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|  | <p align="center">IADC UBO & MPD Committee Meeting MoM</p> | <p align="center">Q1 Meeting 11-12 April 2019 Shell, Amsterdam</p> |
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Day 1 – Thursday, 11 April 2019

Welcome, Introductions, and Safety Moment

Oscar Gabaldon welcomed the UBO & MPD Committee and thanked Shell for sponsoring the meeting. Sharief Moghazy delivered a facility briefing. Introductions were made. Leesa Teel referenced the IADC Anti-trust Guidelines which applies to the meeting. Leesa Teel volunteered to take minutes for Day 1.

Safety Moment - Oscar Gabaldon noted the recent weather in Texas. Borre Fossli noted bicycle safety in Amsterdam.

Oscar Gabaldon asked the committee for any changes to the Q4 2018 meeting minutes. The minutes were approved as written.

Leesa Teel asked the committee for any debrief comments/improvements/suggestions related to the 2019 IADC/SPE MPD and UBO Conference. Comments were made regarding the panel sessions. For future events, panelists will be limited to 3-5 slides and a 5 minutes presentation to have more discussion time. Moderators and Session Chairs will require and vet draft presentations in advance. The committee considered a no draft – no podium rule. The group was generally very pleased with the conference. The Call for Abstracts will be sent to the committee for any updates to the envisioned topics prior to the launch, mid-May.

Leesa Teel reported a request from SPE was made to relocate the MPD/UBO conference to a Fall timeframe. A formal note will be sent to SPE requesting the program committee for the International Drilling Conference be made aware of the move to the Fall, so special consideration can be made for MPD and UBO topics. The committee will focus on paper submissions for other conferences. Leesa noted a session on examining MPD and well control will be convened at the IADC Well Control Conference of the Americas in August. The deadline for abstracts for the 2020 IADC/SPE Drilling Conference is 4 June 2019. (Conference dates are 3-5 March 2020, Galveston, TX)

Committee Meeting Schedule

Q2 2019, 4-6 June, Mays Business School, 842 West Sam Houston Parkway North (CityCentre), Houston. Sponsored by AF Global, Contact: Brian Piccolo

Q3 2019, 17-19 September, IADC HQ, Houston. Sponsored by Beyond Energy, Contact: Mike Vander Staak

Q4 2019, 3-5 December, Proposed location/sponsor Chevron. Confirmation needed from Calvin Holt. Space has been reserved IADC HQ as an alternative. Possible alternate sponsor is Weatherford. Holly has reserved meeting rooms at IADC HQ for the Q4 3-5 December 2019 meeting. It is imperative that we let Leesa Teel and Holly Shock know as soon as possible if the committee would like to hold the meeting at IADC offices.

Q1 2020, 23-24 April, Grand Hyatt Hotel, Denver, Sponsors needed. IADC will distribute information on sponsorships. Pruitt has agreed to sponsor the Denver event. Martyn Parker is the contact.

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Q2 2020, Dates to be determined, June, Rio de Janeiro, Petrobras to host. Sponsored by AFGlobal. Contact: Brian Piccolo

Q3 2020, Dates to be determined, September, Stavanger, Hosted and sponsored by Equinor. Contact: Ragnar Fredriksen

Q4 2020, December dates and location to be discussed at the next committee meeting.

2021 IADC/SPE MPD and UBO Conference & Exhibition

The committee discussed options for the 2021 conference. After some discussion, the committee elected to hold the conference in Kuala Lumpur.

Subcommittee Reports

UBO – Leiro Medina: Draft for 92U due soon and will be concisely written similarly to 92M. Energy Safety Canada will also review the document. The content will be reviewed, and some information will be omitted as some aspects are covered within other published documents. The focus will be concentrated on UBD, i.e. air drilling. The appendix will include multi-phase.

MPD – Bob Goodwin: The final IME document is currently under review. Work submitted by the various volunteers requires review. When the review has been completed, the work will be distributed to the full committee.

