

## CHAPTER

# 13



## SAFETY IN COAL MINES



# SAFETY IN COAL MINES

Safety is always the utmost priority of CIL. Safety is ingrained in the mission statement of CIL and is one of the most important components in overall business strategy. CIL has framed a well-defined “Safety Policy” to ensure safety in all mines and its establishments. CIL has already established a multi-disciplinary Internal Safety Organization (ISO) in all subsidiaries for the implementation of CIL “Safety Policy”. All operations, systems and processes of CIL are meticulously designed and planned with due regard to safety, conservation, sustainable development and clean environment. Workplace hazards and associated risks of mining operations are identified and a Safety Management Plan is prepared for each mine. CIL always encourages employees' participation in safety management so as to promote a proactive safety culture and improve safety awareness amongst all employees. Several initiatives are being taken to achieve “Zero Harm Potential (ZHP)” in mines.

## 1. Safety Policy of CIL

Safety is always given prime importance in the operations of CIL as embodied in the mission. CIL has formulated a Safety Policy for ensuring safety in mines and implementation of which is closely monitored at several levels. Details of Safety Policy of CIL is as under:

- Operations and systems will be planned and designed to eliminate or materially reduce mining hazards;
- Implement Statutory Rules and Regulations and strenuous efforts made for achieving superior standards of safety
- To bring about improvement in working conditions by suitable changes in technology
- Provide material and monetary resources needed for the smooth and efficient execution of Safety Plans
- Deploy safety personnel wholly for accidents for accident prevention or
- Organize appropriate forums with employees' representatives for Joint consultations on safety matters and secure their motivation and commitment in Safety Management
- 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 fulfill implementation of decisions by Committee on Safety in Mines and Safety Conferences and 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.
- Set up a framework for execution of the Safety Policy and Plans through the General Managers of Areas, Agents, Managers and other safety personnel of the Mines
- 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
- 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
- Institute continuous education, training and retraining all employees with the accent placed on development of safety oriented skills
- Continue efforts to better the living conditions and help of all the employees both in and outside the mines.

## 2. Statutory Framework for Coal Mine Safety:

Coal mining, world over, is a 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. Some of the important statutes related to coal mine safety are as follows:

Sl. No.	Statute
1	<b>Occupational Safety, Health and Working Conditions Code, 2020 (replaced The Mines Act, 1952)</b>
2	<b>The Mines Rules, 1955</b>
3	<b>The Coal Mines Regulations, 2017</b>
4	<b>The Mines Rescue Rules, 1985</b>
5	<b>The Electricity Act, 2003</b>
6	<b>The Central Electricity Authority (Measures relating to Safety &amp; Electric Supply) Regulation, 2010</b>
7	<b>The Mines Vocational Training Rules, 1966</b>
8	<b>The Mines Crèche Rules, 1966</b>
9	<b>The Indian Explosive Act, 1884</b>
10	<b>The Explosive Rules, 2008</b>
11	<b>The Indian Boiler Act, 1923</b>
12	<b>The Mines Maternity Benefit Act &amp; Rules, 1963</b>
13	<b>The Workmen Compensation Act, 2010</b>
14	<b>The Factories Act, 1948 -Chapter -III &amp; IV</b>

## 3. Major Activities for Safety & Rescue Division of CIL

- Inspection of mines to review safety status of mine & follow up action thereof to improve safety standard of mines.
- Fact finding enquiry into fatal accidents and major incidents.
- Maintenance of accidents / major incidents database.
- Analysis of mine Accident Statistics in order to find action plan.
- Monitoring mine Safety Audit.
- Imparting specialized training by SIMTARS accredited trainers to unit level and Area level executives, mine officials and members of Safety Committee.
- Framing of internal Technical Circulars / Management Guidelines / Advisory related to safety issues and monitoring implementation thereof.
- Monitoring safety related R&D activities in CIL.
- Organizing a meeting of CIL Safety Board and monitoring recommendations / suggestions made during the meeting.
- Monitoring mine rescue preparedness at different mine rescue establishments.
- Publication of Safety Bulletin for disseminating and sharing of knowledge in order to promote safety awareness and inculcate better safety culture.
- Actively participated in organizing the meeting



of the Standing Committee on safety in coal mines and monitoring recommendations / suggestions made during the meeting.

- Liaisoning with various agencies on the matter of mine safety and ISOs of various subsidiaries.
- Monitoring of CIL Safety Information System (CSIS) database and ensuring timely updation.
- Response to parliamentary questions related to mine safety 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 and information sought under the Right to Information (RTI)- 2005.

#### 4. Measures taken for improvement of safety in 2020

CIL has pursued several measures in the year 2020 along with the on-going safety related initiatives, apart from compliance of statutory requirements for enhancing safety standard in mines of CIL and its Subsidiaries, which are given below:

