Content
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Utility Relay Protection - Advanced

Contact us Today for a FREE quotation to deliver this course at your company's location.

https://www.electricityforum.com/onsite-training-rfq

COURSE DATES AND TIMES

April 20-22 , 2021

10:00 am - 4:30 pm ET

Utility Relay Protection - Advanced - This 18-hour live online instructor-led training course is a must have for all electric utility transmission and distribution engineers who enter into the Protection & Control field and electrical technicians.

The main objective of this course is to identify, discuss and develop solutions to common utility protection issues. This **popular** course gives students a comprehensive understanding of the principles of electric utility protection relaying and applications.

Electric utility protective relays are deployed throughout the T&D power system for the purpose of sensing abnormal electrical events and operating conditions They isolate, working in tandem with circuit breakers, any abnormal conditions that resulting from

environmental effects, physical accidents, equipment breakdown or operational failure which is caused by human error.

A reliable, selective and high-speed isolation and protection system is necessary to prevent damage to vital and expensive utility asset equipment, reduce the risk of serious danger to humans and to maintain power system stability and acceptable power quality.

These stringent requirements, with high potential consequences, make it imperative that utility relay protection systems are designed and maintained to perform their functions with a very high degree of dependability and security.

Topics and Issues:

- Management of Utility Relay Protection Assets and Investment Strategies
- Relay Protection Systems Design Standards and Utility Practices
- Substation Relay Automation – Experiences and Best Practices
- Optimizing Relay Protection System Maintenance and Compliance Reporting
- Introduction of New and Emerging Relay ProtectionTechnologies

WHO SHOULD ATTEND

- Electric Utility Transmission and Distribution Engineers;
- Electrical Power System Planners
- Electrical Power System Engineers
- Consulting Engineers;
- Electrical Engineers And Technical Staff Entering The Protection Field
- Engineers And Technicians Involved With Design, Operation, Maintenance, Testing, And Troubleshooting Of High And Medium Voltage Electrical Systems And Equipment
- Technicians And Technologists In the Electric Utility Field Involved In Design, Operation And Maintenance Who Require Knowledge Of Electrical System Protection Techniques

STUDENTS RECEIVE

- FREE 100-Page Digital Electrical Protection Handbook (Value $20)
- $100 Coupon Toward Any Future Electricity Forum Event (Restrictions Apply)
- 1.8 Continuing Education Unit (CEU) Credits
- FREE Magazine Subscription (Value $25.00)
- Course Materials In PDF Format

COURSE OUTLINE

Utility Relay Protection Fundamentals - Eric Stark, Electricity Forum Electrical Protection Specialist

DAY ONE

Distribution and industrial power electricity

Power systems grid fundamentals

System design considerations

- Safety
- Reliability & Flexibility

System Planning

- Utility service & requirements
- Protection consideration
- Special Loads

Distribution Power system con?gurations

Equipment selection

- Circuit Breakers
- Voltage Transformers
- Current Transformers
- Relays & Protection Schemes
- Microprocessor and Electro-mechanical relays

Distribution Power system analysis

Short circuit calculations

- **E?ects of Short Circuit**
- **Sources of Fault Currents**
- **Sensitivity & speed**
- **Voltage Considerations**
- **Limiting short circuit currents**

Case study calculation using the MVA method

Feeder Protection

- Protection elements
- Relay coordination
- Phase TOC (51)
- Phase IOC (50)
- Ground Relaying elements
- Fault simulation Event Log
- Oscillography

- Hi-Z faults
- Co-ordination of feeder fuses and relays

DAY TWO

Case study: Sequence component calculation

Busbar Protection

Bus protection elements

Bus protection requirements

Bus protection schemes

- High Impedance
- Linear Couplers
- Interlocking
- Unrestrained Differential
- Percent Differential
- Low Impedance microprocessor-based

Transformer Protection

- Transformer theory
- Transformer protection elements
- Current Transformer Percent
- Differential transformer protection
- Magnitude and phase compensation
- Volts/Hz
- Sudden Pressure change detection
- 2nd harmonic inhibit
- 5th harmonic inhibit

- Volts/Hz
- Sudden Pressure change detection

DAY THREE

Transmission Lines Protection

- **Introduction to Transmission Lines**
- **Distance protection theory**
- **Stepped Distance**
- **Pilot Aided schemes:**
- **DUTT, PUTT, POTT, HYBRID POTT, Directional blocking**
- **Power Swings blocking**
- **Line Current Differential protection**

Motor Protection

- Main protection elements to consider
- Motor nameplates
- Thermal overload protection
- Thermal capacity relaying
- Acceleration limits and curve
- Phase and Ground Fault Protection
- Protection elements
- Setting considerations

Case study: A complete relay setting calculation

COURSE SCHEDULE:

Both days:

Start: 10 a.m. Eastern Time
Finish: 4:30 p.m. Eastern Time

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