

# Session #2

# Subsea Blowout Preventers

FINDINGS

# Session #2

## Subsea Blowout Preventers

### FINDINGS

Submittal of documentation and schematics for all control systems (250 416.D)

Submittal of sufficient current documentation and schematics for BOP control systems to allow intervention by another entity

*Submittal of all hydraulic schematics for subsea part of the BOP well control system to allow intervention by another entity. (strike through)*

Intended purpose of the statement is not clear. Industry and BSEE have to come to an agreement on clarity of the statement.

# Session #2

## Subsea Blowout Preventers

### FINDINGS

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

Requirements for independent third party verification via theoretical, actual or historical reference that at least one set of shear rams is capable of cutting any drill pipe body at maximum mud weight or the rated working pressure of the annular preventer – whichever is greater.

# Session #2

# Subsea Blowout Preventers

## FINDINGS

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) (30 CFR 250.442.D) (30 CFR 250.449.J)

1. Should it happen in one trip?
2. Is the subsea testing to be done at existing ambient conditions on MASP
3. Critical functions? (Define critical functions)
4. Each shear ram or one set of shear rams
5. Ram locks – as a separate function
6. Time frame – Standard 53 specifies timing – cannot be done with today's ROVs. Should timing (duration of closing) be included in the regulation.
7. Redundancy versus reliability. Shift focus from redundancy to reliability.
8. Casing shear rams

Intended purpose of the statement is not clear. Industry and BSEE have to come to an agreement on clarity of the statement.

# Session #2

## Subsea Blowout Preventers

### FINDINGS

Requirement for maintaining a ROV and having a trained ROV crew on each floating drilling rig on a continuous basis (30 CFR 250.442.E)

- ▶ Each floating drilling rig shall have a ROV system and a crew capable of demonstrating and proving proficiency to operate all BOP functions controlled by the ROV and any other ancillary equipment (e.g. flying lead) – (Strike Out).
- ▶ Replace the word “continuous” in current CFR with the words “when the BOP stack is deployed”.

# Session #2

# Subsea Blowout Preventers

## FINDINGS

Requirement for auto shear and deadman systems for dynamically positioned rigs (30 CFR 250.442.F)

- ▶ Agree with requirement for dynamically positioned vessels
- ▶ Standard 53 – Includes moored and dynamically positioned modus
- ▶ Understand the differences between the two emergency systems

# Session #2

# Subsea Blowout Preventers

## FINDINGS

Establishment of **minimum requirements for personnel authorized** to operate critical BOP equipment

Define critical – we feel entire BOP system is critical

Develop minimum requirement program . Equipment owner – responsibility

Go further than basic well control certification

Include both BOP and control system OEM operating manuals

Establish who is authorized

Identify daily operation versus emergency

Intended purpose of the statement is not clear. Industry, COAST GUARD and BSEE have to come to an agreement on clarity of the statement.

# Session #2

## Subsea Blowout Preventers

### FINDINGS

**Requirement for documentation** of subsea BOP inspections and maintenance according to API RP 53, Recommended Practices for Blowout Prevention Equipment Systems for Drilling Wells

Documentation for subsea BOP inspections and maintenance shall be according to standard 53 (7.6.14.1) (7.6.14.2)

Intended purpose of the statement is clear. Industry, COAST GUARD and BSEE have to come to an agreement on clarity of the statement.

# Session #2

## Subsea Blowout Preventers

### FINDINGS

Require function testing of all ROV intervention critical functions on subsea BOP stack during stump test and function testing at least one set of rams in initial seafloor test (30 CFR 250.449.J)

1. Testing – close and pressure test verification. (Refer to standard 53)
2. Can do this by running a hot line – does not meet the intent
3. What is the value of testing on the sea floor
  1. – works on the stump
  2. Demonstrate that the ROV works with a dummy stab
4. Too much testing – wear out the BOP
5. Redundancy reliability – if its there, it has to work
6. All critical functions on the stump? – those needed to secure the well
7. Test frequency – every well. One time per year

Covered in standard 53. Industry, COAST GUARD and BSEE to discuss and consider adopting the standard ?

