

## Safety System Easily Integrated With BPCS

If you asked a process control engineer for the attributes of an ideal safety system, the answer might well be a list of what's wrong with the current generation of technologies. Whether purpose-built or based on a common PLC platform, the typical safety instrumented system (SIS) logic solver uses a unique configuration environment unrelated to the basic process control system (BPCS), combines high cost and a large footprint with limited scan rate capability, and is poorly equipped to take advantage of the self-diagnostic capabilities of today's smart field devices.

At least, that's what Emerson Process Management engineers understood when they undertook development of its DeltaV SIS. The new safety system combines the scalability and configuration environment of the DeltaV process automation system with the independence, redundancy, and functionality of a TÜV-approved safety system, and adds field-device monitoring and partial-stroke valve testing capabilities to help leverage the maximum safety integrity level (SIL) from installed equipment. This new development incorporates 11 patent-pending capabilities and represents a significant technological breakthrough.

The SIL 1-3-rated system fits on a DeltaV backplane and can be remotely mounted. It is fully functional with as few as 16 I/O—additional I/O are available in modules of 16. Since each module comes with its own set of processors, the system's scan rate performance does not degrade with loading. "It has the unique capability of permitting any mix of I/O on any screw termination," says Gary Law, Emerson Process Management DeltaV product manager "You can wire analog in/out and discrete in/out to any set of terminations."

Though integrated with the DeltaV automation system, the SIS has its own redundant power supply, "not in any way dependent on DeltaV hardware," says Law. It also has redundant internal processors and can be paired with a backup in a 2oo2 architecture for increased system availability. Hot backup transition is bumpless.

The system can use the intelligent information in HART transmitters as a check on device integrity, and can perform partial-stroke valve testing on valves equipped with Fisher DVC 6000 positioners. "This is a

big deal," Law claims, "as it can eliminate costly and dangerous manual valve testing with valve bypasses." Complete diagnostics information on the valve can be accessed through the system using Valvelink.

According to Emerson Process Management, the engineering configuration methodology is the same as the DeltaV automation system, and the safety system can share information with a DeltaV system without any data mapping. Separate security and graphic elements are used to highlight the fact that the SIS system is being configured. "Without proper privileges, it is impossible for an engineer to affect the SIS configuration," says Law.

Tools are provided to assist with IEC 61511 compliance where verification of configuration changes is a requirement, Law adds. "The system automatically tracks all changes, providing an audit trail and version control." This means a change cannot be implemented without appropriate electronic signatures and approvals, thus ensuring the requirements of IEC 61511 are maintained throughout the safety lifecycle.

In addition, if there is a requirement for online changes of operational parameters, bypasses etc., the requirement for a repeat confirmation step is enforced. All these tools are implemented at the system level, so the user does not need to do any additional special configuration to take advantage of them.

Safety systems have traditionally presented a dilemma to the conscientious process control engineer. The desire for separation and diversity (both in hardware and software) to avoid common failure modes conflicts with the need for reasonably simple, easy to configure safety systems that are well integrated with the BPCS. The result has been separate safety systems that are at best, unwieldy appendages and at worst, complex, outmoded, and arcane.

The new DeltaV SIS solves this problem by replacing separation and diversity with reliability and self-diagnostics. The results are significant gains in simplicity, integration, and ease of use while retaining the ability to satisfy certification requirements.

Emerson is now accepting orders for DeltaV SIS, with shipments to commence in 2004. 



Reprinted from CONTROL, November 2003