



41st Meeting of the standing committee on safety in Coal Mines, Delhi

11

CHAPTER

SAFETY IN COAL MINES

SAFETY IN COAL MINES

Coal India Limited

CIL has always given highest priority to safety and is ingrained in mission statement of CIL. It is one of the most important components in our overall business strategy of CIL has framed a well-defined safety policy to ensure safety in all mines and establishments. CIL has already established a multi-disciplinary Internal Safety Organization (ISO) in all subsidiaries for implementation of Safety Policy. All operations, systems and processes of CIL are meticulously planned and designed with due regard to safety, conservation, sustainable development and clean environment. CIL has identified work place hazards and associated risks in each mining operation and prepared a Risk Assessment based Safety Management Plan for every mine. CIL always encourage employees' participation at all levels so as to promote a proactive safety culture and improve safety awareness upto grass root level. Various initiatives are taken on continual basis at all levels to translate the vision of "Zero Harm Potential (ZHP)" into a reality.

➤ Safety performance of CIL:

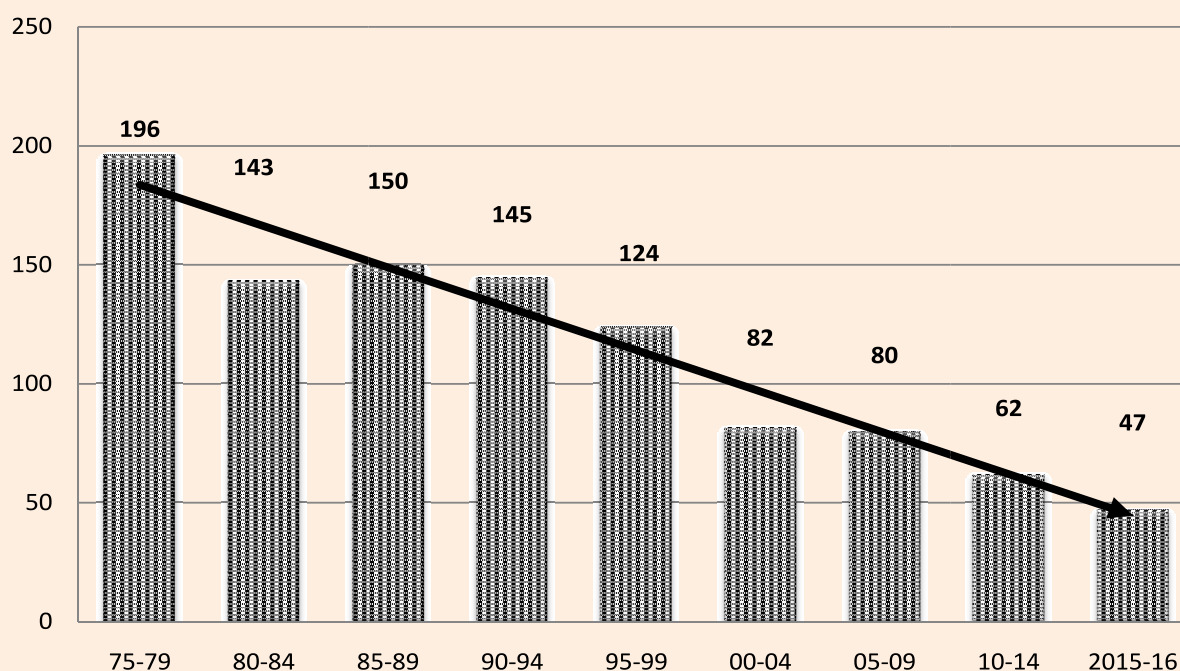
Accident statistics is the indicator of relative status of safety. Over the years the safety standard in mines of CIL has significantly improved as is evidence from the table and graphs below:

