	0	0	0	0	0	0	0	0
	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Granite	1998	0	0	0	0	1	1	1	1	0	0	1.63	0.24
	1999	0	0	3	3	0	0	3	3	0	0.82	0	0.68
	2000	0	0	5	5	2	2	7	7	0	1.13	2.33	1.32
	2001	0	0	7	7	2	2	9	9	0	1.70	1.05	1.50
	2002	0	0	2	2	1	1	3	3	0	0.44	0.69	0.50
	2003	0	0	5	6	2	2	7	8	0	1.03	1.46	1.29
	2004	0	0	1	1	1	1	2	2	0	0.20	0.61	0.30
	2005	0	0	6	7	0	0	6	7	0	1.37	0	1.04
Graphite	1998	0	0	1	2	0	0	1	2	0	4.08	0	3.64
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Iron	1998	0	0	11	13	2	2	13	15	0	0.57	0.14	0.40
	1999	0	0	4	4	4	4	8	8	0	0.18	0.28	0.22
	2000	0	0	6	7	3	3	9	10	0	0.34	0.21	0.28
	2001	0	0	7	7	4	5	11	12	0	0.38	0.36	0.37
	2002	0	0	5	5	5	5	10	10	0	0.24	0.38	0.30
	2003	1	1	6	6	7	8	14	15	0	0.25	0.57	0.39
	2004	0	0	5	5	7	8	12	13	0	0.22	0.50	0.34
	2005	0	0	7	8	8	8	15	16	0	0.36	0.50	0.41
Limestone	1998	0	0	7	8	5	5	12	13	0	0.34	0.64	0.42
	1999	0	0	12	13	0	0	12	13	0	0.60	0	0.44
	2000	0	0	5	5	4	4	9	9	0	0.22	0.47	0.29
	2001	0	0	8	8	3	3	11	11	0	0.44	0.5	0.45
	2002	0	0	8	11	2	2	10	13	0	0.58	0.32	0.52
	2003	0	0	6	8	0	0	6	8	0	0.43	0	0.33
	2004	0	0	11	12	1	1	12	13	0	0.63	0.17	0.52
	2005	0	0	6	6	1	1	7	7	0	0.31	0.17	0.28
Magnesite	1998	0	0	1	1	0	0	1	1	0	0.38	0	0.33
	1999	0	0	0	0	0	0	0	0	0	0	0	0
	2000	0	0	0	0	0	0	0	0	0	0	0	0
	2001	0	0	0	0	0	0	0	0	0	0	0	0
	2002	0	0	0	0	0	0	0	0	0	0	0	0
	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Manganese	1998	1	1	2	2	0	0	3	3	0.37	0.24	0	0.19
	1999	3	3	0	0	1	1	4	4	1.09	0	0.20	0.24
	2000	2	2	3	3	0	0	5	5	0.76	0.33	0	0.31
	2001	1	1	0	0	0	0	1	1	0.4	0	0	0.07

Mineral	Fatal Accidents									Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOT
	YEAR	Acc	Kill	Acc	Kill	Acc	Kill	Acc	Kill				
	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	0	0.08
	2004	1	1	1	1	1	1	3	3	0.33	0.13	0.29	0.21
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Marble	1998	0	0	2	2	0	0	2	2	0	5.48	0	4.54
	1999	0	0	3	4	0	0	3	4	0	3.93	0	3.05
	2000	0	0	2	4	0	0	2	4	0	3.66	0	2.75
	2001	0	0	7	11	0	0	7	11	0	9.07	0	6.54
	2002	0	0	2	3	0	0	2	3	0	2.58	0	1.95
	2003	1	2	5	5	0	0	6	7	N.A.	4.46	0	4.64
	2004	0	0	6	9	1	1	7	10	0	7.85	2.60	6.53
	2005	0	0	3	3	0	0	3	3	0	2.6	0	1.96
Mica	2000	1	1	0	0	0	0	1	1	1.50	0	0	1.02
	2002	1	1	0	0	0	0	1	1	2.31	0	0	1.60
	2004	1	1	0	0	0	0	1	1	2.39	0	0	1.58
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Pyrite	1998	0	0	0	0	0	0	0	0	0	0	0	0
	1999	1	1	0	0	0	0	1	1	2.56	0	0	2.22
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Quartz	2003	0	0	0	0	1	1	1	1	0	0	17.86	1.29
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	1	2	0	0	1	2	0	2.59	0	2.38
Sandstone	1998	0	0	1	1	0	0	1	1	0	3.13	0	2.91
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Silica	1998	0	0	1	2	0	0	1	2	0	0.77	0	0.60
	1999	0	0	4	4	2	2	6	6	0	1.64	3.83	2.03
	2001	0	0	0	0	1	1	1	1	0	0	1.68	0.39
	2002	0	0	2	2	0	0	2	2	0	0.93	0	0.71
	2003	0	0	1	1	1	1	2	2	0	0.47	1.46	0.71
	2004	0	0	1	2	1	1	2	3	0	0.90	1.22	0.98
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Sillimanite	1998	0	0	0	0	1	1	1	1	0	0	0.90	0.80
	1999	0	0	0	0	0	0	0	0	0	0	0	0
	2000	0	0	0	0	0	0	0	0	0	0	0	0
	2001	0	0	0	0	0	0	0	0	0	0	0	0
	2002	0	0	0	0	0	0	0	0	0	0	0	0
	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	1	1	1	1	0	0	0.55	0.33
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Slate	2001	0	0	1	1	0	0	1	1	0	4.42	0	3.77
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0

