



COAL MINING TASK FORCE





FLAGSHIP PROJECTS



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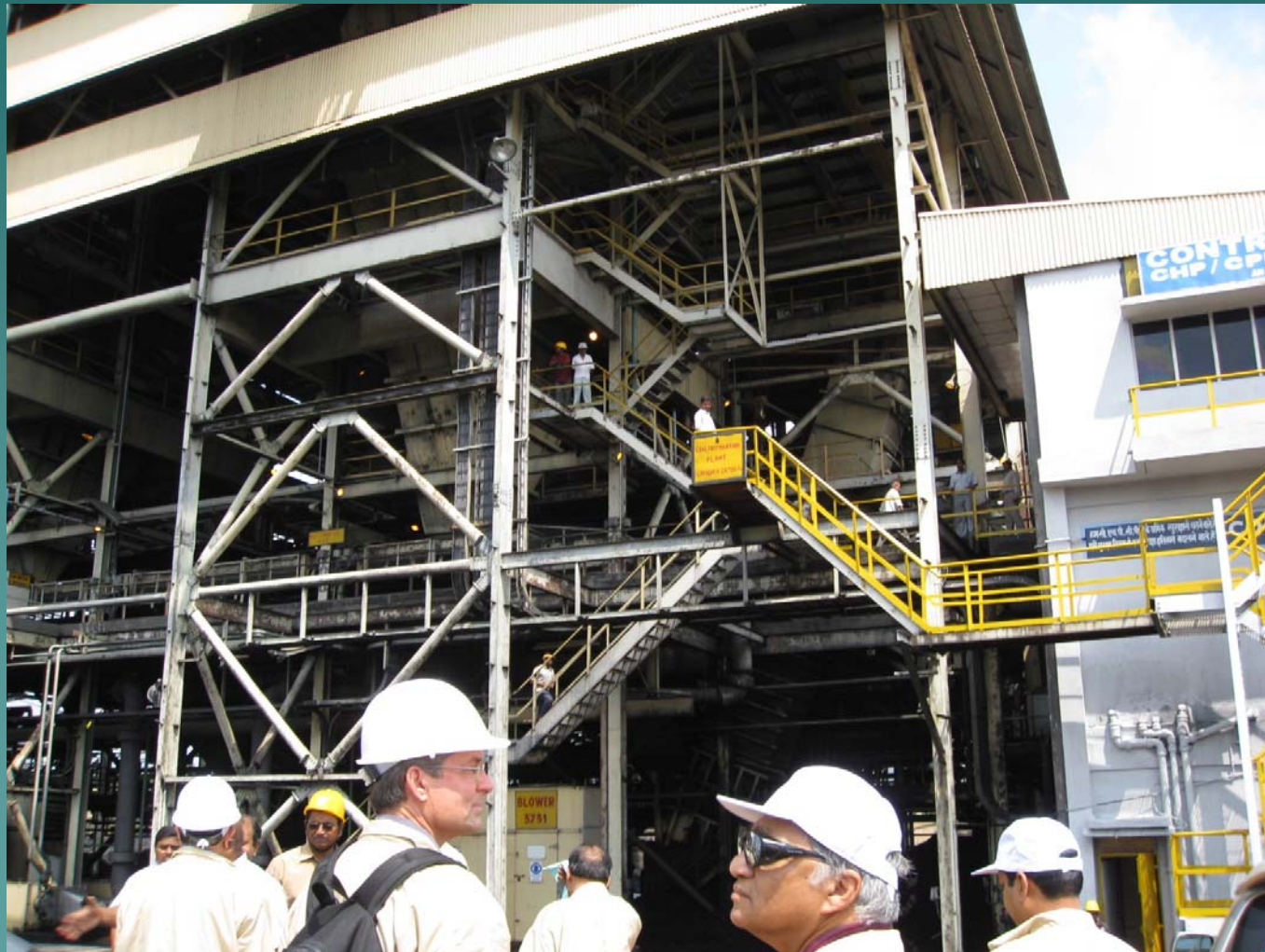
FLAGSHIP PROJECTS



- ◆ **CLM-06-01 : Information Sharing on Coal Processing Technologies**
 - Lead Country : India
 - Partner Country : USA
 - Location : India
- ◆ **CLM-06-09 : Coal Mine Health & Safety**
 - Lead Country : Australia
 - Partner Countries : USA, India, China & Japan
 - Location : Not Applicable
- ◆ **CLM-06-11 : Increasing Recovery and Use of Coal Mine Methane**
 - Lead Country : USA
 - Partner Country : China
 - Location : China



CLM-06-01 : Information Sharing on Coal Processing Technologies.



