DeltaV SIS™ for Process Safety Systems
Smart Safety Loops. Reliable Process.
The DeltaV SIS™ system helps you reliably protect your assets and improve your plant performance. Increased safety integrity is provided by continuously monitoring the ability of sensors, logic solvers, and final elements to perform on demand, with faults diagnosed before they cause spurious trips. The Smart safety instrumented system (SIS) approach increases process reliability and reduces lifecycle costs.

Smart SIS
Optimized process reliability.

Smart SIS, an extension of the PlantWeb™ digital plant architecture, provides an integrated approach to complete safety loops—from sensor, to logic solver, to final control element. As a key component of Emerson’s Smart SIS, the DeltaV SIS system shuts down your plant when needed for safety, but keeps you running safely when devices fail.

Modular Distributed Architecture
Flexibility to meet your project needs.

The unique modular, distributed architecture enables you to custom fit the system to your SIS applications. This modularity gives you the capability to meet changing project requirements. The DeltaV SIS architecture is flexible to help provide the safety you want, when you want, where you want.
As an integrated control and safety system (ICSS), the DeltaV SIS and DeltaV systems share the same engineering, maintenance, and operations environment. All safety-related information is easily accessible through familiar and intuitive applications.

The integrated but separate architecture meets IEC 61508 and IEC 61511 requirements for physical separation and independence of safety and control. The DeltaV SIS system delivers the benefits of total integration and total separation without the tradeoffs associated with the two extremes.

As a stand-alone system, DeltaV SIS can easily be integrated with control systems from other vendors using interfaces that are based on open communication standards, such as Modbus, OPC and OPC Express Interface (Xi).

The IEC 61508-certified SIS function blocks deliver powerful functionality out of the box, simplifying the implementation of complex SIS applications. No custom code is required to implement common SIS tasks. The result is faster configuration and troubleshooting of SIS logic.

Standard operator faceplates automatically provide detailed safety information with no configuration. Using these SIS function blocks can help eliminate engineering hours required to implement emergency shutdown (ESD) systems, fire and gas systems (FGS), and burner management systems (BMS).

The DeltaV SIS system is built for IEC 61511 compliance, providing stringent change management, security management, and documentation tools. The system is certified by TÜV for use in safety integrity level (SIL) 3 applications without restriction. DeltaV SIS is built from the ground up to simplify IEC 61511 compliance, eliminating your concerns related to proper implementation.
The proven PlantWeb digital plant architecture helps you detect operations, process, and equipment problems before they even occur, so you can move from reactive to proactive and profitable management.

Only Emerson Process Management reliably protects your assets by providing an integrated approach to complete safety loops. Improve your performance by continuously monitoring and diagnosing the ability of the sensors, logic solvers, and final control elements to perform on demand as required.

The DeltaV SIS system is IEC 61508 certified for use in SIL 3 applications and provides a comprehensive solution for your process safety system.

- Modular DeltaV SIS logic solver with configurable HART™ I/O
- Embedded digital field communications and integrated asset management
- Integrated operations environment with easy access to all safety and control information
- Intuitive function block engineering environment with integrated change management
- Automatic event reporting of safety information
- Non-intrusive simulation for training and offline testing.
The integrated control and safety system architecture delivered by the DeltaV and DeltaV SIS systems provide reliability and redundancy.

- Ethernet network connections
- Controllers
- Digital HART I/O and classic field interface cards
- Modbus RTU/ASCII interface
- DeltaV SIS logic solvers
- SISNet communications
- Zone servers
- OPC servers
- Backup workstations

**Digital Communications**

- HART
- Modbus RTU/ASCII/TCP
- Ethernet/IP
- OPC
Smart SIS Optimizes Process Reliability

An integrated approach to the entire safety instrumented function (SIF)—from sensor, to logic solver, to final control element—shuts down when needed for safety, but keeps you running safely when components fail.

A total loop approach to safety
Emerson’s Smart SIS is the extension of the PlantWeb architecture to safety instrumented systems. With integrated digital communications and device diagnostics from the sensor, to the logic solver, to the final control element, DeltaV SIS shuts down your plant when needed for safety, but keeps you running safely when components fail.

