

**U.S House of Representatives**  
**Science and Technology Committee**  
***Energy and Environment Subcommittee***

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**Statement of**

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**Vice President Technical Programs**

**Research Partnership to Secure Energy for America**

Good morning, Chairman and members of the Subcommittee. My name is James Pappas. I am employed by the Research Partnership to Secure Energy for America, RPSEA – a 501(c)3 non-profit organization ([www.rpsea.org](http://www.rpsea.org)). Through the Energy Policy Act of 2005 Section 999, RPSEA administers a public – private partnership that performs research and development for the ultra-deepwater in the Gulf of Mexico, unconventional onshore natural gas, and other petroleum resources of the United States, namely for small producing companies. RPSEA has over 172 members, including 26 research universities, companies, and other organizations and manages the \$37.5 million per year of US. Government funds, plus cost share funds from project groups. RPSEA is unique in that we also have an Environmental Advisory Group that enables prominent environmental organizations to

assist us in managing our program. Government funds are generated from royalties and funneled to RPSEA through NETL, the National Energy Technology Lab, on behalf of the U. S. Department of Energy. Additionally, the National Energy Technology Laboratory at the Department of Energy (NETL) has a \$12.5 million per year complementary program under the same Act. Our two groups work together to ensure that research is properly prioritized and funding is effectively utilized.

Deepwater offshore exploration and production is challenging in many respects. Each prospect is full of unknowns, and the industry must be prepared for the worst. Its toolkit is vast but it has not kept up with the challenges. A proactive approach that studies possible outcomes, plans and prepares people, contains the proper amount of safety features and methods to employ them, sets responsible oversight and regulations, and is available to all for use is paramount to the safe and environmentally responsible success of the judicious use of America's oil and gas resources. RPSEA, through its oversight by the Department of Energy through NETL, stands at the forefront of the development of systems to enable the industry to improve energy security. The Research Partnership to Secure Energy for America uniquely provides the structure for researchers and other interested parties from a multitude of companies, research universities, environmental and safety organizations, and others to exchange ideas, transfer technologies, and provide unbiased science to develop sound policy. It is because of the role of our Federal Government through the EPart Section 999 Program that RPSEA has been successful and that its members are willing and anxious to participate – to lead - in these activities that are so important to our country.

RPSEA is unique in that we administer our program through a collaborative research environment that includes subject matter expert volunteers throughout the oil and gas industry, outside of the industry, research universities, national labs, and other state and federal organizations. Furthermore, RPSEA is proud and fortunate to have members from several prominent environmental and safety concerns within our ranks. The inclusion of so many experts from such a large base makes this program a success. All stakeholders are represented. Our fully transparent process has proved to result in high quality technology research and development that is advancing all sciences related to our function. Thus, this one-of-a-kind, all inclusive organization truly represents the public interest. We currently have 71 projects in progress or completed, and an additional 28 projects are in contract negotiations.

Through our experts, who cover all technical disciplines, we develop a five-year plan that we update annually. Specifically, the annual plan (<http://www.rpsea.org/annual-plans>) is submitted by RPSEA only after an exhaustive and comprehensive review of technology ideas generated by nine committees of subject matter experts. More than 700 individuals work to identify and develop these ideas and the subsequent plan. RPSEA takes its direction from the Secretary of Energy when he approves the annual plan after consultation with a Federal Advisory Panel. The needs are prioritized, we balance our near and long term goals, and then we publicly issue requests for proposals. Proposals are evaluated by independent experts and projects are selected that follow Federal Acquisition Regulations. Each project must not only meet the technical objectives, but it must also

provide a plan that ensures that the technology will be safe and have no adverse environmental impact. In fact, some of the current projects specifically address improved safety and environmental performance. Although the projects are managed by RPSEA, they utilize industry advisory boards to assure that they meet their objectives. This process is meant to act as a check-and-balance, and it also assists in early development and commercialization of any related technologies. Our aggressive technology transfer efforts ensure the work being conducted is applied in a cost effective manner.