# Session #2

## Subsea Blowout Preventers

### FINDINGS

**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

**Require function testing auto shear and deadman systems on the subsea BOP stack during the stump test and verify the deadman circuit operates as intended following the BOP initial installation.**

**Intended purpose of the statement is not clear. Industry, COAST GUARD and BSEE have to come to an agreement on clarity of the statement.**

**Clarification Required: Standard 53 has a time based test regime versus between well.**

# Session #2

## Subsea Blowout Preventers FINDINGS

Require pressure testing if any shear rams are used in an emergency.

Require inspection of the blades and pressure testing of the BOP's if any shear ram is activated and comes in contact with any component of the drill string  
30 CFR 250.451 (i)

Committee agrees with the current statement in the 30 CFR 250.451 (i)

# Session #2

## Subsea Blowout Preventers

### FINDINGS

The Agency should **evaluate research on BOP stack sequencing and centralization** and should consider including in the Safety Alert recommendation to lessees using a subsea BOP stack to **centralize the drill pipe by means other than the annular preventer** prior to activating the blind shear ram (BSR).

**If the shear ram design requires the tubular to be guided to a predetermined position to effectively shear the pipe then provision must be made to do so.**

**Intended purpose of the statement is not clear. Industry, COAST GUARD and BSEE have to come to an agreement on clarity of the statement.**

**Clarification Required: Equipment vendors to provide the types and schematics**

# Session #2

## Subsea Blowout Preventers

### FINDINGS

The Agency should consider promulgating regulations that **require operators/contractors to have the capability to monitor the SEM battery(s)** from the drilling rig. The SEM battery, as described in this Report, is very important for the activation of the automatic mode function (AMF/deadman) system. If the battery is weak, the system may not function as it was designed. Having the capability to monitor the SEM battery status from the rig would help ensure sufficient battery power exists to execute the system.

**Not all deadman systems use batteries, SEM is vendor-specific. May not have batteries for a deadman system. Recommend not adopting this as a regulation.**

**If the SEM design requires a battery, then provision must be made to do so.**

# Session #2

## Subsea Blowout Preventers

### FINDINGS

The Agency should consider researching the design options on MODUs **that could protect MUX lines during an explosion incident**. As the Report indicated, the initial explosions most likely damaged or destroyed the MUX lines, thus rendering the rig BOP control system inoperable. Had the system remained intact and operable, personnel may have been able to activate any BOP function sequence.

1. **S.53.7.4.8.25 – MUX cables not required to meet fire test requirements of API 16D if the rig has auto shear and deadman systems**
2. **In the event of an explosion what will happen**
  1. **What systems will be impacted**
  2. **What systems will be in place**
3. **Study automated systems – pre-empted systems to prevent the explosion – active disconnect – shut in the BOP**
4. **Difference between DP and moored rigs**

# Session #2

## Subsea Blowout Preventers

### FINDINGS

The Agency should consider researching the **standardization of Remote Operating Vehicle (ROV) intervention interfaces**, ROV intervention capabilities, and maximum **closing times** when using an ROV.

The ROV system shall be equipped with 17H single port hot stabs capable of closing the pipe ram and shear ram according to Standard 53

Committee recommends that the agency adopt standard 53

# Session #2

## Subsea Blowout Preventers

### FINDINGS

The Agency should consider **researching the effects of a flowing well** on the ability of a subsea BOP to shear pipe.

1. Clear definition of flowing well (valid recommendation)
2. *Include testing with pressure in pipe* (strike out)
3. Data gathering exercise to see what data is available on closing on a flowing well

Intended purpose of the statement is not clear. Industry, COAST GUARD and BSEE have to come to an agreement on gathering data and understanding the objective of the test.

# Session #2

## Subsea Blowout Preventers

### FINDINGS

The Agency should consider **researching a blind shear ram design** that incorporates an improved pipe-centering shear ram.

