



Skill Development Programme

Advanced Technology Applications in Drilling and Blasting Operations

Dates: April 19 - 23, 2021 (5 Day Training course)

Jodhpur

Course Objectives

The pandemic of 'COVID-19' has made mining personals realize the importance of Digital Technology. Mining processes upstream and downstream are related with blasting. With application of digitization and better understanding of process blasting results can be used for the improvement of operations. Greater control over fragmentation, muck piles, excavation and dilution are just the beginning. There are also benefits of lower vibration and safe blast configurations that eliminate expensive downtime and social issues. This course has been designed for blasting personnel to optimize operations in modern mines. To record and analyze all these parameters, digital tools can be of great help. A number of digital technologies are now available and affordable within the mining industry's reach. Through technological innovations & application of "consumer" technologies like devices, cameras, motion sensors, and positioning drones etc, key aspects of mining could be transformed. Topics will cover a variety of themes: modern theory, products, accessories, design, and control of adverse impacts and achievement of targeted results. Course will include use of software and App.

Blast Design for Desired Fragmentation

- Rock Fragmentation Process, Role of Discontinuities, Geology and In-Situ Stresses.
- Fragmentation Prediction and Measurement, Control, Throw and Muckpile Diggability
- Explosives Energy Delivery and Partitioning.
- Dust and Fines Generation.

Explosives & Initiating Systems

- Selection of Explosives and initiation System
- Design to Avoid Malfunction, Hot Hole Blasting,
- Delay sequence and influence on fragmentation and diggability.
- Effect of timing.

Drilling Operations

- Evaluating and selecting drilling equipment, Drill Performance Monitor
- Effects of blast-hole deviation on drilling and muck-pile and Loading cost
- Parameter Affecting Blast Hole Drilling Drill Deviation monitors,
- Measurement While Drilling, GPS Applications, Automation in Drilling
- Mine efficiency with digital drill and blast data, predicting the penetration rate

Open Pit Blasting Operations and Management

- Blast design and patterns.
- Practical blast Execution, Large Scale Blasting , Dilution Control
- Predicted and Actual Blast Results.
- Design according to specific site problems

Downstream Effects of Blasting

- Effect of Powder Factor and its Relevance.

- Impact of Blast Design Parameters on Mine Economics and Costing
- Damage monitoring, prediction and control.
- Energy consumption in downstream operations.
- Integration of drilling and blasting operations, Cost optimization of Mining Operations

Managing Environmental Impact of Blasting

- Blast Design to Minimize Complaints due to Ground and Airblast.
- Blasting Close to Structures. Impact on biodiversity
- Flyrock Prediction and Control
- Dust & Fines Generation Control and Assessment of Pollutants Resulting from Blasting
- Damage to Remaining Rock and Effect on Slope Stability

Technological Innovations & Application

- Instrumentation: Ground Vibration and Air blast monitors, Laser profilers, Fragmentation image analysis systems, , drones in drilling and blasting, Automation in Drilling and charging,
- Performance Evaluation of Drilling and Blasting Operations
- Data collection, Data Analytics and Artificial Intelligence

Case studies would be presented. Quizzes and assignments, Allows participants to practice the following software with actual field data and hands-on experience of Drilling and Blasting Software:

- **Blast Designer (BLADES)**
- **Blast Information Management System (BIMS)**
- **Drill Information Management System (DRIMS)**
- **Predictors** - Flyrock, Air and Ground vibration, Fragmentation
- Smart Blasting App and Smart Drilling App
- Underground Blast Designer, Underground Blast Information Management System (**BIMSu**)

Who Should Participate?

This course is ideal for you mining personnel involved in blasting and drilling activities, both in the underground and surface mining environments, as well as contractors performing blasting activities on mine sites and civil excavations, personnel from explosives companies, suppliers of explosives products, senior management and consultants to the mining industry. This course can be of great helping hand to all levels of mining personals i.e. from Foreman to General Manager, looking to expand their skill sets. It can be a milestone for companies looking towards digitization, application of data analytics and artificial intelligence in their Mines.

Course Director

Dr. Sushil Bhandari obtained BE (Mining) from Jodhpur University, M.Sc. degree in Mining Engineering from Banaras Hindu University and Ph.D. from University of New South Wales (Australia). He remained Professor and Head of the Department of Mining Engineering in Jai Narain Vyas University, Jodhpur. He has 40 years long experience in Teaching. He has published over 100 papers and his book Engineering Rock Blasting Operations is used by students. He is recipient of National Mineral Award 2001, of Government of India for his contribution to Mining Technology.

REGISTRATION

Course Fee: Rs.30,000.00(18%IGST Extra) per participant

- Registration fee includes course material, demonstration and hands on experience of software and instruments.
- Payment is to be made through Bank draft or Bank transfer to: Beneficiary Name - Continuous Excellence
Bank name: Oriental Bank of Commerce, Account No: 12451132001100, RTGS/NEFT IFSC: ORBC0101245.
- This course is Non-Residential. Early bird discounts will be provided if payment sent 15 days before the organization date of the course and if minimum 4 candidates nominated by the organization than Rs.500 per candidate will be reduced.
- For registration and other queries please contact us on this numbers: Tel:(0291)359-1883,+91-9119279727.