Ultra-Deepwater Advisory Committee

Comments and Recommendations

2007 Ultra-Deepwater Annual Plan

July, 2007

The Ultra-Deepwater Advisory Committee

Advisory Committee to The Secretary of Energy

July 24, 2007

The Honorable Samuel W. Bodman
Secretary of Energy
Washington, DC 20585

Dear Mr. Secretary:

On behalf of the Ultra-Deepwater Advisory Committee (UDAC), I am pleased to submit our findings and recommendations based on our review of the ultra-deepwater portion of the Draft Ultra-Deepwater & Unconventional Gas 2007-2008 Research and Development Plan.

Successful execution of this R&D Program will materially contribute to U.S. supply of oil and gas well beyond the 10 year R&D horizon. It is the consensus of this Committee that the resource potential impacted by this technology program is significant and of major importance to the nation. There is a critical need for a sustainable and consistent approach to the technology challenges facing ultra-deepwater development.

The Plan and the processes followed in developing it were professionally done and inclusive, with a significant infusion of industry knowledge. The combined Management Team—DOE, Research Partnership to Secure Energy for America (RPSEA) and its extended network of industry resources—is uniquely qualified to plan and execute this complex 10-year R&D undertaking.

The committee recognizes that RPSEA is in the final stages of completing the detailed plans for the first two years of the R&D efforts. We have confidence that their planning will implement the program consistent with our recommendations.

With regard to overall priorities the committee recommends:

- Providing more emphasis on achieving *Grand Challenge* R&D breakthroughs.
- Targeting R&D projects likely to achieve a significant increase in value through cost reduction and increases in efficiency and technology effectiveness in ultra-deepwater resource development.
- Properly ranking potential projects and limiting project awards to only the most highly rated projects, because the available funding will be limited relative to the list of potential projects outlined in the plan.
- Enhancing the focus on environmental issues.
- Allocating sufficient effort to assessing and demonstrating the likely benefit of these R&D efforts in capturing additional resources in areas currently not open for access.

The UDAC recommends proceeding with implementation of the R&D Plan consistent with the guidelines outlined in our report.

Respectfully submitted,

Philip J Grosswener, Chair
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TABLE OF CONTENTS

1.0 INTRODUCTION

The Ultra Deepwater Advisory Committee (UDAC) advisory committee was formed in accordance with provisions of Section 999D(a) of the 2005 Energy Policy Act (EPACT)

The Committee consists of:

- Individuals with extensive research experience or operational knowledge pertaining to the offshore oil and gas industry,
- Individuals broadly representative of affected interests in ultra-deepwater oil and gas, including environment and safety.

The provisions of EPACT excluded from eligibility to participate in UDAC, Federal employees and board members, officers and employees of Research Partnership to Secure Energy for America (RPSEA).

The duties of the UDAC under EPACT Section 999 are to advise the Secretary on the development and implementation of programs related to ultra-deepwater natural gas and other petroleum resources and to review the draft annual research plan.

The Committee members were appointed by letters from the Secretary on May 11, 2007. Key milestones for the Committee included:

- Committee members received the draft annual plan on June 12, 2007.
- Committee members participated in a joint meeting with DOE and RPSEA representatives on June 21 in Washington, DC. During this meeting DOE and RPSEA representatives provided an overview of the entire DOE oil and gas research effort, including both the traditional R&D program and elements specified in EPACT Section 999. Committee members provided initial comments regarding the ultra-deepwater portion of the draft annual plan at this meeting.
- During the first two weeks of July, Committee members conducted several teleconference calls to develop and consolidate recommendations regarding the draft annual plan.
- The Committee met on July 24 in Houston. Final recommendations were agreed upon by the Committee at this meeting in accordance with the deadline set by the Secretary and the Designated Federal Officer.

2.0 EXECUTIVE SUMMARY AND RECOMMENDATIONS

These findings and recommendations are at a strategic level and address the overall quality of the plan and provide general guidance regarding setting priorities and execution of the plan through the projected 10 year horizon.

Findings:

Successful execution of this R&D Program will materially contribute to U.S. supply of oil and gas well beyond the 10 year R&D horizon. It is the consensus of this Committee that the resource potential impacted by this technology program is significant and of major importance to the Nation. There is a critical need for a sustainable and consistent approach to the technology challenges facing ultra-deepwater development.

The Plan and the processes followed in developing it were professionally done and inclusive, with a significant infusion of industry knowledge. The combined Management Team (DOE, RPSEA and its extended network of industry resources) is uniquely qualified to plan and execute this complex 10 year R&D undertaking.

