

The Ultra-Deepwater Advisory Committee

Advisory Committee to The Secretary of Energy Established Under EPLA 2005 Section 999D

October 23, 2008

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

Dear Mr. Secretary:

On behalf of the Ultra-Deepwater Advisory Committee (UDAC), I am pleased to submit the results of our review of the Ultra-Deepwater Program element of the Draft 2009 Annual Plan for the Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Resources Research and Development Program (the Plan).

The Committee recognizes the accomplishments of the management team (DOE, NETL, and RPSEA) in creating the Plan and implementing EPLA (the Program) to date. The network of industry experts represents 132 organizations, 28 states, the District of Columbia, and the Province of Newfoundland, Canada, collectively more than 500,000 employees world-wide. This network has been particularly effective in identifying the research opportunities with the greatest potential to impact the development of new technology required to develop the oil and gas resources in the U.S. ultra-deepwater in a safe, cost effective and environmentally responsible manner.

There are multiple benefits of this research for consumers, the economy, and national security. The program supports industry efforts to increase and further develop the domestic resource base in the United States. This will help provide a robust, diverse, and affordable supply of energy in the United States that is not dependent on imports, and is essential to economic growth. All consumers regard affordable energy as a crucial component to their lives. This Program is key in providing affordable energy. Finding and developing new reserves is increasingly difficult and requires new technology. Accessing the ultra-deepwater reserves in U.S. territorial waters is one of the best opportunities for substantial new domestic energy resources.

New technology developed through this Plan will contribute to accessing these resources and will enable the development of a workforce capable of filling new jobs created by ultra-deepwater development. This includes research needed for safe infrastructure while protecting the environment. The cooperative nature of this government/industry/academia program, with cost sharing by industry partners to develop and test new technology, brings together the best minds to attack these complex problems. The ultra-deepwater program element is focused on the Gulf of Mexico, but results will be applicable to other areas in U.S. territorial waters such as the offshore Arctic. The

UDAC supports including the technology needs of these other areas, as authorized by EPAct, in the scope of the Program.

The UDAC believes that DOE should work within the Administration to ensure that the Program is sustained, and that new technology is available when needed throughout the lifecycle of ultra-deepwater activity. Appropriations for the program will be required when projects mature to the field-testing stage and to achieve delivery of new technology.

The Plan includes breakthrough Grand Challenge projects, which are intended to leapfrog existing technologies and open access to new supplies of domestic oil and gas. UDAC believes these projects should receive high priority.

Respectfully Submitted,



Kent F. Abadie
Chair – UDAC

UDW Advisory Committee

2009 UDW Annual Plan

Comments and Recommendations

October, 2008

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1.0 INTRODUCTION

The UDW Advisory Committee (UDAC or Committee) was formed pursuant to the provisions of Title IX, Subtitle J, Section 999D(a) of the 2005 Energy Policy Act (EPAAct).

The Committee consists of:

- Individuals with extensive research experience or operational knowledge of offshore natural gas and other petroleum exploration and production; and
- Individuals broadly representative of the affected interests in ultra-deepwater natural gas and other petroleum production, including interests in environmental protection and safe operations.

The provisions of EPAAct excluded Federal employees and board members, officers or employees of the Program consortium, known as Research Partnership to Secure Energy for America (RPSEA).

The duties of the UDAC under EPAAct Title IX, Subtitle J, Section 999D(a) are to advise the Secretary of Energy (Secretary) on the development and implementation of programs under Title IX, Subtitle J, related to UDW natural gas and other petroleum resources and to carry out section 999B(e)(2)(B) which is to comment on the draft annual plan.

The Committee was chartered July 2008, and members received letters of appointment from the Secretary signed August 14, 2008. See Section 4.0 for a list of Committee members.

The Department of Energy (DOE) Designated Federal Officer provided additional guidance for the Draft 2009 Annual Plan Review at the Sixth Meeting of UDAC in Washington on September 9-10, 2008.

