MARINE BOARD SPRING MEETING

April 10, 2013 Washington DC

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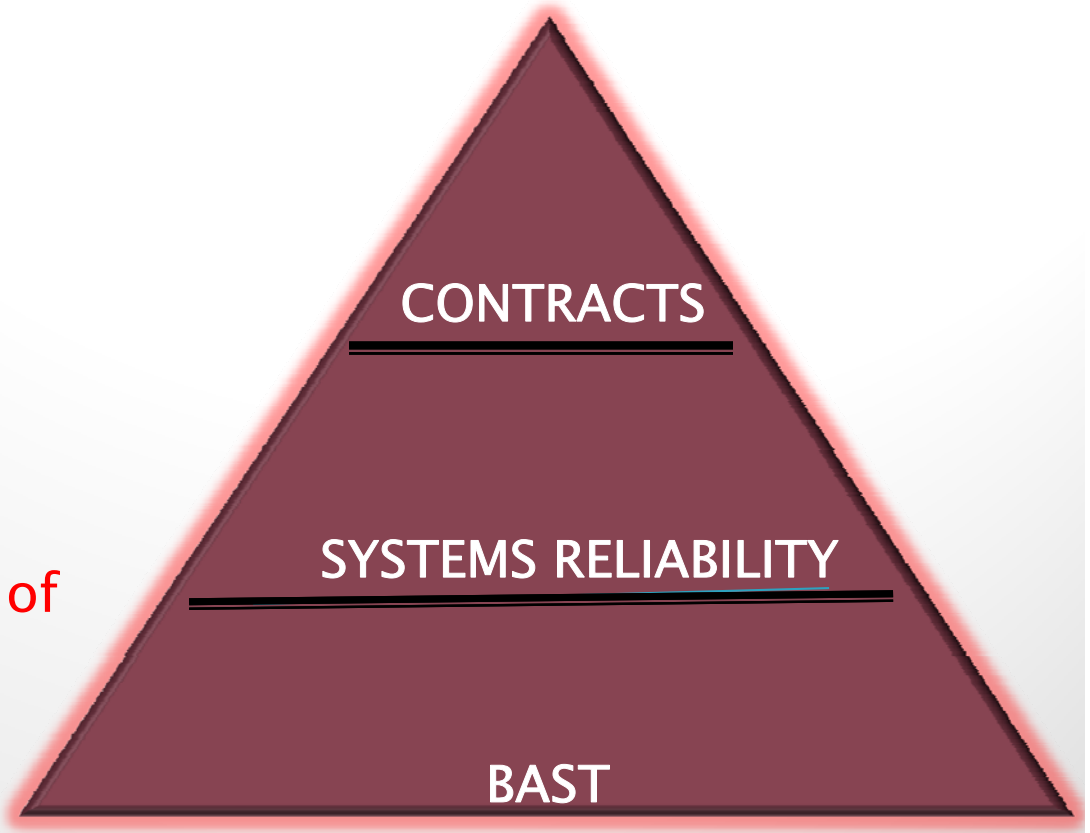
Today's Discussion

- Emerging Technologies Branch
  - Best Available and Safest Technology (BAST)
  - Systems Reliability
  - Contracts
    - Oil and gas research of interest to BSEE
      - Safety
      - Arctic



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Oil and Gas Research Initiatives

- 2013 Safety Broad Agency Announcement (BAA) Timeline
  - Advertise – February, 2013
  - Review White Papers – March, 2013
  - Request Proposals – April, 2013
  - Evaluate Proposals & Funding – May thru August, 2013

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Oil and Gas Research Initiatives

- Safety BAA White Papers
  - **Corrosion Prevention for OCS Facilities** – evaluate & determine best available technologies, products, and practices to prevent, reduce and/or mitigate the effects of corrosion on facilities
  - **R5 Grade Mooring Materials Properties** – investigate & evaluate the material properties (mechanical, thermal, corrosion) of R5 grade mooring material
  - **Novel Cementing Qualification Standardization** – design & develop a standardized qualification and validation test methodology for novel cements, cement materials and cementing alternatives
  - **Materials Suitable for Use in HPHT Conditions** – identify which new HPHT (350°F/15000psi) structural materials and coatings (including Ni based high temperature grades, carbide based coatings and others) are best for use on the OCS

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Oil and Gas Research Initiatives

- Safety BAA White Papers (cont.)
  - **HPHT Equipment and Pressure Testing Methods** – examine pressure testing methods & evaluate the plausibility of reduced pressure test requirements for HPHT heavy walled pressure equipment and validate results
  - **HPHT Safety Factors (SF) & Safety Margins (SM)** –assess, evaluate & validate the best SF and SM for tubulars under HPHT conditions for drilling & production operations, and the ideal working pressure for tubulars under HPHT
  - **ROV Intervention & Capabilities** – determine capability of current fleet of deepwater ROV's available for subsea intervention activities
  - **Improved Shearing for Eccentrically Positioned Tubulars** – identify best procedures/methods to modify existing equipment, develop new equipment, or develop new approaches to ensure tubulars eccentrically positioned in BOP can be sheared

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Oil and Gas Research Initiatives

- Safety BAA White Papers (cont.)
  - **Qualification of Cranes for the Offshore Arctic** – determine if current standards, regulations and practices are applicable for use in validating load ratings for new built cranes and for de-rating of existing cranes
  - **Risk Based Design (RBD)** – validate and compare RBD approach for wells to Working State Design for wells under HPHT conditions to determine best approach
  - **Decommissioning Costs of Pipelines in Water Depths Greater Than 500 ft.** – validate deepwater pipeline decommissioning liabilities to determine if industry is posting adequate bonds to meet decommissioning regulations
  - **Met Ocean Wave and Current Base Shear Study** – create a document on the proper use of API met ocean parameters for design/analysis of fixed GOM platforms (including comparison of loading using API RP 2A, API Bull. 2INT-Met and API RP 2MET)

