DeltaV SIS™ for Process Safety Systems

A Modern Safety System—for the Life of Your Plant

DELTAV SIS

EMERSON™
Process Management

DELTAV SIS

The DeltaV SIS™ *takes a modern approach to increase safety integrity while improving process reliability. The proven DeltaV SIS continuously monitors your plant's safety devices status and diagnoses the health of the entire safety loop—dramatically reducing your risk. The SIL 3 certified system uses electronic marshalling technology to reduce your installation, commissioning and maintenance costs while substantially reducing your equipment footprint. DeltaV SIS—meets your safety system needs today and into the future.*

Smart SIS.

Optimized diagnostics for the entire safety loop

DeltaV SIS provides an integrated, constant monitoring approach for the complete safety loop—from sensor, to logic solver, to final control element. A key component of Emerson's Smart SIS is to detect field device failures before they cause spurious trips.

Distributed Architecture

Flexibility with Electronic Marshalling

The modern, scalable architecture is based on the CHARMs Smart Logic Solver (CSLS) which simplifies the design, installation, wiring and commissioning of any SIS project. This modularity gives you the capability to meet changing project requirements and the flexibility to implement safety functions easily, and safely while eliminating re-work and re-design associated with traditional marshalling.

Flexible Integration

Familiar, intuitive applications for greater availability

As a standalone safety 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.Net.

The DeltaV SIS and DeltaV systems are integrated noticeably in the same engineering, maintenance, and operations environment. All safety-related information is easily accessible through familiar and intuitive applications.

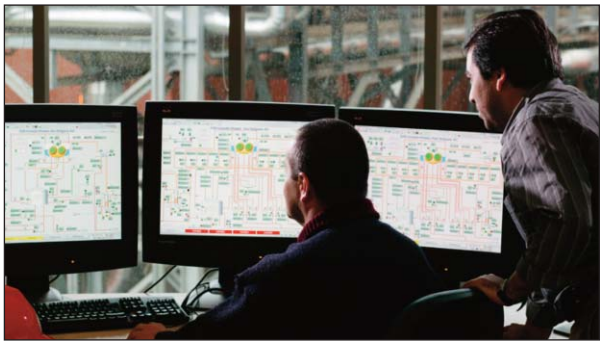
The integrated yet separate architecture meets IEC 61508 and IEC 61511 requirements for physical separation and independence of safety and control. DeltaV SIS delivers the benefits of DeltaV integration and separation without the tradeoffs associated with the two extremes.

Certified Function Blocks

Reduce engineering and complexity

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

Out-of-the-box 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).



Built for IEC 61511 Compliance

Simplified safety lifecycle management

DeltaV SIS 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.

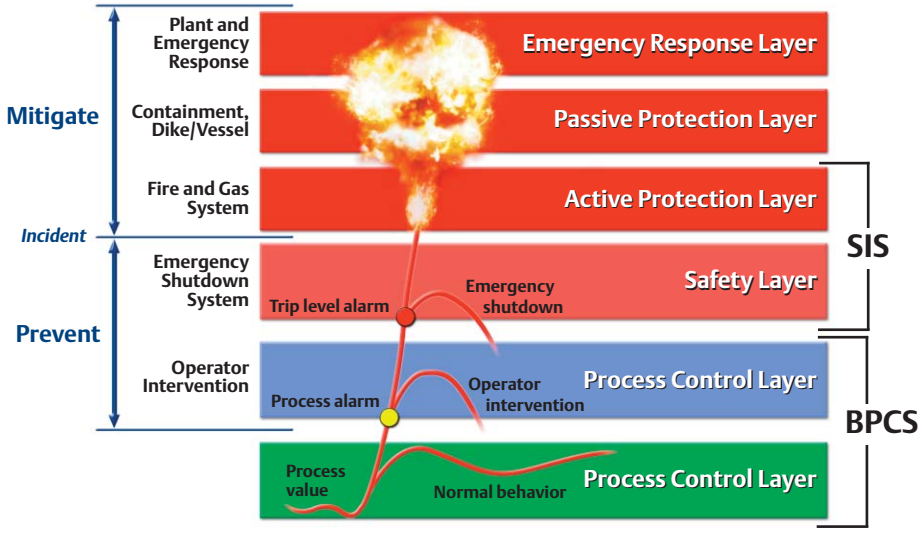
> *A typical refining or petrochemical facility will spend less than 10% of its time in transient operations, but more than 50% of process safety incidents occur during these operations.*
>
> **Duguid, I.M.**
> **Chemical Engineering**

IMPROVE SAFETY INTEGRITY

Understanding the complexities of standards and staying compliant—coupled with the increasing demands to reduce costs—are a constant challenge.

