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Assuring an Adequate Safety Culture in Production Operations

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Outline

- What do we mean by “Culture of Safety?”
- Why do we need an improved Culture of Safety?
- How do we accomplish a Culture of Safety?
- How do we assess that we have an adequate Culture of Safety?
- What are the roles of the Operator and the Regulator?
- Conclusions and References
What is a Culture of Safety?

► A culture is a set of “shared values and beliefs that interact with an organization’s structures and control systems to produce behavioral norms.” - B. Uttal

► Traits of an institution with a Good Culture of Safety:
  • Leadership communication
  • Problem identification and resolution
  • Acceptance of personal accountability
  • Planning and control of work processes
  • Continuous learning
  • Freedom to raise concerns
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Why Do We Need an Improved Culture of Safety?

- Both the President’s Commission on Offshore Drilling and the NAE Macondo Blowout Report concluded: Sweeping reforms required for fundamental transformation of industry’s safety culture.

- A culture that supports safety in design is important.

- A culture that supports safety in operations is critical.
The Human Factor

- 80% of major accidents are caused by human error

- Macondo:
  - Results of negative pressure test misinterpreted
  - Outflow from well overlooked

- Piper Alpha:
  - Failure to record removal of relief valve
  - Failure to recognize gas alarm associated with putting pump in service

- P-36:
  - Opened valve to tank while vent blocked
  - Left water tight doors open after work completed
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Accomplishing a Culture of Safety

From an organizational perspective there must be:

- **Mechanisms** Establishing Structure and Control - specify what is needed and check that it is being done
- **Actions** Establishing Safety Norms - encourage the application of Safety Culture traits

From an individual perspective there must be:

- **Mechanisms** Establishing Competency – knowledge of the structure, control and norms, and ability to perform
- **Actions** Establishing Motivation - showing that individuals actually act and are rewarded in accordance with behavioral norms
Safety Management Systems Are Essential

- Need to manage safety as we do any other activity

- API RP 75 Elements:
  - Purpose, Objectives and Commitment
  - Safety Information
  - Hazards Identification and Analysis
  - Operating Procedures
  - Safe Work Practices and Job Safety Analysis
  - Emergency Response and Control
  - Training
  - Management of Change
  - Quality Assurance and Mechanical Integrity
  - Incident Investigation
  - Audits and Follow-up
Does Implementing a Safety Management System Accomplish a Safety Culture?

► A properly functioning SMS addresses the “mechanism” elements necessary to create a culture of safety
  • Organization – a structure and system of controls
  • Individual – training and competency

► SMS does not address the “action” elements
  • Organization – actions establishing behavioral norms
  • Individual – actions proving motivation

► SMS is a “necessary” but not “sufficient” element in creating a culture of safety
► Just having a SMS does not assure an adequate culture of safety
Setting Company Behavioral Norms and Encouraging Individual Motivation

▶ The job of the leadership of the company
  • Not just Board, CEO, Asset Manager, etc.
  • Leadership is every supervisor

▶ Does not happen by:
  • Statements from the CEO and Human Resources
  • Postings in company internal and external communications
  • Punishing or rewarding individuals for KPIs or INCs
  • Safety minutes prior to meetings

▶ Does happen by:
  • Thousands of individual actions by leadership at all levels
Examples of Setting Norms—Both Good and Bad Examples

► Asset Manager Meets Profitability Targets
  • Cuts maintenance budget, leak develops leading to corporate fines
  • Corporate response- Manager rewarded for meeting targets no personal consequence. Fines blamed on “over-zealous” regulator

► Corporation Meets Established Safety KPIs
  • Major accident occurs with loss of life and major environmental impact
  • Corporate response- Directors rewarded with bonuses for meeting KPIs

► Foreman Shuts In Gas Plant
  • Misunderstood indications, no need to shut in
  • Corporate response- Manager personally thanks foreman and protects production target
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Setting Safety KPIs

- Heinrich’s Theory of Accident Prevention (1931):
  - Safety in industry is depicted as a triangle
  - Direct relationship between low consequence incidents (e.g. LTI, doctor cases, small spills) and fatalities
  - Reducing low consequence incidents reduces the number of fatalities
  - Addressing the root cause of low consequence incidents will reduce fatalities
Are LTIs, Doctor Cases, Spills, etc. good predictors of major events?

- Industry data shows this may be true for certain types of accidents but not for others:
  - Although KPIs for low consequence incidents have declined in recent years, fatality rates have more or less stabilized.
  - There is no correlation between MMS Safety Awards and future fatality rates or very, very rare/very high consequence events.
  - Safety milestone celebration on rig the day before Macondo blowout.
Assessing the Mechanism Aspects of a Safety Culture (Procedures, Training, Competencies)

- Requires assessing the SMS
  - Does it exist on paper
  - Does it cover all required elements
  - Does it cover the elements in sufficient detail
  - Is there proper documentation

- Possible with a pass-fail system

- A pass-fail assessment of SMS compliance assesses the mechanisms aspects but not the action aspects (norms and motivation) necessary for a culture of safety
Assessing the Action Aspects (Norms and Motivations)

- Do the norms and motivations actually exist
- Requires onsite observations, knowledgeable evaluators and subjective judgment
  - It cannot be pass-fail
  - There will always be room for improvement
- California State Lands Commission audit process
  - Interviewers utilize a set of questions in 9 areas
  - Qualitative score and review with top management
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Role of the Operator

- Establish cultural norms and promote behaviors

- Independent internal audits to assess where improvements can be made:
  - Risk based
  - Trained and certified auditors
  - Team with required expertise and knowledge of operations
  - Management engagement with closeout

- An audit which does not find something which can be improved concerning action aspects is not a good audit
Role of Regulator- Objectives

► Help industry move from a “compliance attitude” toward a culture of safety

  • Utilize a pass-fail compliance and punishment mode for inspection of specific regulations (e.g. set pressures of safety devices, timing and results of specified tests)
  • Utilize a more collaborative approach in auditing SMS to assess the level of safety culture and encourage improvements

► Issuing punishment for insufficient documentation leads to attitude of “compliance equals safety” and does NOT influence behavior
Transportation Research Board Report
Recommended an Holistic Approach

► Inspections:
  • Necessary to establish a presence
  • INCs for those items which lend themselves to pass-fail
  • Observations on how SEMS is being utilized

► Audits:
  • Require and review operator’s SMS audit plans
    - Qualifications of teams
    - Quality of audit
    - Close out reports
  • Perform Regulator initiated audits

► Whistleblower System

► Disseminate information
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Conclusions

- Lord Cullen: “The operating staff had no commitment to working to the written procedure; and … the procedure was knowingly and flagrantly disregarded”.

- If we are going to make a step change in safety it is NOT through increased documentation, testing and punishment.

- Both the Operator and Regulator have a role to play in making this happen.

- A change in safety requires a change in attitudes and actions on the part of both management and worker.
References

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  • Definition of Safety Culture and Role of SEMS: Chapter 2
  • Role of BSEE: Chapter 5

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  • Limitations of Heinrich Triangle

  • Establishing a Culture of Safety
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