Does Enform Do Process Safety?

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Process Safety

• Has come to the forefront of oil and gas industry concerns as a result of statements like this:

  – *BP management paid attention to, measured, and rewarded personal safety rather than process safety.*
    (Safety Board report on Texas City refinery explosion, as repeated in President’s Report on BP Deepwater Horizon Oil Spill and Offshore Drilling, 221)

  – *…To understand how this operated we must first make the distinction between occupational safety, sometimes called personal safety, on the one hand, and process safety on the other.*
    (A. Hopkins, “Management Walk-Arounds: Lessons from the Gulf of Mexico Oil Well Blowout” [February 2011], 9)
In nearly every introduction to process safety, this distinction will be made as a way to define the domain of process safety.
Typical Contrasting Descriptions

- **BP management had not distinguished between occupational safety**—concern over **slips, strains, and other workplace accidents**—and **process safety**: hazard analysis, design for safety, material verification, equipment maintenance, and process-change reporting.  
  (President’s Report on BP Deepwater Horizon Oil Spill and Offshore Drilling, 221)

- **This corresponds to a distinction between conventional safety risks, that result in relatively high frequency, low consequence events** (e.g., **slips, trips, and falls**) and **major hazard risks, that give rise to low frequency high consequence events** (e.g., **explosions**).  
  (A. Hopkins, “Management Walk-Arounds: Lessons from the Gulf of Mexico Oil Well Blowout” [February 2011], 9)
Enform on the Spectrum

Personal / Occupational Safety

Process Safety

In terms of... Perception? Reality?
Perception?

If Personal and Process Safety seen as necessarily distinct… easy to perceive Enform as here
Well Known Enform Offerings…

Personal Safety

Process Safety

H₂S ALIVE

CoR Certificate of Recognition
But Don’t These Fit Here?

Personal Safety

Process Safety

Drilling Rig Fire Due to High AOPF, High Pressure Formation Encountered
Near Injury Incident

SAFETY ALERT

Description:
While drilling an exploratory gas well in Northern Alberta with 1400kg/m³ fluid density, the mud motor stalled. A highly over pressured fracture was penetrated and a gas influx entered the wellbore. The well was shut-in and conventional well control procedures were implemented. Maximum Allowable Casing Pressure (MAFP) was exceeded and the Low Choke Method of well control was utilized. Within one hour of the kick, the high gas rate through the degasser had emptied the mud tank and circulation with the mud pump was no longer possible. At this time, the well had begun shaving direct to...

INTERIM IRP 24:
Fracture Stimulation:
Interwellbore Communication

An Industry Recommended Practice for the Canadian Oil and Gas Industry

INTERIM Volume 24 – 2013
Enform’s Reality

Personal Safety

- COR Program H&SMS Offerings
- DACC IRPs
- Enform Guidelines
- Safety Alerts
- Supervisor and Worker Training

Process Safety
Examples of “Process Safety”

DACC IRPs

• Came about as a result of a defining process safety incident in Alberta:

  The Lodgepole Blowout, 1982

• In response:

  Alberta Recommended Practice (ARP) 1: *Drilling Critical Sour Wells* (1987), now exists as IRP 1
Examples of “Process Safety”

DACC IRP Topics:

• Critical Sour Drilling
• Completing and Servicing Critical Sour
• In Situ Heavy Oil Operations
• Well Testing and Fluid Handling
• Minimum Wellhead Requirements
• Critical Sour Underbalanced Drilling
• Standards for Wellsite Supervision of Drilling, Completion, and Workovers
• Pumping of Flammable Fluids
• Slickline Operations
• Non-Water Based Drilling Fluids
• Snubbing Operations
• Wellsite Design Spacing Requirements
• Coiled Tubing Operations
• Underbalanced and Managed Pressure Drilling Operations
• Fracture Stimulation: Interwellbore Communications
• Primary and Remedial Cementing Guidelines
Examples of “Process Safety”

Enform Safety Alerts

- These include process safety or potential process safety incidents (i.e., fire, explosion, loss of containment)
- 15/62 (~25%) since start of 2010 are process safety
Examples of “Process Safety”

Training Courses

- ~15 are fully “process safety”
- Many more overlap process safety concerns
  - E.g., courses that deal with supervisor / worker competency in hazardous process operations
Examples of “Process Safety”

Training Courses

• Notable Examples
  – Coiled Tubing Well Servicing Blowout Prevention
  – Detection and Control of Flammable Substances
  – First Line Supervisor’s Blowout Prevention
  – Second Line Supervisor’s Well Control
  – Well Service Blowout Prevention
  – International Well Control Training
Examples of “Process Safety”