Safety instrumented systems perform a critical role in providing safer, more reliable process operations. Based on industry research, over 92% of all faults in SIS application occur in field instruments and control elements. Therefore, it is critical to consider the entire safety instrumented function as a complete entity. As a smart solution, the DeltaV SIS system continuously monitors the ability of sensors, logic solvers and final elements to perform on demand while diagnosing faults before they cause spurious trips. Digital HART communications is the enabler. This approach increases process availability and reduces lifecycle costs.

Digital transparency
The PlantWeb digital plant architecture enables the use of digital intelligence and predictive diagnostics to increase system availability while reducing life cycle costs and enabling easy regulatory compliance. Emerson products (sensors, systems, and final control elements) are third-party certified to the IEC 61508 standard for use in safety-rated applications.

The DeltaV SIS system
Pressure to keep your plant safe 24 hours a day, 7 days a week is relentless. Equipping your safety instrumented system with today’s digital technologies is your best path to addressing this requirement. A highly reliable safety system starts with predictive intelligence, which provides a wealth of diagnostic information, enabling you to predict and prevent problems before they occur. The DeltaV SIS system is a comprehensive solution for your safety system with the power of embedded digital communications—all day, every day.

Smart logic solver
Bulky logic solvers and multiplexers can now be replaced with state-of-the-art logic solvers that support digital communications to continuously monitor the health of the entire SIF. The DeltaV SIS logic solver, built for digital communications with safety sensors and final control elements, uses the power of predictive field intelligence to increase the overall reliability of the entire SIF. It is TÜV-certified without exception for use in SIL 1-3 safety applications as defined by IEC 61508.
Smart devices deliver predictive and health diagnostics
By replacing switches with transmitters, you take the first step toward reducing undetected failures. Smart transmitters have far fewer dangerous undetected failures than switches. Emerson’s smart sensors, such as Rosemount™ and Micro Motion™ devices, go beyond detecting component failures. They evaluate the performance of the complete measurement system, extending diagnostics to detect formerly undetectable dangerous failures outside the physical bounds of the transmitter—providing both transmitter and process diagnostics.

The end result is greater credit for failure-on-demand calculations, easier compliance with IEC 61511 guidelines, higher safe failure fractions, less redundancy, less proof testing and longer intervals between proof tests.

Smart final elements reduce risk
FIELDVUE™ digital valve controller instruments provide automated performance monitoring and testing by enabling remote partial stroke testing while the safety valve is online. This keeps personnel safely away from the valve’s location. The FIELDVUE DVC6000 SIS for emergency shutdown applications is third-party certified for use in SIL 3 applications.

FIELDVUE instruments have extensive diagnostics to monitor travel deviation, pressure deviation, valve packing friction and more. Information is communicated back to the DeltaV SIS system and the AMS™ Device Manager software.

The SIL-PAC solution incorporates Emerson’s industry-leading actuators, digital valve controllers, solenoids, and valves to provide a SIL 3 certified valve solution:
- Bettis™ G and CBA actuators
- Fisher™ DVC6000 SIS controllers
- ASCO™ solenoids
- Fisher™ valves.

Smart partial stroke testing extends test intervals
Automated partial stroke testing of valves can improve safety integrity, reduce the number of risky personnel trips into the field, and extend the time between mandatory proof tests. Automated partial stroke testing results in increased confidence that the valve will perform on demand while reducing costs. Partial stroke tests can be automatically initiated by the DeltaV SIS logic solver or manually initiated from standard operator faceplates. The DeltaV SIS system communicates with the DVC6000 SIS via the HART protocol so no additional wiring or components are required to automate partial stroke tests. Partial stroke test results are automatically recorded in the DeltaV Event Chronicle for easy documentation.

Asset management helps increase plant availability
AMS Suite™: Intelligent Device Manager enables you to monitor and maintain field devices. Intelligent device diagnostic information allows staff to respond quickly and prevent unexpected downtime. Automatic documentation provides complete device maintenance records.

Key Benefits
- Enables safer plants
- Increased availability
- Reduced lifecycle cost
- Simplified regulatory compliance

Key Features
- IEC 61508 certified sensors, logic solvers, and final elements
- Integrated asset management from AMS Suite
- Integrated digital device diagnostics ensures reliability
  - Extended health diagnostics detect device failures
  - Device alerts enable quick action
  - Inherent SIS signal status propagation
  - HART PV vs. analog value comparison
  - Automatic partial stroke testing
  - Automated proof testing
- Integrated documentation tools
The unique, modular distributed architecture enables you to custom fit the system for your SIS applications. Modularity gives you the flexibility to meet changing project requirements. The DeltaV SIS architecture is flexible to help provide the safety you want, when you want, where you want.

