Ultra-Deepwater Advisory Committee (UDAC)

February 23, 2011

Fourteenth Meeting

Meeting Minutes

Ultra-Deepwater Advisory Committee

I hereby certify that this transcript constitutes an accurate record of the Ultra-Deepwater Advisory Committee meeting held on February 23, 2011.

Dan Daulton, Chair
Ultra-Deepwater Advisory Committee

Oct. 14, 2011
Date

Ultra-Deepwater Advisory Committee (UDAC) Meeting
February 23, 2011, L'Enfant Plaza Hotel, 480 L'Enfant Plaza, SW, Washington, DC

The meeting was called to order at 8:00 am by Deputy Assistant Secretary (DAS) for Oil and Natural Gas, and Designated Federal Officer (DFO) for Ultra-Deepwater Advisory Committee, Christopher A. Smith. After welcome, and introduction of the members, DAS Smith appointed Dan Daulton and Mary Jane Wilson as UDAC Committee Chair and Vice Chair, respectively. (Attachment 1)

Mr. Daulton reported that all members where in attendance (Attachment 2). The Chair conducted the meeting by calling upon each presenter according to the agenda (Attachment 3).

Presentation by Elena Melchert, DOE, Committee Manager for UDAC (Attachment 4)

Elena Melchert, DOE Program Manager for Oil and Gas Production Research, and UDAC Committee Manager, presented background information highlighting historical milestones over the course of the Ultra-Deepwater Research Program, and the UDAC.

Presentation by Deputy Assistant Secretary Christopher A. Smith (Attachment 5)

DAS Smith presented an overview of the role of offshore oil and gas in the Administration's energy policy. He began by acknowledging the tragic loss of life of 11 men on the *Deepwater Horizon*, and then moved to some key findings by the *National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling*. He noted that spill prevention technology was not keeping pace with the development of advanced recovery technology. He referenced remarks by President Obama regarding the importance of safe and responsible oil and gas production, and the refocusing of the DOE Ultra-Deepwater Research Program on risk assessment and safety. He concluded with a discussion on the role of technology in preventing and mitigating an upset event occurring in ultra-deepwater, and on the areas of potential research listed in the *DOE 2011 Annual Plan*.

The UDAC then engaged in discussion with Deputy Assistant Secretary Smith.

Presentation by Roy Long, National Energy Technology Laboratory (NETL) (Attachment 6)

Mr. Long presented an overview of the Department of Energy's oil and gas research program which is implemented by NETL. He began with an overview of the technical capabilities of NETL, and an overview of the oil and gas research portfolio managed by NETL. He presented a brief description of current projects based on prior year funding, including a discussion about the Stripper Well Consortium and projects included in that program. He then described the NETL integrated technology transfer program structure, and concluded with an in depth discussion of the NETL Knowledge Management Database (KMD) including screen shots of the KMD.

The UDAC then engaged in discussion with Mr. Long.

Presentation by Dr. Robert Siegfried, President, Research Partnership to Secure Energy for America (RPSEA) and Mr. James Pappas, Vice President, Ultra-Deepwater Program, RPSEA (Attachment 7)

Dr. Siegfried presented an overview of the RPSEA 2011 Draft Annual Plan (DAP). He was joined in the presentation by Mr. James Pappas. They discussed background information about RPSEA including organizational structure, approach to planning, and project review structure using industry volunteers. Discussion included a summary of the current project portfolio, including overview of performers ranging from universities to State agencies to for profit and non-profit organizations.

Mr. Pappas provide a detailed description of RPSEA's approach taken to build the Ultra-Deepwater Research Program, and provided an overview of DAP specific projects. The presentation continued with an overview of the RPSEA 2011 Draft Annual Plan. By statute, RPSEA, as the Program Consortium under contract to the Department of Energy must offer its recommendations for the annual research program in the form of the DAP. The discussion concluded with an overview of the various ways RPSEA approaches technology transfer.

The UDAC then engaged in discussion with Dr. Siegfried and Mr. Pappas.

Presentation by John Duda, Director, Strategic Center for Natural Gas and Oil
National Energy Technology Laboratory (Attachment 8)

During the working lunch, Mr. Duda presented an overview on the topic of implementing the "Section 999" research program. He presented an overview of various aspects related to implementation including compliance with Federal procurements regulations, the National Environmental Policy Act, and annual audits.

He described the requirement for a Technical Committee to determine that the NETL Complementary Research and the cost-shared research administered by RPSEA are not duplicative but, in fact, are complementary. He reported that the most recent determination by the Technical Committee for 2010 stated that there is no duplication between the two research programs.

He concluded with a discussion about technology transfer, cost-share requirement, recent streamlining of the project approval process, and a summary of research performers by type.

The UDAC then engaged in discussion with Mr. Duda.

Committee Discussion with Secretary of Energy Steven Chu

After lunch, Secretary of Energy Steven Chu joined the meeting. After brief opening remarks, he asked the UDAC to advise on ways to prevent and/or reduce the risk of a "Macondo-like" oil spill from occurring again, and ways to improve safety of operations in ultra-deepwater. He interacted with the members on various topics related to safety and risk assessment in ultra-deepwater operations, and about his experience in working to help stop the *Macondo* oil spill. There was some discussion about the findings and recommendations made by the *National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling.* Also, there were several references to the lessons that could be learned from other industries dealing with high consequence industries such as aviation and nuclear. Secretary Chu also pointed to technical capabilities unique to DOE such as its long-term experience managing research programs of various types, and the capabilities of its national laboratories.

Establishment of *ad hoc* Review Subcommittees
At the departure from the meeting of Secretary Chu, the Chair then led the discussion leading to the establishment of processes and procedures to be used by the UDAC to begin its formal review of the *Draft 2011 Annual Plan*.

The Chair appointed the following to each Subcommittee. The members were asked to organize, and to draft findings and recommendations for presentation at the next meeting on April 6-7, 2011 in Houston, Texas.

Process Subcommittee
Lesli J. Wood – Chair, Nagan Srinivasan, Lars Håvardsholm , Luc Ikelle, Mary Jane Wilson, Stephen Pye, Daniel Daulton

Portfolio Subcommittee
George Cooper – Chair, Quenton Dokken, Hartley Downs, Douglas Foster, James Litton, William New, Elmer Danenberger

Editing Subcommittee
Daniel Daulton, Chair, Mary Jane Wilson, Hartley Downs, Douglas Foster

Presentation by Elena Melchert, UDAC Committee Manager (Attachment 9)
To focus on next steps, Ms. Melchert presented the pending Committee calendar with milestone, deliverables, and schedule.

There being no members of the public wishing to provide public comments, the meeting was adjourned.

