

## Safety in Coal Mines

### 9.1 Jharia & Raniganj Action Plan

**9.1.1** The problems of subsidence and fires are the result of unscientific mining carried out by the erstwhile mine owners over more than 200 years of operations in these coalfields of Jharia and Raniganj prior to nationalisation. The population living in the old mining areas has increased many times over the years, though these areas became unsafe for habitation. In spite of the declaration of these areas unsafe by the local administration, the habitation increased unabated. The problem of subsidence and fire are being addressed by the Government from time to time. In this regard a High Level Committee was set up in December, 1996 under the Chairmanship of the then Secretary, Ministry of Coal with representatives from other Departments, Coal companies and the concerned State Governments to deal with the problem in a comprehensive manner. Based on the recommendations of the Committee

a Master Plan was prepared to deal with the problems of fire and subsidence and related rehabilitation covering the areas under Bharat Coking Coal Ltd. (BCCL) and Eastern Coalfields Ltd. (ECL) in 1999 for implementation of the same in a phased manner.

**9.1.2** The Government has approved the Master Plan dealing with fire, subsidence and rehabilitation and diversion of surface infrastructure within the leasehold of Bharat Coking Coal Limited (BCCL) & Eastern Coalfields Limited (ECL) on 12th August, 2009 at an estimated investment of ₹9773.84 crore (₹7112.11 crores for Jharia Coal Field (JCF) and ₹2661.73 crores for Raniganj Coal Field (RCF) including ₹116.23 crore sanctioned earlier for various Environmental Measures & Subsidence Control (EMSC) schemes for implementation in ten years time. The summarized data of approved Master Plan is given in the table below:-

SI No.	Particulars of the components of Master Plan	RCF(ECL) (April'08)	JCF (BCCL) (March'08)
A	Dealing with fire		
1	Total no. of existing fires	7	67 (under 45 fire projects)
2	Estimated Cost (Rs. crores)	40.28	2311.50
B	Rehabilitation		
1	No. of sites to be Rehabilitated	139	595
2	Area affected in sq.km	8.62	25.69
3	No. of houses to be Vacated/ Rehabilitated		

i)	BCCL (Taking into account superannuation)		44155/ 25000
ii)	Private (Authorised)		29444
iii)	Encroachers (Un-authorised)		23847
iv)	Others		868
	Total No. of houses	33196	98314/ 79159
	Population covered	180263	395795
4	Land required for rehabilitation (Ha)	896.29	1504.99
5	Estimated cost (Rs. crores)	2610.10	4780.60
C	Diversion of Railway line/ Road/ OC pipeline	7 sites	Planning and survey with an outlay of Rs.20 crores
	Estimated Cost (Rs. crores)	11.35	20.00
D	Implementing Agency for fire projects & rehabilitation of BCCL/ ECL houses	ECL	BCCL
E	Implementing Agency for rehabilitation of Non-BCCL/ ECL houses - Private & Encroachers	Asansol Durgapur Development Authority (ADDA), Govt. of WB	Jharia Rehabilitation & Development Authority (JRDA) of Govt. of Jharkhand
F	Implementation Schedule, years	10 (in two Phases each of 5 years)	10 (in two Phases each of 5 years) +2 years for pre implementation phase)
G	Estimated Capital Requirement for fire projects, rehabilitation & diversion of rail/road/pipeline etc. (Rs. crore)	2661.73	7112.11

**9.1.3** Asansol-Durgapur Development Authority (ADDA) and Jharkhand Rehabilitation Development Authority (JRDA) have been notified by the state Governments of West Bengal and Jharkhand respectively as implementing agencies for rehabilitation purposes. Coal companies (ECL & BCCL) will provide technical support and the outlay will be funded partially through the internal resources of CIL and the cess collection under CCDA.

**9.1.4** The implementation of the Master Plan for Jharia and Raniganj Coalfields is being monitored by the High Powered Central Committee (HPCC) constituted by this Ministry under the chairmanship of Secretary (Coal). So far, four meetings of the Committee have been held. 50% of survey works has already been completed for rehabilitation of the affected persons and out of 3100 houses for non BCCL people, 400 houses has already been

occupied and another 400 houses are on the verge of allotment. The remaining houses are expected to be shifted into within 2 to 3 months time. Further, as per the discussion in a review meeting on the implementation of the Master Plan, Ministry of Steel has

been requested to transfer 2300 acres of vacant land, belonging to Durgapur Steel Plant (DSP) for rehabilitation of the affected people, living in Raniganj coalfield area of ECL, keeping in view that DSP has no immediate plan of utilizing the vacant land.



Mechanised Roof Bolting Operations in Underground Coal Mine

## 9.2 Safety Measures / Initiatives

**9.2.1** Safety in coal mines is of paramount importance. In addition to the compliance of the provisions of prescriptive safety legislation under the Mines Act 1952, PSU coal companies have also taken steps for self regulation. These steps include:-

- Establishment of multi-disciplinary Internal Safety Organization (ISO) to assist the line management at various levels in matters related to Safety.
- Introduction of Risk Assessment based Safety Management Plan for

the mines.

- Safety Audit by independent safety auditors.

### Steps for Disaster Prevention:

- Inundation: Thrust on Safety Audit, Check Survey, Trials of Geo-physical Methods for detection of water bodies / proving parting, adequate preparation before monsoon season etc.
- Fire in mines: Panel system working (so that in case of fire that can be isolated immediately), strengthening

of isolation stoppings and use of fire retardant sealant etc.

