Managing an Instrumented Protective Systems (IPS) Program for a Petrochemical Facility

J. Gregory Hall
Principal Electrical Engineer
Eastman Chemical Company
Eastman Chemical Company – Texas Operations (TXO)

- Longview, TX, since 1952
- 40 major chemical and polymer products
- Nearly 6 Million pounds of product shipped daily
- More than 200 buildings and 6,000 acres
- Operations 24 / 7
- OSHA VPP
Who I am?

• Principal Electrical Engineer
• IPS Design Engineer
• IPS Committee Chairman
Which Plant Do You Want?

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What is IPS?

IPS are composed of any combination of sensor(s), logic solver(s), and final element(s) used to implement protective functions that detect abnormal or unacceptable operating conditions and take action on the process to achieve or maintain a safe state.
Greg Hall’s - IPS Responsibilities

- Functional owner of all IPS at TXO
- Chairman of the IPS Committee
- Design SIS
- Oversee design of NSR Safety Interlocks
- Safety Life-Cycle
OSHA & RAGAGEP

• ANSI/ISA-84.00.01-2004 Part 1 (IEC 61511-1 Mod)
• NFPA 85 / 86
• API Practices
• Many others

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IPS Program Elements

1) Hazard and Risk Assessment
2) IPS Classification Assignment
3) IPS Classification Requirements
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IPS – Classifications

SAFETY

SIS (Safety Instrumented Systems)

- ANSI/ISA-84.00.01-2004
  - SIL 3
  - SIL 2
  - SIL 1

- Company or Other Procedures
  - Area Analyzers for Personnel Health Protection
  - BMS - Burner Management System (NFPA 85 & 86)
  - ESD - Operator Activated Emergency Shutdown Systems
  - Safety System
  - Grandfathered SIS
  - IPL - Independent Protection Layer

NSR (Non-SIL Rated)

- Company Procedures
  - Environmental
  - Equipment / Property Protection
  - Process Control
  - Quality

NON-SAFETY

Covered by Other Procedures / Standards

Asset / Personnel Protection

- Fire Protection Systems
- Laboratory Facilities (ANSI/AIHE Z9.5)
- Machine Monitoring / Safety System (API-670)
- Machinery Safeguards

Regulatory

- cGMP
- EPA - GHG
- EPA - RCRA
- EPA - SPCC
- EPA Title V
- FDA
- ISO 9002
- MACT
- NRC
- RR Commission
- SOX
- TCEQ
IPS Program Elements

4) Design and Engineering Requirements
5) Application Software Requirements
6) Installation, Commissioning, and Validation Requirements
7) Operation Requirements
8) Maintenance Requirements
IPS Program Elements

9) Testing Requirements
10) Modification
11) Information and Documentation
12) Grandfathered Safety Interlocks
Responsibilities

- IPS Group
- Safety Department
- IPS Design Engineer
- Operating Department
- Maintenance Department
- Documentation Services
- DCS / PLC Group
What Greases the Wheels?

UPPER MANAGEMENT SUPPORT!!!
Successful IPS Program

• Upper Management Support
• IPS Group to manage program
• Different departments and groups working together
• Feedback from all groups to drive improvement
Conclusion

“A successful IPS program reduces the potential risk associated with health and safety effects, environmental impacts, loss of property, and business interruption costs.”
J. Gregory Hall

• 34 Years with Eastman Chemical Company
• Principal Electrical Engineer
• IPS Design Engineer
• IPS Committee Chairman
• PIP Process Control Function Team for 16 years (PIP – Process Industry Practices)
• Attending Symposium since 1982 (last 17 in a row)