


Process Safety Data

The Cornerstone of PSM (and often its' undermining)

European Workshop on Process
Safety (Nice, 28-29 September
2015)



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What is Process Safety Data?

- Asset/Equipment Information (Prescriptive)
 - P&ID's, vessel datasheet, instrumentation, equipment inventory, etc
 - Details on PSV, Safety Instrumented Systems
- Process Information/Technology (Mostly Prescriptive)
 - Batch instructions, procedures, raw material information, SDS, process safety data, etc
- Process safety data includes information on:
 - Flammability
 - Highly energetic materials
 - Fire and burning properties
 - Thermally unstable materials
 - Exothermic / gas generating reactions
- **Process Safety Data is NOT Prescriptive**



Comparing Strategies for Data Acquisition

Approach	Definition
Complete Dataset	A complete set of data on all materials and processes
Prescribed Dataset	A prescribed “list” of data requirements aligned with a specific “Basis of Safety”
Flowchart Approach	Prescribed flow chart dictates testing requirements to arrive at an ultimate “Basis of safety”

Comparing Strategies for Data Acquisition

Approach	Definition
Tailored (Case-specific) Approach	Data requirements defined on a case-by-case basis.
Prescribed Data plus Situational Data	Key / prescribed parameters provide initial characterisation of the hazards. Post-PHA, specific situational data is obtained for specification of the basis of safety
Assume Worst Case Characteristics	Assume parameters are all at worst case limits
Ignorance	Thinking that all important process safety properties will be available on a Safety Data Sheet (SDS). Approach results from lack of hazard awareness (competence), lack of programs or poor organisational culture.

The Best Approaches...

- Best approaches are:
 - Tailored / Case-specific OR
 - Prescribed + situational approaches
- Most cost-effective and most effective
- Requires strong competence for consistent performance outcomes
- ***... but are hardest to apply in multinational organisations***



The Criticality of Competence in Data Acquisition and Use

- Prescriptive techniques are easier to apply consistently but:
 - are more expensive,
 - inhibit “thinking” and are less flexible to changes
- Tailored / Situational solutions require strong competence across operating units to ensure consistency
- Ensuring this consistency is a challenge
 - Use of “Centres of Excellence” / Regional Champions
 - Central “peer review”
 - Global training / competency development programs

Most Common Pitfalls

- Collecting safety data at the end of development
 - Safety data should evolve with the process to inform process decisions
- Using the wrong lab equipment
 - Over-reliance on equipment you have, not equipment you need
- No characterisation data at PHA stage
 - Inability to answer PHA questions swiftly, leading to assumptions
- Lack of competence in extrapolating data
 - Needs a specialist to interpret data on the PHA team
- Lack of a robust and documented basis of safety
- ...and many more!

Specific Examples

- French clients process condemned on safety grounds at the end of development.
- DSC data (under nitrogen) used for drying temperature specification in a fluidised bed dryer.
- Numerous clients size emergency relief systems for the scenario of fire engulfment using API methods when runaway reaction scenarios exist.
- Hazop concludes “TEMPERATURE LOW” scenario is no risk as kinetics slower and further from boiling point.

Summary

- A clear and unambiguous strategy for process safety data collection is required which is robust and consistent across an organisation
- Prescriptive techniques are rarely the most effective or cost-effective.
- Local competence to generate and interpret data – to link it to safety measures – is critical
- Quality of PSI is a leading indicator of Process Safety maturity of a corporation

Thank you for your attention

- Any Questions?
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