Gas in the Riser – Otto Santos: Oscar attended the last meeting and gave the report. A draft has been prepared which will be an appendix to the IADC Well Control Guidelines. Otto will serve as the new Chair and plans to hold discussion later today regarding future plans and the vision for the subcommittee. The committee requested the subcommittee look at the IME for overlap, noting differences between onshore and offshore operations. The committee requested updates on the work being done by TAMU and LSU at the upcoming committee meetings. It was noted that several volunteers from the committee will attend the 16Q meetings.

DGD – Borre Fossli: Borre gave an update in Sara's absence. RP 92C is 95% ready to go out for comment. The document needs to be vetted for alignment with other documents. He requested the subcommittee be refocused, possibly renamed and/or combined with the well control group.

HSE – Leiro Medina/Jon Thain: Draft curriculum was completed and sent to IADC for consideration. Jacob Petz to follow-up with Mark Denkowski, IADC on status. IADC would like to get an estimate on number of people that will likely require the certification on an annual basis, so resources can be vetted internally. Leiro will compile numbers from the committee for submission.

MPD Influx Control Work Group – Martyn Parker: The committee discussed scope of the document and concerns related to possible contingencies. The document will serve as a guide only for major aspects, as the intent was not to rewrite well control guidelines.

Regulatory Liaison - Konstantin Puskariskij: No formal report. A break-out session is planned for today.

Well Control Liaison – Paul Sonneman: The committee discussed interaction with the IADC Well

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Control Committee. Bob Goodwin will participate in the well control committee meetings on behalf of the UBO/MPD Committee.

Certifying Authority Liaison - Harish Patel: No formal report was given in Harish Patel's absence. The committee discussed feedback from BSEE to use language more prescriptive in nature when developing guidelines using "shall" when appropriate. A PSA representative present at the meeting concurred.

API 16 RCD - Micah Spahn: The API color-coded view was completed in New Orleans. G. Vanni, who was unable to attend is working several action items. Micah noted much work to modernize the document has been completed over the last several committee meetings. He asked anyone with concerns to please see him.

SBP Surface Stack 92M/PCMD Subsea Stack 92P – Andre Fernandes: Andre reported 92M has been published as well as, 92S. The 92P revision is underway and expected to be published in the next few weeks – prior to the next committee meeting. Andre will exchange email with Roland Goodman, API to conduct the final editorial review.

API RP 16Q, Dave Lewis, Chair, API 16Q: A request for participation was distributed to the committee. Volunteers' contact information was sent to the Chair, Dave Lewis. Mr. Lewis will distribute an invitation to a future meeting.

NORSOK – Ragnar Fredriksen: Ragnar expects the herring to be distributed this summer and published later this year. If you have any comments, please send them to Ragnar.

API Acknowledgment of Committee Contributions: Leesa Teel reported on a request from Lee Womble, IADC Division VP – Drilling Services and the IADC Executive Committee to explore ways in which API can recognize the committee for their work on API documents. After some discussion, the committee would like to be formally recognized by API. The committee would like IADC to send a formal letter to API to explore the possibilities for the recognition. The committee also discussed API serving as a sponsor for a future meeting.

Working Session Topics for Subcommittees

The committee separated into the various work groups for the afternoon session.

Recap from Subcommittee Breakout Sessions

Committee members reconvened after the breakout sessions for a recap.

API 16 RCD - Micah Spahn: The subcommittee concentrated on moving from the second to the third edition. Changes in the industry were discussed as they apply to the document. The subcommittee elected to ask API to add to the monogram program. Micah reported no impactful decisions were made today and discussions will continue tomorrow.

MPD – Bob Goodwin: The subcommittee began reviewing the work submitted by volunteers. Discussion today was focused on equipment versus operating limits of the IME. The document will be shared overnight with several subcommittee members for reference.

Gas in the Riser – Otto Santos: Otto reported on the research underway at LSU. The subcommittee held largely philosophical discussions today and continued reading the document.

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Before adjourning for the day, Oscar reminded the group the meeting will begin at 8:30 am tomorrow, with coffee at 8 am. He thanked Sharief again for Shell's hospitality. Mike Vander Staak will take the meeting minutes on Day 2.

