



INTERNATIONAL COOPERATION

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CMM/CBM Clearing House

A CMM/CBM Clearinghouse is functional at CMPDI, Ranchi under the aegis of Ministry of Coal and United States Environmental Protection Agency (US EPA) since 17th November, 2008. It has been established with the financial support of US EPA and Coal India Ltd. on behalf of Ministry of Coal, pursuant to a Govt. level understanding between Ministry of Coal (MoC) & United States Environmental Protection Agency (US EPA). MoU was signed on 16th November, 2006 between the representatives of the Govt. of USA and India at US EPA Headquarter in Washington DC in this regard.

On completion of initial three years term, it was extended twice for another three year terms each. US EPA further extended grant support in April, 2018 for additional three years i.e. 2018-21.

Implementation of CMM/CBM projects is one of the action programme of India's INDCs during COP-21 meeting. Under Global Methane Initiatives (GMI) initiative a Pre-feasibility study on pre-mine methane drainage feasibility for (a) Sawang UG mine, East Bokaro Coalfield in 2014, (b) Chinakuri UG mine, Raniganj Coalfield in 2016 and Pootkee Bulliary UG mine in

Jharia Coalfield in 2019 has been under taken by the US EPA under the Coalbed Methane Outreach Program (CMOP).

International workshops were organized on (i) "CMM Development in India: An Opportunity Area" (November, 2008), (ii) "Development of Coal based Non-conventional Energy Resources in India" (November, 2013) and (iii) "Best Practices in Methane Drainage and Use in Coal Mines" (March, 2017) at Ranchi (Jharkhand) India. Another International Workshop on "Optimum Utilization of CMM/CBM in India" is proposed to be organized during the year, 2019 at Ranchi (Jharkhand) India jointly by USEPA-GMI & CMPDI-CIL under aegis of MoC.

Indo-Australia Collaboration

CMPDI has a Memorandum of Understanding (MoU) with Commonwealth Scientific and Industrial Research Organization (CSIRO), which has been renewed for further ten years, signed on 16th November, 2018 at Brisbane (Australia) and exchanged on 22nd November, 2018 at Sydney (Australia) in presence of Hon'ble President of India, to encourage programs of exchange and collaboration in areas of mutual interest and benefit to both the organizations.



Capacity Building for CMPDI Lab

CMPDI has established a state of the art Coal Bed Methane (CBM) lab that can carry out parametric studies for resource estimation and reservoir characterization for CBM and Shale gas.

In March 2016, S&T Project titled **“Capacity building for extraction of CMM Resource within CIL Command areas”** was approved by Ministry of Coal (MoC) under Govt. of India S&T funding, which is being jointly implemented by CMPDI and CSIRO. The approved cost of this project is ₹ 2392.79 lakh with three (03) years project duration. Revised project completion date is September, 2019. A Collaborative Understanding agreement for execution of the Project has been signed between CSIRO and CMPDI on 22nd December, 2016.

CSIRO Project Team visited CMPDI during 9th – 19th May, 2017 and 11th – 16th March, 2018. CSIRO team assisted CMPDI to draw the required technical specification for laboratory equipment to be procured by CMPDI for this S&T project. Indents have been processed for procurement under the S&T funding.

Virtual Reality Mine Simulator (VRMS)

The Centre of Excellence in Mining Technology (CEMT) has also been established at IIT(ISM), Dhanbad in collaboration with Australian institutions and research organizations for conducting research in the areas of Advanced Mining Technology and Mines Safety. Under this Research Centre, a Virtual Reality Mine Simulator (VRMS) is being established at IIT(ISM), Dhanbad by SIMTARS, Department of Natural Resources, Govt. of Queensland, Australia for simulating advanced mining technology and hazardous coal mine environment with support from CIL.

VRMS will be used for imparting necessary training to executives and operational people for improving safety in Indian coal mines. After successful establishment of this facility at IIT(ISM), the same will be replicated at three different locations in CIL. In addition, the research activities jointly being undertaken by IIT (ISM), Dhanbad and CIL with Australian institutions, have progressed in the areas of segregate blasting, and reducing the potential of mine fire and explosion in coal mines for improvement of production, productivity and safety. IIT(ISM) had approached Coal India Limited (CIL) with an R&D proposal on VRMS in May 2017. The above proposal has been approved and the project is under implementation w.e.f. 01.09.2017.

A non-binding MOU has been signed between NLCIL, NMDC and ECT, Australia on 30.05.2018 to take up the Pilot Plant Project

on R&D collaboration mode at Neyveli. The proposed project is based on the new technology called Matmor Process wherein, Lignite could be used as a reducing agent replacing coking coal in iron ore purification process by which iron ingots with more than 95% purity can be produced.

Indo-Poland Collaboration

Secretary, Ministry of Coal (MoC), Govt. of India led a delegation comprising Joint Secretary, MoC, Adviser, MoC and Chairman, CIL to Poland during 6th to 9th June, 2016 to understand the energy policy of the Republic of Poland with particular reference to development of coal, coal mining technologies, reclamation of mined-out areas, capture and uses of Coal Mine Methane (CMM) and technologies for development of underground (UG) mines, etc.