Mineral	Fatal Accidents									Death Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOT
	YEAR	Acc	Kill	Acc	Kill	Acc	Kill	Acc	Kill				
Steatite	1998	0	0	3	3	1	1	4	4	0	1.14	1.38	1.17
	1999	0	0	3	8	0	0	3	8	0	3.19	0	2.44
	2000	1	1	2	2	0	0	3	3	5.21	0.60	0	0.70
	2001	1	1	3	5	0	0	4	6	3.27	1.50	0	1.39
	2002	0	0	2	2	0	0	2	2	0	0.62	0	0.48
	2003	0	0	2	3	3	3	5	6	0	0.99	4.46	1.54
	2004	0	0	2	2	0	0	2	2	0	0.31	0	0.25
	2005	0	0	2	2	0	0	2	2	0	0.62	0	0.50
Stone	1998	0	0	3	6	0	0	3	6	0	1.91	0	1.14
	1999	0	0	6	6	0	0	6	6	0	1.87	0	1.16
	2000	0	0	6	7	3	3	9	10	0	1.65	1.38	1.56
	2001	0	0	9	9	1	4	10	13	0	2.14	1.93	2.07
	2002	0	0	6	13	1	1	7	14	0	2.70	0.34	1.79
	2003	0	0	6	9	0	0	6	9	0	1.82	0	1.13
	2004	0	0	8	9	0	0	8	9	0	1.78	0	1.13
	2005	0	0	8	9	0	0	8	9	0	1.78	0	1.13
A.Mineral	1998	0	0	0	0	1	1	1	1				
	1999	0	0	0	0	0	0	0	0				
	2000	0	0	0	0	0	0	0	0				
	2001	0	0	1	1	0	0	1	1				
	2002	1	1	0	0	0	0	1	1				
	2003	0	0	0	0	0	0	0	0				
	2004	0	0	0	0	0	0	0	0				
	2005	3	3	0	0	0	0	3	3				
Total	**1998**	**6**	**6**	**32**	**40**	**18**	**19**	**56**	**65**	**0.33**	**0.43**	**0.23**	**0.33**
	1999	**6**	**8**	**40**	**49**	**15**	**15**	**61**	**72**	**0.49**	**0.55**	**0.19**	**0.39**
	2000	**7**	**7**	**30**	**34**	**14**	**14**	**51**	**55**	**0.49**	**0.37**	**0.19**	**0.30**
	2001	**5**	**5**	**45**	**51**	**21**	**25**	**71**	**81**	**0.52**	**0.72**	**0.38**	**0.54**
	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**	**0.47**	**0.26**	**0.39**
	2005	**3**	**3**	**38**	**38**	**11**	**11**	**48**	**52**	**0.37**	**0.43**	**0.16**	**0.32**

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

Mineral	Year	Serious Accidents								Serious Injury Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOT
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
Oil	1998	0	0	0	0	20	21	20	21	0	0	0.71	0.71
	1999	0	0	0	0	23	23	23	23	0	0	0.9	0.9
	2000	0	0	0	0	27	28	27	28	0	0	1.19	1.19
	2001	0	0	0	0	21	22	21	22	0	0	0.9	0.9
	2002	0	0	0	0	31	31	31	31	0	0	1.39	1.39
	2003	0	0	0	0	21	22	21	22	0	0	0.98	0.98
	2004	0	0	0	0	38	39	38	39	0	0	2.09	2.09
	2005	0	0	0	0	15	15	15	15	0	0	0.78	0.78
Apatite	1998	0	0	1	1	1	1	2	2	0	0.91	0.89	0.66
	1999	0	0	1	1	0	2	1	3	0	0.84	1.69	1.11
	2000	0	0	2	2	1	1	3	3	0	1.95	0.93	1.25
	2001	0	0	0	0	1	1	1	1	0	0	1.06	0.51
	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Asbestos	2002	0	0	0	0	0	0	0	0	0	0	0	0
	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Barytes	1999	0	0	0	0	0	0	0	0	0	0	0	0
	2000	0	0	0	0	0	0	0	0	0	0	0	0
	2001	0	0	0	0	0	0	0	0	0	0	0	0
	2002	0	0	0	0	1	1	1	1	0	0	3.79	2.24
	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Bauxite	1999	0	0	0	0	0	0	0	0	0	0	0	0
	2002	0	0	0	0	0	0	0	0	0	0	0	0
	2003	0	0	0	0	2	2	2	2	0	0	2.52	0.44
	2004	0	0	0	0	1	1	1	1	0	0	0.23	0.20
	2005	0	0	0	0	0	0	0	0	0	0	0	0
China Clay	1999	0	0	0	0	0	1	0	1	0	0	0.56	0.24
	2000	0	0	0	0	1	2	1	2	0	0	1.15	0.49
	2002	0	0	0	1	0	0	0	1	0	0.48	0	0.28
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	1	1	0	0	1	1	0	0.49	0	0.29
Chromite	1998	0	0	1	1	0	0	1	1	0	0.19	0	0.11
	1999	1	1	1	1	3	3	5	5	1.18	0.22	1.12	0.62
	2000	0	0	0	0	0	0	0	0	0	0	0	0
	2001	0	0	0	0	0	0	0	0	0	0	0	0
	2002	0	0	0	0	1	1	1	1	0	0	0.41	0.14

