

Integrating PSM within an Organization through an Integrated Management System (IMS)

Amanda Sistilli, Dr. Lianne Lefsrud (University of Alberta), Dr. Graeme Norval (University of Toronto)

Agenda:

- BP Deepwater Horizon
- What is an Integrated Management System?
- How does it apply to Process Safety?
- Examples of IMSs that include PSM
- Benefits, Opportunities and Challenges when implementing an IMS
- My M.Sc. Project Proposal
- Feedback!

BP - Deepwater Horizon Macondo Blowout and Explosion

April 21-22, 2010:

Fire and explosion of offshore rig due to well blowout:

- 11 fatalities, 17 injuries¹
- 5 million barrels of oil spilled into Gulf of Mexico (87 days)¹
- Oil rig sank on April 22¹
- Resignation of BP CEO²
- \$63.4 billion in clean-up costs and legal fees as of Sept. 2017³



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1. "INVESTIGATION REPORT VOLUME 1 - CSB." 5 Jun. 2014, <https://www.csb.gov/file.aspx?DocumentId=5930>. Accessed 20 Oct. 2019.

2. "BP's Tony Hayward: resignation statement | Business | The Guardian." 27 Jul. 2010, <https://www.theguardian.com/business/2010/jul/27/bp-tony-hayward-statement>. Accessed 20 Oct. 2019.

3. "BP Deepwater Horizon costs balloon to \$65 billion - Reuters." 15 Jan. 2018, <https://www.reuters.com/article/us-bp-deepwaterhorizon/bp-deepwater-horizon-costs-balloon-to-65-billion-idUSKBN1F50NL>. Accessed 20 Oct. 2019.

4. "BP oil spill - The Telegraph." <https://www.telegraph.co.uk/news/earth/earthpicturegalleries/8453474/BP-oil-spill-30-pictures-of-the-Deepwater-Horizon-Gulf-of-Mexico-disaster-one-year-ago.html?image=3>. Accessed 20 Oct. 2019.

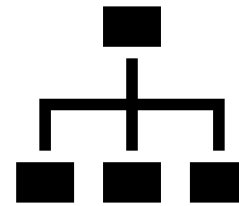
CSB Investigation Findings¹:



**Silos: Lack of
Lessons Learned
Sharing Across
Groups**



**Unequal Focus on
Personal Safety vs
PSM Indicators**



**Board of Director
Oversight and
Shareholder
Activism**

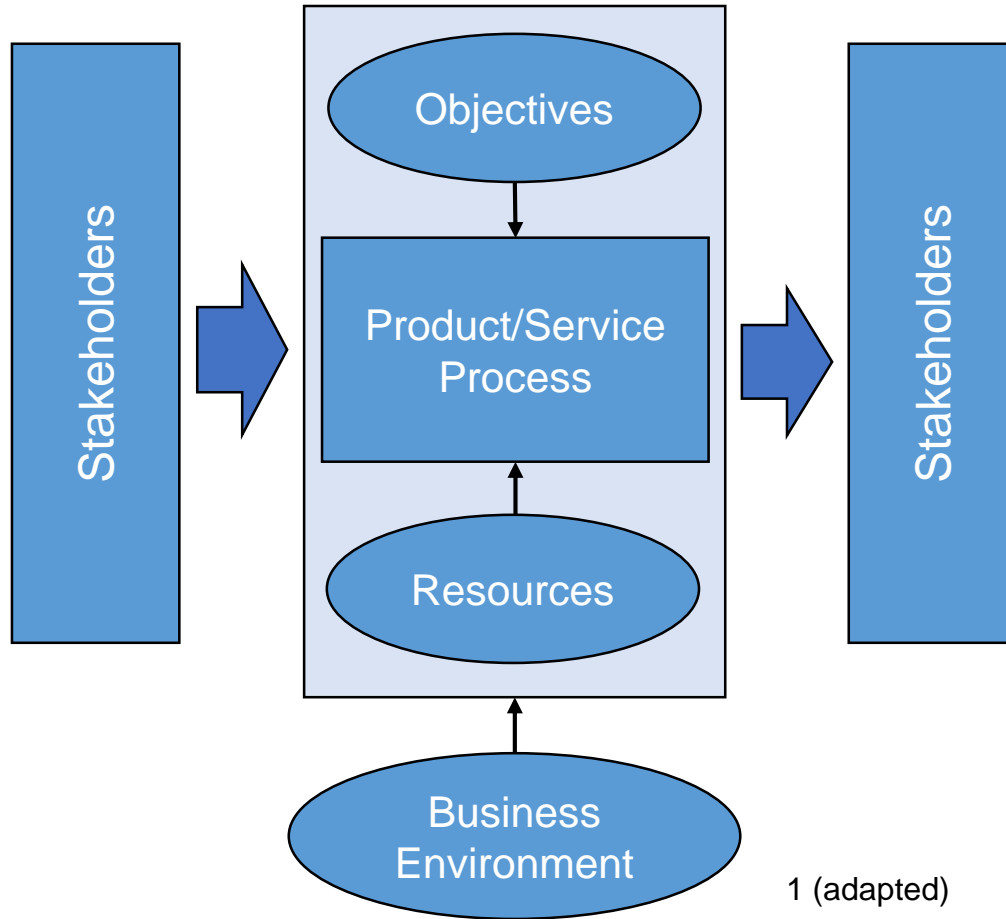


**Poor Risk
Management
between Operator
and Drilling
Contractor**

Integrated Management System (IMS):

“A single set of interconnected processes that share a unique pool of human, information, material, infrastructure and financial resources in order to achieve a composite of goals related to the satisfaction of a variety of stakeholders.”
(Karapetrovic, 2003)

Single Management System



1 (adapted)

Integrated Management System

Integration of Management System Requirements

	MSS requirements			
	ISO 9001 requirement	ISO 14001 requirement	ISO XXX requirement	Non-ISO XXX requirement
Process A	[A long horizontal bar representing the integration of requirements across all processes]			
Process B				
...				
Process X				

Integration of Management System Processes

BP's IMS: The Operating Management System

Operating Management System provides a framework for risk management across operating activities in the areas of health, safety, security, environment, social responsibility and operating reliability.²

- Established in 2006, after Texas City refinery explosion³
- Court finding: In 2010, the scope did NOT yet include contractor rigs¹

Could the OMS have prevented the events in April 2010?

1. "Process Safety - Eversheds Sutherland." 23 Jan. 2014, [https://us.eversheds-sutherland.com/portalresource/lookup/poid/Z1tOI9NPluKPtDNIqLMRV56Pab6TfzcRXncKbDtRr9tObDdEn4JEqC3!/fileUpload.name=/Williams_Gatewood%20-%20Corporate%20Counsel%20-%20Process%20Safety%20\(3\).PDF](https://us.eversheds-sutherland.com/portalresource/lookup/poid/Z1tOI9NPluKPtDNIqLMRV56Pab6TfzcRXncKbDtRr9tObDdEn4JEqC3!/fileUpload.name=/Williams_Gatewood%20-%20Corporate%20Counsel%20-%20Process%20Safety%20(3).PDF). Accessed 20 Oct. 2019.

2. "BP in America Commitment to safety." http://www.bp.com/content/dam/bp-country/en_us/PDF/GOM/BP-US-Safety.pdf. Accessed 19 Oct. 2019.

3. "Baker Panel Report on Texas City Accident - Nancy Leveson." 1 Jan. 2007, <http://sunnyday.mit.edu/Baker-panel-report.pdf>. Accessed 20 Oct. 2019.

Since 2010....

- March 2011: Establishment of Safety and Operational Risk Team
- Operating Management System roll out
- Hazardous releases that could harm a worker, exceed release limits and damage equipment have been reduced by 61%.¹

Examples of IMSs that Include PSM:

ExxonMobil

Operations and
Integrity Management
System (OIMS)



Responsible Care[®]
OUR COMMITMENT TO SUSTAINABILITY

bp



Operating
Management System
(OMS)

