

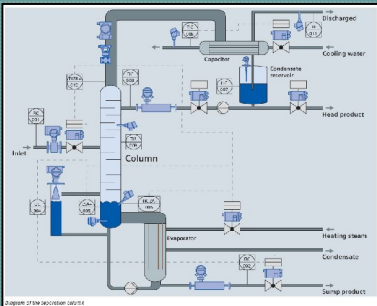


ERSG/Prod/Serv/FS/004/09

SUBJECT:
SIL RISK ASSESSMENT

OUR SERVICES COVER THE
FOLLOWING AREAS:

- Process Hazard Analysis
- Enterprise Risk Management
- Project Management
- RUBI-Software
- Business Continuity Systems
- Process Safety Management
- Risk Training Solutions



SAFETY INTEGRITY LEVEL [SIL]

Introduction

*Risk Management Solutions for
Dynamic and Progressive
Industry*

SIL is a statistical representation of the reliability of the SIS when a process demand occurs. It is used in both ANSI/ISA-S84.01 and IEC 61508 to measure the reliability of SIS. Both ISA and IEC have agreed that there are three categories: SILs 1, 2 and 3. IEC also includes an additional level, SIL 4, that ISA does not. The higher the SIL is, the more reliable or effective the system is.

SILs are correlated to the probability of failure of demand (PFD), which is equivalent to the unavailability of a system at the time of a process demand.

Services

ERSG can provide a full range of Safety Integrity Level services, using a variety of techniques / methodologies:

- Consequence only
- Risk Graph
- Layered Risk Matrix
- Risk matrix
- Layer of protection
- Fault tree analysis

OUR SERVICES COVER THE FOLLOWING METHODS

Methodology

The first step for assignment of Target SIL is to use your (updated) PHA's or conduct new PHA's to screen for the hazards. HAZOP is most commonly used methodology. If the risk is unacceptable then it is reduced or eliminated using non-SIS or SIS elements. You consider SIS only after all the non-SIS protection layers have been considered. HAZOP's identify risks in terms of the likelihood and the severity of the hazards. Target SILs are assigned to SIF's of the SIS identified in the PHA studies.

Various methodologies are available for assignment of target SILs. As in the case with PHA studies, the assignment of Target SILs must involve people with the relevant expertise and experience.

Methodologies used for determining SILs include, but not limited to:

- Consequence only, Risk Graph, Layered Risk Matrix, Risk matrix, Layer of protection, Fault tree analysis

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SIL SOFTWARE TOOL

The Lihou™ software is most frequently employed to record and manage Hazop Studies and easily configured for use in other familiar methodologies such as Process Hazards Analysis (PHA), check-list driven Hazard Identification Reviews (HazId), Risk Assessment Studies, SIL Analysis, Failure Mode and Effect Analysis (FMEA and FMECA), etc.

Requirements: 4Mb RAM, 2Mb Hard Disk, Windows®, 98, NT, 2000, XP.