Attachments

	Presenter	Topic
1	For the Record	Chair and Vice-Chair Appointment Letter
2	For the Record	Committee Members and Meeting Participant Attendance
3	For the Record	Meeting Agenda
4	Ms. Elena Melchert	UDAC Historical Milestones and Overview
5	Mr. Chris Smith	After Macondo: The Road Ahead
6	Mr. Roy Long	Oil and Gas Program Overview
7	Mr. James Pappas	Ultra-Deepwater Draft Annual Plan
8	Mr. John Duda	UDAC Program Implementation
9	Ms. Elena Melchert	UDAC Calendar and Next Steps

Attachment 1

Department of Energy
Washington, DC 20585

MEMORANDUM FOR THE RECORD

FROM: **CHRISTOPHER A. SMITH**
DEPUTY ASSISTANT SECRETARY
OFFICE OF OIL AND NATURAL GAS

SUBJECT: **Appointment of Committee Chair and Vice-Chair**
Ultra-Deepwater Advisory Committee

Whereas, article 12 of the committee charter states that the Secretary shall designate a chair and vice-chair, and article 1.23 of the Department of Energy Delegation Order No. 00-002.00G and article 1.5 of the Department of Energy Redelegation Order No. 00-002.04C transfer this authority of the Secretary to the Assistant Secretary for Fossil Energy, the Assistant Secretary has designated Mr. Daniel J. Daulton and Ms. Mary Jane Wilson to serve as the Chair and Vice-Chair, respectively, of the Ultra-Deepwater Advisory Committee for the term of 2011-2012.

Attachment 2

Ultra-Deepwater Advisory Committee Meeting
Sign-In Sheet - February 23, 2011

Last Name	First Name	Organization	Initial
Cooper*	George A.	University of California, Berkeley	GAC
Danenberger*	Elmer P.	Offshore Consultant	EPD
Daulton	Daniel J.	~~BJ Services Company~~ Baker Hughes	DJD
Dokken	Quenton R.	Gulf of Mexico Foundation	
Downs	Hartley H.	Baker Hughes Incorporated	
Foster	Douglas J.	ConocoPhillips	
Håvardsholm	Lars	Statoil	
Ikelle*	Luc T.	Texas A&M University	
Litton*	James D.	Litton Consulting Group, Inc.	
New	William C.	New Industries, Inc.	
Pye	D. Stephen	Consultant	**TELECONFERENCE**
Srinivasan	Nagan	Deepwater Structures, Inc.	
Wilson*	Mary Jane	WZI Inc.	
Wood*	Lesli J.	Bureau of Economic Geology	

Total Members = 14

QUORUM = 8

Confirmed attendees = 14
Regrets = 0

* Special Government Employee

Ultra-Deepwater Advisory Committee Meeting
February 23, 2011

DOE Staff Roster

U.S. Department of Energy – Office of Oil and Natural Gas

Christopher Smith Deputy Assistant Secretary	Designated Federal Officer
Elena Melchert Program Manager for Section 999	Committee Manager

National Energy Technology Laboratory

John Duda	Director, Strategic Center for Natural Gas & Oil
Roy Long	Ultra-Deepwater & Unconventional Natural Gas and other Petroleum Resources Technology Manager
Gary Covatch	Strategic Center for Natural Gas & Oil

IBM

Karl Lang	Meeting Minutes Recorder/Facilitator
Rob Matey	Meeting General Support
Dana Haraway	Registration Support

Ultra-Deepwater Advisory Committee Meeting
Public Sign-In Sheet - February 23, 2011

Name	Organization	Phone	E-mail
Bob Siegfried	RPSEA	281 690-5502	rsiegfri@aol.com
James Pappas	RPSEA	281-690-5511	jpappas@rpsea.org
George Guthrie	NETL	412 386 6571	george.guthrie@netl.doe.gov
Olayinka Ogunsola	202-586-6743		
Scott Klara	DOE		
~~[illegible]~~	~~GMF~~	~~301 [illegible]~~	
Gary Gentile	Platts	202 383 2251	gary_gentile@platts.com
Trudy Transtrum	DOE		
Jill Schiller	GSA	202-208-2664	jill.schiller@gsa.gov
David Diamond	DOE - PI		david.diamond@hq.doe.gov
Holly Hopkins	API	202 682 8439	hopkinsh@api.org
Alex Matthews	House Science, Space, and Tech. Committee	202-225-6371	alex.matthews@mail.house.gov
Sonia Thangavelu	The George Washington University	240-393-8150	sgthang@gwmail.gwu.edu

Ultra-Deepwater Advisory Committee Meeting
Public Sign-In Sheet - February 23, 2011

Name	Organization	Phone	E-mail
Doug Morris	DOE/EIA	202 586-6577	doug.morris@eia.doe.gov
Ehsan E Khan	DOE	202-586-4785	ehsan.khan@hq.doe.gov

Attachment 3

Department of Energy
Washington, DC 20585

14th Meeting
Ultra-Deepwater Advisory Committee
February 23, 2011
L'Enfant Plaza Hotel, 480 L'Enfant Plaza, SW, Washington, DC

AGENDA

7:30 am	*Sign in*	
7:30 am	*Ethics Briefing for SGEs*	*DOE/General Counsel*
8:00	Call to Order, Welcome, Introductions Appointment of the Chair	Christopher A. Smith Deputy Assistant Secretary (DAS) for Oil and Natural Gas, and Designated Federal Officer (DFO) for Ultra-Deepwater Advisory Committee
8:15	Administrative Topics --Overview of "Section 999" -- Program Timeline --Roles and Responsibilities	Elena Melchert Committee Manager (CM)
9:15	Role of Offshore Oil and Gas in the Administration's Energy Policy	DAS Smith
	Committee Discussion	Dan Daulton, Chair
10:00	Overview of the Oil and Gas Research Program	Roy Long, NETL
	Committee Discussion	Chair Daulton
10:30	BREAK	
10:45	Overview of the Program Consortium's *2011Draft Annual Plan*	Dr. Robert Siegfried, President, RPSEA James Pappas, Vice President Ultra-Deepwater Program, RPSEA
	Committee Discussion	Chair Daulton
11:30	WORKING LUNCH "Implementing Section 999" John Duda, Director, Strategic Center for Natural Gas and Oil National Energy Technology Laboratory, U.S. Department of Energy	

14th Meeting
Ultra-Deepwater Advisory Committee
February 23, 2011
L'Enfant Plaza Hotel, 480 L'Enfant Plaza, SW, Washington, DC

1:00	Introduction of the Secretary of Energy	DAS Smith
	Remarks from the Secretary of Energy	Dr. Steven Chu U.S. Secretary of Energy
2:00	Committee Assignment and Deadline	DFO Smith
2:30	BREAK	
2:45	Overview of the Draft *2011 Annual Plan*	DAS Smith
3:30	Establishment of ad hoc Review Subcommittees Appointment of Subcommittee Chairs	Chair/Facilitator
4:30	Administrative Topics	CM Melchert
4:45	Public Comment	DFO Smith
5:00	Adjourn	Chair Daulton

APPROVED: _____ FEB 22 2011
Christopher A. Smith, Designated Federal Officer — Date

Attachment 4

Overview of "Section 999" and Ultra-Deepwater Advisory Committee

Elena Melchert
Committee Manager
Ultra-Deepwater Advisory Committee

February 23, 2011

U.S. DEPARTMENT OF ENERGY
Oil and Natural Gas

Energy Policy Act of 2005

- **Energy Policy Act of 2005, Public Law 109-58**
- **TITLE IX--RESEARCH AND DEVELOPMENT**
- **Subtitle J--Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Resources**
- **Sec. 999 -- Ultra-deepwater and unconventional onshore natural gas and other petroleum research and development program**
- **Signed into Law August 8, 2005**