Comparative Accident Statistics of CIL of 5 Yearly Average since 1975

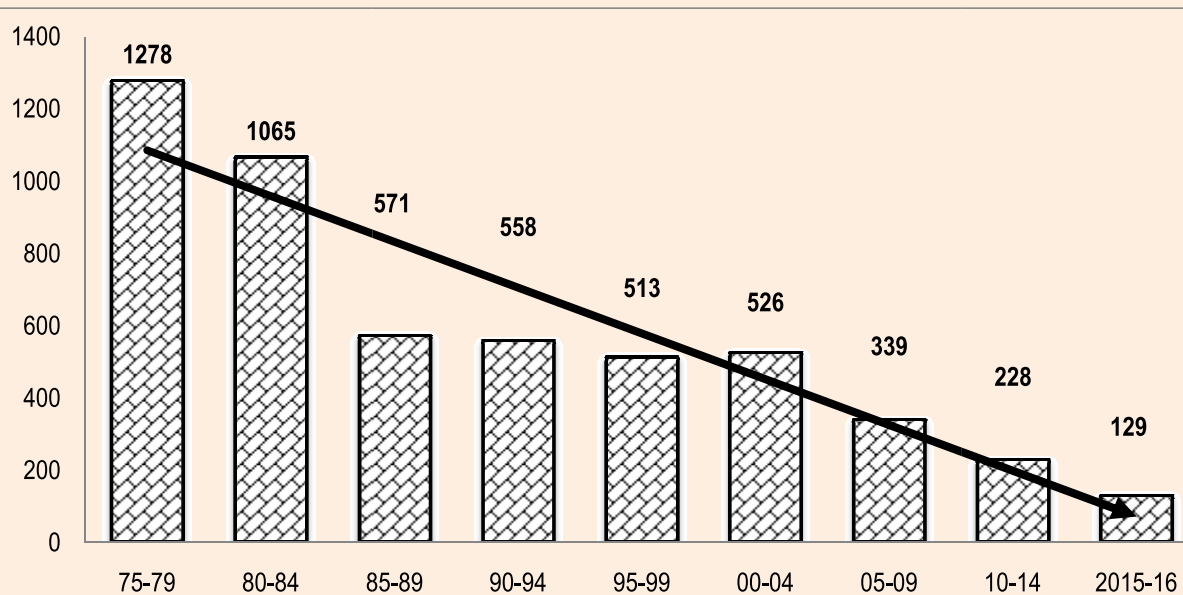
Time Period	Av. Fatal Accidents		Av. Serious Accidents		Av. Fatality Rate		Av. Serious Injury Rate	
	Accident	Fatalities	Accident	Injuries	Per MT	Per 3 Lac Man shifts	Per MT	Per 3 Lac Man shifts
1975-79	157	196	1224	1278	2.18	0.44	14.24	2.89
1980-84	122	143	1018	1065	1.29	0.30	9.75	2.26
1985-89	133	150	550	571	0.98	0.30	3.70	1.15
1990-94	120	145	525	558	0.694	0.30	2.70	1.19
1995-99	98	124	481	513	0.50	0.29	2.06	1.14
2000-04	68	82	499	526	0.28	0.22	1.80	1.47
2005-09	60	80	328	339	0.22	0.25	0.92	1.04
2010-14	56	62	219	228	0.138	0.23	0.49	0.80
2015-16#	38	47	123	129	0.09	0.19	0.26	0.53

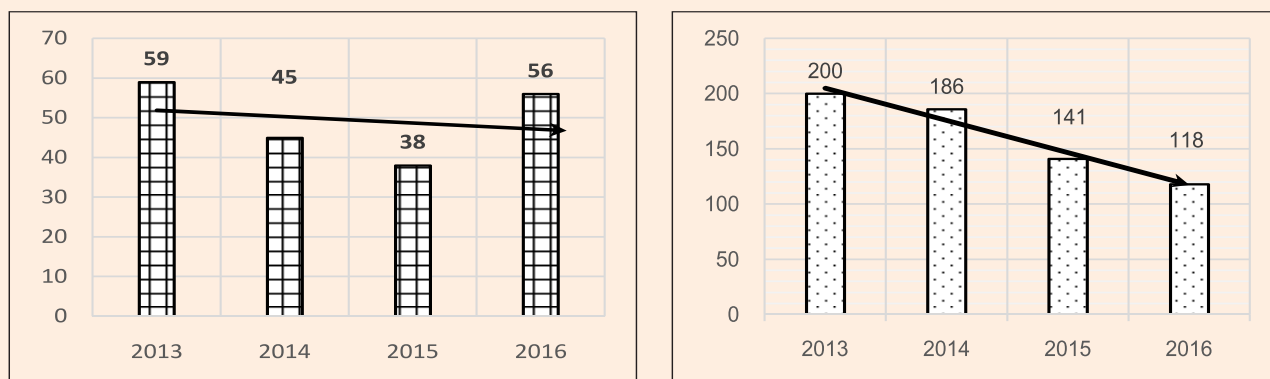
Average of last two years i.e. 2015 & 2016

Graph-1- Trend of 5 Years Average Fatalities in CIL since 1975



Graph-2- Trend of 5 Years Average of Serious Injuries since 1975



Graph-3- Trend of fatalities & serious injuries in CIL for last 4 year

Note: Accident statistics are maintained calendar year wise in conformity with DGMS practice & figures subject to reconciliation with DGMS

