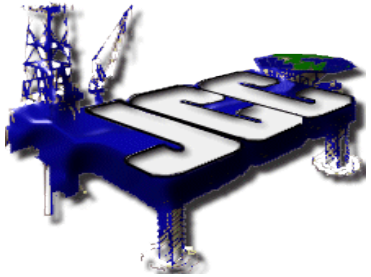
BSEE Proposed Well Control Rule

J. Connor Consulting

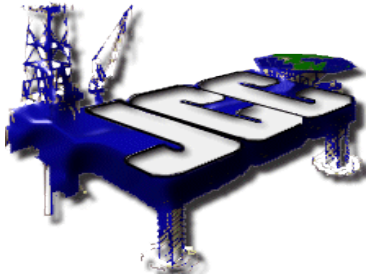
Lance Labiche



AGENDA

- Overview and Potential Impacts or Unintended Consequences of Proposed Rule
  - Drilling Margin
  - Casing/Cementing
  - Containment
  - API Referenced Documents
  - BOP Equipment
  - Inspection/Mechanical Integrity
  - Real Time Monitoring
- update on the status of the rule process

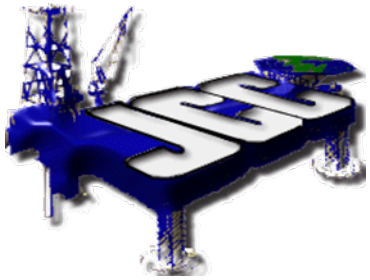
Drilling Margin Requirements



What must my drilling prognosis include?

§ 250.414(C)(1) - Static downhole mud weight must be greater than estimated pore pressure

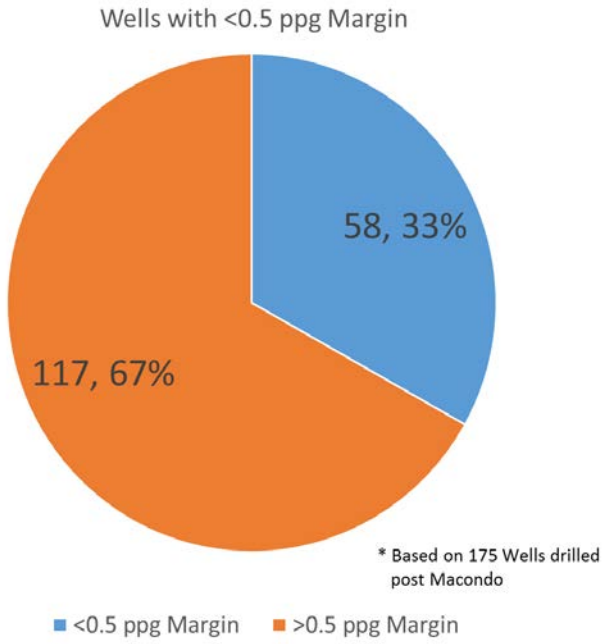
- How do you confirm or verify this?
- Could require the use of PWD on all wells.
- Could make it harder to obtain BSEE's approval for managed pressure drilling operations that use the combination of trapped annular pressure and MW to be overbalanced.



What must my drilling prognosis include?

§ 250.414(C)(2) - Static downhole mud weight must be a minimum of one-half pound per gallon below the lesser of the casing shoe pressure integrity test or the lowest estimated fracture gradient;

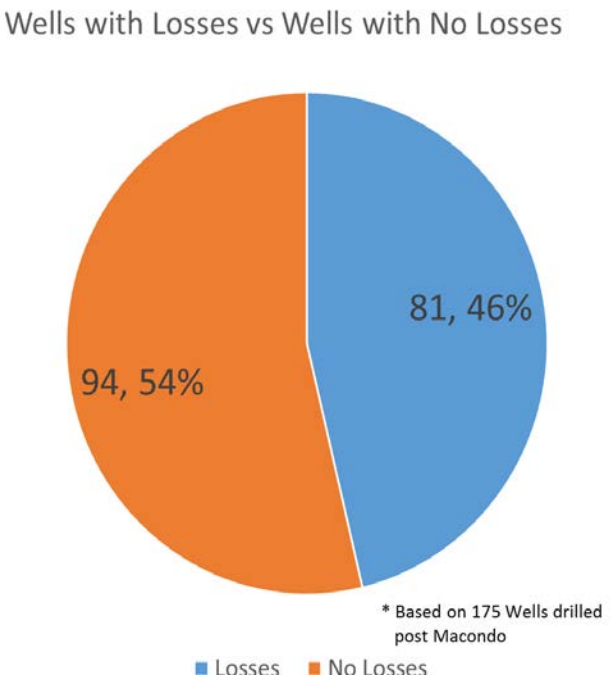
- Need to ensure BSEE understands SDMW is cuttings free
- 33% of wells drilled since Macondo would not be able to be drilled as designed

