

*Ocean Energy Safety Institute
and our
21st Century Ocean Energy Safety
Research Roadmap*

*23 July 2019
Jim Pettigrew*

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Poll Question #1

- How familiar are you with the Ocean Energy Safety Institute?

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Poll Question #2

- What is your current role?

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Poll Question #3

- How long have you been involved in the O&G Industry?

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Poll Question #4

- Should Academia be involved in Industry Research?

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In memoriam



M. Sam Mannan
1954 - 2018

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Dol Intent...

"The *funding for this initiative* was provided to establish an institute that would operate **independently** of the Department of the Interior while also supporting and enhancing Departmental programs through **collaborative research and development** and training to help identify operational improvements in the areas of offshore drilling and production safety and spill prevention.

This is an effort to establish an institute that can **work with academia, the oil and gas industry, regulators and non-governmental organizations** on the extremely important issues of increasing **worker safety and environmental protection** during the exploration, development and production of the nation's valuable offshore oil and natural gas resources."

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Institute Status

- Initial contract through November 2018
- Opportunity for No-Cost extension
- No-Cost extension granted through April 2020
- Developing Consortium opportunity

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Advisory Committee

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Dialogue, Research, Training

- Forums for Dialogue
 - Multiple event discussions have informed research areas and themes
 - 30 April 19 Leading Indicators Forum
- Research
 - Hilcorp Liberty Project
 - Leading Indicators Dashboard
 - Collaborative Research
 - Human Factors Engineering
 - Zonal Isolation
 - New Materials
- Continuing Education opportunities
 - Hazard Analysis for LNG Facilities, Onshore and Offshore
 - New Materials for Offshore O&G: From Molecule to Design
 - Human Factors Engineering and Offshore Drilling: Designing for Safety
 - Other Process Safety related instruction

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Other Efforts

- OESI Research Highlights, 2018-2019
 - oesi.tamu.edu/research/highlights



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Path Forward

- Complete No-Cost Extension Tasks
- Develop Sustainability
 - Mature Consortium
- Initial Research Follow-ons
- Develop further Dialogue opportunities
 - Leading Indicators in Well Control and Process Safety
- Develop Continuing Education portfolio
- Develop Additional Opportunities

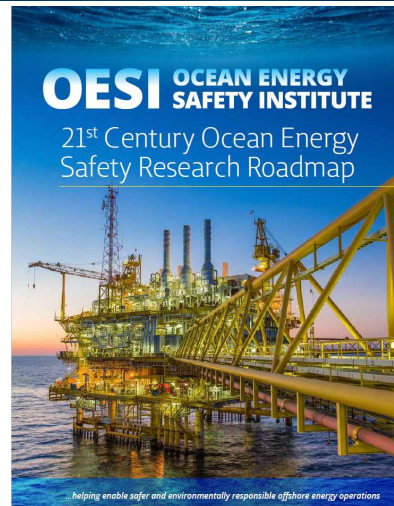
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Additional Opportunities

- 21st Century Ocean Energy Safety Research Roadmap
 - oesi.tamu.edu/research/roadmap



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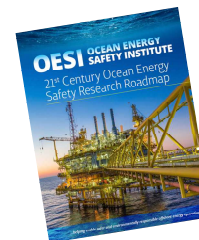
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6-9 May 2019 // Houston, Texas, USA // NRG Park
2019.otcnet.org

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Objectives

- **Develop a technology focused roadmap**
- **To be used to prioritize R&D investments**
 - Improve Offshore Health, Safety and Environmental Performance
- **Focused on Gulf of Mexico**
 - Incorporate findings from all offshore regions



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Resources

- Publications
- Network of Subject Matter Experts
- OESI Documents
 - Ocean Energy Safety Research Roadmap for the 21st Century Forum for Dialogue
 - Portfolio of Ocean Energy Safety Research Efforts
- RPSEA 2018 R&D Plan
- SPE/NAS Gulf Research Program: *'Safer Offshore Energy System Summit'*
- SPE/IADC Safety Workshops and Meetings

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Key Organizations and Reports

- SafeOCS Reporting System
- Center for Offshore Safety
- OESI 21st Century Roadmap
- SPE-GRP Workshop
- Subsea Safety Institute
- RPSEA Roadmap
- The Bureau of Safety and Environmental Enforcement (BSEE)

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Report Content

- Introduction
- Offshore Safety/Environmental Performance Statistics
- Research Needs
 - Drilling and Completions
 - Operations
 - Production
 - Transportation
 - Spills
- Technology Transfer
- International Efforts
- Summary and Recommendations