H&S Management Systems Training and Auditing

- COR Program-based H&SMS training, guidance, and auditing is premised on a management system that includes many elements of a Process Safety Management (PSM) System
  - E.g., management support, inspections, equipment maintenance, training, ERP, incident reporting, etc.
Management System

Personal Safety*

- Element A: Management Involvement and Commitment
- Element B: Hazard Identification and Assessment
  (includes Inspections and Site Specific Hazard ID and Reporting)
- Element C: Hazard Control
  (includes Preventive Maintenance and Hazardous Materials)
- Element D: Training
- Element E: Emergency Response
- Element F: Incident Reporting and Investigations
- Element G: Communication
  (includes Safety Records and Audit)
- Element H: Joint Health and Safety Committee

*Example from Enform COR Audit Protocol

Process Safety**

Process safety leadership
1. Leadership commitment & responsibility
2. Identification & compliance with legislation & industry standards
3. Employee selection, placement, competency & health assurance
4. Workforce involvement
5. Communication with stakeholders

Risk identification & assessment
6. Hazard identification & risk assessment
7. Documentation, records & knowledge management

Risk management
8. Operating manuals & procedures
9. Process & operational status monitoring & handover
10. Management of operational interfaces
11. Standards & practices
12. Management of change & project management
13. Operational readiness & process start-up
14. Emergency preparedness
15. Inspection & maintenance
16. Management of safety critical devices
17. Work control, permit-to-work & test risk management
18. Contractor & supplier, selection & management

Review & improvement
19. Incident reporting & investigation
20. Audit, assurance, management review & intervention

Enform’s Reality

Personal Safety
- COR Program H&SMS Offerings
- Enform Guidelines
- Safety Alerts
- Supervisor and Worker Training

Process Safety
- DACC IRPs

But we have not used the term “process safety”
Enform’s Reality

Personal Safety

- COR Program H&SMS Offerings
- Enform Guidelines
- Safety Alerts
- Supervisor and Worker Training

Process Safety

- DACC IRPs

The upstream industry also rarely uses the term “process safety” ...but are they already doing it?
Enform’s New Strategic Priorities

• Effective 2013, the Board of Directors of Enform set out four strategic priorities:
  – Safety Culture
  – Process Safety
  – Safety Performance Metrics
  – Advocacy
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So what does this mean going forward?
Enform’s Strategy

**Personal Safety**

- Leverage existing depth in H&SMS based programs here…

**Process Safety**

- And continue to drive out and enhance existing deliverables here…

- And ultimately produce an integrated “approach” (practices, methodologies, training, etc.) for the upstream petroleum industry that succeeds because it is “do-able”
For Whom?

Refinery Space

• Well served by existing process safety expertise and publications

• Other jurisdictions demand process safety management (e.g., OSHA 1910.119 in US) and multinationals tend toward global standardization in large operations.
For Whom?

How about upstream from refineries?

Are descriptors like:
• low frequency, high consequence events
• loss of containment of hazardous materials
  • fires and explosions
applicable to these operations?
For Whom?

**Pipeline**

- Those falling under NEB already being pushed toward PSM model by regulation
- But what about thousands of kilometers of collector pipe in existing operations or under construction?
- What specific process safety approaches or offerings would add value here?
For Whom?

Small O&G Facility

• Guideline already in development by CAPP Process Safety Committee

• What scale of process safety management is appropriate to smaller facilities?

• What are the most important process safety disciplines that need to be exercised here?
For Whom?

Completions / Servicing

- E.g.’s, fracture stimulation and snubbing
- Exponential growth in complexity and pressures to be managed
- How does process safety apply to operations where equipment is moved in to isolated area, made up, used, torn down, moved, and repeat?
For Whom?

Drilling

• Move to hydrocarbon based drilling fluids a process safety game changer

• Like completions—process safety for make up / tear down equipment?

• Also—process safety for system and processes designed to deal with potentially unknown formation fluids and pressures?
For Whom?

Keys to Increasing Process Safety Maturity:

• Identification of the highest value add process safety elements for specific operations

• Applying and building forward from what we already do to manage safety and major hazards

• Developing processes and systems that are readily scalable and “do-able”
“Do-able”

- The lesson from “Human Factors”
  - Creating overly complex systems with too many steps simply leads to workarounds
  - “Efficient” is a key ingredient for “Effective”
- Paperwork if necessary…but not necessarily paperwork
- Developing “field level” process safety competencies for front line supervisors and workers
- Promoting and developing process safety disciplines/practices that can be accomplished with existing, in-house company personnel
  - Needs to be workable for small to mid-size Canadian upstream companies
The Road Forward

• Enform deliverables are…

**By Industry For Industry**

• Process Safety development and deliverables will ultimately be determined “by industry”
Thank You