

Effects of Water Depth on Offshore Equipment and Operations

Topic #2: Well Control – Subsea

(Subsea BOP, Scope is the wellhead and above)

Background Information

Within the industry there seems to be a state of confusion. Further to that point, the confusion is expanded with some of the ambiguous language that have been introduced either from within the industry standards, introduced regulations or company guidelines, just to name a few.

Part of the focus of the discussions in the BSEE workshop should look at the various documents that are in use and search for the gaps, misinterpretation and/or ambiguity and seek clarity, where possible.

Several documents are going to be referenced in the workshop and may add some value in meeting the objective. More specifically the workshop will look closely at the recently released NTL's, Drilling Safety Rules and Recommendation from the September 14 BOEMRE Report Regarding The Causes of the April 20, 2010 Macondo Well Blowout.

Other documents may also be used and shared within the group, to provide guidance to meet the broader objective.

- Government Regulations and NTLs
- Industry Standards
- Manufacturing Engineering Bulletins, Technical Alerts or other public documents
- Company Guidelines / Policy / Standard Operating Procedures

General Purpose

This white paper presents a baseline for discussions for subsea BOP drilling systems and the ***Effects of Water Depth on Offshore Equipment and Operations***. This document is meant to provide a brief background of the topic and identify current trends and challenges addressing:

- Current technologies and challenges with implementing those technologies
- Trends and/or notable technologies envisioned for the near and long-term
- Coordination and communication to help align the efforts of industry and regulatory agencies
- Human Factors in safety (e.g. training and procedures)

For the purpose of discussion, deepwater will be defined as: ***“a drilling and/or completion operation that is performed from a floating vessel or structure”***

Scope

Identification of technical challenges / limitations for subsea well control systems and operations, specifically subsea blowout preventers, control systems (primary, secondary and emergency) and the ancillary equipment that support them, are as vital to the successful Deepwater Drilling Operations, as the people, (processes, procedures and training) that operate them.

As an integral part of everyday operations, special consideration should be taken to include marine well containment, (w.r.t. the inspection and recovery techniques) has now become equally important as the other many challenges that we face daily.

This document will focus on all of the equipment installed above the subsea wellhead / tree assembly interface to the diverter, including riser tension / recoil and any associated secondary and/or emergency systems, as they pertain to well control.

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Introduction

This desired outcome of the discussions should provide some insight into how well control equipment is managed and the methodologies used, as they are related to:

- Equipment (maintenance, inspection, testing, training)
- Operating Procedures (maintenance, inspection, testing and uses / limitations)
- Emergency Response (processes, training, procedures and risk assessments)

Another desired outcome could be to develop common language that might be useful to BSSE in their development of CFR's and industry in developing standards, to help the end users focus on the intent and not just the words of the documents.

Efforts shall be taken to discuss and analyze specific requirements and frequency of inspection, testing and optimal configurations for the following systems to include but, are not limited to:

- Diverter, diverter lines and valves (although not considered well control equipment)
- Riser
- Subsea BOP
- Control Systems
- Well Containment

To achieve the object of this workshop, several perspectives are provided below to give insight into what individuals are asking themselves about the issues we routinely face, on any given day.

BSEE Perspective

This paper does a great job in reflecting the many regulatory challenges faced by both the industry and the regulator. It is good that some of the “technical” NTLs will be discussed. There is inadequate guidance in the Code of Federal Regulations for MASP, single bore production risers, HPHT, and other operations or equipment. Therefore the regulator has to issue NTLs for clarification. Many of these NTLs are guidance documents and may not be enforceable regulations. Likewise, industry standards are lagging behind the advanced technologies, so there is a regulatory void that both regulator and operators are trying to fill the best they can:

- *The regulators – by offering guidance via NTLs and taking a conservative stance with a case-by-case approvals rather than standard approvals.*
- *The operators – sometimes moving ahead and spending money on new technologies only to find out that the Federal authorities may, in fact, not approve a project due to the risks involved.*

BSEE's regulatory perspective consists of balancing prescriptive and performance-based regulations. In addition BSEE regulations allow the use of alternate procedures or equipment so long as the alternate procedures or equipment proposed for BSEE approvals provide a level of safety and environmental protection that equals or surpasses current BSEE requirements. (30 CFR 250.141).

