Preventing Process Safety Culture Disease

9th CCPS APAC Regional Meeting
17 September 2015 • Singapore
ABS Group – Who We Serve

• ABS Group > 2,000 employees + a vast network of subcontractors, provides a range of solutions to support safe, reliable and high-performance assets and operations to customers in 30+ countries

• Our parent, ABS, has 4,000+ employees providing marine classification-related services in 40+ countries

Global Presence

Americas
Europe
Middle East
West Africa
Asia Pacific
Australia

Customer Focus

Offshore
Oil, Gas & Chemical
Maritime
Government
Power
Pharmaceuticals
Manufacturing

Service Offerings

Technical Inspection & Verification
Safety & Risk - PSM
Asset Performance Optimization
Advanced Engineering
Management System Certification
## ABS Group Service Lines

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<td>Initial Quality:</td>
<td>PSM/HSE Services</td>
<td>Systems &amp; Technology Services (e.g., Maximo implementation)</td>
<td>Structural Engineering:</td>
<td>Third-party Audit &amp; Certification:</td>
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<tr>
<td>• PQM/TPI</td>
<td>Major Accident Risk:</td>
<td>Reliability Services:</td>
<td>• Buildings &amp; Infrastructure</td>
<td>• ISO-9000</td>
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<td>• ASME/PED/etc.</td>
<td>LOPA/SIS-SIL/Bow-Tie</td>
<td>• Field reliability</td>
<td>• Marine &amp; Offshore</td>
<td>• AS-9000</td>
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<td>• Engineering Verification &amp; Certification</td>
<td>Safety Case</td>
<td>consulting</td>
<td>Structures</td>
<td>• ISO-14000</td>
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<td>• QRA</td>
<td>LOPA/SIS-SIL/Bow-Tie</td>
<td>• Engineering reliability</td>
<td>Offshore, Subsea &amp; Process</td>
<td>• ISO-28000</td>
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<td>• Nuclear PRA</td>
<td>Safety Case</td>
<td>studies</td>
<td>Engineering Support</td>
<td>• ISO-27000</td>
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<td>• Natural Hazard Risk</td>
<td>LOPA/SIS-SIL/Bow-Tie</td>
<td>• RAM modeling &amp; simulation</td>
<td>Materials Engineering</td>
<td>• ISO-50000</td>
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<td>• Environmental Risk &amp; Compliance</td>
<td>LOPA/SIS-SIL/Bow-Tie</td>
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<td>Technical Support</td>
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<td>• Enterprise Risk Management</td>
<td>Safety Case</td>
<td>Condition Monitoring Solutions</td>
<td>Acquisition Support</td>
<td>Second-party Audits (e.g., vendor audits)</td>
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<td>• Emergency Management</td>
<td>Safety Case</td>
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<td>IV&amp;V</td>
<td>First-party Audits</td>
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<td>• Incident Investigation/Root Cause Analysis</td>
<td>Safety Case</td>
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<td>Engineering Failure Analysis</td>
<td>Training</td>
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<td>• Safety Culture Improvement</td>
<td>Safety Case</td>
<td>Operational Excellence</td>
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<td>• Software Tools</td>
<td>Safety Case</td>
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Presentation Outline

• Relationship between process safety culture, leadership and operational discipline
• Key attributes of process safety culture/leadership
• Preventing process safety culture disease
ABS Group Safety Culture Credentials and Experience

- Developed Center for Chemical Process Safety Culture Awareness Tool
- Developed Risk Based Process Safety management system structure – Process Safety Culture element – 1st time in an “official” SMS framework
- BP Texas City/Baker Panel evaluation of PSM performance and culture
- CCPS Culture Committee
- Conducted 35+ safety culture evaluations
  - Variety of industries-oil and gas, offshore, refineries, terminal and pipelines, drilling, chemical, petrochemical, Pharma, biogen, consumer, mining
  - Single plant, up to 80 representative facilities, normally 8-12 globally distributed NA, LA, EU, ME, AP
  - Surveys and interviews done Eng, Span, Port, Danish, French, Arabic, Tagalog, Mandarin
  - Always anonymous and includes contractors. Goes up to SVP or President, wherever safety and money decisions flow up to. 50% of the time get to the CEO
  - Most studies are motivated by external influence, some by owners/Boards; rarely organic
Why So Much Fuss about Culture/Leadership?