1. Conducting Safety Audit: Safety Audit for FY 2020-21 in all producing mines of CIL is under progress for assessing present safety status and to identify deficiencies, if any. Safety Audits of Mine are being done through multi-disciplinary Inter-Area Safety Audit teams. Apart from pointing out the existing safety status of mines, Safety Audit also suggests remedial measures for improving safety standards. Deficiencies pointed out during safety audit are rectified. ISO of the respective subsidiary is entrusted to monitor the whole process.
2. Safety Management Plans (SMPs) – Site-specific risk assessment based SMPs have been prepared for each mine of CIL by involving mine officials and workmen. SMPs are reviewed on a regular basis. Implementation of SMPs are monitored through Internal Safety Organization (ISO) of each subsidiary. The process of Safety Management in mines is a continuous and on-going process for improving safety standards of mines.
3. Principal Hazards Management Plans (PHMPs): Principal Hazards Management Plans (PHMP) are formulated as a part of Safety Management Plan (SMP) to avert any mine disaster or major mine accident. Trigger Action Response Plan (TARP) are also prepared to deal with emergency situations effectively.
4. Standard Operating Procedures (SOPs): Site-specific, Risk Assessment based Standard Operating Procedures (SOPs) for all Mining and Allied operations are framed and implemented. The SOPs are being updated on regular basis to cater to the changing mine conditions.
5. Special Safety Drives on different Safety Issues: Special Safety drives on various safety issues were organized to improve standard of mines safety and enhance safety awareness amongst employees.
6. Regular coordination with ISOs: Several meetings were held under the Chairmanship of the Director (Technical), CIL for assessing the safety status of mines and other establishments for enhancing safety.
7. National Dust Prevention Committee meeting: The 19th meeting of the National Dust Prevention Committee (NDPC) was held on 19th December, 2020 in Kolkata under the Chairmanship of the Director (Technical), CIL through VC for assessing the status of dust suppression arrangement and measures taken to reduce adverse effects of dust related problems in mines of CIL and other coal producing companies.
8. Preparation and sharing of Video Clips or Animation films: Video Clips / Animation Films on various Mine Safety Procedures, Dos & Don'ts related to operation and Accident Analysis are being prepared for mutually sharing amongst all employees. These video clips or Animation films are being used widely during training programmes organized at different VTCs and other establishments also. This endeavour is expected to enhance safety

awareness amongst all employees and to develop the best safety cultures at grass root

level. Subsidiary-wise status of sharing of video-clips or animation films as on 01.12.20 are as under:

Sl.No.	Subsidiary	Shared to (Numbers of persons)		
		Departmental	Contractual	Total
1	BCCL	32,187	2,708	34,895
2	ECL	55,512	5,142	60,654
3	CCL	23,786	888	24,674
4	NCL	10,064	7,250	17,314
5	SECL	25,604	5,160	30,764
6	WCL	16,701	4,245	20,946
7	MCL	12,482	11,163	23,645
<b>TOTAL</b>	<b>CIL</b>	<b>176,336</b>	<b>36,556</b>	<b>212,892</b>

9. Adoption of Star Rating of mines: For encouraging the best practices in mines including safety practices, the Star Rating System have been adopted.

10. Special safety awareness drive for “COVID-19” based on DGMS

### "Circulars"



Several programmes have been organised to improve awareness amongst employees and their families about corona viruses. All possible precautionary measures as suggested by DGMS are also being compiled in mines. Further, 35 hospitals of CIL spread across eight coal producing states have set aside 1513 beds & 98 ICU beds for corona suspected cases and corona positive cases and 549 beds for quarantine facilities.

Apart from the above specific actions, the following

measures are continued for improving safety standards:

- i. Emphasis on adoption of the state-of-the art technology in suitable geo-mining locales.
  - a. Adoption of Mass Production Technology (MPT) in more number of UG mines.
  - b. Deployment of more nos. of Surface Miners to eliminate blasting operation

- in OCPs for safe and eco-friendly operation.
  - c. Deployment of relatively higher capacity HEMM in more number of OCPs.
  - d. Mechanization of UG drilling operation for roof bolting.
- ii. Adoption Of the state-of-the art mechanism for Strata Management
  - a. Scientifically determined Rock Mass Rating (RMR) based Strata Support System.
  - b. Mechanized Drilling for Roof bolting purpose.
  - c. Need based application of Resin Capsules in place of Cement capsules.
  - d. Use of modern Strata Monitoring Instruments as per requirement.
  - e. Strata Control Cell for monitoring efficacy of strata support system. An in-house Rock Testing Laboratory established in Nagpur, WCL for determination of Rock Mass Rating (RMR) of strata was accredited with NABL certificate.
  - f. Imparting quality training to support crews & front-line mine officials, supervisors & grass root level workmen.
- iii. Mechanism for monitoring of mine environment:
  - a. Detection of mine gases by Multi-gas detector, Methanometer, CO-detector etc.
  - b. Continuous monitoring of mine environment by installing Environmental Tele Monitoring System (ETMS) & Local Methane Detectors (LMD) etc.
  - c. Regular Mine Air Sampling and
- Analysis by using Gas Chromatograph.
  - d. Personal Dust Sampler (PDS) for detecting dust concentration.
  - e. Use of Continuous Ambient Air Quality Monitoring System (CAAQMS) in large OCPs to assess the ambient dust concentration.
- iv. Strengthening Water Danger Management:
  - a. Preparation and maintenance of seam-wise Water Danger Plan.
  - b. Preparation and implementation of Monsoon Action Plan.
  - c. Adequate Pumping Facilities with adequate capacity of Sumps.
  - d. Liaison with the State Meteorological Dept. & Dam Authorities.
  - e. Construction of Embankments against water bodies.
  - f. Inter-mine joint survey between adjoining mines to prove inter-mine barriers.
  - g. Conducting Check Survey & Joint Survey to eliminate errors in mine survey.
- v. Training on Mine Safety:
  - a. Initial and Refresher training & On-the-Job Training as per statute.
  - b. Training on Simulators to HEMM operators.
  - c. Skill up-gradation of frontline mine officials on continual basis on various topics.
  - d. Sensitization of all employees including Members of Safety Committees and contractual workmen on regular basis.
  - e. Experienced electrical supervisors of the Area are being engaged for imparting training to electricians and

electrical helpers in VTCs.