Table-2: Overall in CIL - All parameters have shown improvement in 2016 vis-a-vis 2015

S I. No.	Parameters	2016	2015	Change in absolute nos.	% of Change
1	Number of fatal accidents	38	38	0	0
2	Number of fatalities	56	38	+18	+47.37
3	Number of serious Accidents	113	132	-22	-16.54
4	Number of serious injuries	118	140	-24	-17.14
5	Fatality Rate per MT of coal production	0.10	0.07	+0.03	+38.96
6	Fatality Rate per 3 lakhs man shift deployed	0.23	0.15	+0.08	+53.33
7	Serious injury Rate per MT.of coal production	0.22	0.27	-0.05	-18.52
8	Serious injury Rate per 3 lakhs man-shift deployed	0.49	0.56	-0.07	-12.5

Note: Accident statistics are maintained calendar year wise in conformity with DGMS practice & figures subject to reconciliation with DGMS

Table-3: Company-wise Accident Statistics of CIL for the year 2016

Company	Fatal Accidents	Fatalities	Serious Accidents	Serious Injuries	Fatality Rate		Serious Injury Rate	
					Per Mill. Te	Per 3 lac manshifts	Per Mill. Te	Per 3 lac manshifts
ECL	9	26	42	44	0.61	0.51	1.03	0.86
BCCL	6	6	5	5	0.17	0.17	0.14	0.14
CCL	4	4	7	8	0.07	0.13	0.13	0.26
NCL	4	4	13	13	0.05	0.31	0.15	1.01
WCL	5	5	14	14	0.12	0.12	0.34	0.34
SECL	8	9	25	27	0.07	0.18	0.20	0.53
MCL	2	2	7	7	0.01	0.13	0.05	0.44
NEC	0	0	0	0	0.00	0.00	0.00	0.00
CIL	38	56	113	118	0.10	0.23	0.22	0.49

Note: Accident Statistics are maintained calendar year wise in conformity with DGMS practice & figures subject to reconciliation with DGMS

Table - 4 : Company-wise Accident statistics during the period 2014 to 2016

Company	Fatal Accidents			Fatalities			Serious Accidents			Serious injuries		
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
ECL	6	7	9	6	7	26	69	39	42	69	40	44
BCCL	7	7	6	7	7	6	17	9	5	17	9	5
CCL	5	2	4	5	2	4	7	5	7	7	5	8
NCL	6	1	4	6	1	4	9	18	13	9	20	13
WCL	9	8	5	10	8	5	36	24	14	38	27	14
SECL	11	10	8	12	10	9	31	33	25	32	35	27
MCL	0	3	2	0	3	2	13	4	7	13	4	7
NEC	0	0	0	0	0	0	1	0	0	1	0	0
CIL	44	38	38	46	38	56	183	132	113	186	140	118
	Fatality Rate Per MT of coal production			Fatality Rate Per 3 lac man shifts			Serious Injuries Rate Per MT of coal production			Serious Injuries Rate 3 lac manshifts		
CIL	0.09	0.07	0.10	0.18	0.15	0.23	0.38	0.27	0.22	0.72	0.56	0.49

This improvement in safety is attributed to the following contributing factors:

- Collective commitment and synergetic collaboration of the management and employees.
- Use of state-of-the-art technology in the field of mining methods, machineries and safety monitoring mechanism.
- Continuous improvement in knowledge, skill and awareness of workforce through imparting quality training and relentless safety awareness drives.

- Constant vigilance round the clock supervision and assistances from various quarters.

➤ **Major Activities of the Safety & Rescue Division of CIL**

- o Inspection of mine to review safety status & follow up action.
- o Prima-facie fact-finding enquiries into fatal accidents and major incidences such as mine fire, subsidence, in-rush of water, slope failure, explosion etc.
- o Organizing meeting of CIL Safety Board and monitoring recommendations / suggestions made during meeting
- o Assisting in organizing the Standing Committee on safety in coal mines and monitoring recommendations / suggestions made during meeting.
- o Framing of internal technical circulars / guidelines related to safety issues and monitoring implementation thereof.
- o Maintenance of accidents / major incidents statistics database.
- o Publication of safety bulletin for disseminating and sharing of knowledge in order to promote safety awareness and inculcate better safety culture.
- o Framing reply of different coal mine safety related parliamentary questions including queries raised by different standing committees such as standing committee on Steel & Coal, Standing Committee on labour, as well as questions raised by COPU, MOC, CA&G and VIPs.
- o Monitoring safety related R&D activities in CIL.
- o Imparting specialized training by SIMTARS accredited trainers to unit level and Area level executives who are directly engaged in ensuring safety in mine.

