Project Wide Development of a Protective Devices Register
Manuel (Manny) Hernandez

FLUOR®
What is it?

• A Register that lists and reflects the current installation status of all plant protective devices…
• Identifies their service & function…
• Along with the location of the device…
• And the hazardous event protected…
• Along with the risk rating for the specific hazard.
Why is its Function?

• Provides a single listing of all plant devices associated with safety and a way of ensuring and documenting that those safety devices are serviced, checked, and tested as required.
Responsibilities

• During project execution a Single Point of Authority (SPA) ensures that a Protective Devices Register has been created and that it is kept up-to-date by unit project team members.

• SPA is responsible for ensuring that the Protective Devices Register is transferred to the site at completion of the project.
Responsibilities

• Each Unit’s HSSE advisors are responsible for ensuring that the Protective Devices Registers are being populated and are up-to-date.
Responsibilities

• Discipline leaders will appoint a specific person in their respective disciplines to populate the Register and keep track of changes.
Responsibilities

• The Site’s Unit Managers and Discipline Managers are responsible for maintaining the Registers up-to-date after project completion and during regular Plant operations.
Responsibilities

- SINGLE POINT OF AUTHORITY
- Overall Responsibility for the Protective Devices Register
  - Unit HSSE Advisors
  - Responsibility for the Protective Devices Register in their unit.
  - Disciplines: Control Systems, Mechanical, Electrical, Civil, Structural
  - Each Discipline assigns a specific person responsible for populating the Register for that discipline

- Unit HSSE Advisors
- Disciplines: Control Systems, Mechanical, Electrical, Civil, Structural
What Is Included?

Two conditions have to be met for and equipment/device to be included in the Registers.

1. The Equipment’s/Device’s main service function is to prevent a major accident that could have direct impact on the safety of people, the environment, or the integrity of the plant.
What Is Included?

• 2. The Equipments/Device must be listed in a Master Protective Systems/Devices Listing.

IF both conditions are met, then the equipment/device must be included in the Registers.
Is the Device’s main Function is to prevent a major Accident?

- Y/N
  - Y
    - Included in a Master Protective Systems/Device Listing?
      - Y/N
        - N
          - Do not Include in the Protective Devices Register
        - Y
          - Must Include in the Protective Devices Register
  - N
    - Y/N
      - N
        - Do not Include in the Protective Devices Register
      - Y
        - Must Include in the Protective Devices Register
Protective Systems/Device Listing

A. Mechanical Devices
B. Instrumentation and Control Devices and Protective Systems
C. Electrical Devices and Protective Systems
D. Emergency Response and Crisis Management Systems & Devices
E. Miscellaneous Protective Systems
Mechanical Devices

A. Pressure/Vacuum Relief Devices
B. Vents
C. Flare Systems
D. Liquid Containment and Disposal Systems
E. Valves, Valve Locking, and Valve Configuration Systems
F. Mechanical Overspeed and Overload Devices
G. Machinery Condition Monitoring
Instrumentation and Control Devices & Protective Systems

A. Safety Instrumented Systems
B. Shutdown Systems
C. Emergency Isolation Valves
D. Critical Alarms
E. Emergency Depressuring Systems
F. Other Combustion Safeguards
G. Fixed Gas detection Systems (Hyrdocarbons and Toxic Gas)
Emergency Response and Crisis Management Systems & Devices

A. Eyewash and Safety Showers
B. Fire Water Systems
C. Mobile Equipment
D. Fire & Smoke Detection Systems
E. Other Fire Suppression
Miscellaneous Protective Systems

A. Environmental Protection Systems
B. Fire Water Systems
C. Mobile Equipment
D. Fire & Smoke Detection Systems
E. Other Fire Suppression
Register Fields to Include

A. Unit: Plant Unit
B. Group: (ex. Mechanical Devices)
C. Category: (ex. Pressure/Relief Devices)
D. Sub-Category: (ex. Relief Valves)
E. Device Identifier: (tag number)
F. Installation Status:  
   (installed, to be installed, out of service, etc.)
Register Fields to Include

G. Service Description
H. Device Location
I. Equipment Protected: (if applicable)
J. Model Number:
K. Design Basis (Technical Reference):
L. Hazardous Event Protected: (description)
Register Fields to Include

M. Risk Rating: (High, Medium, Low) as determined by risk rating tables
N. Testing/Calibration Frequency:
O. Inspection Frequency:
P. Preventive Maintenance Frequency:
Q. Link to Preventive Maintenance Procedures:
R. Comments:
## Risk Ranking Table

<table>
<thead>
<tr>
<th>RISK Level</th>
<th>Health/Safety</th>
<th>Environmental</th>
<th>Financial Loss</th>
<th>Reputation</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>10 fatalities</td>
<td>10,000 bbls oil</td>
<td>$100M to $1B</td>
<td>National Outrage</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>1 fatalities</td>
<td>100 bbls oil</td>
<td>$1 - $10 million</td>
<td>National Media</td>
</tr>
<tr>
<td>LOW</td>
<td>permanent Injury to 1</td>
<td>Minimal quantity</td>
<td>$100k-$1 million</td>
<td>Regional Media</td>
</tr>
</tbody>
</table>
Data sources

A. If the device is a instrumented system, data maybe be exported from SPI (Smart Plant Instrumentation)

B. If the device is not an instrumented system, then obtain information from the manufacturer, purchase orders, or from plant sources.
SPI

Instrument Equipment contained in SPI (InTools)

A. Control Valves
B. On-Off Valves
C. Transmitters
D. Analyzers
E. Fire & Gas Detectors
F. Pressure Safety Valves
G. Third Party devices in the field
The Protective Devices Register is intended to function as a single source repository for information on plant equipment related to plant safety. If a device or system meets the criteria for inclusion in the register it is mandatory to include.
Contact

Manuel.Hernandez@Fluor.com