Cause and Effects

The key inputs to the design of the ESD and F&G systems includes overall system design philosophies and cause and effects. Simply put, if a series of events (causes) happen, a series of outputs (effects) will occur.

The cause and effects detail the required control output (effect) based on a certain set of instrumentation or operator inputs (causes) and originates from the process discipline. For the attached highlighted example, follow the high-high pressure signal horizontally to the intersection marked “X” and follow vertically to the automatic valves closure actions (effects).

Input/Output types

There are two types of input/output (I/O) to DCS systems:

- Digital: On or off indication/instruction.

- Analogue: variable signal between set levels.

You will often hear instrument systems engineers talking about I/O quantity. This is simply the number of digital and analogue inputs and outputs a system needs. When specifying a system, the engineer will typically add 20% additional I/O capacity to allow for future expansion and modifications to the system. A typical platform DCS system may have many thousand I/Os.