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CHAPTER

Deep hole heavy blasting operation



Opencast benches with Dragline & shovel dumper combination



underground gallery with metal supports

RESEARCH & DEVELOPMENT

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Status of research projects under S&T grant of Ministry of Coal

Research and development (R&D) projects are covered under 4 thematic areas viz. improvement in production, productivity & safety in coal mines, coal beneficiation & utilization, and protection of environment & ecology.

The R&D activity in coal sector is administered through an apex body namely, Standing Scientific Research Committee (SSRC) with Secretary (Coal) as its Chairman. The other members of this apex body include Chairman CIL, CMDs of CMPDI, SCCL and NLC, Directors of concerned CSIR laboratories, representatives of Department of S&T, NITI Aayog and educational institutions, amongst others. The main function of SSRC is to plan, programmes, budget and oversee the implementations of research projects and seek review the R&D work.

The SSRC is assisted by a Technical sub-committee headed by CMD, CMPDI. The committee deals with research proposals related to coal exploration, mining, mine safety, coal beneficiation & utilisation and also the project proposals on mine environment and reclamation.

CMPDI acts as the Nodal Agency for co-ordination of research activities in the coal sector, which involves identification of 'Thrust Areas' for research activities, identification of agencies which can take up the research work in the identified fields,

processing of proposals for Government approval, preparation of budget estimates, disbursement of fund, monitoring the progress of implementation of the projects, etc.

A total no. of 386 S&T projects were taken up (till 31.12.2015) and 314 S&T projects completed (till 31.12.2015).

PHYSICAL PERFORMANCE

During 2015-16, one project has been completed. The status of coal S&T projects during 2015-16 is as under:

i)	Projects on-going as on 1.4.2015	12
ii)	Projects approved by SSRC during 2015-16	03
iii)	Projects completed during 2015-16 (till 31.12.2015)	01
iv)	Project expected to be completed during Jan'16-Mar'16	01
v)	Projects on-going as on 31.12.2015	14

FINANCIAL STATUS

Budget provision vis-à-vis actual fund disbursement of S&T projects during the period is given below:

(In Crore)

2014-15		2015-16		
RE	Actual	RE	Actual (till 31.12.2015)	Provisional (01.01.2016 to 31.03.2016)
18.00	16.16	18.00	6.26	7.74

Status of research and development projects undertaken by CIL

For in-house R&D work of CIL, an R&D Board headed by Chairman, CIL is empowered to take decisions. CMPDI acts

as the Nodal Agency for processing the proposals for CIL approval, preparation of budget estimates, disbursement of fund, monitoring the progress of implementation in the projects, etc.

In order to enhance R&D base in command areas of CIL, the CIL Board in its meeting held on 24th March 2008 had delegated substantial powers to CIL R&D Board and the Apex Committee of the R&D Board. The Apex Committee is empowered to sanction individual R&D projects up to Rs.5.0 crore value with a limit of Rs. 25.0 crore per annum considering all the projects together and CIL R&D Board is empowered to sanction individual R&D project up to Rs. 50.0 crore.

So far, 72 +3* = 75* projects have been taken up under the funds of CIL R&D Board, out of which 54 projects have been completed till 31.12.2015.

Status of CIL R&D Board Projects during 2015-16 is as follows:

(i)	Projects on-going as on 1.4.2015	-	15
(ii)	Projects sanctioned during 2015-16	-	03
(iii)	Projects completed during 2015-16 (till 31.12.15)	-	02
(iv)	Projects expected to be completed during Jan'16-Mar'16	-	03
(v)	Projects on-going as on 31.12.2015	-	13+3*

* Considered by R&D Board of CIL

Following coal S&T project was completed during 2015-16:

- Modeling of airborne dust in opencast mines:
 - o Under the project, mathematical dust prediction models were developed for different activities of opencast mines, viz. drilling, blasting, loading, dumping, transportation and also CHP activities. Field investigations were carried out in PK OCP of SCCL, Bhuvaneshwari OCP, Jagannath Area of Talcher Coalfields and Samaleswari OCP, IB Valley Area of MCL. During field investigations, around 1000 dust samples were collected in different seasons of the year using different dust monitoring equipment.
 - o Artificial 'Neural Networks approach' was used to find the reliability of the data and subsequently, 'Multi Regression Analysis' was used to develop

the prediction models. Generated data was also validated using the developed models. The regression co-efficient of most of the models were more than 80 per cent indicating a good reliability.

- o It was found that the variation between the actual field values and predicted values of these models are within 30 per cent. The developed models could be used for predicting dust concentrations at different mining areas.

Following major R&D projects were completed during 2015-16:

- Construction of quick setting stopping in case of fire in underground mines using expansion foam agent:
 - o Under this project, 7 stoppings , as envisaged in the project proposal have been constructed in Orient mine-3 and Hirakhand Bundia mine in Orient area, MCL (2 at Hirakhand Bundia and 5 at Orient mine no. 3) with new compound "Blockage-52" developed by NIT, Rourkela, S&R Division, CIL and M/s Trans Marketing, Kolkata. It has been observed that it took hardly three hours to construct a stopping excluding preparatory work, which takes nearly 4-5 hours. In a shift one stopping could be built comfortably with this new compound "Blockage 52". Their continuous field monitoring is being done to assess the effects of air circulation, blasting and other mining conditions on long term stability of these stoppings.
- Green House Gases recovery from coal mines and coal beds for conversion to Energy (GHG2E)
 - o The project has been successfully completed. CMPDI part of jobs have been completed in time and report has been submitted to Imperial College, London, which is the overall co-ordinator of the project. Final integrated overview of the project is awaited from Imperial College, London.

FINANCIAL STATUS

Budget provision vis-à-vis actual fund disbursements CIL R&D projects during the period are given below:

(In Crore)

2014-15		2015-16		
RE	Actual	RE	Actual (till 31.12.2015)	Provisional (01.01.2016 to 31.03.2016)
18.00	13.52	20.00	2.73	15.00