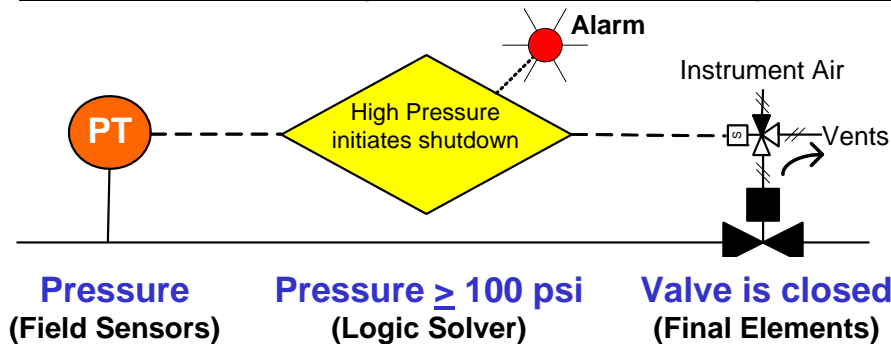


What is a Safety Instrumented System?

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A safety instrumented system (SIS) takes automated action to keep a plant in a safe state, or to put it into a safe state, when abnormal conditions are present. The SIS may implement a single function or multiple functions to protect against various process hazards in your plant. There are many other names that you may use for this kind of a system, for example, safety shutdown system, emergency shutdown system, safety interlock, protective instrumented system, or safety critical system. In most cases, each function in an SIS consists of three components, as shown in the drawing above:

- a sensor which monitors the process to detect an upset or abnormal condition (for example, a pressure sensor)
- a logic device which receives the signal from the sensor, determines if the condition is hazardous, and, if so, sends a signal to take action
- a final control device, which receives the signal from the logic device and implements the appropriate action in the plant (for example, opening or closing a valve, shutting down a pump)

SISs are designed at different safety integrity levels (SILs) based on the risk posed by the process hazard. The higher the SIL, the more likely there will be multiple, redundant components (for example, more than one sensor, logic solver, or final element) and more rigorous testing and management requirements.

Do you know?

- Safety systems, such as an SIS, are covered by a design basis and a mechanical integrity (MI) program.
- SIS MI includes procedures for inspection, preventive maintenance, proof test, and repair.
- MI frequency is specified to ensure that the SIS is as reliable as required by the plant designer.
- MI relies on knowledgeable people who follow rigorous work practices to determine the condition of the SIS equipment.
- When an SIS is activated, you should know what actions to take, such as emergency response activities.

What can you do?

- Understand the causes and consequences of abnormal operation in your plant.
- Know if you have an SIS in your plant, how it works, what conditions cause it to act, what it does, and what you must do if the SIS activates.
- Know where to find the documentation for the SISs in your plant.
- Make certain that SISs are properly inspected and tested so they remain in good working condition.
- Notify your supervisor if an SIS is not working properly, and follow your plant procedures to maintain safe operation while repair is completed.

Know how the Safety Instrumented Systems in your plant work!