

SCADA Fundamentals Certification

4 Days

- **Overview**
 - What is SCADA
 - Components of a SCADA system
- **Field Devices**
 - Remote terminal units (RTUs)
 - Programmable logic controllers (PLCs)
 - Flow computers
 - Intelligent end devices
 - Control philosophies
 - Basic feedback control
 - Programming
- **Communications**
 - SCADA communication media
 - » Radio
 - » Cellular
 - » Satellite
 - » Telco
- **Network Infrastructure**
 - SCADA LANs
 - Network protocols
 - Wide area networks
 - Redundancy issues
 - Integrating SCADA LANs with enterprise LANs
 - » Decision support servers
 - » Interfaces
 - » Firewalls
- **Legacy Data Acquisition Protocols**
 - Protocol fundamentals
 - » Structure, handshaking, error checking
 - Legacy serial protocols
 - » Poll models
 - » Round robin
 - » Report by exception
 - » Spontaneous report by exception
 - » Timed polling
 - EFM Polling / API 21.1 / 21.2
- **TCP/IP Protocol**
 - History and terminology
 - TCP/IP architecture and addressing overview
 - Key concepts

Curriculum | SCADA Fundamentals Certification

- **Host Systems**
 - Computer operating system choices
 - Host system architectures and control strategies
 - Host system features
 - Standard SCADA features
- **Advanced Applications**
 - Gas management systems
 - Liquids management systems
 - Leak detection
 - Training systems
- **New Technologies**
 - Internet of things (IoT)
 - Message queuing telemetry transport (MQTT)
 - Edge computing
 - Analytics
 - Cloud
- **Skills**
 - Education
 - Experience
 - Troubleshooting
 - Maintenance planning
 - Cause / effect failure analysis
- **Maintenance Planning**
 - Change requirement identification
 - Risk analysis
 - Detailed execution plan
 - Contingency plans
 - Offline development and testing
 - Communications/scheduling
 - Live system deployment
 - Verification and monitoring
 - Recent SCADA advisory bulletins
- **Forensics**
 - Critical system failure analysis
 - Review of SCADA problems and alleviation
 - Discussion of actual SCADA mishaps
 - Best practices approach to maintenance activities

Curriculum | SCADA Fundamentals Certification

- **Alarm Management**
 - API 1167 / ISA 18.2
 - Alarm rationalization
 - CRM requirements
 - Key considerations
- **Significant pipeline incidents**
 - 2005 NTSB study
 - Key incidents
- **Regulations | Standards | Procedures**
 - PIPES Act of 2006, Section 19
 - Key concepts in CRM
 - » Overview of the CRM rule
 - » Roles & responsibilities
 - » Adequate information
 - » Alarm management
 - » Fatigue management
 - » Training
 - » Compliance Management
- **ICS and SCADA Cybersecurity**
 - Introduction
 - » What is ICS/SCADA cybersecurity
 - » Why it's important
 - » Real-world incidents
 - » Trends
 - Governance
 - » Regulations
 - » Standards
 - Top 20 critical security controls