



MAESTRO
CONSULTANTS

**MAINTAIN
INSTRUMENTED
PROTECTION SYSTEMS
(IPS)**

COURSE OUTLINE 2025

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TRAINING TITLE

MAINTAIN INSTRUMENTED PROTECTION SYSTEMS (IPS)

VENUE

Vienna, Austria

DURATION

5 Days

DATES

27-31 October 2025

PRICE

\$6,500 per attendee including training material/handouts, morning/afternoon coffee breaks, and Lunch.

TRAINING INTRODUCTION

This 5-day course provides a comprehensive understanding of the principles, design, operation, and maintenance of Instrumented Protection Systems (IPS), commonly used in safety-critical industrial environments such as oil and gas, petrochemical, and power generation facilities. The course focuses on ensuring the reliability, functionality, and regulatory compliance of IPS through proper inspection, testing, and maintenance. It emphasizes the role of IPS in risk reduction and process safety, aligning with international standards such as IEC 61511 and IEC 61508.

TRAINING OBJECTIVES

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

- Understand the function and components of Instrumented Protection Systems (IPS).
- Recognize the role of IPS in overall process safety and hazard mitigation.
- Apply industry standards and regulatory requirements for IPS maintenance.
- Plan and execute periodic inspection, testing, and maintenance of IPS components.
- Troubleshoot common IPS issues and implement corrective actions to ensure integrity and functionality.

TRAINING AUDIENCE

- Instrumentation and control technicians
- Electrical and instrumentation (E&I) engineers
- Maintenance engineers and supervisors
- Process safety and reliability professionals
- Operations personnel involved in functional safety
- Project engineers involved in IPS design and implementation

TRAINING OUTLINE

Day 1: Introduction to Instrumented Protection Systems

- Definition and purpose of IPS
- IPS vs. general control systems
- Safety lifecycle and the role of IPS
- Overview of functional safety (IEC 61508 / IEC 61511)
- Risk reduction and Safety Integrity Levels (SIL)

Day 2: Components and Architecture of IPS

- IPS architecture: sensors, logic solvers, and final elements
- Redundancy and fault tolerance
- Common designs: 1oo1, 1oo2, 2oo3, etc.
- Interface between IPS and other control systems (e.g., DCS, PLCs)
- Environmental and operational considerations

Day 3: IPS Maintenance Principles

- Scheduled vs. condition-based maintenance
- Maintenance requirements for IPS components
- Proof testing: frequency, procedures, and documentation
- Managing bypasses, overrides, and impairments
- Spare parts management and change control

Day 4: Inspection and Functional Testing

- Functional testing of IPS logic solvers, sensors, and final elements

- Test procedures and validation against design intent
- Recording and evaluating test results
- Identifying and addressing test failures
- Impact of testing on process operations and safety

Day 5: Compliance, Troubleshooting, and Performance Monitoring

- Regulatory and standard compliance: IEC 61511 maintenance requirements
- Failure diagnostics and root cause analysis of IPS faults
- Monitoring system performance and availability
- Documentation and reporting for audits
- Continuous improvement and lessons learned

TRAINING CERTIFICATE

MAESTRO CONSULTANTS Certificate of Completion for delegates who attend and complete the training course.

METHODOLOGY

Our courses are highly interactive, typically taking a case study approach that we have found to be an effective method of fostering discussions and transferring knowledge. Participants will learn by active participation during the program through the use of individual exercises, questionnaires, team exercises, training videos and discussions of “real life” issues in their organizations. The material has been designed to enable delegates to apply all of the material with immediate effect back in the workplace.