Real-Time Monitoring & Offshore Safety

Background & BSEE Study – John Cushing

Real-Time Monitoring & Offshore Safety

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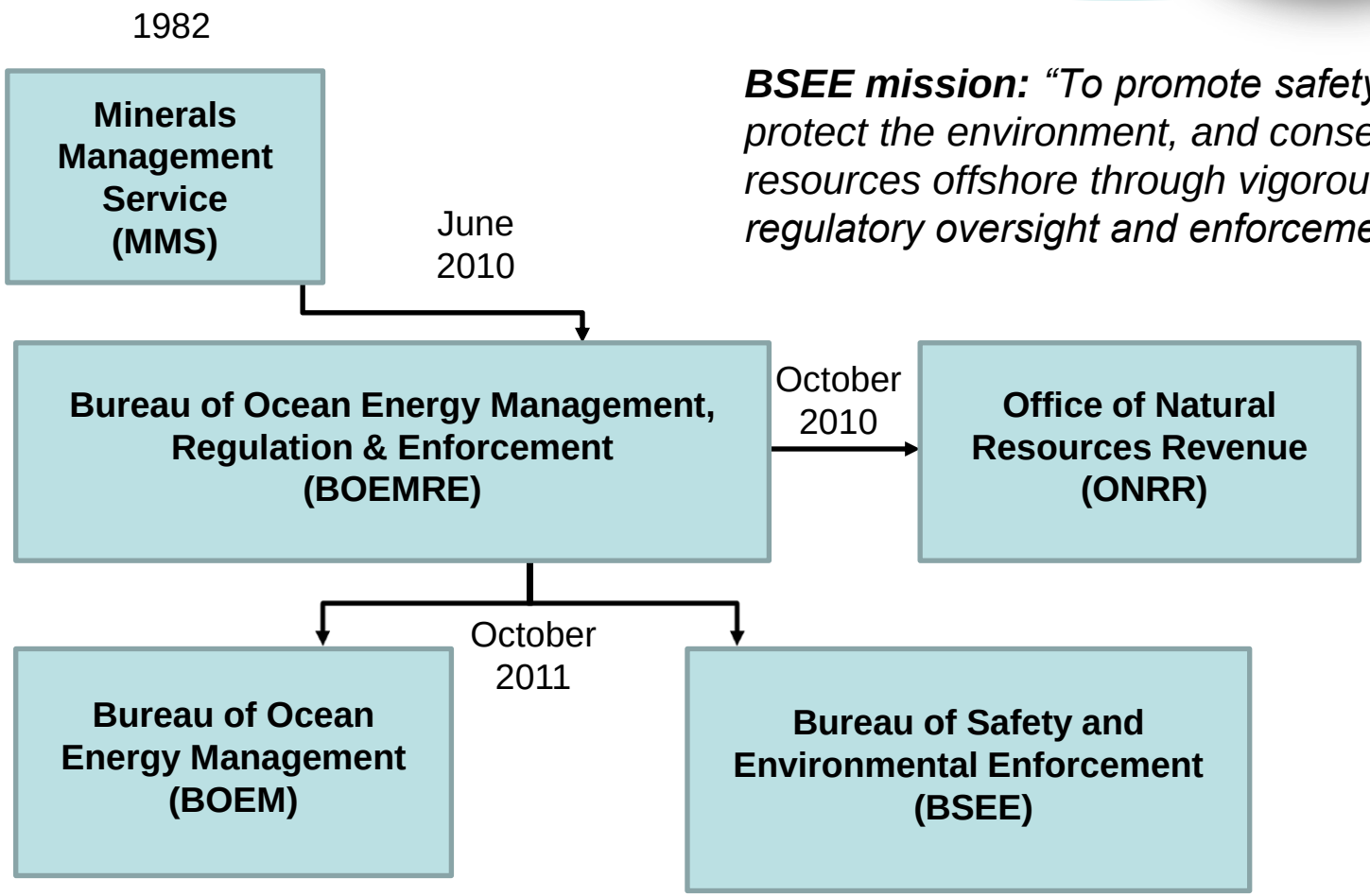
Background Info