The Committee recognizes that the program consortium, Research Partnership to Secure Energy for America (RPSEA), is in the final stages of completing the detailed plans for the first two years of the R&D efforts. We have confidence that their planning will implement the program consistent with our recommendations.

Recommendations:

With regard to overall priorities the committee recommends:

- Providing more emphasis on achieving *Grand Challenge* R&D breakthroughs.
- Targeting R&D projects likely to achieve a significant increase in value through cost reduction and increases in efficiency and technology effectiveness in ultra-deepwater resource development.
- Properly ranking potential projects and limiting project awards to only the most highly rated projects, because the available funding will be limited relative to the list of potential projects outlined in the plan.
- Enhancing the focus on environmental issues.
- Allocating sufficient effort to assessing and demonstrating the likely benefit of these R&D efforts in capturing additional resources in areas currently not open for access.

Detailed recommendations are provided in Section 3.

3.0 SUB GROUP REPORTS

At the June 21st meeting the following Sub Groups and schedule was established for developing the Subgroup analyses and reports.

Four Recommendation Areas:

- Environmental
- Solicitation Process (includes: Success Measures, Technology Transfer)
- R&D Theme Content (includes: Prioritization, Timing Near/Long Term, Grand Challenges, and Drilling)
- Access

Schedule

7/6 – Recommendations to leaders
7/11 – Compilation of list sent to sub-team
7/13 – Sub-team conference call
7/17 – Consolidation list sent to all
7/24 – Meeting in Houston

Treatment of Non-Consensus

In situations where members were divided, the following categorization was used:
Majority Agreement – 50% or greater of Committee members were in agreement with the statement
Minority Opinion – fewer than 50% of Committee members were in agreement with the statement

3.1 R&D THEME CONTENT

The Committee recommends the following:

- Drilling and Completions (D&C)
  - Increase emphasis on D&C.
  - Clearly define D&C as a Crosscutting and Grand Challenge technology.
  - Emphasize initiatives to reduce D&C risk and increase technology effectiveness. *D&C is one of major costs in expanding to Ultra Deep Water.*

- Grand Challenge
  - Emphasize R&D initiatives which achieve major breakthroughs vs. simply achieving incremental improvements.
  - *Majority Agreement*: Budget **at least** 20% of resources toward achieving Grand Challenge / Game Changing breakthroughs. A Grand Challenge is defined as a transformational technology (refer to page 108 of Draft Annual Plan).
  - *Minority Opinion:* Percentage not needed in second bullet above.
  - Continue to conduct Workshops with specific objectives of ensuring holistic AND highly innovative approaches are developed.

- R&D Portfolio balance
  - Consolidate the number of themes and individual R&D projects to minimize dilution of effort.
  - Increase emphasis on long-term vs. short-term priorities. *Industry is comfortable with and usually willing to fund short term needs.*
  - Increase emphasis on applied science vs. product development activities. *Focus should be on areas where industry is not funding.*
  - Identify and Prioritize on Key Leveraging and Cross Cutting Technologies vs. field specific needs.
  - In early phases of R&D process, select and execute projects with broad industry support to increase leverage of money, people resources and public support.

- Met-ocean Criteria (separate from environmental theme)
  - Structure and select initial R&D project(s) to achieve broad support and participation across industry and the appropriate Federal agencies. *Worthy of significant effort.*

- Characterize Resource Potential
  - Develop R&D projects which build on past studies, with the specific objective of assessing and documenting broad potential to add new resources in areas not currently open for access. *The results of this effort should be widely disseminated.*
  - Establish more aggressive technology-enabled targets (> 1%) for resource capture within existing areas of access. *Emphasize this point to any potential constituencies opposed to moving forward with the R&D Program.*
  - Identify the key technology levers needed to capture additional resources. Further define leveraging technologies as applicable to either the regions currently open for access or to regions not currently open due to restrictions.

3.2 SOLICITATION PROCESS

We recommend that the solicitations and awards focus on big ideas with a wide scope of applications and the greatest impact on unlocking ultra-deepwater (UDW) resources. In other words, research must focus on science and technologies, big challenges that the UDW industry may perceive today as risky and long term.

- Target R&D projects likely to achieve a significant increase in value through cost reduction and increases in efficiency and technology effectiveness in UDW resource development. *We would consider the selection of less than ten projects to be consistent with this general recommendation.*
- Develop specific metrics for monitoring the probability of success of projects.