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

But with traditional safety systems, once it's installed and validated, your plant's safety integrity level quickly begins to decline as loops are not called upon regularly enough to ensure all devices are functioning as they should. A traditional safety system may not know for months or longer that a valve is stuck.



The modern DeltaV SIS continually monitors the health of the entire safety loop. It takes into account devices' predicted lifespan and pre-empts end of lifecycle with maintenance notifications and testing that can be initiated automatically by the DeltaV SIS logic solver, or manually from operator faceplates. The result is your SIS integrity level stays at a stable level longer, extending the time between full proof tests.

Emergency Shutdown System

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

Prevent incidents from occurring

The DeltaV SIS has been widely 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 your plant to a safe state, by manipulating the required final elements (valves, pumps).

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 modern system provides SIL 3 reliability in compliance with IEC 61508 and IEC 61511 international standards, and in addition has many innovations: repeat confirmation built into the operator graphics,

tracking changes 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

Fire and Gas System

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, DeltaV SIS can 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 standalone systems that take actions when required. With today's technology, many companies use 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

Burner Management System

DeltaV SIS has been used for burner management system (BMS) applications, a safety solution to control and monitor 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.

KNOW THE HEALTH OF YOUR SAFETY LOOPS—24/7

Because safety systems are designed to perform only when an abnormal situation occurs, how to make sure it will perform reliably when needed?

A modern approach to safety

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 non-critical 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, DeltaV SIS continuously monitors the ability of sensors, logic solvers and final elements to perform on demand by diagnosing faults before they cause spurious trips or fail to perform. Digital HART® communications is the enabler. This approach increases process availability and reduces lifecycle costs.

24/7 Safety

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. DeltaV SIS is a comprehensive solution for your safety system with the power of embedded digital communications—all day, every day.

Smart logic solver

Bulky multiplexers with traditional logic solvers 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 for use in all SIL 1, SIL 2 and SIL 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.

> *Being able to monitor the health of the equipment positions us to be proactive with our maintenance programs. This helps us improve overall availability.*
>
> **George Cushon**
> **OPTI Canada Inc.**

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 partial stroke testing extends test intervals

Partial stroke testing of valves can improve safety integrity and extend the time between mandatory proof-tests. 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 series 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.

Smart final elements reduce risk

FIELDVUE™ digital valve controller instruments provide automated performance monitoring and remote testing. This keeps personnel safely away from the valve's location. This keeps personnel safely away from the valve's location. The FIELDVUE DVC6000 series 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 complete SIL 3-certified valve solution:

- Bettis™ G and CBA actuators
- Fisher™ DVC6000 series SIS controllers
- ASCO™ solenoids
- Fisher™ valves.

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.

MODERN ARCHITECTURE

DeltaV SIS—Modern safety that is smart and flexible.

The DeltaV SIS modern approach to safety reduces risk to your operations in multiple ways.

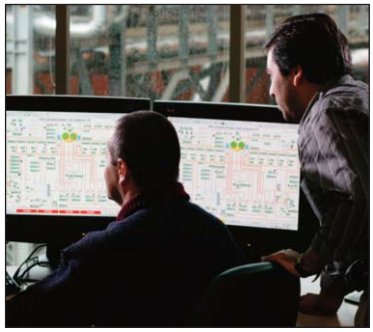
Electronic marshalling provides unprecedented flexibility to easily change or expand your safety system—flexibility that lets you separate engineering from logic configuration. SIS CHARMs connect to any I/O type.

