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17 October 2000
 Rev 2
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Department of Interior - MMS 30 CFR Part 250

Proposed Rule Changes

Reference: Federal Register, June 21, 2000

Executive Summary

Comments in this summary are limited to BOP (Blowout Prevention) equipment, related systems, operations, and maintenance.

In the Federal Register of June 21, 2000, section Regulatory Flexibility (RF) Act, page 38461 covers anticipated cost of the proposed rules. The major cost discussed is for the purchase of blind shear rams to be installed on surface rigs. WEST believes this discussion did not recognize proposed changes to subsea accumulator requirements of section 250.442 would additionally have a significant impact for floating drilling rigs with the exception of some of the newest rigs in service. We did not attempt to estimate these anticipated significant costs.

Inclusion by reference of selected sections of API RP 53, third edition is considered an improvement in the rules.

Increasing the specificity of "minimize the number of turns" in 250.431(e) for bottom-founded drilling units diverter piping will require some rigs to affect modifications. Because this is large bore piping, costs could be significant.

Comparisons are not provided to sections of the regulations that could refer to other industry standards, namely diverters (API RP 64), choke and kill systems (API RP 16C), or marine riser (API RP 16Q). This review was funded under MMS's 2000 research program and is now under review prior to publication.

API RP 53 Recommendation:

The seven sections of API RP 53 (Sections 13.3, 17.10, 17.11, 17.12, 18.10, 18.11, and 18.12) that are recommended for inclusion into MMS regulations are about five pages of very useful recommended practices. The last paragraph of Section 18.10.3 states "A full internal and external inspection of the flexible choke and kill lines should be performed in accordance with the equipment manufacturer's guidelines. In WEST's experience, this is not always complied with, but is important in avoiding an Odyssey type event in the OCS. On the other hand, limiting inclusion to these sections will obviously result in differences between MMS requirements and the rest of API RP 53, as well as necessitating additional MMS text to cover requirements that are adequately specified elsewhere. The regulations fail to benefit in the other areas covered in this industry standard. Finally, the best operators in the OCS want their contractors to work to these minimum API standards. Failing to

include API RP 53 in its entirety results in a financial penalty, albeit self-imposed, for such contractors compared to others.

Several specific examples of where API RP 53 has good auditable points that WEST considers important and the MMS regulations are silent or require clarification are:

1. Section 14.3.4 requires BOP control fluid pumping systems to “be protected from over pressurization by a minimum of two devices . . .” This protects rig workers from bursting pipe, even more critical at the newest rig’s discharge pressures of 5,000 psi. WEST has recently been involved in the start-up of one of these rigs where the relief valve was undersized.
2. MMS 250.443 (g), BOP systems. Requiring ram locking devices is a good practice. However, testing these devices is not specified. API RP 53, sections 17.5.8 and 18.5.9 recommend rams be tested without operating pressure to verify the ram locking system works. This is an excellent oilfield practice that supplements the MMS statement and should be considered for inclusion.
3. Further improvement could include removing un-auditable statements throughout the OCS document; consider 250.431(e) “Diverter Systems” requirement are not auditable, e.g., “minimize”, “maximize”, “sharp turns” and, in WEST’s experience, frequently result in significant discussions between MMS district supervisors and inconsistent interpretation. RP #53 provides good guidance on a similar issue, choke and kill lines. Section 13.3.i.1 states, “... short radius pipe bends ($R/d < 10$) should be targeted in the direction of expected flow.”. Reference to auditable standards or quantitative guidance is appreciated.

Proposed Regulation Comments

Upon a review of the new proposed regulations, WEST has the following observations and/or recommendations:

- 1) General: When regulations are different for surface and subsea, please make this clear. When sections apply to both, please state so.
- 2) MMS 250.412 - Correct typo please - “plat” in the title should read “Platform”.

MMS 250.431 requires 10 inch surface stack diverter lines and 12 inch for subsea stacks. Although not a change in requirement, it is more rigorous and clear than both API RP 53 and API RP 64. Part (e) of this requirement provides an additional auditable requirement in their parenthetical “only one 90-degree turn allowed for each line for bottom-founded drilling units”.

- 3) MMS 250.434 Diverter tests – Item (c) remove the word pod. These are not used for diverter control systems.

MMS 250.441 Surface stack requirements – As noted above, the proposed requirement requires surface stacks to have blind-shear rams. Several BOP manufacturers note operating pressure requirement variability of as much as 30% for a given pipe grade. Additionally, test data for shearing pipe is limited from some of the manufacturers, particularly for the newer grades. In deepwater applications, mud weight and wellbore pressure also significantly impact the hydraulic pressures required to shear pipe. As a result, the operating limits of shear rams are frequently unclear. Consideration should be given to ensure these limits are clear for all drilling operations.