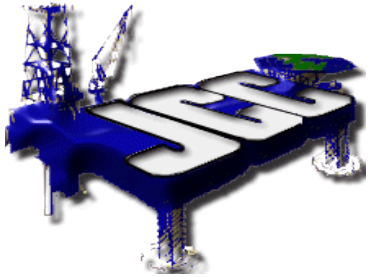


What must my drilling prognosis include?

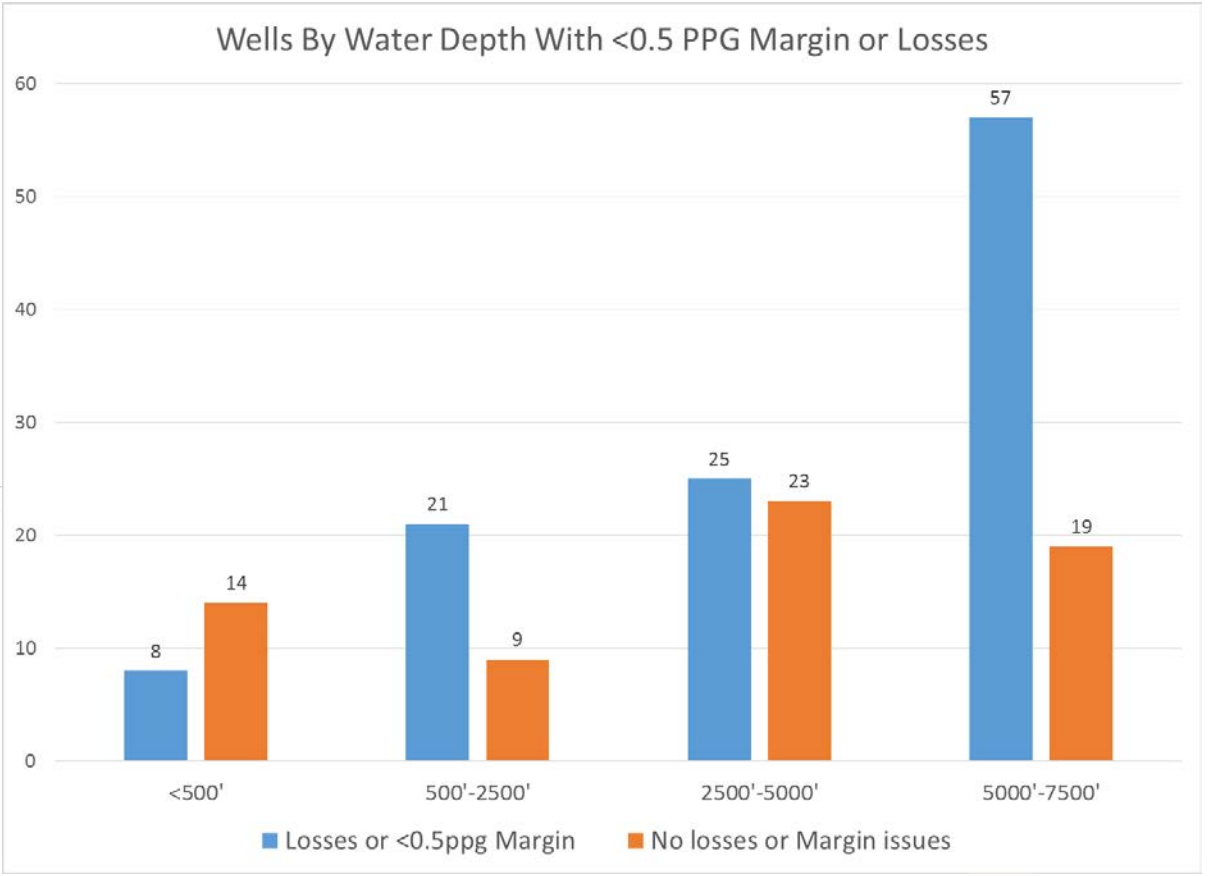
§ 250.414(C)(3) - The equivalent circulating density must be below the lesser of the casing shoe pressure integrity test or the lowest estimated fracture gradient

