



# Engineering Staff College of India

## Mining Division



*3-Day Continuing Professional Development Programme*

*Classroom/Residential*

### Electrical Safety & Energy Audit in Mining Projects

**4 – 6 October 2023**

#### Introduction

Safety is always of utmost priority and being aware of the working environment is the first step in preventing injury or illness in the workplace. Using electrical equipment on the job is always hazardous. Compared with other industries, mining industry is among the most hazardous when it comes to working with electrical power. Mine Safety and Health Administration data report one fatality for every 22 electrical-related injuries — compared with an average of one fatality for every 203 injuries for all other mining injury types. Almost three-quarters of mine-related electrical injuries and deaths involve using machines, tools, appliances, or lightning that come in contact with wiring, transformers, or other electrical components. Hence there is an utmost need to follow all electrical safety measures during operation and maintenance of electrical systems. It is very much essential to ensure electrical safety in mines as mining environment has the potential to affect the safety features of the electrical equipment. Design of flame proof and moisture proof equipment as per the prevailing hazardous zone of classification plays a major role. Good documentation like availability of as-built and updated single line diagrams of the facility, cable schedules, earth pits layout plans, control schematic diagrams, adequacy of the protection systems including protective relay settings, regular proactive maintenance practices or condition based maintenance, strict adherence of safety work permit systems like LOTO, OTO for energization and de-energization of electrical equipment, practicing either multiple work permits or cross linking of the permits when multiple works are being taken up on the same equipment, maintain safe environment design basis reports and necessary approvals either from state/central electricity authorities plays a vital role in enhancing electrical safety. Safety systems shall never be deviated or bypassed and utmost importance shall be given. Maintaining bypass registers and regularizing the same within predefined time, maintaining earthing systems as per IS 3043 and lightning protection systems as per IS 2309 maintains electrical and personnel safety. Competency and adequacy of electrical staff, training and retraining, reporting near miss incidents, carrying out the root cause analysis, action plans to prevent the similar nature of failures and communicating the same among the employees' results in improvement in safety culture. All these best practices of electrical safety aspects in mines definitely achieve three zeroes i.e. zero electrical equipment breakdowns, zero electrical related accidents and zero power interruptions due to equipment failures.

#### Objectives

Mining has high potential risk of accidents. The probability that something will cause injury combined with the potential severity of that injury is known as risk. Risk assessment based safety and health management system brings together the policies and procedures required to effectively mitigate the risks associated with the mining operations. The regular occurrence of accidents in mining industry supports the need for improvements in the way major hazards are identified, assessed and managed. Recognizing that it is desirable to prevent any fatalities, injuries or ill-health affecting miners or general public this programme is formulated to enable the identification and deliberation on the various risks in the use of electrical energy and connected equipment in mining, their assessment and preparation of risk assessment based safety management plans which are used to help to prevent or mitigate major hazards to minimize the electrical accidents by learning the various safety aspects with focus on the general transmission and distribution electrical network systems and associated major electrical equipment in mining industry. Familiarizing with the latest statutory requirements based on central electricity authority and guidelines from DGMS. Understanding the safety interlocks /controls and protections provided in the electrical systems and equipment so as to ensure always that these safety interlocks and protections are in service. Electrical hazards can be minimized by adhering to safety measures during the operation of electrical systems and by best maintenance procedures.

ISO 30001 Risk Management provides principles, a framework and a process for an effective risk management strategy for managing risks

Energy is critical to organizations, but often represents a significant cost and is the major contributor to climate change, making up nearly 60 % of the world's greenhouse gas emissions. Taking action to better manage our energy consumption not only helps the planet, it saves money for organizations and society as a whole. Energy management systems is a strategic tool that helps organizations use their energy more efficiently and effectively. ISO 50001 gives organizations a recognized framework for developing an effective energy management system.

### Course Coverage & Benefits to the participant

- General Safety
- Create a culture of safety as safety is the responsibility of everyone involved
- General arrangement of transmission and distribution systems
- Control and protection systems to safeguard personnel and equipment
- Electrical safety measures during operation and maintenance of electrical systems and equipment to prevent electrical accidents in mines
- System of earthing and lightning protection schemes to ensure electrical safety
- Best maintenance practices to minimize electrical hazards.
- Legislation and safety laws, statutory guidelines (CEA/DGMS) on electrical safety of transmission & distribution systems
- Electrical safety audit guidelines to enhance safety culture
- Energy Management System-ISO 50001:2018 & Energy Audit
- Risk Management System-ISO 31000

### Methodology

Lectures/presentations, case studies, interactive sessions.

### Resource Persons

The resource persons/faculty consists of experts from the industry, research establishments and academia besides in-house faculty of ESCI.

