MCL CONTROL

Functional Safety in Processes, Risk Analysis and Safety Instrumented Systems

Part I: Basic Concepts of Functional Safety and SIL determination studies

A.- General objectives

1. Expand practical knowledge in the application of Safety Instrumented Systems (SIS) for the process industry.
2. Know and apply the various methodologies for determining the Safety Integrity Level (SIL) of the Safety Instrumented Functions (SIF) of a Safety Instrumented System (SIS).

B.- Competences to develop.

Application of methodologies recognized in the industry for the definition of Safety Instrumented Functions (SIF) and the determination of their corresponding safety integrity level (SIL) required to guarantee the operation of a process plant within tolerable risk values. .

C.- Addressed to:

Engineers and technicians who work in the areas of risk analysis and implementation of protection layers and SIS in process plants. Engineers who want to prepare for the functional safety certification exam according to the IEC-61511 standard.

D.- Methodology:

- "Online" modality course with sessions recorded and available to be reviewed later.
- Theoretical / practical – Exercise sessions.

E.- Previous knowledge

General knowledge of industrial instrumentation and automatic control systems. Basic knowledge of process plant design. Engineering studies or equivalent, related to the area in question.

F.- _ Contents

Chapter 1.-Introduction

Dangers and risks. Risk reduction (the ALARP concept). Fatal accident rate. Safety features and functional safety. Security systems engineering. Security features. Introduction to standards: IEC 61508, IEC 61511, ISA SP 84.01. Definition of equipment under control. The security life cycle and its phases. Implications of the IEC-61508 standard on control systems.

Chapter 2.-Hazards and risk reduction

Typical dangers in various processes. Basic dangers of the process industry. Introduction to hazard analysis and the IEC model. Process control vs. protection control . la seguridad. CapasRisk classification and risk reduction. The concept of Safety Integrity Level (SIL). Practical exercise.

Chapter 3.- Hazard and risk studies

Methodologies for the study of Hazards. Risk analysis and risk reduction. Hazard studies and the safety life cycle. Evaluation of SIS requirements. Compliance with IEC requirements. HAZOPs and layer of protection analysis (LOPA). fault trees. Hazards introduced by control systems.

Chapter 4.- Methodologies for Determining the required SIL.

Methodologies for the determination of the SIL (Matrix of Protection Layers, Risk Graphs, Analysis of Protection Layers - LOPA).

F.-Required tools

Scientific calculator.

G.-Duration

5 days in sessions of 4 hours each day.