IADC Well Control Committee
Meeting Minutes
13th March 2019
IADC Crown Center
Houston, TX USA

Contractor roundtable

An informal discussion of drilling contractors was held prior to the Well Control Committee meeting. Contractors present included Pacific Drilling, Ensco, H&P, Seadrill, Patterson-UTI, Nabors, Diamond Offshore, Nabors, and Rowan. Key topics discussed included the following:

- Weather reduced EDS event offshore
- "Well hopping" criteria applied by BSEE in the Gulf of Mexico
- Changes contained in recently published API Standard 53 5th edition
- Keeping the hole clean to avoid BOP bonnet seal issues
- Well control and barrier issues caused by operator required procedures
- Proposed "10 Commandments" outlining basic principles of well control
- Issues encountered when lubricating and bleeding
- IADC MPD forum conducted prior day
- Increased collaboration between offshore and onshore contractors on MPD procedures
- Effects of turnover on maintaining trained drill crews
- More focus on training for horizontal wells versus traditional vertical wells
- Well control training curriculum under development by IADC UBO/MPD Committee

Well Control Committee Meeting

Welcome & Introductions

Steve Kropla of IADC opened the meeting and welcomed the attendees. He then provided a building safety briefing and reminded everyone the meeting was subject to the IADC Antitrust Policy and Guidelines.

Mr. Kropla asked those present to introduce themselves.

IOGP Shear Ram Performance JIP

Leonard Childers of BP gave a presentation on the IOGP Shear Ram Performance JIP. This JIP resulted from the organizations Global Industry Response Group report following the Macondo incident. The report recommended that *the BOP design…should be reviewed to determine survivability and operability during a well blowout*.

This initiative was picked up by the BOP Reliability & Technology Task Force, part of IOGP's Wells Expert Committee, which also resulted from the GIRG report. In 2014 work began on a JIP to develop a standardized shear ram database collecting industry shear data. Nothing of this sort had existed prior to Macondo.

The objective of the project is to provide a sound and consistent basis of BOP shear ram capability and reliable performance data that can be applied to improving the safety, performance, and operation of subsea BOPs. The initial work was partially funded by IOGP. Initial development included OEMs, drilling contractors and operators.

A key item identified by the JIP was the need for a consistent database using a standardized protocol to shear test tubulars. After a standardized procedure was developed, the group wanted to publish the protocol in an industry recognized document. Following discussions between IOGP and API, the protocol was eventually published in July 2018 as API 16TR1. Work is now underway on a second edition to this Technical Report, expected within the next 18 months.

Mr. Childers stressed that API 16A is for shear ram qualification – API 16TR1 is for performance testing, not qualification testing.

The aim of the JIP is to collect high quality shear ram performance test data (shear force/pressure and related geometric and material data) from tests using the standard test protocol on BOPs. This is done to create a centralized record of historical shear ram performance data and to support the ability to quantify hydraulic pressure requirements to shear tubulars and seal for specific well and BOP design.

There are currently over 760 test results in the database, which now being managed by Stress Engineering Services. There are seven member operators in the JIP, with two others having expressed interest. New member companies are welcome to strengthen and expand its database for the benefit of the entire industry. Interested parties should contact George R. Ross at Stress Engineering Services Inc. at 281-955-2900.

DeepStar JIP Update

Shak Shamshy and Dave Barrow of Chevron presented an update on the DeepStar Joint Industry Project. An initial presentation had been given to the Well Control Committee at its meeting in Galveston in August 2015.

DeepStar started in 1991 with Texaco, and was assumed by Chevron took over after the Texaco acquisition. Two years ago, it was restructed into four key areas: flow assurance, floating systems, subsea systems, and drilling & completions.

The JIP currently includes 10 operators with global representation. Fees are $100K/year; previous fees went as high as $1 million for two years. Associate members are $15K. All members have access to all data relating to 13 core projects and other information.

The group recently formed a partnership with the Nippon Foundation, which includes 10 projects involving Japanese service companies. This enables participating companies to access approximately $2 million worth of data for DeepStar membership price. Outside the core, the JIP also has satellite projects with variable pricing. Any core member can initiate a satellite project, with other core and associate members able to join as well.

Mr. Barrow reviewed a number of projects that had been undertaken during the project's history. Some of these have had significant impact on drilling & completions, particularly on HPHT and 20kpsi drilling systems, and wellhead fatigue. He noted the drilling risers study had led to API 16Q.