- f. Domain knowledge of experienced Agent, Mine Managers and other senior level executives are being utilized in imparting training to enhance the quality of training as well as to bring seriousness in all vocational training programmes.
- g. However, many of these programme are done thorough VC mode this year due to prevailing Covid-19 situations for safety reasons.

#### 4. Mine Safety Inspection

- Round-the-clock Supervision of all mining operations by adequate number of competent & statutory Supervisors and mine Officials.
- Regular Inspection by Workmen Inspectors appointed in each mine.
- Surprise back shift mine Inspections by mine and area level officials.
- Regular mine Inspection by officials of Internal Safety Organization of respective subsidiary and CIL.
- Periodic mine Inspections by senior officials of CIL & Subsidiaries, Trade union representatives and officials of MOC.

#### 5. Steps for prevention accidents in OCPs

- a. Formulation and Implementation of Mine-specific Traffic Rules.
- b. Code of Practice for HEMM Operators, Maintenance staff & others.
- c. Sensitization training of Contractor's Workmen involved in contractual jobs.
- d. Installed a 'Universal Equipment Simulator' at Central Excavation Training Institute (CETI) in NCL, Singrauli to impart simulation training to Dragline, Shovel and Dozer Operators. Simulator allows operators to hone their skills.

- e. Lighting arrangements by using high mast towers are provided for enhancement of standard of illumination.
- f. Eco-friendly Surface Miners for blast free mining and avoidance of associated risks.
- g. Dumpers fitted with Proximity Warning Devices, Rear view mirrors and camera, Audio-Visual Alarm (AVA), Automatic Fire Detection & Suppression System (AFDSS) etc.
- h. Ergonomically designed seats & AC Cabins for operators' comfort.
- i. GPS based Operator Independent Truck Dispatch System (OITDS) in large OCPs for tracking movement of HEMMs inside OC mine. E-surveillance unit has been installed in mines for monitoring operations 24X7 in real time by using GPS/GPRS-based vehicle tracking, and geo-fencing system.

#### 6. Mine Emergency Response System

- Emergency Action Plans prepared as per statute for each mine.
- Mock Rehearsals for examining the efficacy of Emergency Action Plan.
- Demarcating Emergency Escape Routes in belowground.
- Check list prepared for dealing with an emergency in mine.
- Flow Chart prepared for transmission of information regarding crisis / disaster in mines from site of accident to the Ministry of Coal, New Delhi.

#### Rescue Services for Emergency Response System in CIL:

- CIL is maintaining a well established Rescue Organization comprising 6 Mine Rescue Stations (MRS), 13 Rescue Rooms-with-Refresher Training facilities (RRRT) and 17 Rescue Rooms (RR).
- All Rescue Stations / Rescue Rooms are fully



equipped with adequate numbers of rescue apparatus as per the Mine Rescue Rules (MRR) - 1985.

- This Rescue Organization is staffed by adequate numbers of Rescue Trained Personnel (RTP) as per the MRR-1985.
- All RTP are being periodically re-trained to conduct rescue operations in hot, humid and

irrespirable atmospheres in modern training galleries as well as in mines.

- A new rescue van was introduced at Mines Rescue Station, Dhansar in BCCL in 2020. The van will be used to store & transport rescue equipment & personnel to an accident site in case of emergencies like fire & accidents in its mines



Advanced Life Support ambulance equipped with a ventilator

- Advanced Life Support ambulance equipped with a ventilator, a defibrillator have been introduced for ALS interventions on site & during transit to facilitate rescue and recovery operations and other medical emergencies.
- CIL employs Permanent Brigade Members and RTPs for 24x7 on call. The Mine Rescue Station and Rescue Rooms are established at strategic locations. The details are as under:

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



## 8. Safety Monitoring of CIL

Safety in mines are being monitored at various levels by the agencies mentioned here:



## 9. Coal India Limited

### Analysis of Accident Statistics in CIL

Mine Accidents Statistics is the relative indicator for safety status in mines. Over the years the Safety Standard and over performance on safety matters has improved significantly. The same has been reflected in figures of CIL's Accident Statistics.

This improvement in safety is attributed to the following 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 mechanisms.
- Constant vigil, round the clock supervision and assistance from all concerned quarters.
- Continuous improvement in knowledge, skill and awareness of workforce through imparting quality training and relentless safety awareness drives.