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Offshore Safety/Environmental Performance Statistics

Incidents on the Outer Continental Shelf

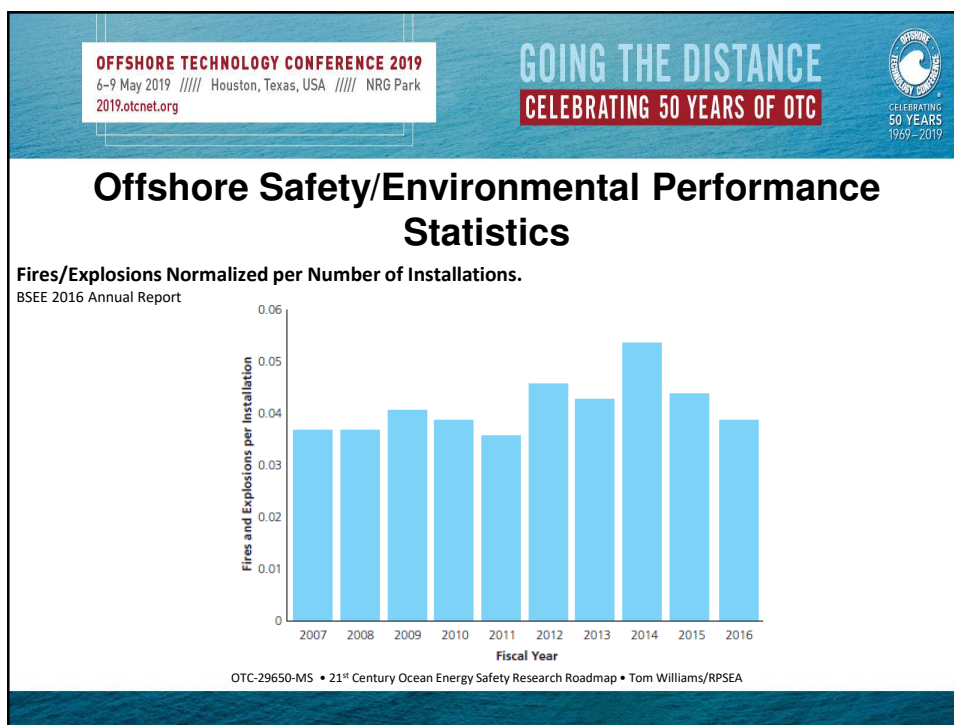
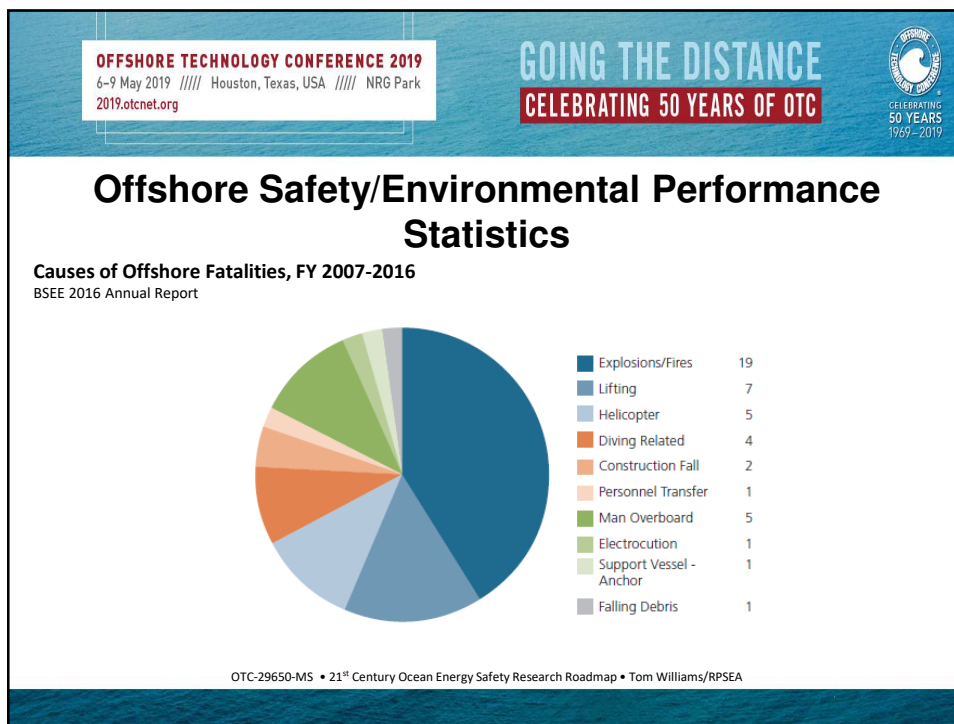
www.bsee.gov/stats-facts/offshore-incident-statistics