CLM-06-01 : Information Sharing on Coal Processing Technologies.



- ◆ Focuses on improving knowledge of the coal processing technologies available in partner countries.
- ◆ Participating Partners: India and the U.S.
- ◆ Expected benefits of the project include:
 - Improvement of energy utilization due to reduced transportation, processing and burning of high ash rock.
 - Reduced emission of fly ash and air pollutants.
 - Free capacity in the currently overloaded rail & power infrastructure.



CLM-06-01 : Information Sharing on Coal Processing Technologies.



- ◆ Workshop held at the Indian Institute of Coal Management, Ranchi, in August 2007.
- ◆ Fall 2007: US State Department Provided a \$1.03 million grant to university-industry team led by the Center for Advanced Separation Technologies at Virginia Tech who added equal matching funds.
- ◆ Purpose: to develop low cost dry beneficiation technologies to remove ash. Will include US DOE funded/developed technologies.
- ◆ Implementation underway, with the addition of Coal India Ltd. who has decided to fund a project on Build & Operate (BO) concept.



CLM-06-02 Coal Beneficiation: Economic Modeling, Analysis and Case Studies



Purpose

- ◆ Develop a Coal Preparation Plant Simulator to optimize plant performance for specific cases and evaluate process economics.
- ◆ Determine optimum ash levels for a given coal.
- ◆ The model should act as a comprehensive decision making tool incorporating economics into the level of washing, utilization of rejects, operation of power plants and environmental impacts.

CLM-06-02 Coal Beneficiation: Economic Modeling, Analysis and Case Studies



- ◆ Funding approved by Coal India Ltd (CIL) in April 2008 for project developed jointly with the US Department of Energy's Office of Fossil Energy, and India's Ministry of Coal. Project team includes: Sharpe International LLC, Bharat Heavy Electricals Ltd., Central Fuel Research Institute, and Central Mine Planning and Design Institute.
- ◆ Total project cost is Rs.53.09 million (\$1.252 Million)

CLM-06-03 : Fine Coal Beneficiation – Joint Venture Project



- ◆ During the crushing process coal “fines” are generated, which are difficult to beneficiate/wash.
- ◆ There is need for a suitable process for washing fine coal, preferably with a minimum of water and costly reagents, by adopting enhanced gravity separation technologies.
- ◆ Fine coal beneficiation will first be tried on coking coal due to the low ash requirement for metallurgical coal.
- ◆ India and the United States are participating Partners in this project.

CLM-06-03 : Fine Coal Beneficiation – Joint Venture Project



- ◆ Workshop held at Indian Institute of Coal Management, Ranchi in August 2007 included this topic.
- ◆ This project is also included in the Indo-US Joint Working Group on Coal.
- ◆ Funding for a advanced fine coal cleaning demonstration project, developed jointly by the US Department of Energy's Office of Fossil Energy, and India's Ministry of Coal, approved by Coal India Ltd (CIL) - April 2008.
- ◆ Project team includes: Virginia Tech's Center for Advanced Separation Technologies, and CIL's Central Mine Planning and Design Institute along with Bharat Coking Coal Ltd.
- ◆ Total Project cost is Rs. 271.424 million (\$6,399,000USD)

CLM-06-04 : Information Sharing on Coal Drying



- ◆ High moisture levels in washed coal reduce the benefits of ash reduction by reducing the heat content and thermal efficiency.
- ◆ Australia has shared their available information and it is being studied to determine next steps.

CLM-06-05 : Joint Venture Project on Waste Coal Management



- ◆ This project centers on management of waste generated by coal beneficiation.
- ◆ These rejects contain substantial amount of carbon, which, when disposed in mined out areas in hot and humid countries, create environmental problems due to spontaneous combustion.
- ◆ This project seeks to use this waste product as a fuel source.
- ◆ India is the participating Partner in this project.

CLM-06-05 : Joint Venture Project on Waste Coal Management



- ◆ Workshop on this topic held at the Indian Institute of Coal Management, Ranchi, in August 2007.
- ◆ Coal India Ltd. (CIL) would like to have a JV project on a Build Operate Maintenance basis at their Piparwar Coal Washery. Partner country is yet to be identified.
- ◆ US DOE, Ministry of Coal and CIL in discussions regarding potential waste coal project activities including evaluation of suitable technologies and best practices.