Mineral	Year	Serious Accidents								Serious Injury Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOT
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
	2003	0	0	1	1	0	0	1	1	0	0.25	0	0.14
	2004	0	0	1	1	0	0	1	1	0	0.27	0	0.15
	2005	0	0	0	0	1	1	1	1	0	0	0.31	0.13
Copper	1998	4	4	3	3	1	1	8	8	0.72	7.69	0.36	0.92
	1999	1	1	0	0	0	0	1	1	0.22	0	0	0.13
	2000	1	1	3	3	3	3	7	7	0.24	7.65	1.25	1.02
	2001	1	3	2	2	5	5	8	10	1.15	7.63	4.45	2.5
	2002	2	2	2	3	1	1	5	6	0.92	11.9	1.09	1.79
	2003	0	0	2	2	2	2	4	4	0	7.94	2.18	1.2
	2004	1	1	0	0	0	0	1	1	0.86	0	0	0.39
	2005	0	0	4	4	0	0	4	4	0	15.15	0	1.94
Diamond	1999	0	0	0	0	3	3	3	3	0	0	11.11	7.73
	2000	0	0	1	1	1	1	2	2	0	12.5	3.97	5.52
	2001	0	0	0	0	4	4	4	4	0	0	19.14	15.63
	2002	0	0	2	2	0	0	2	2	0	40	0	9.71
	2003	0	0	0	0	1	1	1	1	0	0	6.41	4.85
	2004	0	0	1	1	0	0	1	1	0	20	0	4.40
	2005	0	0	0	0	1	1	1	1	0	0	6.28	4.76
Dolomite	1998	0	0	1	1	1	1	2	2	0	0.36	1.3	0.56
	1999	0	0	0	0	3	3	3	3	0	0	4.13	0.98
	2000	0	0	1	1	2	2	3	3	0	0.47	2.85	1.07
	2002	0	0	0	0	1	1	1	1	0	0	1.35	0.45
	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	1	1	1	1	2	2	0	0.56	1.43	0.81
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Felspar	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Fluorite	1998	1	1	0	0	1	1	2	2	0	0	16.13	6.45
	2002	0	0	1	1	0	0	1	1	0	7.69	0	6.71
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Galena & Sphalarite	1998	25	25	0	0	17	17	42	42	9.02	0	6.35	7.55
	1999	41	41	0	0	9	9	50	50	14.83	0	3.28	9.07
	2000	23	24	0	0	11	11	34	35	9.17	0	4.16	6.65
	2001	26	26	1	1	17	17	44	44	11.55	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	5.45	3.53	4.55	4.89
	2004	21	21	2	2	7	7	30	30	15.57	3.32	4.43	8.50
	2005	14	14	0	0	10	10	24	24	12.57	0	4.88	6.36
Garnet	2001	0	0	0	0	1	1	1	1	0	0	2.04	0.39
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Gold	1998	47	47	0	0	30	30	77	77	13.22	0	11.66	12.5

