Operation and Maintenance
Of the Ocean Energy Safety Institute

Annual Report

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1. Introduction and Background
In the wake of the Deepwater Horizon disaster that killed 11 people, injured 16 others and released an estimated 5 million barrels of oil, then Secretary of the Interior Ken Salazar proposed the concept of establishing an “Ocean Energy Safety Institute” designed to facilitate research and development, training, and implementation in the areas of offshore drilling safety, blowout containment and oil spill response. The creation of the Institute also stems from a recommendation from the Ocean Energy Safety Advisory Committee (OESC), a federal advisory group comprised of representatives from industry, federal government agencies, non-governmental organizations and the academic community.

On November 7, 2013, BSEE announced that the team of Texas institutions led by the Texas A&M Engineering Experiment Station’s (TEES) Mary Kay O’Connor Process Safety Center had been selected to manage the Ocean Energy Safety Institute. The press conference was attended by US congressman Bill Flores (R-Texas) who praised the collaboration between government and academia. Also in attendance was BSEE Director, Brian Salerno who traveled with his team to College Station for the announcement, tour the facilities and hold meetings with university professors, TEES researchers and officials from the University of Houston and University of Texas.

2. OESI Director of Operations and Program Manager
One of the first steps after the creation of OESI was the establishment of the OESI facilities and hiring of personnel. The search process for the Director of Operations and Program Managers began soon after the contract signature with the development of the job descriptions. Five candidates for the Director of Operations position were selected for interviews by the end of March 2014. Site visits were then scheduled for three of the candidates in mid-April 2014 at TAMU. TEES administration, the PI and co-PIs interviewed the candidates face-to-face, and via phone conference. Additionally the candidates were asked to develop their vision for OESI and present it to an audience, which included professors and graduate students. The presentations were also recorded and made available to Bureau of Safety and Environmental Enforcement (BSEE) and Bureau of Ocean Energy Management (BOEM).

After the week of site interviews, Jim Pettigrew, retired Navy Captain with 28 years of leadership, program management and operational risk experience was offered the Director of Operations position. He has led Research and Development programs that have spanned the spectrum of the environment; Autonomous Underwater Vehicles mapping the ocean floor and measuring the water column; to Remote Sensing Satellite systems, continuously sensing the atmosphere and the ocean surface. He led the men and women of our country as a Commanding Officer and as the Naval Oceanography Chief of Staff. A majority of his Navy career was spent at sea or in direct support of worldwide maritime operations. Captain Pettigrew, assumed his new position on May 12, 2014.

In addition to the Director of Operations, OESI hired a Program Manager, who is based at the University of Houston, reports to the Director of Operations, and acts as a subject matter expert for the Ocean Energy Safety Institute (OESI) program. In addition, the Program Manager works with the Director to create and participate in forums intended to foster dialogue.
Mr. Paul Robinson was one of two final candidates for the Program Manager position. His strong technical background within the offshore energy industry and his previous experience as a Program Manager, made him the appropriate selection. Mr. Robinson assumed his new position on October 13, 2014.

3. OESI internal meetings
Soon after the announcement of the creation of OESI, a kick-off conference call between the PI, the co-PI’s, BSEE and BOEM was held on December 2, 2013. After a review of the contract, the attendees discussed the hiring process for the OESI director; organization of the first possible summit; the development of a continuing education course catalogue for the education and training of federal employees; the necessity of discussions with industry about failure reporting; and communication with stakeholders.

On February 5-6, 2014, representatives from BSEE and BOEM traveled to Texas A&M University in College Station, Texas for a two-day planning session. They met the PI and the co-PI’s to discuss the search for a first Director and the path forward for the Institute. The group also discussed the development of outreach and relationship building opportunities between the Institute, industry, academia and other governmental agencies. In line with that effort a series of forums were discussed, to be hosted by the Institute in 2014, covering topics such as risk, research, failure data reporting, best available and safest technologies and human factors.

Since the kick-off conference call, bi-weekly conference calls were held with OESI leadership, BSEE, and BOEM. The objective of these calls is to discuss the progress of OESI, OESI outreach activities, and to ensure alignment of effort between all of the OESI team.

4. Communication plan
The communication plan lists the multiple ways for OESI to communicate, both internally and externally. Each communication path is described by its purpose, audience, timing and who is accountable. The plan was reviewed and approved by the BSEE Public Affairs Office.