Applications that require safety instrumented systems to reduce risk come in all sizes and topologies. You need an SIS offering that can handle the smallest to the largest application and one that has the flexibility to address widely distributed architectures. The modular SIF-based DeltaV SIS architecture delivers the capability to meet changing project requirements.

**Flexible architecture**

Whether you have an isolated boiler or a large ESD application, the DeltaV SIS system scales to help provide the safety coverage you require for your SIL 1, 2 and 3 applications. Unlike other approaches, the modular logic solver hardware scales in sizes of 16 configurable I/O. This means you automatically add memory and logic solver processing every time you add I/O. The days of running out of memory or processing power are over.

**A SIF-based approach**

The DeltaV SIS architecture allows you to concentrate on the design of each SIF—each logic solver is a container for a small number of SIFs and there can be no unplanned interaction between them. This is very different from the traditional approach where hundreds of SIFs are all placed in a single safety PLC and the effect of changing a single register or the addition of a SIF could affect all of the logic. The DeltaV SIS architecture isolates SIFs, eliminates single points of failure, and simplifies change management. For complex applications, which require multiple SIFs acting on the same final element, input data is shared among multiple logic solvers so that cause and effect logic can easily be implemented in a single SIS module.

Given this flexibility, the DeltaV SIS system is ideally suited for all safety applications up to SIL 3: from small burner management applications to large ESD and fire and gas applications.
**Key Benefits**

- Increased engineering flexibility
- Increased overall reliability
- Isolated failures—no single point of failure
- Isolation of changes and maintenance
- Adding new SIFs does not affect existing SIFs' logic, scan rate, or execution
- Custom fit for applications
- Can implement centralized or decentralized
- SIL 3 certified without restriction
- No repair time required for degraded mode
- Fits any size application

**Key Features**

- A SIF-based approach to logic solving
- Modular logic solver with configurable I/O
- Scalable from 16 to 30,000 I/O
- Flexible redundancy
- SIL 3 rating for simplex and redundant SLS
- Deterministic scan rate
- Remote I/O capability
- Expandable online
- SIL 3 certified SISNet communications
- Up to 62 km distances between nodes

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**SLS 1508 logic solver**

Key features of the SLS 1508 logic solver include:
- SIL 3 certified by TÜV
- 24V DC redundant power
- dual-modular redundant logic processing
- dual-voting on output channels
- 16 channels per logic solver
- configurable HART I/O for AI, AO, DI, and DO
- line fault detection on all I/O
- 50ms execution
- -40° to 70°C temperature rating (compliant with NAMUR NE 21 temperature rating)
- ISA G3 (corrosive environment rating)
- I/O published locally every scan on redundant peer-to-peer links
- data integrity checking every scan
- online logic modification.

**Redundant logic solver**

You can increase the availability of your SIS loops with a redundant pair of SLS logic solvers. Key features include:
- quad-modular redundant logic processing
- quad-voting on output channels
- separate power
- same input data for each logic solver
- continuously drives output channels if a redundant partner fails
- automatic online proof testing
- in-situ hardware and software upgrades.

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The flexible, modular SLS 1508 logic solvers can be installed in redundant pairs for increased process availability.
As an integrated control and safety system, DeltaV and DeltaV SIS provide increased visibility into your process. DeltaV SIS is integrated with the DeltaV system’s engineering, maintenance and operations environment. All safety-related information is easily accessible through familiar and intuitive applications. The integrated but separate architecture meets IEC 61511 requirements for physical separation and independence of safety and control. The DeltaV SIS system delivers the benefits of total integration and total separation without the tradeoffs associated with the two extremes.

**Operations**
The operator interface provides a powerful environment for safety operation, with built-in features for easy information access. Alarm management, operator navigation, standard faceplates and detail displays provide a consistent and intuitive operating environment.

To more effectively operate your plant, operators have one common operating environment for both the basic process control system (BPCS) and SIS when using the DeltaV control system. This integrated operator interface includes alarm handling, time synchronization, user security and device health monitoring.