Mineral	Year	Serious Accidents								Serious Injury Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOT
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
													7
	1999	44	48	0	0	19	19	63	67	13.36	0	8.62	11.38
	2000	31	31	0	0	8	8	39	39	9.92	0	3.79	7.31
	2001	25	25	0	0	7	7	32	32	13.57	0	4.16	8.84
	2002	27	27	0	0	13	13	40	40	15.63	0	8.52	11.97
	2003	46	46	0	0	15	15	61	61	26.64	0	9.83	18.25
	2004	22	22	0	0	13	13	35	35	17.25	0	9.20	14.30
	2005	9	9	0	0	1	1	10	10	6.84	0	0.74	3.67
Granite	1998	0	0	1	1	0	0	1	1	0	0.28	0	0.24
	1999	0	0	5	8	0	0	5	8	0	2.2	0	1.82
	2000	0	0	2	2	0	0	2	2	0	0.45	0	0.38
	2001	0	0	0	0	0	0	0	0	0	0	0	0
	2002	0	0	0	0	1	1	1	1	0	0	0.69	0.17
	2003	0	0	0	1	0	1	0	2	0	0.22	0.69	0.33
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	1	2	0	0	1	2	0	0.39	0	0.30
Iron	1998	0	0	22	33	38	38	60	71	0	1.44	2.64	1.9
	1999	0	0	12	13	24	26	36	39	0	0.6	1.8	1.08
	2000	0	0	19	19	15	15	34	34	0	0.92	1.03	0.96
	2001	0	0	27	28	27	27	54	55	0	1.51	1.95	1.7
	2002	0	0	24	24	36	36	60	60	0	1.17	2.73	1.78
	2003	0	0	16	19	22	24	38	43	0	0.93	1.82	1.28
	2004	0	0	20	22	24	24	44	46	0	1.09	1.53	1.28
	2005	0	0	10	10	24	24	34	34	0	0.53	1.49	0.93
Limestone	1998	0	0	8	8	11	11	19	19	0	0.34	1.4	0.61
	1999	1	1	5	8	12	12	18	21	1000	0.37	1.5	0.71
	2000	0	0	8	8	9	9	17	17	0	0.35	1.07	0.55
	2001	0	0	6	6	8	8	14	14	0	0.33	1.34	0.58
	2002	0	0	4	4	4	4	8	8	0	0.21	0.64	0.32
	2003	0	0	5	5	8	8	13	13	0	0.26	1.27	0.52
	2004	0	0	6	6	8	8	14	14	0	0.32	1.37	0.57
	2005	0	0	5	5	4	4	9	9	0	0.26	0.69	0.36
Magnesite	1998	0	0	1	1	0	0	1	1	0	0.38	0	0.33
	1999	0	0	0	0	1	1	1	1	0	0	3.69	0.37
	2000	0	0	2	4	1	1	3	5	0	1.48	2.42	1.61
	2001	0	0	1	1	0	0	1	1	0	0.4	0	0.35
	2002	0	0	2	2	2	2	4	4	0	1.04	5.97	1.78
	2003	0	0	1	1	0	0	1	1	0	0.52	0	0.44
	2004	0	0	0	0	1	1	1	1	0	0	2.36	0.47
	2005	0	0	0	0	0	0	0	0	0	0	0	0

Mineral	Year	Serious Accidents								Serious Injury Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOT
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
Manga-nese	1998	7	9	1	1	2	2	10	12	3.32	0.12	0.42	0.76
	1999	4	6	3	3	1	1	8	10	2.19	0.35	0.2	0.61
	2000	6	6	0	0	1	1	7	7	2.29	0	0.23	0.43
	2001	2	2	0	0	4	4	6	6	0.8	0	1	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	1.57	0.13	1.61	0.8
	2004	6	6	0	0	3	3	9	9	2.44	0	0.87	0.67
	2005	2	2	1	1	2	2	5	5	0.66	0.13	0.51	0.34
Marble	1998	0	0	0	0	0	0	0	0	0	0	0	0
	1999	0	0	0	0	0	0	0	0	0	0	0	0
	2000	0	0	0	1	0	0	0	1	0	0.91	0	0.69
	2001	0	0	0	1	0	0	0	1	0	0.82	0	0.59
	2002	0	0	0	0	0	0	0	0	0	0	0	0
	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Mica	2000	1	1	0	0	0	0	1	1	1.5	0	0	1.02
	2002	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Pyrite	1998	0	0	1	1	0	0	1	1	0	0	0	1.91
	1999	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Quartz	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Silica	1998	0	0	0	0	0	0	0	0	0	0	0	0
	1999	0	0	0	0	0	0	0	0	0	0	0	0
	2001	0	0	0	0	0	0	0	0	0	0	0	0
	2002	0	0	0	0	0	0	0	0	0	0	0	0
	2003	0	0	0	2	0	2	0	4	0	0.93	2.96	1.41
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Sillimanite	1998	0	0	0	0	2	2	2	2	0	0	1.81	1.59
	1999	0	0	0	0	2	2	2	2	0	0	1.81	1.59
	2000	0	0	0	0	1	1	1	1	0	0	0.95	0.83
	2001	0	0	0	0	2	2	2	2	0	0	1.46	1.21
	2002	0	0	0	0	1	1	1	1	0	0	0.79	0.65
	2003	0	0	0	0	1	1	1	1	0	0	0.79	0.65
	2004	0	0	0	0	2	2	2	2	0	0	1.08	0.58
	2005	0	0	0	0	0	0	0	0	0	0	0	0