➤ **Measures taken for improvement of safety in 2016:**

To improve safety standard, CIL and its subsidiaries have vigorously pursued several measures in the year 2016 along with on-going safety related initiatives apart from compliance of statutory requirements for safety, which are given below.

- **Internal Safety Organization (ISO):** Continuous review of safety status of mines is being done by the multi-disciplinary Internal Safety Organization (ISO).
- **Guidelines on corrective measures:** After analysis of fatal accidents which occurred at different point of time in 2016, several directives / guidelines on corrective measures to be taken for prevention of recurrence of similar type of accidents in future have been issued by the Safety & Rescue Division of CIL.
- **Training for preparation of Risk Assessment based SMP:** Executives who have been trained by SIMTARS, Australia are engaged for imparting training and upgrading the knowledge of mine level executives as well as members of safety committee of mine to identify the hazards and evaluate the associated risks in the mines and prepare Risk assessment based Safety Management Plans (SMPs).
- **Preparation and Implementation of risk Assessment based Safety Management Plan (SMP):** The risk assessment based Safety Management Plans (SMPs) have been prepared for all mines of CIL and control measures suggested thereof in SMPs are being implemented. It is a continuous ongoing process.
- **Standard Operating Procedure (SOP):** 8 Risk assessment based site specific Standard Operating Procedures (SOP) are formulated and being implemented for various mining and allied operations.
- **Adoption of the state-of-the art technology suitable to geo-mining locales.**
 - o Adoption of Mass Production Technology in more number of UG mines.
 - o Deployment of more number of surface miners to eliminate blasting operation in OCPs.

- o Deployment of relatively higher capacity HEMM in more number of OCPs.
- o Mechanisation of UG drilling.
- o Phasing out manual loading in UG mines.
- **Strata Management**
 - o Scientifically determined Rock Mass Rating (RMR) based Support System.
 - o Strata Control Cell for monitoring support system.
 - o Roof bolting by using mechanized Drilling for Roof Bolting.
 - o Use of Resin capsules in place of Cement capsules.
 - o Use of modern Strata Monitoring Instruments.
 - o Imparting quality training to support crews & front-line mine officials.
- **Monitoring of mine environment:**
 - o Spot detection of mine gases by using Methanometer, CO-detector, Multi-gas detector etc.
 - o Continuous monitoring of mine environment by installing Environmental Tele Monitoring System (ETMS) & Local Methane Detectors (LMD) etc.
 - o Regular Mine Air Sampling and Analysis by Gas Chromatograph.
 - o Personal dust sampler (PDS).
- **Mine Ventilation:**
 - o Pressure-Quantity Survey on regular basis.
 - o Supply of Air quantity maintained by suitable main mechanical ventilator (Surface), Auxiliary Fan & Booster fan (UG).
 - o Ventilation stoppings.
 - o Air Crossings.
 - o Central & Peripheral Ventilation for extensive UG mine.
 - o Modern gadgets for air measurement.
- **Water Danger management:**
 - o Conducting Check Survey to eliminate errors in mine survey.
 - o Preparation and maintenance of seam-wise Water Danger Plan.
 - o Preparation and implementation of Monsoon Preparation Plan.
 - o Adequate Pumping facilities & adequate sumps.
 - o Liaison with the State Meteorological Dept. & Dam Authority, if any.
 - o Construction of embankments with proper design against water bodies.
 - o Advance borehole for locating water body.
- **Safety Training:**
 - o Risk management training.
 - o Class room audio-visual training at VTCs.
 - o Initial and refresher training & On-the-Job training as per statute.
 - o Training on Simulators to dumper operators.
 - o Skill up-gradation of frontline officials and workmen.
 - o Behavioural based training
 - o Family counselling.
- **Mine Safety Inspection:**

Following inspections are being made in each mine to ensure that all mining operations are carried out in the mine as per the provisions of the relevant statute and safety norms,

 - o Round the clock supervision of all mining operations by adequate number of competent & statutory supervisors and officers.
 - o Periodic mine inspection by Head Quarter and area level senior officials.
 - o Surprise back shift mine inspection by mine and area level officials.

- o Regular inspection by workmen inspectors appointed in each mine.
- o Monthly mine inspection and meeting of safety committee for each mine.
- o Regular mine inspection by officials of Internal Safety Organization
- o Periodic mine inspection by High Powered Task Force, Area and Subsidiary level Tri-partite Safety Committee members, etc.