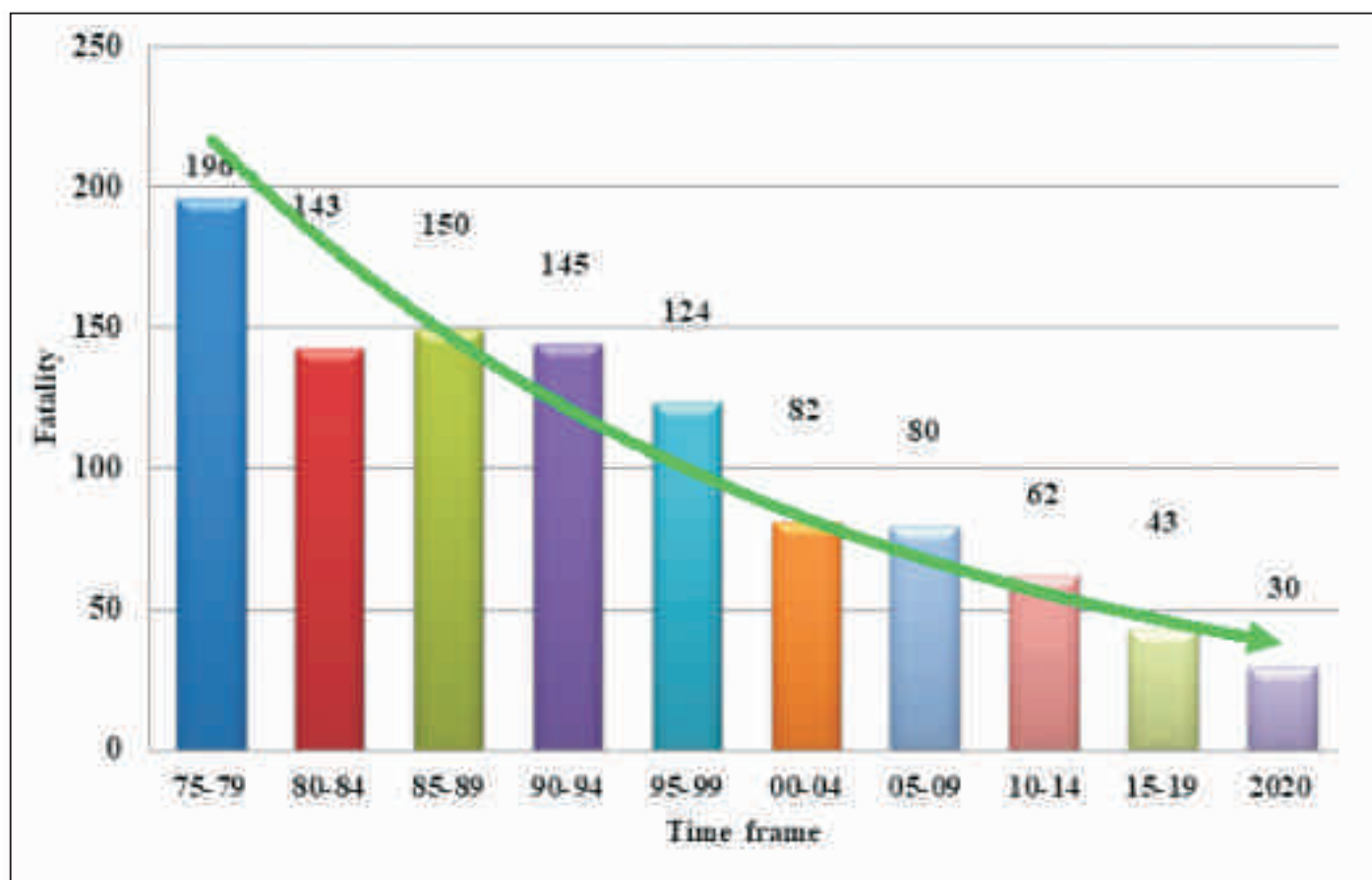
Salient features of continuous and sustained improvement in CIL's safety performance:

### Comparative Accidents Statistics of CIL of 5 Yearly Average since 1975

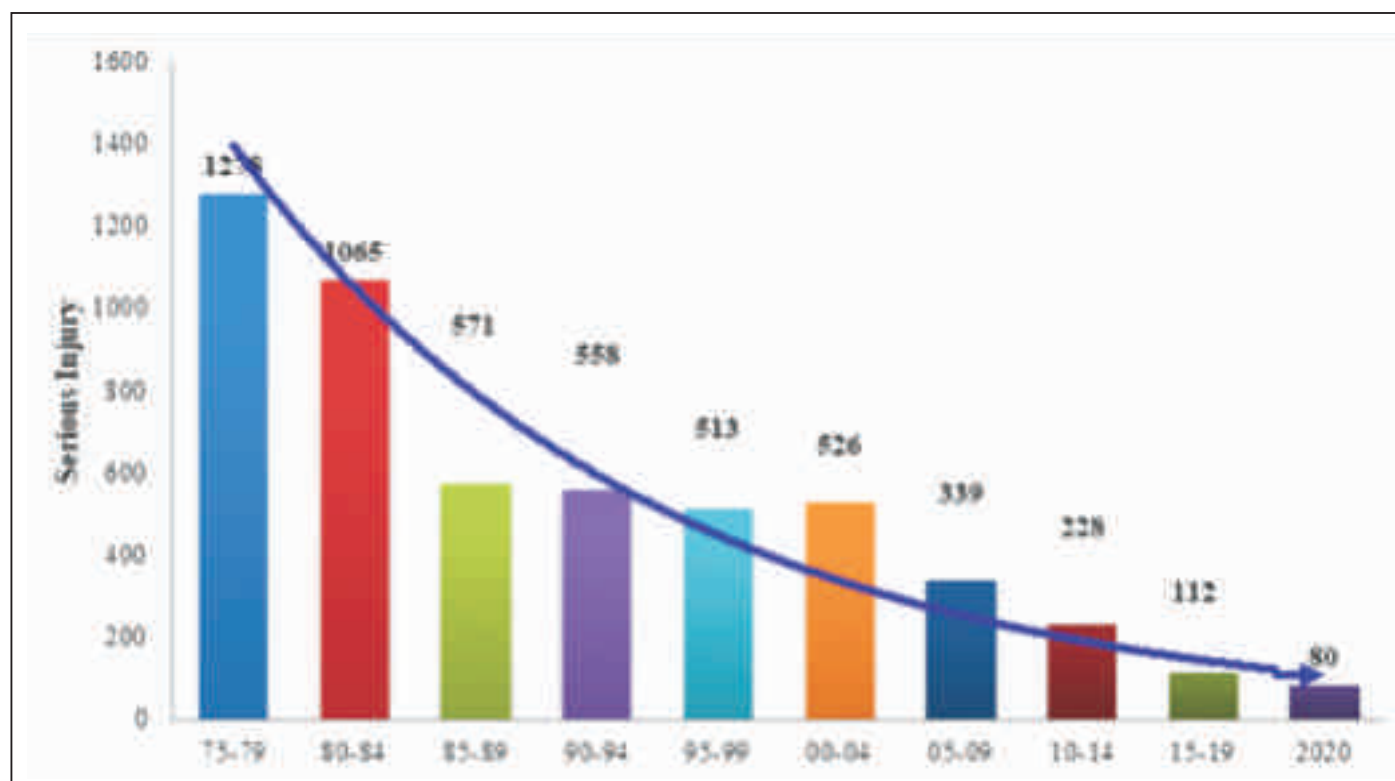
Time frame	Av. Fatal Accidents		Av. Serious Accidents		Av. Fatality Rate		Av. Serious Injury Rate	
	Accident	Fatalities	Accident	Injuries	Per Mill. Te	Per 3 Lac Manshifts	Per Mill. Te	Per 3 Lac Manshifts
1975-79	157	196	1224	1278	2.18	0.44	14.24	2.89
1980-84	122	143	1018	1065	1.29	0.30	9.75	2.26
1985-89	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
2015-19	33	43	107	112	0.08	0.18	0.19	0.47
2020	29	30	73	80	0.05	0.14	0.13	0.37

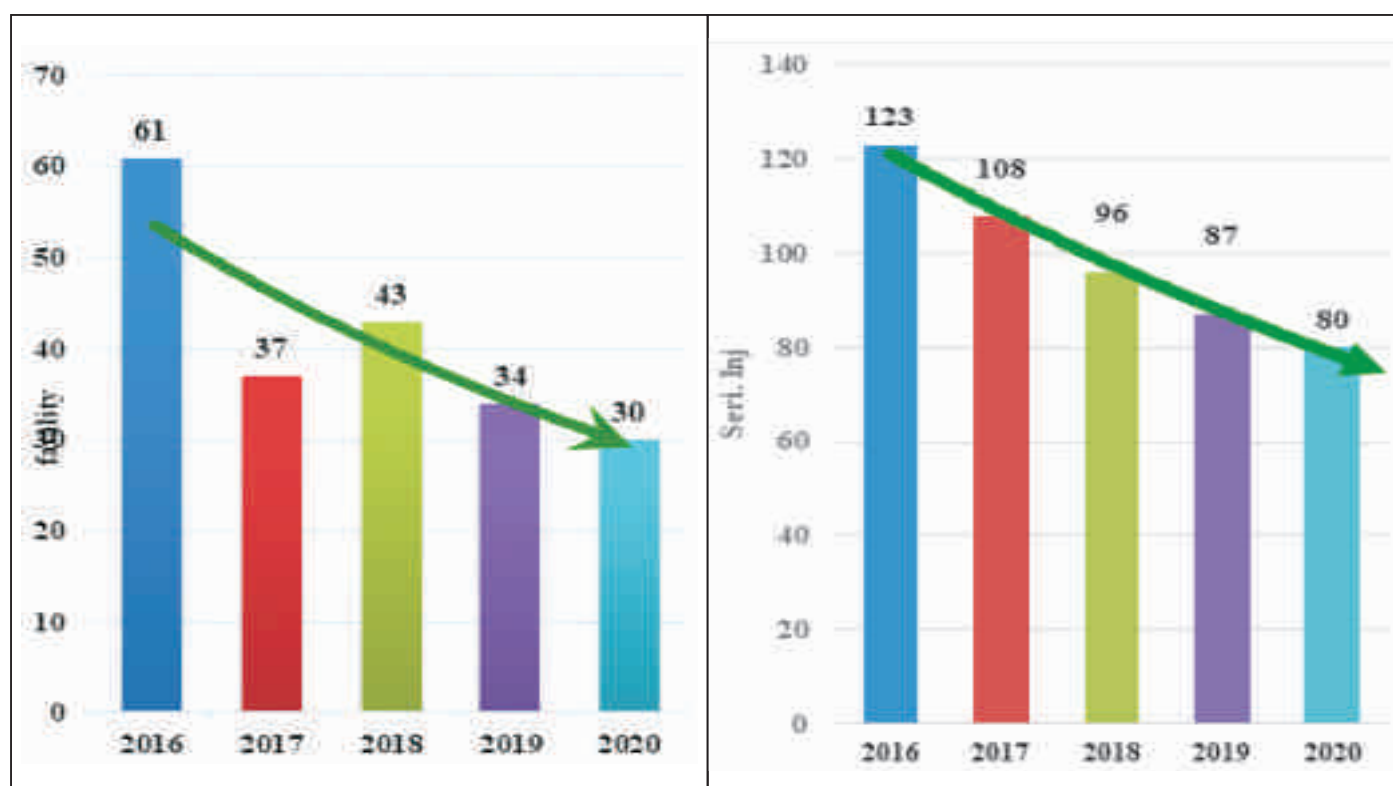
Note: Subject to reconciliation with DGMS & Accident Statistics are maintained calendar year-wise in conformity with DGMS practice

