Industry & Govt Changes
Post Macondo

Charlie Williams – Chief Scientist Shell
Executive Director - Center for Offshore Safety
Deepwater – Industry Focus/Approach

Joint Industry Task Force Groups

- Offshore Equipment
- Offshore Procedures
- Subsea Well Control & Containment
- Oil Spill Preparedness & Response
Results of Joint Industry Task Forces

• **Offshore Equipment**
  API Std 53 *Practices for Blowout Prevention Equipment Systems for Drilling Wells*

• **Offshore Procedures**
  API RP 96 *Deepwater Well Design Considerations*
  API Bulletin 97 Well Construction *Interface Document*
  API RP 65-2 *Cementing & Isolation & Barriers*

• **Subsea Well Control & Containment**

• **Oil Spill Preparedness & Response**
Each company has stated personnel and equipment are available to contain a deepwater well control incident in the U.S. Gulf of Mexico.

Each company has stated exercises (planned and unannounced) will be conducted on a regular basis to ensure personnel and equipment are ready to respond.

Helix Well Containment Group

Wild Well Control*

Marine Well Containment Company

*Source: “Oil containment system wants to travel the world.” Houston Chronicle, 2011.
Helix Containment System

- Q4000
- Non-DP Storage Tanker
- 12" Flex Export Line Floating Offloading Hose (Hawser not shown)
- Helix Producer I
- 6-5/8" HD-563 Q-125 32 Bbl/Rt Casing (5-5/8" ID) (All Threaded, Q4000 Installed)
- 5" 10,000 PSI Flexible Riser
- Intervention Riser System
- Stack Can Connect to BOP, Wellhead or Tree
- IRS
- SSOD
- BOP Stack
- Subsea Shut Off Device / Well Cap
MWCC Expanded System – in Construction
Post Macondo - Regulatory Response in the US

US Government Focus – Four Areas

- Worst Case Blow-out Discharge & Blow-out Response (NTL-2010-N06)
- Drilling Safety Rules (Interim Final Rule) – Well Integrity & BOP’s
- Adequate Spill Response & Well Containment Resources (NTL-2010-N10)
- Safety & Environmental Management System (SEMS)
Post Macondo - Regulatory Response

US Government Focus – Four Areas

- **Worst Case Blow-out Discharge & Blow-out Response (NTL-2010-N06)**
  - New requirements / definitions for WCD calculation
  - New requirements for describing intervention & relief well drilling constraints

- **Drilling Safety Rules (Interim Final Rule)**
  - **Well Integrity**
    - Isolating Potential Flow Zones (API RP 65-2 mandatory)
    - Certification of casing & cement program by Professional Engineer
    - Two Independent Barriers during completion (certified by PE)
    - Installation, sealing, and locking of casing hangers
    - Approval for change-out to lighter fluids – negative test procedures
  - **BOP’s & Control Systems**
    - Blind-shear ram function – testing & 3rd Party verification
    - Requirements & function testing for auto shear & deadman
    - Minimum requirements for ROV intervention plus testing
    - BOP inspection & maintenance to API RP 53
    - Minimum requirements for personnel operating BOP equipment

- **Adequate Spill Response & Well Containment Resources (NTL-2010-N10)**
  - Signed statement of compliance
  - Well Containment Screening Tool - Demonstrate well design can be capped or cap & flow
  - Well Containment Plan (Usually via Containment Company)
  - Demonstrate access to equipment & staff resources to deploy containment

- **Safety & Environmental Management System (SEMS)**
  - All elements of API RP75 SEMS made mandatory
  - Audits required
  - Operator responsible for SEMS verification of Contractors
NTL-2010-N06 – Effective Date: 18 June 2010

— Blowout/worst case discharge scenario
— Describe surface intervention methods to stop flow & rig availability & constraints for a relief well
Interim Final Rule – 14 October 2010

- Supersedes NTL – 2010 – N05
- Mandatory API RP 65 – Part 2
- Certification by a professional engineer of casing & cementing
- Two independent test barriers (certified by a professional engineer);
- Proper installation, sealing and locking of the casing or liner;
- Approval by BOEM District Manager before replacing a heavier drilling fluid with a lighter fluid
- Documentation & schematics for all well control systems;
- Third party verification that blind-shear rams can cut any drill pipe in the hole
- Subsea BOP stack with ROV intervention capability + testing
- ROV & crew on floating drilling rig
- Auto shear & deadman systems for DP rigs + testing
- Min training for personnel operating BOP + enhanced DW well control
- Subsea BOP inspections & maintenance according to API RP 53
NTL-2010-N10 – 8 November 2010

- Statement of Compliance with Applicable Regulations
- Demonstrating Spill Response & Well Containment Resources

Containment Options: (all must have a top-hat + dispersant)
- Cap & Shut-in
- Cap & Flow
- Cap & Subsurface Pressure Relief

Documentation:
- Well Design Sheet
- Flow Schematic
- Functional Specification of Containment Equipment
- Responsible Party Check-list
## Safety & Environmental Management Systems – SEMS
Or Process Safety

### What are the Elements of SEMS?

<table>
<thead>
<tr>
<th>Leadership &amp; Commitment</th>
<th>Mechanical Integrity</th>
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<tbody>
<tr>
<td>Safety &amp; Environmental Information</td>
<td>Pre-startup Review</td>
</tr>
<tr>
<td>Hazards Analysis</td>
<td>Emergency Response &amp; Control</td>
</tr>
<tr>
<td>Management of Change</td>
<td>Incident Investigation</td>
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<td>Operating Procedures</td>
<td>Audit</td>
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<td>Safe Work Practices</td>
<td>Records &amp; Documentation</td>
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<td>Training</td>
<td>Contractor Management</td>
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Center for Offshore Safety

Our Mission...