BSEE mission: *"To promote safety, protect the environment, and conserve resources offshore through vigorous regulatory oversight and enforcement"*



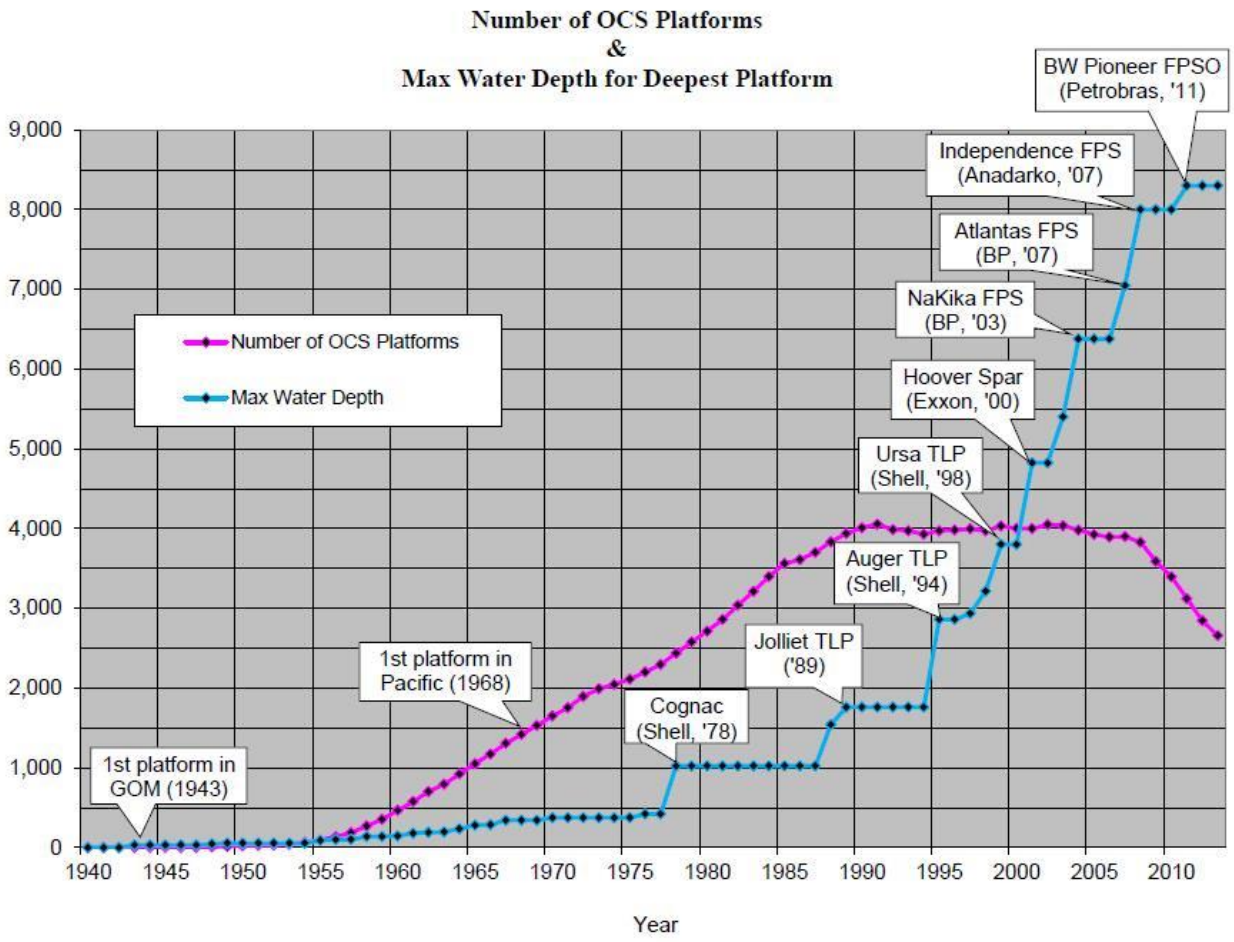
BSEE's Inspection Program

- The OCS Lands Act (OCSLA) gives DOI (and BSEE) the authority to regulate offshore oil & gas facilities.
- OCSLA requires all offshore facilities (production platforms & drilling rigs) on the OCS to have <u>annual inspections</u>.
- BSEE currently conducts annual inspections for approx. <u>2,500</u> production platforms, plus monthly inspections for approx. <u>100</u> drilling rigs.
- BSEE routinely conducts <u>random</u> & <u>follow-up inspections</u>, particularly for facilities with poor compliance records.
- BSEE is also responsible for the safe design, fabrication, installation, operation, and decommissioning of these facilities.
- BSEE uses a "Platform Verification Program" and CVAs to provide 3rd party oversight for design, fabrication, and installation of all floating platforms, plus higher-risk and higher complexity fixed platforms.

Production Platforms (fixed & floating)

MODUs

U.S. Offshore Oil & Gas Activity

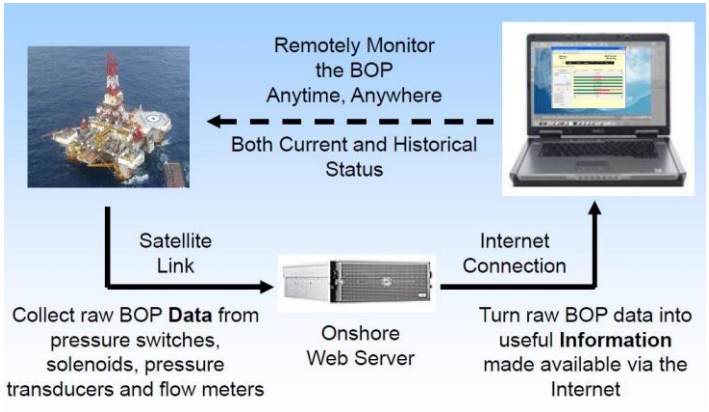


BSEE's RTM initiative

- The Deepwater Horizon disaster in April 2010 resulted in many investigations and audits of MMS's Offshore Safety Program, each with recommendations for potential areas of improvement.
- The DOI OIG report (No. CR-EV-MMS-0015-2010, dated December 2010) included this recommendation relating to RTM:

> *Recommendation 18*: Analyze the benefits of obtaining electronic access to real-time data transmitted from offshore platforms/drilling rigs, such as operators' surveillance cameras and BOP monitoring systems, and/or other automated control and monitoring systems to provide BOEMRE with additional oversight tools.

RTM Usage by the Offshore Oil & Gas Industry