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Section 999 Requirements

- **Program Elements**
  - Ultra-Deepwater Resources
  - Unconventional Resources
  - Small Producer Program
  - NETL Complementary Research
- **Other Requirements**
  - Program Consortium
  - Annual Plan
  - 2 Federal Advisory Committees
  - Technical Committee
  - Technology Transfer
  - Annual Audit
  - Benefits Assessment

3

Section 999: Advisory Committees

- **Advise the Secretary of Energy on development and implementation of activities related to:**
  - Ultra-Deepwater Program (Ultra-Deepwater Advisory Committee – UDAC)
  - Unconventional Resources Program (Unconventional Resources Technology Advisory Committee – URTAC)
- **Responsibilities**
  - Review annual plans
  - Make recommendations
- **http://www.fossil.energy.gov/programs/oilgas/advisorycommittees/UltraDeepwater.html**

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Program Milestones

August 2005	Energy Policy Act of 2005 signed into law [P.L. 109-58, 119 Stat. 922]
May 2006	*Ultra-Deepwater Advisory Committee* (UDAC) and *Unconventional Resources Technology Advisory Committee* (URTAC) chartered (Section 999D)
January 2007	Contract with Research to Secure Energy for America (RPSEA) as the Program consortium goes into effect (calendar year contract)
May 2007	UDAC and URTAC members appointed for 2007-2008
June-July 2007	Advisory Committees review 2007 Annual Plan and deliver written recommendations to the Secretary of Energy
August 2007	2007 Annual Plan published; DOE/Fossil Energy (FE) receives FY07 funds; RPSEA receives initial research funding

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Program Milestones

January 2008	Advisory Committees meet to review 2008 Annual Plan
March 2008	Advisory Committees meet to complete review of 2008 Annual Plan and provide written recommendations; final report delivered to the Secretary
June 2008	Technical Committee [Section 999H(d)(4)] determines that the NETL Complementary Research Program is not duplicative of the consortium-administered program
August 2008	UDAC & URTAC members appointed for 2008-2010
September 2008	UDAC & URTAC meet to begin draft review of 2009 Annual Plan
October 2008	UDAC & URTAC meet on Subcommittee reports, and deliver final recommendations on the 2009 Annual Plan

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Program Milestones

August 2009	Technical Committee meets
September 2009	UDAC & URTAC begin review of Draft 2010 Annual Plan
October 2009	UDAC & URTAC meet on Subcommittee reports, and deliver final recommendations on the Draft 2010 Annual Plan
April 2010	*Macondo explosion: 11 lives lost*
July 2010	Technical Committee meets
September 2010	URTAC meets to review Draft 2011 Annual Plan
October 2010	URTAC meets on Subcommittee reports, delivers final recommendations on the Draft 2011 Annual Plan
February 2011	UDAC meets to review Draft 2011 Annual Plan
April 2011	UDAC meets to hear and discuss Subcommittee reports, determine final recommendations, and adjourn work on the Draft 2011 Annual Plan

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Committee Responsibilities

- **The primary responsibilities of the Committee are:**
  - **Advise the Secretary of Energy on the "*…development and implementation of programs related to ultra-deepwater natural gas and other petroleum resources…*"**
  - **Review the Annual Plan and provide written comments, findings, and recommendations to the Secretary of Energy.**
  - **The Committee does not provide recommendations to other bodies or discuss Committee business with the press.**

8

Committee Responsibilities

- Other responsibilities of the Committee include:
  - Committee members may not speak ***in an official capacity*** outside Committee meetings.
    - Members are free to talk to Congress and Administration officials as individuals on matters not related to the work of the UDAC
  - The Committee does not review proposals submitted under RPSEA solicitations, nor recommend awards.
  - RPSEA is a contractor of the U.S. Department of Energy and does not report to the UDAC.
  - Members may not advise both RPSEA and the Secretary of Energy at the same time.

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Committee Responsibilities

- 2011 Annual Plan Review Process

  February 23rd Meeting:
  - Establish ad-hoc Review Subcommittees
    - Q: Does the UDAC wish to continue the Standing Subcommittee on Portfolio?
    - Q: Does the UDAC wish to continue the Standing Subcommittee on Process?
  - Each Subcommittee will meet to develop draft findings and draft recommendations for the UDAC.
  - Subcommittee meetings are held via conference calls and/or WebEx.
    - DOE provides logistics and support services for such meetings.

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Committee Responsibilities

- **2011 Annual Plan Review Process**

  Meeting on April 6-7, Houston, TX :

  - **Subcommittees present their reports to the UDAC**
  - **UDAC develops *final* findings and recommendations on the *2011 Annual Plan***
  - **Chair appoints Editing Subcommittee to develop the UDAC's written report**
    - **Editing Subcommittee may not change the letter or spirit of the UDAC findings or recommendations**
  - **Editing Subcommittee begins meeting immediately after the UDAC meeting adjourns**

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Committee Responsibilities

- **2011 Annual Plan Review Process**

  Conference Call Meeting on April (TBD) Washington, DC:

  - **UDAC meets via conference call to vote on the Editing Subcommittee report (date April 2011 TBD)**
  - **Chair delivers the UDAC final recommendations to the Secretary of Energy via the Designated Federal Officer (DFO).**

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Attachment 5

U.S. DEPARTMENT OF ENERGY
Oil and Natural Gas

AFTER MACONDO
The road ahead

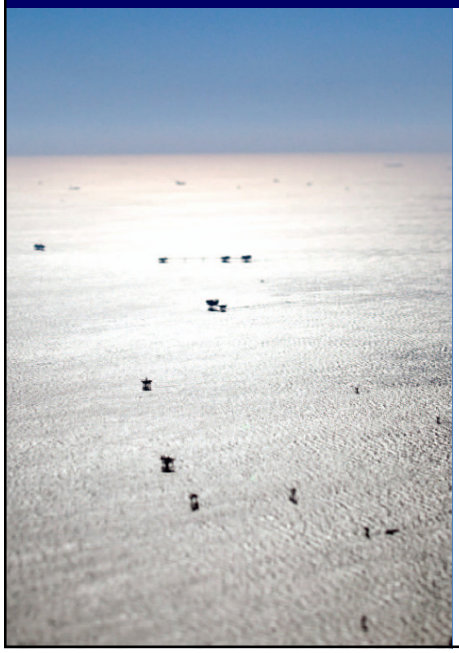
Presentation to the
Ultra Deepwater Advisory Committee

Christopher Smith
Deputy Assistant Secretary
Office of Oil and Natural Gas

23February 2011

April 20, 2010

Oil and Natural Gas



Jason Anderson

Aaron Dale Burkeen

Donald Clark

Stephen Curtis

Gordon Jones

Roy Wyatt Kemp

Karl Dale Kleppinger, Jr.