### Target Participants

This programme would be useful to electrical engineers and managers, excavation and equipment engineers, mining & electrical supervisors. Safety officers

### Programme Dates & Timings

**4 – 6 October 2023**

**10.00 a.m. - 5.30 p.m.** each day.

### Course Fee for 3-Days

- **Residential:** INR 25,000/- (Rupees Twenty Five thousand only) per participant which includes course material, course kit, twin-sharing/single AC accommodation, breakfast, lunch, dinner, tea and snacks during the actual days of training programme.
- **Non-Residential:** INR 20,000/- (Rupees Twenty thousand only) per participant which includes course material, course kit, lunch, tea and snacks during actual days of training programme.
- *Special concession of 10% in course fees to organization for 5 or more nominations and attendance.*

**GST @18%** is to be paid extra over and above the course fee. **PAN:** AAATT3439Q, **GST No:** 36AAATT3439Q1ZV, **HS No.:** 999293 (under commercial training or coaching services – clause 65(105) (ZZC) of Finance act – 1994).

Course fee is to be paid in favour of “**THE I.E.(I) – ENGINEERING STAFF COLLEGE OF INDIA**” in the form of demand draft payable at Hyderabad. Alternatively the payment may be made by **Electronic Fund Transfer (EFT)** to ESCI –**SB A/c No. 33705165550** with **State Bank of India, Manikonda Branch, Door No.2-30/1, Indira Nagar, Gachibowli, Hyderabad – 500032**, our **NEFT/RTGS/IFSC Code No. SBIN0011076 – MICR No. 500002107**. *While using EFT method of payment, please ensure to communicate your company name, contact details, our invoice reference and programme title.*

## Registration

To register, please send your nominations by providing name, designation, contact address, email address, mobile no. / telephone number of the participant along with the details of mode of payment of fee, addressed to: [mining@escihyd.org](mailto:mining@escihyd.org).

## Certification

A certificate of participation on the signature of the Director, ESCI would be awarded to each participant on conclusion of the programme.

## Profile of Expert Speakers



**Mr. P Ranganatheeswar** graduated in Mining Engineering from Osmania University in the year 1979. Immediately thereafter, joined The Singareni Collieries Company Ltd (SCCL) as a Graduate Trainee and risen up to the Mine Manager level & well experienced in the coal winning operations from manual, semi mechanized to fully mechanized working faces including highly productive long-wall faces. Joined Directorate General of Mines Safety/DGMS as Dy. Director and retired as Dy. Director General spanning about 27 years' work experience in the Government sector. He was also the Secretary to the Board of Mining Examinations (Coal and Metal). He visited Germany, France, U.K., Australia, USA, South Africa and China on different collaborative projects to oversee and understand the best mining practices adopted in their countries. After Retirement he worked as Advisor (Mining) at Gayatri Projects Limited and worked as task based Advisor (Mining) for M/s Central Coal Fields Limited.



**Mr V Lakshmi Narayana** obtained Diploma in Mining Engineering in 1977 and graduated in Mining Engineering from University of Jodhpur, Rajasthan in 1982. He obtained ME (OCM), MCA, M.Sc.in Yoga (2010, Annamalai University), PGD in Materials Management (1987) and Diploma in Naturopathy. He is holder of First Class Manager's Certificate in Coal and Metal. He is a Fellow, Institution of Engineers (2009) and life member of the Mining Engineers' Association of India (1997). He is the holder of Medallion in First-Aid and was active Rescue Trained Person. He is a recipient of "Eminent Mining Engineer" award from IEI in 2014. The Indian Mining & Engineering Journal gave Life Time Achievement Award to him in recognition of outstanding contribution to Indian Mining Industry in 2017

He joined as Mining Graduate Trainee in SCCL in March, 1982 and rose to the position as Colliery Manager and later joined DGMS as Dy. Director in 1990 and superannuated as Dy. Director General in 2017.

He authored no. of articles on Mining Legislation, Safety Management System, Blasting, Mine Environment, Opencast Mining, Zero harm status, thick seam mining, Slope stability, Accident control etc., and presented in National & International Seminars. He conducted many interactive workshops on Safety Management Plan and Safe Operating Procedures at various mining areas, He worked as part-time lecturer in Govt. Engineering College, Bilaspur and College of Agriculture Engineering & Technology, Udaipur. He visited Australia in 1998 and USA in 2008 and undergone specialized training in Safety Management System, Long wall Mining and extraction of coal by Continuous Miner.



**Mr G L Kanta Rao** graduated in B-Tech in Electrical Engineering, from JNTU, Kakinada in the year 1980-81. As a practicing Engineer, worked in Hindustan Zinc Limited, Sargipali Mines, Orissa, for about 12½ years and rose to the position of Manager (Elect) providing support to engineering, technical and other varied aspects to an underground semi- mechanized lead mine deploying SDL, winders, crushers and rock breakers, locomotives etc. Thereafter joined DGMS initially as Deputy Director of Mines Safety (Elect) in 1995 and superannuated as Deputy Director General of Mines Safety during in 2018 after a meritorious service of 23 years involved in statutory inspections and accident enquiries in coal, non-coal and oil mines across different parts of India.

As DDG (Elect) and authorized Chief Electrical Inspector of Mines was associated as member of various committees (CEA, Govt. of India and BIS) to bring in amendments, evaluations etc., in relation to the subject of mines.