Promote the highest level of safety for offshore drilling, completions, & operations by effective leadership, communication, teamwork, utilization of disciplined safety management systems & independent third-party auditing & certification.
COS Major Objectives

Enhancing and continuously improving industry’s safety and environmental performance

Increasing public awareness of industry’s safety and environmental performance to enhance public confidence in and trust of the industry

Stimulating cooperation within industry to share best practices and learn from each other by providing a platform for collaboration between industry, the government, and other stakeholders.
COS Operating Basis

The Center for Offshore Safety will be responsible for:

• Providing expert assistance to member companies,
• Assuring that third party certification program auditors meet the program’s goals, and that the program is complementary with government regulations,
• Compiling and analyzing key industry metrics,
• Coordinating Center sponsored functions designed to facilitate the sharing and learning process,
• Identifying and promoting opportunities for industry to continuously improve,
• Interfacing with Industry leaders to assure leadership and system deficiencies are recognized and addressed promptly, and
• Communicating with government and external stakeholders.
COS / OOC / IADC SEAMS Toolkit

- Audit Checklist & Audit Guidance Document
- Compliance Readiness Worksheet
- Matrices of Regulatory Mandated Training for Drilling/Marine/Production
- Knowledge and Skills Documentation Worksheet
- Operator-Contractor Letter Templates
- Terms/Definitions – Clarification Document

Primary focus is operator/contractor relationship and meeting associated SEAMS requirements
The *SEMS Compliance Readiness Worksheet*, divided into 13 sections
Corresponds with API RP 75 & 30 CFR 250 – Subpart S (SEMS)

Accompanying each audit question is the reference text from:
30 CFR 250 – Subpart S (SEMS) or API RP 75 or both.

For example:

<table>
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<th>5</th>
<th>Audit Question</th>
<th>Has a management representative been appointed that is responsible for establishing, implementing and maintaining the SEMS?</th>
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<td></td>
<td>§250.1909(b)</td>
<td>[Specifically you, through your management, must:] (b) Appoint management representatives who are responsible for establishing, implementing and maintaining an effective SEMS program.</td>
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<td></td>
<td>RP 75 1-1.2.2(c)</td>
<td>[This recommended practice is based on the following principles:] c. Management appoints specific representatives who will be responsible for establishing, implementing and maintaining the safety and environmental management program.</td>
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</table>
Key Objectives - COS 3rd Party Certification

✔ COS accredited 3rd party audits satisfy BOEMRE’s requirements for audits.

• COS establishes standards for 3rd party Audit Service Providers, auditors, and SEMS audit protocol and certifications

✔ Member specific data is treated private and confidential.

✔ The auditing process results in learnings and best practices being shared with the COS which then shares with industry leading to improved industry performance.
COS Vision and Path Forward

• One-stop central source for:
  - Information & knowledge
  - Audit accreditation
  - Program certification
  - Tools and technical assistance

• Promote an industry culture of incident-free operations
  - Process safety in addition to personal safety
  - Emphasis on behavior
  - No harm to people, no harm to environment

• Elevate the industry’s quality and safety standards
  - Create and share best practices
  - Continuous improvement

- Development
  - SEMS Audit Tools
    - Accreditation
    - Certification
    - Other Initiatives

- Implementation
  - Information & Knowledge Management
  - Expand Education and Outreach
  - New Initiatives

- Sustainability
  - Assess Effectiveness
  - Leverage Other Organizations
  - Continuous Improvement Cycle
Our Goal: Safe & Reliable Operations

PREVENTATIVE BARRIERS MINIMIZE LIKELIHOOD OF AN INCIDENT

- Technical standards & procedures
- Competent staff & contractors; rigorous drills
- Equipment testing & certification
- HSE Case management of major hazards
- Minimum two tested & independent barriers
- Human behaviours & culture

= Zero process safety incidents
Oil Spill Response Framework
MSRC and CGA Expansion Post DWH

- Key response tools have been expanded/enhanced
- Mechanical Recovery – increase capability:
  - Off-shore capability, including:
    - Deepwater vessels
    - Sustainability (night spill detection, adverse weather)
    - Newer technology skimmers (efficiency of oil vs. water recovery)
    - Increase floating inventory of boom for containment and enhanced encounter rate
    - Increase Vessel of Opportunity (VOO) skimming systems
- Near-shore skimming capacity
- Full-time response personnel
- Dispersants – increase in aircraft capacity and inventory for subsea use (with MWCC)
- Burning – increase in fire boom inventory in GoM
Deepwater Oil Well Blowout – Sensing and Tracking

- Improvement Capability: Integrated, day and night, satellite, multi-spectral photography, aerial radar