Mineral	Year	Serious Accidents								Serious Injury Rate per 1000 persons			
		Belowground		Opencast		Aboveground		Total		BG	OC	AG	TOT
		Acc	S/Inj	Acc	S/Inj	Acc	S/Inj	Acc	S/Inj				
Slate	2001	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Steatite	1998	0	0	0	2	0	0	0	2	0	0.76	0	0.58
	1999	0	0	1	3	0	0	1	3	0	1.2	0	0.91
	2000	0	0	0	0	0	0	0	0	0	0	0	0
	2001	0	0	0	2	0	0	0	2	0	0.6	0	0.46
	2002	0	0	0	0	0	0	0	0	0	0	0	0
	2003	0	0	0	0	0	0	0	0	0	0	0	0
	2004	0	0	1	1	0	0	1	1	0	0.32	0	0.25
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Stone	1998	0	0	0	3	0	0	0	3	0	0.96	0	0.57
	1999	0	0	1	2	0	0	1	2	0	0.62	0	0.39
	2000	0	0	0	1	0	0	0	1	0	0.24	0	0.16
	2001	0	0	0	2	0	0	0	2	0	0.48	0	0.32
	2002	0	0	1	3	0	0	1	3	0	0.62	0	0.38
	2003	0	0	0	5	0	0	0	5	0	1.04	0	0.64
	2004	0	0	2	5	0	0	2	5	0	1.01	0	0.62
	2005	0	0	0	0	0	0	0	0	0	0	0	0
Others Minerals	1998	5	5	0	0	1	1	6	6				
	1999	4	4	0	0	5	5	9	9				
	2000	4	4	0	0	2	2	6	6				
	2001	5	5	0	0	6	6	11	11				
	2002	9	9	0	0	2	2	11	11				
	2003	8	8	0	0	1	1	9	9				
	2004	4	4	0	0	1	1	5	5				
	2005	2	2	0	0	10	10	3	3				
Total	**1998**	**89**	**91**	**40**	**56**	**125**	**126**	**254**	**273**	**5.07**	**0.6**	**1.52**	**1.40**
	1999	**96**	**102**	**29**	**39**	**105**	**110**	**230**	**251**	**6.22**	**0.44**	**1.42**	**1.37**
	2000	**66**	**67**	**38**	**42**	**83**	**85**	**187**	**194**	**4.65**	**0.46**	**1.14**	**1.08**
	2001	**59**	**61**	**37**	**43**	**103**	**104**	**199**	**208**	**5.57**	**0.53**	**1.50**	**1.29**
	2002	**52**	**52**	**40**	**44**	**113**	**113**	**205**	**209**	**5.06**	**0.53**	**1.72**	**1.31**
	2003	**69**	**69**	**27**	**38**	**89**	**95**	**185**	**202**	**6.71**	**0.46**	**1.44**	**1.27**
	2004	**54**	**54**	**34**	**39**	**99**	**100**	**187**	**193**	**6.97**	**0.46**	**1.75**	**1.29**
	2005	**27**	**27**	**22**	**23**	**59**	**59**	**108**	**109**	**3.35**	**0.30**	**0.90**	**0.69**

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 2005.

Equipment, appliances, materials and machinery approved during the year 2005		
Sl. No.	Equipment/appliances/materials/ machinery	No. of approvals granted/renewed/ extended during the year
1.	Self Rescuer	2
2.	Methanometer	6
3.	Helmet	4
4.	Cap Lamp	4
5.	Footwear	18
6.	Gas Detector/Monitor	7
7.	Cap Lamp Bulb	2
8.	Dust Respirator	0
9.	Breathing Apparatus	0
10.	Fire-resistant plastic sheeting	0
11.	Fire-resistant brattice cloth	0
12.	Ventilation ducting	0
13.	Personal dust sampler	1
14.	Co detector tubes/aspirator	2
15.	Environmental monitoring system	1
16.	Hydraulic props	0
17.	Powered support	0
18.	Friction props	0
19.	Linc bar	0
20.	Explosives	37
21.	Exploders	6
22.	Detonators	21
23.	Flame proof equipment - motor, switches, circuit breakers etc	35
24.	Intrinsically safe apparatus	14
25.	Equipment for use in hazardous area	24
26.	Cables	4
27.	Cage suspension gears	23
28.	Fire resistant conveyor belting	8
29.	Automatic contrivance	2
30.	Man riding system	1
31.	Fire resistant hydraulic fluid	4
32.	High pressure hose	4
33.	Accreditation of Test House	1
34.	Power brake and emergency stop valve	1
35.	Chair lift system	2
36.	Head rope attachment	1
37.	Tail rope attachment	3
38.	Winding Rope	1
39.	Automatic recording speed indicator	3
	TOTAL	**242**