Blair Manuel

Dewey Revette

Shane Roshto

Adam Weise

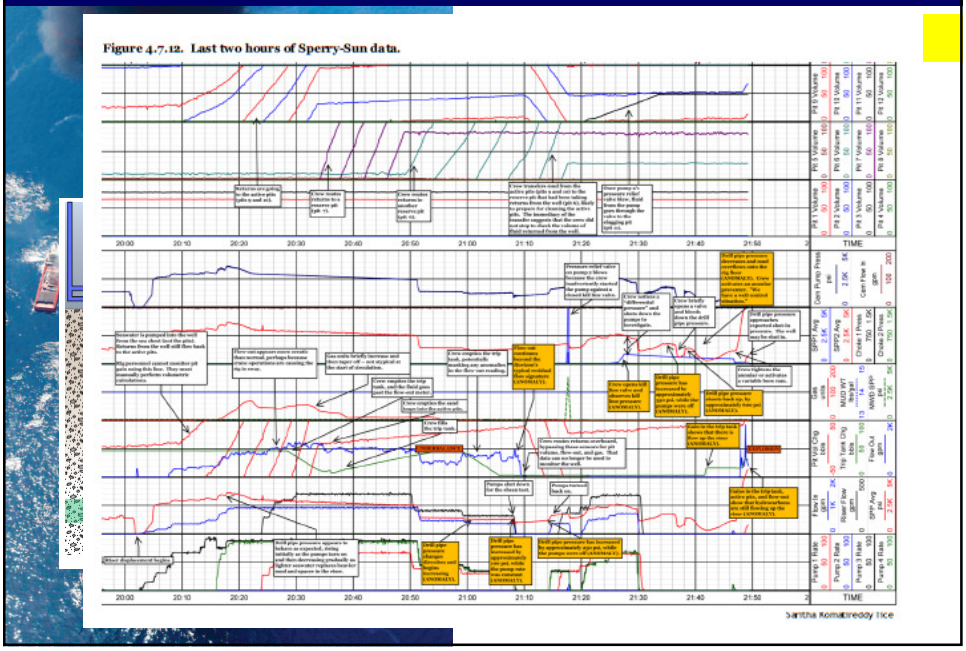
A high-stakes balancing act

Oil and Natural Gas

- Hydrostatic pressure vs. formation pressure
- Pore pressure vs. fracture gradient
- Data vs. intuition
- Time (money) vs. safety

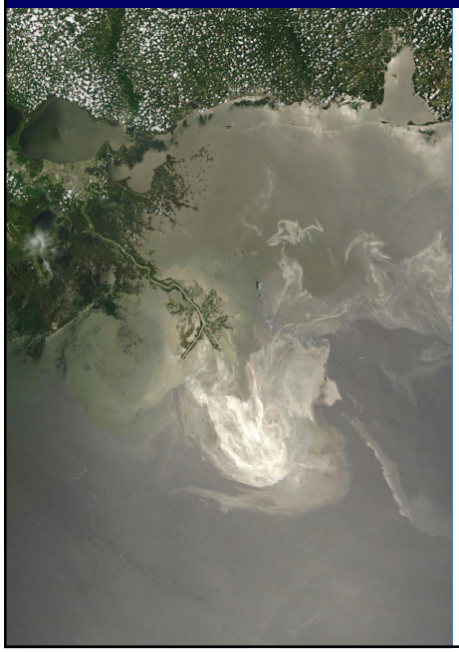
A string of challenges and questionable decisions…

Oil and Natural Gas



"This wouldn't have happened to us"

Oil and Natural Gas

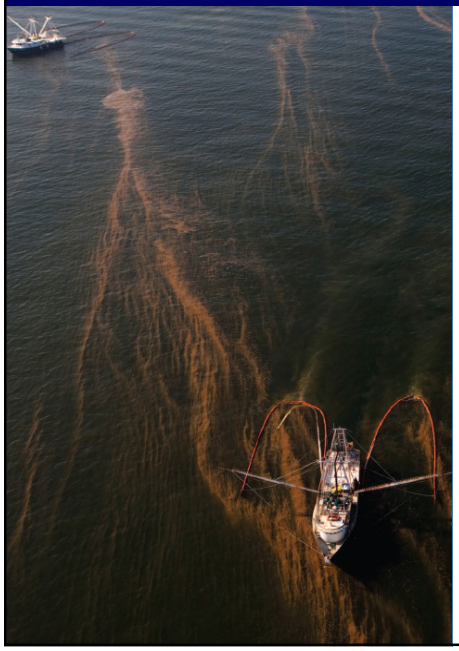


> *The immediate causes of the Macondo well blowout can be traced to a series of identifiable mistakes made by BP, Halliburton, and Transocean that reveal such systematic failures in risk management that they place in doubt the safety culture of the entire industry.*

OIL SPILL COMMISSION REPORT

Mitigating and cleaning up

Oil and Natural Gas



> *Two decades after the Exxon Valdez oil spill, cleanup technology has progressed so little that the biggest advancement in the Gulf of Mexico disaster — at least in the public's mind — is an oil-water separator based on a 17-year-old patent and promoted by the movie star Kevin Costner.*

NEW YORK TIMES, 24 JUNE 2011

The future of oil and gas

Oil and Natural Gas

I continue to believe that domestic oil production is an important part of our overall strategy for energy security, but I've always said it must be done responsibly for the safety of our workers and our environment

PRESIDENT OBAMA, APRIL 30, 2010

RPSEA and NETL

Oil and Natural Gas

Using authority provided by Subtitle J of EPAct 2005 the Department of Energy has refocused activities conducted within the program to address concerns about environmental sustainability and safety.

SEC. 999B. ULTRA-DEEPWATER AND UNCONVENTIONAL ONSHORE NATURAL GAS AND OTHER PETROLEUM RESEARCH AND DEVELOPMENT PROGRAM. 42 USC 16372.

(a) IN GENERAL.—The Secretary shall carry out the activities under section 999A, to maximize the value of natural gas and other petroleum resources of the United States, by increasing the supply of such resources, through reducing the cost and increasing the efficiency of exploration for and production of such resources, while improving safety and minimizing environmental impacts.

(b) ROLE OF THE SECRETARY.—The Secretary shall have ultimate responsibility for, and oversight of, all aspects of the program under this section.

(f) AWARDS.—

(1) IN GENERAL.—Upon approval of the Secretary the program consortium shall make awards to research performers to carry out research, development, demonstration, and commercial application activities under the program under this section. The program consortium shall not be eligible to receive such awards, but provided that conflict of interest procedures in section 999B(c)(3) are followed, entities who are members of the program consortium are not precluded from receiving research awards as either individual research performers or as research performers who are members of a research collaboration.

(e) ANNUAL PLAN.—

(1) IN GENERAL.—The program under this section shall be carried out pursuant to an annual plan prepared by the Secretary in accordance with paragraph (2).

(2) DEVELOPMENT.—

(A) SOLICITATION OF RECOMMENDATIONS.—Before drafting an annual plan under this subsection, the Secretary shall solicit specific written recommendations from the program consortium for each element to be addressed in the plan, including those described in paragraph (4). The program consortium shall submit its recommendations in the form of a draft annual plan.