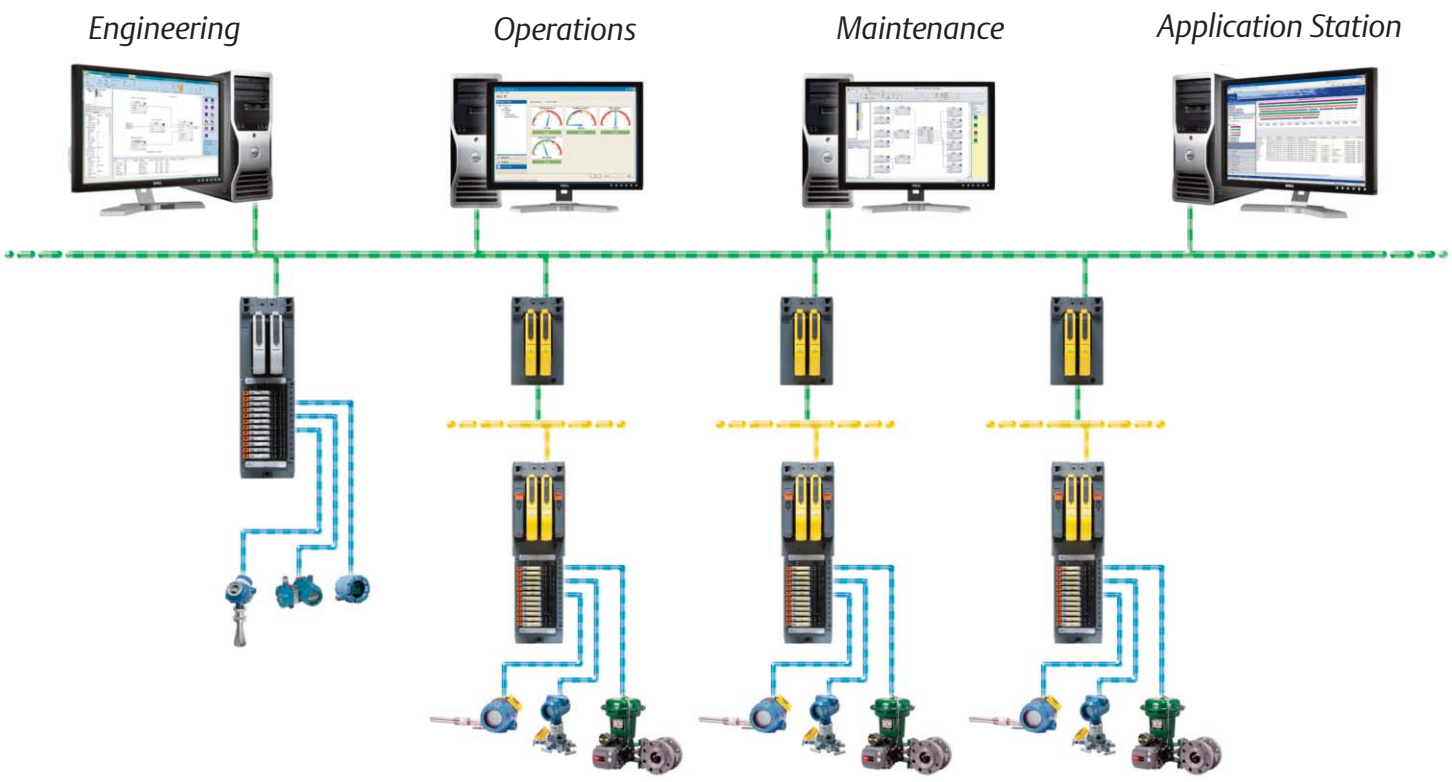
In addition to reducing your installation, re-work and commissioning costs, DeltaV SIS electronic marshalling and characterization module (CHARM) technologies reduce your equipment footprint. It eliminates traditional marshalling cabinets and gives you freedom to connect existing loop wiring to a single CHARMs terminal block or land new or existing I/O to field enclosures near your devices—either way, you free up footprint for future expansion or modification.

Modern means taking full advantage of smart instrumentation to continuously monitor your entire safety loop, ensuring it will perform on demand when it's needed and not shut you down when it shouldn't.

Smart, flexible modern safety to meet your present and future safety needs—confidently.

> *DeltaV SIS was best suited for our safety shutdown applications because of its modularity, integration with the control systems and safety loop diagnostics.*
>
> **Steve Schmitz**
> **Rohm and Haas**





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

- Modern, smart SIS for optimized reliability with constant monitoring of safety status and loop health
- Flexibility with CHARMs eliminates traditional marshalling
- 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

MODIFY AND EXPAND CONFIDENTLY

Modifications or additions to your control system can mean excessive engineering re-work to your safety system. And with demanding standards and regulations, verifying those changes can be complex and time-consuming.

