



## **SAFETY IN COAL MINES**



# Safety in Coal Mines

## Coal India Ltd

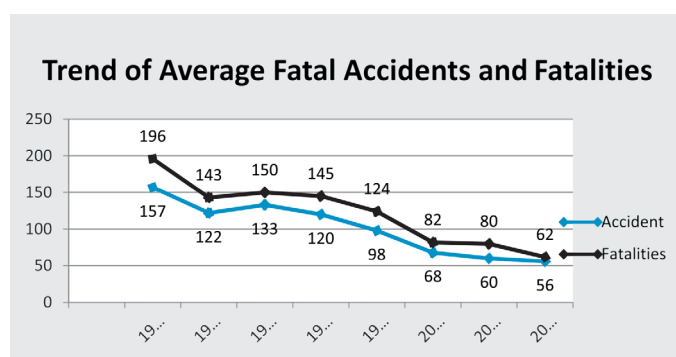
CIL has always given the highest priority to safety, considered as part of its core business process and embedded in its mission statement. A multidisciplinary Internal Safety Organization (ISO) has been put in place in every subsidiary of CIL to stringently monitor the implementation of CIL's safety policy.

Accident-statistics is a major indicator of safety status. Over the years, safety-performance in terms of accidents in CIL has improved significantly. This improvement can be attributed to the following factors:

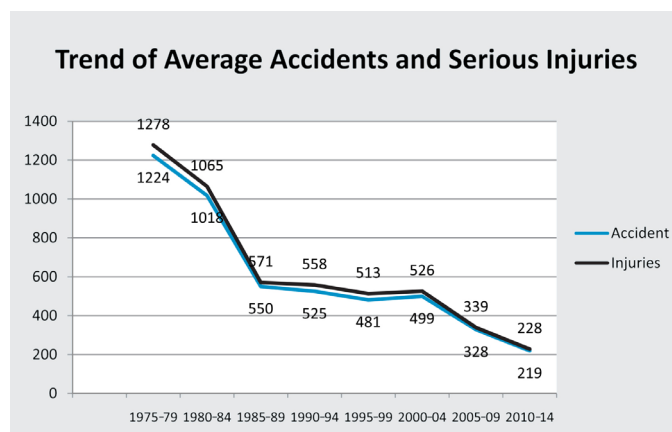
- Collective commitment of the management and employees.
- Use of state-of-the-art technology in mining.
- Quality training and relentless safety awareness drives.
- Strong oversight mechanisms.

There were a total of 46 fatalities in 2014, and 186 serious injuries.

Average fatal accidents and fatalities since the inception of CIL have shown a declining trend over a period of time as evident from the graph given below:



The average serious injuries in CIL have also shown a reducing trend over a period of time as evident from the graph in the next column:



## Major Activities of the Safety & Rescue division of CIL

- Inspection of mine to review safety status & follow up action.
- Prima-facie fact-finding enquiries into fatal accidents and major incidences such as mine fire, subsidence, in-rush of water, slope failure, explosion etc.
- Organizing appropriate review-forums with employees representatives for joint consultations on safety-related issues.
- Regular meetings of the CIL Safety Board and consistent monitoring of recommendations / suggestions made during the meeting.
- Regular meetings of the National Dust Prevention Committee (NDPC)
- Maintenance of accidents / major incidents related statistics in CIL's database.
- Publication of Safety Bulletin for disseminating and sharing knowledge in the field of safety awareness.
- Making safety a thrust area in R&D activities.
- Imparting specialised training by accredited trainers to unit level and area level executives directly engaged in ensuring safety in mines.

**Measures for Improvement of Safety in 2014**

- Continuous oversight of safety status of mines with the help of multi-disciplinary Internal Safety Organizations (ISOs).
- Special directives on corrective measures to be taken for prevention of recurrence of accident.
- Stress on preparation and implementation of mine-wise Risk Assessment Plans at the beginning of the calendar year based on CIL's Safety Management Plan (SMP). Training of executives by Simtars, Australia in Risk Assessment based SMP.
- A roadmap for conducting ' Safety Audit by external independent agencies has been put in place to bring uniformity and efficiency in Mine Safety audit.

**SAFETY MONITORING AGENCIES IN CIL**

Apart from statutory monitoring by DGMS, the status of safety is being monitored at various levels by the following agencies:

Level	Monitoring Mechanism
Mine Level	<ul style="list-style-type: none"> <li>• Workman Inspectors: as per Mines Rule-1955</li> <li>• Pit Safety Committees constituted as per Mines Rule-1955</li> </ul>
Area Level	<ul style="list-style-type: none"> <li>• Bipartite/Tripartite Committee Meetings</li> <li>• Safety Officers' Coordination Meetings</li> </ul>
Subsidiary Level	<ul style="list-style-type: none"> <li>• Bipartite/Tripartite Committee Meetings</li> <li>• Area - Safety-Officers' Coordination Meetings</li> <li>• Inspections by ISO Officials</li> </ul>
CIL Head Quarter Level	<ul style="list-style-type: none"> <li>• CIL Safety Board meetings</li> <li>• CMD's meet</li> <li>• Director (Tech)'s Coordination Meeting</li> </ul>
Ministry of Coal/Standing Committees	<ul style="list-style-type: none"> <li>• Standing Committee on Safety in Coal Mines</li> <li>• National Conference on Safety in mines</li> <li>• Review by different Parliamentary Standing Committees</li> </ul>

