



GOVERNMENT OF INDIA
MINISTRY OF LABOUR & EMPLOYMENT
DIRECTORATE GENERAL OF MINES SAFETY
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Challenges and Proposed Action Plan for DGMS

With the increased demands and accelerated growth of Indian economies, there is immense pressure on mining sector to extract minerals, fuel Oil and Gases including atomic minerals mining at faster pace. The deposits which were considered uneconomic and unviable are being extracted from difficult geo-mining domains. Heavy Mechanization and introduction of New Technologies have made this possible. There is all round growth and advancement in application of latest and the modern technologies in mining sector. The depth of mining has advanced from a range of 150 – 250m to 300 – 600m. In some sector it has crossed into the range of 600 to 1000m or more. The advancement made in the loading and transport sector has resulted in deployment of machines of extra large capacities which were non-existent a decade back. Shovels of 60 to 80 m³ sizes and draglines of 80 to 120 m³ sizes are in operation in the Opencast mines in other countries which are also being introduced in some of the Ultra Mega Projects in Coal & Lignite Sectors. Mines are being planned of capacities 25 to 45 Million Tonnes per Annum and India will soon have a mine producing about 90 Million Tonnes per Annum in Lignite Sector. The introduction of Mass Production Technology like use of Continuous Miner and Shuttle Car/Ram Car as well as application of high Capacity Shearer with 1000 to 1200 Tonnes Capacity Longwall Support are in pipelines to boost production of coal from underground mines. In the medium scale mines also, the mechanised drilling and roof bolting are being introduced.

The Opencast mines are being planned at very high stripping ratios by increasing from 1 in 4 to 1 in 13 & 15. Such mines will generate huge volumes of waste to the tune of 20 to 50 million m³ per annum resulting in problems of land and dumps stability. Dumps of heights from 60m is now being planned upto 120 to 250m Problems associated with such large capacity deep Opencast mines would be to deal with Pit and Dump Slope problems. Similarly in Opencast Mines, the New Technology like High Wall Mining, In-Pit Cutting , Crushing, Loading and Transport by Belt conveyors are being planned.

Therefore, the challenges before DGMS as well as with the Mining companies are:-

- To Create Compatible infrastructure such as standards of Haul Roads and Benches in Opencast Mines;
- To Solve Problems of Pit and Dump Slope Stability;
- To Provide adequate infrastructure for maintenance and operation of Large Capacity Machines
- To Solve Strata Control Problems of Deeper Mines
- To Provide solutions for Mine Environment and Gas Monitoring
- To install system for Dust, Noise and Vibration Control
- To Monitor and Control Mass Blasting and Ground Vibration Problems
- To Prepare and Implement a Customized Training and HR Capacity Building Plan
- To Provide for an effective Emergency Response Mechanism at Mines

Action Plan and Road Maps Ahead

In order to meet the aforesaid challenges, we have taken up an ambitious plan in DGMS:

(A) DISASTER CONTROL MEASURES

1. Eliminate the Risk of Explosion and Fires in Underground Mine

- (i) Use of On-line Gas Monitoring and Control System in Identified Mines
 - (ii) Improvement in the Skill of Supervisory Officials in operation and maintenance of such system
 - (iii) Inter-linking of such system through the use of latest Information and Communication Technology(ICT)
2. **Constant Vigil on Dangers from Surface and Underground Water Sources**
- (i) Through Use of fast and accurate mine surveying and Platting Instruments along with associated Software.
 - (ii) Use of latest Technology like GPS, GPR, Micro-Seismic Systems to monitor the workings, barriers, water bodies and other associated alarm system
3. Dump Slope Design and Monitoring using Latest Gadgets like Targetless Theodolight, Infrared Sensors and Monitoring Instruments.
4. Used of Latest Strata Control Techniques to detect movement and stress conditions in the workings and the goaves.
5. Use and Application of latest Apparatus and Gadgets for emergency escape devices

(B) Accident Reduction Program

- (1) Identification of Fatal Risk Areas and Corrective Measures in Underground and Surface Operations
 - I. Fire and Spontaneous Heating in Depillaring areas and Sealed off Areas in Coal Mines through continuous monitoring and analysis of data and information
 - II. Elimination of Personal Risk to bad roof and side conditions by introduction of remote controlled operation of machines
 - III. Introduction of safe methods and system in adverse geo-mining conditions
- (2) Reduction of Accidents during Transportation in Opencast Mines

- (3) Elimination of Risk of Silicosis and Pneumoconiosis in Mines through use of effective dust control measures such as wet drilling, static and personal dust monitoring. Regular Medical Surveillance on identified group of persons to monitor the risk of such disease.
- (4) Introduction of latest technology for anti collision and personal emergency devices to track the men and machinery in mines both belowground as well as on surface.

(C) Development and Modernization in DGMS to meet the above Target

1. Expansion Programme in DGMS by Opening up New Zonal and Regional Offices all over the country.
2. Implementation of Manpower Expansion Program approved by the Government of India to increase the strength of Inspecting Officers and associated staff.
3. Modernization of facilities in DGMS for effective monitoring of mine workings, environment, Occupational Health and Safety Appliances
4. Occupational Safety and Health Surveillance in Un-organised Sector Mines through Integrated Team of Experts from the fields of Mining, Occupational Health & Hygiene and Social Scientists

(D) E-Governance and Use of ICT in Mines Safety

- (1) Computerisation and Automation of DGMS Activities such as Inspections, Enquiries, Approvals, Permissions, Exemptions & Examinations through implementation of e-Governance.
- (2) Computerisation of Office Procedure, Tracking of Compliance status in Mines, and development of Mines Safety Database of India

(E) Development and Use of New Technologies in the Fields of Mining Methods, Strata Control, Blasting, Mine Mechanisation, Mine Ventilation and Environmental Control would be the focus of the R& D Activates in DGMS

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