Should an emergency stop be required for the application, two mechanisms may be used. You may hard-wire a physical emergency shutdown mushroom button to the input of a logic solver. You may also soft-wire an emergency shutdown and display it on an SIS graphic on the operator station. To comply with IEC 61511, the DeltaV SIS system requires a repeat confirmation on the emergency shutdown action before it will take effect—avoiding an accidental shutdown.

**Engineering**
The DeltaV SIS system gives you the benefits of drag-and-drop function block configuration, comprehensive security and explorer-based software for intuitive project implementation. The engineering software allows you to manage all aspects of your system configuration, including hardware configuration, control strategies, built-in change management and history.
The DeltaV SIS system maintains proper security on safety logic software and makes the management of required safety logic modifications easier.

For DeltaV BPCS users, the integrated configuration environment simplifies and streamlines the engineering effort. This integrated approach eliminates time-wasting, difficult-to-maintain data mapping and handshaking logic that is common with disparate systems. Additionally, non-intrusive simulation allows for comprehensive testing of safety logic before installation.

**Maintenance**
To manage change and maintain compliance over time, the DeltaV SIS system provides comprehensive version control and audit trail functionality for required engineering modifications. Electronic signatures ensure proper authorization for online changes. To support compliance documentation requirements, a comprehensive history of plant safety events are automatically recorded. AMS Device Manager provides detailed diagnostic information to diagnose device problems quickly and correctly. It also documents and archives instrument configurations and changes, as well as health information and alarms.

**Connecting to existing BPCS**
No matter what DCS or PLC you are using as your basic process control system, you can increase your plant’s availability using the advanced diagnostics in Emerson’s Smart SIS solution.

**Modbus integration**
Modbus RTU and Modbus TCP can be used to integrate the DeltaV SIS system and your BPCS. Modbus brings the advantage of familiarity to most users, as well as the comfort of decades of proven reliability.

**OPC Xi and OPC**
The DeltaV SIS system can connect with your non-DeltaV BPCS via OPC or OPC Xi. All operating and event information is available to your operator interfaces and history collection software as part of an integrated solution.

OPC Express Interface (Xi) is a new data communications interface developed by many diverse process automation suppliers. OPC Xi connectivity provides secure, robust, firewall-friendly data access to real-time and historical process data, as well as real-time alarm and event data.

**Key Benefits**
- Reduced safety lifecycle costs
- Equipment and installation costs
- Engineering and maintenance costs
- Reduced training costs
- Easier regulatory compliance
- Robust security
- Increased visibility into the process

**Key Integration Features**
- Simplified architecture with no mapping of data
- Integrated engineering, maintenance and operations environment
- Time synchronization and event collection
- Security management with SIS locks
- Advanced alarm management
- Change management including version control, audit trail and electronic signatures
- Integrated, non-intrusive ICSS simulation for testing and operator training

**Key Separation Features**
- Built-in IEC 61511 compliance
- Separate hardware for control and safety
- Separate power for control and safety
- Separate control and safety networks
- Gateway between SIS and control network provides firewall protection
Certified Function Blocks Reduce Engineering and Complexity

Provides powerful functionality out of the box, simplifying the implementation of complex SIS applications.

No custom code is required to implement common SIS tasks with the IEC 61508 certified function blocks, providing faster configuration and troubleshooting of SIS logic. Standard operator faceplates automatically provide detailed safety information with no configuration. Using these function blocks can help eliminate engineering hours previously needed to implement ESD, FGS, and BMS applications. The certified function blocks deliver powerful functionality out of the box, simplifying the implementation of complex SIS applications.

Intuitive safety software functions

The DeltaV SIS system provides a full palette of smart safety function blocks certified by TÜV for safety applications. Special blocks like MooN voter blocks with bypass management reduce what used to be pages and pages of ladder logic or custom programming to engineer, test, and commission into a simple drag-and-drop configuration activity. Using standard function blocks instead of custom programming makes it easy for engineers to troubleshoot and maintain logic, even if they did not create it.

Other capabilities that make the certified DeltaV SIS software intuitive include:
- built-in sequence of events handler with automatic first-out trapping
- built-in maintenance bypasses
- easy compliance to IEC 61511 standard
- non-intrusive simulation
- built-in alarm management per EEMUA 191 standard
- standard operator faceplates automatically provide safety information with no configuration.