#### Pipe centering

1. Industry designs (in the works)
  1. NOV – Centering
  2. GE – Centering
  3. Enovate
2. Can't depend on the current design to center pipe prior to shear or to shear a non-centered pipe
3. *Develop sealing CSR – all shear rams should seal (strike out)*

Is recommendation valid: Yes, but also include researching shearing non-centered pipe

If the shear ram design requires the tubular to be guided to a predetermined position to effectively shear the pipe then provision must be made to do so.

# Session #2

## Subsea Blowout Preventers

### Other Findings

1. USCG is interfacing with subsea marine groups to make a draft document for testing and inspection.
2. USCG likes to get feedback on the draft proposal from the industry.
3. Schedule for draft: December 2011.
4. Industry want to know about mandates on Emergency disconnect systems – Regulatory agency is working on three high priority items. This will be open for public comment. These are not regulatory texts – more of a wide open forum to get industry feedback. Schedule: Early 2012.
5. Industry prefers technical bulletin for battery voltage monitoring over regulations. Regulatory agency thinks the regulation should apply “to the situation”. Regulatory agency tries make sure that industry has the right understanding of the regulation.
6. Industry’s question: How do you challenge a finding/citation? Regulatory agency: There is a formal procedure in place to provide explanation.
7. Industry’s concern: Pressure switch requirement is ambiguous. Regulatory agency’s reply: Level of details needed has to be discussed. Regulatory agencies are open for discussion. Same formal training for inspectors.
8. USCG is working with BSEE for more consistent regulations

# Session #2

## Subsea Blowout Preventers

### Issues & Challenges

The Breakout Session is striving to identify actions that can be taken to improve offshore operations and regulatory oversight. In order to facilitate this, the following should be determined for each suggested action:

- ▶ Brainstorming to identify the topic issues, challenges w.r.t technologies
- ▶ Identify areas where further guidance is needed (e.g., industry standards and regulations).
- ▶ Identify, discuss, and agree on recommendations.

# Session #2

## Subsea Blowout Preventers

### BOP Compliance versus redundancy

- ▶ **ISSUE:** Industry: Compliance versus redundancy is an issue. Clarity on the redundancy requirements. Type of FMEA to be performed. FMEA still requires testing at least once. Compliance of a system should be based on a standard. What failure modes require BOP stack to be retrieved.
  - **RECOMMENDATION:** More clarity on the line separating critical and non-critical functions. Compare practices with other industries (nuclear/power). Consistent FMEA process to be made available. Improve risk assessment process to bring clarity to compliance versus redundancy.
  - **PRIORITY/TIMING:** (HIGH/MEDIUM/LOW): **HIGH**
  - **RESPONSIBLE PARTY:** BSEE in collaboration with the industry

# Session #2

## Subsea Blowout Preventers

### Human Machine Interface (HMI)

- ▶ **ISSUE:** Regulator: Is there room for a fully automatic system? Does machine take the initiative or the human? Industry: While marine propulsion system is self-communicating, the well itself needs human interaction. Automatic disconnect initiation was not well received by the crew.
- ▶ **RECOMMENDATION:** Area of responsibility needs to be clear – should you be calculating kick or shut-in/kill a well. Alarm optimization/management can be adapted from other industries (like chemical industry/ pipeline). API 1167 – alarm management RP.
- ▶ **PRIORITY/TIMING:** (HIGH/MEDIUM/LOW): MEDIUM
- ▶ **RESPONSIBLE:** Industry

# Session #2

## Subsea Blowout Preventers

### Wellbore Fluid Management Systems

- ▶ **ISSUE:** Kick detection/early warning systems on floating systems. Flow measurement is an issue.
- ▶ **RECOMMENDATION:** Research and development of wellbore fluid management systems.
- ▶ **PRIORITY/TIMING:** (HIGH/MEDIUM/LOW): HIGH
- ▶ **RESPONSIBLE PARTY:** Industry

# Session #2

# Subsea Blowout Preventers

## Field Performance Reporting

- ▶ **ISSUE:** Recurring issues on the same components. Lack of knowledge transfer from OEM/component manufacturer to contractor/operator. Two-way communication between OEM and the equipment owner.
- ▶ **RECOMMENDATION:** Cross-fleet, good operating practices, improve and open the line of communication between equipment owner and OEM.
- ▶ **PRIORITY/TIMING:** (HIGH/MEDIUM/LOW): LOW
- ▶ **RESPONSIBILITY:** Industry

