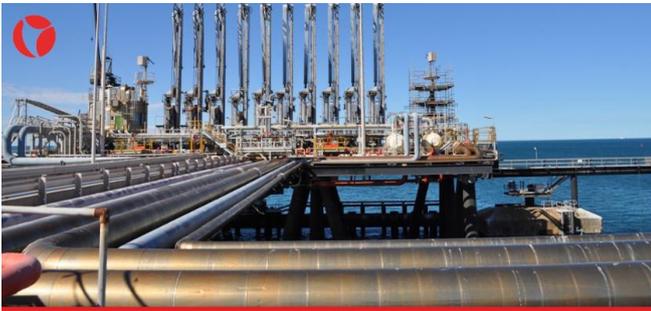




# FACT SHEET (LIVE COURSE)

## Functional Safety: SIL Allocation and Verification



**Functional Safety, SIL: Legislation, Standard and Norms, Life Cycle, Risk Analysis, Protection Layers, SIL Allocation Methods, Safety Requirements, Conceptual Design.**

### Who Should Attend?

This course is intended for graduates (or soon to be), designers, freelancers, technicians and engineers involved in: calculation, design, selection, manufacturing, safety, quality and maintenance of systems and equipment in industrial processes.

**Previous knowledge of this subject is not required to attend to the course.**

### Training Objectives

The main objective of this course is to transfer to participants the theoretical and practical skills required in projects, obtained from experience and sound engineering practices.

### Methodology

Instructor-led training course in adult learning format with discussions, individual exercises and simplified case studies, providing practical knowledge to implement in the field.

### Duration

The duration of this training course is **24 hours**, divided into several sessions to facilitate the learning process.

### What to expect?

Analyze applicable standards in Functional Safety.

Understand the need of analyzing the Process Risks.

To analyze possible protection layers and the feasibility for the existing ones.

To apply different methods for SIL allocation of SIS protections.

Understand safety parameters provided by manufacturers.

Select the SIS components per the SIL required.

To develop the SIL Verification calculations and to know its implications in the Safety System design.



## Contents

### SIS Introduction

SIS Introduction

### Applicable Codes

Regulation

Standards

Norms

### Safety Life Cycle

Safety Life Cycle

### Risk Analysis:

Hazard identification

Analysis of Consequences

Probability of Occurrence

### Protection Layers:

Protection Layers

### Viability

Viability

### Required time parameters

Process Safety Time

Maximum Response Time

Designed Response Time

### SIL Allocation methods:

Risk Matrix

Calibrated Risk Chart

LOPA (Layer of Protection Analysis)

### SRS

Safety Requirements Specification (SRS), structure and basic required parameters

### Basic Reliability Engineering

Integrity

Reliability

Failure data of equipment and systems

### Conceptual design

Conceptual design

### SIL Verification and detailed design

SIL Verification and detailed design

### Case studies in the classroom:

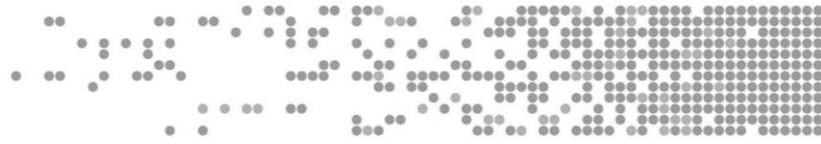
Reasoning questions to settle concepts

Protection Layers Feasibility Analysis – LOPA exercise

SIL Assignment exercises

Probability Failure on Demand (PFDavg) calculations

SIF design



## Instructor

More than thirteen (13) years of experience in multidisciplinary engineering and construction projects, in fields such as Oil & Gas, Energy and Industrial processes in general, from both the Engineering (EPC) and the end user (Production) point of views, in positions like Instrumentation and Process Control Discipline Lead and Functional Safety Manager.

**Vast experience as Coach and Trainer** (Instrumentation and Process Control, Industrial Electricity, Risk Analysis, Functional Safety, SIS...), having taught at the University and training courses for experienced professionals to EPCs and Manufacturing and Production Companies globally.

**Co-author of the book “Seguridad Funcional en Instalaciones de Proceso: Sistemas Instrumentados de Seguridad y Análisis SIL”, edited in June 2012 by Diaz de Santos and ISA-Spain.**

## Tailored Training

The most effective training is one that satisfies the needs of each company's business focus and deliverables. **We adapt our training programs to each specific requirement, offering bespoke solutions for each need.** The result, 100% tailored programs, developed to maximize the time investment and deliver tangible and intangible returns to the work teams.

After an assessment phase, a tailored training plan is de-signed jointly with the client. This plan is specifically tailored to meet the client's needs, focusing on effectively enhancing the capabilities of the work team. **We provide practical, dynamic and hands-on training**, making available the best instructors in each subject.

## Arveng Training

Arveng Training has developed effective and practical courses for the needs of today's industrial challenges by delivering specific and high-quality engineering training courses utilizing all three approaches: classroom, on-line and tailored training. We are proud to have imparted more than 100 classroom courses, 200 online courses and over 15 in-company sessions. Our training activities has benefited over 1,500 professionals. Our greatest pride is in the letters of recommendation we receive from so many of our customers in this area.

**We consider the time of our students as the most valuable.** For this reason, all our courses have been designed with the main objective of quickly the professional skills of the participants, through our expert instructors in different disciplines. **We stimulate creativity, innovation and initiative to make the participants inquisitive to bring good engineering practices and lessons learned to the field that benefits their employers in the long term.**

## Our Company

**Arveng Training & Engineering SL is a leading company providing Training and Engineering services based in Madrid, Spain.** Our mission and vision are to be a leading training and engineering services company. We are a team of highly motivated, talented high qualified professionals with more than 20 years of experience. Our main goal is to provide our clients, the best training and engineering services and to exceed their expectations in all their spheres of industrial activity, through our renowned services which are based on efficient, innovative, cost-effective and transparent principles.

Established in July 2010, mainly oriented to the industrial sector, from the very beginning Arveng has always worked with closeness, responsibility and commitment in the different areas of activity.