5.0 Coal & Metalliferous Mining Examinations during 2005

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

Shri B.Bhattacharjee	Chairman, Board of Mining Examination,
Shri Sashi Kumar	CMD, CIL
Shri M.K.Thapar	CMD,SECL
Shri V.K.Singh	D(T),WCL
Prof. A.Bhattacharjee	HOD, Min.Engg.IIT, Kharagpur
Shri P.Vasudeva Rao	Director(Tech), SCCLtd.,

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

Shri B.Bhattacharjee	Chairman, Board of Mining Examination,
Shri P.M.Reddy	Ex.CMD., MOILtd.,
Prof.S.B.Srivastava	HOD,Min.,I.S.M., Dhanbad.
Shri K.S.Chowdary	Ex.Director,H.Z.Ltd.,
Shri R.Gupta	CMD,UCIL,
Shri B.Ramesh Kumar	CMD,NMDC

Examiners for Certificates of Competency.

Coal Mining Examinations

(a) Following were the Examiners for Manager's Certificates of Competency Examinations held in 2005.

Subject	Ist. Class Manager's Certificate	IInd Class Manager's Certificate
Mine Management, Legislation & General Safety	Shri Deepak Gupta	Shri J.P.Kashyap
Winning & Working	Shri J.V.Duttatreyulu	B.R.Tripathi
Mine Ventilation	Shri D.K.Basu,	Shri B.K.Sinha
Mining Machinery	Shri K.K.Sharan	Shri A.K.Shukla
Mine Surveying	Shri A.K.Pal	Shri S.P.Singh

(b) Following were the Examiners for Surveyor's Certificates of Competency Examination held in 2005.

Surveying Paper-I	Shri A.K.Sinha
Surveying Paper-II	Shri P.K.Mondal

Metal Mining Examinations

(a) Following were the examiners for Manager's certificate of Competency Exam held in 2005.

Subject	**Ist. Class Manager's Certificate (Un-restricted)**	**IInd Class Manager's Certificate (Un-restricted)**
Mine Management, Legislation and General Safety	Shri M.M.Sharma	Shri S.Puri
Winning & Working	Shri A.C.Kundu	Shri B.N.Shukla
Mine Ventilation,	Shri C.P.N.Pathak	Shri D.Acharya
Mining Machinery	Shri R.K.Mehandi Ratta	Shri A.K.Sen
Mine Surveying	Shri H.R.Kalihari	Shri A.K.Sinha

Subject	**Ist Class Manager's Certificate (Restricted)**	**IInd Class Manager's Certificate (Restricted)**
Mine Management Legislation And General Safety	Shri S.J.Sibal	Shri J.P.Kashyap
Winning & Working	Shri K.S.Anandan	Shri V.K.Mitra
Mining Machinery	Shri M.Venkataiah	Shri K.Y.P.Kulkarni
Mine Surveying	Shri R.C.Srivastava	Shri Y.S.Reddy

(b) Following were the examiners for Surveyor's Certificate of Competency Examination held in 2005.

Surveyor's Certificate Restricted to Opencast Mines	Shri P.K.Sharma
Surveyor's Certificate (Un-restricted) Part-I	Shri A.Biswas
Part-II	Shri S.C.Bhowmick

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 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.

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 the status of safety in mining 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 Conference was held in the year 1958 followed by 2nd in July, 1966, 3rd in 1973, 4th in 1978, 5th in 1980, 6th in 1986, 7th in 1988, 8th in 1993 and 9th Conference was held at New Delhi on 2nd & 3rd February, 2000.

8.0 Plan Schemes

DGMS is implementing four Plan Schemes to provide in-house technical support, namely:

(i) Study of Mine Accidents and Development of Mines Safety Information System (SOMA)

The scheme has been formulated by merging two on-going plan schemes of DGMS, namely "Development of Mine Safety Information System (DMSIS,1976)" and "Study of Mine Accidents to Plan Preventive Measures (SOMA, 1976)". These two schemes were functional independently during the 8th plan period and during the first 4 years of the 9th plan. In 2001-2002, i.e. the terminal year of the 9th plan, keeping the objective of integration in view, these schemes were merged into one scheme "Study of Mine Accidents and Development of Mines Safety Information System (SOMA)".

(A) 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 occurred in all 501-coal mines and 8 lignite mines of the country during the period 2001, 2002, 2003, 2004 and 2005 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**				
	2001	**2002**	**2003**	**2004**	**2005**
ECL	8	11	12	11	9
BCCL	9	6	7	10	8
SECL	7	7	8	10	8
MCL	1	2	2	4	3
WCL	6	7	9	9	9
CCL	4	6	5	6	7
NCL	1	1	2	2	1
NECL	0	0	0	1	0
SCCL	6	5	8	9	10
TISCO	1	1	1	2	2
IISCO	0	0	0	0	0
Total	**43**	**46**	**54**	**64**	**57**
LIGNITE	**-**	**3**	**3**	**3**	**-**

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 devices suitable corrective measures and implement the same in 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.