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



Graph: 2 – Trend of 5 Yearly Average of Serious Injuries since 1975



**Graph-3: Trend of Fatalities & Serious Injuries for last 5 years in CIL****Table – 2: Overall Accident Statistics in 2020 vis-a-vis 2019 in CIL**

Sl. No.	Parameters	2019	2020	Reduction in absolute nos.	% of Reduction
1	Number of fatal accidents	30	29	1	3%
2	Number of fatalities	34	30	4	12%
3	Number of serious Accidents	86	73	13	15%
4	Number of serious injuries	90	80	10	11%
5	Fatality Rate per Mte. of coal production	0.06	0.05	0.01	16%
6	Fatality Rate per 3 lakhs manshift deployed	0.15	0.14	0.01	7%
7	Serious injury Rate per Mte.of coal production	0.15	0.13	0.02	13%
8	Serious injury Rate per 3 lakhs manshift deployed	0.40	0.37	0.03	7%

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 2020**

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	6	7	18	22	0.15	0.16	0.47	0.50
BCCL	2	2	9	9	0.08	0.07	0.34	0.32
CCL	1	1	7	7	0.02	0.04	0.11	0.28
NCL	2	2	14	15	0.02	0.18	0.13	1.36
WCL	4	4	6	7	0.08	0.07	0.14	0.13
SECL	10	10	15	16	0.07	0.26	0.11	0.41
MCL	4	4	4	4	0.03	0.26	0.03	0.26
NEC	0	0	0	0	0.00	0.00	0.00	0.00
<b>CIL</b>	<b>29</b>	<b>30</b>	<b>73</b>	<b>80</b>	<b>0.05</b>	<b>0.14</b>	<b>0.13</b>	<b>0.37</b>

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 2018 to 2020**

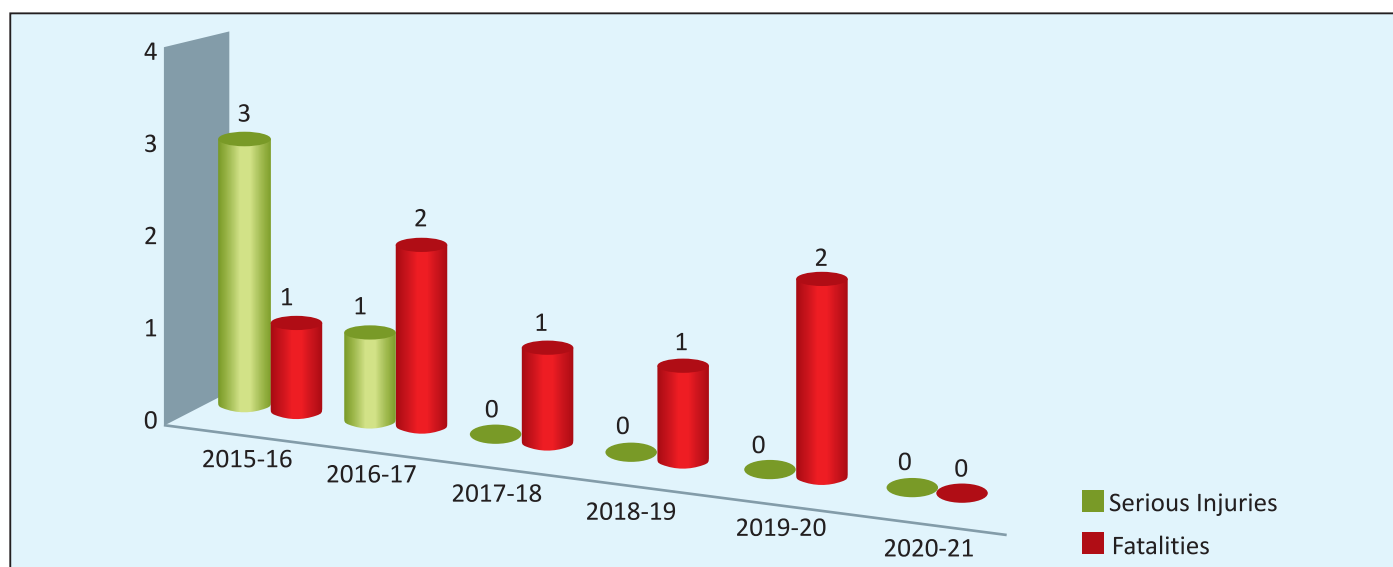
Company	Fatal Accidents			Fatalities			Serious Accidents			Serious injuries		
	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020
ECL	1	7	6	2	7	7	24	18	18	25	18	22
BCCL	2	6	2	2	6	2	7	10	9	7	12	9
CCL	5	2	1	8	2	1	9	4	7	16	4	7
NCL	3	2	2	3	2	2	8	12	14	8	12	15
WCL	2	2	4	5	2	4	17	16	6	17	17	7
SECL	12	6	0	15	7	10	20	22	15	21	23	16
MCL	8	5	4	8	8	4	4	4	4	4	4	4
NEC	0	0	0	0	0	0	0	0	0	0	0	0
<b>CIL</b>	<b>33</b>	<b>30</b>	<b>29</b>	<b>43</b>	<b>34</b>	<b>30</b>	<b>89</b>	<b>86</b>	<b>73</b>	<b>98</b>	<b>90</b>	<b>80</b>