Presently, he is conducting technical safety audits of mines of HINDALCO (Orissa), JSW (Orissa) and HZL, Rajasthan as and when services are sought for.

As a nominated member on "HIGH LEVEL EXPERT COMMITTEE ON SAFETY" of coal mines under Ministry of Coal, Govt. of India he is extending required advisory services and guidance in respect of safety to different identified mines under Ministry of Coal, Government of India. Some of the recommendations are Root cause analysis, as part of SMP, for accidents, internal and external safety audits by professionally trained and accredited trainers as envisaged in SMP and under consideration by MoC, Government of India.



**Mr Ankem V R N B Manikyala Rao** is an engineering graduate in Electrical and electronics engineering with specialization in M Tech Power systems. Completed MBA in operations management and presently pursuing Ph.D. on optimization of renewable energy integrated with cogeneration systems. Have 34 years of industrial experience in CHP plants including coal handling systems and process chemical industries of department of atomic energy. Looked after safety of the electrical systems and worked as a designated safety officer to fulfill the statutory requirements of CEA guidelines. Carried out the safety audits to fulfill the statutory requirements and to enhance the safety. Being a certified energy auditor carried out energy audits in thermal power plants and chemical industries.



**Mr A V Raghuram** graduated in B'Tech (EEE) from S.V. University College of Engineering, Tirupathi and M.Tech (Mining Machinery) from Kothagudem School of Mines, Osmania University, P.G. Diploma in Materials Management from Annamalai University. In SCCL worked mostly in Longwall Projects at VK7 Inc., GDK 10 A Inc., GDK 9 Inc., and Adriyala Project for Project implementation, Installation, commissioning, operation and Maintenance of Longwall machinery and Electrical Systems

Presently he is Advisor (Engg. – Electrical) in SMSL @ Tummalapalli Project - Excavation of Uranium ore for UCIL & Consultant for Electrical Equipment (System Design & Selection) and Pneumatic tools for Mining Industry.



**Mr Atmakuru Chandra Mohana Rao** graduated in B.E. (Mech) from S.V.U., Tirupati and M.Tech. (Machine Design) from JNTU, Kakinada.

- Boiler operation engineer certificate of AP State
- Modern Thermal Power Plant 500MW operator simulator - Certificate Tata Electric Companies
- Certified Energy Auditor by BEE Govt. of India

He worked as General Manager (Technical) – Head of ACC Wadi, Heavy Water Plant, Manuguru, Maintenance Manager, Atomic Power Station (D.A.E.), Kalpakkam, Specialization in O&M, Commissioning of Nuclear, Chemical and Thermal Power Plants.

Presently working as Advisor, Engineering Staff College of India.



**Dr M S Venkataramayya** is a postgraduate in Mining Engineering from Kothagudem School of Mines, Osmania University and obtained his Doctorate from NITK, Surathkal, Karnataka.

He served in The Singareni Collieries Company Limited for 37 years in various positions and superannuated in 2017 as General Manager. He is presently working as Professor in Mining Department in Malla Reddy Engineering College, Hyderabad, Guest faculty in College of Engineering, Osmania University and also a member of Board of Studies in various Engineering Colleges in the state of Telangana and Andhra Pradesh. He is also holding the position as Adviser, Mining Division in Engineering Staff College of India Hyderabad.

He is a Fellow of Institution of Engineers (FIE) and Life Member of Institution of Engineers, MEAI (Mining Engineers' Association of India), MGMI (Mining, Geology, Metallurgical Association of India), Alumni of Mining Engineers' Association (Osmania University and Kakatiya University).



**Er K J Amarnath** a Gold Medalist, in BE (Mining Engineering) from College of Engineering, Osmania University, Hyderabad. He retired as Chief General Manager from The Singareni Collieries Company Ltd. (A Government Company) after rendering a meritorious service of about 38 years in various capacities in Underground and Opencast Technology in Planning & Operations, Human Resource Development, Business Development, Education, Safety, Corporate Planning and Projects. Further, he was Director in NSGPVL, A Joint Venture Company of NTPC Ltd, A Central Government PSU and The Singareni Collieries Company Ltd, A Government Company.

He visited the United Kingdom, Spain, United States of America & Australia during his service which enhanced his capabilities in terms of Technical, Managerial & Business Skills. He is also a holder of First Class Manager's Certificate of Competency issued by The Director General of Mines Safety, Ministry of Labour, Government of India.

He is a Fellow of Institution of Engineers (FIE) and Life Member of Institution of Engineers, MEAI (Mining Engineers' Association of India), vice-chairman MGMI (Mining, Geology, Metallurgical Association of India), Hyderabad Chapter and vice-president of Alumni of Mining Engineers' Association (Osmania University)

Presently he is working as Senior Faculty-Head, Mining Division, Engineering Staff College of India, Hyderabad.

### Contact Persons

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### **Mining Division, Engineering Staff College of India**

An Autonomous Organ of The Institution of Engineers (India)  
(An ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO 50001:2018 & ISO/IEC 17025:2017 Certified, AICTE & CEA Recognised Institution)

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