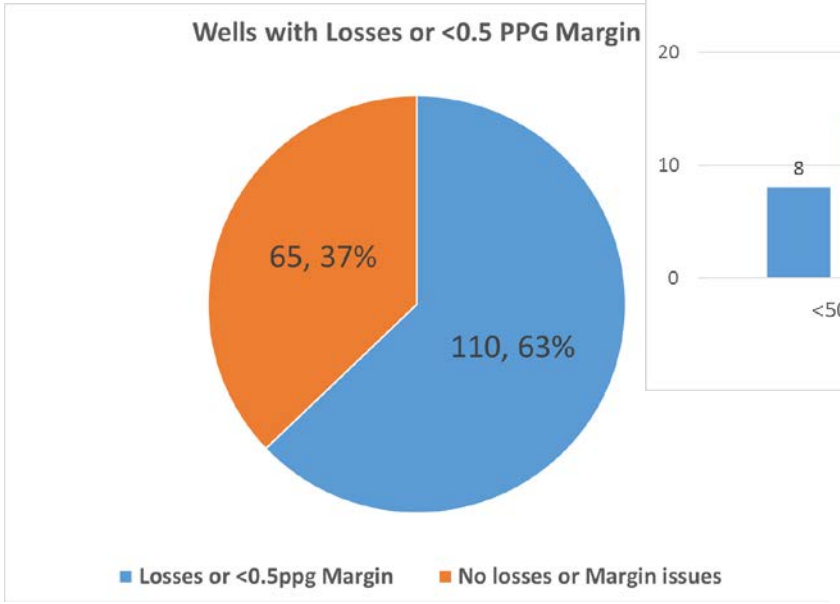
- Could result in the requirement to run casing as soon as lost returns are observed.
- Critical to differentiate between lost returns and seepage losses.
- 46% of wells drilled since Macondo would not be able to be drilled as designed





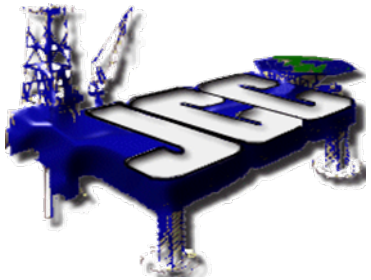
Wells With Either Lost Returns or < 0.5 ppg Margin





* Based on 175 wells drilled Post Macondo

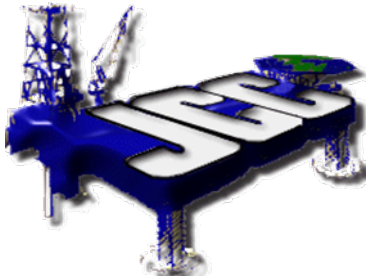
Casing and Cementing Requirements



What must I do in certain cementing and casing situations?

§ 250.428(c)(1) - Have indication of inadequate cement job (such as lost returns, no cement returns to mudline or expected height, cement channeling, or failure of equipment), (1) Locate the top of cement by: (i) Running a temperature survey; (ii) Running a cement evaluation log; or (iii) Using a combination of these techniques.

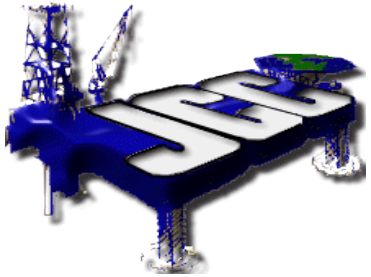
- Many times lost returns are anticipated and mitigated in the design of the cement job, recommended to insert “unplanned lost returns”.
- Expected height is too vague
- Need to add the ability to use lift pressure analysis to determine adequacy of cement job (BSEE currently allows this with an alternative compliance request)



What must I do in certain cementing and casing situations?

