TECHNICAL FACTS
Safety Lifecycle Digitalization

HIMA SMART SAFETY.

#safetygoesdigital

SIF Performance Monitoring

Ensuring the Effectiveness of Your Safety Instrumented Function

Understanding the Importance of Safety Instrumented Functions

Safety Instrumented Functions (SIF) are essential components within a plant's safety architecture, designed to activate only when there is a process demand to prevent potentially catastrophic hazardous scenarios. The integrity of these critical safety loops is very important, as they serve as a last line of automated defense against high-risk events. However, during plant operations deviations from the original expectations or the original design assumptions may arise and get unnoticed. This discrepancies are often a symptom of an issue within the design, improper operational practices, or a misalignment between the SIF's configuration and the real-world demands of the plant.

Unintended activations of SIFs can signal a deviation from the ideal safety design and also lead to unnecessary disruptions in production, resulting in significant production losses. By closely monitoring the performance of SIFs, it is possible to gain critical insights into the effectiveness of our safety measures, identify areas for improvement, and ensure that the system is functioning as intended, thereby safeguarding both the plant and its operators from unnecessary risks.

Regular evaluation and fine-tuning of these functions are essential for maintaining an optimal balance between safety and operational excellence. By ensuring that SIFs are designed, implemented, and maintained correctly, it is possible to minimize the likelihood of unnecessary activations, reduce downtime, and enhance the overall safety and efficiency of the plant.

Why SIF Performance Monitoring Matters

After a successful commissioning and startup of a Safety Instrumented System, normally it lasts in the operation phase for over 20 years. During these years of operation, the maintenance teams carry out their maintenance and testing routines which sometimes may not be fully completed. Additionally, changes on the SIS are often required to keep the system actual along the long period of operation. These changes may include adjusting set points, changing hardware, adding new loops, modifying logic, and more.

As a result a gap can develop between the initial design and the current status of the Safety Instrumented System, and this gap gets bigger over time and may lead to deviation in safety performances and negative production impacts.

Monitoring the performance of Safety Instrumented Functions (SIFs) supports closing this gap to the minimum level and provide further insights into critical performance indicators to support informed decision-making process.

Highlights

- Read out data from the Safety Logic Solver to access process safety events related to SIF and take up from that.
- Build your SIF structure and get automatic identification of events for any voting structure.
- Manage your SIF following the asset structure and sort/group data per unit, site, or entire enterprise.
- Make sure design criteria are fulfilled during operation, have an easy evaluation of changes, and maintain safety performances to the highest level.
- Design vs. actual demand mode: Automatically compare the design demand mode with the actual demand mode to identify discrepancies.
- Model your SIF down to the device level and push performance evaluation deeper.
- Device-Level Monitoring. Examine the status of input/output devices within each SIF, including detected failures, total number of failures, and active bypass status.

A Holistic Approach to Enhanced Safety and Efficiency

1 **Compliance with the Design**
Now operators can monitor how much each SIF is complying with the initial design. The HIMA solution alerts the operators whenever the safety perfromance degrades from the initial design.

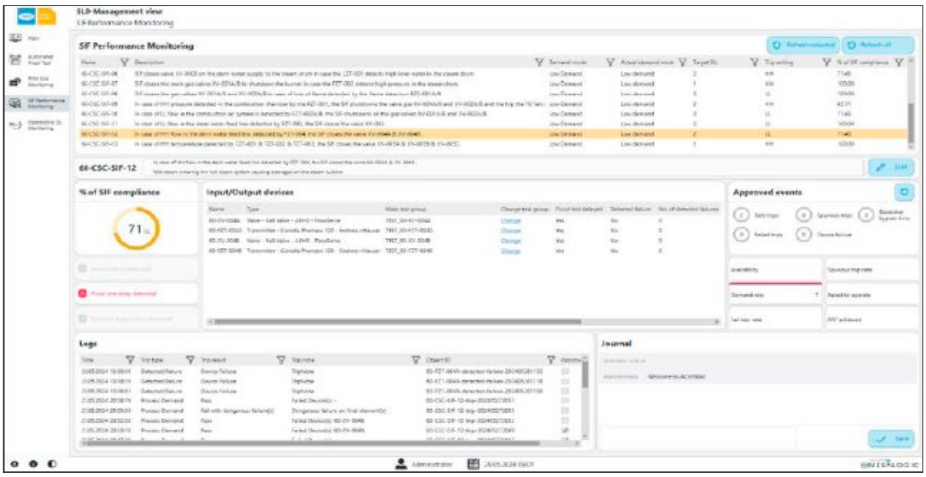
2 **Efficient Maintenance**
The package monitors the performance of each SIF, offering valuable insights into which SIF requires more attention from the maintenance team. This proactive approach helps operators prevent trips and maintain their production levels at optimal limits.

3 **Resources Optimization**
An average plant contains hundreds of SIFs. The amount of man hours needed to collect and analyze data for each single SIF is challenging. The solution collects these data automatically, processes them, and provides KPIs without human intervention.

4 **Document Management System**
Process safety data are spread across different departments and can be found in different formats. The HIMA solution consolidates all essential data onto a single platform, streamlining the documentation process.

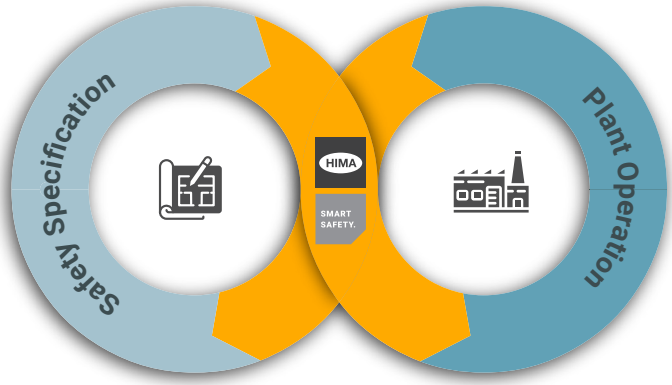
SIF Performance Monitoring Indicators

SIF Performance Monitoring application is a comprehensive digital solution that leverages cutting-edge tools to deliver a tailored and effective application. It integrates SLM, the only TÜV-certified Lifecycle Management System, with a specialized HMI Dashboard system, providing users with a streamlined experience for monitoring and maintaining functional safety throughout operations.



Detailed overview of the SIF Performance Monitoring Package.

For each SIF, the package automatically monitors certain performance indicators (PIs), contributing to overall SIF compliance against the design specifications. These include SIF Availability, Spurious Trip Rate, Demand Rate, Failed to Operate Rate, Fail Test Rate, and Risk Reduction Factor (optional).



Benefits

- Reduced downtime and improved safety
- Automation and resource optimization
- Enduring compliance and improved monitoring
- Risk management and performance insights
- Operational efficiency and informed decision-making

Included Services

	Service Type	Description	Implementation Phase
1	Digital Ready Service (optional available)	Evaluating the existing infrastructure, identifying the gaps, and recommending action plan	Before
2	Implementation and Integration Services	Configuration, set-up and integration into existing systems	During
3	Training and Onboarding	Comprehensive training for optimal use of the package	After
4	Consultation and Advisory Services (optional available)	Ongoing consulting services to analyze the data and make further recommendations	After