➤ **Special drive for accident prevention in OCPs:**

- o Formulation and implementation of Mine-specific Traffic Rules.
- o Code of practices for HEMM operators, maintenance staff & others.
- o Preparation and implementation of Risk Assessment based Safety Management Plan (SMP).
- o Preparation and implementation of Risk Assessment based Safe Operating Procedures (SOP) for all opencast mining operations.
- o Training of Contractor's workers involved in contractual jobs.
- o Training on Simulators to dumper operators.
- o Lighting arrangement using tower/ masts.
- o Eco-friendly surface miners for blast free mining.
- o Dumpers fitted with Proximity Warning Devices, Rear view camera, Audio-Visual Alarm (AVA), automatic fire detection & suppression system.
- o Ergonomically designed seats & AC cabins for operators' comfort.
- o Wet drilling & water sprinklers for dust suppression.
- o Shock Tubes & Electronic Detonators for control of ground vibration & fly rocks.
- o GPS based Operator Independent Truck Dispatch System (OITDS) in large OCPs

➤ **Emergency Response System:**

- o Emergency action plans of each mine is being reviewed from time to time
- o Mock rehearsals are being adopted for examining the preparedness/efficacy of emergency action plan.
- o Demarcating escape routes: An exercise for demarcating escape routes in underground mines, on plans as well as belowground by fluorescent paint, display of the same at the entry to the mine has been done.
- o A check list for dealing with emergency has been prepared.
- o CIL has prepared a flow chart for sending information regarding crisis / disaster in mines from site of accident to the Ministry of Coal, New Delhi. This is prepared in line with guidelines of crisis management plan of the Ministry of Coal so that quick communication can be sent to all concerned and rescue & recovery & corrective actions are initiated at the earliest.

➤ **Rescue Services for Emergency Response System in CIL:**

- o CIL is maintaining a well establishment rescue organization comprising of 6 Mine Rescue Stations (MRS), 13 Rescue Rooms-with-Refresher Training facilities (RRRT) and 17 Rescue Rooms (RR).
- o All Rescue Stations / Rescue Rooms are fully equipped with adequate numbers of rescue apparatus as per the Mine Rescue Rules (MRR) - 1985.
- o This rescue organization is staffed by adequate numbers of Rescue Trained Personnel (RTP)s as per the MRR-1985.
- o All RTPs are being periodically retrained to conduct rescue operations in hot, humid and irrespirable atmospheres in modern training galleries as well as in mines.
- o CIL employs permanent brigade members and RTPs who are on call 24x7.

The Mine Rescue Station and Rescue Rooms are established at strategic locations spreading across different subsidiaries to cater to the emergencies in their command Area. The details are as under:

Company	Rescue establishment presently operating		
	Mine Rescue Station (MRS)	Rescue room with Refreshers Training (RRRT)	Rescue Room (RR)
ECL	Sitarampur	Kenda	Jhanjra ,Kalidaspur,Mugma
BCCL	Dhansar		Moonidih, Madhuband, Sudamdih
CCL	Ramgarh	Kathara & Churi	Dhori, Kedla & Urimari
SECL	Manindragarh	Sohagpur, Kusmunda, Johilla, Bistrampur, Baikunthpur	Chirimiri, Raigarh, Bhatgaon, Jamuna & Kotma, korba
WCL	Nagpur	Parasia, Pathakhera,Tadali	Damua , New Majri & Sasti
MCL	Brajraj Nagar	Talcher,	-
NEC	-	Tipong	-
Total	6	13	17

- **Safety Monitoring in CIL:** Apart from statutory monitoring by DGMS, the status of safety is being monitored at various levels by the following agencies:

Level	Monitored By
Mine level	1. Workman inspectors: as per Mines Rule-1955. 2. Pit safety committee: constituted as per Mines Rule-1955.
Area level	1. Bipartite/tripartite committee meeting. 2. Safety officers' coordination meeting.
Subsidiary HQ level	1. Bipartite/tripartite committee. 2. Area safety officers' coordination meeting. 3. Inspection by ISO Officials.
CIL HQ: Corporate Level	1. CIL Safety Board. 2. CMDs meet. 3 Co-ordination meeting with ISOs. 4. NDPC meeting.
Ministry of Coal (MOC) / Other Ministerial Level	1. Standing committee on Safety in coal mines. 2. National conference on safety in mines. 3. Various Parliamentary Standing Committees.