The schedule of work for the review of the 2009 Plan included the following key milestones:

- 8/14/2008 - DOE Notice to UDAC for Draft 2009 Annual Plan Review
- 9/9-10/2008 - 6th UDAC Meeting in Washington, DC
- 09-10/2008 - Subcommittee Inputs to Leaders
- 10/10/2008 - Leaders submit recommendations to Chair
- 10/14/2008 - Combined Recommendations Distributed by Chair
- 10/15/2008 - 7th UDAC Meeting in Houston, TX
- 10/16/2008 - Edit Subcommittee Compiles Subcommittee Reports into Draft Final Report
- 10/21/2008 - Edit Subcommittee Distributes Draft Final Report and Transmittal Letter to UDAC
- 10/23/2008 - 8th UDAC Meeting: Teleconference to Review and Vote on Final UDAC Report

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2.0 EXECUTIVE SUMMARY AND RECOMMENDATIONS

The UDAC recognizes the experience and expertise of the team responsible for planning and executing the UDW Program element: the DOE, National Energy Technology Laboratory (NETL) and RPSEA (the Consortium). An extensive effort, supported by a large number of industry experts, has been successful in identifying research opportunities which are aligned with the Program goals.

The UDAC met September 9-10, 2008, and agreed to form five subcommittees to review the 2009 Draft Plan. These subcommittees focused on:

- R&D Program Focus
- Program Scope
- Process
- Program Progress & Value
- Societal Impact

The Plan, if successfully executed, will contribute to the primary Program goal of increasing the UDW resource base and converting discovered resources into proven reserves which can be safely and economically recovered while protecting the environment. However, this will require awarding the contracts to organizations selected to perform the research, and delivery of the expected results to the UDW industry. The UDAC notes that only three contracts had been awarded by mid-October 2008 since the beginning of the Program. The Committee recognizes that NETL and RPSEA are working to streamline the process and improve R&D project awards and anticipates that these efforts will be successful. The UDAC recommends that efforts be made to expedite the award process, and to establish a system of monitoring the status of the Program, including measures and scorecards.

In accordance with EAct, the UDAC believes the Program results are beneficial and should encompass areas beyond the Gulf of Mexico within U.S. territorial waters, including the Arctic. These other areas should not dilute the Program to the point where funds may be insufficient for executing Grand Challenge/breakthrough projects. The Committee recommends that more emphasis be given to projects representing Grand Challenges.

While safety and the environment are aspects of the Plan, efforts should be put forth to better define and address these elements. The Committee recommends that safety and environment aspects of the Plan should each be given greater emphasis.

Please be aware that funding levels should be closely monitored and appropriation authorization provided by EAct may need to be activated. As projects move toward the field demonstration stage, current funding provisions may be insufficient in view of the high costs of technology evaluation and implementation in the UDW operating environment. For example, R&D programs of similar nature, such as DEMO 2000 sponsored by the Research Council of Norway,

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have been funded with a total cost-share of USD \$500 Million from 1999 – 2008. The Committee recommends looking for opportunities for international collaboration, and increased focus on cost sharing by industry.

Finally, the maturation timeline for UDW developments is in its early phases, and will extend over the next twenty years and longer. R&D technology development will be a key enabler throughout the entire lifecycle. EPAct and programs of this nature will be vitally important in the next few decades to ensure our energy security.

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3.0 SUBCOMMITTEE REPORTS

At the September 9-10 meeting, the UDAC agreed to divide the UDW Program element of the Draft 2009 Annual Plan for the UDW and Unconventional Natural Gas and Other Petroleum Resources Research and Development Program (the Plan) and review the following focus areas:

- R&D Program Focus
- Program Scope
- Process
- Program Progress & Value
- Societal Impacts

Subcommittees were formed to assess the Plan for each of the five (5) focus areas and provided the review and recommendations to the Secretary.