CLM-06-06 : Extraction of Steep Seam Coal



- ◆ Seams in India's Northeast Coalfield are friable, steep, and highly gassy.
- ◆ Production and productivity is low.
- ◆ This activity explored alternative mining methods available in the partner countries but was unable to find suitable technology.
- ◆ CMTF recommends that this activity be closed.

CLM-06-07: Leading Practice Sustainable Development Program for the Mining Industry



- ◆ Integrates environmental, economic and social aspects through all phases of mineral production and setting social and environmental benchmarks which go beyond currently prescribed regulations.
- ◆ Improves information exchange and the broader use of current technologies and practices.

8 Handbooks Produced to Date...



- ◆ Community Engagement and Development
- ◆ Mine Rehabilitation
- ◆ Mine Closure and Completion
- ◆ Stewardship
- ◆ Biodiversity Management
- ◆ Tailings Management
- ◆ Managing Acid and Metalliferous Drainage
- ◆ Working with Indigenous Communities



CLM-06-07: Leading Practice Sustainable Development Program for the Mining Industry



- ◆ In partnership with Coal India Ltd., Australia sponsored a workshop and field visit focused on "Mine Rehabilitation, Closure and Completion" in Kolkata On 17-20 April 2008.
- ◆ Participation included around 80 mine managers, engineers, and government officials working on environmental issues.

CLM-06-07: Leading Practice Sustainable Development Program for the Mining Industry



Work in Progress includes:

DUE OUT SOON

- ◆ Cyanide Management;
- ◆ Water Management;
- ◆ Risk Assessment and Management;

DUE OUT in 2009

- ◆ Noise, Particulate and Blast Management;
- ◆ Monitoring, Auditing and Performance; and
- ◆ Hazardous Materials Management.

CLM-06-08: Overburden Slope Stability



CLM-06-08: Overburden Slope Stability



- ◆ USA experts visited 5 mines at Western Coalfields Ltd. and Northern Coalfields Ltd. and conducted a training program on Slope Stability at the Indian Institute of Coal Management, Ranchi in April 2008.

CLM-06-09: Coal Mine Health and Safety



- ◆ Seeks to develop a strategic approach towards risk management and to advance towards the goal of **zero fatalities** and injury in coal mining industry in partner countries.
- ◆ The project will identify major hazards and core risks associated with coal mining, which will assist countries in building staff capacity to enforce statutory and regulatory requirements.



CLM-06-09: Coal Mine Health and Safety



A Health & Safety Working Group is working on 5 separate projects:

- Developing a leading safety technology road-map and arranging site visits to other Partner countries
- Compiling a table of Partner countries' mine safety curriculum
- Compiling information about the legislative frameworks of Partner countries
- Producing a report that lists the hazard identification/risk management methods currently used in Partner countries
- Developing case studies illustrating how to build effective safety leadership in an organization



CLM-06-09: Coal Mine Health and Safety



- ◆ Three meetings in USA, Australia, and India already held.
- ◆ The next meeting of the Steering Committee is tentatively scheduled for October or November 2008.



CLM-06-10: Reclamation of Legacy Coal Mines to Abate Hazards



- ◆ Unreclaimed lands are not available for productive use and degrade the quality of the environment, damaging water resources and endangering the health and safety of the public.

CLM-06-10: Reclamation of Legacy Coal Mines to Abate Hazards



- ◆ Project 06-10 promotes the reclamation of mined areas left without adequate reclamation.



CLM-06-11: Increasing Recovery and Use of Coal Mine Methane



- ◆ This project seeks to increase coal mine methane production and utilization by promoting use of more effective drilling and mine drainage technologies and techniques in advance of mining, and the recovery or use of low-grade coal mine methane sources, such as ventilation air methane.
- ◆ China, India, and the United States are participating Partners in this project.



CLM-06-11: Increasing Recovery and Use of Coal Mine Methane



- ◆ Methane is a potent greenhouse gas and the primary component of natural gas.
- ◆ The benefits of utilizing coal mine methane include:
 - A new source of clean, local energy
 - Improved air quality and mine safety
 - An additional revenue stream for the coal mine
 - Increased mine productivity
 - Reduced greenhouse gas emissions



CLM-06-11: Increasing Recovery and Use of Coal Mine Methane



- ◆ USEPA is conducting a coal mine methane (CMM) feasibility study at the Hebi mine in Henan, China. The \$400,000 study includes:
 - Analysis of methane resource data
 - Market assessment for the produced methane
 - Evaluation of degas and utilization technologies
 - Preliminary engineering design
 - Estimate of project capital and operating costs
 - Economic & financial analysis with cash flow projections



CLM-06-12: Integrated Coal and Methane Extraction



- ◆ This project seeks to improve mine safety and increase coal mine methane production and utilization in Partner countries.
- ◆ The project will apply and demonstrate an advanced approach and technologies to support and promote integrated coal production and methane extraction in Partner countries.
- ◆ Australia, China, and the United States are participating Partners in this project.