The diagram below, included in the communication plan, demonstrates the communication flow of how information should be processed before being released to the stakeholders.
As part of the effort to provide regular and diverse pieces of communication to our stakeholders, OESI is developing multiple communication tools which are described and pictured below:

- **OESI listserv**: The listserv is used each time new information needs to be communicated about OESI activities, especially the announcement for a newsletter release or for the date of an upcoming forum. The OESI listserv has over 400 contacts. Subscription continues to grow on a continuous basis.

- **OceaNews**: The OESI newsletter, OceaNews, is released tri-annually to provide information to stakeholders about OESI. The first edition was released in May 2014 and the second edition in August 2014. The third edition is being written, with anticipated release in December 2014.
• **OESI website:** The OESI website has been established (oesi.tamu.edu), and information is continually updated.

![OESI website banner](image)

• **LinkedIn Group:** The LinkedIn group was established in May. Within two months the group had over 100 members, and currently numbers over 240 members. The objective of this group is to leverage the networking capabilities of LinkedIn as another avenue to engage the ocean energy safety community.

![LinkedIn Group screenshot](image)

5. **OESI forums**
The primary mission of the Ocean Energy Safety Institute (OESI) is to provide a forum for dialogue, shared learning, and cooperative research among academia, government, industry, and other non-governmental organizations, in ocean energy-related technologies and activities that ensure safe and environmentally responsible ocean energy operations. One of the mechanisms to accomplish the OESI mission is to hold periodic ‘forums’ which will include all stakeholders. Since its creation, OESI organized three two-day forums. The first two forums were held at the University of Houston in May and August 2014, and the topics discussed were Risk and Data Sharing respectively. The third forum was held at Texas A&M University in October 2014 and discussed the Research Roadmap for Ocean Energy Safety. The following sub-sections discuss in more detail the three events.

![OESI Charter School Conference](image)
5.1 Risk Forum

“Risk Awareness, Risk Perception and using the Awareness and Perception in Making Operational Decisions on a Continuing Basis” was OESI’s inaugural event. This opening forum was held at the University of Houston, May 12-13, 2014. The first day, the PI and the Director of BSEE gave introductions and opening remarks followed by a Q&A session. The rest of the day was divided into three sessions, each addressing a different topic linked to risk in the ocean energy industry. The first session was, “How are risk predictions made for offshore operations? How is risk measured and managed in other industries? What models are used?” the second “What is an acceptable level of risk? How should industry manage risk?” and the third “What are effective leading risk indicators of future process safety performance (particularly in the prevention of high consequence events)?” The second day, the topics discussed on the first day were further addressed in breakout sessions, with the objective of identifying gaps and needs in these areas, and how OESI could address them. Finally, a general session discussed the questions and thoughts of the attendees concerning OESI operations. With over 140 attendees, the risk forum was successful at bringing together industry, academia, and the government in an environment of dialogue and information exchange.

The dialogue that took place in this two-day risk forum was very successful since the primary objective of OESI is to promote dialogue, so that all stakeholders can meet together and talk about ocean energy safety related topics. The primary conclusion of the forum was that OESI needs to develop its roadmap, and establish its processes and advisory committees. In addition, OESI should consult with other entities already working in ocean energy safety like the Center for Offshore Safety (COS), Society of Petroleum Engineers (SPE), American Petroleum Institute (API), etc. to better assess gaps and needs in all topics. “Don’t reinvent the wheel”.

Concerning the questions addressed in this forum, i.e., risk assessment methodologies, acceptable level of risk, risk indicators; the three sessions agreed that future work should focus on gaps and needs, and not on reinventing risk methods for technologies that have already proven to be satisfactory. Future work of OESI could be to facilitate the sharing of industry risk assessment methodologies and indicators, and facilitate a common understanding. This would allow these methodologies and indicators be accessible to all operators.
A topic that OESI should start looking into is the role of human factors and safety culture in risk assessment and management. Topics like the role of human and organization performance in risk assessment, the techniques and mechanisms promoting staff competency and development, the decision making process, the organizational health assessment through incident analysis and the safety leadership best practices, should be investigated further.

Another important topic identified by the forum dialogue was risk communication. OESI could help industry and government to describe the ideas of risk assessment and management, and communicate the basics, standards and best practices, identified through forums.

A recurring theme was data collection and analysis. Data collection and reporting work well within a company, but there is a need for a culture of sharing between companies. Criteria for sharing need to be developed, as well as robust statistical methodologies. Once reported, the data has to be analyzed and the findings of the analysis implemented to enable the industry to reduce risk. In addition, sharing the knowledge learned from incidents is very important; the incidents should not only be counted and reported.