- 4) **Comments in CFR on MMS 250.442**, page 38455 concerning accumulator volumetric capacity – reference to API RP 53, section 12.3 is inconsistent with the proposed rule which specifies section 13.3. Section 13.3 is the correct reference, as section 13 covers Control Systems for Subsea BOP Stacks. A number of issues are of note on this topic:
- a. The sentence whereby the proposed MMS 250.442 includes this API standard by reference, begins with “The subsea accumulator must meet or exceed the provisions of Section 13.3. . . .” However, this section does not include auditable subsea volumetric requirements other than that necessary to effect specified response times.
 - b. The response time specified for rams in API RP 53, section 13.3.5 is “45 seconds or less”. For deepwater applications on today’s newest rigs, the industry has strived for completion of the entire EDS (Emergency Disconnect Sequence) in the order of 45 seconds. Although EDSs vary from rig to rig, critical features common to all are shear and lock to maintain the seal affected, then disconnect the LMRP (Lower Marine Riser Package) connector. For EDSs that include closing casing shear rams, which do not have the ability to seal the sheared pipe, two shear rams must close within the specified time. Thus, the subsea volumetric requirement in the proposed rule does not reflect the need during an EDS for a fifth generation rig.
- 5) **MMS 250.443 BOP Systems** – We assume this applies to all systems surface and subsea; however, it is not clear if this is the case. For subsea, the MMS requirement for accumulator volume is less than API RP 53, section 13.3.2. On the other hand, the requirement exceeds API RP 53, section 12.3.2 for surface stacks. API RP 16E has a performance based method of specifying the required accumulator pressure after the recommended functions have been activated, which includes the ram operating ratios. Using this recommendation will ensure you have the energy to complete an additional ram closure against rated wellbore pressure after completing the specified BOP functions.

On another topic, assuming precharge gas in the subsea accumulators acts as an ideal gas as does API RP 16E has resulted in errors in the 10% range in the past. However, changes in the fifth generation control systems, combined with operating capabilities up to 12,000 feet of water, can result in errors in useable fluid subsea exceeding 40% because of this assumption.

Finally, there are no guidelines on the accumulator volumetric requirements for “deadman” systems. As noted above, not all dynamically positioned rigs have such systems. For those that do, failure to account for deviations from ideal gas behavior might result in inadequate energy to complete the control sequence required to secure the well.

Recommendation: Although more rigorous than both API RP 53 and MMS requirements, WEST recommends considering the adoption of API RP 16E accumulator volume requirements, along with requiring corrections for non-ideal behavior of the precharge gas (use of compressibility factors is one such method). Additionally, if deadman systems are installed, specify accumulator volumetric requirements similar to that of API RP 16E, including correction of the non-ideal behavior of the precharge gas. Note that, in WEST's experience, some GOM rigs meet API RP 53 requirements, but not API RP 16E.

- 6) MMS 250.443 (b), BOP Systems, automatic backup to the primary accumulator charging system – Another example of repeating requirements covered in API RP 53, sections 12.4 and 13.4, but not included in this proposed rule.
- 7) MMS 250.443 (g), BOP systems. Requiring ram locking devices were previously addressed. RP # 53, section 17.5.8 and 18.5.9, both require the ram locking system to be used during wellbore testing. The API recommendation is an improvement compared to MMS regulations. However, a test frequency using the ram locking system needs to be provided.
- 8) MMS 250.446, Quality Management sections of API RP 53 are included in the regulation. Other quality standards that should be considered for inclusion or reference include API RP Q1 – “The supplier shall establish and maintain documented procedures for implementing corrective and preventive action...”, and API Specification 16A, Appendix G – “The operator of drill through equipment manufactured to this specification shall provide a written report to the equipment manufacturer of any malfunction or failure which occurs...”.
- 9) Wellbore testing - The MMS 250.448 provides a lower acceptance standard for low pressure wellbore testing compared to API RP 53, sections 17.3.2 and 18.3.2. Another issue is the pressure just before wellbore assist begins to aid the seal. This intermediate pressure, which ranges between 2,000 psi and 4,500 psi, depending on the closing ratio, is another possible mode of failure. Practically, demonstrating a ram maintains pressure integrity at these intermediate/transition pressures, gives a better measure of “fitness for purpose”, as compared to maximum working pressure tests. Intermediate/transition pressure tests should only be conducted initially and on an annual basis. Both issues should be considered for inclusion.
- 10) MMS 250.449 (f) – Wellbore pressure testing of variable bore-pipe rams. Testing against all sizes of pipe in use may be more rigorous than the largest and smallest specified in API RP 53.
- 11) MMS 250.515 Blind-shear rams are specified as required for completion activities. Shear concerns listed in MMS 250.441 above apply for this section as well.
- 12) MMS 250.615 Blind-shear rams are specified as required for workover activities. Shear concerns listed in MMS 250.441 above apply for this section as well.