

OPERATING PROCEDURES

Operating procedures, also known as standard operating procedures (SOP) or standard operating instructions (SOI), provide instructions and guidance for safe and reliable operation during normal operating modes, including:

- Steady-state,
- Start-up,
- Shutdown,
- Maintenance,
- Instrument Testing,
- Preparation for Maintenance, and
- Process equipment bypassed or out of service.

The procedures should define how operating personnel interact with the IPS during each operating mode. Controls, alarms, graphics, and indications should be described to ensure the operator understands the information being displayed and what is expected in response to abnormal and emergency conditions.

Operating procedures should include safe operating procedures, which provide the following information:

- Hazardous event being prevented by the IPS,
- IPS description,
- Set points and IPS actions,
- Correct use of bypasses and resets, including the process conditions necessary for safe use, and
- Response to IPS alarms and trips,
- When and how to execute a manual shutdown, and
- Provisions for operation with detected faults, including compensating measures necessary to maintain safe operation.

Safe operating procedures may be integrated within the facility's general operating procedures or maintained as a separate set of procedures. When the procedures are integrated into the general procedures, a special symbol or format should be used to annotate those related to safe operation. Operating procedures should be in place prior to process equipment start-up, updated before any change is placed in service, and kept current throughout the IPS life.

6.5.1 Operator Response to Hazardous Events

The process industry often relies on operators to make critical decisions with regard to plant operation. Most owner/operators establish minimum education, skills and/or experience requirements for employment as an operator. This background is then supplemented through site-specific training on operating practices and procedures.

Caution should be applied when expecting operators to take responsibility for executing an IPF. Rigorous procedures and training are necessary to consistently achieve risk reduction (Appendix B). Based on information and/or observation, the operator makes the decision to take a specific action among a set of actions that are possible, such as bringing the process to safer operating conditions, initiating manual shutdown of selected parts of the process, performing manual equipment isolation, or reducing production rates. An operator is generally expected to be capable of executing any of the following actions:

- Detect and respond to changes in the operation of the control system by monitoring trends in production, quality, and input/output signals,
- Perform production or quality critical actions based on alarms or indications,
- Record information and data according to procedure,
- Respond to detected faults of IPS equipment by implementing compensating measures and initiating a maintenance order, if necessary,
- Respond to protective alarms to prevent hazardous event,
- Respond to abnormal and emergency operation and conditions,
- Record and report IPS trips, and
- Initiate alarms that require personnel to shelter-in-place or move to a safe area (see Appendix B.6).

Human factors should be considered, assessing how effective an operator can be during the hazardous event propagation. Work load, human reliability, or human factor analysis can be used to assess task expectations related to the work environment. Instrumentation and controls used as part of the supervisory function (see Appendix B) should be designed and managed to achieve the desired risk reduction.

The amount of time available for