



## 3 Days Training Programme on **Advanced Power System Protection, Short Circuit Calculation, Parameters, Relay Setting & Relay Co-ordination**

2-4 June at Kolkata, 20-22 June at Nagpur.

### Description:

Protection of Electrical power systems requires an understanding of complete power system design, system faults and their detection, as well as their safe disconnection. This course presents a comprehensive and systematic description of the concepts and principles of operation and application of protection schemes for various power system elements, setting and relay coordination. The course begins with an overview of power system, various causes of system failure, improper relay setting, components of power system protection schemes as well microprocessor-based relays and their application. This course deals with protection systems from a practical perspective and includes important functional aspects such as testing and coordination of protection systems.

### Objectives:

#### Upon Completion of this course the participant will be able to

- Enhance your knowledge and skill of electrical system protection techniques including fault
- understanding of Electrical protective devices
- Understand problems generally faced and solutions successfully adopted by industry
- Learn to calculate the basic fault currents flowing in any part of the electrical system
- Design your own system of Power flow and analysis.
- Do relay setting by your own.

Improve your electrical system protection against possible electrical faults.

### Who Should Attend:

This course has been specifically designed for Electrical utility Managers, engineers, supervisors, having knowledge of Power system, Power Distribution Managers and others involved in the electric power generation and distribution systems.

The course will definitely be beneficial for the all the other department people concerned with the plant operations, maintenance and safety. It could be also useful for the procurement and quality personnel.

### Course Contents:

#### Major Contents:

1. Important basics of Power System protection.
2. Key Elements of Power system and Protection
3. Types of Power System Protection
4. Importance of relay, Relay setting and Co-ordination
5. Power system protection for Transformer, Line & Bus Bar & Motor.
6. Advanced Relay coordination.

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7. Lots of Practical's,.

**Sub contents:** PROTECTIVE RELAY COORDINATION IN ELECTRICAL POWER SYSTEM

- Type of faults in electrical system and electrical machines
- Methodology adopted for detection of faults
- Current, voltage and power operated relays
- Protective relays for protection of electrical power system
- Protective relays for protection of electrical machines i.e. Generators and Motors
- Security of power supply and isolation of faulty section/ equipment in the event of faults and on interrupted operation of healthy sections of power system and equipment
- Primary and Back up protection relays
- Short circuit withstand capability of electrical equipment and fault clearing time
- Critical fault clearing time based on power system stability consideration
- Discrimination/ coordination of relay operations in power system
- Discriminative relay coordination of main and back up protection relays
- Relay co-ordination based on magnitude of fault current
- Relay coordination based on operating time of relays
- Relay errors
- Relay overshoots
- Relay coordination for Carrier aided protection systems and communication based protective systems using optical fiber cables for transmission lines and cables
- Coordination of stalling protection relays for motor protection and use of speed switches
- Relay coordination graphical plots
  - Relay coordination using the Relay coordination module,
  - Numerical relays: Introduction, advantages and applications.

**Case Studies and Real time Solution:**

## Certification

Every successful participant will be awarded an Attendance Certificate

## Delivery Methodology

- Pre Course Test
- Classroom Sessions, Animations & Videos
- Real Life Case studies
- Assignments & Exercises
- Discussion and Interaction
- Feedback and Assessment
- Post Course Test
- Delivery 10:00 AM to 17:00 PM



# Centre For Industrial Solutions and Advanced Training

AN ISO 9001:2015 CERTIFIED

*Dates: 2-4 June at Kolkata, 20-22 June and 8-10 August at Nagpur.*

*Registration Fees: INR 30000/- + GST@18%.*

**Bank Account Details:** Current Account Name: “**Centre for Industrial Solutions and Advanced Training**” Bank: IDBI, Sadar, Nagpur, Maharashtra 440018, India; Account No: **0509 1020 0000 3353**; IFSC Code: IBKL0000648; MICR Code 440259006; Swift Code IBKLINBBNGP.

GST: 27ABBPW5589J1ZV; SAC Code: 999292

*For Registration, please contact:*

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**Contact for any In-house Training at your plant. We do undertake all types of Training activities at all levels**

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**Centre For Industrial Solution and Advanced Training**

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