- Many companies use RTM Centers, particularly for higher risk operations.
- RTM Centers provide access for expert consultants and "2nd set of eyes."
- RTM Centers staffed by highly trained/experienced personnel.
- RTM data can be misinterpreted without direct communication between offshore and onshore personnel.
- Videoconference link is vital component, with clear protocols for interaction.

BSEE's RTM study

General questions:

- What are best practices for RTM?
- What are critical operations & parameters to monitor?
  - To prevent loss of well control
  - To prevent other undesirable events
- For industry, what should be minimum requirements for RTM?
- For BSEE, what role should RTM play in safety oversight?

BSEE's RTM study

Timeline:

- **Summer 2012**: BSEE conducted site visits to RTM Centers
- **Fall 2012**: BSEE established internal RTM Team
- **Spring 2013**: RTM Team formed sub-teams to consider what are critical operations & parameters for…
  - Drilling
  - Completion & Workover
  - Production
- **Spring 2014**: RTM Team completed preliminary findings and recommendations for follow-up work

BSEE's RTM study

<u>Questions considered by RTM Team:</u>

A. **<u>Use of RTM by industry</u>** – What minimum requirements should BSEE consider establishing in its regulations for the use of RTM technologies by the offshore oil & gas industry?

1) What critical operations and parameters should be monitored using RTM?
   a) For drilling?
   b) For completion and workover?
   c) For production?
2) What criteria, or risk thresholds, should trigger RTM requirements? Should it be based on water depth, well depth, well complexity, and/or other factors?

BSEE's RTM study

B. **Use of RTM by BSEE** – How should BSEE use RTM technologies to more efficiently and effectively carry out its safety and environmental protection responsibilities?