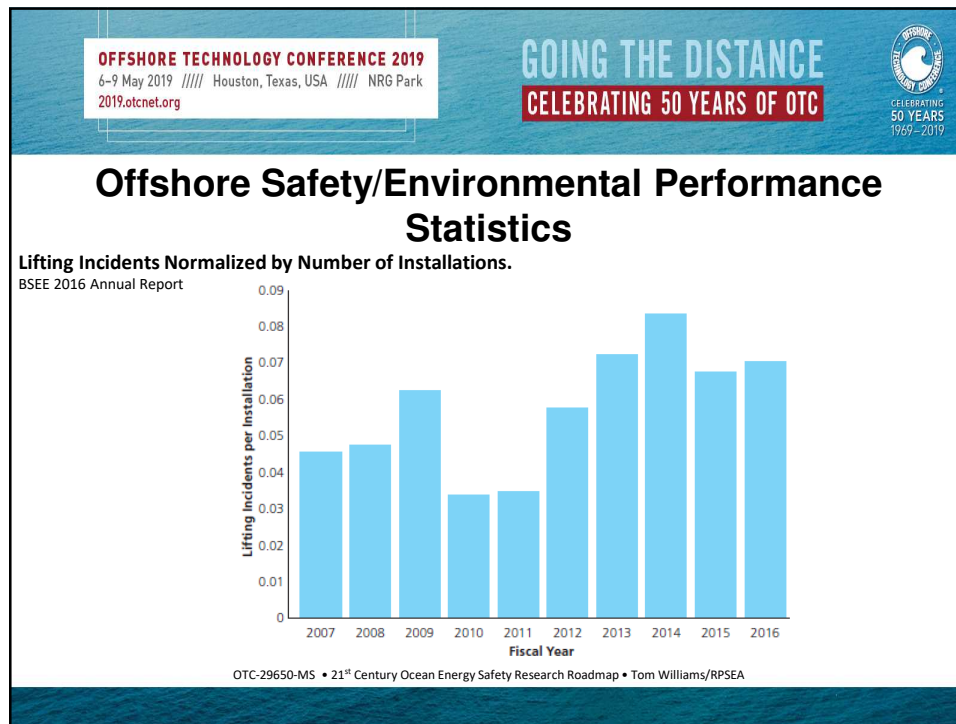
Fiscal Year	Collision	Evacuations & Musters	Fatalities	Fires & Explosion	Gas Release	Injuries	Lifting	Loss of Well Control	Spills*	TOTAL
2017	11	53	0	73	16	150	126	0	10	429
2016	9	50	2	86	17	150	155	2	16	473
2015	9	70	1	105	21	206	163	3	24	580
2014	0	52	2	135	21	285	210	5	21	711
2013	21	68	4	116	21	276	197	8	24	716
2012	13	48	1	132	27	280	167	3	30	676
2011	11	36	3	113	17	221	110	5	4	520
2010	14	31	12	134	20	253	118	4	9	595
2009	26	55	4	148	33	260	243	7	7	783
2008	28	43	12	141	22	263	185	7	33	734
2007	26	33	5	145	14	322	180	6	7	738

*The numbers in the Spills column include spills of oil, drilling mud, and other chemicals.

*For years prior to FY 2012, the number shown is the count of spills ≥ 50 barrels. For later years, the number shown is the count of spills ≥ 1 bbl.

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Research Needs – Drilling and Completions

- **Planning** – *reduce risks*
- **BOP Reliability**
- **Future Technology** – *electric BOPs*
- **Well Control Equipment Standards and Testing**
- **Simulators**
- **Exploration** – *shallow hazards, seismic sources*
- **Development** – *kick detection, use of AI*
- **HP/HT** – *high pressure protection system (HIPPS)*
- **Managed Pressure Drilling**– *equipment & instrumentation*
- **Dual Gradient and Riserless Drilling**

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Research Needs - Operations

- **Surface**
 - Improved safety systems
 - Transfer of personnel
 - Cybersecurity
- **Subsea**
 - Reliability of electrical systems
 - Extended reach systems (subsea boosting, all-electric controls, seabed water treatment/pumping, etc.)