# Session #2

# Subsea Blowout Preventers

## Competency

- ▶ ISSUE: BOP maintenance crew – no mechanism for ensuring for adequate competency. Well control has certifications but none for BOP maintenance crew.
- ▶ RECOMMENDATION: Standard for ensuring BOP maintenance competency
- ▶ PRIORITY/TIMING: (HIGH/MEDIUM/LOW): HIGH
- ▶ RESPONSIBILITY: IADC

# Session #2

## Subsea Blowout Preventers

### Subsea Completions on a Floating Rig

- ▶ **ISSUE:** Lack of clarifications for BOP stack requirements – shearability, well control, configuration. Industry does not need more regulation – but clarity on the existing ones.
- ▶ **RECOMMENDATION:** Adopt ISO 13628–7
- ▶ **PRIORITY/TIMING:** (HIGH/MEDIUM/LOW): HIGH
- ▶ **RESPONSIBILITY:** BSEE in collaboration with the industry

# Session #2

## Subsea Blowout Preventers

### Over Functioning of BOP

- ▶ **ISSUE:** Regulator: Industry thinks over-testing reduces reliability and not the reverse, as believed. Variability of data leads to error. Low probability of failure of demand increases the error band during statistical analysis.
- ▶ **RECOMMENDATION:** Real-time monitoring of performance.
- ▶ **PRIORITY/TIMING:** (HIGH/MEDIUM/LOW): HIGH.
- ▶ **RESPONSIBLE PARTY:** Industry.

# Session #2

## Subsea Blowout Preventers

### Well Control Responsibility

- ▶ **ISSUE: Regulator:** Who will control the well in case of a kick? How do you pin point one major issue from a number of minor issues happening together?  
**Industry:** uses Wellcap as a standard.
- ▶ **RECOMMENDATION:** Better communication between the various industry initiatives
- ▶ **PRIORITY/TIMING:** (HIGH/MEDIUM/LOW)
- ▶ **RESPONSIBLE PARTY:**

# Session #2

## Subsea Blowout Preventers Feedback on the Workshop

- ▶ What is the output from the workshop to white paper. White paper was more preparatory for the workshop. There will be a report given to ANL which will be shared with the industry. This will pinpoint the focus areas. Reliability of equipment and Human Machine Interface are the two areas which needs focus.
- ▶ Regulatory agency would appreciate feedback on consistency in the message regulations.
- ▶ Industry got an opportunity to communicate with regulatory agencies.
- ▶ Papers referenced (OCF) in white paper were not available
- ▶ Does industry have opportunity to challenge disagree policy – Regulator says area manager can be contacted
- ▶ Industry looked like a badly organized flea market – too many meeting not clearly related to each other. Would have been Improved/more brain–storming time.
- ▶ Brain storming session was well received
- ▶ Biggest and well represented group – this was the intent of the workshop per regulatory agency
- ▶ More brain storming on training requirements

# Session #2

## Subsea Blowout Preventers

### Feedback on the Workshop

- ▶ Better if there was an idea on the output required/material requirement
- ▶ Communication between groups need to be improved. More workshops (annual?) is better. District level meetings or even telecons can be arranged. Focus areas need to be captured prior.
- ▶ SMEs attendance was beneficial
- ▶ ANL white paper needs to be reviewed before published. Can the feedback from the workshop be included in the final safety measures rule.
- ▶ First time a large diverse group gathering has happened. The response needs to be pro-active than reactive. Effort needs to continue long-term.
- ▶ Informative and good
- ▶ Better if more time is allocated. Topics could have been narrowed down.

# Session #2

## Subsea Blowout Preventers

### Issues & Challenges

### Recommendations on Needed Actions

- What is the suggested action?
- Who is the intended audience that must take this action (regulators/industry/standards developing organizations) and who is impacted by this action?
- What is the time frame for needed action?