Status handling

Input processing provides status handling with no need for custom code and different options are available. For example, voter blocks can automatically degrade voting when an input value is bad. With integrated HART I/O, device diagnostic information is automatically presented to operations with no additional configuration.
Sequence of events
Built-in sequence of events handler, with automatic first-out trapping, eliminates hours of engineering while reducing testing and simplifying maintenance.

Voter function blocks
Voter function blocks provide advanced features like built-in bypass and deviation alarms to improve plant availability. The voting is configured using radio buttons and check boxes with extendable blocks ensuring the same approach is taken throughout the configuration, regardless of the application size.

Voter blocks include advanced features such as maintenance and startup bypasses with a variety of options to meet your application needs.

Cause and effect function blocks
Traditional SIS project requirements are typically detailed using cause-and-effect matrices (CEM). Once approved, these are often translated into logic diagrams and ultimately into ladder logic of the selected supplier. No more. With the CEM function block, the cause-and-effect diagrams can be deployed directly in the logic solver, enabling fast configuration and reduced testing. The CEM table executes as it is presented. Documentation is easy, since the CEM configuration is the logic that executes.

CEM function blocks include advanced functionality, including a state machine for each effect to handle trip status, resetting and forcing of outputs.

State transition and step sequencer function blocks
Function blocks for state transitions and step sequencing provide powerful functionality out of the box for BMS applications. These function blocks convert what is typically a very complicated set of custom logic into a simple, intuitive configuration task that is easy to implement, troubleshoot and maintain. Templates can be created and re-used for multiple BMS applications.

Standard design templates make configuring operator graphics easy for voter, CEM, state transition and step sequencer function blocks. Status information is automatically presented to the operator without mapping data tags or creating custom templates or faceplates.

Key Benefits
- Implement complex logic in a single module, eliminating pages of custom programming
- No custom code needed to implement common tasks
- Simplified configuration and troubleshooting of logic
- Consistent approach throughout SIS applications
- Significantly reduce engineering hours required to implement ESD, FGS and BMS applications
- Rich function block information
- No concerns for migration to future releases

Key Features
- Powerful, intuitive, out-of-the-box functionality
- Intuitive drag-and-drop function block interface
- Inherent status propagation and status handling
- Built-in overrides and deviation alarms
- Automatic degraded voting when device failures are detected
- Built-in sequence of events handler with automatic first-out trapping
- Powerful state transition and step sequence function blocks for BMS
The DeltaV SIS system is built for IEC 61511 compliance, providing stringent change management, security management and documentation tools. It is certified for use in SIL 3 applications without restriction. The system is built from the ground up to simplify regulatory compliance—eliminating your concerns related to proper implementation.

**Change Management**
Increasingly stringent regulations require manufacturers to provide comprehensive documentation of their process. DeltaV Configuration Audit Trail is a powerful tool that tracks changes and manages revision information for any item in the configuration database, including SIS items. This application creates and maintains a change history for configuration items, such as modules, SIS modules, phases, operations, unit procedures, user accounts and operator graphics—making regulatory compliance simpler.

**Protected composite templates**
For reduced complexity in global engineering and IEC 61508 compliance, the DeltaV SIS system includes protected composite templates. Templates, such as certified safety logic, are created on a ‘master’ DeltaV SIS system and then distributed to engineering centers for implementation. The templates are protected from modification by only allowing changes to occur on the master system.

**Easy to track changes**
Comprehensive version control of a configuration item is automatically tracked and updated. The new version is time-stamped and a history comment can be recorded when the item is checked back in. Embedded reporting tools give engineers the ability to print configuration change histories for any item in the configuration database. By keeping detailed historical information on configuration items, the system automatically maintains quality data for regulatory compliance requirements and troubleshooting.

**Ensure authorized configuration changes**
The DeltaV SIS security system gives you the ability to grant privileges to individual users. Items may be checked out for editing only by approved users.

**Ensure compliance during operation with Electronic Signatures**
To support compliance requirements for online changes, the DeltaV SIS system uses an electronic signature functionality designed to meet the life science industry’s stringent requirements. Any actions taken can be configured to require a confirmation in which the user’s name and password is needed to execute, as well as an additional verifying user name and password if required.
Security
Adaptable User Manager
With the role-based user access, you have complete flexibility to define the security structure to match your operating philosophy.