1) **RTM to supplement BSEE's existing Inspection Program** – How could BSEE use RTM technologies to supplement and enhance its existing Inspection Program and reduce the need to fly offshore?
   a) Should BSEE use RTM to witness BOP tests, and complete other inspection activities, without flying offshore?
   b) Should BSEE use RTM to replace/supplement other enforcement activities?
2) **RTM for new BSEE safety and enforcement missions** – How could BSEE use RTM in new applications to expand and enhance its safety and environmental enforcement missions?
   a) What should be BSEE's role in monitoring drilling & production activities?
   b) Should BSEE use RTM technologies to monitor offshore environment?

BSEE's RTM study

Key issues discussed:

The following are key issues discussed by the RTM Team regarding what role BSEE should play in monitoring RTM data from offshore drilling rigs or production platforms:

A. RTM has potential to be powerful enabling technology to transform how safety and environmental oversight of offshore operations are conducted, both by industry and BSEE.

B. The critical operations and parameters for drilling, completion, workover, and production activities need to be identified.

C. Consideration needs to be given to what "value-added" BSEE personnel could provide by taking on an oversight role during critical drilling, completion, and workover operations.

BSEE's RTM study

Key issues discussed (continued):

D. RTM data could have limited usefulness, and could be easily misinterpreted, without direct communication with the control room on the offshore drilling rig or production platform.

E. The technological and legal aspects of obtaining RTM data from the various operators is a challenging area with many unknowns.

F. Daily Drilling Reports can provide useful information for BSEE oversight of drilling operations.

BSEE's RTM study

Possible options:

The following are some possible options discussed by the RTM Team on how BSEE could incorporate RTM oversight into its safety regime:

Option #1 – Oversight via RTM Centers

- Provide BSEE oversight by traveling to industry RTM Centers?

Option #2 – RTM internet portal

- Create BSEE internet portal to gather/access RTM data?

Option #3 – BSEE RTM Center

- Establish BSEE RTM Center?
  - For emergency operations?
  - For 24/7 operations?

BSEE's RTM study

Topics for Further Consideration:

The following are topics for further consideration recommended by the RTM Team:

1. Consider whether to implement a BSEE oversight and emergency response capability for monitoring critical offshore oil and gas activities via the RTM Centers already being used by offshore oil & gas operators (Option #1).
2. Conduct research on the feasibility of collecting RTM data streams from offshore drilling rigs and production platforms and developing an internet portal so BSEE personnel can access the RTM data (Option #2).
3. Conduct a more detailed evaluation of RTM technologies and best practices for drilling, completion, workover, and production operations by holding a public workshop and conducting follow-on research.
4. Evaluate the potential use of IADC's Daily Drilling Report for drilling safety oversight by BSEE.

Marine Board deliverables

- **<u>RTM public workshop</u>**:
  - Develop the workshop agenda, select and invite speakers and discussants, and moderate the discussions.
  - Issue interim report summarizing presentations and discussion at workshop and any findings the committee draws from the event and from the BSEE technical report.
- **<u>Final report</u>**: Hold additional meetings to develop and provide final report with findings and recommendations on the use of RTM by the offshore oil & gas industry and BSEE.

Marine Board deliverables

- The final report to address these five issues:
  1. The critical operations and specific parameters that should be monitored to manage and mitigate environmental and safety risks (e.g., to reduce the risk of well kicks, blowouts, and other sources of casualties).
  2. The role automation and predictive software tools should play in RTM.
  3. The role condition-based monitoring (CBM) should play in RTM, and describe how the operating equipment using CBM could be tailored to and/or used for RTM.
  4. Whether RTM should be incorporated into BSEE's regulatory scheme, in either a prescriptive or performance-based manner.
  5. How BSEE should leverage RTM to enhance its safety enforcement program.

Reference Material

- Summary of BSEE's Real-Time Monitoring study, completed March 2014

  Provided as hand-out

- 838 Inc. Final Report, "An Assessment of the Various Types of Real-Time Data Monitoring Systems Available for Offshore Oil and Gas Operations":

  http://www.bsee.gov/Technology-and-Research/Technology-Assessment-Programs/Projects/Project-707/

Website:

www.bsee.gov