The modern DeltaV SIS builds in unprecedented flexibility so you can evolve your safety system confidently and cost-effectively. It does this with electronic marshalling and CHARM technologies, which let you separate safety loop installation from logic configuration. That means you can start hardware design earlier in the engineering process—before HazOps completion.

These technologies were developed in response to customers with moving offshore oil platforms where home run wiring means crucial added weight as well as high installation costs, (and every square inch of automation system footprint is severely limited). Electronic marshalling lets you land whole groups of safety loops in nearby field enclosures, running a redundant Ethernet cable to the controller.

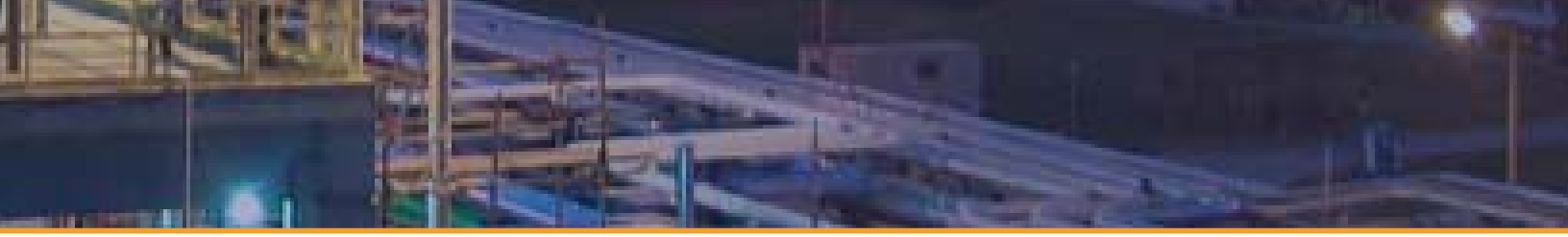
Footprint constraints with layers of past configuration loops abandoned in place are no problem. Simply re-connect the existing wiring from active loops to a single CHARMs base plate in any order or configuration, and you'll actually create extra space for later use. Move traditional I/O into field enclosures closer to field instruments—landing wires where they fit best—regardless of their I/O type. CHARMs I/O take up about 1/3 the space of traditional I/O and marshalling cabinets.

Applications that require safety instrumented systems to reduce risk come in all sizes. You need an SIS that can handle the smallest to the largest application and the flexibility to address widely distributed architectures.

Flexible architecture

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 need, when and where you need it.

Whether you have an isolated boiler or a large ESD application, the DeltaV SIS system scales to provide the safety coverage you require for your SIL 1, SIL 2 and SIL 3 applications.



CHARMs Smart Logic Solver

The DeltaV SIS CHARMs Smart Logic Solver (CSLS) provides flexibility and ease of use with Emerson's Electronic Marshalling solution. Each CSLS provides I/O processing, SIL 3-capable logic solving, and diagnostics in a single logic solver.

The CSLS supports up to 96 individually configurable channels, allowing flexibility for implementing safety instrumented functions, and its designed specifically to eliminate conventional marshalling. Several CSLS can be combined to use 1536 I/O on the same local safety network and grow to as much as 30,000 I/O.

All communications are completely redundant from the channel (LS-CHARM) to the CSLS. Integrated HART® I/O,as well as conventional wiring and device alerts, brings field diagnostics into the CSLS.

CSLS 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
- online proof testing
- in-situ hardware and software upgrades.

Lower your risks with a modern safety system:

- Optimized safety reliability
- Increased engineering flexibility to meet your project needs
- Increased overall reliability
- Simplified safety lifecycle management
- I/O anywhere you need it
- Reduced installed cost of system
- Fully redundant communications
- Field mounted capable hardware
- Plug & play I/O
- No single point of failure
- Isolation of changes and maintenance
- SIF-based approach to logic solving
- Adding new SIFs does not affect existing SIF logic, scan rate, or execution
- SIL 3 certified without restriction
- Scalable from 2 to 30,000 I/O
- Remote I/O capability
- SIL 3 certified safety communications
- Up to 62 km distances between nodes

REDUCE COMPLEXITY AND ENGINEERING EFFORTS

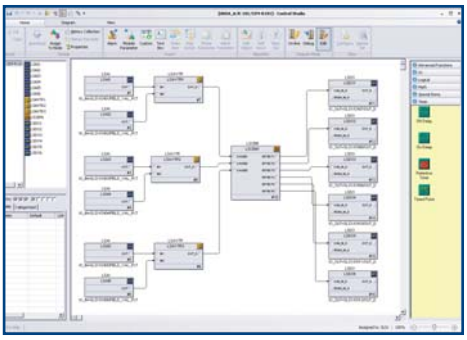
With traditional SIS, initial configuration requires extensive customization and any change in process design means extensive rework. And testing DeltaV SIS makes it easier.