(B) In the year 2005, work of collection, compilation and analysis on a PC platform in respect of accident due to roof fall, side fall, wheeled trackless transportation machinery and haulage in coal mine was conducted in order to identify critical causation factors of such types of accidents and to find out probable corrective measures for their prevention.

Progress:

- Scrutiny of enquiry reports and extraction of data for entry into EDP – 196
- Visit to mines in connection with safety campaigns.
- Compilation and publication of Annual Report, 2004.
- Compilation and publication of Standard Note on DGMS, 2005
- Identification of accident-prone mines in respect of coal mines.
- Information bulletin and technical circular issued.
- Compilation of statistics and preparation of manuscript for –
    - Statistics of Mines in India, Vol.I (Coal), 2004
    - Statistics of Mines in India, Vol.II(Non-Coal), 2004
    - Monthly Review of Accidents
    - Report on Monthly Inspection Analysis
- Providing EDP Facilities to other field offices of DGMS
- Processing of applications and preparing a list of winner for National Safety Awards (Mines)

(ii) Augmentation of S&T Capabilities, Mines Rescue Services and Human Resource Development (S&T)

Origin: This scheme has been formulated by merging the objectives of ongoing schemes namely "Augmentation of Science & Technological support capabilities in DGMS (S&T)(1981)", "Development of Mines Rescue Services (DMRS)(1981)" and "Human Resource Development for improving health and safety standards in mines (HRD)(1990)"

Scientific and Technological Support (S&T)

This scheme aims at providing in-house scientific support to the officers of DGMS in discharge of their enforcemental, regulatory and promotional role. It also provides scientific support to mine operators, workers organisation and other institutions concerned with occupational health and safety matters. The activities of the S&T plan scheme covers a wide cross-section of facets of occupational safety and health including occupational hygiene/health, strata control, mine ventilation, mine gases, fires and explosion, mining techniques, mine mechanization, oil and opencast mines safety, standard setting and policy planning.

The support activities are broadly divided into three categories:

(i) Planned support: This plan support is provided to field offices on:

- A current issue which has emerged into an enforcemental problem;
- An enforcemental strategy calling for development of monitoring equipments or techniques; and
- Monitoring of quality assurance of external organisation in sampling, pre-approval testing and other similar activities.

These activities are selected on merit, including improvement of efficiency and safety and future needs.

(ii) Reactive Support: Reactive Support is provided in response to demands from field offices in areas where:

- In-house assessment and analysis of a problem leads to better understanding of enforcemental problem and helps in determining enforcemental strategy;
- Support is required on a technical problem without referring to external agency.

(iii) Testing Services: This service is provided to the field offices as a sample check on quality control standards and in emergency response situation.

Major Programmes: The major programmes of the S&T plan scheme includes

(1) Occupational Safety:

(a) Monitoring of implementation of the Technical Standards on Support system in Bord and Pillar workings.
(b) Review of standards on stability of multi-seam workings.
(c) Review of standards on detection, control, dealing with and protective measures against fire and revision of standards/guidelines.
(d) Assessment of hazards associated with mine mechanization and standardization of monitoring techniques and control measures.

(i) Standardization of prototype test(s) houses for testing powered supports and hydraulic/friction props.
(ii) Standardization of Ultrasonic Testing Techniques and formulation of Acceptance & Rejection Norms.
(iii) Testing of fire resistant hydraulic oils.

(2) Occupational Hygiene and Health

(a) Standardization of techniques for monitoring and control of occupational hazards from noise, air borne dust, mine gases and poor illumination.
(b) Review and standards of medical examinations.
(c) Review and standardization of procedures for surveillance of occupational disease already established.

(B) Development of Mines Rescue Services:

This plan scheme aims at promoting proper rescue services in mining industry. The scheme envisages critical appraisal of design characteristics of rescue apparatus and self rescuers, evaluation of field performance of the same, inquiry into accidents in use of rescue apparatus, inspection of rescue stations/rescue rooms organizing rescue competitions, monitoring formulation of emergency plan by the management of all underground mines and to deal with applications for grant of permissions/approval/relaxation under the Mines Rescue Rules, 1985.

