

Witness Testimony

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[Ultradeep Water Research and Development: What Are the Benefits?](#)

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Mr. Chairman, thank you for the opportunity to testify before your committee today.

My purpose and objectives in this testimony are to convey my impression of various factors that can influence the chances of H.R. 6 receiving the petroleum industry partnership and support required by the Ultra-deep water research administration and management model. I will also make specific suggestions that would support and guide a successful execution of the important and worthwhile national energy objectives that this bill represents.

In my career, I spent 22 years as a seismic research scientist and technical advisor in the petroleum industry before joining the University of Houston in 2001, where I founded the Mission-Oriented Seismic Research Program and industry consortium. The purpose of that educational and research program is to address and solve fundamental seismic problems whose solutions would produce the biggest positive step change in our ability to locate and produce hydrocarbons. Our sponsors include all the major publicly traded petroleum companies world-wide, four foreign national petroleum companies and the largest service companies. Located in the City of Houston, the energy capital of the world, we benefit from and leverage the highest concentration of brainpower in the industry. We partner with world-class industry experts through working teams that focus on research projects within our program.

The industry trend to deep and ultra-deep water has an immediate associated increase in cost for every stage of exploration and production. For example, drilling costs and production facility investment are significantly higher in deep water. Hence, there is a reduced tolerance and lower ceiling for the number of dry holes as their expense rises.

In addition, there are new and serious technical challenges and obstacles occurring specifically in the new deeper marine environment. When combined with intrinsic higher deepwater costs this confluence of technical and economic factors provides a strong impetus for greater technical capability and the support for fundamental R&D efforts directed at those challenges. Heightened cost demands that fewer wells define and delineate reservoirs, and this must occur in the face of new geologic and geophysical challenges. The idea is if this R&D is successful, it will deliver reduced risk and increased reliability in the prediction of new and definition of current reservoirs.

In my particular technical area, deep water can all by itself cause the failure of certain traditional coherent noise reduction methods for removing multiply reflected events from seismic data. A complex subsurface adds another hurdle; e.g., the inability to accurately locate and define hydrocarbon targets beneath salt, basalt and other complex overburdens is a major obstacle to effective E&P in the Gulf of Mexico and elsewhere. Sub-sea sediments are often unconsolidated in ultra-deep water and can be markedly different from those in shallower depths, causing major drilling problems; and this is often not discernable using current seismic data analysis.

In seeking an ultra-deep partnership with petroleum companies in both manpower and resources several points are worth keeping in mind: (1) The challenges that deep and ultra deep water E&P faces are best understood by the petroleum industry; (2) The experts are for the most part in the petroleum industry or outside and are already funded by the petroleum industry; (3) There is a high level of hesitation and reluctance on the part of big oil and gas

companies to "partner" with academic, government labs and federal agencies - and often for good reasons; (4) That reluctance and level of scrutiny increases with the amount of funding or matching contribution being requested.

There are two basic types of funding channels in petroleum-academic partnership: (1) smaller essentially educational/research support grants that are often combined for impact as part of a consortium with other companies, and (2) larger investments which derive from a business unit or corporate strategic decision, and invite a greater scrutiny, oversight of direction, and clarity of managing the progress in providing impactful deliverables. The H.R. 6 Ultra-deep program falls in the second category.

Why this hesitation on the part of industry to partner? It certainly isn't that industry is risk averse nor is it hesitant to try new ideas that aim to solve real problems. There is a view that academic and government labs often march to a different drummer than industry research, and can measure success in terms of number of published papers and reports. Industry measures success by the positive impact the research has on E&P effectiveness and counting papers is rarely a measure of that value and significance. Research that is directed, fundamental and impactful is the central objective, and serves the aligned interests of forefront science and the petroleum industry's need for step improved prediction and reliability. A goal with that high bar can benefit from the pooling of industry and government resources, and that objective is what H.R. 6 is meant to facilitate.

There is a view in industry that these partnerships were often window dressing where industry was called in at the beginning to provide an imprimatur of solving real world problems, but never consulted afterward or kept informed. Technical service projects supported at universities were also generally frowned upon as inappropriate and inconsistent with their educational mandate, and better suited for commercial service companies. Petroleum companies have plenty of their own bureaucracy, and rarely see the need of additional federal bureaucracy unless a significant and unique overriding benefit can be delivered.

One of the key points and strengths of H.R. 6 is its explicit recognition of these issues reflected in that the Ultra-Deep water program would be administered by DOE but managed by a consortium of academic/ industry professionals. I would respectfully suggest that the management be under the authority and the responsibility of industry experts, with academics involved where appropriate to carry out the plan and help provide deliverables. A critical point in the success of H.R. 6 would be the quality of the industry people chosen to manage this program. Another factor to consider is that industry is already well aware of academics who seek industry support and already selects to fund those considered capable of addressing their concerns.

A reasonable question is: Why should the federal government support R&D that can impact the bottom-line profit of the petroleum industry? A response is that the technical challenges facing the large oil and gas producers in ultra-deep water is of such a magnitude today, that they can and will, at some point, shift their investment and exploration portfolio towards other opportunities, e.g., the Mid-east and Russia, where other issues are present, but not perhaps of such a daunting technical nature. The interests of the United States in energy, national security, and economic growth and stability dictate a maximum amount of domestic reserve and production and an overall diversity of sources of hydrocarbons. A US government investment in ultra-deep water R&D, truly partnered and managed by the best minds in the petroleum industry, would, if carried out in an effective manner, help serve the near and long-term interests of our country. That new capability would benefit the entire global energy landscape and allow currently inaccessible resources to become accessible.

Chairman Hall: Again, thank you for the opportunity to testify before your committee. I look forward to your questions.