Outlining US Offshore Safety Regulations & Standards

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Restoring Confidence in Deepwater Drilling Operations

- Spill Response Capability
- Well Containment & Intervention Capability
- Safe Drilling Operations
- Industry Drilling Standards

energy API
Topics

• US Regulatory changes
  • Drilling Safety Rule
  • SEMS

• US Joint Industry Task Force Work

• New and Revised API Standards
  • RP 96
  • API/IADC BUL 97
  • API RP/Standard 53
  • API Standard 65-2
  • Additional API Standards Activities

• Center for Offshore Safety
Interim Final Drilling Safety Rule

Increased Safety Measures for Oil and Gas Operations on the OCS.

The interim final rule established regulations based on the May 27, 2010, *Increased Safety Measures for Energy Development on the Outer Continental Shelf* report. The rule was effective upon publication, but included a 60-day public comment period. Included requirements to improve well control through improved well design and BOP design and testing.

BSEE Workplace Safety Rule

- The rule became effective on November 15, 2010, allows one year for implementation - November 15, 2011.
- The rule incorporates in its entirety and makes mandatory API RP 75.
- BSEE Issued NTL No.2011-N09 October 21, 2011, to “…clarify the policies, procedures and requirements for the OCS lessees and operators…”
- Proposed Changes to SEMS rule (SEMS II) were published in the FR on September 14, 2011, comments were due November 14, 2011.
Oil and Gas Industry Response

Created 4 Joint Industry Task Forces:

- Prevention
  - Operating Procedures Task Force
  - Equipment Task Force

- Intervention
  - Subsea Well Control and Containment Task Force

- Spill Response
  - Oil Spill Preparedness and Response Task Force
Operating Procedures Task Force

• Focus on Drilling & Completion safety, design, procedures and operations associated Deepwater Wells
• JITF met ~2 weeks in May to develop recommendations for DOI focused on (5) areas:
  1. Cementing
  2. Loads and Resistance Deepwater Well Design Considerations
  3. Fluid Displacement and Negative Testing
  4. Abandonment and Barriers
  5. Adopt Safety Case & Well Construction Interface
Offshore Equipment Task Force

• Review Current BOP Equipment Designs, Testing Protocols, Regulations and Data
  • Secondary BOP Control Systems
  • BOP Testing and Test Data
  • Remotely Operated Vehicles

• Recommendations
  • Safety Case Regime
  • A robust MOC process
  • Accessing shear data
  • ROV – standards for GOM
  • Investigate Acoustic reliability
JITF Summary

- Provided input to DOI’s 30-day Safety Report
- Included recommendation for Incorporation by Reference of API Recommended Practice on Cementing (RP 65-2)
- Proposal for a new API Recommended Practice on Deepwater Well Design Construction (RP 96)
- Proposal for developing a Well Construction Interface Document to align safety programs (Bulletin 97) – Joint with IADC
- Revised API RP 53 on Blowout Prevention Systems
- Provide comments to DOI on Interim Final Drilling Rule
- Final Reports Issued March 2012
Standards

600+ Industry Standards and Technical Reports covering:
- Exploration & Production
- Refining
- Marketing
- Pipeline
- Measurement
- Safety and Fire Protection
- Petroleum E-Commerce

The API Standardization Department was formed in 1923, and the first API standard was published the following year on drilling threads.

One third of all API standards are referenced in the U.S. Code of Federal Regulations.

Foundation of Self Supporting Programs, Basis for Worldwide Operations, Core of Institute’s Technical Authority
Use of API Standards

- National Technology Transfer and Advancement Act
  - NTTAA requires Federal Agencies to use voluntary consensus standards, encourages participation
  - API standards are cited in regulations by agencies including FTC, OSHA, EPA, DOT and BSEE

- 102 API standards are cited over 350 times in the U.S. Code of Federal Regulations

- An 2010 OGP Report No. 426, “Regulator’s Use of Standards,” March 2010
  - API are the most widely cited standards by the surveyed international regulators, with 225 references.