§ 250.428(d) – Inadequate cement job, Take remedial actions The District Manager must review and approve all remedial actions before you may take them…Any changes to the well program will require submittal of a certification by a professional engineer (PE) certifying that he or she reviewed and approved the proposed changes

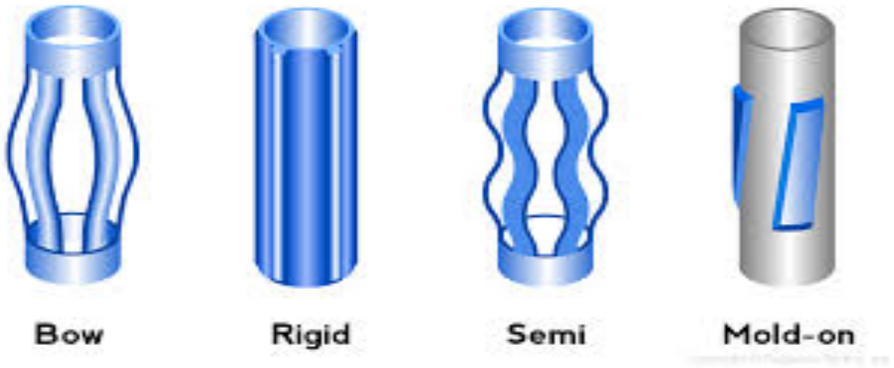
- This could overwhelm the available BSEE and PE resources.
- This could also lead to rig downtime as a result of having to wait on a PE or BSEE before conducting the remedial cement job.



What well casing and cementing requirements must I meet?

§ 250.420(a)(6) - Provide adequate centralization to ensure proper cementation

- The regulation seems to require centralizers be used on all hole sections.
- There are instances where using centralizers will actually increase risk.
- Wording needs to change to recognize methods other than centralizers to meet cementing requirements.