OESI published a summary of the discussions during the Forum. The document is available on the OESI website (password protected) and hardcopies are available from OESI.

5.2 Data Forum
The second OESI Forum entitled “Eliminating Barriers to Data Sharing, and Solutions” was held at the University of Houston, 12-13 August 2014, with the same objective: promote dialogue and shared learning among academia, government, industry, and other non-governmental organizations. The first day began with opening remarks from the PI and the Director of BSEE, the rest of the day being divided into three sessions, each addressing a different topic. The first session discussed existing equipment reliability data and how to improve that data, the second discussed the barriers to collecting and sharing more data, and the third discussed the gaps in equipment reliability data and near miss. The second day, these topics were further addressed in breakout sessions. Finally, general session discussed the plans of OESI to develop an advisory committee and a research oversight committee with the stakeholders.

With over 100 attendees, the Data forum was successful at bringing together industry, academia, and the government in an environment of dialogue and cooperation. As an end result of the forum a list of
study opportunities for OESI was developed. Overall a success, the Data Forum helped ensure OESI continues on the correct path as it moves into the future.

The discussion about data collection identified a need for clear objectives and industrywide accepted definitions and standards. Two views of data collection were presented; either big data which collects everything or the problem-oriented data collection that collects data to solve a specific problem or answer a specific question. There was no consensus to decide which direction data collection should go, and more research on the optimum granularity of data collection is needed.

Additional barriers like the legal aspect of data sharing and the fear of litigation, as well as marketing and commercial constraints were discussed. However, the audience commonly agreed that these barriers can be overcome if data collection presents a return on investment for the industry, solves a real requirement or problem, and can help in the decision making process. Ultimately, Industry must be ready for compromise.

The audience recommended that OESI first catalog existing databases and determine what problem each database is trying to solve and how analysis of the collected data improves decision making. This catalogue could also help to identify the gaps in the overall picture of data collection. From that catalogue, recommendations could be made on how existing databases could be improved in aspects like data quality, data validation, and on how to make them more accessible and searchable. It is important to learn from successful data collection initiatives to see how they overcame the barriers.

Following this Forum, OESI worked on a document summarizing the discussions of the event. The document is in final preparation and will be available soon on the OESI website (password protected) and by hardcopy.
5.3 Research Roadmap

On October 7-8, 2014, OESI convened top academic and research experts from various companies, universities and organizations for an unprecedented think-tank workshop to address the development of an “Ocean Energy Safety Research Roadmap for the 21st Century”, at Texas A&M University, College Station, TX. The morning of the first day was dedicated to the presentation of current and future research initiatives by many of the key players in Ocean Energy Safety: National Academy of Science (NAS), API, COS, DeepStar, and Research Partnership to Secure Energy for America (RPSEA). These presentations were preceded by an overview of the Ocean Energy Safety Research portfolio presented by the MKOPSC. The afternoon of the first day welcomed presentations on more specific research topics related to Ocean Energy Safety such as nano-technologies, system reliability, subsea well modeling, real-time monitoring, and smart cementing. A perspective from other industries also provided valuable insight from atmospheric modeling of climate extremes to military simulations. During breaks throughout the day, poster sessions were held and students from Texas A&M University and the University of Houston discussed their research with academic and industrial experts.

Additionally, OESI distributed to the attendees a draft report intended to provide a compilation of research initiatives in Ocean Energy Safety. An in-depth evaluation of the research results and a precise evaluation and prioritization of future research needs is beyond the scope of this document, but the report provides a summary of the main research topics in the different areas of Ocean Energy Safety; oil spill, platform, subsea, environmental conditions, and safety management systems, together with the main funding agencies and a general assessment of research gaps, whenever possible, are identified.

During the second day, the attendees were divided into three groups to further discuss drilling safety, well containment, and spill response. The result of the discussions in each breakout session consisted of identified research topics along with other comments on the draft research report. With over 80 attendees, the Research Workshop was successful at bringing together industry, academia, and the government in an environment of dialogue and cooperation; as well as beginning to identify possible gaps in ocean energy research.

OESI is currently working on the proceedings summarizing the discussion of this two day event, and also updating the draft research report.
5.4 Future forums

The next forum for dialogue will focus on Human Factors and Shallow Water Blowouts. We expect this forum to take place in March 2015. OESI will organize and conduct this forum with the assistance of RPSEA. Dr. Camille Peres, an assistant professor in environmental and occupational health from Texas A&M University will assist OESI in the identification of presenters, attendees and topics of the Human Factors portion. In spring 2015, a second Research Roadmap workshop will be organized to take the next steps in developing an Ocean Energy Safety Research Roadmap. This discussion will build on the results of the initial Roadmap discussions in October 2014.