**Table – 5: Company-wise Fatality & Serious Injury Rate During the period 2018 to 2020**

Company	Fatality Rate Per MT of coal production			Fatality Rate Per 3 lac manshifts			Serious Injury Rate Per MT of coal production			Serious Injury per Rate 3 lac manshifts		
	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020
<b>ECL</b>	0.04	0.14	0.15	0.04	0.16	0.16	0.52	0.35	0.47	0.53	0.40	0.50
<b>BCCL</b>	0.06	0.21	0.08	0.06	0.20	0.07	0.22	0.43	0.34	0.22	0.41	0.32
<b>CCL</b>	0.12	0.03	0.02	0.29	0.08	0.04	0.24	0.06	0.11	0.58	0.15	0.28
<b>NCL</b>	0.03	0.02	0.02	0.26	0.18	0.18	0.08	0.11	0.13	0.69	1.09	1.36
<b>WCL</b>	0.10	0.04	0.08	0.09	0.04	0.07	0.34	0.31	0.14	0.30	0.31	0.13
<b>SECL</b>	0.10	0.05	0.07	0.34	0.17	0.26	0.12	0.16	0.11	0.43	0.56	0.41
<b>MCL</b>	0.06	0.06	0.03	0.50	0.49	0.26	0.03	0.03	0.03	0.25	0.25	0.26
<b>NEC</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>CIL</b>	0.07	0.06	0.05	0.18	0.15	0.14	0.16	0.15	0.13	0.41	0.40	0.37

**10. Accident Statistics of NLCIL MINES - (for last five years)**

Year	Fatalities	Serious Injuries
<b>2015-16</b>	1	3
<b>2016-17</b>	2	1
<b>2017-18</b>	1	0
<b>2018-19</b>	1	0
<b>2019-20</b>	2	0
<b>2020-21 (Upto Dec. 2020)</b>	0	0





## 11. Safety measures at NLCIL

The following safety measures are being adopted in NLCIL to achieve Zero Accident Potential:

1. Mines at Neyveli (Mine-I, Mine-IA & Mine-II) are being operated with State of the Art Technology i.e. Bucket Wheel Excavators, Spreaders, stackers and series of conveyors having inbuilt safety features.
2. Standard operating procedures (around 300 Nos.) have been framed for all the activities of the mines and are being strictly implemented.
3. Risk assessment based Safety Management Plans have been prepared covering all the activities of the mine including Bench operation, Bucket Wheel Excavators, Belt Conveyors, Lignite production, storage and dispatch, Haul roads, OB dumps, Mine water management and are under implementation.
4. Pit Safety Committee meetings conducted monthly besides special meetings.
5. Each mine is maintaining two fire tenders, being handled by CISF personnel, round the clock.

6. Water danger potentials are studied and well managed by a separate department called ground water control division.
7. For dust suppression each BWE bucket has been provided with water spraying arrangement and drill machines are provided with dust extractors and wet drilling arrangement. Sufficient Nos. of Water tankers (28KL each) have been provided for dust suppression on the haul road.
8. New technology like SIMULATOR is used worldwide for imparting equipment training to workmen in virtual environment without any risk of accident during training. For this, Simulator has been procured at NLCIL from 5DT Technologies of South Africa and it was installed and commissioned at Group Vestibule Training Centre, Neyveli.

## 12. Safety and R&D initiatives

### Safety Trainings

Training given at GVTC, Neyveli for the period April 2020 to December 2020

Type of training		Persons trained
Basic/Initial training imparted to employees		2
Basic/Initial training imparted to contract workers		530
Basic/Initial training imparted to Apprenticeship Trainees		47
Refresher Training	Contract workers	1639
	Regular Employees	612
Special Training	Contract workers	257
	Regular Employees	181
Other Training (Executives, Supervisors, Apprentices and CISF etc)		27
Total no. of persons trained		3295

### 13. Emergency response System

Principal Hazards have been identified as a part of Safety Management plan in all the NLCIL mines and Emergency Action Plan is in place. There is also a detailed Monsoon Action Plan which comes into force as soon as any weather warning is received by Mine officials from Meteorological department with regard to high wind velocities and heavy rainfall.

### 14. Occupational Health services

1. In the mines of NLC India Limited, the following actions have been taken with regard to OH services:

2. Health facilities are being provided to all mine workers including contract workmen. One 355 bed multi-functional general hospital is functioning at Neyveli and one Occupational Health Centre is operational at Barsingsar Mine, Rajasthan.
3. For all the workmen at NLCIL Mines, including contract workmen, Periodical medical examination is conducted once in 3 years at Industrial Medical Centre dedicated for this purpose at NLC General Hospital. Based on the result of PME necessary action is taken.

