

Training  
Course

## Maintain Instrumented Protection Systems (IPS)

## Course Plan

### Introduction

Instrumented Protection Systems (IPS), also known as Safety Instrumented Systems (SIS), are critical layers of protection in industrial environments, particularly in oil, gas, petrochemical, and power plants. These systems are designed to detect abnormal conditions and take automatic action to prevent accidents or mitigate consequences.

This course provides participants with essential knowledge and skills to maintain, test, and troubleshoot IPS effectively while ensuring compliance with international safety standards such as IEC 61508 and IEC 61511. It focuses on safety integrity levels (SIL), lifecycle management, reliability, and field instrumentation.

### Course Objectives:

- ✓ Understand the principles and architecture of Instrumented Protection Systems (IPS).
- ✓ Identify the components of IPS including sensors, logic solvers, and final elements.
- ✓ Maintain and test IPS in accordance with safety standards.
- ✓ Interpret IPS documentation and safety requirements specifications (SRS).
- ✓ Understand Safety Integrity Levels (SIL) and risk reduction principles.
- ✓ Perform regular functional testing and validation of IPS.
- ✓ Troubleshoot IPS faults and ensure proper functionality.
- ✓ Apply preventive and corrective maintenance procedures.

- ✓ Ensure documentation and compliance with IEC 61508/61511.
- ✓ Enhance plant reliability and safety through effective IPS maintenance.

## Who Should Attend?

- Instrumentation and control engineers
- Maintenance technicians and supervisors
- Safety system engineers and designers
- Process engineers involved in IPS operation
- Industrial automation specialists
- HSE and compliance professionals
- Operators of safety-critical systems
- Technical trainers and engineering graduates in automation and safety

## Training Methods:

- ✓ Online Video material.
- ✓ Presentation.
- ✓ Live Interactive sessions.
- ✓ Course presenter will make extensive use of all tools that will be needed for the virtual environment.
- ✓ Questions & Answers

## Course Outline:

### Day One

- Introduction to Instrumented Protection Systems (IPS)
- Purpose and Role of IPS in Industrial Safety
- IPS Architecture and Functional Layers
- Key Standards: IEC 61508 and IEC 61511 Overview
- Safety Integrity Level (SIL) Concepts and Risk Reduction

### Day Two

- Components of IPS: Sensors, Logic Solvers, Final Elements
- IPS Lifecycle Phases: From Design to Decommissioning
- Hazard and Risk Assessment for IPS Applications
- Developing Safety Requirements Specifications (SRS)
- System Redundancy and Reliability Engineering

### Day Three

- Testing and Validation of IPS Functions
- Preventive and Corrective Maintenance Practices
- Field Device Testing (Transmitters, Switches, Valves)
- Function Block Diagrams and IPS Logic Interpretation
- Shutdown Systems (ESD), Fire and Gas Systems Integration

### Day Four

- Proof Testing Procedures and Documentation
- Maintenance Scheduling and Planning for IPS
- Diagnostic Coverage and Failure Modes
- Common Faults and Troubleshooting Techniques
- Use of Simulation and Test Tools in IPS Maintenance

### Day Five

- Management of Change (MoC) in IPS
- Cybersecurity Considerations for Safety Systems
- Roles and Responsibilities in IPS Maintenance
- Compliance Auditing and Performance Monitoring
- Case Studies from Oil & Gas and Industrial Plants

## Training Details

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|--------------------------|--|
| Course Duration          | 5 Days   |
| Pre-Schedule             | 27 – 31 October 2025   |
| Venue                    | Kaiserin Elisabeth – Hotel - Vienna  |
| Training Fees Per Person | KWD 1500 ( One Thousand Five Hundred Only )  |
| Course Fees Include      | <ul style="list-style-type: none"> <li>✓ Tuition documentation</li> <li>✓ Curriculum and Training Handout</li> <li>✓ Five star Lunch</li> <li>✓ Completion Certificates</li> <li>✓ Lunch Included</li> </ul> |