6. OESI Symposium

Each year OESI will conduct an annual symposium. During the initial years of OESI’s existence, while stakeholders are continuing to be developed; the OESI Symposium will be held in conjunction with the MKOPSC International Symposium. The symposium is held each year during the last week of October in College Station, TX; and draws attendance from safety experts worldwide.

This year, Director Salerno will be the speaker for the Frank P. Lees Memorial Lecture. During the two and a half day symposium, two sessions will be dedicated to Ocean Energy Safety related topics. Examples of these presentations include:

- "Case Study: Laser-based gas detection technology and dispersion modeling used to eliminate false alarms and improve safety performance on Terra Nova FPSO" Rajat Barua, Senscient
- "Subsea Blowout Preventers Risk Model" Mike Crosby, Lloyd's Register
- "The Use of Bowtie Theory to Develop and Deliver Process Safety Indicators" Stuart Maxwell, Lockheed Martin

7. Outreach activities

Outreach activities are and will continue to be essential in furthering the mission of OESI, to further develop the relationships required to achieve dialogue throughout all industry stakeholders. Much of this year’s outreach focused on developing those relationships and spreading the word of what OESI is, what OESI isn’t, and what our future plans are. Significant efforts have been made to connect with members of the Ocean Energy Safety Advisory Committee (OESC); in order to learn more about those proceedings and the original perceptions of the OESC.

Although there were some early outreach efforts, much of the effort has been since the May 2014 timeframe. The principal opportunities are captured below:

- April 9-10, 2014: Dr. Hasan and Dr. Laboureur attended the second annual Center for Offshore Safety (COS) Forum.
- May 12-13, 2014: PI, Co-PIs and OESI Director attend “OESI Risk Forum”.
- May 21, 2014: PI and OESI Director met with IBM representatives.
- May 27, 2014: PI spoke with the Society of Petroleum Engineers (SPE).
- June 4, 2014: OESI Director attended the Offshore Operators Committee (OOC) Quarterly Conference.
• June 5, 2014: PI, Co-PIs and OESI Director met with COS and American Petroleum Institute (API).
• June 5, 2014: OESI Director attended the Chemical Safety Board (CSB) Findings on Macondo.
• June 13, 2014: OESI Director met with TAMU Energy Institute.
• June 17, 2014: PI and OESI Director attended presentations from Japan Atomic Energy Agency (JAEA) and the Center for Robot Assisted Search and Rescue (CRASR).
• June 19, 2014: OESI Director traveled to New Orleans, LA, and met with representatives from the OOC.
• June 20, 2014: OESI Director traveled to Stennis Space Center, MS, and met with representatives from the Oceanographer of Navy, and the Naval Oceanographic Office.
• June 24, 2014: PI and OESI Director met with Mr. Tom Moore of Aker Solutions.
• June 25, 2014: PI and OESI Director met with Mr. Will Pecue III, President of Taylor Energy.
• July 2, 2014: OESI Director toured Helmerich and Payne (H&P) to learn about drill rig construction and operations. Also met with COS.
• July 8, 2014: PI and OESI Director met with members of Total.
• July 22, 2014: PI and OESI Director met with Dr Mike Payne of BP.
• July 30, 2014: OESI Director attended the Chemical Safety Board (CSB) Findings on Macondo.
• August 12-13, 2014: PI, Co-PIs and OESI Director attended the “OESI Eliminating Barriers to Data Sharing, and Solutions Forum”.
• August 15, 2014: PI and OESI Director met with Dr Hilde of University of Maryland.
• August 20, 2014: OESI Director met with Kevin Renfro of Anadarko.
• August 21, 2014: OESI Director met with Dan Smallwood of ConocoPhillips.
• August 29, 2014: OESI Director met with James Pappas of Research Partnership to Secure Energy for America (RPSEA).
• September 4, 2014: OESI Director met with Dr Kevin McSweeney of American Bureau of Shipping (ABS).
• September 10, 2014: OESI Director met with COS and Lloyds Register Energy.
• September 10-11, 2014: Dr. Hasan and Dr. Van Oort attended the 2014 SPE Deepwater Drilling and Completions Conference.
• September 12, 2014: OESI Director presented a talk entitled “Ocean Energy Safety Institute, a Vision” at the National Ocean Industries Association (NOIA) Board of Directors in Houston, TX.
• September 15, 2014: PI and OESI Director met with members of ConocoPhillips.
• September 19, 2014: PI, Co-PIs and OESI Director met with members of API Working Group on OESI.
• September 22, 2014: PI and OESI Director met with members of Shell.
• September 24-25, 2014: OESI Director attended the Decomworld, Subsea Integrity Conference in Houston, TX and presented a talk entitled: “Ocean Energy Safety Institute in the Subsea Arena”.
• September 30 – October 1, 2014: OESI Director attended the Decomworld, Offshore Safety Conference in Houston, TX and presented a talk entitled: “Ocean Energy Safety Institute, a Vision”.
• October 7-8, 2014: PI, Co-PIs and OESI Director attended the “OESI Research Roadmap for the 21st Century”.
• October 10, 2014: OESI Director attended Subsea Engineering orientation presented by FMC Technologies and TAMU Subsea Engineering program.
• October 13, 2014: OESI Director met with representatives of the National Academy of Science (NAS) and NOIA.
• October 14, 2014: OESI Director met with members of BSEE.
• October 15, 2014: OESI Director met with Dr Michael Baram, member of the OESC and the Conservation Law Foundation.
• October 15, 2014: OESI Director met with members of SPE Working Group on Near Miss Database.
• October 16, 2014: OESI Director met with members of the Woods Hole Oceanographic Institute.
• October 28-30, 2014: PI, OESI Director and Program Manager will attend the MKOPSC International Symposium.