Key core projects are focusing on shear rams and early kick detection sensor qualification. A satellite project is working on an Insert SCSSV for deep-set valves. He also showed a "Drilling Roadmap" listing numerous projects for consideration as either core or satellite projects.

He noted the group was dominated by operators, and queried the Committee as to possible projects with a broad interest among non-operator groups. The Committee consensus was that cost vs. value is issue for contractors and others right now.

Companies interested in being part of the JIP are encouraged to contact Mr. Barrow, Mr. Shamsky, or Joe Gomes at the Offshore Operators Committee.

The group took a short break.

WellSharp Update

Alma Roberts of IADC provided metrics for the well servicing instruction given since the last Committee meeting in December. Kristin Blissit said IADC is ready to begin pilot testing for the WellSharp Well Servicing Introductory level instruction. She said that in January 2020, the WellCAP well servicing instruction will be discontinued.

WellSharp Plus is expected to launch around June 2019, and WellCAP Plus is to be discontinued. Human factors will be included in the facilitator course.

Mark Denkowski spoke about the knowledge retention program intended to bridge between certification periods to minimize the amount of knowledge between retraining periods. IADC has developing an AI-aided tool to aid in retention of well control knowledge to help maintain knowledge of drill crews. He stated IADC had met with onshore members in Tulsa recently to identify key items to focus on. They will follow a similar process with onshore members. They are also speaking with commercial providers on data they feel should be included.

IADC feels the WellSharp metrics are helpful in identifying gaps in knowledge that can be addressed by ongoing refreshers or other methods to help retain knowledge of key well control tropics and procedures.

The knowledge retention system will use different database than WellSharp testing database. It will not include a test and will not result in a certificate, will be a voluntary system for supporting retention of knowledge. Progress quizzes are included but there will not be any type of formal assessment or certification.

He stated the vision of this program is not to replace the standard two-year certification, just to maintain knowledge. Some contractors expressed skepticism about spending money on training not otherwise required, stating it might be better accepted if it could somehow be adopted as an alternative to the required two year training cycle. Others felt knowledge retention could be strengthened through actual training exercises conducted on the rig. While generally felt to be a worthwhile pursuit, others felt it would be necessary to provide some type of incentives to encourage use.

Some presented had reported difficulties in accessing student scores in the database, particularly the speed of the system. Mr. Denkowski said IADC has been encountering some issues with the database provider that are currently in process of being addressed. IADC is also working on a real-time technical support solution for assistance when difficulties occur.

MPD Return Flow Pathways

Adam Keith of Nabors Drilling made a presentation on issues Nabors has encountered with MPD systems in various operations. Usually the issues have resulted from practices that certain operators have insisted on which Nabors has at times felt had the potential to compromise safety.

In response to these practices, Nabors has restated its policies when MPD operations are used on the rig. There are seven main points:

- Managed Pressure Drilling (MPD) operations shall maintain bottom hole pressure at or above formation pressure such that formation fluids do not enter the wellbore.
- When MPD operators and equipment are present at the drilling site, an Influx Management Matrix shall be created and agreed by Nabors and Customer. This specifies the operating conditions and establishes the boundaries at which to stop MPD and efficiently hand over to conventional rig-based well control procedures.
- For third party MPD operations where no MPD operators are present at the drilling site such that Nabors employees are at least partially responsible to operate the third party MPD equipment, no Influx Management Matrix will be permitted and any influx will be considered a kick and the rig BOP closed and well secured. Formation fluids shall be circulated out using the rig well control choke(s) and choke manifold.
- The rotating control device (RCD) located above the annular is not part of the well control equipment.
- The rig well control equipment (pressurized containment) begins at the kill line wing valves and includes the BOP stack (annular, rams, mud cross), choke line wing valves, choke line, and rig choke manifold.
- Managed Pressure Drilling (MPD) shall not utilize the same flow path required for conventional well control after exiting the wellbore either at or above the blowout preventer.
- The rig well control choke(s) and choke manifold are not permitted to be used for MPD operations.

Mr. Keith displayed a series of diagrams showing approved and not approved well control equipment arrangements showing MPD flow paths. These graphics depicted Class 4 stacks commonly found in the U.S. and certain other parts of the world, and illustrated the relationship between the MPD manifold, flowline, orbit valves, annular and rig choke manifold. A photograph demonstrated how the MPD exits were configured on a Nabors rig.

