

PSM in Incident and Project Delay Disputes

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Process Safety and Loss Management

- In early times
 - Done locally by experience—trial and error
 - Process safety focused on chemistry, plant design and operations
 - Loss focused on chemicals and materials of value

Process Safety and Loss Management

- In modern times
 - Practiced and understood world wide
 - Integrated and logically developed programs under regulations
 - Procedures and methods differ but have common PSLM objectives
 - Process safety focus on protection of people, property, environment
 - Loss considers valued materials, wastes, and other financial losses and liabilities associated with the operations

PSM

- February 1992, process safety management (PSM) promulgated by US OSHA
- Applies to systems involving hazardous chemicals
- Requires compliance with 14 elements
- Hazards analysis (HAZOPs) a key element
- PSM and PSLM closely related and used interchangeably
- Similar programs implemented in other countries
- Benefits of PSM type programs are recognized and realized

PSM Expectations and Challenges

- Upper managers
 - Concerned with company and business risks
 - Rely on technical staff for plant risk management (PSM)
 - Expect low/remote likelihood of accidents

PSM Expectations and Challenges (contd.)

- Technical managers
 - Manage plant specific process safety, HAZOPs/PSM
 - Costs for risk reductions may not include litigation and intangible costs
 - Litigation and intangible costs contribute to “L” in PSLM

PSM Expectations and Challenges (contd.)

- Mind set and expectation in Operating Plants
 - Implementing PSM and HAZOPs eliminates incidents
- Reality
 - Risks and incidents can be reduced not eliminated

PSM Expectations and Challenges (contd.)

- Mind set and expectation in Capital Projects
 - Process design and HAZOPs complete
 - Firm basis for detail design, procurement, construction done
- Reality
 - Firm design basis rarely achieved
 - Late design changes happen and cause delays and cost overruns

PSM and Post Accident Law Suits

- In the US lawsuits usually follow after accidents
- Post-accident mentality in lawsuits
 - Adequacy, quality and implementation of PSM deficient
 - “But for the deficient PSM accident was preventable”
 - Limitations of HAZOPs and PSM do not matter

Capital Project Lawsuits

- New and Retrofit Capital Project lawsuits can result from:
 - Schedule and construction delays with cost overruns
 - Start-up and operational problems
 - Inefficient plant performance

Capital Project Lawsuits (contd.)

- Underlying causes
 - Untimely and inadequate HAZOPs/risk analysis
 - Late HAZOP-initiated changes causing engineering rework, procurement and construction delays
 - Unproven technology with deficient design and risk evaluation

List of Selected Example Lawsuits

- Pipe rupture---fatalities, property damage---deficient PSM
- Gas release---exposure---health effects---deficient PSM
- Toll Manufacturing---explosion---PSM was business owner's responsibility
- Post plant acquisition---explosion---seller's HAZOP/PSM deficient

List of Selected Example Lawsuits (contd.)

- New chemical plant---delay/cost overrun---late HAZOP
- New plant retrofit---cost overrun---late HAZOP
- Metals recovery plant---delay/cost overrun---Deficient HAZOP and process design

Pipe Rupture Case

- Two similar pipe elbows in parallel trains in same service
- Second train and elbow installed much later than the first
- Second one failed—fatalities, damaged plant
- Lawsuit alleged elbow failure due to deficient PSM

Pipe Rupture Case (contd.)

- In-depth cause analysis included:
 - PSM implementation
 - HAZOP Performance
 - Operations and maintenance records
- Analysis did not corroborate allegations—
inadvertent failure
- Court dismissed case on summary judgment
- Extensive, efforts time, costs expended in
defense

New Plant Delay and Cost Overrun

- Multimillion dollar capital project
- Owner obtained “proven” technology from licensor
- Engineer did feasibility study for owner
- Tight schedule and budget mandated by Owner
- Same Engineer given detail design-build/EPC contract

New Plant Delay and Cost Overrun (contd.)

- Licensor's process package stated as "frozen" for design
- HAZOPs done over 4 months during detailed design
- Late design changes, schedule delays, cost overruns
- Engineer sued
- Defense showed HAZOP and technology deficiencies
- Matter settled out of court

Lessons Learned

- Post accident lawsuits allege deficient and non-compliant PSM/HAZOP
- Limitations and site specific nature of PSM/HAZOP not recognized
- Defense efforts time and costs can be huge

Lessons Learned (contd.)

- Capital project delay and cost overrun lawsuits can have underlying technology deficiencies and late HAZOPs causing design and project completion delays
- Defense costs and efforts can be huge
- Unanticipated legal defense costs can cause huge financial losses (the big “L” in PSLM)

Suggestions for Loss (“L”) Prevention-- Operating Plants

- Expect and prepare for post accident lawsuits
- Perform timely, thorough and defensible hazards analysis
- Implement risk reduction measures
- Keep upper management and involved staff fully apprised

Suggestions for Loss (“L”) Prevention-- Operating Plants (contd.)

- Keep PSM, HAZOPs and related programs up-to-date
- Maintain clear, organized documents, drawings and records in support of proactive due diligence
- Keep in-house counsel informed
- Budget time and money to implement the above

Suggestions for Loss (“L”) Prevention—Capital Projects

- On capital projects insist on timely performance of hazards and risk analysis
- Involve process, engineering, operations and construction personnel early in the project to flush out key design decisions
- Insist on “frozen” design package before starting detailed design

Suggestions for Loss (“L”) Prevention—Capital Projects (contd.)

- Keep management and key staff fully apprised
- Keep clear, organized project files with documents that support progress and decisions
- Keep in-house counsel informed and obtain guidance
- Budget time and money to implement the above

OSHA Violations

