INTERNATIONAL ASSOCIATION OF DRILLING CONTRACTORS

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ART Drilling Control Systems Subcommittee Meeting
11:00 am, Tuesday, 5 April 2011
Transocean – Houston, TX

Attendees:
Singh Baljit, AGR Subsea
Frank Cummings, Athens Group
Brad Rosenhagen, AWC Incorporated
David Wagner, AWC, Incorporated
Paulo Biasotto, Bureau Veritas
Mike Killalea, IADC
Ronald Downlearn, Knowledge Ops
Wenbo Liu, Landy Energy
Yancy Xiong, Landy Energy
Tim Mournian, Marine Cybernetics
Clinton Chapman, Schlumberger
Lea Huegel, Stran Technologies
Troy Hetherington, Stran Technologies
Terry Loftis, Transocean
James Penny, Transocean
Emanuele La Bella, Transocean
Jared Tillman, Transocean
Donn Nguyen, Transocean
Tim Ho, Transocean
Trent Martin, Transocean
Nathan Moralez, Transocean

Minutes:

1. Subcommittee Chairman welcomed the participants and opened the meeting with a Safety Briefing. Lunch was served.

2. Problems with Transocean's WebEx provider prevented access to our desktop and with assistance of Clinton Chapman, we switched to Schlumberger's website. Unfortunately, problems persisted, and the presentation was emailed to the remote attendees and we continued with audio, only.

3. Clinton Chapman began the DSATS presentation and Trenton Martin provided the following Minutes and capture of possible IADC Tasks:

POSSIBLE IADC DCS TASKS/ACTIONS/INVOLVMENET EXTRACTED FROM MEETING NOTES

- Determine the drivers ... Who will provide the data and ensure DSATS and IADC are not working in a Silo? Who wants the architecture? Who will consume the architecture?
- If there are 30 pieces of machinery (as an example) under DSATS DCD automation control, how do it switch off once of them or do you switch off all of them? (maybe it's a function of criticality)

- Determine establish the prioritization, if any. Will a DSATS DCD agent be able to field tool requests from another agent?
- How does the driller regain control from the DSATS DCD: Authorization monitoring and disconnect automation
- Big Red Button…(s). Symbolic or physical? Would moving the joystick suffice (for example)
- UI standardization - Can this be integrated into the drillers console (if desired)
- Help further define the state/phases of the drilling operation.
- Impact of cascading intelligent controls system (EDS, Autodriller with DCD).
- Review and comment on the use cases being worked on by DSATS.
- Fail-safes: establish for specific events…
- How will the transition between services occur (e.g. baker to SLB). Manual , automatic
- As an organization IADC-DCS needs to define where does DASTS brings value for specific phases of well construction
- Possible define a focus group on IR (iron roughneck) … connections, slips.... control.
- Define a clear line of demarcation for IADC /SPE responsibilities. A couple of possibilities mentioned:
    - SP DSATS – Anything that effect downhole conditions at different phases | IADC – non – downhole.
    - SPE DSATS is the data exchange mechanism, the IADC task will define what will be done with it.
- Setup an IADC DCS focus group to act as a conduit to SPE DSATS

NOTES FROM AIDC MEETING 5 APRIL 2011
4 Greenway Plaza, C-100
Presentation by SPE-DSATS representative Clint Chapman

- Presentation Overview
    - Slide about LoCoHoPo(Shell)
    - Slide on SPE DSATS
    - Slide on - Support for initiates, standardization, and lessons learned and best practices.
        - There are a few teams (reliability and Comms Team).
    - Deliverables for the Comms Team: 4 Phases.
    - Slide on Discussion on Phase I - Equipment interface points …
        - The drilling recorder and aggregator (are considered nice to haves for drilling automation) are not mandatory components for DSATS.
        - Authorization and protocol selection
        - Control Set points
        - Feedback from system.
        - Health.
        - QUESTION: Who are the drivers? Who is providing this data? The people who are running the system, who are making the system. You do not want to be working in a Silo. A: We have representative from Operators, Drilling contractors, OEMs, Service providers.
        - Adopted protocol - OPC UA. Working with and OPC foundation (there is participation from the OPC foundation DSATS team).
    - Slide on Discussion on Phase II: Covering high level architecture.
        - DISCUSSION: E.G. SoftTorque® would not fit in this (..)
        - The driller will be able to start and stop the automation process.
        - DCD: **D**SATS **C**omms **D**evice. - - Generic interface that will translate to rig specific
            - Provides a firewall to control system

- Enforces limits
- Monitors health
- QUESTION TO IADC from DSATS: Is only one agent in charge of automating a piece of equipment at one time.
  DISCUSSION: If there are 30 pieces of machinery under automation control, how do you switch off once of them or do you switch off all of them
- DISCUSSION: maybe it's a function of criticality?
- DISCUSSION: We are building a tool today without all the aspects of what we can accomplish with it, tomorrow.
- QUESTION: Are we going to decide who has priority?
  - e.g. Pride is in charge of Drilling operations,
  - Baker and/or SLB is in charge of …
  - Someone else in charge of MPD …
  - Will this switch can happen manually or possibly an automatic switch over?… E.G. Phase based and who's in charge of difference phases.
  - OBSERVATION: It could be as simplistic as an auto/manual switch.
- DISCUSSION: Clint discusses if a service is available in the system through some automation mechanism. If a new capability (calculation for example) is made available on the rig, will it be automatically discoverable through the DCD or DSATS architecture.
- DISCUSSION: One of the items missing is the well control

- SLIDE on Phase III: (not in progress yet)
  Identify terminology and interfaces of the components (limits, Alarms and events)
- SLIDE on Phase IV (not in progress yet)
  - Define commissioning tests.
  - There may be further phases as the SPE DSATS team moves forward.
- Where Can IADC DCS help/participate?
  - How does the driller regain control: Authorization monitoring and disconnect automation
  - Can this be integrated into the drillers console (if desired)
  - Big Red Button…

  - DISCUSSION: Audience drew a parallel to the Auto driller.
  - DISCUSSION: Using the locale / remote analogy. If the driller picked up on the joystick, would it kick out of AUTO … was we do with the Autodriller.
  - QUESTION: what is the value? The driller is sitting in the Cyberbase® chair. Would this system be dependent on the driller, the level of competence of the driller… "I don't know which switch to turn on or off"?
  - DISCUSSION: What are the expectations ...how does it control the auto-driller?
    - Safe and standard operations. … Consistency.
  - DISCUSSION: The motivation is to generate a computer based smart driller... … does not get distracted

DISCUSSION: SPE to provide the architectural use cases of the DSATS program
DISCUSSION: What are the expectations… would the DSATS DCD automation stop at the drill floor… would it extend further to the subsea…?

- Blow out preventers are not on the list – as these do not depend on down hole measurements
- Iron roughnecks were not on the list – as these do not depend on downhole measurements.

  DISCUSSION: Could the lines of demarcation focus on the IADC -DCS to handle items not specifically related to what is happening down hole...

  DISCUSSION: SPE/DSATS -- handles exchange of data… and it is up to IADC; what do we do with that data?

DISCUSSION: The automation mechanism should be defined on the type of formation, and who is in control.

DISCUSSION: Fail-safes are a big issue. The operator may be the one to make the decision if we are to use the DSATS…

DISCUSSION: The objective should be to build the integration so that the option is available when the time comes to make that decision.

DISCUSSION: Who will provide the set-points through that zone of interest? Currently this is still conceptual.

DISCUSSION: Need to ensure a manual way is always available. It may eventually be that we will be dependent on the DCS

- SLIDE on How can IADC help--- transition handling
  - What is the best way to transition control between services? Will this be automated, or manually initiated?
  - Must the driller consciously do the handover between the control services? This is an important piece of information for SPE-DSATS to move forward.
- Slide on Alarms
  - NOTE: Alarms also have different users. E.G. The driller will have different alarms of interest than the ET (TL: example driller getting a "high CPU utilization" alarm is pretty useless to the Driller or the AD).
    - Drillers
    - ET
    - Operators.
    - Authorities.
  - DISCUSSION: Clint acknowledges the idea of alarm roles is good. (notifications)
  - QUESTION: what if the user is not in front of the screen. ..
  - Fail safes…
  - DISCUSSION: Historically there has been too much information. … Not just alarms. There is some data that they just do not need to see… … E.g. the driller does not need to see the bearing temperature.
  - DISCUSSION: If you have the alarm capability you can auctioneer this off to who needs, it, implement a fall back strategy… all these things come possible once the data highway is there.
  - DISCUSSION: Will the Macondo disaster affect what the authorities require to record and respond. E.g. if we get an alarm. Will the alarms need to be reported to specific party? e.g. the government?
  - DISCUSSION: As an organization IADC-DCS need to define in the specific phase of well construction; where does 'integration of surface drilling equipment and downhole tools bring value?
  - SLIDE ON contractual issues…. Contractor /operator role… no feedback as of yet.

QUESTION: do you fee like you have canvassed all the service companies…?
Baker, SLB, Halliburton are involved
Current OEMS: NOV and Canri are involved
It would be nice to have more of them. Possible define focused groups on IR control (for example).
Rig contractors -- TOI, Maersk (Comms) are involved
MiSWACO, At-Balance… are involved

DISCUSSION: Is OPC UA fast enough… Currently some tests have shown a practical limit of to 20Hz. With the exception of SoftTorque® there are no for seeable applications requiring 100 - 1000 Hz.

DISCUSSION: Mentioned integrating well supervisory - from the standpoint of a choke.
DISCUSSION: TL The integration with downhole pressure measurement and the chock has real potential. The communication time- lag from downhole, to surface, and back down to the BOP through multiplexed subsea control, might not?

Clint will share the presentation.

DISCUSSION: SPE-DSATS would like to get a clear line of demarcation of responsibilities between DSATS and IADC for the integration work.

DISCUSSION: Should DCS represent the "driller" in the role of integrated controls (e.g. downhole & surface); in other words, the user? …

DISCUSSION: Maybe there should be a group set up as guidance and a filter between responses.

DISCUSSION: Do we need to have a work shop on what the console should be?

DISCUSSION: SPE DSATS will wrap up Phase II by the end of this year. Phase III by the end of next year.

DISCUSSION: Clint will have DSATS provide the latest tag list (last one posted June 10th.).

NOTE: Anyone is welcome to join DSATS. Just go to the SPE site.

4. Closing comments noted that the presentation was very much appreciated and thanks to Clinton for pulling this together. Thanks also to Trenton Martin for serving as the scribe and to all for their attendance.

   Terry Loftis advised he would distribute minutes of the meeting, including a copy of the presentation. Attendees and absent subcommittee members are requested to review the Minutes and Presentation and provide feedback which identify and itemize specific tasks (please also refer to those highlighted by Trenton, at the beginning of his Minutes) which IADC/DCS could engage and provide support to the DSATS group and our common objective of integrating downhole instrumentation and tools with surface drilling control systems. Subcommittee members are also requested to prioritize those tasks in respect to importance. Thereafter, we look to consolidate all tasks and assign Working Groups to each.

5. The Drilling Control Systems Subcommittee meets on the first Tuesday of each month. However, the first week of May is OTC, so the next subcommittee meeting was pushed back one week and scheduled for **Tuesday, May 10th, 8:30 am** at IADC headquarters, located at 10370 Richmond Ave, Suite 760, Houston, TX 77042 USA.
   Register for the meeting at http://www.iadc.org/committees/advanced_rig_technology/meetings.htm

6. There being no further business, the meeting was adjourned.