CSB Investigations and Safety Culture

6/11/2013
Disclaimer

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WHAT IS THE CSB?

• An *independent* U.S. federal agency
  – investigating chemical accidents
  – promoting prevention – public knowledge

• Authorized by Congress in 1990

• Five Board Members; approx 45 staff

• Modeled after NTSB

• Intent of CSB investigations are to get to root cause(s) and make recommendations toward prevention

• Not regulatory; no enforcement authority
CSB Investigation Approach

• Formal analysis to identify underlying technical, human factor, management system, organizational and regulatory causes of the incident.
  – Beyond immediate technical events and individual actions
  – Focus is on improving safety NOT assigning blame

• Addressing the immediate cause ONLY prevents that exact accident from occurring again.
Investigative Approach

• Analysis of Safety Systems
  – Not just how they are set up but how the systems work in real life (interviewing employees at all levels within organization)
  – Why conditions or decisions leading to accident were seen as normal, rational, or acceptable prior to the accident

• More emphasis on Organizational and Social Causes
  – Safety culture
  – Organizational Structure
  – Cost Pressures
  – Regulatory Gaps and ineffective enforcement
  – Performance Agreements or bonus structure
Myths about Errors

• No events = no human error problems.
• Training will solve human problems.
• Significance determines culpability.
• Experience means error-free performance.
• Errors are the cause of accidents.
• Errors are bad.
‘person’ vs. ‘system’ view of error

• **Person Centered View**
  • Focus on the individual, excluding other factors
  • Individual responsibility and blame -careless, at fault, ‘bad’
  • Solution: change behavior / remove the individual

• **System View**
  • Focus on factors that influence errors
  • Human beings are fallible, errors to be expected
  • Solution: change system / conditions of work
BP Texas City

- March 23, 2005
- Blowdown drum
- Liquid hydrocarbon
- Vapor cloud explosion
- 15 deaths/180 injuries
- Baker Panel
Baker panel findings

- BP had not provided effective process safety leadership
- BP had not established an open trusting relationship between management and the workplace
- Lack of a unifying process safety culture
- Personal Safety emphasis; not process safety
  - Reliance on low LTIR gave misleading risk indicator
- Cost cutting pressures seriously degraded infrastructure
  - Mgmt failed to assess impact of cost and staff reductions on safety
Lessons Learned (?) from BP Texas City

Key Organizational Findings

• Personnel checked off safety procedures as done when incomplete (Reluctance to Simplify)
• An absence of reporting of abnormal situations for fear of blame, reprisals (sensitivity to operations)
• No emphasis on learning from mistakes to prevent worse incidents (Preoccupation with failure)
• Failure to respond to multiple internal surveys revealing deep problems (Preoccupation with failure)
Safety Culture Survey - Attributes

- the degree to which the workforce feels “empowered” as to process safety
- the extent to which the workforce feels free to report safety-related incidents
- the process safety awareness, knowledge, and competency of the workforce;
- relationships and trust between different workforce / management and contractors
- whether deviations from policies and procedures are tolerated;
- the extent of information flow at all levels
- whether the workforce has a shared belief that safety comes first, regardless of financial, scheduling, or cost objectives; and
- the extent to which the workforce is vigilant about process safety risks, continuously tries to reduce them, and seeks to learn from incidents and near misses.
Percentages of Disagree/Tend to Disagree Responses to Survey Item: “I believe a culture exists at this refinery that encourages raising process safety concerns.”

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Percentage Disagree / Tend to disagree:
“After a process related incident, accident or near miss, management is more concerned with correcting hazards than assigning blame or issuing discipline”

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Percentage Disagree / Tend to Disagree:
“When a process safety issue is involved, I can challenge decisions made by supervisors without fear of negative consequence”

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Deepwater Horizon (DWH) Incident

- April 20\textsuperscript{th}, 2010
- 11 deaths
- 17 serious Injuries
- \textasciitilde5 million barrels of oil spilled in Gulf
- Tremendous Economic Impact
Personal vs. major hazard safety

• BP and Transocean primarily measure safety performance using worker injury data
• BP executives on the rig to mark safety record
• Safety bonuses and awards are largely based on injury data
Safety Culture

- Big risk for big reward
  - Commercial risk vs. safety
- Plan for worst
  - Considered ‘low’ safety risk; environmental mitigation focused on spill vs. stopping a well flow
- Focus on personal safety
- Pay attention to warning signs
  - Prior incidents
  - Prior audit reports
- Question data and pay attention to anomalies
- Raise concerns; stop work authority
- Complacency – no ‘big’ accidents so start to not be concerned with little things
- Normalization of Deviance (acceptance of deviance)

July 15, 2013
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<tr>
<th>Value</th>
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<tr>
<td>Recognized value</td>
<td>Normalization of Deviance</td>
<td>Unified culture??</td>
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<td>Learning Driven</td>
<td>Encourage Reporting</td>
<td>Mgt wants reports? No retaliation?</td>
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<td>Resiliency (safety conscious)</td>
<td>Tolerate inadequate systems</td>
<td>Challenge : Low probability / high consequence</td>
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<tr>
<td>Accountability</td>
<td>Retain safe workers</td>
<td>Safe workers vs. safe system</td>
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<td>Integrated in all activities</td>
<td>Work pressures</td>
<td>When convenient or even under pressure</td>
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<td>Leadership Clear</td>
<td>Mgt commitment to safety</td>
<td>Top down and bottom up leadership</td>
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Safety Culture and Safety Outcomes

• Study Conducted by Mark Fleming of Saint Mary’s University, Canada

• Reviewed 17 offshore disasters to identify cultural causal factors
  – 14 contained cultural causes
    • Tolerance of inadequate systems or resources (10)
    • Normalization of deviance (9)
    • Complacency (8)
    • Work pressure / cost (4)
Chemical Facility Incidents

DuPont Yerkes
New York

Hot Work Incident

Found inadequate PHA
Challenges going forward

- Personal Safety vs. Process Safety and safety culture
- Impact of Regulatory Oversight
- Need to integrate ‘safety’ into production; not an extra layer -
- Measurement of safety culture
- Issue of multiple cultures
- Delta of what is thought to be happening and what is happening
- How do you fix a ‘bad’ safety culture?
Contact the CSB

• Web site: www.csb.gov

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