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3.1. R&D PROGRAM FOCUS

Overview

The Committee is pleased that many of the recommendations from the previous UDAC have been implemented. The Ultra-Deepwater Program element concentrates on six major needs:

1. Drilling, Completions, and Interventions Breakthroughs
2. Appraisal & Development Geoscience and Reservoir Engineering
3. Significantly Extend Subsea Tieback Distances/Surface Host Elimination
4. Dry Trees/Direct Well Intervention and Risers in 10,000 Feet Water Depth
5. Continuous Improvement/Optimization of Field Development
6. Associated Safety and Environmental Concerns

Finding #1: Program Content

The UDAC is in general agreement with the first five needs that have been identified and the criteria that are being used to make selections (Note: Need 6 referenced above requires clarification relative to the definitions of “safety” and “environment”, which is addressed in Section 3.1 “R&D Program Focus” and Section 3.5 “Societal Impact” of this Report). We recognize that the project selections are what ultimately define the Program focus.

Recommendations:

- Safety and environmental projects should be considered as separate topics.
- Safety and environmental projects should be identified with specific phases of the exploration and production lifecycle (i.e., find, develop, produce and abandon).
- The project impact assessment utilized in the project selection process should be made public and available to the UDAC.

Finding #2: Safety and Environmental Impact

The Plan does not have clear definitions for the terms “safety” and “environmental”. The Plan recommends assessing the safety and environmental impact of UDW funded projects, but not the overall safety or environmental impact of ultra deepwater development.

Recommendations:

- Fund projects which address the overall safety impact of UDW activity.
- Fund projects which address the overall environmental impact of UDW activity.

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Finding #3: Safety

Identified metocean projects address global warming effects on hurricanes and offshore current predictions. Wind and wave predictions are critical to safe, advanced structural design necessary to drill and develop UDW projects.

Recommendation:

The metocean program should be strengthened regarding wind and wave predictions.

Finding #4: Environmental

No environmentally based R&D projects have been solicited and selected that address biological and ecological impacts, both positive and negative, of UDW activity.

Recommendation:

Environmental studies should address the biological and ecological impacts, both positive and negative, of UDW activity.

Finding #5: Grand Challenges

The Plan does not contain sufficient R&D projects which constitute Grand Challenge technologies. "Grand Challenges" are defined as transformational technologies which, if successfully developed, are capable of leapfrogging conventional pathways.

Recommendation:

The UDW Program element should be primarily directed at R&D that drives step changes in the industry (i.e., Grand Challenges).

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3.2. PROGRAM SCOPE

Overview

In reviewing the Plan, the overall Program scope for the UDW element is oriented toward the ultra-deep waters of the Gulf of Mexico. EPAct provides for the UDW Program elements to encompass U.S. territorial waters within specified water depths and subsurface formation depths, which are not limited to the Gulf of Mexico. Technology and experience from UDW arenas other than the Gulf of Mexico are valuable in securing energy for America.

Finding #1: Other Petroleum Provinces

Technology and the knowledge base needed to explore and exploit hydrocarbons in ultra-deep waters coincide to a large extent with those needed for developing other oil and gas provinces that will be of importance to the U.S. (e.g. offshore, harsh metocean conditions, Arctic and remote locations). In terms of domestic oil and gas supply, these regions will become strategically and economically important to the U.S. in the future.

Recommendation:

Expand the Plan's scope to petroleum provinces within the definition of EPAct (e.g., Arctic) and undertake technology development to maximize the supply of domestic oil and gas. Caution should be exercised to avoid diluting available funds in a way that impacts the total size of projects and promoting the most beneficial R&D technologies.

Finding #2: International Deepwater R&D Program Collaboration

UDW oil and gas operators and service industry in the U.S. work globally and do not limit their activity and technology base to U.S. territorial waters. DEMO 2000 in Norway (USD \$500 Million total funding from 1999 to 2008), Brazil, Industry Technology Facilitator (ITF) in the United Kingdom, and the consortium 'West Africa Deepwater Operators' (WADO) have shared their offshore technologies and experiences for many years.

Recommendation:

Seek cooperation and experience with similar programs internationally in order to gain leverage/synergy and avoid redundancy/duplication of effort.