- API Standards also widely cited by States
  - 184 API standards are cited over 3300 times in state regulations
API RP96 DW Well Design Construction

- DW Rig Sys Impact on Well Design
- Barriers
  - Philosophy, type & number
  - Validate, accept & maintain
- Fluid Displacements
- Well Design & Loads
  - Production Liner or Long String
  - Tubing & Casing & APB
  - Wellhead Bending & Fatigue
  - Casing Wear
- Well Op’s (Drill, Comp, TA/PA)
- Management of Change
  - Unexpected & Contingencies
  - Interface with Stakeholder

Status – RP passed initial ballot with significant comments, 2nd ballot closed November 18, comment resolution complete, recirculation soon
RP 96 Description

• Reviews Deepwater rig systems and BOPs (to show how rigs affect well design)
• Examples of current DW GOM well architecture, and Barrier Philosophy (7 pages)
• Defines load cases (internal and external pressures) and reviews survival design considerations
• Special considerations for drilling and completions
• Extensive review and examples for conducting displacement operations during drilling and completion operations
• Review of management of change, including Stop Work Authority
• 3 annexes provide examples for barriers employed during several operations, barrier definitions and examples for negative testing (53 pages total)
RP 96 Conclusions

- RP 96 is not meant to be a text book for new engineers or drilling engineers new to Deep Water. It will not define what design factor to use for burst, for example.
- It is designed to demonstrate and give examples of casing loads, items to consider when designing wells, and examples of different well design considerations and design rationale.
- It gives multiple examples (but is not intended to cover all cases) for considerations when displacing wells and performing negative tests.
- It provides detailed definitions for barriers.
- It reviews operational considerations for drilling and completions, such as open water work, well testing and more.
- Special operational considerations such as landing strings, APB, Intelligent Wells
API/IADC Bul. 97
Well Construction Interface Document Guidelines (WCID)

- Well Construction Interface / BOD
  - Location & Environment
  - Geologic & Geophysical
  - Well Design
  - Well Barriers (with Much Detail)
  - Casing Design
  - Well Execution Plan (with Detail)
  - Critical Well Risk Assessments

- Rig Contractor SC & Operator SMS
  - Mgt Structure / RR’s / SWA
  - MOC - Rig Contractor & Operator
  - Personnel Management
  - Well Control Procedures
  - Risk Management Processes
  - Emergency Response
  - Monitoring, Auditing And Review

Status – ballot successfully closed early October, comment resolution continues
RP 53 vs. Standard 53

Recommended Practices for Blowout Prevention Equipment Systems for Drilling Wells

API RECOMMENDED PRACTICE 53
THIRD EDITION, MARCH 1997

REAFFIRMED, SEPTEMBER 1, 2004
API RP 65 History

- Work Group composed of operators, rig contractors, service companies, industry associations and government regulators was formed in response to MMS data on uncontrolled annular flows presented in Aug 2000

- RP 65 (Part 1), *Cementing Shallow Water Flows in Deep Water Wells* was published in September 2002

- RP 65 - Part 2, *Isolating Potential Flow Zones During Well Construction* was published in May 2010

- RP 65 - Part 2 incorporated into 30 CFR Part 250 on October 14, 2010

- In response to the Macondo incident, an Ad Hoc WG was formed in July 2010 to rewrite the RP 65 – Part 2, 1st Edition

- WG Charge was to incorporate lessons from Macondo and to align document with planned API RP 96

- STD 65 – Part - 2, 2nd Edition was published in December 2010
RP 65-1, *Cementing Shallow Water Flows in Deep Water Wells*

- Change document from a Recommended Practice to a Standard
  - Modify or remove conflicting/confusing/ambiguous “should” statements as appropriate
    - As used in a standard, “should” denotes a recommendation or that which is advised but not required in order to conform to the standard.
  - Add “shall” requirements critical to isolating SWF zones
    - As used in a standard, “shall” denotes a minimum requirement in order to conform to the recommended practice.
- Incorporate new sections
  - Include new technologies
    - Address changes in industry deepwater drilling practices
- Change scorecard to a process checklist
Additional API Standards Activities

Many API Standards have been either newly created or revised as a result of the event:

- 1\textsuperscript{st} Edition of API Spec Q2 on quality programs for service and supply organizations (Dec 2011)
- 4\textsuperscript{th} Edition of API Spec 16A on BOP design and manufacture (est. 2012)
- New document on Capping Stacks
- New document on Containment Plans
- New document on Spill Response Plans
Our Mission...

