Safety Instrumented Systems:Crucial Safety Component inProcess Industriesaa

What are Safety Instrumented Systems?

Safety instrumented systems (SIS) refer to integrated systems of sensor(s),

logic solver(s), and final element(s) that are designed to automatically take the process or equipment to a safe state when predetermined conditions are

violated. The primary purpose of a SIS is to detect and respond to potentially

dangerous or emergency conditions to prevent hazardous events such as fires,

explosions, toxic releases or uncontrollable releases of fluids from happening.

Types of Safety Instrumented Functions

There are generally three types of safetyinstrumented functions (SIFs) that SIS are designed to perform:

Emergency Shutdown (ESD) – <u>Safety</u>

Instrumented Systems is shuts down a process orhalts the flow of materials

when hazardous conditions are detected. This couldinclude automatically closing valves, stopping pumps or shutdown ofrelated equipment to isolate hazardous materials.

Fire and Gas Monitoring (FGM) -

Detects and responds to fire or gas release incidents. Gas and flame detectors

automatically trigger mitigation actions like drainageof flammable liquids, activation of deluge systems or ventilation.

Burner Management Systems (BMS) -

Protects boilers and industrial furnaces bymonitoring and controlling the safe

operation of fuel and air flows, ignition, flamestability and otherparameters. Automatically shuts down fuel supply in case of abnormal conditions.

Key Components of a SIS

A typical SIS consists of the following main components:

Sensors – Devices that detect process variables like temperature, pressure,

flow or levels exceeding preset safety limits. Common sensors include thermocouples, pressure transmitters and flow meters.