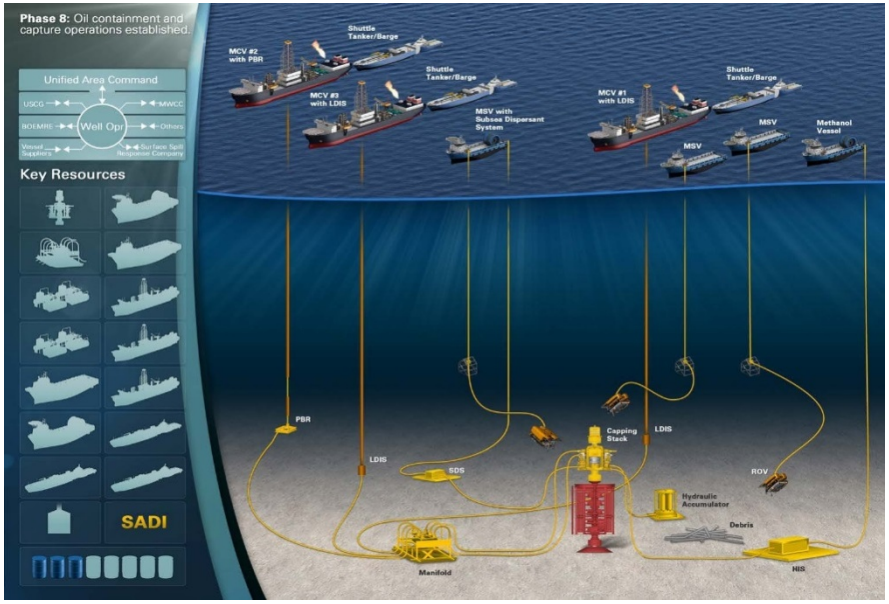


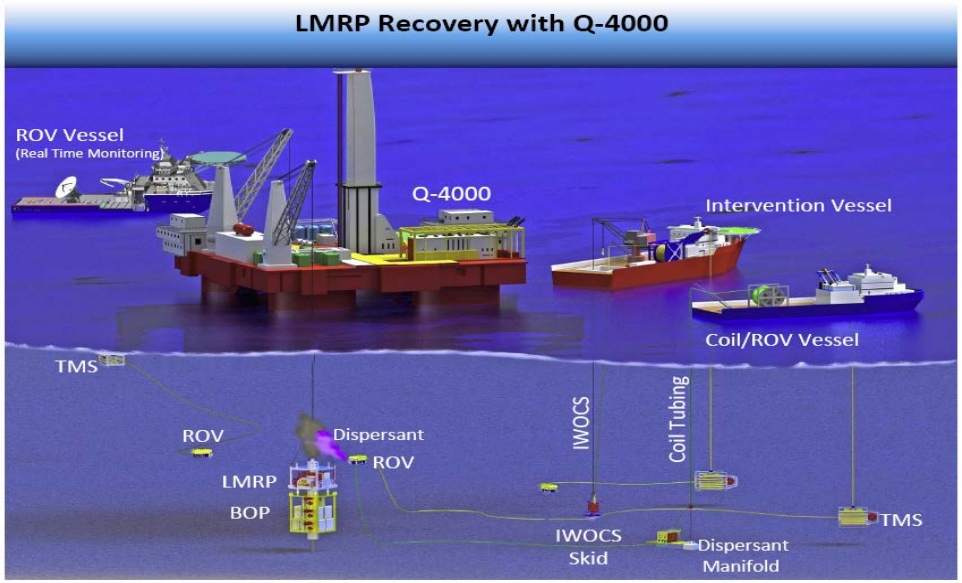
Containment Requirements

What well casing and cementing requirements must I meet?

§ 250.420(e)(2)&(3) - Have all equipment unique to containment operations available for inspection at all times.

- There is very little equipment unique to containment operations
- Need to understand what is meant by “available for inspection at all times.





Standards Requirements

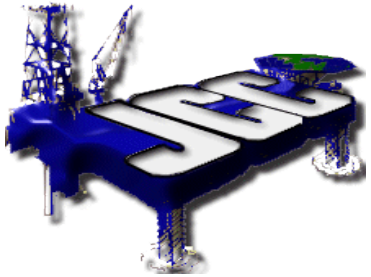
Documents incorporated by reference

§ 250.198 – Incorporates the following API documents:

- API Spec 11D1
- API Standard 53
- API Spec. 6A
- API Spec 16A
- API Spec. 16C
- API Spec. 16D
- API Spec 17D
- API RP 17H
- API Spec. Q1

- Each should and shall in these documents could be a potential enforcement action.
- The incorporation of these API documents could result in the creation of potentially hundreds or thousands of potential incidents of noncompliance (PINCs).
- Could lead to numerous unintended consequences.

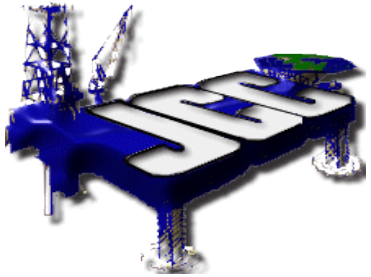
BOP Equipment Requirements



What associated systems and related equipment must all BOP systems include?

§ 250.735(a) - You must be able to operate all BOP functions without assistance from a charging system, with the blind shear ram being the last in the sequence, and still have enough pressure to shear pipe and seal the well with a minimum pressure of 200 psi remaining on the bottles above the precharge

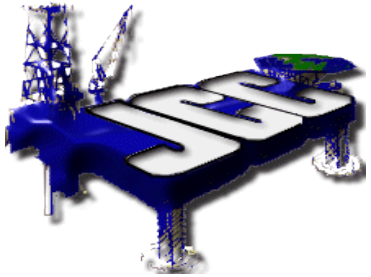
- Will likely result in the need for a dedicated accumulator and HPU for the blind shear rams.
- Time for compliance is 3 months after publication of final rule. Industry would not be able to comply in that time frame. Could lead to extended downtime on rigs.
- Estimated cost from $850k – $1.6MM



What are the requirements for a subsea BOP system?

§ 250.734(a)(3) - Have the accumulator capacity located subsea, to provide fast closure of the BOP components and to operate all critical functions in case of a loss of the power fluid connection to the surface

- The BOP frames might not be able to accommodate the additional bottles which would then drive the requirement for a subsea accumulator module (SAM) to be installed on the seafloor next to the BOP.
- Time for compliance is 3 months after publication of final rule. Industry would not be able to comply in that time frame. Could lead to extended downtime for deepwater rigs.
- Estimated cost – $1.9 MM/rig



What are the requirements for a subsea BOP system?

