

VAIL-SIL

Safety Integrity Level

VAIL-SIL is a software product that is used to facilitate VELOSI's Safety Integrity Level (SIL) methodology for safety critical systems. SIL is a unique tool that ensures safety integrity requirements of safety functions are maintained. These requirements are allocated placements within the E/E/PES safety related systems. E/E/PES is a term introduced by IEC61508 standards, which stands for Electrical/Electronics/Programmable Electronics Systems.

VAIL-SIL allows you to quantify the SIL level for safety critical systems such as a glycol contractor, recycle compressor, production separator, etc. and helps you to identify the safety level of your equipment.

Methodology

Various methodologies are available for the assessment of target SILs. VELOSI has implemented three different methodologies:

1. Layer of Protection Analysis (LOPA)
2. Risk matrix
3. Risk graph

Key features

VAIL-SIL is not limited to calculating or finding out target SILs only, it also includes:

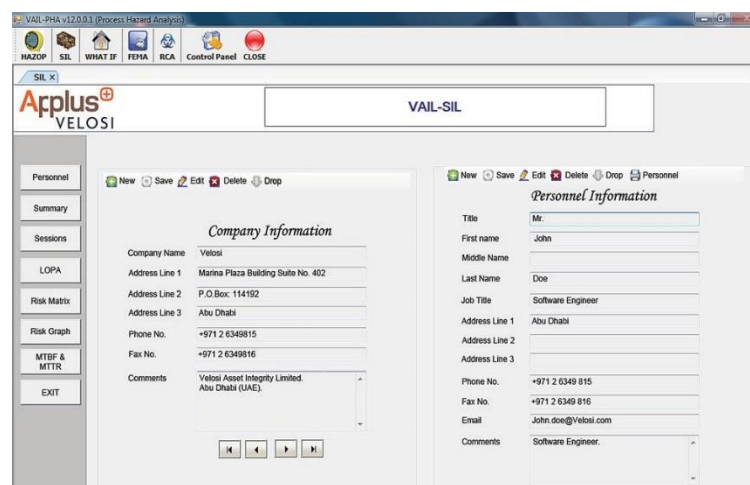
- Overall summaries of SILs with mutual comparison of all the three above mentioned methodologies
- Target PFD calculations
- Testing interval calculations
- Mean Time Between Failure (MTBF)
- Mean Time To Repair (MTTR)
- Dynamic reporting
- SIL Study Session Team's Record Management, etc.

Layer of Protection Analysis

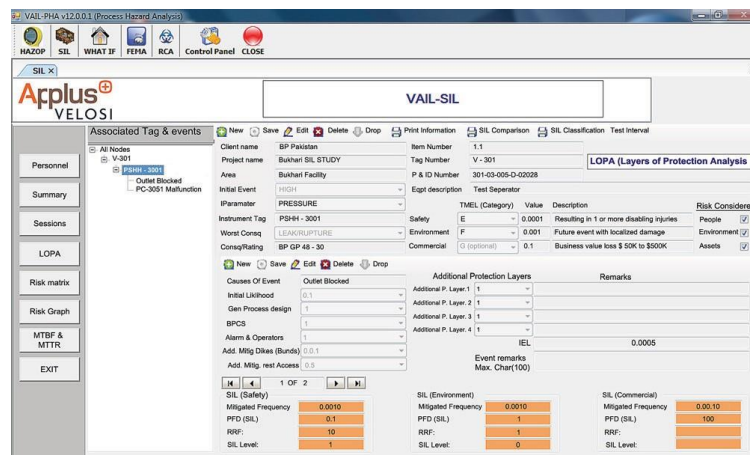
The LOPA method was developed by the American Institute of Chemical Engineers as a tool for assessing the SIL requirements of SIFs (AIChemE 1993).

Advantages

- Can be used both as a relatively coarse filtering tool and for more precise analysis.
- Can be performed as a team exercise; at least for semi quantitative assessments.
- Facilitates the identification of all relevant risk mitigation measures and taking credit for them in the assessment.



VAIL-SIL Main screen view



VAIL-SIL Layers of Protection Analysis (LOPA) data section

Risk matrix

Risk Matrix is a tool used in the Risk Assessment process. It allows the severity of the risk of an event occurring to be determined. The best feature of VAIL-SIL is that it can perceive dynamic changes and can show risk levels, SIL levels and relevant box selection in the matrix as well.
Risk graph

Risk graph methods are widely used for reasons outlined below:

Benefits

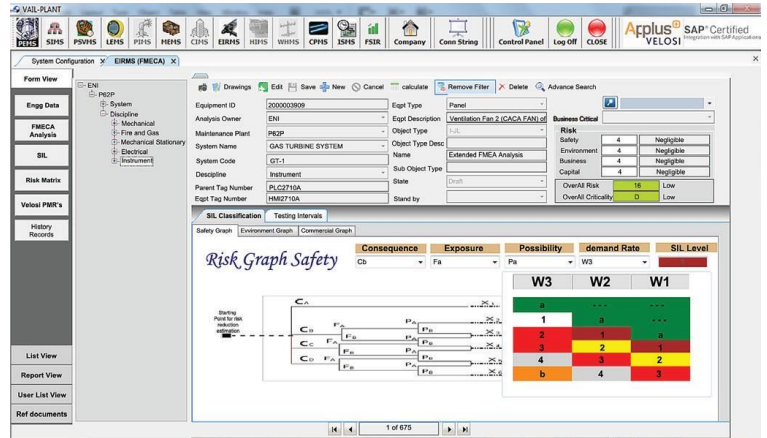
- They are semi-qualitative/semi-quantitative
- They are normally applied as a team exercise
- They do not require a detailed study of relatively minor hazards.

Testing interval calculation

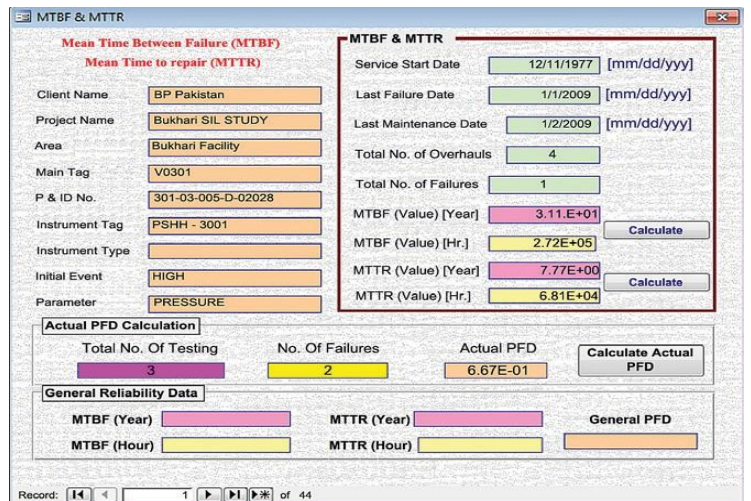
IEC-61508 has been implemented in VAIL-SIL to calculate the testing interval based on selected PFD and Architecture (Voting). VAIL-SIL also has a feature to find the Probability of Failure on Demand which can be categorized as calculated PFD and actual PFD.

MTBF and MTTR

VAIL-SIL has a feature to calculate the Mean Time between Failure and Mean Time to Repair along with general reliability data as well.



VAIL-SIL Risk Matrix screen overview



Testing interval calc. & reliability data overview