(B) SUBMISSION OF RECOMMENDATIONS; OTHER COMMENT.—The Secretary shall submit the recommendations of the program consortium under subparagraph (A) to the Ultra-Deepwater Advisory Committee established under section 999D(a) and to the Unconventional Resources Technology Advisory Committee established under section 999D(b), and such Advisory Committees shall provide to the Secretary written comments by a date determined by the Secretary. The Secretary may also solicit comments from any other experts.

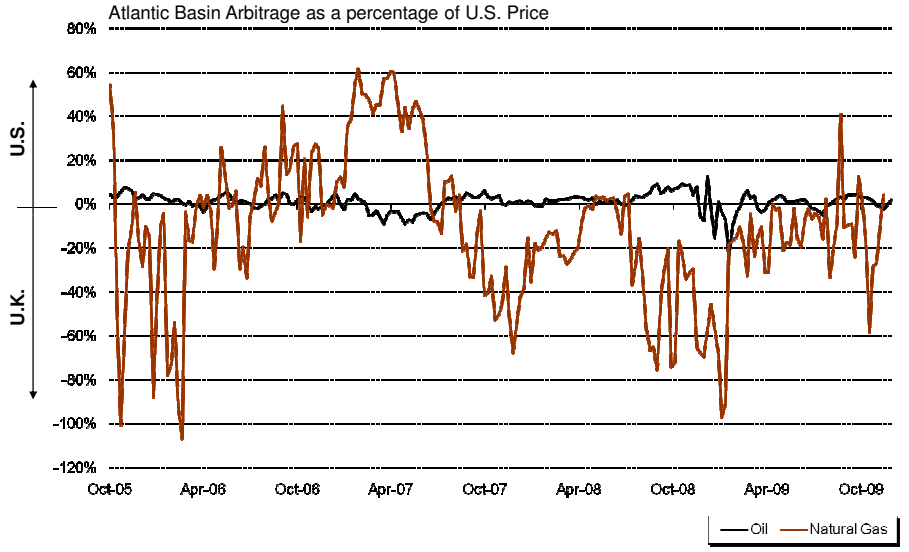
RPSEA
Research Partnership to Secure Energy for America

DOE's goals can only be accomplished through an effective public-private partnership with industry

RPSEA and NETL have made great strides in creating an effective, collaborative partnership.

Natural Gas: a Uniquely Domestic Commodity

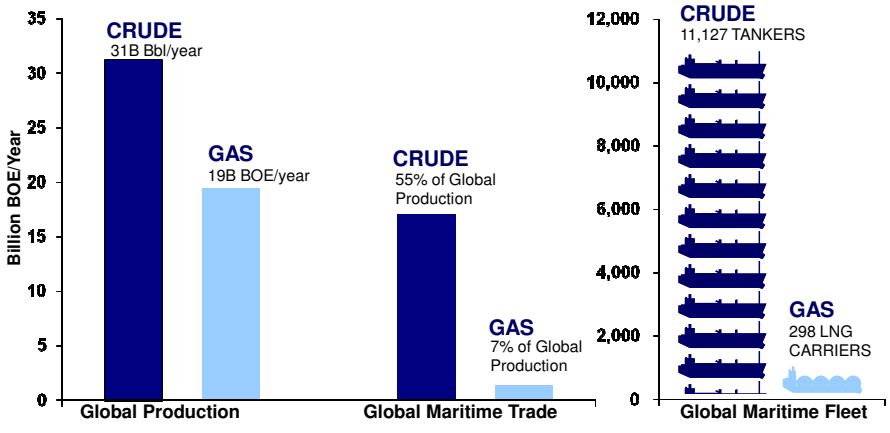
Oil and Natural Gas



Sources: Energy Information Administration, World Gas Intelligence

Structural differences between oil and gas drive global arbitrage

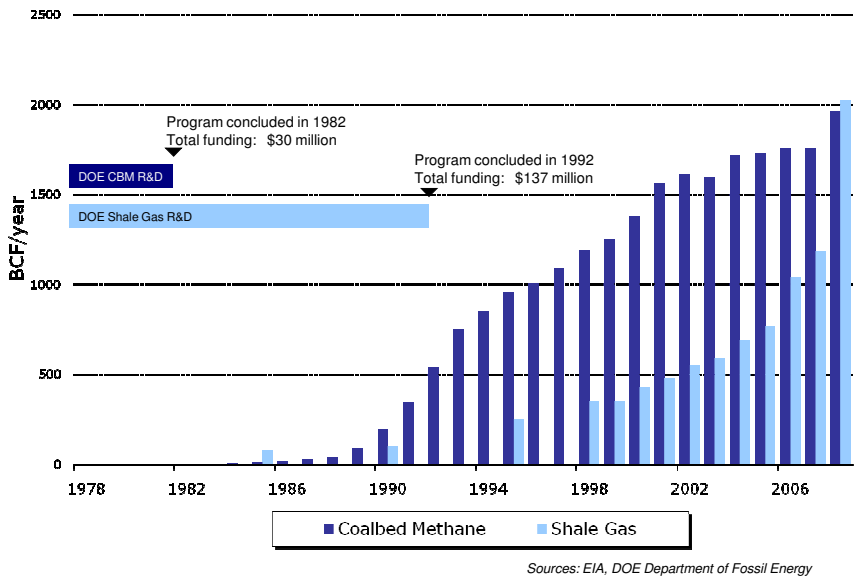
Oil and Natural Gas



Sources: EIA, BP Statistical Review of World Energy, June 2009, Pacific L.A. Marine Terminal LLC, GIIGNEL

DOE has a successful track record of promoting innovation in the natural gas sector

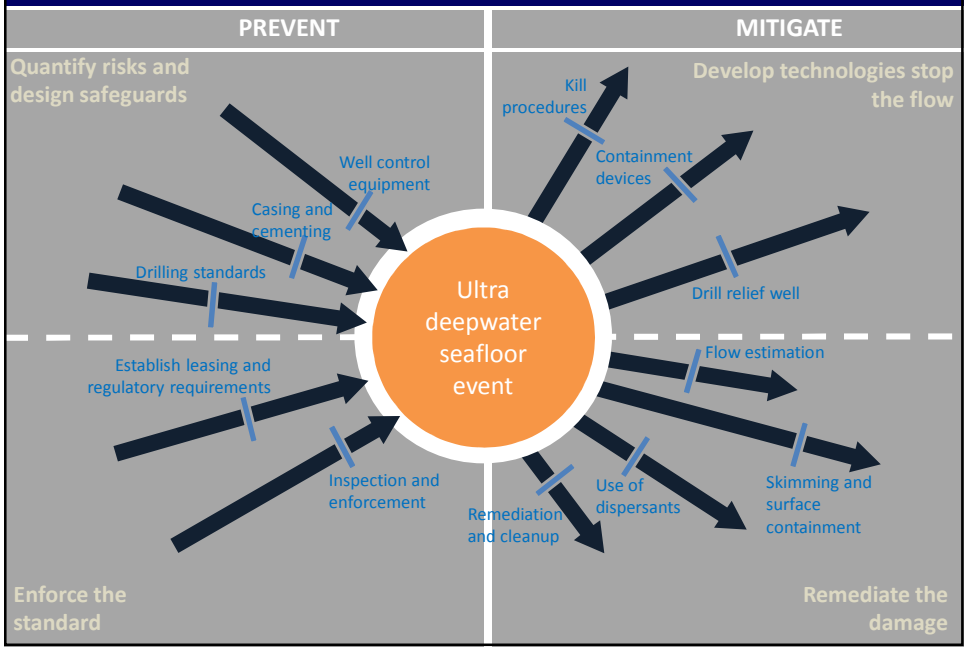
Oil and Natural Gas



Sources: EIA, DOE Department of Fossil Energy

Responding to the spill

Oil and Natural Gas



Draft Annual Plan

Oil and Natural Gas

1. Environmental and Safety Needs Related to Drilling, Completion, and Intervention
2. Increasing Safety of Early Appraisal and Development via Improved Geoscience and Reservoir Evaluation Technologies
3. Environmental and Safety Risks of Significantly Extending Subsea Tieback Distances
4. Enhance Technology for Dry Trees/Direct Well Intervention and Risers in 10,000' Water Depth to Improve Environmental and Safety Performance
5. Continuous Improvement and Innovation: Environmental and Safety