Promote the highest level of safety for offshore drilling, completions, & operations by:

- effective leadership,
- communication,
- teamwork,
- safety management systems
- independent third-party auditing & certification.
COS Major Activities

Provide a platform for learning & sharing between industry, government, & other stakeholders regarding SEMS

Effective auditing & measurement of SEMS implementation

Offshore:
- Audit Tools
- Auditor training & qualification
- Audit team qualification
- Audit the Auditor

Measurement, reporting, analysis, learning, & sharing:
- Audit results
- Incidents, high potential near misses
- Safety performance indicators

Gap closure via development & sharing of good practices
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
COS Third Party Auditing

1. Establishes standards for 3rd party Audit Service Providers (ASPs), auditors, and SEMS audit protocol and certifications,

2. Works with COS members to understand industry audit requirements to assure sufficient numbers of COS accredited 3rd party auditors for COS members,

3. Accredits ASPs; periodically validates ASPs' and Auditors' performance, and effectiveness of COS audit protocol,

4. Compiles industry data and shares w/industry via COS reports and sponsored forums, and

5. Agrees to maintains confidentiality of COS Member specific data.
Key Objectives - COS 3rd Party Certification

✓ COS accredited 3rd party audits should satisfy BSEE requirements for SEMS audits.

✓ 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

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

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

- Sustainability
  - Assess Effectiveness
  - Leverage Other Organizations
  - Continuous Improvement Cycle
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Questions?

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Well bore integrity provides the first line of defense against a blowout by preventing a loss of well control. Provisions in the rule addressing well bore integrity are:

- Making mandatory the currently voluntary practices recommended in the American Petroleum Institute’s (API) standard, RP 65 – Part 2, Isolating Potential Flow Zones During Well Construction (an industry standard program);
- Requiring submittal of certification by a professional engineer that the casing and cementing program is appropriate for the purposes for which it is intended under expected wellbore pressure;
- Requiring two independent test barriers across each flow path during well completion activities (certified by a professional engineer);
- Ensuring proper installation, sealing and locking of the casing or liner;
- Requiring approval from the BOEM District Manager before replacing a heavier drilling fluid with a lighter fluid; and
- Requiring enhanced deepwater well control training for rig personnel.
Provisions in the rule on well control equipment include:

- Submittal of documentation and schematics for all control systems;
- Requirements for independent third party verification that the blind-shear rams are capable of cutting any drill pipe in the hole under maximum anticipated surface pressure;
- Requirement for a subsea BOP stack equipped with Remotely Operated Vehicle (ROV) intervention capability (at a minimum the ROV must be capable of closing one set of pipe rams, closing one set of blind-shear rams, and unlatching the Lower Marine Riser Package);
- Requirement for maintaining a ROV and having a trained ROV crew on each floating drilling rig on a continuous basis;
- Requirement for auto shear and deadman systems for dynamically positioned rigs;
- Establishment of minimum requirements for personnel authorized to operate critical BOP equipment;
- Requirement for documentation of subsea BOP inspections and maintenance according to API RP 53, Recommended Practices for Blowout Prevention Equipment Systems for Drilling Wells;
- Require testing of all ROV intervention functions on subsea BOP stack during stump test and testing at least one set of rams in initial seafloor test;
- Require function testing auto shear and deadman systems on the subsea BOP stack during the stump test and testing the deadman system during the initial test on the seafloor; and
- Require pressure testing if any shear rams are used in an emergency.