### 15. Initial Medical Examination:

#### Type of Medical Examination

Type of Medical Examination	Number of persons 2019-20	Number of persons 2020-21 (upto Dec 2020)
	Actual	Actual
Initial Medical Examination (IME)	618	944
Periodical Medical Examination (PME)	4086	1335

### 16. Accident Statistics of SCCL–

- Details of fatal and serious accidents and rate of fatality and serious injury during 2015-16 to 2019-20 (up to 31st Dec, 2020) is given in the table below.

Year	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
2015-16	7	7	225	225	0.12	0.14	3.73	4.51
2016-17	10	12	220	224	0.20	0.25	3.65	4.66
2017-18	11	12	210	215	0.19	0.24	3.47	4.32
2018-19	7	7	187	187	0.11	0.16	2.90	4.17
2019-20	7	7	122	123	0.11	0.17	1.92	2.90
2020-21*	8	11	71	74	0.34	0.44	2.27	2.98

\*up to 31st Dec-2020.

ii. Details of fatal and serious accidents and rate of fatality and serious injury during 2015 to 2020 is given in the table below.

Year	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
2015	7	7	245	245	0.12	0.14	4.05	4.98
2016	10	12	216	218	0.20	0.25	3.66	4.54
2017	11	12	213	219	0.20	0.24	3.60	4.39
2018	7	7	190	191	0.11	0.15	2.91	4.09
2019	8	8	138	138	0.12	0.19	2.10	3.28
2020*	9	12	97	101	0.24	0.34	2.02	2.84

\*up to 31st Dec-2020.

## 17. Safety Measures in SCCL:

- Manual loading has been completely phased out by introducing semi mechanization with LHDs, SDLs and mechanized technologies such as Longwall, Continuous Miner to reduce human drudgery and reduction of persons at active working places to reduce the risk of accidents and disasters.
- Top priority is accorded for ensuring safety of the workers exposed to the roof fall dangers. Mechanized roofbolting systems are introduced and 253 roof bolters are provided in all the UG mines.
- Illumination fortnight is conducted to improve the lighting standards in all the mines and dept.
- All UG mines are provided with man riding/winding systems to avoid risky walking along steep gradients.
- Below ground communication and tracking system with WIFI is proposed in 10 UG mines.
- Two Nos. of training simulators for 6 types of HEMM are procured at a cost of Rs 4 crores for technical training centre (TTC, RG-1) for providing training on HEMM to operators of OC mines
- Whenever the workers are exposed to higher temperatures and humid conditions in underground mines(ALP mine),air Chilling Plants are provided to create comfortable conditions and to reduce the risk to the workers.
- Tube bundle system (ALP Mine) and Telemonitoring (VK7 and GDK 11) provided for monitoring of harmful gases.
- Lightweight cap lamps have been procured for all the UG mines.
- Involvement of representatives of workmen in Bipartite and Tripartite meetings, Regional Safety Committee meetings, Pit Safety Committee meetings inviting their suggestions regarding safety related activities and implementation of their suggestions.
- LIDAR has been commissioned at GK OC, KGM Area to assess the movement of OB dumps and benches on a real time basis for taking proper remedial actions.
- 9 Nos. of Nevis CD-60 Model, type mounted (DFDS) Dry Fog Dust Suppression for dust suppression machines are provided at CHPs for dust suppression

13. SCCL has 1 main hospital, 6 area hospitals and 12 Occupational Health Centers (OHS) managed by 27 OHS trained doctors to carry out all the tests and medical examinations required as per the statute and recommendations of National Safety Conferences. Hospitals are equipped with sophisticated equipment like CT scan, 2D Echo and Dialysis Centers.

#### **SIMTARS:**

- 10 officers have been trained by SCCL at Safety in Mines Testing and Research Station (SIMTARS), Australia in Risk Management.
- SCCL has established two state of art “Safety Management Training Centers” at Ramagundam and Mandamarri at the standards of SIMTARS, Australia.
- Training on “Development and Implementation of Safety Management Plan (SMP)” is being imparted to the Safety Management Teams of the concerned mines by the SIMTARS accredited trainers under the program of “Train the Trainers”. 27 training programmes were conducted during 2019-20, trained about, 196 executives and 462 workmen. Due to Covid pandemic, the scheduled training were delayed and 7 trainings were completed during 2020-21, trained about, 46 executives and 118 workmen.
- Safety Management Plans of all operating mines were prepared under the guidance of SIMTARS accredited trainers and submitted to DGMS.

#### **Rescue Services in SCCL:**

- A Central monitoring mechanism with the Department of Rescue headed by a General Manager has been established at Ramagundam. In addition to this, three Rescue Room for Refresher Training (RRRT) centers were established at Kothagudem, Mandamarri and Bhoopalapally Areas.
- Rescue services in SCCL were modernized in the year in 2002 to be the best in India and on par with those in developed countries meeting International Standards.
- Apart from the basic rescue equipment required as per the statute, SCCL has procured state of the art Hydraulic Rescue Tools consisting of Hydraulic Cutters, Spreaders, Combi-Tools, Rescue Rams and Lifting Jacks. Pneumatic High Pressure Lifting bags, Concrete Cutters and Wood Cutters to deal with various types of disasters.
- SCCL Rescue Team led by Directors and GMs attended International Mines Rescue Conference thrice and participated five times in International Mines Rescue Competitions conducted once in two years.
- The Rescue services of SCCL are extended to civil calamities also such as road/train accidents, vehicle collisions, fire incidents in villages, and fire accidents in thermal power plants.

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