- What is culture? Leadership?
- How do you know if yours is good? Bad?
- Can one be bad and the other be good?
- Where is it best to have it in your organization?
  - Top? Middle? Bottom?
- What can do you to figure out what yours is?
- What can you do/how can you improve it?
- Is that easy to do? How long does it take?
- How do you know when you get there?
- How can you monitor it regularly?
Culture, Leadership and Operating Discipline

• **Culture** is the tendency in all of us – and our organization - to want to do the *right thing in the right way at the right time, ALL the time* – even when/if no one is looking – *ABSG definition*

  – Culture is the result of all the actions - and inactions - in institutional/workforce memory
  – Organizational culture is a complex combination of individual cultures + environment = Safety climate

  – Culture is hard to measure and more difficult to change; the “root cause of the next decade”

• **Leadership** is an essential feature of a good culture – *CCPS characterization*

  – CCPS’s 20 elements for success, Vision 2020 and RBPS Culture and Conduct of Operations elements
  – UK Process Safety Leadership Group's report following Buncefield
  – AFPM/API have been focusing on Process Safety Leadership as one of its assessment areas

• **Operational discipline** (or the lack thereof) is a behavioral result of your culture and leadership

• **CONOPs** is a system designed to create and manage *operational discipline*
Center for Chemical Process Safety Made Culture and Operational Discipline Official SMS Elements

- Evaluated major organizational accidents and prepared Safety Culture Awareness tool
- ABSC included Process Safety Culture as an element in CCPS *Guidelines for Risk Based Process Safety*
- Defined the twelve essential features of a good culture
- Defined a management practice for *Conduct of Operations* to help create operational discipline and excellence
- Created structure for a culture management practice
Process Safety Culture Essential Features

1. Establish safety as a core value
2. Provide strong leadership
3. Establish and enforce high standards of performance
4. Formalize the safety culture emphasis/approach
5. Maintain a sense of vulnerability
6. Empower individuals to successfully fulfill their safety responsibilities
7. Defer to expertise
8. Ensure open and effective communications
9. Establish a questioning/learning environment
10. Foster mutual trust
11. Provide timely response to safety issues and concerns
12. Provide continuous monitoring of performance
## Compare Safety Culture Frameworks to CCPS Features

<table>
<thead>
<tr>
<th>CCPS Culture Framework</th>
<th>Reasons for Comparison</th>
<th>HRO</th>
<th>UKHSE</th>
<th>IAEA</th>
<th>NRC</th>
<th>IMNO</th>
<th>California</th>
<th>BSEE</th>
<th>CNEB</th>
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<tbody>
<tr>
<td>Establish safety as a core value</td>
<td>Enact responsibilities and empower for safety (CCPS)</td>
<td>Demands personal responsibility for safety (CCPS)</td>
<td>High priority for safety (CCPS)</td>
<td>Safety is a core value (CCPS)</td>
<td>Integration of good health and safety, management with business (CCPS)</td>
<td>Leadership is clearly committed to safety (CCPS)</td>
<td>There is a culture and commitment to safety (CCPS)</td>
<td>Leadership is clearly committed to safety (CCPS)</td>
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<td>Provide a strong leadership</td>
<td>Leadership is clearly committed to safety values and actions (CCPS)</td>
<td>Leadership is committed to safety (CCPS)</td>
<td>Clear roles, responsibilities, and accountability (CCPS)</td>
<td>Top management commitment to safety (CCPS)</td>
<td>Clear and visible process safety leadership is at the core of managing a facility (CCPS)</td>
<td>Good process safety management does not happen by chance and it is supported by a clearly defined culture (CCPS)</td>
<td>Visible, active commitment from the board (CCPS)</td>
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<td>Leadership by Authority (CCPS)</td>
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<td>Establish and enforce high standards of performance</td>
<td>Personal accountability (CCPS)</td>
<td>Personal accountability (CCPS)</td>
<td>Nuclear technology is recognized as special and unique (CCPS)</td>
<td>Good housekeeping (CCPS)</td>
<td>Inescapable momentum (CCPS)</td>
<td>Clear leadership (CCPS)</td>
<td>Process safety leadership is required at all levels (CCPS)</td>
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<td>Leadership by Authority (CCPS)</td>
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<td>Formalize the safety culture emphasis/approach</td>
<td>Progressive learning (CCPS)</td>
<td>Work processes (CCPS)</td>
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<td>Use of work process (CCPS)</td>
<td>Systems approach to safety (CCPS)</td>
<td>Top management commitment to safety (CCPS)</td>
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<td>Leadership by Authority (CCPS)</td>
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<td>Maintain a sense of vulnerability</td>
<td>Proactive and predictive (CCPS)</td>
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<td>Present normative and interactive (CCPS)</td>
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<td>Resistance to complacency (CCPS)</td>
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<td>Empower individuals to successfully fulfill their safety responsibilities</td>
<td>Responsible work environment (CCPS)</td>
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<td>Sufficient and competent staff (CCPS)</td>
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<td>Engagement of employees (CCPS)</td>
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<td>Defer to expertise</td>
<td>Consensus with regulations and procedures (CCPS)</td>
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<td>Effective safety and environmental communication (CCPS)</td>
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<td>Foster mutual trust</td>
<td>Trust pervades the organization (CCPS)</td>
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<td>Provide continuous monitoring of performance</td>
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CCPS culture framework is the most complete.
## Mapping of ESH Technical Performance and Culture Evidence to Process Safety Culture Factors

