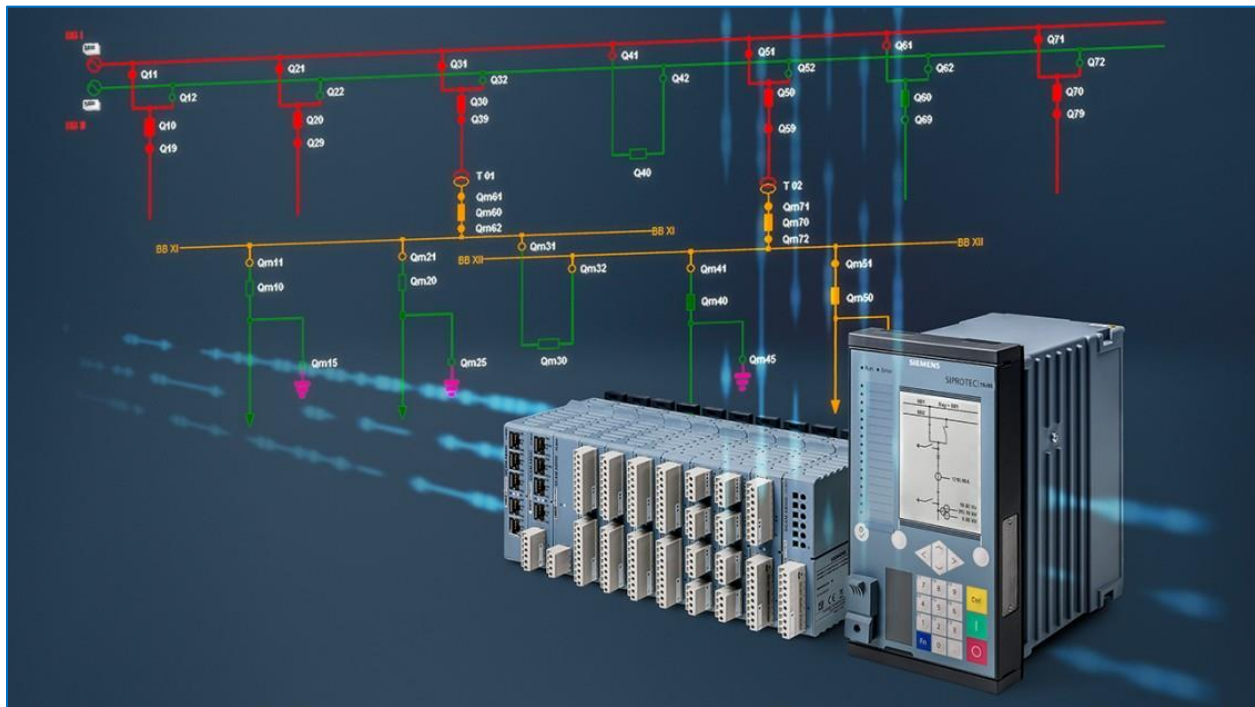




IE291: Substation Automation Systems & Application

Training Description:

The Substation Automation Systems & Application training course is designed to provide participants with comprehensive knowledge and hands-on skills for designing, implementing and operating modern automated substations. Automation enhances operational efficiency, reliability, safety and monitoring capabilities in power systems, making it critical for utility, industrial and commercial operations. This training course offers a structured approach to substation automation systems, communication protocols, protection schemes and intelligent device integration.

The training course focuses on automation architecture, intelligent electronic devices (IEDs), communication standards, SCADA integration, protection coordination and real-time monitoring. Participants will learn to configure, test and maintain automated substations while applying practical techniques through case studies, simulations and interactive exercises. Emphasis is placed on system reliability, fault detection, operational efficiency and compliance with industry standards.

By the end of the training course, participants will be able to design, implement and operate substation automation systems, configure protection and control devices, integrate communication networks and SCADA systems and optimize monitoring for reliable and efficient operations. The training course enhances technical competence, strengthens analytical skills and builds confidence in managing complex automated substations.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Understand principles and architecture of substation automation systems
- ✓ Identify and configure intelligent electronic devices (IEDs)
- ✓ Implement communication protocols for substation automation
- ✓ Integrate SCADA and monitoring systems for real-time control
- ✓ Apply protection schemes and fault management strategies
- ✓ Perform testing, commissioning and maintenance of automation systems
- ✓ Analyze system performance to optimize reliability and efficiency
- ✓ Develop strategies for upgrading conventional substations to automated systems

Training Designed for:

This training course is intended for electrical engineers, substation operators, protection engineers, automation specialists and technical personnel responsible for designing, operating or maintaining automated substations. It is suitable for professionals in utilities, industrial facilities and power generation or distribution companies. Participants seeking practical, hands-on experience in substation automation, IED configuration, SCADA integration and digital monitoring will benefit greatly from this course.

Training Requirement:

"Hands on practical sessions, equipment and software will be applied during the course if required and as per the client's request."

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

INTRODUCTION TO SUBSTATION AUTOMATION SYSTEMS

- ❖ Understanding concepts, architecture and benefits
 - Overview of substation automation systems
 - Conventional vs automated substations
 - Benefits of automation for reliability, safety and efficiency
 - Substation architecture: primary equipment, control and communication layers
 - Intelligent electronic devices (IEDs) introduction
 - Practical demonstration: Components and layout of an automated substation

DAY TWO:

COMMUNICATION NETWORKS AND PROTOCOLS

- ❖ Connecting devices for reliable control and monitoring
 - Communication standards: IEC 61850, DNP3, Modbus and others
 - Network topologies and data exchange methods
 - Time synchronization and redundancy in automation networks
 - Device configuration and addressing
 - Workshop: Configuring network settings for IED communication
 - Case study: Communication challenges in automated substations

DAY THREE:

PROTECTION SCHEMES AND CONTROL LOGIC

- ❖ Ensuring safety and fault management in automation systems
 - Protection coordination and principles in automated substations
 - IED-based protection devices and relays
 - Control logic design for circuit breakers, transformers and busbars
 - Fault detection and isolation strategies
 - Practical exercise: Configuring IED logic and protection settings
 - Group discussion: Case studies of protection system design

DAY FOUR:

SCADA INTEGRATION AND MONITORING

- ❖ Real-time control and operational efficiency
 - SCADA system architecture and integration with automation devices
 - Data acquisition, monitoring and alarm management
 - Human-machine interface (HMI) configuration and dashboards
 - Remote control and automation commands
 - Workshop: Integrating IEDs with SCADA and testing system operation
 - Practical exercise: Monitoring and analyzing system performance

DAY FIVE:

TESTING, COMMISSIONING AND PERFORMANCE OPTIMIZATION

- ❖ Ensuring reliable operation and continuous improvement
 - Testing procedures for automated substations

- Commissioning of IEDs, communication networks and SCADA systems
 - Performance analysis and optimization techniques
 - Risk assessment and troubleshooting automated systems
 - Group exercise: End-to-end commissioning and system validation
 - Final presentations: Substation automation design and operational plan
 - Course wrap-up: Lessons learned and implementation strategies
- ❖ Course Conclusion
 - ❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

Aisha Relativo - Training & Career Development Manager

aisha@cmc-me.com / training@cmc-me.com

Tel.: +971 2 665 3945 or +971 2 643 6653 | Mob.: +971 52 2954615