U.S. DEPARTMENT OF ENERGY
Oil and Natural Gas

QUESTIONS

Attachment 6

NATIONAL ENERGY TECHNOLOGY LABORATORY

Oil and Gas Program Overview

Roy Long, Technology Manager, NETL

UDAC Meeting, February 23, 2011, Washington, D.C.

U.S. DEPARTMENT OF ENERGY

February 23, 2011

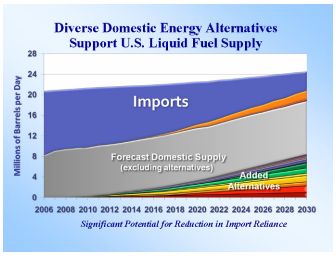
Outline

- **Introduction**
- **Traditional O&G Program Overview**
  - O&G Projects Summary
  - Stripper Well Consortium Highlight
- **Integrated Technology Transfer Program**
  - Structure
  - Publications
  - Knowledge Management Database (KMD)

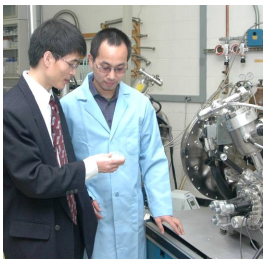
NETL Applies Basic Science to Technology Development, Demonstration, & Deployment

Onsite Research & Development

Systems, Analyses, & Planning



Extramural Research & Collaboration



Developing the critical science and technology to discover and Commercialize advanced energy systems that efficiently utilize domestic Resources in an environmentally sustainable manner

NETL Natural Gas & Oil R&D Program
Comprehensive R&D Portfolio

Advancing Technologies Supporting Development of Domestic Unconventional Resources

Unconventional FE Technologies

Methane Hydrates

Environmental Solutions

Ultra-Deepwater & Unconventional Resources Program

EPAct 2005 Title IX, Subtitle J

Outline

- Introduction
- **Traditional O&G Program Overview**
  - O&G Projects Summary
  - Stripper Well Consortium Highlight
- Integrated Technology Transfer Program
  - Structure
  - Publications
  - Knowledge Management Database (KMD)

Traditional Program Overview

- **67 Projects (excludes Hydrates and Section 999 projects)**
- **$121 MM Total Value ($85 MM Gov't. Share, $36 MM Cost-Share)**
- **Current projects from prior year funding:**
  - Fracture Flowback & Produced Water Treatment and Mgmt.
  - Environmental Impact Mitigation
  - Water Resources Management
  - Enhanced Oil Recovery
  - Unconventional Oil Production
  - Increasing Domestic Oil and Gas Production
  - Reservoir Characterization
  - Drilling/Completion/HPHT Downhole Tools
  - Seismic Technology
  - Oil and Gas Infrastructure-Related
  - Technology Transfer

Stripper Well Consortium

- Industry-driven consortium est. Oct 2000
- Funded by NETL, NYSERDA, members (75)
- ~100 projects funded
- SWC - $9.6 million Cost Share - $7.6 million
- Target: small independents
- Excellent Cooperation amongst members
- Projects: 1 year duration
- Process very Operator friendly

- **Low-cost innovative technology to:**
  - Increase production
  - Reduce operating costs
  - Reduce environmental footprint

www.energy.psu.edu/swc

Outline

- Introduction
- Traditional O&G Program Overview
  - O&G Projects Summary
  - Stripper Well Consortium Highlight
- **Integrated Technology Transfer Program**
  - Structure
  - Publications
  - Knowledge Management Database (KMD)

NETL Integrated Technology Transfer Program Structure

		Program Consortium	NETL	Contractors	DOE-HQ
Information to be Delivered	Project Reports		Complementary program	Interim and final reports	
	Project Data Sets		Complementary program	Spreadsheets, GIS, other	
	Project Software			Models and online tools	
	Presentations/papers	Program and project level	Program and project level	Project level	High Level Program
	Program Information	RFPs, deliverables, metrics, feedback	Program updates, benefit assessments		Program activity, FAC reports, mandated info.
Delivery Vehicle	Project websites			Selected projects have websites	
	Program websites	RPSEA site with links	KMD Portal on NETL site with links		Pages on DOE site
	Publications	Newsletter, articles in trade press	Newsletter, Techlines, articles in trade press	Technical papers, articles	Press releases, Techlines
	Forums/Workshops	Forums/Workshops	PTTC Workshops		
	Public meetings	SPE papers, other technical meetings	SPE papers, other technical meetings	SPE papers, other technical meetings	

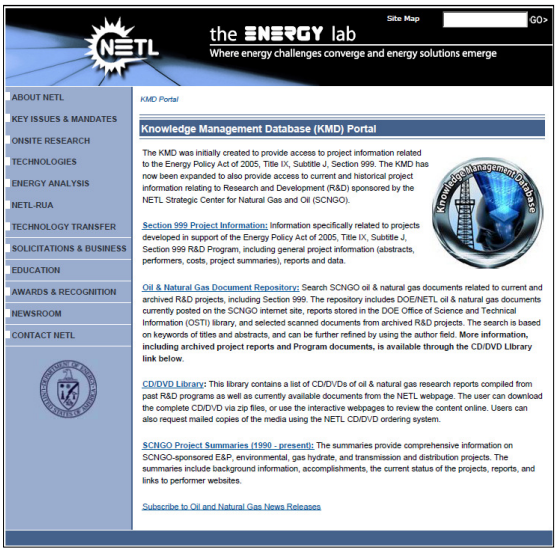
Technology Transfer Program

Publications Currently Available

KMD: What is it?

FE's First "One Stop Shopping" for all Current and Historical DOE Oil & Gas R&D

More than 30,000 records and reports of R&D in upstream oil and gas



www.netl.doe.gov/kmd

How Do I Use the KMD?