I have been invited to discuss oil spill prevention and mitigation technologies in deep water, as well as standards for deepwater gas and oil drilling. The recent incident involving the Deepwater Horizon is a tragedy that has resulted in the loss of 11 lives, an environmental nightmare, and hardship on countless Americans. Clearly, no one expected this incident to happen. The U. S. offshore drilling industry had an extraordinary safety record prior to its occurrence. Quite appropriately, the incident has resulted in everyone reflecting, refocusing, and rethinking the importance of offshore production, as well as the research required to ensure the safe and environmentally sound production of these precious resources. As efforts continue to rein in the blowout, to clean-up the environment, and to identify the root cause of the accident, the failure of the overall system and the resulting impacts have already identified specific areas requiring research.

Through RPSEA's Environmental Advisory Group, as well as its Drilling Advisory Group, we have pinpointed several areas of study:

- **Technology enhancement to minimize incidents** – This program will aim to

prevent incidents from occurring in the first place. A review of the state-of-the art of technologies that may be used to improve safety, protect the environment, and ensure wellbore integrity of offshore operations will identify priorities, as well as technology gaps and further research needs. The review should consist of an evaluation of existing safeguards and international offshore procedures, standards, and practices. It should also identify promising technologies to address safety and environmental concerns associated with deepwater, harsh environments.

One of RPSEA's projects, the **Environmentally Friendly Drilling Systems Program** ([www.efdsystems.org](http://www.efdsystems.org)), enlists the participation of several research universities, national laboratories, and industry contributors. Its advisory committee includes members from all stakeholder groups including environmental organizations, academia, industry, and other concerned citizens. The project is focused on identifying and developing new technologies for environmentally sensitive development of unconventional onshore energy resources. Its objective is to identify, develop, and transfer critical, cost effective, new technologies to allow onshore reserves development in a safe and environmentally friendly manner. This project can serve as a model for a similar offshore program that will enable **all** stakeholders to identify needed research, to provide direction, and to follow progress. Furthermore, the new offshore program can be developed using the same organizational structure as the Environmentally Friendly Drilling Systems Program, and might also explore various approaches to regulate safe activity in the offshore sector, in addition to identifying and developing new technologies. For example, it might investigate the feasibility of a performance-based systems approach to

enhance or complement the current prescriptive-based method of laws and regulations. It might also address recommendations contained in the Secretary of Interior's May 27, 2010 report: "Increased Safety Measures for Energy Development on the Outer Continental Shelf," particularly recommendations concerning well control systems and safety equipment. Other research needs related to wellbore integrity include cement evaluation technologies, methods to maintain communication and power between the surface and subsea safety systems, and increasing the intervention capability of remotely operated vehicles.

- **Identification, development, and improvement of proactive and reactive response procedures and processes** will address the research required to minimize response time to an incident, so that environmental impact is minimized.

The primary response objectives in any open-water marine spill are:

- Prevent the spill from moving onshore
- Reduce the environmental impact
- Speed the degradation of any unrecovered oil while minimizing the harm on the ecosystems
- Mobilize rapid well intervention/containment standby equipment

The industry has various vessels and equipment on standby used to contain spills, to skim, and to deploy dispersants. But quite frankly, the research in this area has been lagging and as evident was not prepared for this past incident. RPSEA is in a position to immediately conduct a research program to identify the state-of-the-art

technologies and methodologies to enhance a response to an emergency situation. The Secretary of Interior's report, previously mentioned, also recommends a comprehensive study of methods for more rapid and effective response to deepwater blowouts. This program can also include early warning sensors to identify potential hazards to the environment. And it should also include studies to understand the effect on marine life and other wildlife movements resulting from an incident. Other evaluations might include the effects of using different dispersants on the ocean and marine life, advancing skimming technologies and separation/water handling technologies, prescribed burns impacts, and general emergency preparedness logistics improvements.

- **Development of an understanding of the value of ecosystem services and location identification of high value in a seasonally dynamic ecosystem** – This program will aim to determine the value of ecosystems. The goal is to study deepwater, coastal regions and Gulf Coast wetlands, in order to identify high value areas to place monitoring and early warning devices. Valuation of ecosystem services can furthermore be used to prioritize spending on ecosystem protection.