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3.3. PROCESS

Overview

The Program is well established and in the early stages of execution. The challenges to UDW R&D are broad, complex, requires innovation and capital intensive. Implementing a plan of this magnitude requires cooperation between entities involved in administering the Program and stakeholders. UDAC believes this endeavor has been successfully achieved thus far, however, improvements are required in certain areas.

Finding #1: Intellectual Property

No evidence has surfaced that contractual provisions governing intellectual property (IP) rights are a barrier to the selection and award process, however, it remains a critical success factor to the UDW Program element.

Recommendation:

Continue monitoring IP rights in the project selection/award process.

Finding #2: Request for Proposal (RFP)

Although progress has been made, RFP solicitations tend to be very specific and may curtail scientific creativity.

Recommendation:

The RFP solicitation process should be reviewed to allow a broader approach to problem identification and solving to promote “out of the box” thinking and a broader base of respondents.

Finding #3: Contract Award Process

Although streamlining has been implemented, contractual complexity with respect to research performers has resulted in protracted cycle times to achieve contract award, withdrawal of potential contractors, and qualified candidates not responding to RFPs.

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Recommendations:

- Explore and implement ways to further streamline the contract award process. For example, examine the potential of linking cost share to the commercial structure of the contract by establishing cost-share tranches that correlate to procurement, cooperative research and grant commercial structures. Procurement contracts could be utilized for R&D cost share up to 50%. Cost-share proposals ranging from 50% to 75% may be considered to be collaborative R&D governed by cooperative research-type contracts. RFPs selected/awarded that exceed 75% of cost share could be delivered under a grant.
- Perform an after action review to identify the key success elements of the Unconventional Program and apply these learnings to the UDW Program element, as appropriate.
- Conduct a survey of the UDW research community to identify process changes which may yield increased response to UDW RFPs.

Finding #4: Private-Sector Funding

The Plan continues to promote minimum cost share of 20%. The Program may benefit from increased private sector funding, including cost sharing. Programs of similar nature, such as DEMO 2000 (Norway), provide for research performer cost shares starting at 75%.

Recommendations:

- Promote higher cost share proposals by increasing the weight allocated to the cost share element in the proposal evaluation and selection process
- Consider in-kind contributions in the cost share element of the proposal (e.g., rig time, vessel utilization, core samples, etc.)
- Encourage private funding sources to support the UDW Program element

Finding #5: Complementary Program

The UDW Program element could benefit from a more robust Complementary Program with greater focus on UDW technology needs identified in the Plan.

Recommendation:

The Complementary Program should identify and assign resources to UDW technology needs specified in the Plan that are unfunded and not redundant.

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3.4. PROGRAM PROGRESS & VALUE

Overview

With limited project awards to date, it is difficult to identify the value and benefit of the Program from a quantitative prospective due to the lack of tangible data associated with project(s) progress.

Finding #1: Program Monitoring

The Plan provides for implementation of certain monitoring and measurement systems identified as:

- Monitoring and Reporting Program Management Performance and Budget Metrics
- Program Benefits Assessment

Recommendation:

The referenced status reports should be made available to the public through the “Technology Transfer” vehicles used by NETL and RPSEA (i.e., web sites, public mailers, etc).

Finding #2: Program Metrics

Metrics are being captured with respect to requirements of EPAct.

Recommendation:

Produce a quarterly executive summary document using a simple table format. An example of the data to be included follows:

- Reference year of funding allocation
- Number of projects solicited
- Number of projects awarded
- Contract award value
- Project name and affiliate (university, private sector company, etc.)
- Projected start and completion dates
- Value of the UDW Program element (estimated by Benefits Assessment)
- Projected additional federal royalty
- Potential jobs created

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Finding #3: Program Value (Long Term)

The extreme conditions of UDW require cutting edge technologies that can take many years to develop and progress to commerciality and reliability. Technology demonstration in the UDW environment requires significant investment. The UDW provinces are in early stages of development and will continue to have technology needs for many decades spanning the entire E&P lifecycle (find, develop, produce, and abandon).