There Are Now Two Ways

1. **Accessing SPE's One Petro Website Portal (www.onepetro.org)**
   - It is now possible to search all DOE oil and gas published papers via SPE's archival library
2. **Or, just enter at the NETL Portal (www.netl.doe.gov/kmd)**
   - This allows access to papers in addition to all other publications, including CD's and DVD's

www.netl.doe.gov/kmd

SPE's One Petro Website Portal

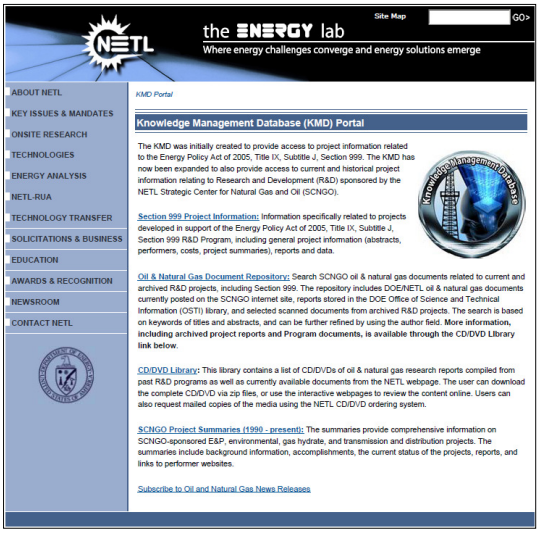
www.onepetro.org

KMD Portal Page

4 Document Repositories

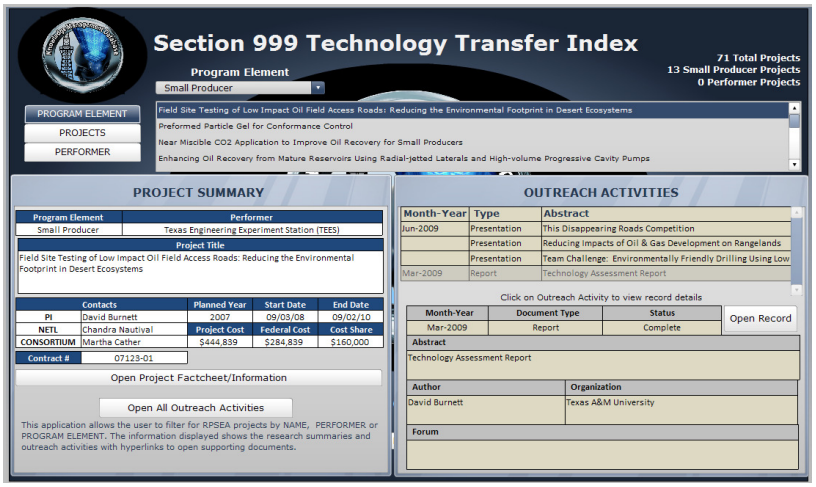
- Sec999 Project Information
- O&G Document Repository
- CD/DVD Library
- SCNGO Project Summaries

www.netl.doe.gov/kmd



www.netl.doe.gov/kmd

The Section 999 Technology Transfer Index can be Searched by Program, Projects or Performer



www.netl.doe.gov/kmd

The Section 999 Technology Transfer Index Can Also be Downloaded in its Entirety

Project				Activity			
Area	Contract Number	Project Title (linked to Summary)	Project Details	Month-Year	Type	Abstract	Activity Details
Unconventional	07122-07	Novel Concepts for Unconventional Gas Development in Shales, Tight Sands and Coalbeds	Performer: Carter Technology PI: Ernest Carter Project Cost: $114,600 Federal Cost: $91,680 Cost Share: $22,920 Start Date: Jul-2008	2/19/2009	Report	Novel Concepts for Unconventional Gas Development of Gas Resources in Gas Shales, Tight Sands and Coalbeds - Final Report	Forum: Author: Ernest E. Carter Organization: Carter Technologies Co Status: Complete
Unconventional	07122-09	Application Of Natural Gas Composition To Modeling Communication Within And Filling Of Large Tight-Gas-Sand Reservoirs, Rocky Mountains	Performer: Colorado School of Mines PI: Harris Project Cost: $1,016,417 Federal Cost: $670,417 Cost Share: $346,000 Start Date: Aug-2008	1/1/2009	Document	Application of Natural Gas Composition to Modeling Communication within and	Forum: Author: Organization: Colorado School of Mines
				4/6/2010	Presentation	Application of Natural Gas Composition to Modeling Communication within and	Forum: RPSEA Unconventional Gas Conference 2010 Author: Nicholas B. Harris Organization: Colorado School of Mines
Unconventional	07122-12	An Integrated Framework for the Treatment and Management of Produced Water	Performer: Colorado School of Mines PI: Jorg Drewes Project Cost: $4,017,085 Federal Cost: $2,560,939 Cost Share: $1,456,663 Start Date: Sep-2008	10/16/2008	Document	Technology Status Assessment	Forum: Author: Organization: Colorado School of Mines
				11/1/2009	Document	Technical Assessment of Produced Water Treatment Technologies - 1st Edition	Forum: Author: Organization: Colorado School of Mines
Unconventional	07122-14	Comprehensive Investigation of the Biogeochemical Factors Enhancing Microbially Generated Methane in Coal Beds	Performer: Colorado School of Mines PI: Junk Munakata-Marr Project Cost: $1,246,740 Federal Cost: $864,333 Cost Share: $382,407 Start Date: Sep-2008 End Date: Sep-2010		Document	Comprehensive Investigation of Factors Enhancing Microbially Generated Coal Bed Methane - Research Highlights	Forum: Author: Organization: Colorado School of Mines Status: Complete

Links to Detailed Project Summaries

Links to Project Technical Abstracts

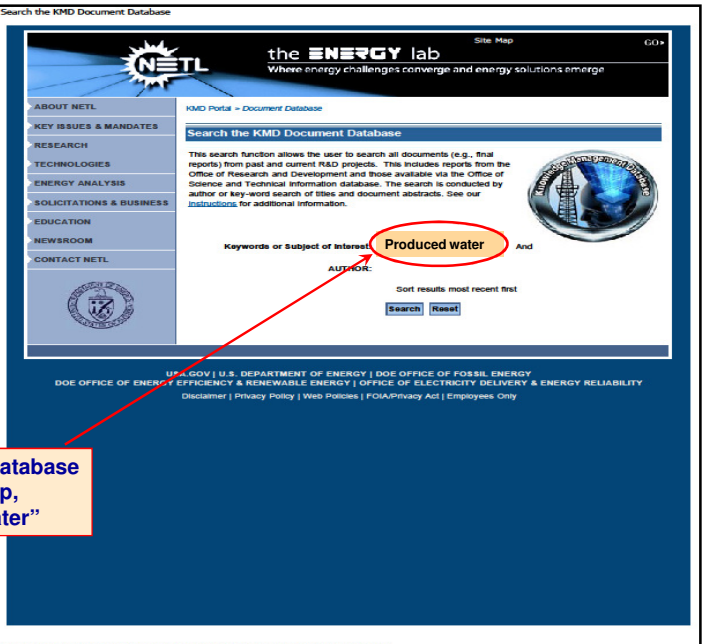
www.netl.doe.gov/kmd

Main KMD Database Key Word Search

Click on the "Document Repository" Icon

www.netl.doe.gov/kmd

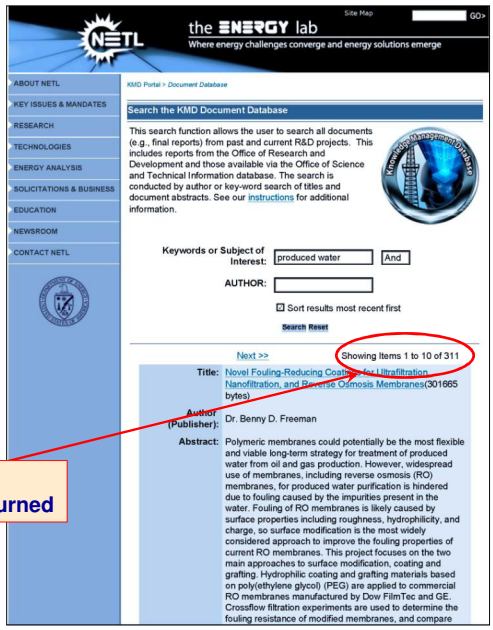
KMD Search Page



After the Document Database Search page comes up, type in "Produced Water"