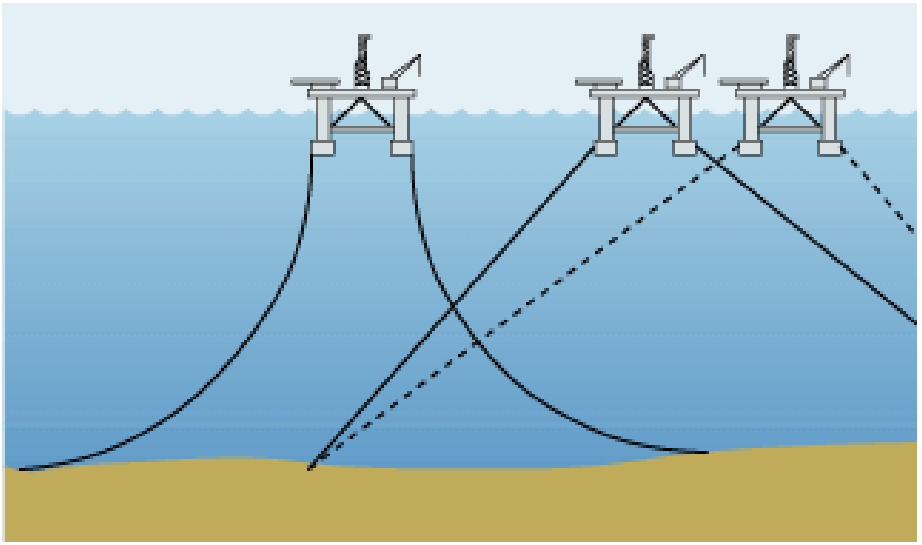
§ 250.734(a)(4) - The ROV must be capable of performing critical functions, including opening and closing each shear ram, choke and kill side outlet valves, all pipe rams, and LMRP disconnect under MASP conditions as defined for the operation.

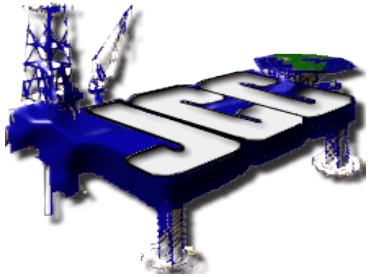
- The addition of all of these hotstabs will add numerous leak points on the BOP.
- Additional control panels will make it difficult to work on the stack.
- 3 months to come into compliance. Could extended downtime for deepwater rigs.
- Estimated cost - $275K per rig

What are the requirements for a subsea BOP system?

§ 250.734(a)(6) - provide autoshear and deadman systems for moored rigs

- Not all moored rigs are equipped with autoshear/deadman systems (would require a significant amount of work to retrofit)
- 3 months to come into compliance. Could lead to extended downtime for moored rigs that don't currently have these systems.
- Could deter moored rigs from other parts of world from entering GOM.



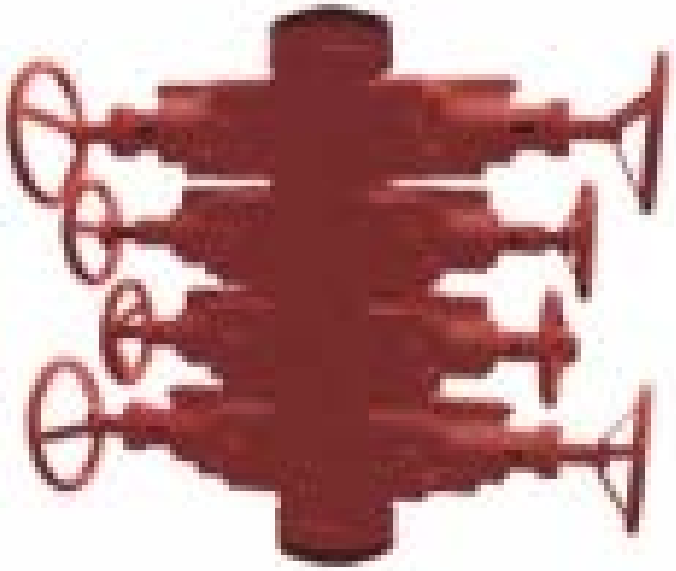


What are the requirements for a surface BOP stack?

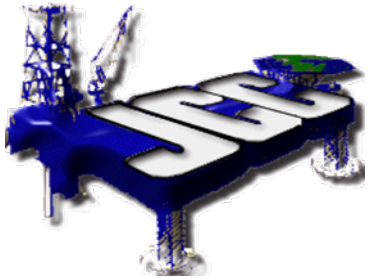
§ 250.733(e) - You must install hydraulically operated locks.