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Oil and Gas Research Initiatives

- 2013 Arctic BAA Timeline
  - Advertise – December, 2012
  - Review White Papers – February, 2013
  - Request Proposals – April, 2013
  - Evaluate Proposals & Funding – April thru July, 2013

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Oil and Gas Research Initiatives

- Arctic BAA
  - Research available physical ocean/met data for Beaufort & Chukchi Seas to support the use of reliability based design criteria for offshore Arctic structures
  - Evaluate existing sea ice data for Beaufort & Chukchi Seas for use in reliability based RBD for offshore Arctic structures
  - Hold workshop on physical ocean/met data available for Chukchi Sea to aid in decision making and to identify data gaps
  - Assess unmanned aerial system/vehicle technologies for monitoring/measuring ice features in Beaufort & Chukchi Seas
  - Assess subsea glider technologies for mapping/measuring ice keel/ice gouge geometries, subsea pipeline surveillance, and under ice oil accumulations

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Areas of Additional/Possible Future Interest

- Well control
  - Use of surface choke manifold systems in Managed Pressure Drilling (MPD) for early kick detection
  - Deep gas wells being drilled on the shelf are approaching BHT of 450-500°F. Current relief well ranging tool has a 350°F limit
- Sustained casing pressure
  - Are leaky connections (non metal to metal) a cause?
  - Selection of casing to minimize hoop stresses opposite cement
- Defining shearing capability criteria for BOP
  - Different manufacturers use different assumptions when determining ability to shear

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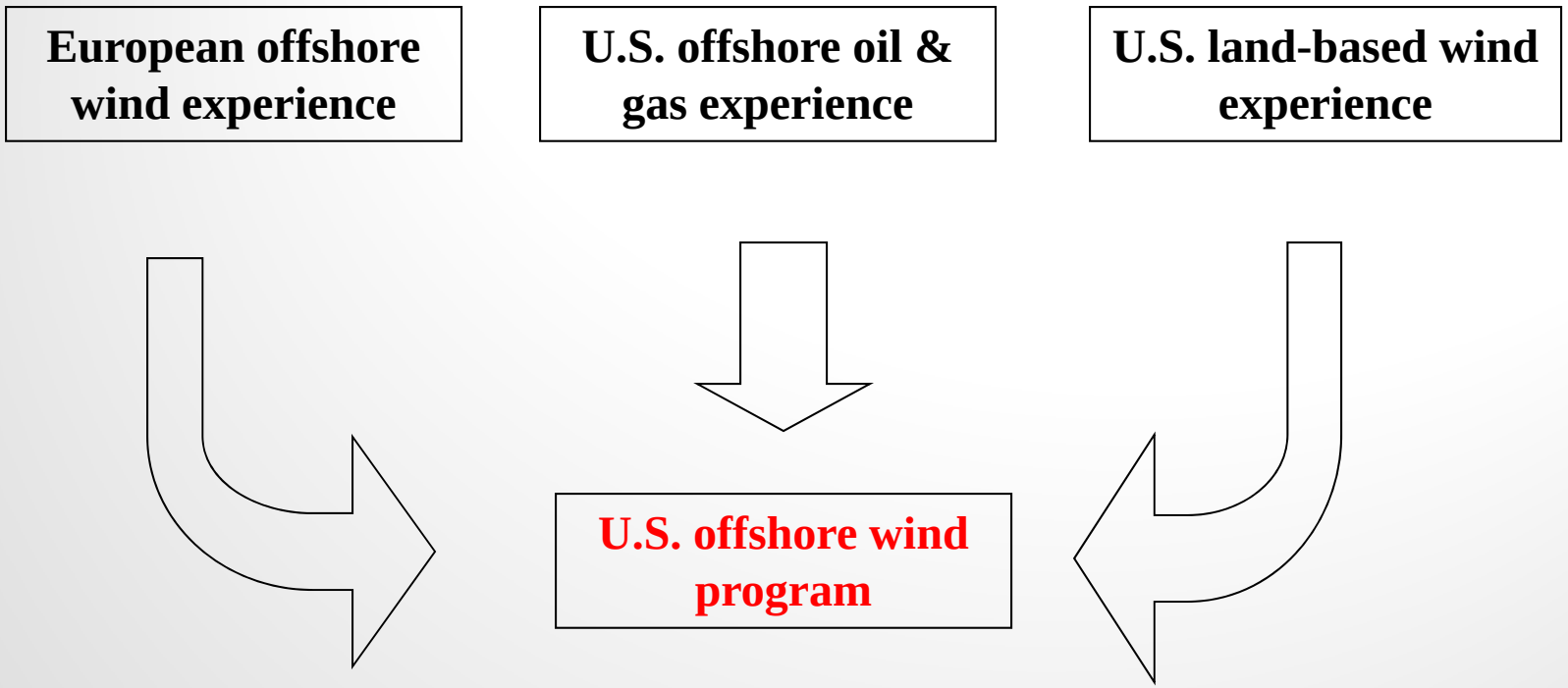
Renewable Energy research



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Renewable Energy research

Marine Board studies:

- CVA Workshop
- Structural Integrity of Offshore Wind Turbines
- Offshore Wind Farm Worker Safety

TAR studies:

- Safety Management System (SMS) template/audit checklist
- Fatigue design for wind turbines
- Design Basis for wind turbines
- Design standards – fixed and floating turbines
- Inspection methodologies
- Scour considerations
- Resonance/vibration design considerations
- Electrical cable burial considerations
- Metocean design parameters

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Questions, Comments, Discussion

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