



WELLVANTAGE REMOTE OPERATIONS DEEPWATER

(FORMALLY RTOC)

National Academy of Sciences
Workshop April 21st – 22nd

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DEFINITIONS AND CAUTIONARY NOTE

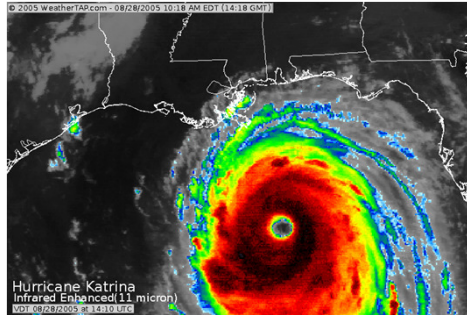
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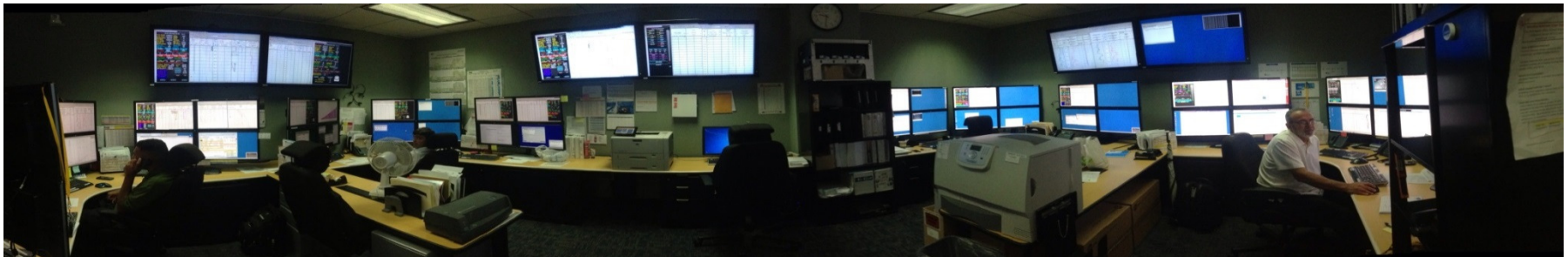
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HISTORY AND OPERATIONS

- Does your company use real-time monitoring for its offshore operations? If not, why?
 - Yes – *New Orleans Since 2002 / Houston since 2006 (After Katrina)*



- If your company does use real-time monitoring, what are the critical operations and specific parameters that your company monitors?
 - *Deepwater*
 - *Drilling Centric*
 - *Data streamed for Deepwater Completions / P&A / Workovers – Scope is project dependent.*
 - *Well Control and Performance Based Parameters*



PARAMETERS AND RTM REQUIREMENTS

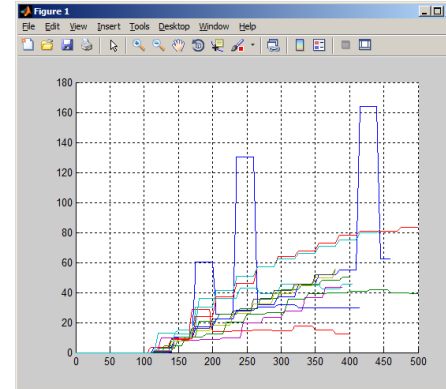
- Do you believe there are specific types of wells or operations and parameters (for drilling, completions or workovers, or production operations) that always should be monitored with real-time monitoring?
 - *For Shell – All Deepwater Operations*
 - *Well Control – Pit Volumes, MW, ECD, Flow in/Out*
- 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)?
 - *All Deepwater Wells (Drilling)*
 - *Deepwater P&A (Surface parameters only)*
 - *Deepwater Workovers – Drill pipe operations only (Does not include coil operations)*
 - *Deepwater Completions – Data monitored and Streamed to engineering teams*



PREDICTIVE SOFTWARE AND AUTOMATION

- Does your company rely on any automation and predictive software in real-time monitoring?

- *Predictive Software*
 - *Connection Flow Monitoring*
 - *Heat Check Calculator*



- What role could automation and predictive software tools play in real-time monitoring?
 - *Predictive software tools could help supplement real-time monitoring, but not replace it.*
 - *Automation is still in it's infancy.*

CONDITION BASED MONITORING

Condition-based monitoring is viewed by BSEE as monitoring the operating condition of critical equipment and using any generated data to predict and proactively intervene when needed. As such, 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.

- *Do not see direct connection to Drilling / CWI operations.*
- *Possibly for surface equipment monitoring.*
- *Production has benefits, as operations are long term and repeatable.*
- *Ex: Temperature, pressure monitoring.*
- *Operating equipment is maintained by contractor, either rig or service company.*

LEVERAGE OF TECHNOLOGIES

BSEE would like to use real-time monitoring technologies to accomplish many of its safety and environmental protection responsibilities. Real-time monitoring technologies could be incorporated into BSEE's existing safety and environmental regulations in order to replace or supplement its on-site inspection program.

- How could BSEE leverage such technologies?
 - *Shell is open to BSEE coming to RTM centers to view data from the rigs. (Provides context)*
- Which activities could real-time monitoring supplement or replace?
 - *Currently, they could not replace any onsite activities, but could offer possibilities for items such as BOP monitoring.*

BSEE OPPORTUNITIES

- What opportunities do you see for BSEE to use real-time monitoring to provide timely, functional, and value added inspections?
 - *Don't see connection to DW operations, aside from possible reduction in onsite visits for items that could be monitored remotely, such as BOP testing.*
 - *Historical data could be useful, in certain cases.*
- What would you recommend that BSEE do in the real-time monitoring area?
 - Sufficient staff to monitor BOP testing from onshore vs offshore.