Major Programme:

→ Installation of testing facility for SCBA & Resuscitator
→ Creation of Rescue Data bases
  (i) CMR/OMR/MMR/ dBase
  (ii) RRAE databases
→ Design of rescue systems
  (i) Inundation RRS
  (ii) Fire RRS
  (iii) Explosion RRS
→ Development of disaster control systems
→ Testing of Self-Rescuers, Testing SCBA
→ Rescuers Competition
→ Standard setting, review of emergency plans
→ Issue of Technical circular's to the mining industry

(C) Human Resource Development:

This scheme, which started on a modest scale from 1.4.90. The scheme envisages setting-up of a Mines Safety & Health Academy comprising Institutes at Dhanbad and Nagpur for imparting structured training to the Inspection Officers of DGMS so as to update and upgrade their technical and professional competence and improve their effectiveness in regulatory, enforcemental, advisory and promotional roles. The facilities so created would be also utilized for disseminating latest information on mine safety principles and practices amongst the key safety personnel of the mining industry and the Workmen's Inspectors.

Major Programmes:

(1) Development of training schedules
(2) Conduct of training programmes

(a) Training of DGMS Officers

(i) New Entrants
(ii) Existing officers
(iii) Special Lectures

(b) Training of Key personnel in Mining Industry

(i) Managerial Personnel
(ii) Safety Officers
(iii) Ventilation Officers
(iv) Engineers
(v) Industrial Hygienists
(vi) Executive Trainees
(vii) VTOs

(c) Training of Workmen's Inspectors.

During the year 2005, the following activities were undertaken by S&T wing:

Activity	**Achievement**
(A) Augmentation of S&T Capabilities:	
1. Mine Environment surveys	13 mines
2. Occupational Health Review, Survey & Medical exam	06 mines
3. Ground Control.	20 mines
4. Testing of machinery parts	02 nos
5. Additional job:-	
(a) Gas analysis	33 nos.
(B) Development of Mines Rescue Services:	
1. Installation of testing services for SCBA & Resuscitator	Contd.
2. Creation of Rescue databases	Contd.
3. Review of Rescue systems	Contd.
4. Testing of self rescuers	Nil
5. Rescue competition	07 nos.
6. Standard setting, review of emergency plans	--
7. Field visits	16 nos.
(C) Human Resource Development	
1. Development of training scheduled	1
2. Conduct of training programs:-	
(a) DGMS Officers	21
(b) Key personnel from mining industry	78 persons
(c) Workmen's Inspectors	65

(iii) Strengthening of Machinery for Conduct of Statutory Examinations (SSEX)"

This scheme was conceived during the 9th plan period and was principally approved by the Ministry of Labour. However, due to various procedural and other problems, the work could not start till the penultimate year of the current plan period. Feasibility study vis-à-vis computerization of the examination system has been done.

The main objectives of the scheme is to strengthen and improve the efficiency of the statutory examination system by:

- Developing a quick and transparent system of examination with the aid of computer and associated information technology.
- Review of the examination system in vogue, in order to eliminate redundancy and standardize procedures.
- Developing computerized application-processing system, issue of certificate and maintenance of records connected therewith.

(iv) Improving efficiency by providing infrastructure facilities in DGMS (PIF)

The purpose of the scheme is to develop infrastructure facility by providing own office and residential complexes to the officers and staff members, providing better communication facilities and office equipment and furnishing of offices. The facility so created would improve the efficiency of officers and staff members of the DGMS. The scheme also envisages improvement of enforcement of safety laws in the mining industry by strengthening the legal set up in DGMS. The scheme proposes creation of adequate no. of posts in the legal set up and also provision of infrastructural facilities to enable the legal officers to play their role in enforcemental activities. The legal set up so created will also be utilized for rendering advise to organisation on legal matters and also providing legal assistance to the Board of Mining Examinations.

This scheme was conceived during the 9th plan period and was principally approved by the Ministry of Labour in March, 1999. However, due to various procedural and other problems, the work could not start till the penultimate year of the current plan period.

Construction work of residential quarters at Udaipur & Bhubaneswar and construction of boundary wall of Dhanbad office were completed.

(v) Modernization of Information Database Relating to Mine Management (MID)(Merged)

The purpose of the scheme is to reach beyond current efforts to reinvent DGMS by identifying breakthrough strategies that rethink the core value of key services, improve service delivery, reduce cost and redefine administrative processes. The application of e-Governance to the processes of functioning of DGMS will bring about simple, moral, accountable, responsive and transparent governance. It will help the organization in managing its operations at various phases of governance making the entire process user friendly.

The objective of the scheme would be:

(i) Identification of mines safety information need and identify the boundaries of an e-governance system;

(ii) develop a core group within the organization to formulate and use computer based 'MIS' vis-à-vis mines safety;

(iii) develop modules of need-based software with the help of experts;

(iv) create infrastructure to implement computer based systems including establishment of LAN/WAN, establish electronic communication channels;

(v) establish a comprehensive protocol for use of such system;

(vi) establishment and operation of modern survey system and electronic storage of mine plans; and

(vii) establish a comprehensive training system for officers of DGMS in use of such new systems.

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