Process Hazard Analysis: Study Enhancement

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Beginning Thoughts

The Three Laws of Technology

By Arthur C. Clark

• When an engineer states that something is possible, he is almost certainly RIGHT. When he states that something is impossible, he is very probably WRONG.

• Any sufficiently advanced technology is indistinguishable from magic.
Study Objectives

- Federal Requirements
- Companies Requirements
- Tools
- Training
- "Bringing all Together"
- Cost and Savings
Federal Requirements

• OSHA CFR Title 29 §1910.119
  – Process Safety Management of Highly Hazardous Chemicals

• EPA CFR Title 40 Part 68
  – Chemical Accident Prevention Provisions
Company Requirements

• Accuracy and Precision

• Compliance

• Speed
Accuracy and Precision

• Right Recommendations
• Vague Recommendations
• Constrictive Recommendations
• Wrong Recommendations
Speed

• TIME IS MONEY!!!!

• Too Quick of a Pace for the Study
  – Team Fails by Being Rushed
  – Missed Consequences

• Too Slow of a Pace for the Study
  – Team Fails by Tiring of Thinking
  – Missed Consequences
  – Unnecessary Consequences (Whines)
Tools

- Willing People
- Deep Knowledge
- Accessible Information
- Archiving and Accessing Captured Information for Study
- Equipment
- EIS
Tools

• People, Knowledge, Information, Computer Programs, Archiving Information, Access to Information

• Typical for All PHAs
Tools: Equipment

• Displaying Information
  – Eye strain
  – Comfort

• Markups of P&IDs
  – To Keep the Team on Same “Page”
  – Verbal Directions of Nodes
    – Not Quick

• Derailing the Thought Train
Tools: Equipment, cont.

• Monitors for each Team Member & Space remaining for P&IDs
  
  - Same Page Issue
  - Quick Editing
  - Comfortable
Tools: Equipment, cont.

- Document Camera to Project Drawings
  - Use Basic Marked Drawings
  - Lower Eye Strain
  - Faster Information Recognition
  - Visual Data preferred
Cost Analysis

• Equipment

• Training for Leaders

Savings!!!!!!!
Equipment

- Six Monitors @ $150 each
  - Two – Operators
  - Two – Engineers
  - Three – Other Skill Sets

- One Document Camera @ $2000

- Other Minor Equipment @ $300
Total Cost

Total = $3350
Training for Leaders

Necessary Training

• Basic Leader Development (In House?)

• Basic Instructor Development (In House?)

• Negotiating Development (In House?)

Items to consider

• Basic Interview Development

• Basic Speakers Development
Savings, Initial

- Time for Initial Studies
  - Normal; 5 to 8 weeks
  - With Enhancements; 3 to 4 weeks
- Using one Operator & two Engineers; combined cost $270/hr

- Time Savings ~$11,300 per study
Savings, Revalidation

• Time for Revalidation Studies
  – Normal; 2 to 4 weeks
  – Enhanced; 1 to 8 study days

• Using one Operator & two Engineers; combined cost $270/hr

• Time Savings ~ $11,300 for each study
The Bottom Line

• Equipment Total = $3350

• Savings per study = ~ $11,300

• Net Saving for the first Study = $7,950
Desired Results

PHA

PSI

Changes
THANKS

- Mary Kay O’Connor
  Process Safety Center

- Dr. M. Sam Mannan

- INVISTA

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A Few Questions

Questions

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