**Neyveli Lignite Corporation:**

The following safety measures have been taken to prevent accidents in Mines:-

- Only highly sophisticated mining machineries are deployed for continuous lignite mining and allied activities.
- All machineries fitted with limit switches, emergency switches, slip monitoring devices, various type of safety clutches, safety coupling like fluid-couplings, brakes and other systems, to ensure machine-safety.
- Mixed emulsion is extensively used during blasting operations to reduce hazards.
- Apart from unit level monitoring of safety systems, safety monitoring is carried out by ISO at corporate level.
- Personal protective equipments are issued specific to job requirements of employees / contract workers.
- Systematic indepth' Accident Analysis' is being done for accident prevention / to avert recurrence of accidents.
- Serious/Reportable/Near miss accident victims are given appropriate counseling.
- Code-of-practices for different operations like Specialized Mining Equipment Operations, Ancillary Equipment Operations etc. are being meticulously followed.
- Inter-Unit Safety Assessments are being carried out in every quarter to ensure that safety standards are maintained as per the statute.
- Risk Assessment and Safety Audit for Mines are being carried out by Accredited External Agencies once in 2 years.
- Compulsory Training for all categories of employees, including the contract employees.
- Continuous monitoring of behavioral attitude/commitment of employees towards Safety.

**Accident Statistics of NLC - (for last five years):**

Year	Fatalities	Serious Injuries
2010-11	2	2
2011-12	1	6
2012-13	4	4
2013-14	1	4
2014-15 (upto Dec, 2014)	1	--

**Accident Statistics of SCCL - (for last five years):**

Year	Fatalities	Serious Injuries
2010-11	2	2
2011-12	1	6
2012-13	4	4
2013-14	1	4
2014-15 (upto Dec, 2014)	1	--

**SAFETY MEASURES IN SCCL:**

- Implementation of Risk Assessment based Safety-Management Plan.
- Identification of hazards in all mining operations and associated risks thereof.
- Adoption of control measures for elimination/mitigation of recorded hazards.
- Adoption of the Roof Support System based on geo-technical studies.
- Phasing out (conventional mining methods)
- Use of 'Continuous Miner' and 'Long-Wall' technology to eliminate blasting hazards.
- Introduction of Roof-Bolters for Resin-Capsules bolting.
- Use of rear-view cameras and proximity-warning devices in dumpers in Open-Cast mines.
- Introduction of automatic fire-detection and fire-suppression systems in all HEMM.
- Use of Man Riding Systems in Underground mines.
- Tele monitoring system for real time monitoring of CH<sub>4</sub> and CO gases in UG mines.
- Analysis of mine-air samples.
- Introducing Simulators for training operators.

**JHARIA & RANIGANJ MASTER PLAN:**

Un-scientific, unsystematic and illegal mining are the primary causes of fires. Coal, left as safety pillars and ribs during the course of extraction (mining) in old workings and abandoned mines, catches fire due to spontaneous combustion and this situation gets further aggravated due to illegal mining. The population living in the old mining areas has increased manifold over the years, inspite of declaring of these areas as unsafe by the local administration.

In order to address these, and related issues, the Master Plan for Jharia and Raniganj Coalfields dealing with fire, subsidence and rehabilitation and diversion of surface infrastructure has been approved in August, 2009 at an estimated investment of ₹ 9657.61 Crore (₹ 7028.40 Crore for Jharia Coalfield and ₹ 2629.21 Crore for Raniganj Coalfield) excluding ₹ 116.23 Crore sanctioned earlier for various EMSC schemes for implementation in 10/12 years in two phases of five years each. The Jharia Rehabilitation & Development Authority (JRDA) and Asansol Durgapur Development Authority (ADDA) have been identified as implementing agencies for rehabilitation of non ECL/non BCCL houses by the State Governments of Jharkhand and West Bengal respectively. For speedy implementation of the Master Plan, a High Powered Central Committee under the Chairmanship of Secretary (Coal) has been constituted with representatives from different Ministries and State Governments of Jharkhand and West Bengal. The progress is reviewed on a quarterly basis.

Out of 28 Fire schemes proposed in Master Plan (phase – I) 4 schemes have been completed and the rest are in different stages of execution.

**In Raniganj Coalfields (RCF)**

- Demographic survey has been completed in all 141 sites and 44598 households have been identified.
- ECL has vested 270.38 acres of land to Asansol Durgapur Development Authority (ADDA) which would accommodate about 20,000 houses.

**In Jharia Coalfield**

- Out of 595 fire affected subsidence prone sites, demographic survey in 532 sites have been completed in which 74354 families have been identified

- Out of 25000 houses proposed for resettlement of affected BCCL persons, 1496 houses have been constructed and occupied, 4080 quarters are under construction, work order has been awarded for 4020 quarters and tenders have been floated for 2240 quarters.
- Out of 54159 quarters for rehabilitation of non-BCCL endangered persons, 2352 houses have been constructed, 2000 units are under construction and tenders have been floated for 2000 units.