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Research Needs – Production

- **Design, development, demonstration and deployment of equipment that requires inherently less maintenance and improved safety**
- **Leading indicators to improve risk management**
- **Hydrate detection/monitoring**
- **Halite prediction, management, mitigation**
- **AI technologies to improve data processing**
- **Early detection of gas and chemical leaks**

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Research Needs – Spills

- **Prevention**
- **Intervention (capping, drilling fluid)**
- **Relief Wells**
- **Containment**
- **Airborne Oil Spill Monitoring**
- **Response**

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Technology Transfer

- **Coordination**
- **Leveraging with Existing Conferences, Forums and Workshops**
- **Webcasts/Podcasts**

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International Efforts

- **International Regulators Forum**
- **International Committee on Regulatory Authority Research and Development (ICRARD)**
- **API-IOGP Europe Cybersecurity Conference**
- **Research Council of Norway**
- **Canada**
 - **Oil Spill Response Center**
 - **Offshore Energy Research Association of Nova Scotia (OERA)**
- **China**
 - **ABS-China Offshore Technology Center**
 - **China National Offshore Oil Corporation**
- **Centre for Offshore Research & Engineering (CORE) – Singapore**
- **Brazil (Petrobras)**
- **Australia - CISIRO**

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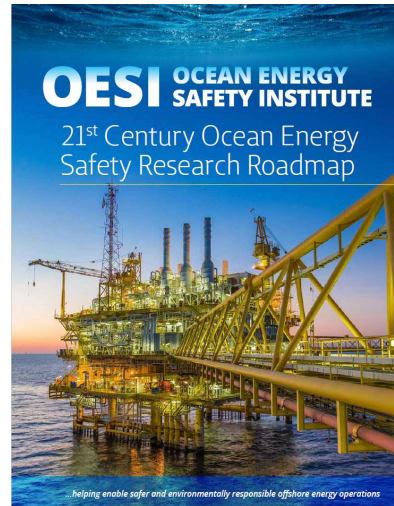
Summary and Recommendations

- **Leverage wherever possible**
- **Create synergies through integration**
- **Allow for investment in high-risk, high-reward activities**
- **Avoid funding disparate small/one-time projects**
- **Focus as the portfolio matures**
- **Assure safety and environmental protection goals are addressed and documented**

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An informed way forward...

- Inform academic research with Industry Stakeholder priorities
- 21st Century Ocean Energy Safety Research Roadmap
 - oesi.tamu.edu/research/roadmap



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Summary

- Forums for Dialogue
- Research
 - Leading Indicators Dashboard
 - Collaborative Research
 - Human Factors Engineering
 - Zonal Isolation
 - New Materials
- Continuing Education opportunities
 - Hazard Analysis for LNG Facilities, Onshore and Offshore
 - New Materials for Offshore O&G: From Molecule to Design
 - Human Factors Engineering and Offshore Drilling: Designing for Safety
 - Other Process Safety related instruction
- *All informed by Research Roadmap*

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Thanks for your time...

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RPSEA is a multi-purpose entity established to facilitate a **public-private partnership** cooperative effort to **identify and develop new methods** and integrated systems for **safely** exploring, producing, and transporting-to-market energy or other derivative products from petroleum and other resources in an **environmentally sound and sustainable manner**, and to ensure that small producers are involved in the development of technical and knowledge resources necessary to continue their important contribution to energy production in the U.S.

RPSEA 2.0

**RPSEA OFFSHORE
 RESEARCH PROGRAM**

**RPSEA ONSHORE
 RESEARCH PROGRAM**

ENERGY INNOVATION PROGRAM

**NEW AUTHORIZATION OF RPSEA
 APPROPRIATIONS
 RESEARCH PROGRAM MANAGEMENT
 Maintain PAC's/TAC's**

Current Efforts

- Methane Emissions Measurements
- Flaring
- WSRNGI
- OESI

Future

- Expansion of Current Efforts
- **Research Program Management when Authorization/Appropriations Occur.**
 - ✓ RPSEA Staff – manages programs
 - ✓ RPSEA members – perform research

- Provide Technical Reviews and Technology Development Assistance
 - ✓ Review Panels
 - ✓ Laboratory Facilities
- Provide Technology Transfer
- Assist with Business Development

- HTC-International
- SSI

RPSEA Members involved only on project-to-project basis until reauthorization/Appropriations occur.

RPSEA Members involved in Technology Advisory Committees and Contracted for Services (labs, workshops, training, etc.)

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