

12

CHAPTER



INTERNATIONAL CO-OPERATION

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INDO-EU COLLABORATION

- The 9th meeting of Indo-EU Working Group on Coal and Clean-Coal technologies was held on 10th to 11th September, 2014 at Potsdam, Germany. One of the key areas for cooperation is the development and deployment of advanced coal mining. The aim of advanced coal technologies is to increase the efficiency and safety in coal production and to mitigate environmental & social impact. Co-operation of EU was sought for various aspects related to coal mining like steeply dipping deep-seated coal seams as under:
 - o Innovative mining technologies and environmental friendly solutions.
 - o Development of technology for deep coal mines and possible solutions for Indian conditions.
 - o Technological improvements to manage these risks, especially on prevention, and include rock stress monitoring system, mine atmosphere control, methane drainage technique, personnel tracking system and staff training for emergency situations.
 - o The need to modernize, develop and adopt technologies for high capacity and productive underground coal mining from deep and thick coal seams.
 - o Underground coal mining technologies for mass production for steep and gassy coal seams.
 - o Results of feasibility study to design a mining methodology for NEC coalfields.
- A proposal titled "Introduction of a new underground mining technology at North-East Coalfields in Assam, India" was placed before the Indo-EU Working Group on clean coal technology for consideration in 2012. The feasibility study to design a suitable mining technology and operation was awarded by the European Commission

to a Spanish Consortium led by M/s AITEMIN. The members from the Spanish Consortium visited the North-East Coalfields in Assam, India from 10-14 Feb. 2014 for preliminary discussions and data collection. The feasibility study report was submitted to the European Commission in Oct. 2014. Recently, in Dec. 2015, soft copy of the report has been received through M/s AITEMIN. However, the feasibility study report is yet to be made available to CIL/ CMPDI by the European Commission.

INDO-US COLLABORATION

The 11th Indo-US CWG meeting was held at Washington DC on 16th Sept.'15, for review of Indo-US collaborative projects. The status of on-going projects under Indo-US CWG was reviewed. Presentations were made by CMPDI on new areas of collaboration.

The Status of projects under Indo-US CWG as follows:

- Development of coal preparation plant simulator:
 - o The identified US consultant M/s Sharpe International LLC, USA (SI) was awarded the work in October 2009 for development of a coal Preparation Plant Simulator. Total work was split into 18 activities out of which 11 activities were completed. Later, SI expressed their inability in October 2013 to complete the work. US representatives were requested to take up the matter with M/s Sharpe for a meaningful conclusion of the project.
 - o US DoE had agreed to contact the software developer and possibly assist with identifying an industry expert to replace the original expert who is unable to complete the project. In the meantime, Mr Manoj Mohanty of Southern Illinois University Carbondale has expressed desire "to complete the project that SI could not complete". As the project was identified under Indo-US Coal Working Group work plan, the proposal of Mr Mohanty is to be routed through US DoE.

- Cost effective technology for Beneficiation and Recovery of fine coal:
 - o US DoE had identified Virginia Tech University (VTU) for establishing efficient technologies for beneficiation and dewatering of Indian Coal fines through a demonstration plant, Based on technologies identified after pilot scale, tests carried out for Indian coking coal samples on different state-of-the-art equipment at VTU. A joint proposal was drawn and approved by CIL R&D Board in Dec. 2010. The VTU, however, expressed to sign an International Agreement and as such the project could not be started. The issue is being reviewed by CIL R&D Board.
 - o In the meanwhile, Prof. Roe Hoan Yoon of Virginia Polytechnic Institute and State University (Virginia Tech) has informed that VTU had developed a HHS process for fine Coal Cleaning and would be submitting a proposal on the same. However the proposal is awaited. As the project was identified under Indo-US Coal Working Group work plan, the proposal may be routed through US DoE.
- Underground Coal Gasification (UCG):
 - o UCG, which may offer solution to the untapped isolated coal deposits lying at depths, is one of the key areas under Indo-US collaboration. In order to promote R&D efforts for potential application of technological advances and to establish these in the Indian geo-mining condition, a brief proposal for capacity building has been sent for consideration under the Indo-US Coal Working Group, USA.
 - o In a meeting held on 16th Sep.'15 at Washington DC, under the Indo-US Coal Working Group regarding capacity building in UCG, DoE agreed to identify US experts and inform the Indian side for further course of action.
 - o Further, India has sought information on Shale Gas assessment in "Barren Measures" above coal seams, which may be potential business collaboration.
- Planning large-capacity opencast mines:
 - o The National Energy Technology Laboratory (NETL), USA has been entrusted with the responsibility for identifying suitable US agencies for cooperation in this area. As advised by US side, M/s Norwest Corporation and M/s Art Sullivan Mine Services were contacted in September 2014 and response from both was received. Subsequently, the subject of "large capacity opencast mine planning, norms and standard, safe designs and dump optimization" was finalized with M/s Norwest Corporation. CMPDI has received the proposal from M/s Norwest Corporation on 29th Sep.'15. The proposal is currently under legal vetting and financial evaluation at CMPDI. Certain clarifications are being sought from Norwest on terms and conditions laid down in the proposal. After incorporation of these, the proposal will be forwarded further for approval.
- Mine Rehabilitation and Reclamation:
 - o Projects on sustainable mine closure activities and mining wasteland to be utilized as a source of livelihood for local community were proposed to be carried out with the help of US agencies. For this purpose, a technical presentation was made by CMPDI on 10th March, 2014 in Delhi and possible areas of cooperation were discussed. It was advised by US side to contact M/s Norwest Corporation & M/s Art Sullivan Mine services for further assistance.
 - o In the meantime, an Indo-US CWG meeting was held at Washington DC on 16th Sep.'15 for review of Indo-US collaborative projects. In the meeting, M/s Norwest and Art Sullivan Mine Services with Mill Creek Engineering agreed to send detailed proposal for consideration of CMPDI and the proposal is awaited. Further, draft proposal, received from M/s Norwest Corporation on 15th December, 2015, has been examined. The proposal is currently under legal vetting and financial evaluation at CMPDI. Certain clarifications are being sought from Norwest on terms and conditions laid down in the proposal.