Recommendations:

- Funding levels should be closely monitored and appropriation authorization provided by EAct (section 999H[e]) may need to be activated in the future.
- Continue EAct and other programs of this nature to provide R&D for the required UDW technologies throughout the entire E&P lifecycle (find, develop, produce & abandon), which will take place over the next several decades.

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3.5. SOCIETAL IMPACTS

Overview

The Plan insufficiently addresses the distinction between safety and environment and lacks clear executable projects in these areas. There is great opportunity to promote sustainable development and attract young professionals to the workforce through projects that are environmentally and safety focused.

Finding #1: Environmental Research Plan

The environmental aspects of the UDW Program element are not clearly understood within the context of other environmental federally funded programs (e.g., NOAA, NSF, etc.). Specific environmental programs relating to UDW activities are not identified in the Plan.

Recommendations:

- Fund projects on atmospheric or oceanic research that clearly demonstrate a benefit to UDW development, not merely augmenting research already funded by other government agencies. (See Section 3.1)
- Emphasis should be placed on environmental projects which study the impacts of UDW activity, both positive or negative. (See Section 3.1)

Finding #2: Environmental Impact Assessment

The Plan does not describe how environmental impact(s) of UDW projects will be evaluated.

Recommendation:

Define strategies for assessing and monitoring potential environmental impact, both positive and negative. Consider developing a detailed document describing what is known and not known about the ecology of UDW environments, and how oil/gas exploration, drilling, and production activities could potentially impact environmental quality, productivity, and sustainability.

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Finding #3: Workforce Development

Private funding of fellowships/scholarships/internships supporting UDW R&D programs is an effective way to enhance future workforce and attract young professionals to the oil and gas industry. This enhances the U.S.'s ability to implement and follow through on UDW technology and be competitive on a global scale to secure our future energy independence.

Recommendation:

Encourage continuation of this practice.

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4.0 ULTRA DEEPWATER ADVISORY COMMITTEE – 2008-2010

Mr. Kent F. Abadie Manager Development and Production Shell Exploration & Production Company	Dr. Joe R. Fowler* President Stress Engineering Services, Inc.	Mr. Stephen Sears* Department Chair Dept. of Petroleum Engineering Louisiana State University
Mr. Raymond G. Charles Area Exploration & Geoscience Manager ExxonMobil Exploration Company	Dr. Luc T. Ikelle* Robert R. Berg Professor Texas A&M University	Mr. Paul T. Tranter Vice President Asset Management, Floating Rigs Transocean, Inc.
Mr. Paul N. Cicio President Industrial Energy Consumers of America	Mr. Arnis Judzis Vice President TerraTek Schlumberger	Mr. Paul M. Wiencke Director Research Council of Norway
Mr. Daniel J. Daulton U.S. Technical Marketing Manager BJ Services Company	Mr. Richard K. Mitchell Vice President Worldwide Drilling & E&P Services Devon Energy Corporation	Ms. Mary Jane Wilson* President and CEO WZI Inc.
Dr. Quenton R. Dokken Executive Director Gulf of Mexico Foundation	Mr. Daniel T. Seamount, Jr., Chair Alaska Oil & Gas Conservation Commission	

*Special Government Employee

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5.0 SUBCOMMITTEE TOPICS AND MEMBERS

The Plan review and preparation of the final Committee Report involved the following:

R&D Program Focus

Lead – Joe Fowler

Members – Ray Charles & Dan Daulton

Program Scope

Lead – Arnis Judzis

Members – Dan Seamount & Morten Weincke

Process

Lead – Luc Ikelle

Members – Kent Abadie, Joe Fowler & Paul Tranter

Program Progress & Value

Lead – Richard Mitchell

Members – Paul Cicio, Dan Daulton & Quenton Dokken

Societal Impacts

Lead – Quenton Dokken

Members – Paul Cicio, Stephen Sears & Mary Jane Wilson

Editing Subcommittee

Lead – Kent Abadie

Members – Dan Daulton, Arnis Judzis & Stephen Sears