The modern DeltaV SIS certified, pre-configured function blocks simplify SIS application implementation. No custom code is required to implement 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 provides a full palette of smart safety function blocks certified by TÜV for safety applications. Special blocks like 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.



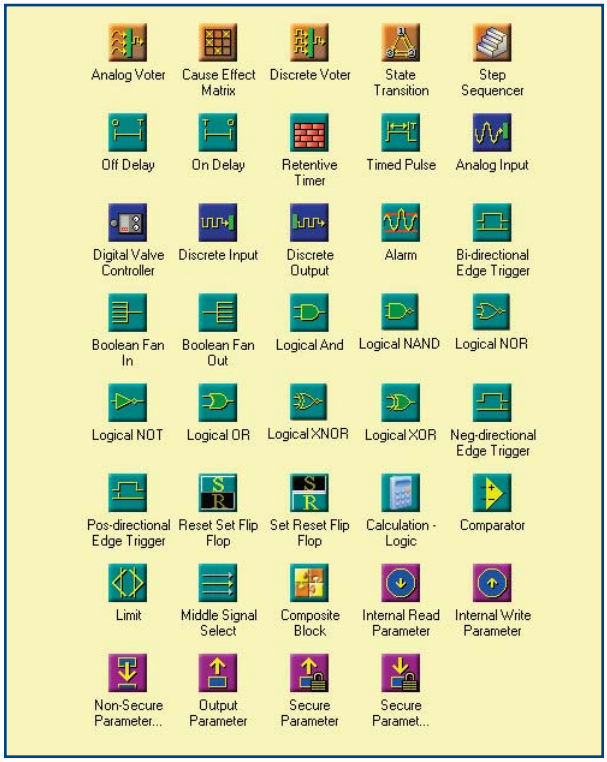
Voter function blocks

Voter function blocks provide advanced features like built-in bypass and deviation alarms to improve plant safety. The voting is configured to ensure 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.



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, making documentation easy.

CEM function blocks include advanced functionality 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 all types of applications, including BMS.

Standard design templates make configuring operator graphics easy for voter, CEM, state transition and step sequencer function blocks.

Other capabilities that make the TÜV-certified DeltaV SIS software intuitive include:

- built-in sequence of events handler with automatic first-out trapping with 1msec resolution
- built-in maintenance bypasses
- facilitates compliance to IEC 61511 standard
- built-in alarm management
- standard operator faceplates automatically provide safety information with no configuration.

Status handling

Input processing provides status handling—no custom code needed; 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.

Status information is automatically presented to the operator without mapping data tags or creating custom templates or faceplates.

Discover the Benefits:

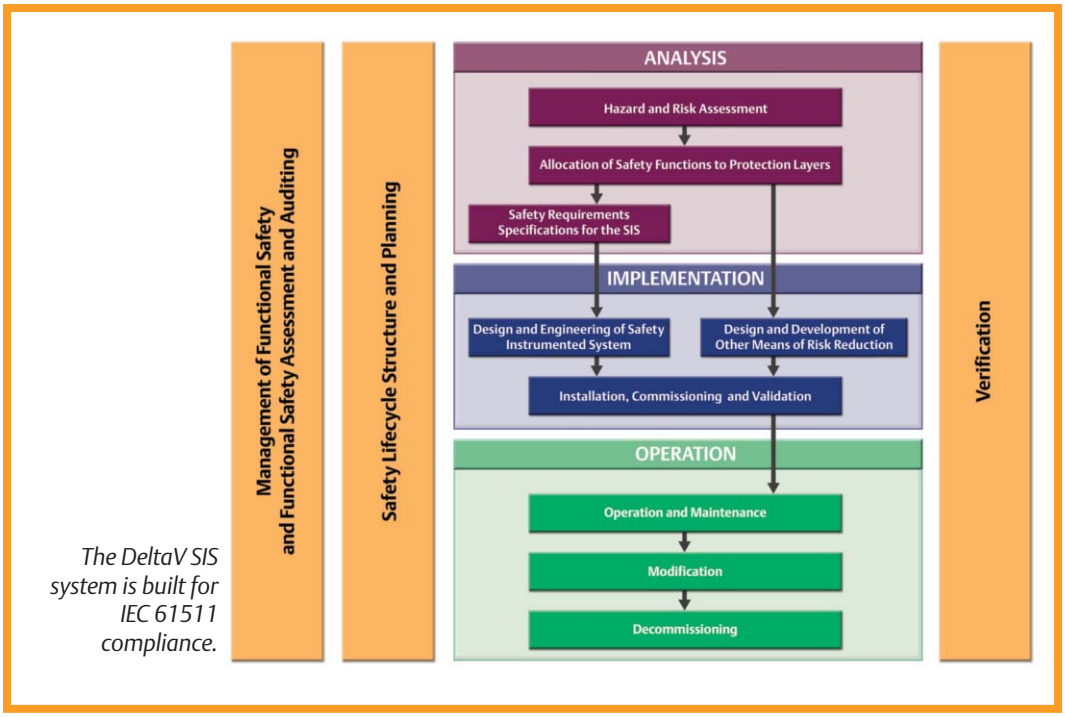
- Implement complex logic in a single module, eliminating pages of custom programming
- No custom code needed to implement common tasks
- Simplified configuration and troubleshooting of logic
- Consistent approach throughout SIS applications
- Significantly reduce engineering hours required to implement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

SIMPLIFY COMPLIANCE

Change management of your traditional SIS is expensive, complex, and introduces risk of error—errors that ripple through your documentation.

Certified for use in SIL3 applications without restriction.

Modern DeltaV SIS is built for IEC 61511 to simplify regulatory compliance, with documentation tools that can eliminate risk of error and improper implementation. DeltaV SIS provides stringent change management, asset management, security management and documentation control. The system is built from the ground up to simplify regulatory compliance.



The DeltaV SIS system is built for IEC 61511 compliance.

Change Management

Increasingly stringent regulations require manufacturers to provide comprehensive documentation of their process. DeltaV SIS Version Control and Audit Trail (VCAT) is a powerful tool that tracks changes and manages revision information for any item in the configuration database. This application creates and maintains a change history for configuration items, such as SIS modules, 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 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, DeltaV SIS 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. For integrated systems, 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
DeltaV SIS was developed with system security as a key design criterion. To safeguard your assets and ensure proper access, the system delivers these security capabilities:

- Workstation hardening disables unused operating system services and disables CDROM and USB ports to prevent the introduction of viruses and malware.
- Unauthorized network devices cannot participate in DeltaV SIS communications, because DeltaV SIS 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 SIS and AMS Device Manager workstations.
- Custom build switches with pre-determined configuration.

Asset management

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.

Documentation control

Syncade Smart Operations Management suite provides 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.

Discover the Value:

- 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 enforces confirmation for online changes
- Automatic logging of events and diagnostic faults

FLEXIBLE INTEGRATION

Separate systems that don't talk to one another require complex data-mapping and multiple databases to talk to each other. Standalone, interfaced or integrated—DeltaV SIS meets your needs.

Connecting to existing BPCS

As a modern standalone safety system, DeltaV SIS can easily integrate with any DCS or PLC using interfaces that are based on open communication standards, such as Modbus, OPC and OPC.Net.

