Instrumentation
Emergency Shutdown

Course Objectives

1. Describe common types of alarms.
2. Describe common emergency shutdown (ESD) systems used in process control.
3. Describe common startup permissive conditions.
4. Describe common interlock sensors, including optical and interlock, to control process functioning.
5. Identify safety concerns related to process variable interactions.
6. Describe voting logic.
7. Discuss redundancy systems used to prevent interrupted operations.
8. Identify permissives, interlocks, and emergency shutdown devices on a P&ID.
9. Describe what a specific emergency shutdown device is designed to protect, given a basic description of the process and a P&ID.

Key Terms (Define the following)

permissives - _____

_____

alarms - _____

_____

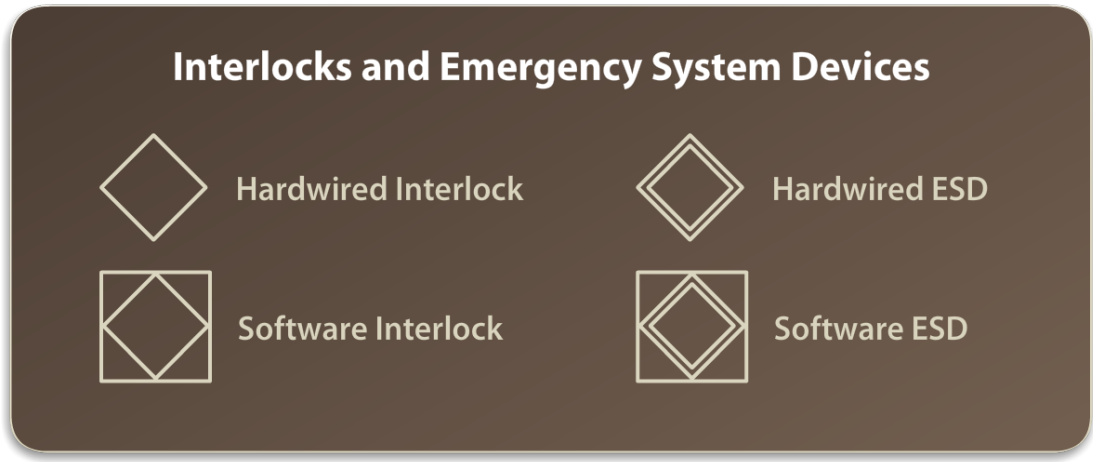
interlocks - _____

_____

Emergency Shutdown Device (ESDs) - _____

_____

Principles



Questions

1. The P&ID designation LSLL means
   - ☐ level switch low low
   - ☐ level safety low low
   - ☐ low switch low level
   - ☐ level scan low low

2. Interlocks are always hardwired between equipment.
   - ☐ True
   - ☐ False

3. Final control elements cannot be labeled as a safety valve.
   - ☐ True
   - ☐ False