We recommend that a prioritization be carried out to narrow the focus of the solicitation. The narrowing should take place using the following guidelines:

- The solicitation process should direct the program toward development of technologies that will have the highest impact.
- Develop weighting factors for proposal selection that include assessments of potential size of payout and probability of success. In essence, develop at least qualitative assessments of expected value of each R&D project.
- Prescreen all potential projects and issue request for proposals (RFP) for only those projects for which RPSEA intends to award a contract. Minimize/eliminate time to prepare proposals which will not likely be funded.
- Create a "projects funnel" in which active projects, as completed, are replaced by stand-by projects ready to be issued.

Although we are recommending a narrowing of the focus of the solicitation, we value the work that has been done. We recommend that R&D projects that do not make the final list for solicitations still be part of the public record, as the exploration and production industry and academia may find them useful in developing proposals to alternative funding agencies.

We recommend that more emphasis must be placed on research projects related to development of UDW discoveries to ensure that the lag between exploration and development is as small as possible. With development, we then know that UDW discoveries are economically viable and therefore a real asset to the nation. *Use the cost-sharing component to the fullest extent possible to improve the funding level of R&D development technologies.*

We recommend that the RFP must clearly state the intellectual property and technology rights of participating parties, as well as the conditions associated with these rights.

3.3 ENVIRONMENTAL

Our basic knowledge of biological communities that might be affected by ultra-deepwater exploration, development and production activities is limited. Expanding that knowledge base will be important in designing strategies that will minimize or avoid adverse impacts to those communities. Such activity would be a valuable compliment to this program. As the resources of the ultra-deep ocean are explored and developed we will need to expand our ability to identify potential concerns quickly and efficiently.

Ecological impact survey techniques should be developed and adopted to ensure that ultra-deepwater ecosystems that might be affected can be readily identified. Protocols for assessing those ecosystems, especially ones associated with seeps and similar phenomena, should be developed that are compatible with exploration, development and production activities.

It will also be important to address potential environmental scenarios involving natural disasters and industrial accidents, both to satisfy requirements of regulatory agencies and the concerns of the general public. The triggering events which should be considered include: blowouts, hurricanes/earthquakes, catastrophic accidents at offshore facilities, and risk of spills. These analyses are not needed initially, but the R&D program should, in subsequent years develop studies to include:

- Update any existing studies with benchmarks of progress by industry to reduce risks due to blowouts,
- Update, if currently available, or prepare a grass roots study of environmental impacts to GOM infrastructure losses due to recent hurricanes.
- Prepare a risk analysis, using best available risk assessment techniques, to demonstrate to all potential stakeholders that any/all future developments in ultra deep water can be managed at acceptable levels of risk. This study should include extensive peer review.

The Committee makes the following recommendations:

Any proposal funded under the Ultra-deepwater Program Element must include an assessment of the potential environmental benefits/impact of the technology or action that the proposal would create or enhance. Additionally, the environmental benefits and possible mitigation of negative impact(s), if any, should be addressed (both impacts related to the research itself and to the wider application of the technology that is developed).

Expand the industry knowledge base in the met-ocean area, especially related to ultra-deep waters. This would have significant environmental benefits, such as establishing new design criteria for exploration, drilling and production activities and platforms that would minimize potential for accidental discharges, etc. This is a cross cutting theme which is also addressed by the other Task Groups.

3.4 ACCESS

The directives of EPACT 999A and 999B are to increase the supply of natural gas and other petroleum products through "research, development, demonstration, and commercialization of ultra deep water technologies while improving safety and minimizing environmental impacts."

We recommend that each breakthrough technology project that is funded through this program should analyze the applicability to all waters of the U.S. This should include developing updates to estimates of increased reserves of oil and gas in restricted areas. The analysis should include applicability in various met-ocean conditions and geographic locations. In waters having a moratorium, the analysis of applicability should address how the breakthrough technology mitigates those historic environmental and safety issues (blowouts, spills, hurricanes potential, tides, etc.) that led to the moratorium. We recommend that the Secretary of Energy and the Secretary of Interior jointly report the applicability analysis to Congress.

Minority Opinion (start): The UDAC recommends, in addition to the base R&D efforts developed under the Plan, policy efforts which would provide broader (both geographic and geologic) access to U.S. resources to help meet America's growing energy needs. Inputs to the policy making process should consider the following points:

- Additional resource development can occur as it does across America today in an environmentally responsible manner. Energy development and environmental protection can and should continue to coexist.

