Process Safety Management in Upstream and Gas

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Areas of Discussion

Backdrop | Approach | Needs
Backdrop: Geographic Diversity

2.61 Million bbls per day Production in 2012

20+ Countries outside of the United States
Operational Diversity
Growth

Continued Development of Existing Production

- Reliability and efficiency improvement
- Enhanced recovery
- Expanded production

New Development Areas and Opportunities

- Deepwater
- LNG
- Sour gas
- Shale gas
- Gas to liquids
- Oil sands
OE Equation

Potential for occurrence of a high impact incident in our expanding, complex portfolio is mitigated by our OEMS, OE culture and workforce OC.

Growing Portfolio

Increased Complexity

Aging Infrastructure

Decreasing Stakeholder Tolerance

Increasing Costs of Incidents

Production, Cost and Schedule

OE Management System

OE Culture

Workforce Organizational Capability

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Approach to Applying Process Safety Management

Standardize | Prioritize | Verify
Prioritize

Key Facilities
- Plants, Terminals & Gathering Stations
- Sour Operations
- Deepwater
- Manned Platforms
- Drilling Rigs

Key Activities
- Major Sim Ops
- Turnarounds
- Drilling
- Phased Start-up
- Construction
- Maintenance

Key Risk - Loss of Containment
- Toxic release
- Ignited release (fire & blast)
- Multiple causes – integrity, design procedural
Focus on the Future

Concept Selection
- Siting
- Technology selection
- Inherently safer concepts

Engineering
- Inherently safer design
- Human factors
- Risk assessment
- Engineering standards
- Material selection

Construction
- Materials verification
- Inspection and quality control
- Management of change
- Management of PSI

Preparing for Operations
- Procedures
- Operational readiness and PSSR
- Organizational readiness
- Operator training
Verify

Safeguard Stewardship

- Building process safety fluency at all levels of operations and engineering
- Helping leaders understand where to focus and what questions to ask
- Raising the visibility of metrics - leading as well as lagging
- Building a more formalized verification system – compliance assurance

Audit

- Improving audit and assurance at all levels
  - Audits are both a critical verification step and improvement opportunity
Improvement and Learning

The Management System Process provides a mechanism to improve at the system level based on incident learning, audit findings, metrics and the results of field verifications.
Needs: How can you help?

Competency of engineers in Process Safety

- Process safety competencies are needed in new hire engineers - need is not limited to Chemical Engineers
- Instill a sense of vulnerability

Research that addresses business needs

- Inherently safer technologies
- Improved understanding of risk
- Incident learning and Information Management