National Academy of Engineering
and
National Research Council

Final Report

Best Available and Safest Technologies for Offshore Oil and Gas Operations: Options for Implementation

Brief Overview

Public Release was in October 2013

BAST Requirement

- Outer Continental Shelf Lands Act directs the Interior Secretary to require BAST on new drilling and production operations, and existing ones when practicable.
- The requirement is applicable when the Secretary determines BAST to be economically feasible and wherever equipment failure would have significant effects on safety, health, or the environment.
- BAST is not required where incremental benefits are clearly insufficient to justify incremental costs.

Study Task

- Identify and consider a range of options that DOI's Bureau of Safety and Environmental Enforcement (BSEE) could use for improving BAST implementation.
- Do not recommend a specific BAST approach.

Study Approach

- Consistent with its task statement, the committee did not do an in-depth evaluation of the BAST approach BSEE has been using.
- Committee mainly focused on developing options regarding BSEE's plans for an independent Ocean Energy Safety Institute (OESI) which would provide technical support for BAST implementation.
- Committee recommended actions to enhance BSEE's fundamental capabilities for supporting any identified options.

Committee Roster

- **Donald Winter** (chair), University of Michigan, Ann Arbor
- **Paul Bommer**, University of Texas, Austin
- **Robert Brenner**, Duke University
- **Anthony Ciavarelli**, Human Factors Associates
- **Louis Anthony (Tony) Cox, Jr.**, Cox Associates, LLC
- **James Dyer**, University of Texas, Austin
- **Thomas Kitsos**, ocean policy consultant
- **Donald Liu**, independent consultant
- **Roger McCarthy**, McCarthy Engineering
- **Charles McQueary**, independent consultant
- **Richard Sears**, Stanford University
- **Gordon Sterling**, independent consultant
- **Manuel Terranova**, Peaxy Inc.

Identification of Technologies

- BSEE needs a portfolio of efforts to find advances in candidate technologies and to lead and support safety-related research within industry.
- Examine models in multiparty collaboration for insights into how to utilize those efforts.

Evaluation of Technologies

- Take a system-level view of any technology and its impact on safety; recognize the complexity and limited understanding of geologic environment.
- Economic analyses will tend to be qualitative because of the extreme difficulty in quantifying reduced risk of offshore accidents or likely reductions in severity due to technology installation.
- Economic analyses will unlikely create a “bright line” with regard to what constitutes BAST.

Technology Development and Maturation

- BSEE should develop and maintain an in-depth understanding of existing industry and government capabilities for development, evaluation, and testing of technologies.

- Tailor approaches, especially for high-priority critical technologies [e.g., BOPs and wellhead instrumentation].

- Consider using legislative or regulatory incentives to speed the deployment of technologies.

Ocean Energy Safety Institute

- OESI is a suitable vehicle for identifying, evaluating, and maturing new technologies.
- If properly organized, staffed, and supported, OESI could be a key source of advice to BSEE for BAST technology.
- The scale and structure will need to be significantly expanded to address fully the challenges posed offshore.
- The funding level of up to $5 million over 5 years in BSEE's RFP is not adequate.
- OESI will need a funding commitment that is consistently in the range of several million dollars per year.

OESI Structure , Governance & Location

- Consider expanding the OESI charter to evolve into either an FFRDC or UARC to provide more long-term stability.
- Consider establishing two governing committees to provide oversight and guidance for:
  - Coordination of overall policy and direction, and
  - Ensure the quality of the research programs it pursues.
- Consider locating OESI in the greater Houston area.

Chief Engineer within BSEE

- Consider hiring a highly reputable chief engineer or chief scientist with technical expertise in offshore drilling, exploration, and production to work within the bureau.