# Safe Automation in the Process Industry – Virtual Class

**Audience:**   Process Engineering, Process Automation and Process Safety personnel
**Time:**   16 hours: 8:00 am to 12:00 pm, Monday-Thursday
**CEUs:**   1.5

## Overview

*Safe Automation in the Process industry* is a 16-hour virtual course designed to orient attendees to the principles of safe automation, including the practices and terminology used to design and implement instrumented safeguards. Experienced attendees also gain an awareness of recent developments in safe automation terminology, standards, and practices.  This course covers:

- Lifecycle Process
- Human Error Management
- Safe Automation Basics
- Designing for Security
- Instrument Justification and Alarm Management
- Automation Device Selection (e.g., instrumentation, logic solvers, auxiliaries)
- Monitoring and Metrics

## Objective

The course participants gain an understanding of:

- Relationship between inherently safer design and functional safety
- Key instrumented safeguard management practices, including bypass management, change management, maintenance planning, automation organization planning, auditing, etc.
- How safe automation is included in the standard project work process

- Fundamentals of safety function specification
- Selecting automation devices that are fit for purpose and reliable
- Essentials of alarm management, including instrument and alarm justification
- Establishing metrics for automation performance

**Detailed Course Outline**

Session 1:
1.  Foundation of Safe Automation
    a.  Industry standards associated to functional safety
    b.  Functional safety plan
    c.  Safety lifecycle and project management workflow
    d.  Organization to support safe automation
2.  Automation Basics
    a.  Relationship between automation and Recognized and Generally Accepted Good Engineering Practices (RAGAGEP)
    b.  Impact of operating plan on automation design
    c.  Effective human machine interfaces
    d.  Identification of safety functions
    e.  Justification for alarms and instrumentation
3.  Fundamentals of Industrial Automation and Control System (IACS) Security
    a.  Separation and independence
    b.  Automation data access levels
    c.  Network architecture impact on difficulty of security
    d.  Difference between objectives of IACS security and office network (IT) security
    e.  Bypass management

Session Two:
4.  Procedures and People for Functional Safety
    a.  Operations procedures
    b.  Maintenance procedures
    c.  Change management
    d.  Competency management
5.  Safe Automation Metrics
    a.  Functional safety KPIs
    b.  Reliability monitoring
    c.  Performance Assurance
6.  Controlling Systematic Error in Automation Systems
    a.  Functional Safety Assessments
    b.  Functional Audits

Session Three:
7.  Hazards and Risk Analysis (H&RA)
    a.  Basic steps
    b.  Hazardous vs harmful events
    c.  H&RA complexities
    d.  Risk reduction allocation
8.  Instrumented Safeguard Functional Specification
    a.  SCAI setpoint and response time
    b.  Maximum allowable leak rate
    c.  Compensating Measures
    d.  Features for safe operation

9. Safety Requirement Specification
   a. Mode of operation
   b. Hardware fault tolerance
   c. Planning for failure

Session Four:
10. SCAI Equipment Selection
    a. Fit for purpose
    b. Prior use and certification
11. Design Performance Verification
    a. Performance is the SUM of the parts
    b. Impact of dependencies with other functions
12. Implementing for SCAI success
    a. Implementation assurance
    b. Alarm management

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