- **Statutory Frame-work for safety in coal mines:**

Coal mining, world over, is highly regulated industry due to presence of many inherent, operational and occupational hazards. Coal Mine Safety Legislation in India is one of the most comprehensive and extensive statutory framework for ensuring occupational health and safety (OHS). Compliance of these safety statutes is mandatory. The operations in coal mines are regulated by the Mines Act, 1952, the Mine Rules –1955, the Coal Mine Regulation-1957 and several other statutes framed there under. Some of the important statutes related to coal mine safety are as follows:

Sl. No.	Statute
1	The Mines Act -1952
2	The Mines Rules -1955
3	The Coal Mine Regulation -1957
4	The Mines Rescue Rules -1985
5	The Electricity Act- 2003
6	Central Electricity Authority (measures related to safety & supply) Regulations - 2010
7	The Mines Vocational Training Rules -1966
8	The Mines Crèche Rules -1966
9	Indian Explosive Act, 1884
10	The Explosive Rules - 2008
11	Indian Boiler Act, 1923
12	Mines Maternity Benefit Act & Rules -1963
13	The Workmen Compensation Act - 2009
14	The Factories Act - 1948 Chapter -III & IV

➤ Safety Policy of CIL:

CIL has formulated a safety policy for ensuring safety in mines and implementation of which is closely monitored at several levels.

- o Operations and systems will be planned and designed to eliminate or materially reduce mining hazards;
- o Implement Statutory Rules and Regulations and strenuous efforts made for achieving superior standards of safety;
- o To bring about improvement in working conditions by suitable changes in technology;
- o Provide material and monetary resources needed for the smooth and efficient execution of safety plans;
- o Deploy safety personnel for accident prevention work;
- o Organize appropriate forums with employees' representatives for Joint consultation on safety matters and secure their motivation and commitment in safety management;

- o Prepare annual Safety Plan and long term Safety Plan at beginning of every calendar year, unit-wise and for the company, to effect improved safety in operations as per respective geo-mining needs to prepare the units for onset of monsoon, to fulfil implementation of decisions by Committee on Safety in Mines and Safety Conferences and to take measures for overcoming accident proneness as may be reflected through study of accident analysis, keeping priority in sensitive areas of roof-falls, haulage, explosives, machinery etc.
- o Set up a frame work for execution of the Safety Policy and Plans through the General Managers of Areas, Agents, Managers and other safety personnel of the mines;
- o Multi-level monitoring of the implementation of the Safety Plans through Internal Safety Organization at the company headquarters and Area Safety Officers at area level;
- o All senior executives at all levels of management, will continue to inculcate a safety consciousness and develop involvement in practicing safety towards accident prevention in their functioning;
- o Institute continuous education, training and retraining all employees with the accent placed on development of safety oriented skills;
- o Continue efforts to better the living conditions and help of all the employees both in and outside the mines.

➤ Accident Statistics of NICIL - (for last five years):

Year	Fatalities	Serious Injuries
2012-13	4	4
2013-14	1	4
2014-15	1	1
2015-16	3	2
2016-17(up to Dec'16)	Nil	1

Sl. No	Particulars	2016 – 17 April'16 to November 16
		Mines
1	Numbers of Fatal Accidents	-
2	Numbers of Fatalities	-
3	Numbers of Serious Accidents	-
4	Numbers of Serious injuries	1
5	Numbers of Reportable Accidents	-
6	Total man days worked	2519229
7	Total Production in Million Tonnes	13.00
8	Fatality rate per Million Tonnes of Lignite Production	-
9	Fatality rate per 3 lakh man shifts deployed	-
10	Serious injury rate per Million Tonnes of Lignite production	-
11	Serious injury rate per 3 lakh man-shifts deployed	-

➤ **Safety Budget & Actual**

Year	Safety Budget	
	Allocated	Actual upto October 2016
2016-17	₹ 550.00 Lakhs	About ₹ 303.00 Lakhs

➤ **Safety Training**

GVTC UPTO OCTOBER 2016

BASIC TRAINING		REFRESHER TRAINING		SPECIAL TRAINING	OTHER TRAINING	Total no. of PERSONS TRAINED
EMPLOYEES	CONTRACT WORKERS	EMPLOYEES	CONTRACT WORKERS			
82	831	1076	1703	890	102	4684

GIVEN AT (L&DC) 2016-'17

YEAR	NO OF PRGMS.	EXE.	NON EXE.	TOTAL
2016-2017 Upto Oct. 2016	25	301	415	716

FIRST AID TRAINING GIVEN IN NLCIL MINES 2016-17' UP TO NOVEMBER 2016

YEAR	MINE-I	MINEIA	MINE-II	B.Mine	NLCIL MINES
2016-17	161	129	120	5	415

➤ Safety Measures

The following safety measures are taken to prevent accident in Mines.