RPSEA has several research projects related to safety and environmental studies. In addition, every project in the RPSEA program is required to employ a level of understanding of safety and environmental impact. Example projects include:

- Our **composite riser for ultra-deepwater high pressure wells** project is aimed to decrease weight requirements, thus easing the task of riser installation and reducing the potential for human injury.
- The **fatigue performance analysis of high strength risers in sour environments** project is aimed to improve our understanding of long term riser fatigue physical changes under various dynamic conditions, for various fluid types.
- The **effects of climate change on hurricane activity** project is a study to better forecast storms in the Gulf of Mexico that can inevitably allow companies to safely and effectively shut down operations and may have an additional benefit of improving hurricane early warning for all Gulf Coast Americans.
- Included in another project is a **Self Standing Riser System (SSR)** that has recently been developed, with a demonstration project for use in deep water well intervention ongoing. This technology includes a riser and an adjustable air can that may enable operators to do various deep water tasks in an easier, timelier, and safer manner. The system may include blowout preventers at both the mudline (seafloor) and at the water's surface, adding redundancy to current systems.
- Both the **hybrid power systems study** and the **ultra-deepwater electrical power distribution systems** projects aim to place power where it is needed – near the wellhead. Doing so can increase monitoring and control capabilities, add levels of redundancy to current systems, and reduce response times.
- Similarly, **wireless subsea communications** can be a game changer when it comes to monitoring and control.



- The **new technologies to monitor and inspect pipelines** project has the potential to revolutionize early warning methods in that arena.
- The **3-D, high resolution, laser imaging** project similarly has the potential to greatly improve offshore equipment inspection, maintenance, and repair.

Abstracts describing each of these projects and others can be found online under the RPSEA public access section at <http://www.rpsea.org/en/cms/?1475>

When the thorough investigation of the Deepwater Horizon incident is completed, there will be identified needed changes in deepwater drilling standards. Areas that might, require additional standards or recommended practice development include:

- Blowout preventer inspection and enforcement procedures, including backup equipment, and reporting requirements
- Well control procedures, training programs, and/or response mechanisms for deepwater wells
- Improved comprehensive safety management programs
- Emergency equipment certification and testing improvements
- Streamlined reporting systems to Governmental agencies
- Additional safety barriers during critical well construction stages
- Well construction certification procedures for cement and tubular equipment
- Standardized well construction procedures from wellhead to the reservoir
- Increased enforcement by Government agencies, including training and development of additional personnel

RPSEA is currently in the process of developing our **2011 Annual Plan** for research. The Deepwater Horizon incident has greatly influenced us, and thus we will place even more emphasis on safety and environmental research. The Deepwater Horizon incident has greatly influenced us, and thus we will place even more emphasis on safety and environmental research. We must do all we can to make certain that an incident like that involving the Deepwater Horizon never happens again.

The value of collaborative research is important. It is precisely because of government funding that a combined group from academia, research organizations, and industry can perform this type of research, which otherwise would not be cost effective. Thanks to government funding through the Energy Policy Act, coupled with significant industry cost share, the higher risk technology challenges are being addressed, The Section 999 funding of \$50 million per year (\$37.5 million to RPSEA and \$12.5 million to NETL for complementary research), has been far from sufficient to address all the concerns. I hope you will agree with the over 170 member companies of RPSEA that this program is a great value to our country. We could be far more effective if additional funds that have been authorized were appropriated.

The universities, the subject matter experts, the vendor community, the small producers, and the major integrated operators, in cooperation with NETL and the DOE, have the network in place to immediately begin to develop the technologies needed to add increased safety and environmental protection to our drilling efforts. I urge you to see RPSEA as a part of the solution to balancing our nation's energy imperatives and environmental

requirements. We are ready now. We have the network now. We are up and running and there will be no delay because our relationship with the government and other stakeholders is already in place. We can begin developing solutions now.

Thank you for this opportunity to discuss the ongoing research and needs related to deepwater spill prevention and mitigation.