The need to balance prescriptive and performance-based regulations arises because:

- Performance-based regulations may impose excessive costs on industry
- in the search for ways to meet regulatory standards.

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- Small businesses may simply prefer to be told exactly what to do, rather than incur costs to identify steps needed to achieve a performance standard.
- This “guidance” effectively takes the form of prescriptive standards that performance standards are supposed to replace.

Performance standards present fewer implementation issues in cases where actual performance can be evaluated and verified. However, for rare and catastrophic events, performance cannot be measured directly and instead must be predicted, making implementation more difficult.

BSEE uses a hybrid approach that may minimize some of the weaknesses of both design and performance standards. Instead of choosing between prescriptive and performance-based regulations, BSEE uses a blend of instruments. The approach is to require specific technologies or designs, but to add to the regulation “equivalency clauses” or provisions for alternative compliance mechanisms. These provisions effectively allow industry to “opt-out” of the prescriptive standard if they can demonstrate that they can achieve a comparable level of performance or better through other means.

Equipment Manufacture Employee Perspective

Since the Macondo incident, there has been confusion in regards to requirements for inspection, inspection frequency and certification of equipment. Regarding shearing, there has been confusion about terminology and what is required to certify that the shear rams are “fit for use”. This workshop has the potential of establishing guidance and direction that can be implemented consistently without going through the rigorous processes that may be required in developing government rules, company policy and industry standards. In addition, first hand exposure will provide more clarity and better understanding of the requirements.

Well Control SME Perspective

Attending a workshop like this will provide a venue to connect with various parties involved in well construction process. It broadens ones prospective on how stake holders are inter-related with each, and provide a chance to know requirements of customers.

Currently many industry initiatives are going on, this workshop will help in defining and calcifying the efforts needed to stay safe and compliant with upcoming changes. This would be a collaborative effort where sharing information and knowledge will benefit all participants.

Drilling Contractor Employee Perspective

Every serious opportunity for Contractors, Operators, OEMs and Regulators to get together to discuss our business should be embraced by each of us. Sessions such as this are, or should be, instrumental in guiding us all forward to achieve our individual goals in a safe and efficient manner.

One size will never fit all, but cross party workshops can go a long way to ensure that all, or at least many, points of view are considered when creating minimum safety, equipment, operational and training standards.

Operator Employee Perspective

There is value in holding a workshop like this because it is a great opportunity to get operators, mfgs, drilling contractors, third party suppliers, licensing or certifying authorities, industry organizations and

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regulators together in one room to focus on one objective and develop verbiage that is useful immediately.

Since the Macondo incident, there have been multiple efforts from multiple fronts. This workshop has the potential of establishing guidance and direction that can be implemented consistently without going through the rigorous processes that may be required in developing government rules, company policy and industry standards.

Attending this workshop should provide me with the insight into the processes of; training personnel, operational well control procedures, manufacturing and inspection / maintenance of the equipment and methods for the introduction of new technology into the industry.

If this work session objectives are achieved, the outcome has potential to produce significant results between industry and regulators.

Analysis

At the recent Offshore Compliance Forum (OCF), there were several presentations providing some insight related to subsea BOP issues.

One presentation specifically (Session #2) dissected **“THE DRILLING SAFETY RULE – An Interim Final Rule to Enhance Safety Measures for Energy Development on the Outer Continental Shelf”**.

Given the breadth and scope of the requirements, it was difficult to determine what were the actual requirements requested?

Another presentation (Session #5) focused on subsea BOP's while other presentations / discussions addressed other industry actions taken since the Macondo incident. During the discussions attendees were informed about the details of the work, specifically the Joint Industry Task Force (JITF), API standards, industry committees (OOC, COS) and other organization efforts on a global scale (OGP, etc.).

When all of the efforts noted above are taken into account, the opportunity for a thorough analysis could be performed and the objectives of this workshop would be achieved.

Findings

To retain the momentum coming out of the OCF, attendees of the BSEE workshop should take into consideration the work presented and apply those discussions where possible. As a result of the discussion from this workshop, there is potential of coming away with:

- Current status and clarification on Industry standards
- Clarification and better understanding of regulatory requirements, w.r.t. well control systems
- New ideas, procedures and “paths” being utilized by others with industry
- A better informed community in understanding the how important interaction and cooperation between regulators and industry