Power Generation

S+ Applications
High integrity burner management safety systems

With 80 years of engineering experience in burner management and 30 years experience in designing, implementing and maintaining safety systems, ABB provides an integrated system application solution for Burner Management Systems.

Overview

For the past eight decades, ABB has worked with clients and industry-standards organizations to improve boiler control and safety during the most hazardous operating phases of start-up and low-load operation.

The Burner Management System (BMS) solution for simple or multiple-burner boilers offers a field-proven control system for safe operation of all types of boilers: including gas-fired, oil-fired, dual-fuel (gas and oil) and coal-fired.

The Symphony™ Plus BMS safety system can be fully integrated with a Symphony Plus process control system. This enables common, plant-wide operations and information environments across both the Basic Process Control System (BPCS) and the Safety Instrumented System (SIS).

S+ Safety includes a comprehensive library of standard reusable components and extended automation entities such as faceplates, graphic elements, trends, document links, and alarms and events.

In addition, ABB provides a broad family of safety certified libraries that contain control modules, function blocks, data types and graphic elements with special features for building BMS applications.

These standard libraries are fully compliant with the currently applicable National Fire Protection Association (NFPA) 8502 Standard.

Safety remains paramount when installing a BMS for a boiler. Boiler or furnace protection against abnormal conditions, safety interlocks for normal start-up and shut-down, and flame safety applications are fundamental measures for protecting people, equipment and the environment. ABB provides certified building blocks for BMS applications. This enhances functionality, increases safety, and greatly simplifies the engineering process.

With Symphony Plus, ABB offers an integrated system application, compliant with NFPA standards, that meets your needs for safe high intregrity BMS applications.

S+ Applications
High integrity burner management safety systems

Certified libraries
ABB offers a wide range of control modules for monitoring and controlling safety systems. A complete range of high-level control modules, faceplates, graphic elements, alarm management and operational templates and strategies are included.

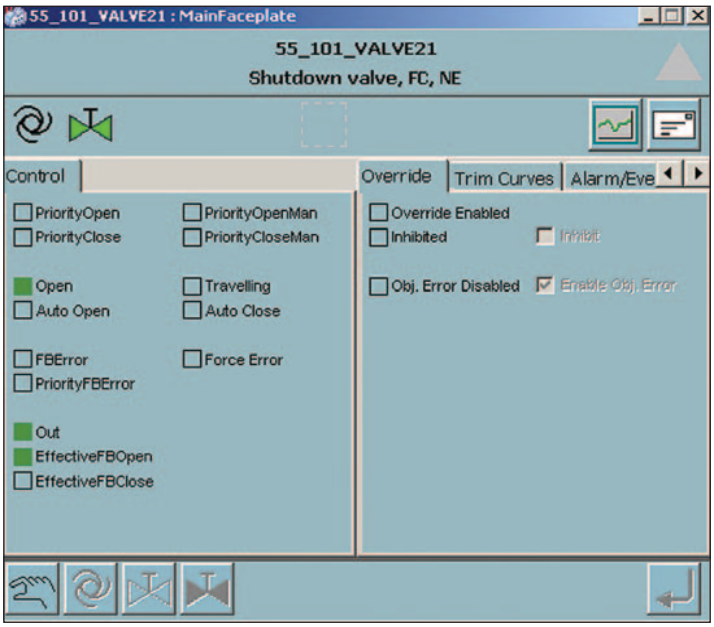
Enable and reset override control functionality is built into the types to supervise the use of overrides (Force, Inhibit, Disable) in safety applications. All modules can be used in SIL 2-3 classified applications.

Fault tolerance for maximum availability
The Symphony Plus safety controller is the AC 800M HI which offers a SIL3 TÜV certified control environment for BMS applications. The AC 800M high integrity controller is realized by combining the processor module with the co-processor, while flexible redundancy schemes enable controller configurations up to and including quad configuration.

Access management
Access control, confirm operation and force control are all fire wall mechanisms embedded within the S+ Safety controller. Access control to SIL applications includes functionality for configuration, operation and maintenance. In accordance with several safety standards, a physical input implemented as a hard-wired signal to the safety controller must be activated to enable the highest level of authorized access. When the access enable input is actived, permission is given to make online changes in a SIL application.

High integrity I/O
SIL3-compliant high integrity I/O modules within the S800 I/O family are used for Symphony Plus safety-critical applications. These I/O modules include those for 4-20 mA analog inputs, 24 Vdc supervised digital inputs and 24 Vdc digital outputs. The digital output module provides both normally energized and normally deenergized outputs typically used in ESD and Fire & Gas (F&G) systems respectively. The digital inputs support local time-tagging of signal changes for high-resolution sequence-of-events logging. Analog inputs support HART pass-through for easy calibration, monitoring and diagnosis with configurable access when using HART device integration.

Predefined descriptive graphic displays of common objects speed up engineering work.