Day 2 – Friday, 12 April 2019

Welcome, Introductions, and Safety Moment

Oscar Gabaldon welcomed the UBO & MPD Committee and thanked Shell for sponsoring the meeting. Sharief Moghazy delivered a facility briefing. A special thanks to Sharief for taking the place for standing in for Sara. Mike Vander Staak will be taking minutes for day two.

Safety Moment(s) – Mention made that now there is a push in Stavanger to avoid all gathering together for musters to avoid a catastrophe within the group. Bob Goodwin shared a safety minute about not talking and texting while walking.

Oscar has informed us that for today we will break out into the various groups to continue with the break out sessions. Estimated finish time for the committee meeting will be 2:30 – 3:00.

Liero Medina prepared a quick spreadsheet to determine the amount of people at the various companies and shared this with IADC. This spreadsheet is intended to determine the level of interest in the MPD training and to provide these numbers to IADC so they can evaluate the work involved in supporting this. IADC at this point does not understand what kind of time and support staff will be required in order to support this training. The spreadsheet was sent out April 12, 2019 from Holly Shock and at the end of the session April 12, 2019, these numbers will be discussed and recorded. It is suggested that Jon Thain collect and collate the information regarding the training requirements.

Recap from Subcommittee Breakout Sessions - Day 2

Committee members reconvened after the breakout sessions for a recap.

API 16 RCD - Micah Spahn: Good session, continued the draft for the API review adding sealing assy. to the program. Generation of the draft to API for the monogramming program is well underway. Updates pending from the group leader. API is looking for a thorough review. Workgroup session minutes as provided by Micah are included in Appendix 2, below.

MPD – Bob Goodwin: Robert Goodwin has committed to compile the notes from the MPD work group and send that out to the group by April 22, 2019.

Robert will also prepare a skype meeting for May and begin to communicate with the group. The focus of today discussion was around equipment versus operating limits of the IME.

Specific sections 3.1 – 3.14 as submitted by Sagar, also went through section 5 which was completed by Martyn Parker then went on to begin reviewing section 6 as completed by Harshad Patil.

Robert and Harshad will go over the document and make appropriate changes as noted in the review panes of the sections covered in preparation for the next meeting or skype call.

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Gas in the Riser – Otto Santos: Updates pending from the group leader. Analyzed the document in the current form Deep water guidelines and discussed.

Today's topics;

- Definitions of riser gas handling
- Methods for handling gas in riser
- Constant pump pressure and variable pressure and rate

Suggested next meeting topics;

- Continue with reverse circulation
- Method for riser gas handling during CML operations
- Equipment

It has been determined that the document is well within the scope of the committee tasks, but we need to consider operational parameters supported by experimental data or simulations.

MPD IADC Accreditation:

Request that Holly Shock send a reminder email to follow up on the MPD IADC Accreditation.

Oscar Gabaldon called the groups together for final comments and additions to close out the meeting.

Oscar thanked Shell and all of the participants for their attendance and participation.

The meeting was called to a close at 2:30 pm April 12, 2019.