- o Explosion: Early Gas detection through various modern gadgets (both sensors & catalytic base), Continuous type computer based on-line Gas monitoring for highly gassy and fiery mines and erection of explosion proof stopping.

### 9.2.2 Emergency Response Systems

- Emergency Escape Routes.
- State of the art Rescue Apparatus like BG-4 Self Contained Breathing Apparatus was introduced in Rescue Stations and Rescue Personnel were trained for their use.

### 9.2.3 For reduction of Roof/Side falls accident

Roof / Side fall accident is still one of the major causes of fatal accident in underground mines. Coal Companies have given priority for ensuring roof support management through :

- Stress on face mechanization to reduce exposure of workmen in active working zone.
- Geo-mechanical properties of overlying rocks are being studied and Support Systems are being scientifically designed on the basis of Rock-Mass-Rating (RMR) of overlying strata and duly approved by DGMS.
- Greater use of Roof Bolting/ Stitching methods of roof support

- Introduction of mechanized drilling by roof bolting machines.
- Emphasis on development of indicators for detecting impending load on roof through R&D.

### 9.2.4 For reduction of accident in Opencast as well as on Surface of Mines:

The following measures are being taken for reduction of fatalities in Opencast Mines & on Surface:

- Mine-specific Traffic Rule.
- Code of Practices for HEMM operators, Maintenance staffs & others.
- Standard of Procedure related to safe operation of various mining operation.
- Risk Assessment & Management
- Training of Contractor's Workers involved in transporting

### 9.2.5 Monitoring the status of safety through the following agencies :

- Workmen's Inspectors
- Safety Committee at mine level
- Area Level Tripartite Committees
- Tripartite Safety Committee
- CIL Safety Board
- Standing Committee on Safety in Coal Mines
- Conferences on Safety in Mines
- Different Parliamentary Standing Committee

### 9.3 Accident Statistics

#### 9.3.1 Company-wise accident statistics for the year 2010

Company	Fatal Accidents	Fatalities	Serious Accidents	Serious Injuries	Fatality Rate		Serious Injury Rate	
					Per MT	Per 3 lac man shifts	Per MT	Per 3 lac man shifts
ECL	12	12	53	53	0.73	0.69	5.18	1.43
BCCL	9	9	21	26	0.71	0.68	3.55	0.79
CCL	8	10	8	9	1.12	0.59	0.59	0.36
NCL	12	12	7	7	0.16	0.81	0.11	0.54
WCL	13	16	37	61	1.08	1.05	2.76	2.57
SECL	20	33	36	44	0.62	0.85	2.18	1.79
MCL	2	2	3	3	0.02	0.27	0.02	0.27
NEC	1	1	0	0	1.12	1.28	0.00	0.00
CIL	77	95	165	183	1.11	0.82	2.83	1.35
SCCL	10	12	298	308	0.24	0.24	6.13	6.30
NLC	2	3	4	5	0.13	0.21	0.22	0.35

Note: Figures for 2010 are updated as on 31-12-10 and provisional.

#### 9.3.2 Company-wise accident statistics during the period 2007 to 2010

Company	Fatal Accidents				Fatalities				Serious Accidents				Serious Injuries			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
BCCL	9	11	14	9	9	11	18	9	59	48	41	21	60	48	44	26
CCL	7	4	6	8	8	4	6	10	21	18	6	8	22	19	8	9
ECL	7	11	8	12	8	11	9	12	120	112	110	53	132	113	112	53
MCL	4	4	3	2	4	4	3	2	8	5	6	3	8	5	6	3
NCL	6	5	4	12	6	9	4	12	12	8	2	7	13	8	2	7
NEC	0	2	0	1	0	7	0	1	0	0	0	0	0	14	0	0
SECL	14	11	9	20	14	12	9	33	71	54	35	36	75	55	38	44
WCL	12	11	11	13	12	13	13	16	53	29	38	37	54	29	39	41
CIL	59	59	55	77	61	71	62	95	344	274	238	165	364	291	249	183
SCCL	10	12	17	10	10	13	21	12	556	427	405	298	561	429	410	308
NLC	2	2	3	2	2	2	3	3	4	3	8	4	7	3	9	5

Note: Figures for 2009 & 2010 are updated as on 31-12-10 are provisional and subject to reconciliation with DGMS.

### 9.3.3 Rate of Fatality and Serious Injury of CIL, SCCL & NLC during the period 2007 to 2010

Company	Fatality Rate Per MT				Fatality Rate Per 3 lac manshifts				Serious Injuries Rate Per MT				Serious Injuries Rate 3 lac manshifts			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
@ CIL	0.53	0.84	0.73	1.11	0.55	0.59	0.55	0.82	5.68	4.63	3.92	2.83	2.63	2.00	1.65	1.35
*SCCL	0.24	0.30	0.43	0.24	0.18	0.26	0.42	0.24	13.52	9.92	8.48	6.13	10.25	8.51	8.28	6.30
NLC	0.09	0.10	0.13	0.13	0.14	0.14	0.21	0.21	0.31	0.15	0.39	0.22	0.49	0.21	0.62	0.35

@ Note: Figures for the year 2010 are updated as on 31-12-2010 and are provisional.

\* Figures are subject to reconciliation with DGMS.