A separate set of locks and keys is provided for control and safety. Through a single sign-on, you can define groups of users and assign them privileges. For example, one group may be able to change only control operating parameters, while another may be able to change safety parameters. And you can limit a user to particular areas of the plant—providing you with peace of mind that only the appropriate people are making decisions affecting your plant.

Easy security management
When you make changes to system users and their privileges in DeltaV User Manager, the changes are immediately applied across all DeltaV and AMS applications and Windows security is automatically updated.

Built for security
The DeltaV system was developed with system security as a key design criterion. To safeguard your assets and ensure proper access, the system delivers these security capabilities:
- DeltaV controllers have been hardened to mitigate specific, well-documented security threats.
- Workstation hardening disables unused operating system services and disables CDROM and USB ports to prevent the introduction of viruses and malware.
- The DeltaV Flexlock security application creates a secure workstation desktop to prevent unauthorized access outside of the DeltaV operations environment.
- DeltaV Smart Switches provide auto lockdown to prevent unauthorized network connections on switch ports.
- Unauthorized network devices cannot participate in DeltaV communications, because DeltaV devices are authenticated as part of system configuration.
- Physical access to local equipment is not required for routine maintenance procedures and troubleshooting because system diagnostics are done over the network using DeltaV and AMS Device Manager workstations.

Syncade™ Suite
Syncade Smart Operations Management suite extends the value of PlantWeb by providing electronic manufacturing control that optimizes plant-wide work processes and increases productivity. Safety workflow, such as proof-testing, is guided, verified, and documented for easy regulatory compliance.

AMS Suite
When maintenance functions are performed, AMS Device Manager automatically records activity in the Audit Trail for a complete history. AMS Suite provides integrated device configuration and security to reduce lifecycle costs. QuickCheck allows for easier interlock verification. Additionally, Meridium APM software can be seamlessly integrated with AMS Suite in real-time to easily verify proof-testing compliance. AMS Suite allows you to operate with confidence.

Key Benefits
- Simplified regulatory compliance
- Standardized designs
- Reduced engineering effort
- Reduced lifecycle costs
- Robust security

Key Features
- IEC 61511 compliance is enforced by engineering tools, with no restrictions
- Change management of safety logic and field device configuration/calibration
- Integrated security for competency management
- Secure write mechanism provides repeat confirmation for online changes
- Automatic logging of events and diagnostic faults
- Non-intrusive simulation for testing and operator training

Page 15—DeltaV SIS system
Safety Applications Help Protect Your Plant

Ensures maximum uptime for your plant.

Safety applications are designed to protect your plant and personnel from hazardous conditions and provide a rapid and coordinated operational response to emergency situations, ensuring maximum uptime for your plant.

The DeltaV SIS system provides a high level of reliability and availability through redundant architecture design, including redundant networks, logic solvers and I/O. The system automatically monitors, controls and collects safety-related data for ESD, FGS and BMS applications.

Prevent incidents from occurring

The DeltaV SIS system can be used for emergency shutdown applications to prevent hazardous situations from occurring, and can initiate the shutdown of a plant, unit, or piece of equipment should it be required. Sensors are used to detect certain conditions, and the DeltaV SIS logic solver is configured to meet your safety requirements to take the final elements (valves, pumps) to a safe state.

The combination of sensor, logic solver and final element form a safety instrumented function (SIF). Each SIF is designed to prevent a specific hazard from occurring by reducing a certain amount of risk. This risk reduction equates to a safety integrity level (SIL). The DeltaV SIS system provides SIL 3 reliability in compliance with IEC 61508 and IEC 61511 international standards, and in addition has many innovations: repeat confirmation built in to the operator graphics, version control that can be defined by SIL level, powerful voting functionality and a very flexible cause and effect matrix (CEM) function block that is intuitive and easy to use.
Mitigate the consequences of events when they occur

IEC 61511 recognizes fire and gas systems (FGS) as mitigative SIS systems. The major focus of a FGS is to mitigate an incident AFTER it has occurred. This is done to gain time for people to evacuate the area, contain the incident from escalating and allow emergency response teams to assess and deal with the incident. By monitoring process areas where fire, build up of a potentially flammable gas or toxic gases may occur, the DeltaV SIS system can be configured to detect these hazardous events, alert personnel and initiate timely actions in order to minimize the consequences of an incident.