- o In respect of the above, a working document 'Safety Management Plan' had been brought out and distributed to the operation/ Maintenance areas of NLC India Limited Mines and recommendations are implemented.
- o A well laid Emergency Preparedness Plan/ Pre Monsoon Action Plan is being prepared for every mine every year to take care of any emergency situation.
- o The Risk Assessment, Occupational Health and Safety Audit for NLC India Limited Mines were carried out in the year 2003, 2007 and 2012 by accredited External Agency. Risk Assessment for NLC India Limited mines was carried out by ISM, Dhanbad in the year 2016.
- o NLC India Limited has obtained certification for all the Mines as under and the stipulated norms in the certifications and are being maintained.
 - Quality Management System ISO 9001: 2000.
 - Environment Management System ISO 14001: 2004.
 - Occupational Health and Safety Assessment Series – OSHAS 18001: 1999.
- o Area wise responsibility with priority to safety is being enforced at all mine operational/ maintenance Activities for ensuring specific site supervision.
- o Neyveli Mines: An Internal Safety Organization (ISO) is headed by CGM/Safety and Multidisciplinary team for each mine consisting of engineers from mining, mechanical & electrical discipline. These teams inspect the mines on daily basis. The suggestions given by the team are implemented then and there. Monthly ISO Safety meeting with all the safety officers of respective mines are held and suggestions given and the implementation are reviewed.
- o Safe work practices, for all the important operation/ maintenance of the 'Specialized Mining Equipments' have been formulated/ modelled/ codified and approved by DGMS and the same is being followed in all spheres of activities.
- o Daily/ Regular/ Periodical Maintenance check lists for the "Specialized Mining Equipments" had been prepared and enforced for strict compliance.
- o Inter Unit Safety Assessments are being carried out for every quarter to assess safety standards maintained as per statute.
- o Systematic in-depth Accident Analysis is being done and counselling of near miss/ Serious Accident Victims is being done for accident prevention/ to avert recurrence of accidents.
- o Commitment on inculcating Safety Awareness by way of imparting adequate/ need based training with new training modules to all employees and the compulsory training for all categories of employees, including the contract employees before their deployment in shop floor and in their assigned working areas. In addition to the above, work related specific job training / refresher training are also being imparted to all categories of employees.
- o Safety Status/ Safety Performance of every activity is being monitored / reviewed under the statutory framework.
- o Once in a quarter safety performance is reviewed and discussed in the Board.
- o Continuous monitoring of behavioural sense/ attitude/ commitment of employees towards safety is being done.
- o Continual improvement on safety awareness in mines through Public Address System, LED display board (JUMBO SIZE), Display of Safety Boards, etc.
- o Week long Safety Week Celebrations are conducted every year to enhance the safety awareness among employees and their families.
- o All efforts are taken at NLC India Limited mines to impart the best practices to be followed in mines. NLC India Limited follows the dictum that a "Safe Mine is a Productive Mine". The safe worker/ employee are honoured suitably at Safety Week Celebration function conducted every year grandly by NLC India Limited mines. Workmen/ Employees working in mines are also sent on safety tours to study the working condition/safety methodology followed in other mines. Officers are also sent to seminars.

- o Surveillance camera being installed in Specialized Mining Equipments.
- o NLC India Limited regularly conducts tripartite meeting and also participates in National conference on safety in mines. In those forums, many recommendations are given for safety compliance which NLC India Limited whole heartedly implements for faithful and committed compliance of those recommendations.

➤ **Safety & R&D initiatives:**

- o The following measures are taken as Safety & R&D initiatives at NLC Mines. The standard of illumination, noise, vibration etc., are studied and monitored with respect to the safe limit of the said parameters on regular basis in addition to these set by the expert agency evolved from broad R&D initiatives pertaining to safety maintenance and performance.

➤ **Emergency response system:**

- o The Risk Assessment, Occupational Health and Safety Audit for NLCIL mines were carried out in the year 2003, 2007 and 2012 by accredited External Agency. Risk Assessment for NLCIL mines was carried out by ISM, Dhanbad in the year 2016.

➤ **Occupational Health services**

- o All the NLC mines are having First Aid Centers along with well equipped required number of Ambulance Vans.
- o In case of any accident / any irregularities in health for the workers / labourers working in the mines, the victims are given First Aid treatment at First Aid Centres and then shifted to well equipped General Hospital located at a distance of about 8 K.M. with more than 375 beds. It is manned by more than 75 highly qualified medical personnel in all branches equipped with all modern facilities & equipment.
- o Apart from the above, a well-established "Department of Industrial Hygiene and Occupational Diseases" (DIHOD) is also functioning effectively in NLCIL. This Department is headed by Chief General Superintendent of Medical Services, who is highly qualified and experienced in Industrial Hygiene and Occupational Diseases. Out of 8, two more Medical Officers having post-graduate

qualification in Industrial Hygiene are also working in this Department.

- o Well qualified and experienced Para-medical staff also is attached to this division. For the smooth and independent working of the department, a well equipped laboratory also is available.
- o Modern equipment like ECG, Audiogram, X-ray etc are provided in this department and all records of the health care system are fully computerized.

➤ **Initial medical examination:**

In accordance with Rule 29 B of the Mines Rule 1955, all persons are subjected to initial medical examination before employment in mines. The initial medical examination is done at DIHOD, General Hospital, and NLC.

➤ **Periodical medical examination:**

In accordance with Rule 29 B of the Mines Rule 1955, all persons are subjected to periodical medical examination once in every 5 years and once in 3 years for those who are crossing 45 years of age. The periodical medical examination is done at DIHOD, General Hospital/NLC regularly.

➤ **Accident Statistics of SCCL – (for the last five years):**

Year	Fatalities	Serious Injuries
2011-12	13	323
2012-13	9	375
2013-14	12	321
2014-15	7	271
2015-16	7	225
2016-17 (upto Dec'16)	10	174

➤ **Safety Measures in SCCL:**

- o Training for trainers is planned with the help of SIMTARS, Australia to improve the knowledge and capability for developing safety management system at par with the International Standards and specialized training in risk management and hazard identification.
- o Implementation of Risk Assessment based Safety Management Plans.

- o Organising Safety Week, First-aid and Rescue Competitions at Company level.
- o Follow up action and preparation of compliance reports in respect of the following:-
 - Recommendations of safety conferences.
 - Recommendations of Standing Committee on safety in coal mines.
 - Tripartite safety review meetings at company level.
- o Identification of hazards in all mining operations and associated risks thereof.
- o Adoption of the Roof Support System based on geo-technical studies.
- o Phasing out conventional mining methods.
- o Continuous Miner and Long wall Technologies are being introduced in feasible areas to enhance the safety of workings.
- o Introduction of Roof-Bolters for Resin-Capsules bolting.
- o Use of Rear-view Cameras and proximity-warning devices in Dumpers in Open cast mines.
- o Men transport systems have been introduced in all underground mines.
- o Tele Monitoring system for real time monitoring of CH₄ and CO gases in UG mines.
- o Analysis of mine Air samples by Gas-Chromatographs.
- o Introduction Automatic fire detection and suppression systems (AFD & SS) in all HEMM.
- o Safety Audits are being conducted on regular basis by constituting a committees.
- o To monitor strata control mine environment activities, each region is provided with strata monitoring cells. The services of scientific institutions like, CIMFR, NIRM etc., are being utilized for designing panels for effective strata management and environmental issues.
- o SCCL is contemplating to monitor slope stability by using the latest technology i.e Radar.

Safety Statistics of SCCL during the year 2016 is given below.

Company	Fatal Accidents	Fatalities	Serious Accidents	Serious Injuries	Fatality Rate		Serious Injury Rate	
					Per MT	Per 3 lakh man-shifts	Per MT	Per 3 lakh man-shifts
SCCL: 2016	10	12	216	218	0.20	0.26	3.66	4.65

Note: Figures are subject to reconciliation with DGMS.

Categorywise accident statistics during 2012 to 2016 is given below

Fatal Accidents					Fatalities					Serious Accidents					Serious Injuries				
2012	2013	2014	2015	2016	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
11	11	8	7	10	12	12	9	7	12	339	364	270	245	216	341	369	271	245	218

The rate of fatality and serious injury during 2012 to 2016 is given in the table below

Fatality rate per MT.					Fatality rate per 3 lakh man-shifts					Serious injuries per MT.					Serious Injuries per 3 lakh man-shifts				
2012	2013	2014	2015	2016	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
0.22	0.24	0.17	0.12	0.20	0.22	0.24	0.18	0.14	0.26	6.30	7.36	5.25	4.05	3.66	6.22	7.38	5.55	5.01	4.65