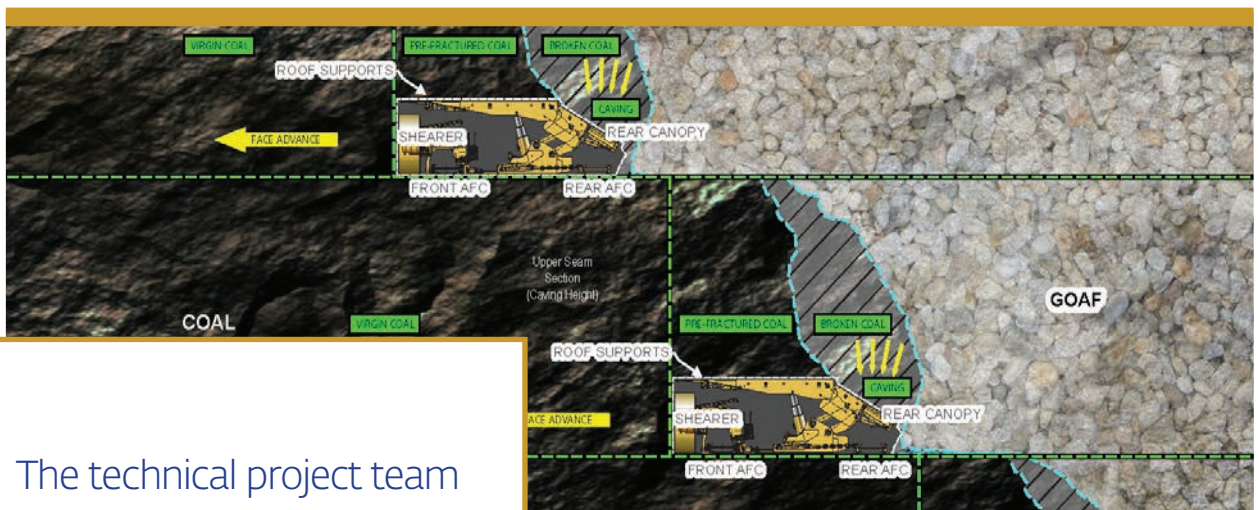


RPMGlobal overcomes significant technical challenges to deliver feasibility study for a nation building energy project

Barapukuria Coal Mining Company Limited | Dighipara Coal Field | Coal | Consulting & Advisory Services | Bangladesh



The technical project team undertook development of a resource model of the deposit and generation of a Statement of Coal Resources

Overview

RPMGlobal, in cooperation with its consortium partners Fugro Land Germany GmbH (Fugro) and Mibrag Consulting International GmbH (Mibrag), and in consultation with its client, Barapukuria Coal Mining Company Limited (BCMCL), recently completed a feasibility study for the development of the Dighipara Coal Field. The Government of Bangladesh deem the project a vital development, and see it as fundamental to delivering reliable power supply to the people of Northern Bangladesh.

This project was carried out over a period of three years and involved the comprehensive analysis of the physical characteristics of the deposit via an extensive geological exploration and data acquisition program. The program encompassed an exploration program that included the completion of sixty fully cored boreholes, a 3D seismic survey (acquisition, processing and interpretation), laboratory analysis of coal quality, gas composition and gas content, spontaneous combustion assessment and geotechnical characterisation, as well as a battery of hydrogeological and geotechnical field studies. In parallel to this, the technical project team undertook development of a resource model of the deposit and generation of a Statement of Coal Resources and a three phase resource development planning project that covered assessment of open cut versus underground mining as well as a detailed optioneering analysis.

The final portion of the study included preparation of a formal feasibility study document, Statement of Coal Reserves, as well as a formal environmental and social impact assessment for submission to regulators.

Challenge

The Dighipara Coal Field is characterised by what can only be described as a series of highly challenging geological, hydrogeological, geotechnical and mining conditions. Geotechnical and hydrogeological numerical modelling carried out during the study illustrated that, in the absence of any mitigating measures, an underground longwall mining operation could generate a mine water make almost two orders of magnitude more than is experienced by similar mines in other parts of the world. This was largely an outcome of the fundamental in situ hydrogeology of the deposit.

At Dighipara, the coal bearing sequence is overlain by a weathered formation that extends from the surface down to a depth of more than 350m. This formation, known at the Dupi Tilla, hosts a series of artesian and sub-artesian aquifers. These aquifers typically have high hydraulic conductivities and experience high volume flows. Therefore the primary challenge that the study team faced was to engineer a water management system that both limited ingress of water into the mine workings, as well as managed mine water make in a way that minimised risk to personnel, equipment and mine infrastructure and maximised productivity potential from the mine.



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Approach

From the inception of the project through to the delivery of the final report, the study team applied a process of information based decision-making. This process, in conjunction with the largely parallel nature of the data acquisition and engineering study portions of the project, resulted in a situation where feedback from engineering analysis led to changes in exploration and laboratory analysis programs. This enabled the consortium to navigate the inherent technical challenges by delivering an adaptive approach to the project.

Some key examples of this adaptive approach include:

- Modifications in drilling patterns, laboratory analysis and field investigations over the entire course of the project so as to ensure that the data was collected in a way that best served the ongoing needs of the project.
- Through the development of sophisticated geotechnical and hydrogeological numerical models, the consortium was able to determine the impacts that mining operations may have on the in situ geological environment as well as to derive a deep understanding of the likelihood and consequence that particular hazards may have on mining operations.
- Adoption of a circular analysis process allowed the study team to identify key mitigating measures that could be used to minimise the overall risk associated with specific aspects of the project.

Impact

Over the course of the feasibility study, RPMGlobal's project team successfully overcame the project challenges to deliver value to BCMCL. Most notably, the team delivered key project outcomes which entailed:

- Providing an end-to-end project delivery service that combined world's best practice exploration and analysis techniques with sophisticated scientific and engineering processes.
- Preparation of a robust mine design and production schedule that the client could be confident took into account not only the safe and efficient operation of the mine, but also delivered a stable economic outcome through delivery of a production profile that met both the necessary production and quality parameters.

The joint collaboration between RPMGlobal and its network of partners and sub-consultants underpinned a successful result for what is a critical national asset for the nation of Bangladesh. By effectively overcoming challenges spanning language, location, geography and time, RPMGlobal's tailored approach to the feasibility study resulted in a positive outcome for all stakeholders.