Fire and gas systems are usually stand alone systems that take actions when required. With today’s technology, many companies utilize an integrated approach and interface the FGS with the ESD system to initiate plant shutdown if hazardous events occur.

The integrated system can alert personnel in a fast, accurate and structured way, giving employees time to decide what course of action to take while bringing the plant to a pre-determined state.

Permit the system to operate when safe

The DeltaV SIS system can be used for burner management system (BMS) applications, a safety solution for control and monitoring of burner units. Through proper sequencing and interlocks, the DeltaV SIS BMS application allows the burner unit(s) to go safely through all relevant states, from start-up to operation and shutdown when needed. If so required (usually dependent on the size of the burner unit), the DeltaV SIS system can also be configured to provide automated leak testing of the gas valves. Using specially developed function blocks, the DeltaV SIS BMS solution is highly flexible and easy to maintain and monitor.
Emerson is an industry leader in providing services throughout the lifecycle of your operations, no matter where on the globe you operate.

Managing risk with global standards
Companies that correctly plan for and manage the operational risks inherent to industrial processes avoid exposure to production outages, equipment damage, environmental incidents, injury to personnel and loss of life. The international community has developed standards for the evaluation and design of safety functions. The IEC 61511 standard is aimed directly at total process plant operations and covers the whole safety lifecycle of the system from concept to operation and maintenance, to decommissioning.

Certified safety process
Emerson utilizes a Functional Safety Management System as defined by the IEC 61511 standard. This TÜV-certified system covers:
- Management of functional safety
- Safety lifecycle structure and planning
- Verification
- Design and engineering of SIS
- Installation, commissioning and validation
- Maintenance and modification.

Emerson Certified Functional Safety Experts utilize this process and their expertise with the latest safety technologies and practices to help clients define and implement their safety systems. Our processes are consistent with the most stringent demands for protection, risk reduction and reliability.

Certified safety experts
IEC 61511 requires personnel and organizations to be competent and qualified to carry out safety activities.

Emerson is the first safety systems provider to develop TÜV-certified procedures in alignment with IEC 61511. In addition, all employees involved with safety systems engineering and development are required to complete extensive safety training and Emerson certification.

Many of our engineers and technologists have also completed a rigorous competency qualification for system design engineers known as the Certified Functional Safety Expert (CFSE) exam. This certification requires experience in the SIS field, as well as successful completion of a comprehensive examination.

Reducing failures from the start
IEC 61511 defines a process to help reduce random hardware failures and reduce systemic failures. Having CFSE experts involved early in the lifecycle process helps reduce faults caused by poor specifications or poor engineering.
Differentiated safety services throughout the safety lifecycle

Emerson provides solutions with certified hardware, software, and engineering services needed to meet the requirements of the safety system lifecycle. Emerson has extensive global coverage for main automation contractor (MAC) services—providing a single source for all of your safety project needs. These services include all aspects of your automation project from front end engineering design (FEED) onward. Emerson can provide a turnkey solution for your project that includes equipment selection, commissioning services, and implementation and operational capabilities.

ANALYSIS

As part of pre-project planning, FEED is early design work done after conceptual business planning and prior to detailed design. Once the safety integrity levels (SIL) of the safety instrument functions (SIF) are defined, Emerson can compile your safety requirement specification (SRS). We also offer SIS functional safety consulting to help you design the safety loop and select the components that are needed.

IMPLEMENTATION

Emerson project services for application software follow our TÜV-certified processes and provide documented verification of all design, implementation, and testing activity. Each step of the process is reviewed and documented to help ensure compliance with IEC 61511.

OPERATION

Emerson’s SureService™ program offers an array of support services designed to help you achieve your business objectives, reduce your operating and service costs, and keep your systems running at peak performance. These support services include:

- Guardian Support
- Emergency Onsite Service
- Express Module Replacement
- Critical Data Backup
- Local Spares Management
- Functional Safety Maintenance and Proof Testing
- Power and Grounding Integrity
- Security Assessment
- Alarm Management
- SIS Modification
- Extended Software Support
- Premier Service.

Emerson—a partner you can trust

For over 100 years, Emerson has been a global leader in providing process automation solutions with a commitment to total quality, plant safety, and dedication to meeting customer expectations. We can help you operate your plant safely, reliably, and more efficiently—giving you peace of mind.