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Appendix 1. Attendance List

| No. | Name | Company Name |
|-----|-----------------------------|--|
| 1 | Sohall Mohammed | ABS |
| 2 | Brian Piccolo | AFGLOBAL CORPORATION |
| 3 | Shawn McClosky | AFGLOBAL CORPORATION |
| 4 | Mike Vander Staak | BEYOND ENERGY SERVICES & TECHNOLOGY CORP |
| 5 | Leiro Medina | BEYOND ENERGY SERVICES & TECHNOLOGY CORP |
| 6 | Jorge Bedoya | BLADE ENERGY PARTNERS |
| 7 | Alexa Gonzalez | BLADE ENERGY PARTNERS |
| 8 | Craig Leqqett | BLADE ENERGY PARTNERS |
| 9 | Oscar Gabaldon | BLADE ENERGY PARTNERS |
| 10 | Martin Culen | BLADE ENERGY PARTNERS |
| 11 | Jon Tyler | CAMERON A SCHLUMBERGER COMPANY DRILLING |
| 12 | Børre Fossli | ENHANCED DRILLING |
| 13 | Ragnar Fredriksen | EQUINOR |
| 14 | Dale Walden | EXXON MOBIL |
| 15 | Paul Francis | FENTEN LTD |
| 16 | Joseph M Karigan | HALLIBURTON ENERGY SERVICES |
| 17 | CJ Bernard | HALLIBURTON ENERGY SERVICES |
| 18 | Leesa Teel | IADC |
| 19 | Glenn-Ole Kaasa | KELDA DRILLING CONTROLS AS |
| 20 | Otto Santos | LOUISIANA STATE UNIVERSITY |
| 21 | Konstantin Puskarsklj | MAERSK DRILLING |
| 22 | Adebowale Solarin | MAERSK DRILLING |
| 23 | Kim Laursen | MAERSK TRAINING, INC |
| 24 | Bastiaan Liezenberg | MI - SWACO |
| 25 | Andre Perales - Seibert | NABORS CORPORATE SERVICES, INC. |
| 26 | Dwayne Barnwell | NOV |
| 27 | Cristiano Xavier | OCYAN |
| 28 | Leandro Diniz Branalo Rocha | OCYAN |
| 29 | Rodrigo Machado | OCYAN |
| 30 | Thijs Visser | OCYAN |
| 31 | Frederick Jacquemin | PACIFIC DRILLING |
| 32 | Andre Fernandes | PETROBRAS |
| 33 | Roar Sognnes | PETROLEUM SAFETY AUTHORITY NORWAY |
| 34 | Siv Adelheid Eeg | PETROLEUM SAFETY AUTHORITY NORWAY |
| 35 | Micah Spahn | PRUITT |
| 36 | Martyn Parker | PRUITT |



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|----|-----------------|--|
| 37 | Akram Nabiyev | PRUITT |
| 38 | David Postel | REGIONAL MARINE & ENGINEERING SERVICES |
| 39 | Sharief Moghazy | SHELL INTERNATIONAL E&P INC |
| 40 | Gavin Humphreys | STENA DRILLING |
| 41 | Jon Thain | TRANSOCEAN |
| 42 | Harshad Patil | WEATHERFORD INTERNATIONAL |
| 43 | Robert Goodwin | WEATHERFORD INTERNATIONAL |
| 44 | Azfar Mahmood | WEATHERFORD INTERNATIONAL |

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Appendix 2. API 16 RCD Workgroup session minutes.

- Attendees:
 - Micah Spahn, Joe Karigan, David Postel, Brian Piccolo, Shawn McClosky, Azfar Mahmood, Tom Askeland, Bas Liezenberg
- It was noticed that the meeting attendees are all RCD Manufacturer's so any conclusions may need vetting by industry.
- Update presented by Micah Spahn from attendance of the API Winter Standards meeting
 - SRRR Form, TG approved for work on Ed. 3
 - API Monogram Program, discussion has begun with monogram program committee, email from API to Micah Spahn will be forwarded to the Distribution Group
- General discussion pertaining to API reference documents 16A & 6A reconfirmed that 6A will be by latest edition but that 16A all OEMs need to review for pertinence.
 - If we utilize the latest edition (4th) it will allow for multi-tiered classification of hardware, including Utility Bolting for non-pressure retaining, controlling or load path assemblies, e.g. assembly hardware for the sealing assemblies.
- Guilherme's review of Annex B & C applicability was received today (4-11) and was visited briefly but not in detail yet.
- Review all of Edition 2 clarification requests for applicability in Ed. 3 task was introduced and agreed upon as necessary to not carry these issues forward into the new edition.
- Discussed marking language for 'dimensionally interchangeable major subcomponents', i.e. bearing or sealing assembly as well as adding these components to the monogram program to match with how industry is utilizing RCDs.
 - Task group is aware that we need to ensure API monogram program requirements are met (Functional, Technical, & Manufacturing Requirements) as well as prevent past issues of marked subcomponents.
- It was decided that additional verbiage is necessary to clarify the testing requirements of RCDs that have multiple seal assembly housings; this verbiage will be similar to an existing note pertaining to the dynamic test procedure.