Making Wells Safer

Systematic Approach to Wells Process Safety

BSEE Forum
May 22nd, 2012

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‘Process Safety’ means the management of hazards that can give rise to major accidents involving release of potentially dangerous materials, release of energy (such as fire or explosion) or both.

‘Process Safety’ includes:

- Multiple Fatalities
- Catastrophic Event
- Fatality
- Uncontrolled & Sustained Release
- Loss of Containment
- Load Case > Design Case
- Single Barrier Failure
- RAM4+ P Near Miss (HiPo)
- LTI
- TRC
- FAC
- Unsafe Acts and conditions / Process Safety Exceptions
Systematic Approach to Wells Process

Process Safety Mandatory Manual Requirements (Asset Integrity, DEM 1, DEM2, Overrides of Safety Systems)

Design to company standards
- Design HSE Case
- Casing and Tubing Design & Engineering Manual

Dramatically competent People for all phases of well life
- Well Distance Learning Manual & RD1/2

Manage the technical and construction risk
- Rig HSE Case
- Well Abandonment Manual
- Well Control Manual

We operate within the appropriate parameters
- Well Integrity Manual

Design Integrity
- Technical Integrity

Wellbore Integrity
- Operating Integrity

People
Minimize Likelihood

Standards
- Global Wells Standards
- Well Design Manual
- Well Control Manual
- Well Integrity Manual
- Rig Safety Cases

People
- Competence Testing (rd 1 & rd 2)
- Technical Authorities (DCAF)
- Principal Technical Experts
- Contractor competency

Equipment
- Well Specifications/Design
- Multiple Safety Barriers
- Equipment Qualification and Testing
- Well Integrity Monitoring
- Well Construction - 24/7 Real Time Operating Centre’s

Mitigate Consequences

Standards
- Cap and Contain - Well Design
- Well Control Manual
- Blowout containment plan
- Well Kill Program
- Relief well plan - pre spud

People
- Blowout support contractors
- Technical Authorities (DCAF)
- Principal Technical Experts

Equipment
- Well Control Equipment - Cap and Contain
- Spill containment
- Oil Spill Containment System (Joint Project – required GOM only)
Competency Development:

- Unique to Shell and recognized across the industry
- Established 1973 start of Shell “Drilling” assessment round 1 and round 2, revised 2005 to include Well Intervention.
- Post Graduate development managed globally
- Implemented globally for all Shell Wells staff
- Syllabus includes practical field and office elements
- Individuals have to pass round 1 and round 2 examinations - “Certified Engineer” after passing round 2 and global panel audit
- Wells Distance Learning Package (WDLP) is accredited to academic Masters of Science Degree level by 2 universities
Expertise and Competency Testing

- Round 2 Diploma
- Trade test before hire for all consultants
- Advanced Well Control course & examination - mandatory every 2 years for all operations staff
- Contractor Competency: Well CAP and IWCF well control certification standard
- Principal Technical Experts – network of industry-renowned experts to support and assure Shell’s well designs and technical standards
In Well Design “Focus on the Prevention Side of the Bow-Tie...so you never have to “work” on the recovery side”

In Emergency Response “Focus on the Recovery Side of the Bow-Tie...so you never experience the full consequence

The HSE or “Safety Case” is a great tool to ensure proper management of major hazards.

A Case is only effective if people understand their role in “Critical Activities” to maintain Barriers & Controls.
HSE Case Purpose

- Provides a roadmap to the systems and processes used to manage the major accident hazards
- Demonstrates that hazards have been identified, appropriate barriers have been provided and there are robust activities, procedures and competencies in place to ensure these barriers remain effective for the duration of the activity.

Bridging documents define the interface between the company’s and contractor’s HSE-MS, including critical HSE case outputs.
Plans include

- Emergency response
- Blowout Contingency Planning
  - Relief well Planning
  - Well cap and Contain
Summary: Process Safety for Wells

- Systematic Approach for Wellbore Integrity
  - Design Integrity
  - Technical Integrity
  - Operating Integrity
- Competence of Personnel is required throughout all phases