Sustainable SIS Solution

Maintain safety integrity and competency throughout the process plant life cycle
Yokogawa recognizes the continuous challenges for plant owners to operate/maintain process safety integrity throughout the whole life cycle of their plant. Yokogawa has come up with a Sustainable SIS (SSIS) solution. This holistic approach ensures that not only an optimum safety solution is realized, in addition maintainable throughout the lifetime of your plant. Yokogawa’s SSIS solution allows you to retake ownership of your process safety environment by making it comprehensible, manageable, compliant and secure. SSIS solution provides peace of mind allowing you to focus on your core business.

**Safety Application**
- Securing Solution
- Monitoring Solution

Clear visualization of your safety applications
- Implicit compliance by embedded functional safety management
- Management of the safety application for the life of the process

SSIS solution allows safety application to be maintained at the required level at ease in accordance with functional safety standards IEC 61508 and IEC 61511 throughout the plant life cycle. This is achieved by providing the following solutions:

- Current safety standards require the actual safety performance of a process to be verified against the design performance target and assessment of plant safety when SIS is bypassed. This is achieved by providing the following solutions:

**Safety Application Securing Solution**
- Improve
- Safety Performance Monitoring Solution
- Monitor & Analyze

**Safety Performance Monitoring Solution**
- Implement
- SIL 3 Safety Instrumented System ProSafe-RS

**Sustainable SIS (SSIS) Solution**
Clear visualization of your safety applications

1 Challenge

Considering the potentially huge impact of incidents in the process industries, every person involved with the Safety systems on our site has a responsibility to assure operational integrity. With our many systems, understanding their current functionality and design is complicated.

2 Challenge

Recently I joined this company as an operator. I want to grasp the process safety related requirements of functional safety standard IEC 61511. However, it is challenging and difficult to interpret the SIS application program and it is worrying whether it can actually be effectively understood.

3 Challenge

In a realization phase, I do not know whether the safety requirement specifications behave as expected until the test begins. If a big problem is found in the test, it will affect the schedule. I want to confirm it at an early stage, however it is difficult and time consuming to verify the logic on paper.

SSIS solution provides a more tangible visualization of your safety applications.

- SSIS solution represents process safety functions in the form of design documents, cause & effect matrices and state/transition diagrams. It makes the functionality easy to understand by all departments, not just application engineers.
- Operators, maintenance and process engineers can interactively support design and problem solving!
- The cause & effect matrix and state/transition diagrams can be dynamically simulated. Designs and modifications can be extensively tested with simulation offline before deployment.

Safety Requirements Specifications (SRS)  Application expressions by SSIS solution

Import design  Cause & effect matrix

Application simulation by SSIS solution  Easy to test  Simulation  Easy to understand

State/transition diagrams
SSIS solution makes it possible that realization in accordance with functional safety standards IEC 61508 and IEC 61511 will be deliverable with global consistency.

- SSIS solution has embedded management functions for ensuring functional safety management procedures in accordance with functional safety standards IEC 61508 and IEC 61511. These management functions mean that Yokogawa can provide globally consistent safety engineering with homogeneous quality compliant with the recognized best practices.
- For extensions and modifications, SSIS solution provides high-quality managed engineering. The change records and test scripts are captured and maintained in the database for smooth project execution. Furthermore, the potential direct and indirect impact of changes can be analyzed in detail by using the simulator features as recommended in the standards.

SSIS solution can securely maintain the "consistency" of the safety system information.

- All information for a safety instrumented system is registered in SSIS solution database. It is easy to recover historical activities relating to engineering and changes.
- The latest design documents can be automatically generated at any time ensuring there is no inconsistency with the application currently being implemented. Modifications can be planned on a design document basis with peace of mind.

Items stored in the database
- Design documents
- Application software
- Change records
- Test records and test scripts
- Engineering organizations and procedures

Management of the safety application for the life of the process

I am thinking about modifying the plant, but the safety system was installed 15 years ago and the person in charge at that time has retired. I do not know what small incremental modifications have been carried out or why. I am concerned about whether the available design documents reflect the current SIS status.
SSIS solution provides continuous improvements of plant safety.

- SSIS solution collects automatically safety statistic to be used for Safety Instrumented Functions (SIFs) improvement.
- SSIS solution provides evidence of safety performance and SIFs availability records for audit by regulatory authority.
- The designed safety performance is compared against the actual operational safety function activity, to highlight issues, validate safety design, optimize test scheduling and help users improve safety and availability of the plant.

SSIS solution facilitates decision making prior to override.

- SSIS solution helps you assess the impact of overrides before their implementation including effects which may manifest in other equipment. It improves visibility of potential unsafe situations and increases safety compliance by aiding policy enforcement and traceability.

Current Plant State

Oil Booster Pumps

Main Oil Line

Override Target

What is going to happen?

See whether there are sufficient protections by other SIFs – **before executing**.
**Get SIStainability!**

- How can I get SIStainability, SSIS solution, in our plant? SSIS solution can be adapted to your plant by installing and engineering ProSafe-RS and following SSIS solution enablers.
- What if my current SIS is not a Yokogawa solution? Yokogawa can reverse validate existing SIS solutions into SSIS solution environment and regenerate your safety applications functionality on a Yokogawa ProSafe-RS platform.

SIL3 Safety Instrumented System

**SSIS solution enablers**

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iDefine for ProSafe-RS is developed by Trinity Integrated Systems. It can be purchased only from Yokogawa.

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Syllabic Business Automation underlies a process of co-innovation and collaboration with customers that leverages Yokogawa’s domain knowledge and digital automation technologies to create sustainable value.

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Represented by: