Panel Session 1:
“Large Operators Drilling Real-Time Monitoring”

Transportation Research Board of the National Academies

“Committee on the Application of Real-Time Monitoring of Offshore Oil and Gas Operations Workshop”

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Introduction

- TOTAL E&P would like to thank the TRB/NA, BSEE and API for the opportunity to participate in this workshop, and looks forward to future collaboration on this evolving discipline.

- This presentation will attempt to answer the questions posed by TRB/BSEE with regard to RTM in drilling operations, as well as offer some points for consideration.

- Some information (written or verbal) contained here-in may not necessarily reflect a current or planned policy/position of TOTAL E&P, and may be offered by the presenter solely as a suggestion or opinion.
Q - Does your company use real-time monitoring for its offshore operations?

- Limited use of ‘real-time monitoring’ onshore for drilling/completion activity
  - More experience exists for production and geosciences applications
- For most drilling/completion activity, ‘real time well information’ is accessible to onshore personnel via internet/PC from the Mud-Loggers and MWD service providers
- Norway affiliate has the most experience with remote operation centers for drilling/completion activities
  - Emphasis is on information availability to onshore personnel and collaborative decision making
  - TASC (Total Activity Support Centre) – ‘light’ version of a typical Real Time Operation Center (RTOC)
  - Not necessarily 24/7
  - Collaborative tool used during critical operations / operational problems
  - Support to operations
    - Videoconferencing (rig call, etc.)
    - Performance follow-up
    - Reporting
  - Considering expansion to include drilling engineering simulations
Planned Pilot Program – ‘Real Time Support Center’

- Planning to implement a pilot ‘Real Time Support Center’ in Pau, France
  - Not 24/7 - only during office hours for a period of 6 months

- Focusing on:
  - ‘Support’ rather than monitoring
  - Easy access for onshore support team to real-time and historic rig data
  - Eventual transfer to subsidiaries/hubs
  - Allowing expansion of services with time

- Objectives:
  - Establish a monitoring arrangement for several rigs
  - Test a service provider
  - Gather information on the technical aspects (bandwidth, latency, WITSML etc)
  - Examine methods to present data, the automatic analysis of performance, the modeling of data in real-time
  - Explore IT issues such as: cyber security, rig telecom infrastructure, data handling etc
  - Establish protocols for communication with the site, interaction with the Chain of Command
  - Assess the value to Total both at HQ level and also feedback from the subsidiary

- If successful, the objective would be to transfer the active monitoring into the subsidiaries, possibly grouped by regional ‘hubs’
  - HQ center would then be a ‘passive’ monitoring service, only used for specific issues or support
Q: [If so], what are the critical operations and specific parameters that your company monitors?

- Currently do not routinely “remotely monitor” real time data or displays during operations
- Do monitor real time data (via internet/PC) when onshore assessments are required for collaborative efforts, support, etc.
- Ideas for future application:
  - Monitoring/analysis of process efficiency (ROP, tripping, connections, etc)
  - Data management (integration, archiving)
  - Learnings follow-up
  - Monitoring rig performance
  - Logistics support
- Essentially ‘outsourcing’ of non ‘rig-critical’ tasks onshore, which allows rig team more time to focus on ‘rig-critical’ tasks
- No intention to replicate the role of ‘well control’ monitoring activity onshore - this responsibility will stay on the rig
- Will embrace any resulting HSE benefits that may be realized
Q: Do you believe there are specific types of wells or operations and parameters that always should be monitored with real-time monitoring?

- No requirements in place for wells to ‘always’ be monitored remotely in real-time
  - Intent is for the rig team to maintain this capability
- We are searching for ways to leverage RTM technologies to support the rig team, while also enhancing utilization of our onshore resources
- Priority for onshore RT support (once enabled) would likely be linked to well complexity and operating environment
- Parameters would include those already available through current avenues (3rd party sensors such as MWD/LWD, mudlogging, etc.), with enhanced IT capabilities (network, data transfer rate, etc.)
Q: Are there specific criteria or risk thresholds that your company uses to prompt real-time monitoring requirements? (e.g. factors such as well or water depth, frontier area, HP/HT wells, or well complexity)?

- Nothing has been specified, however these factors would likely influence the consideration for implementing RT support capability once developed.
- Local resources/infrastructure would also be considered.
- Company Management System does contain requirements for additional follow-up/support from HQ based on such criteria, but does not currently entail ‘real-time monitoring’.
Q: Does your company rely on any automation and predictive software in real-time monitoring?

- Not currently, being considered in Norway support center
- Will also be examined during the planned pilot program
  - Looking at:
  - Data aggregation, plus metrics, trend analysis through ‘drilling engines’
Q: What role could automation and predictive software tools play in real-time monitoring?

- Industry is still evolving in this area
- Several service companies have the ability to ‘automate’ the process of running drilling engineering simulations / predictive models to continually identify departures from expected parameters – i.e. torque/drag, ECD, vibration, ROP enhancement, hole cleaning, etc.
- Analysis of trends based on pre-determined models/algorithms using multiple data sources
- Enable the rig team to make informed and timely decisions using high quality ‘right time’ information
- These processes do not necessarily need to happen ‘remotely’, but could be enhanced with remote support
Q: What role could condition-based monitoring play in real-time monitoring? Describe how operating equipment using condition-based monitoring could be tailored and/or used for real-time monitoring.

- In context of drilling operations, may consider the ‘wellbore’ as the ‘equipment’ being monitored
- More dynamic/transient than with surface/near surface equipment that would typically apply to CBM
- For the wellbore and associated operations:
  - Applying similar principles of CBM
  - Using all available surface/downhole measurement tools
  - Then applying processes that deliver reliable information to assess the current and trending state (condition) of the operation
  - In time to take necessary measures to maintain a desirable condition
Q: How could BSEE leverage RTM technologies?

Q: Which [BSEE] activities could real-time monitoring supplement or replace?

Q: What opportunities do you see for BSEE to use real-time monitoring to provide timely, functional, and value added inspections?

- Industry is still in the process of determining how to optimize the use of RTM technologies, with regard to drilling operations in particular.
- Clear HSE benefits of remote RTM centers for drilling operations has yet to be established.
- For this reason, the links between the ‘remote’ / ‘real-time’ aspects, and ‘BSEE activities’ is also immature.
- BSEE could benefit by using the RT infrastructure to move some ‘administrative/IT’ tasks onshore, so that site inspections could focus more on actual observations, and less on the ‘paperwork’.
Q: What would you recommend that BSEE do in the real-time monitoring area?

- Regulatory requirements should be supported by data / experience
- Performance based vs. prescriptive
- Allow the technology evolve, build into organizations and cultures
  - (Evolution vs. Revolution)
- Continue to work with closely with industry to find ways to leverage the technologies for tangible, cost effective benefits to all
Closing Thoughts

- Data collection, transmission, IT infrastructure technologies continue to improve, as well as their integration into O&G activities
- We should leverage these technologies to their greatest potential, but carefully
- Maintain the goal of ‘right time support’ to the decision makers at the task level
- Must manage the ‘soft issues’
  - ‘Big brother’
  - ‘Who’s doing what’
  - ‘Location, location….’
- The rig team must remain in control, be empowered, and expected, to make critical and timely decisions based on high quality information
- Capitalize on learnings from other industries?
  - Military
  - Space
  - Transportation
THANK YOU!