Modbus integration

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

OPC.Net and OPC

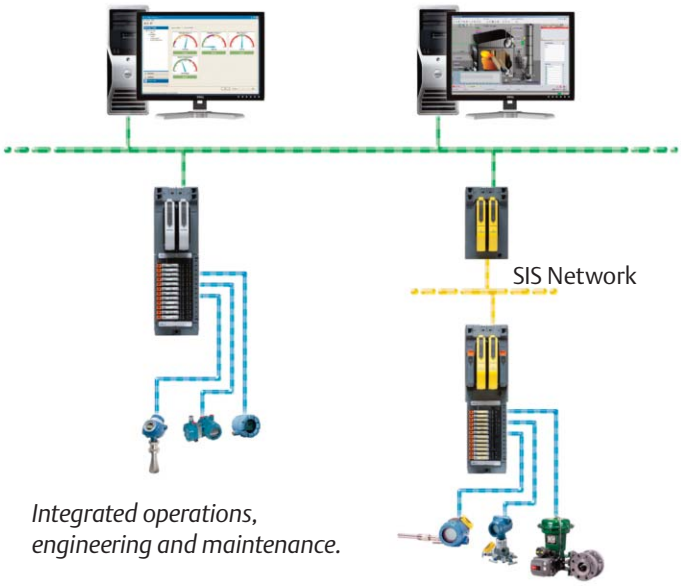
DeltaV SIS can connect with your non-DeltaV BPCS via OPC or OPC.Net. All information is available to your operator interfaces and history collection software as part of an integrated solution.

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

The OPC communications standard has served the process industry well for over a decade. It supports access to real-time and historical data, as well as alarm and event data.

The modern IEC61508-certified DeltaV SIS gives a common interface with your control system to monitor assets and deliver crucial data for safer, more robust operations.

While DeltaV SIS can interface with any control system, it can also be integrated with the DeltaV system, providing 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 yet separate architecture meets IEC 61511 requirements for physical separation and independence of safety and control.



Integrated operations, engineering and maintenance.

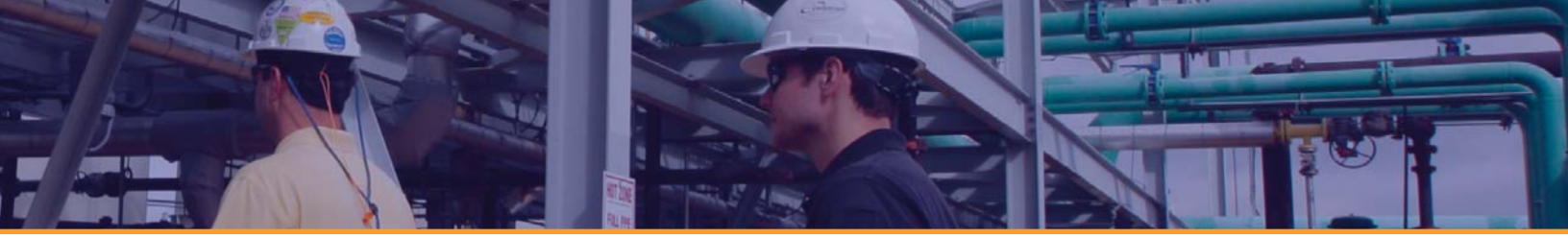
Architecturally independent safety system

The DeltaV SIS power supplies, communication channels, hardware and real-time operating systems are physically separate and independent of the control system, maintaining the separation required by IEC 61508 and IEC 61511 standards. This system automatically monitors, controls and collects safety-related data.

Operations

The operator interface provides a powerful environment 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 run 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



combines 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

DeltaV SIS 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. DeltaV SIS maintains proper security on safety logic software and makes managing 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.

Maintenance

To manage change and maintain compliance over time, DeltaV SIS 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 is automatically recorded. AMS Device Manager provides detailed information to diagnose device problems quickly and correctly. It also documents and archives instrument configurations and changes, as well as health information and alarms.

Discover the Benefits:

- Reduced safety lifecycle costs
  - Equipment and installation costs
  - Engineering and maintenance costs
- Reduced training costs
- Easier regulatory compliance
- Robust security

Integration Features

- Simplified architecture with no data mapping
- Integrated engineering, maintenance and operations environment
- Time synchronization and event collection
- Security management with user authentication
- Advanced alarm management
- Change management including version control, audit trail and electronic signatures

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 SAFETY LIFECYCLE MANAGEMENT SERVICES

Providing industry leading 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.

International standards for the evaluation and design of safety functions for total process plant operations cover the whole lifecycle of the safety system from concept to operation, maintenance, function testing, through to decommissioning.

Emerson Process Management offers the total solution to provide the certified hardware, software, and engineering services needed to meet the requirements of the safety system lifecycle.