### Process Safety/ESH Culture Evaluation Sources

<table>
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<th>Surveys and interviews</th>
<th>Work observations</th>
<th>PSM/EHS leading indicators</th>
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### Process Safety/ESH Performance Information Sources

- Incidents and investigation results
- Audits and assessments
- Action item completion history

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### Essential Features

- Causal Factors
- Tenets of Operation

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**Source:** ABS Group
### Ranking of Cultural Causal Factors Present - Study Results

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<td>1. Normalization of deviance</td>
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<td>2. Non-responsiveness to safety concerns</td>
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<td>3. Lack of a questioning/learning environment</td>
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<td>4. No performance monitoring/pursuit of improvement</td>
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<td>5. Lack of sense of vulnerability</td>
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<td>6. Lack of trust – unsafe reporting environment</td>
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### Culture Disease Pathology

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- **Core Value**
- **Strong Leadership**
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### Core Value

- Strong Leadership
### Culture Disease Pathology

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**Core Values**

- Unresponsiveness to Safety Concerns
- No Continuous Improvement Monitoring
- Lack of Accountability – Normalization of Deviance
- No deference to expertise
- Lack of a Questioning/Learning Environment
- No Formal System
- Low Sense of Vulnerability
- Lack of Empowerment
- Lack of Effective Communications
- Lack of Mutual Trust
- Core Value
- Strong Leadership

**Overview**

- Unresponsiveness to Safety Concerns
- No Continuous Improvement Monitoring
- Lack of Accountability – Normalization of Deviance
- No deference to expertise
- Lack of a Questioning/Learning Environment
- No Formal System
- Low Sense of Vulnerability
- Lack of Empowerment
- Lack of Effective Communications
- Lack of Mutual Trust
- Core Value
- Strong Leadership

**Visual Representation**

- Unresponsiveness to Safety Concerns
- No Continuous Improvement Monitoring
- Lack of Accountability – Normalization of Deviance
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- No Formal System
- Low Sense of Vulnerability
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- Lack of Effective Communications
- Lack of Mutual Trust
- Core Value
- Strong Leadership
Observations - Safety Culture Disease Progression

• Just like technical root causes - there's never only one cultural causal factor
• Culture degradation flows upward - but is reversible
• Higher level cultural causal factors are outcomes of lower level degradation
• Most prevalent culture causal factor is Lack of Strong Leadership – at one or more organizational levels
• Culture disease-caused accidents can be prevented
  o Culture vitamins
  o Culture health check-ups
  o Culture vaccinations
  o Culture surgery
## Culture Disease Vaccine

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Leadership excellence throughout the organization is the best process safety culture disease vaccination there is.
Some Culture Improvement Lessons

• If you have poor culture, marked by mistrust or needs large improvement, the worst thing you can do is too just start “talking” about it at the top
• The “top” needs to first start “behaving” better to address culture weaknesses
• Then, the talk will build up from the bottom
• If you survey, do it anonymous and voluntary; you should commit to sharing the results – quickly
• Any education/training, etc. should extend to ALL of the workforce, including contractors
• BUILD OWNERSHIP
Safety Culture and Operational Discipline Improvement

Case Study

- 2 billion sales, 3000+ employees, 40+ facilities, global company
- Responsible Care, "Goal is Zero", some leading metrics, quarterly CEO/staff management review
- 4th-quartile employee safety rate had recently stagnated/spiked due to "untrendy causes"
- ABSG did a global safety performance assurance review/culture evaluation
- Company implemented a corporate, plant, work group, and personnel culture strengthening program over a year
- Began monitoring safety culture monthly using **event root cause/cultural cause mapping** to adjust/focus culture strengthening
- Resumed their drive to zero for personnel/process safety metrics
  - multiple years without process safety or environmental incidents
  - zero contractor injuries
  - 50% reduction in combined injury rate
Vision For “Perfect Process Safety”

- A culture based on proper ownership of HSE empowered by visionary leadership
- Risk-informed sensitivity that guides everything
- Effective, fit-for-purpose management systems
- PS practices embraced and followed with good *operational discipline* at ALL levels
- Learning from ALL sources – internal, external and outside industry group
- Well-formed/visible performance pyramid; metrics at every level to drive intended behaviors
- Goals and actual performance that improves
Need to Exterminate Poor Culture Rats

Figure 2: Leading and lagging indicators set to detect defects in important risk control systems.

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Continuous, Sustainable Improvement in Process Safety Performance Demands...

Effective RCA and corrective action creates improvement

Use of leading indicators to be continuous

Addressing culture and behaviors to be sustainable
Time for Questions