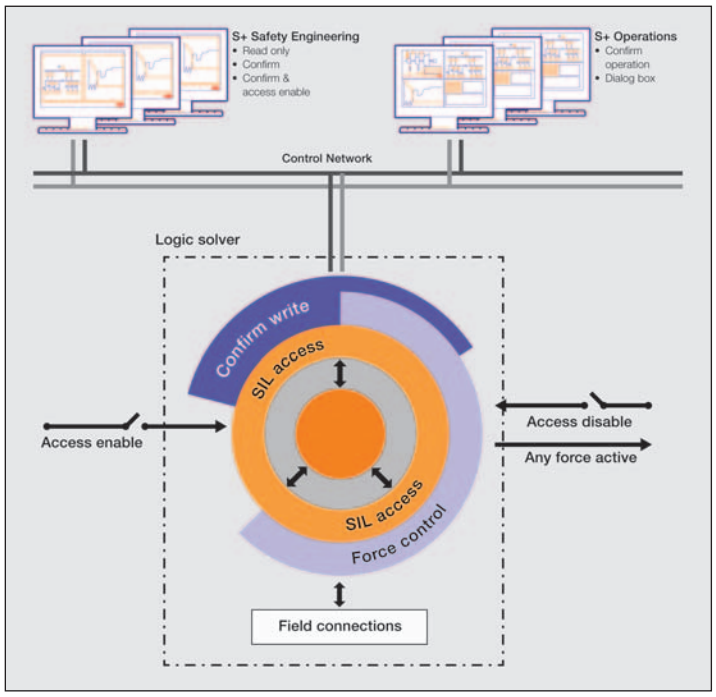
Symphony Plus AC 800M HI controller is SIL3-certified both in single and redundant configurations.

S+ Applications
High integrity burner management safety systems

Force Control
Force Control in the S+ Safety system has been implemented to support all operational, engineering, maintenance and management activities throughout the system life cycle. When designing SIL applications, the safety engineer defines the maximum number of concurrent forced inputs and outputs. During operation and maintenance, the access management software keeps track of the active number of forced I/O points. This information can be made available via the safety operator's personalized workplace. For emergency reset of all forces, a firmware function that includes a dedicated physical input is available in the safety controller. This complies with regulatory requirements and reduces time-consuming application design, implementation and testing.

High integrity instrumentation
ABB can provide a wide range of safety-certified sensors and positioners. Various solutions are available ranging from full-redundancy, high-integrity transmitters designed and certified by TÜV against IEC 61508 requirements to standard transmitters with enhanced internal diagnostics to minimize the probability of failure on demand.

Embedded firewalls and confirmation procedures protect the SIL application from inadvertent/accidental control actions.



Sequence of events (SOE) and alarms
Alarms and time-tagged event messages are stored and presented with milli-second accuracy in alarm lists and SOE displays. This standard feature of the safety system constitutes a powerful tool to quickly identify the root cause should a shutdown or hazardous event occur.

Messaging
Remote personnel are notified of critical events via mobile telephones, email accounts and pagers by the safety system's SMS (Simple Messaging Service) and email messaging service. Using GSM (Global System for Mobile communications) mobile phone technology, Symphony Plus allows remote acknowledgement of notification and confirmation of receipt.

Information management
Symphony Plus collects and securely stores business, process and safety data from all plant sources. Due to the powerful and flexible system functionality and features, this data can be analyzed and transformed into useful information, and presented to plant-users to improve operational efficiency, safety and profitability. Examples of safety compliance reports that can be created include:

Override report – Shows an overview of all tags that are currently in force, blocked, suppressed or in override, etc. In combination with the standard S+ Safety audit trail functionality, the report also enables historical reviews of when or by whom a tag was blocked or suppressed.

Valve verification report – Summarizes valve functionality in the system. This report contains valve operation information such as calculated valve travel time and operational status, as well as a fault-frequency report on valves and valve groups.

Valve leakage test report – Summarizes results from valve-leakage testing. The Valve Leakage Test Report can be used on all valves, both critical and non-critical. The report consists of logging pressure data for a valve after the operator has created a difference across the valve.

Automatic shutdown report (ASR) – Validates the success of a Process Shutdown (PSD) or Emergency Shutdown (ESD). The ASR report contains an overview of all shutdowns performed in the system, and gives the operator detailed information of cause and effect relationships, including status of the operations performed.

S+ Applications
High integrity burner management safety systems

On-line diagnostics
Each safety controller in the Symphony Plus safety system issues detailed messages about safety-related information and problems. These are typically monitored through the operator station. This high level of diagnostics is essential for the integrity of the ESD. System status and asset displays provide detailed information about the health and location of every device in the safety system.

Safety workplace
The library modules typically used for BMS applications provide a set of easily configured operator displays and dialogs. These displays can be organized in a hierarchical structure with an overview display for status presentations and detailed displays with object presentations. The overview display contains the status of the whole shutdown system and includes links to cause & effect type detail displays and shutdown level displays.

Every ESD field device connected to a safety controller has a corresponding predefined graphic display (faceplate) with real-time information and dialog with the device. Interactive operator graphics can easily be customized through the use of predefined elements and symbols.

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