Certified safety process

Emerson uses a Functional Safety Management System as defined by the IEC 61511 standard. This TÜV-certified system covers:

- Management of functional safety
- Safety lifecycle structure/ planning
- Verification
- Design and engineering of SIS up to decommissioning

Emerson's certified functional safety experts apply this process and their expertise with the latest safety technologies and proven practices to help you define and implement a safety system that is 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 has committed the resources to become the first safety systems provider to develop TÜV-certified procedures in alignment with IEC 61511. In addition, all employees involved with safety system 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)


TÜV NORD

Certificate

Emerson Process Management
Process Systems and Solutions
1100 W. Louis Henna Blvd.
Building One
Round Rock, TX 78681 USA
has implemented a

-Functional Safety Management System-

in accordance with

IEC 61511 and IEC 61508

for Management and Control of SIS applications using DeltaV SIS and associated field devices.

IEC 61511:2003
Safety Instrumented Systems for the Process Industry Sector
IEC 61508:2010
Functional safety of electrical/electronic programmable safety related systems

The certification is based on the assessment report SEBS-A.102430/12FSM and the certificate addendum SEBS-A.102430/12LOC in the valid versions. It does not replace any specific certification required for safety related E/E/PES or EUC.

Expiry date: 2015-12-10
Reference No.: G.SEB.BS.02.005.06.031

exam. This certification requires a minimum amount of experience in safety instrumented systems (SIS) field, as well as successful completion of a comprehensive examination.

Reducing failures from the start

Reducing random hardware failures and reducing systematic failures are what IEC 61511 is all about. Having CFSE experts involved early in the process helps ensure that systematic faults, caused by poor specifications or poor engineering, are reduced. This is critical because 80% of all SIS-related failures can be attributed to design and implementation errors. Omissions in the design of a safety loop or safety instrumented functions (SIF) could remain undiscovered until an incident occurs.

Differentiated safety services throughout the safety lifecycle

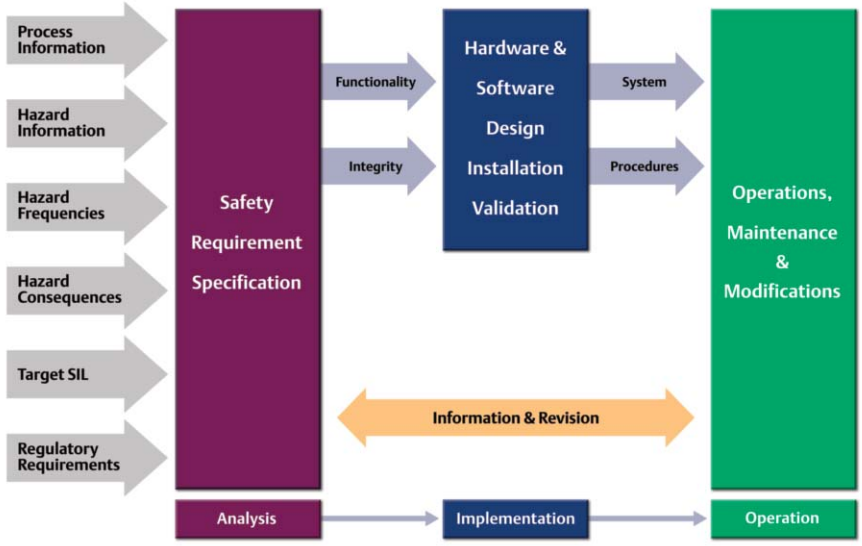
Emerson provides solutions with certified hardware, software, and engineering services needed to meet the requirements of the safety system lifecycle. Emerson has extensive global coverage for main automation contractor (MAC) services—providing a single source for all of your project needs. These services 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

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.



Globally, Emerson can help you with IEC 61511 Safety Life Cycle management.

Operation

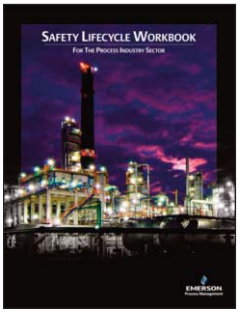
Emerson's SureService™ program offers an array of support services designed to help you achieve your business objectives, reduce your operating and service costs, and keep your systems running at peak performance. These support services include:

- 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 Modifications
- Extended Software Support.

Globally balanced capabilities

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.

We recommend the following:



Safety Lifecycle Workbook for the Process Industry Sector
www.DeltaVSIS.com/workbook

Emerson Process Management
1100 W. Louis Henna Blvd., Building One
Round Rock, TX 78681-7430

www.DeltaVSIS.com

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DELTAV SIS

EMERSON
Process Management