A 5-member team of Polish Experts (3 from AGH University, Krakow, Poland & 2 from GIG, Katowice, Poland) visited MoC, CIL (HQ), ECL, BCCL and CMPDI (HQ) along with a team of 4 members from manufacturers of Poland. This visit (4th to 7th July 2016) was made by Polish Experts in sequel to the visit made by aforesaid Indian delegation. In view of above, a Poland Technology Group (PTG) has been constituted and some of the following areas were identified for obtaining the solutions from Polish side:

- Slope stability of overburden dumps (using advanced modelling technique),
- Dry Coal beneficiation,
- Extraction of remnant coal pillars with surface structure protection,
- Pre-drainage of CMM and commercial recovery of CBM, and
- Control measures for mine fires of Jharia.

A data dossier on the above identified 5 areas has been prepared by CMPDI with necessary technical help from different subsidiaries of CIL for examination by the CIL.

In continuation of the collaborative studies, a team of 4 officers (2 from CMPDI and 1 each from CCL & BCCL) visited Poland from 13th to 17th February, 2017 to enhance skill in the field of methane extraction and dry coal beneficiation.

- A team of two officers visited Coal Mine Methane (CMM) extraction and utilization sites and observed the technologies, being followed under guidance of Dean

of AGH University of Science and Technology, Krakow, Poland.

- A team of two officers visited Comex AS, Kety, Poland to see a dry beneficiation demonstration plant based on X-Ray sorting technology, developed by Comex Innovative & Industrial Technologies. The team was also taken to one FGX Dry Coal Processing Plant at Poczesna, Cz-stochowa, Poland. Poland does not manufacture FGX separator; therefore, they couldn't give any figure related to organic efficiency.

The fifth session of the India-Poland Joint Commission on Economic Cooperation (JCEC) was held in New Delhi on 27.11.2017.

A Polish delegation involving representatives from M/s JSW, M/s PeBeKa and Central Mining Institute, Poland visited India during January, 2018 and a meeting was held on 16.01.2018 with the Indian representatives involving officials from CIL & SAIL. Capabilities of the above institutes/organization of Poland were presented and views exchanged for further collaboration in different mining activities including participation in global tender for CMM Drainage in Moonidih UG Mine of BCCL for which Global Bid was published in August, 2018 by BCCL. CIL also presented about the brief activities done during the last few fiscal and the short-listed areas identified under PTG for collaboration. The data dossier, which was earlier sent to Polish group, was again handed over to the Dy. Director General of the Central Mining Institute, Poland.

Consequently, an MoU on cooperation in the area of coal mining has been signed between Govt. of Poland and Govt. of India on 4th February, 2019 at New Delhi. Polish delegation visited CIL on 7th Feb, 2019 and explored the possibilities for joint cooperation for which a core team has been constituted.

India-Indonesia Collaboration

The 4th meeting of the Joint Working Group on coal between the Ministry of Energy and Mineral Resources (MEMR), Republic of Indonesia and the Ministry of Coal, Republic of India was held on 20.04.2017 in Jakarta. Both side agreed that technology and science are crucial in mining industry in order to have sustainable, scientific, safe and environmental friendly mining.

Both side agreed for future cooperation in "Geological exploration between CMPDI and Geological Agency of Indonesia" related to coking coal characterization, capacity building for CBM

laboratory analysis, geophysical exploration for coal and building geological models, based on geological data. It was also agreed to exchange the best practices in the areas of coal mining like mine planning and design, satellite monitoring of mined-out areas for reclamation, IT enabled solutions for vehicle movement monitoring and environmental management of coal mines.

Capacity building between HRD agency of MEMR of Indonesia and Indian institutes like IIT-ISM, Dhanbad, IIT, Kharagpur and IIT, BHU was also agreed. It was also decided that lab to lab cooperation between Central Institute of Mining and Fuel Research (CIMFR), Dhanbad of India and R&D agency of MEMR of Indonesia to conduct research on coal gasification, mine water treatment technology and clinker formation as a result of blending.

A 6-member Indonesian delegation visited CMPDI, Ranchi, CIMFR, Dhanbad and MoC New Delhi during 3rd to 5th May, 2017. During visit to CMPDI on 03.05.2017, capabilities of CMPDI were presented to the Indonesian team on the identified areas as discussed in the 4th meeting of the Joint Working Group on coal between the two countries. Indonesian delegates also visited CIMFR laboratories in Dhanbad on 04.05.2017 and different research programme and other activities, being carried out by CIMFR, were briefed to the delegation. Another team visited Piparwar Opencast Mine of CCL on 04.05.2017.

Following points were agreed by the Indonesian team during the meeting held on 05.05.17 at MoC

Geological agency of Government of Indonesia and CMPDI will explore the possibility of cooperation in preliminary exploration/geological mapping of coking coal deposits in Indonesia:

- After establishing potential of coking coal deposits, the 7 Government owned companies of the two countries, namely Coal India Limited & PT. BUKIT ASAM/Local Government Company, will explore possibility of forming an SPV for exploration, development and operation of coking coal assets in Indonesia. The Government of Indonesia will facilitate exploration license / mining license to the SPV (s), as per the extant laws of the country.
- Govt. of India and Govt. of Indonesia will facilitate B2B cooperation between private coal companies of Indonesia and CMPDI in exploration and related laboratory services.