It was noted that a common complaint is that some customers prefer to use choke as an inexpensive solution. Contractors in general are opposed to this practice.

Mr. Keith stated that in the process of refining their policies, Nabors had drilled 70 wells in two months on trial project with a certain operator. When Nabors questioned some of the customer's practices, following some discussion the operator understood their concerns and made necessary adjustments. He encouraged contractors to have similar discussions with operators when they are uncertain of a specific practice, noting the conversation might not be as difficult as they might think. In any case, he stressed the importance of explicitly stating what is accepted and what is not to avoid operators from requesting undesired configurations.

He noted this also stressed the importance of proper crew training to recognize the proper and improper configuration of MPD and well control equipment.

Update on WCC Subcommittees & Workgroups

Well Control Practices Subcommittee: Paul Sonnemann, SafeKick – Mr. Sonnemann reviewed a spreadsheet showing topics that had been identified by the Subcommittee. He stated in the last few meetings the group had discussed kick sheets. In the Subcommittee meeting following the Committee meeting, he said he would like to discuss the use of well control equipment for non-secondary well control purposes. He reviewed a list of pros and cons the group had developed

regarding the use of kick sheets. He stated the group might propose replacing kick sheets with a type of "kick map."

Curriculum Subcommittee: Matt Parizi, Chevron – There was no report from this group.

Barriers Subcommittee – Scott Randall, PlusAlpha Risk – There was no report from this group.

Next Meeting

Mr. Kropla stated that notice of the next Well Control Committee meeting will be distributed once the date has been established. He then adjourned the meeting.

Attendance:

First Name	Last Name	Company Name
Austin	Johnson	**AFGLOBAL CORPORATION**
Reggie	Welty	**CAD CONTROL SYSTEMS, INC**
Johnny	Aldridge	**CAD CONTROL SYSTEMS, INC**
Ian	McDaniel	**CAMERON A SCHLUMBERGER COMPANY**
William Scott	Schafer	**CHEVRON**
Shakir	Shamshy	**CHEVRON**
Frank W.	Pearson	**CHEVRON**
Dave	Barrow	**CHEVRON**
Charles	Boyd	**CS INC. (CS)**
Chris	Fitchett	**DIAMOND OFFSHORE**
Jon	Shoemaker	**DIAMOND OFFSHORE DRILLING, INC**
Euan Angus	Kennedy	**DRILLING SYSTEMS (UK) LTD**
Jim	Krupa	**DRILLING SYSTEMS (UK) LTD**
Chris	Stewart	**ENSCO PLC**
Thomas S	Proehl	**ENSCO PLC**
Clint	Loggins	**EXXONMOBIL**
Shane	Singletary	**HELMERICH & PAYNE INTERNATIONAL**
Mitchel	McKinnis	**HELMERICH & PAYNE INTERNATIONAL DRILLING CO.**
Steve	Kropla	**IADC**
Mark	Denkowski	**IADC**
Roger	Sanchez	**MAERSK DRILLING USA INC**
Sundeep	Yalamanchi	**M-I SWACO A SCHLUMBERGER COMPANY**

Darryl	Colacino	**MODURESOURCES USA INC**
Adam	Keith	**NABORS CORPORATE SERVICES, INC.**
Orlan	Lyle	**NOBLE DRILLING SERVICES INC.**
Andrew	Warren	**OTC SOLUTIONS, LLC**
Steven	Ronan	**OTC SOLUTIONS, LLC**
Doug	Foster	**OTC SOLUTIONS, LLC**
Justin	Bussey	**PATTERSON-UTI DRILLING COMPANY**
Dustin James	Dvorak	**PATTERSON-UTI DRILLING COMPANY**
Mike	Garvin	**PATTERSON-UTI DRILLING COMPANY**
Benny Wayne	Mason	**RIG QA INTERNATIONAL INC**
Paul	Sonnemann	**SAFEKICK**
Neil C	Gooding	**SEADRILL MANAGEMENT LTD**
Randy	Smith	**SMITH MASON & COMPANY**
Joshua	Robnett	**SUBSEA SOLUTIONS, LLC**
Barry J.	Cooper	**WELL CONTROL SCHOOL-SYSTEM 21**
Todd	Roberts	**WILD WELL CONTROL INC**
Haris	Qureshi	**WILD WELL CONTROL INC.**