- Will require almost all surface BOP stacks to be retrofitted with hydraulically operated locks.

- 3 month compliance time could lead to extended rig downtime for jackups and platform rigs.



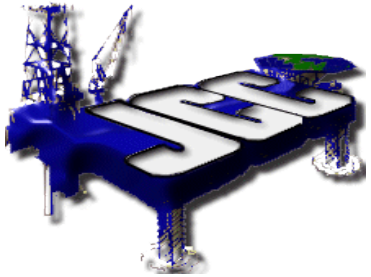
Inspection and Mechanical Integrity Requirements



What are the BOP maintenance and inspection requirements?

§ 250.739(b) - A complete breakdown and detailed physical inspection of the BOP and every associated system and component must be performed every 5 years. This complete breakdown and inspection may not be performed in phased intervals.

- Could require that the entire system including the riser, choke/kill lines, surface choke manifold, BOP, and LMRP to be shipped to an onshore location once every five years for this major inspection.
- Each deepwater rig could be shutdown for 6 months (or longer) every five years to conduct this inspection.
- With adequate tracking system for inspections of individual components there is no benefit to safety.



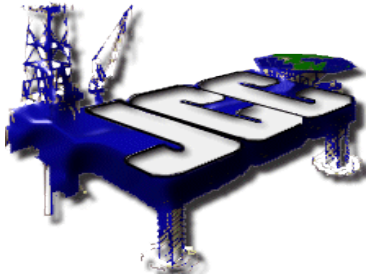
What are the BOP maintenance and inspection requirements?

§ 250.739(c)(1) - You must provide a written report of equipment failure to the manufacturer of such equipment within 30 days after the discovery and identification of the failure.

- Need to define failure. Failure during testing or failure while conducting well operations?

§ 250.739(c)(2) - You must ensure that an investigation and a failure analysis are initiated within 60 days of the failure to determine the cause of the failure.

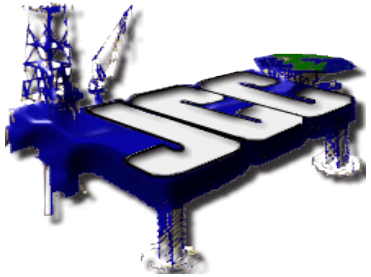
- Could quickly overwhelm already short staffed qualified subsea engineers



What are the BSEE-approved verification organization requirements for BOP systems and system components?

§ 250.732 - The requirement for the annual mechanical integrity report will pose the following challenges to industry:

- The BSEE approved verification organization (BAVO) will have to make a determination if the BOP stack meets all regulatory requirements, industry standards and recognized engineering practices, however BSEE does not identify “the recognized engineering practices”. Will lead to inconsistencies among 3rd parties
- The BAVO will have to verify the complete documentation of the equipment’s service life exists that demonstrates that the BOP stack has not been compromised or damaged from previous service.
- If there are any components that do not have complete documentation of their entire service life, this potentially could mean that those pieces of equipment have to be taken out of service.

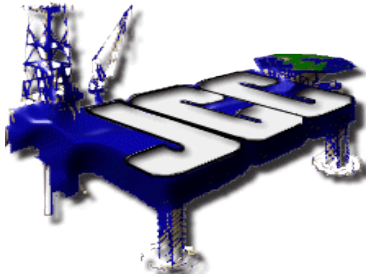


What are the BSEE-approved verification organization requirements for BOP systems and system components?

§ 250.732 - Continued

- The BAVO will have to provide a description of the SEMS plans reviewed related to assurance of quality and mechanical integrity of critical equipment and verification that the plans are comprehensive and fully implemented.

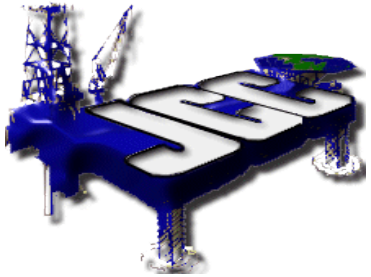
- This will require that the BAVO not only be BOP experts but also SEMS experts. This is also redundant to the SEMS requirements. The SEMS regulations already require a SEMS audit which makes this a double regulation.



What are the BSEE-approved verification organization requirements for BOP systems and system components?