After incorporation of these, the proposal will be forwarded further for approval.

- CMM/CBM Clearinghouse:
 - o India CMM/CBM Clearinghouse is a non-profit, non-governmental organisation established under the aegis of Ministry of Coal, Government of India and United States Environmental Protection Agency (USEPA) with an aim to contribute to the commercial development of CMM/CBM in India. The term of the Clearing house has been extended for the 2nd term up to November, 2018.

INDO-AUSTRALIA COLLABORATION

In pursuant to the directive of Ministry of Coal, CMPDI on behalf of CIL, has formulated a project proposal on mitigation and utilization of Ventilation Air Methane (VAM) at Moonidih, BCCL, with CSIRO, Australia under National Clean Energy Fund (NCEF) of Government of India. The implementing agencies for the project will be CSIRO and CMPDI with BCCL as a sub-implementing agency. The proposal for implementation is under consideration.

Further, a new S&T Project "Capacity building for extraction of CMM resource within CIL command areas" is under formulation by CMPDI with CSIRO, Australia.

INDO-POLAND COLLABORATION

Under India-Poland Joint Commission for Economic Cooperation, a Joint working Group on coal is functional under Ministry of coal and the last meeting of the Working Group was held during 12-16 June 2015 along with field visits. The following areas were identified for technical cooperation between both the sides

- Thick seam underground coal mining
- Exploitation of highly gassy seams.
- Deployment of PSLW with high speed stowing/backfilling.
- Developing clean coal technologies like washing of coal and CBM/CMM/VAM & UCG

- Surface to underground (2way) wireless communication system.

Subsequently a delegation led by Dy. Economic Minister of Republic of Poland met Secretary (Coal) and expressed interest for increased engagement in the coal sector with India. It was requested to clearly outline the areas for further engagement so that an agreement could be entered into.

MOZAMBIQUE

Coal India Africana Limitada (CIAL), a wholly owned subsidiary of CIL has been granted prospecting Licenses for 2 coal blocks, covering a total area of 224 sq. km by the Ministry of Mineral Resources, Government of Mozambique.

Progress of activities related to exploration of the allotted coal blocks in Mozambique are given below:

- The final Geological Report (GR) of these two allocated coal blocks in Mozambique have been prepared based on the outcome of the exploration programme carried out in the last financial year. Based on the findings of the exploration programme, a total of 170 sq. km (approx.) where even the top most coaly horizon was not found up to a depth of 500 m has been surrendered. The Government of Mozambique has issued prospecting licenses for remaining 54 sq. km area valid up to 6th Aug., 2019. Based on the Geological Report, Mine-ability study to assess the techno-commercial viability of mining has also been conducted. Further actions are being undertaken to take a conclusive view for operationalization of the afore-said coal blocks are being conducted.

SOUTH AFRICA

The CIL Board accorded approval to the proposal for execution of MoU with African Exploration Mining & Finance Corporation, SOC Ltd (AEMFC) an entity owned by the Government of South Africa for identification, acquisition, exploration, development and operation of coal assets in South Africa.