

# Online asset management for safety instrumented systems

An online asset management system can more effectively meet requirements of IEC 61511 for safety instrumented system (SIS) applications. If properly designed and managed, asset management software can help manufacturers more easily meet regulatory requirements while reducing overall costs. These benefits stem from faster installation and commissioning of SIS field devices, easier safety instrumented function (SIF) checkout, faster and safer proof tests, more accurate documentation for regulatory and insurance purposes, and simpler management of changes in the system.

Multiplexers, where used, meet the requirements of IEC 61511. Use of HART devices entails logging with the Hart Communication Foundation and adherence to published specifications and standards. To ensure safe use, a system administrator must be certain that password security setup allows access only by those authorized to perform maintenance on SIS devices through this system.

You also need to establish procedures to ensure proper use of handheld communicators with these devices. And, if the system you're implementing requires multiplexers, you'll need to account for failure rates in the probabilistic analysis of each SIF. Those responsible must get training in the execution of SIS procedures, general requirements of SIS operation and maintenance, and proper operation of the asset management software.

With proper system implementation, processing companies can adapt an online asset management system to the requirements of a SIS to help meet regulatory requirements. Key features of some online asset management systems that apply to the SIS technology in a process plant include easy access to device diagnostics, user security, automatic documentation, storage of device data, efficient SIF proof testing, and calibration verification.

SIS operators will benefit through faster installation and commissioning, thorough SIF checkout, faster and safer proof testing, accurate documentation meeting regulatory and insurance requirements, and careful management of change.

## The SIS process

SISs commonly take a process to a safe state when processes exceed or violate a dangerous level. They allow the process to move forward in a safe manner when conditions allow. The SIS may also mitigate consequences of an

industrial hazard, should one occur. They are typically passive, taking action only when the special instrumentation that is a part of the SIS detects a dangerous condition. It's critical that all elements of a SIS are in correct working order, so periodic testing of the various components is necessary.

Advanced asset management systems interface with basic process control networks, communicating directly and continuously with the smart field devices that are essential to process automation. As such, they're capable of acquiring diagnostic data each field device generates, archiving that information in a comprehensive database, and processing the data to make it easier for plant personnel to keep track of and manage their most important production assets.

## Using multiplexers

A typical HART termination panel uses a resistor to extract HART signals routed to the multiplexer. Transmitter signals do not pass through the multiplexer, and therefore the multiplexer is not considered part of the SIS.

Several manufacturers have had component-level failure modes, effects, and diagnostic analysis (FMEDA) of their equipment, which included providing worst-case dangerous failure rates for use in probabilistic SIL verification. If the SIF meets the probabilistic integrity requirements, the HART multiplexer may be connected at all times. This is a key factor enabling the system under evaluation to fulfill other requirements of the IEC 61511 standard.

Periodic online test and inspection procedures check for assurance that expected SIS parameters as stored in the database are still current. Inspectors can then track down any unauthorized changes found during periodic inspections, such as changes made inadvertently using a handheld field communicator.

Certain asset management systems can remotely activate online self-test facilities now available in smart instruments. This can satisfy the need for partial online SIF testing, extending the time period between offline tests. The software should automatically create a record of each test and allow additional comments by authorized personnel.

## Behind the Byline

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By Rustin Ekness

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