§ 250.732 - Continued

- The BAVO must verify the qualification and training of inspection, repair and maintenance personnel for the BOP systems meet recognized engineering practices and OEM requirements.
  - BSEE does not define “recognized engineering practices” which will lead to inconsistencies between the third parties.
  - The OEMs for subsea BOP equipment in the GOM do not identify training requirements for inspection, repair or maintenance personnel.
  - These issues at best will lead to inconsistencies and could possibly make it where the BAVO is not willing to issue this verification.
- The annual mechanical integrity report is redundant. All of these areas are already covered by in between well maintenance requirements and SEMS requirements.

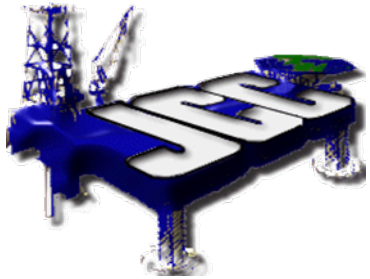


What are the BSEE-approved verification organization requirements for BOP systems and system components?

The BAVO will have to certify that:

- "Test data clearly demonstrates the shear ram(s) will shear the drill pipe at the water depth."
  - The shear tests are performed at atmospheric conditions so they do not clearly demonstrate the above requirement.
  - This might lead to the BAVO not issuing this certification which would lead to BSEE being unwilling to approve the APD.
- "The BOP was designed, tested, and maintained to perform at the most extreme anticipated conditions."
  - BSEE does not define the most extreme anticipated conditions.
  - If BSEE's intent is closing in against flow, the BOPs are not designed for that condition so this could lead to the BAVO not issuing this certification which could lead to BSEE not approving the APD.

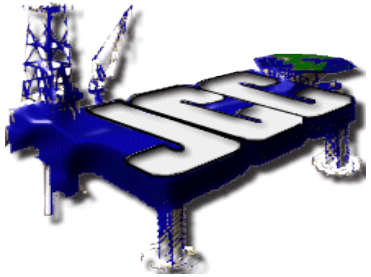
Real Time Monitoring Requirements



What are the real-time monitoring requirements?

§ 250.724(a)(1) - … gather and monitor real-time well data using an independent, automatic, and continuous monitoring system capable of recording, storing, and transmitting all aspects of: (1) the BOP control system; (2) The well's fluid handling systems on the rig; and (3) The well's downhole conditions with the bottom hole assembly tools (if any tools are installed).

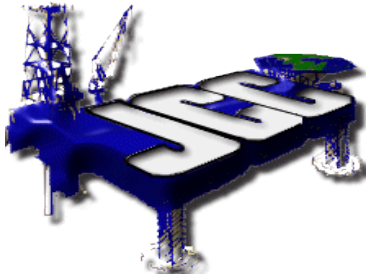
- "all aspects of" needs to be better defined.
- The IT security could leave these systems vulnerable to attacks
- Could result in dilution of talent pool of offshore workers because the best and brightest are being used in monitoring centers



What are the real-time monitoring requirements?

§ 250.724(b) - You must immediately transmit these data as they are gathered to a designated onshore location during operations where they must be monitored by qualified personnel who must be in continuous contact with rig personnel during operations.

- If data transmission is interrupted the rule indicates that a rig shutdown would be required.
- Continuous monitoring by a qualified individual could result in less qualified persons on the rig if they are being pulled into RTM centers (especially subsea engineers for BOP control systems).
- Has it been proven this increases safety?
- Alternative proposal to BSEE would be to transmit and store data to shore but keep qualified individuals on the rig.



What are the real-time monitoring requirements?

§ 250.724(c) - If you lose any real-time monitoring capability during operations covered by this section, you must immediately notify the District Manager..

- Need to define a length of time that RTM must be down before contacting BSEE.

- Will pull BSEE resources away from reviewing permits.

Current Status of Rule Making Process

- The final rule was sent to OMB on February 3, 2016 and posted on February 4, 2016 at:

  http://www.reginfo.gov/public/do/eoDetails?rrid=125942

- Industry has several meetings scheduled with Office of Information and Regulatory Affairs (OIRA) to discuss concerns with the final rule.

- The final rule will be published after OIRA review. It is expected to be published sometime in late spring/early summer of 2016.

Questions?

Lance.Labiche@jccteam.com

www.jccteam.com