CLM-06-12: Integrated Coal and Methane Extraction



- ◆ The Australian Government recently concluded the funding agreement with CSIRO, Australia, the provider, and project planning is underway.
- ◆ Potential projects sites in China have been investigated and following site selection, data collection, site characterisation, and risk evaluation will commence.
- ◆ The project will run to 2011

CLM-06-13: Thick Coal Seam Extraction



- ◆ Australia and Singareni Coal LTD. in India are participating in this project.
- ◆ There is an urgent need for a comprehensive investigation of options for thick seam mining and to develop extraction technologies and update designs for improving coal recovery in thick seam environments in these two Partner countries.
- ◆ The major outcome of this project is optimization of extraction methods and/or designs to substantially improve recovery rates and safety of mining operations in Indian thick seam environments.

CLM-06-13: Thick Coal Seam Extraction



- ◆ The Australian Government recently concluded the funding agreement with the provider (CSIRO, Australia) and this project is underway.
- ◆ The project team has visited India to investigate field sites, collect initial data and undertake discussions on project work.
- ◆ Site characterisation and drilling to determine geological and geotechnical parameters are next steps.
- ◆ The project will run to 2011.

CLM-06-14: Underground Coal Gasification in India



- ◆ Underground Coal Gasification (UCG) is a proven technology for accessing energy resources in unminable coal seams by producing syngas for power generation, production of synthetic liquid fuels, natural gas or chemicals
- ◆ The project will share best practices, such as gasification impacts on ground water, mitigation measures and experiences with regulatory arrangements.
- ◆ United States, India and Australia are participating in this project.

CLM-06-14: Underground Coal Gasification in India



The project consists of three phases:

- ◆ Phase 1. Completed a workshop for information exchange on best practices in Kolkata, India with over 100 government and private sector attendees
- ◆ Phase 2. Ongoing site visits with technical experts
- ◆ Phase 3. Identification of potential commercial UCG plant sites and design and implementation of pilot UCG plant
 - Status: Two U.S. project proposals currently under review by Coal India Ltd. and Reliance Industries Ltd.

CLM-06-15: Workforce Assessment and Training Needs



- ◆ There is a global shortage of mining professionals.
- ◆ The project concerns the development of a strategic approach to address mining skills shortages in Partner countries.
- ◆ Partners are sharing information on current strategies and practices and identifying areas for capacity building within the Health and Safety Working Group and further work on this project will depend on those outcomes.

CLM-06-16: Technical Improvement for Control of Coalfield Fires



- ◆ Extinguishing coal fires can be regarded as 'low hanging fruit' in reducing greenhouse gas emissions (GHG).



CLM-06-16: Technical Improvement for Control of Coalfield Fires



- ◆ GHG emissions can be reduced by accelerating progress of controlling coalfield fires by developing a new detection and monitoring system to prioritize fire containment and extinguishment actions in remote arid areas.
- ◆ To accomplish this goal, the following three steps are needed:
 1. improve geophysical detection of a burning zone
 2. develop a coalfield fire monitoring system in China
 3. select adaptive materials for fire extinguishment.

CLM-07-17: Underground Coal Mine Fires Prevention Control



- ◆ This project, endorsed by PIC in Tokyo, will involve Australian and Indian partners developing strategies for preventing and controlling underground coal mine fires.
- ◆ The objective is to improve safety and the economics of underground coal mining while reducing fugitive GHG emissions.
- ◆ This project will conduct field investigations in Australia and India, and develop appropriate control strategies for varied mining conditions.

CLM-07-17: Underground Coal Mine Fires Prevention Control



- ◆ The Australian Government has approved funding for this project and has made an offer to CSIRO, Australia to undertake the work pursuant to this project.
- ◆ A funding agreement is expected to be concluded soon.

CLM-07-18: Acceleration of Underground Coal Gasification in India



- ◆ This project, also endorsed in Tokyo, will demonstrate a UCG design in India to prove it can be scaled up to meet commercial power station needs.
- ◆ Australia has been active in CLM-06-14 and is currently considering a number of reports covering data collection, process design and commercial possibilities.
- ◆ As CLM-06-14 progresses, Australia will determine whether to proceed with this project.