8. OESI advisory structure
A major task for OESI is to work on the sustainability of the Institute. In order words, build a strategy that will allow OESI to continue to fulfill its mission without further government funding, while considering industry participation and other potential opportunities for funding. Additionally, an advisory structure should be set up to help determine the future focus of efforts for OESI.

At the end of the Data forum, the PI described a first vision of an OESI advisory structure. The OESI external committee structure will consist of two entities: the Advisory Committee (AC) and the Research Oversight Committee (ROC). The AC will assess performance and recommend focus and direction for OESI. The AC will consist of Industry, Government, Non-Governmental organizations and Research/Academia organizations. The level of financial commitment would be somewhere between $10K and $50K annually, depending on the size and focus of the company. No membership fee will be required for government agencies and academic organizations. The AC is expected to reach a maximum of 32 members from across the spectrum of Industry, with a total of ~$0.5M-0.7M per year to cover the OESI operating costs. However, in order to leverage the initial BSEE funding, OESI intends to initially convene the AC without membership fees for the first 2-3 years. The specifics of this will continue to be developed.

In addition, the ROC will recommend, prioritize and review research efforts and projects and should primarily consist of industry participants. The level of commitment would be based on the cost of approved research projects. The ROC is expected to reach 10-12 members from the operating sector of the industry.

To drive home the reason stakeholders should desire to be a part of OESI, the PI developed the PRIDE acronym:

• Participate in the determination of Priorities and direction of OESI.
• Leverage world-class Research programs.
• Active Interaction with Industry, NGOs and Regulators.
• Enhanced Dialogue with all members of the Ocean Energy community.
• Access to next generation of Ocean Energy Expertise.

Additionally, the PI, co-PI’s, and OESI Director met several times with representatives from a Work Group chartered by the API Upstream Committee to further discuss OESI advisory structure topics. Based on these meetings and feedback, OESI renamed the Research Oversight Committee to the
Research Advisory Committee, and provided the Working Group a first version of the OESI constitution and by-laws.

9. Plans for the future of OESI
The first year for the Ocean Energy Safety Institute was dedicated to development of internal operations, stakeholder identification and information sharing. A Director of Operations was hired in May and a Program Manager in October, which completes the current planned team. OESI also worked to build on the working relationship with BSEE through bi-weekly conference calls, and several other opportunities through phone, email and face-to-face meetings.

This year, OESI also started the development of outreach and relationship building opportunities among OESI, industry, academia, governmental agencies, and non-governmental organizations.

In addition to continuing the efforts of year one, the two major goals for OESI’s second year will be the development of an advisory structure and the development of research opportunities.

To ensure both the input of all stakeholders and its future sustainability, OESI will establish an Advisory Committee structure by the end of Q1 2015. This initial structure will inform the prioritization of future OESI Forum topic and research projects, the two primary missions of OESI.

Additionally, during the second year, OESI will expand the initial catalogue of continuing education courses available at the three partner universities, and will begin working on the assessment of available training, academic programs and continuing education programs in Ocean Energy Safety related topics. Other tasks laid out in the Cooperative Agreement will continue to be addressed as well.