IMS Example: ExxonMobil OIMS



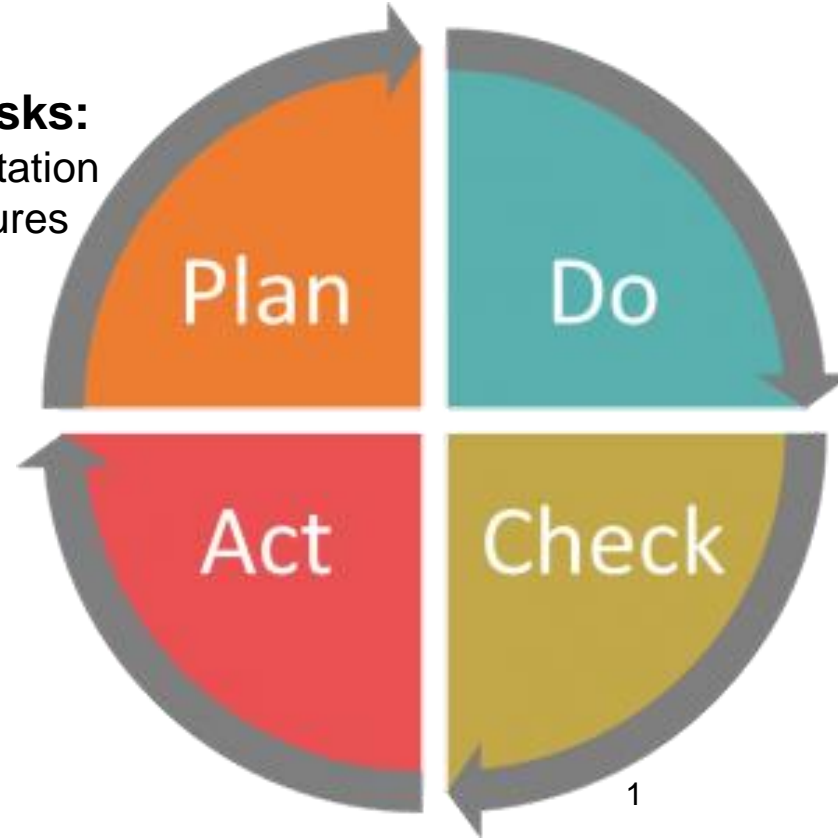
How does PSM fit in?

Understanding Hazards and Risks:

- Process knowledge and documentation
- Project review and design procedures
- Process risk assessment and risk reduction
- Human Factors²

Process Safety Leadership:

- Accountability
- Regs., Codes and Standards
- Process Safety Culture
- Conduct of Operations²



Risk Management:

- Training and Competency
- MOC
- Process Equip. and Integrity
- Emergency Management Planning²

Review and Improvement:

- Investigation
- Audits Process
- Enhancement of Process Safety Knowledge
- Key Performance Indicators²

1. "How to Improve Business Performance and Productivity with" 1 May. 2018, <https://www.inspiring.uk.com/the-deming-cycle/>. Accessed 20 Oct. 2019.

2. Canadian Standards Association. CAN/CSA-Z767-17 Process Safety Management, approved August 2017.

The Case for Process Safety Integration:

1. By excluding PSM from an integrated management system we are potentially neglecting major hazards in the corporate risk framework.
2. An IMS may help improve the traction and streamlining of PSM practices for small organizations or non-chemical industry organizations that use hazardous chemicals.

Potential Benefits of an IMS:

- Reduced documentation
- Standardization of processes and reduction of processes
- Decrease audit and compliance costs
- Improved accountability
- Improved mitigation of risks
- Easier to leverage resources
- Improved safety performance¹

Potential Challenges in Implementing IMS:

- Complicated organization processes
- Resistance and confusion of staff
- A lot of work up front
- Department reps may not be knowledgeable in all facets of the IMS
- Limited external auditor choices¹

In Academic Literature

- There is a gap in literature regarding the business case for PSM integration even though we know that it is being done in industry.
- Many papers that refer to OHS, Quality and EHS integration use chemical companies in their case studies but don't mention PSM integration. (Schevchenko et al. 2018, Pagell et al. 2014, Simon et al. 2013, Labodova 2008, Mearns and Havold 2003)

My Proposed Research

- Case-study based thesis studying PSM IMSs in industry and their impacts on PSM performance
- Paper-based thesis:
 1. Survey of organizations that process and use specific chemicals, inquire on PSM integration and compare PSM KPIs.
 2. In depth case study on a group of companies looking at 2-3 variables in PSM integration
 3. A roadmap for PSM integration

Finding Organizations to Collaborate With:

1. Assess PSM integration and performance in different types of organizations
 - Using one/two chemicals as a constant hazard and collect data on the types on incidents occurring in industry
2. Reach out to industry to solicit corporate/municipal volunteers for surveys and case studies

Let's Open up the Floor

I am seeking feedback on my research proposal:

- How could my research be most useful?
- Are there specific companies / contaminants that I should examine?
- Certain reports or articles? Certain integration approaches?

Would you and your organization be interested in being involved?

If you see this as a possible opportunity, let's connect!

Amanda Sistilli, P.Eng.:

Email: sistilli@ualberta.ca

LinkedIn: <https://www.linkedin.com/in/amandasistilli/>