- Potential for additional resource capture would have a significant impact on U.S. jobs and reductions in U.S. Current Account Deficits. Cumulatively there are likely a few "Prudhoe Bays" out there in currently restricted areas.

- The recently published National Petroleum Council Report indicates likely near term worldwide supply challenges in meeting projected demand. It appears that even with best possible scenarios for developing alternate energy sources and conservation, supply will be short. Incremental production from areas currently restricted from access can have a material impact on worldwide supply and result in downward pressure on oil and gas prices. *(Minority Opinion end)*

In order to carry out this mission the projects funded through the research and development phases will require flexible access to apply new breakthrough technologies. Special expedited access should be provided to qualifying experimental demonstration projects; once efficacy is proven the breakthrough technology project can continue to operate to allow further study while additional access will be granted through a normal review cycle.

It is recommended that under EPACT Sec. 999A (e) the Secretary of Energy consult with the Secretary of Interior to develop an "Experimental Memorandum of Understanding",[1] which provides:

1) An application for an experimental demonstration project will be filed with Minerals Management Service (MMS) and approved in less than 90 days of application.
2) The application will provide for a discreet demonstration period with a discreet reporting schedule, which include:
    a. safety improvement assets
    b. environmental impact improvements

[1] This concept is similar in principle to EPA approved Experimental Exemption for new technologies.

3) In the event that the demonstration project is successful, the project may apply for a permit to extend the scope of the operation.
4) The demonstration project may continue to operate and gather data while the greater development of the project is permitted.

In the event the demonstration is unsuccessful, the demonstration equipment would be removed or abandoned as appropriate and in accordance with all applicable rules and regulations.

4.0 COMMITTEE AND SUBGROUP MEMBERS

* Special Government Employee

Mr. Kent F. Abadie	Manager, Development and Production	Shell Exploration & Production Company	New Orleans, LA
Mr. Ronald G. Bland	Shared Technologies Manager	Bake Hughes Drilling Fluids	Houston, TX
Mr. Raymond G. Charles	Area Exploration & Geoscience Manager	ExxonMobil Exploration Company	Houston, TX
Mr. Quenton R. Dokken	Executive Director	Gulf of Mexico Foundation	Corpus Christi, TX
Dr. Joe R. Fowler*	President	Stress Engineering Services, Inc.	Houston, TX
Mr. Phil Grossweiler*	Energy Industry Consultant	M&H Energy Services	Houston, TX
Mr. Michael Idelchik	Vice President Advanced Technologies	General Electric Company	Niskayuna, NY
Dr. Luc T. Ikelle*	Robert R. Berg Professor	Texas A&M University	College Station, TX
Mr. Arnis Judzis	Vice President	Schlumberger, Inc.	Salt Lake City, UT
Dr. Larry D. McKinney	Director of Coastal Fisheries	Texas Parks & Wildlife Department	Aransas Pass, TX
Mr. Albert Modiano	Vice President	U.S. Oil & Gas Association	Washington, DC
Mr. Richard L. Morrison	Vice President Safety & Technology – GoM Deepwater	BP America Inc.	Houston, TX
Mr. Daniel T. Seamount, Jr.	Commissioner	Alaska Oil & Gas Conservation Commission	Anchorage, AK
Dr. Yoram Shoham*	Geophysicist	Society of Exploration Geophysicists	Bellaire, TX
Dr. Roger M. Slatt*	Gungoll Chair Professor of Petroleum Geology & Geophysics	University of Oklahoma Sarkeys Energy Center	Norman, OK
Mr. Thomas N. Totten	Manager – Marine Strategic Planning	J. Ray McDermott	Houston, TX
Mr. Paul H. Tranter	Vice President Performance & Operations	Transocean, Inc.	Houston, TX
Mr. Paul M. Wiencke	Director	Research Council of Norway	Oslo, Norway
Ms. Mary Jane Wilson*	President and CEO	WZI Inc.	Bakersfield, CA

SUBGROUP TOPICS AND MEMBERS

Four Recommendation Areas:

R&D Theme Content (includes: Prioritization, Timing Near/Long Term, Grand Challenges, and Drilling)

Lead – Slatt

Members – Charles, Fowler, Bland, Judzis, Ikelle, Morrison, Grossweiler, Shoham, Tranter

Solicitation Process (includes: Success Measures, Technology Transfer)

Lead – Ikelle

Members – Idelchik, Abadie, Totten

Environmental

Lead – Dokken

Members – McKinney, Wilson, Modiano, Grossweiler, Shoham

Access

Lead – Wilson

Members – Charles, Seamont