Electricity Forum Training Institute

LOOK INSIDE FOR DISCOUNT PROGRAM PRICING

ELECTRICAL PROTECTION FOR INDUSTRIAL POWER SYSTEMS

April 4-5, 2017	Richmond, BC
April 6-7, 2017	Edmonton, AB
April 10-11, 2017	Winnipeg, MB
April 12-13 2017	Toronto, ON

Gain valuable experience in utility and industrial electrical system analysis, protection, control, communication, and automation

BONUS FEATURES

- This Course Includes our Latest Electrical Protection and Control Handbook!
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Complete course details:
www.electricityforum.com/forums/electrical-relay-protection.html

ELECTRICAL RELAY PROTECTION FOR INDUSTRIAL ELECTRICAL POWER SYSTEMS

Large or small, each and every industrial, commercial and institutional organization needs to understand how to protect their investment in their electric power systems. To do this properly, you need to know how to perform an analysis of all the parts of their power system: such as analyze fault data, come up with protection settings, then get all of the components of your plant to be controlled by the operators who are responsible for integrating the power system into communication and data acquisition modes.

The Electrical Protection For Industrial Electrical Power Systems training course provides a comprehensive understanding of the principles of digital Power System relaying and protection applications. The class will review the major components of a Power System as well as basic theory and protection principles.

Students will be learn the essentials of electrical protection design, relay coordination, fusing fundamentals, and breaker fundamentals. Students will be provided with an understanding of digital protective relaying, as we go through practical examples of generator, feeder, motor, and transformer electrical protection.

COURSE BENEFITS

- Gain valuable experience in utility and industrial electrical system analysis, protection, control, communication, and automation
- Learn the latest trends in evolving electrical protection standards, design methods, and new technologies
- Gain Valuable knowledge of electrical power system analysis and short circuit calculations, time current coordination curves, fusing fundamentals, and more!
- Learn how to keep your electrical system engineers, operators and project managers on track by using the latest relay protection techniques

WHO SHOULD ATTEND

- Industrial, commercial, institutional electrical engineers, and technologists
- Consulting electrical engineers
- Project engineers
- Design engineers
- Field technicians
- Electrical technicians
- Plant operators
- Plant engineers
- Electrical supervisors
- Managers in charge of plant communication infrastructure

AGENDA - DAY 1

SESSION 1: POWER SYSTEM FAULTS

- **Different types of faults**
- **Incidence of faults on power system equipment**
- **Effects of power system faults**
- **Magnitude of fault current, short circuit calculations**
- **Detection of faults**
- **Clearance of faults**
- **Requirements of protective relaying systems**

SESSION 2: POWER SYSTEM CONFIGURATIONS

- **Typical system configurations**
- **Design considerations**
- **Radial systems, loop systems, selective systems**

SESSION 3: SHORT CIRCUIT CALCULATIONS

- **Short circuit theory, terminology and studies**
- **Fault current sources and characteristics**
- **Equipment ratings and asymmetrical factors**
- **Analysis of a computerized fault study**

SESSION 4: FAULT STUDIES

- **Equipment ratings**
- **Asymmetric factors**
- **Purposes of fault calculations**
- **Types of faults**
- **Modeling methods**
- **Fault calculations**

SESSION 5: COMPONENTS OF POWER SYSTEM PROTECTION SCHEMES

- **Fault detecting relays**
- **Tripping relays and other auxiliary relays**
- **Circuit breakers - bulk oil, air-blast, vacuum, SF6**
- **Current Transformers**
- **Voltage Transformers**
- **Ground Transformers**
- **The transition from electro-mechanical relays to electronic and digital microprocessor-based relays**
- **The application of programmable logic controllers**
- **Modern microprocessor-based relays: review of types available**

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SESSION 6: CURRENT TRANSFORMERS (CTs) & VOLTAGE TRANSFORMERS (VTs)

- Various types of CTs, VTs & CVTs
- Theory and characteristics of CTs
- Application requirements of CTs for protective relaying
- Accuracy classifications
- Future trends in CT design
- Testing of CTs and VTs

AGENDA - DAY 2

SESSION 7: CO-ORDINATION OF ELECTRICAL PROTECTION SCHEMES

- Fuse to fuse
- Circuit breaker to fuse
- Fuse to circuit breaker
- Back up protection
- Limitation of fault current
- Selective zones of protection
- Types of bus protection schemes
- Basic concept of differential protection
- Application to various bus configurations
- Applications to switchboards
- Testing of bus protection schemes

SESSION 8: FEEDER OVERCURRENT PROTECTION

- Protective relaying requirements for loop and radial systems
- Elements of feeder protection schemes
- High set, low set, and inverse -timed elements
- Co-ordination with other devices and fuses
- Auto-reclosing of feeder circuit breakers
- Various types of overcurrent relays
- Electromechanical, electronic & digital relays
- Relay setting criteria
- Testing of overcurrent protection schemes

SESSION 9: TRANSFORMER PROTECTION

- Protection characteristics
- Data requirements
- Basic protection systems
- Factors affecting protection
- Overload Protection
- Phase and Ground Fault Protection
- Primary Fuse Protection
- Primary Breaker Protection

SESSION 10: MOTOR PROTECTION

- NEC and ANSI/IEEE Standards
- Motor nameplates
- ANSI/IEEE device numbers and functions
- Motor TCC curves
- MCP Low-voltage Protection
- Medium-voltage Motor Protection
- NEMA Class E2 Controllers
- Thermal Overload Protection
- Thermal Locked Rotor Protection
- Phase and Ground Fault Protection
- Miscellaneous Protection (Undervoltage, Single-Phasing, etc.)

SESSION 11: GENERATOR PROTECTION

- Voltage restraint/dependent phase overcurrent
- Ground fault protection
- Differential protection
- Loss of Field protection
- Volts/Hertz protection
- Frequency protection

"Our motivation is your education."

WAYS TO REGISTER

1 (855) 824-6131

(905) 686-1078

ON-LINE:
www.electricityforum.com/forums/electrical-relay-protection.html

MAIL:
The Electricity Forum
1885 Clements Rd., Unit 215
Pickering, ON L1W 3V4

ATTENDEE INFORMATION

To receive registration fee discounts, you must **REGISTER AND PREPAY** prior to the course date.

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The registration fee to attend the Electrical Relay Protection Seminar is $799.00 + Tax. The fee includes forum participation, refreshments. NOTE: LUNCH IS PROVIDED WITH THIS COURSE.

Register and prepay 14 days before forum date and receive an early bird discount of $50.00

REGISTER 3 DELEGATES AT FULL PRICE AND GET THE 4th REGISTRATION FREE!

WHEN & WHERE

Richmond, BC - April 4-5, 2017
Holiday Inn Vancouver Airport
10720 Cambie Road
Richmond, BC
Tel: 604-821-1818

Edmonton, AB - April 6-7, 2017
Sawridge Hotel Edmonton South
4235 Gateway Blvd N
Tel: 780-438-1222

Winnipeg, MB - April 10-11, 2017
Sandman Hotel & Suites Winnipeg Airport
1750 Sargent Ave.
Winnipeg, MB
Tel: 204-775-7263

Toronto, ON - April 12-13, 2017
Hampton Inn and Suites
3279 Caroga Drive,
Mississauga, ON

COURSE INSTRUCTOR
DR. EDUARD LOICZLI, P. ENG, ELECTRICAL PROTECTION CONSULTANT, THE ELECTRICITY FORUM

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