www.netl.doe.gov/kmd

KMD Search Results Page



See results and note number of entries returned

www.netl.doe.gov/kmd

CD/DVD Key Word Search

Clicking on the "CD/DVD Library" Icon

www.netl.doe.gov/kmd

Or, Search Only the CD/DVD Database by Keyword

Note same Key Word search format as before

Note that all CD/DVD's are listed On the first page – they can be:
1) Ordered
2) Downloaded in their entirety
3) Searched for individual papers or reports

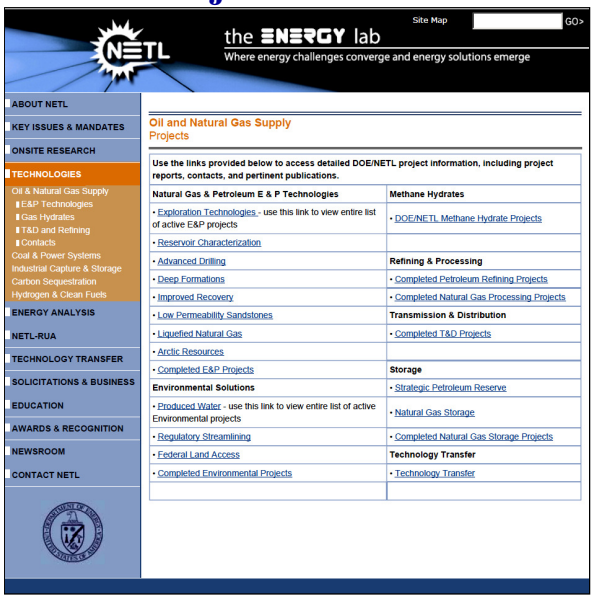
www.netl.doe.gov/kmd

Going Directly to SCNGP Oil and Gas Project Summary Page

Clicking on the "Project Summaries" Icon

www.netl.doe.gov/kmd

SCNGO Project Summaries Portal



Questions

Attachment 7

RPSEA

Research Partnership to Secure Energy for America

2011 Ultra-Deepwater Draft Annual Plan

James M. Pappas

UDAC Meeting
L'Enfant Plaza Hotel
Washington, D.C.
February 23, 2011

Secure Energy for America

Contents

- RPSEA Organization
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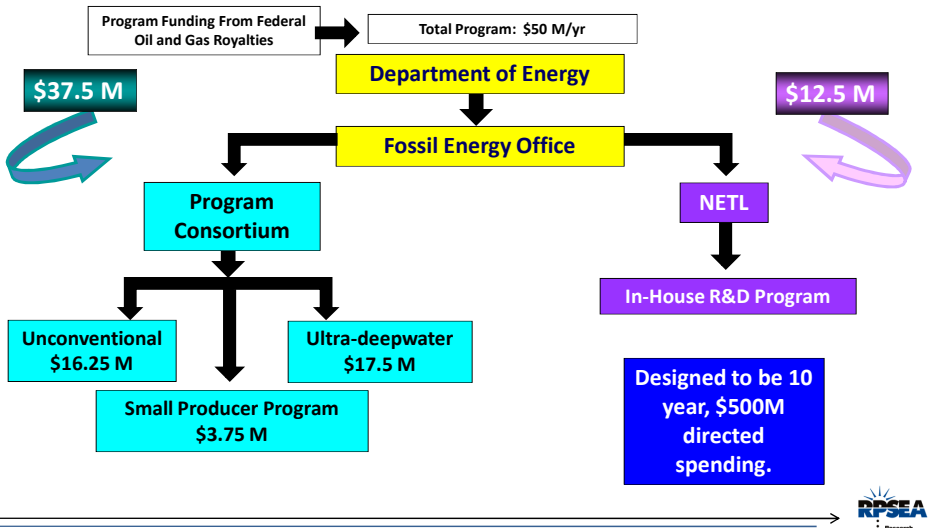
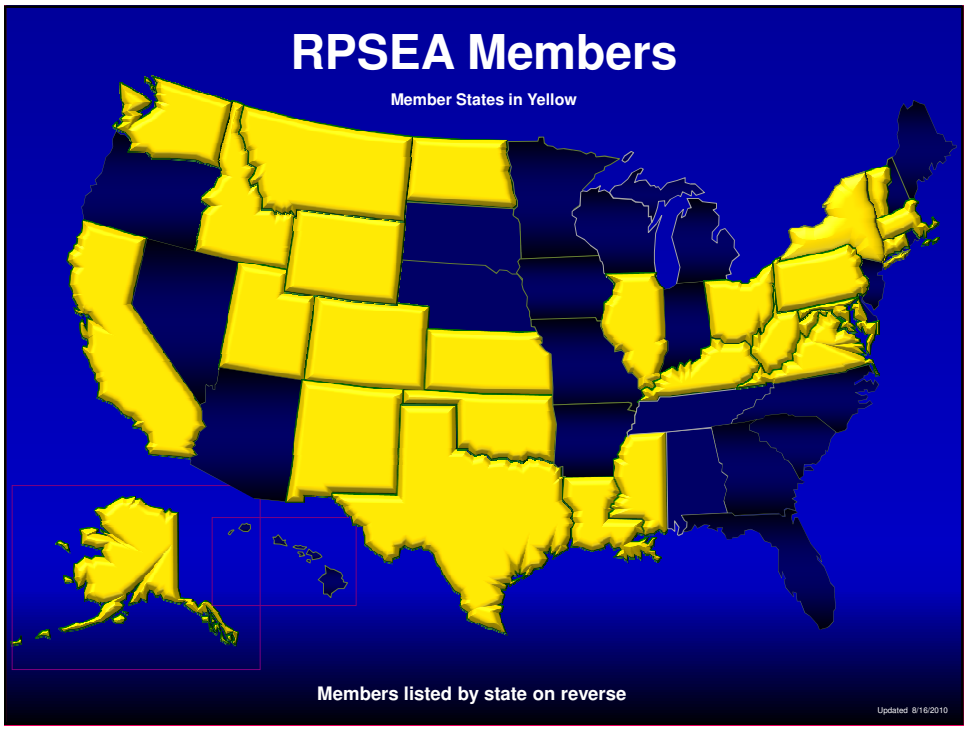
Current Program Structure/Funding



Secure Energy for America

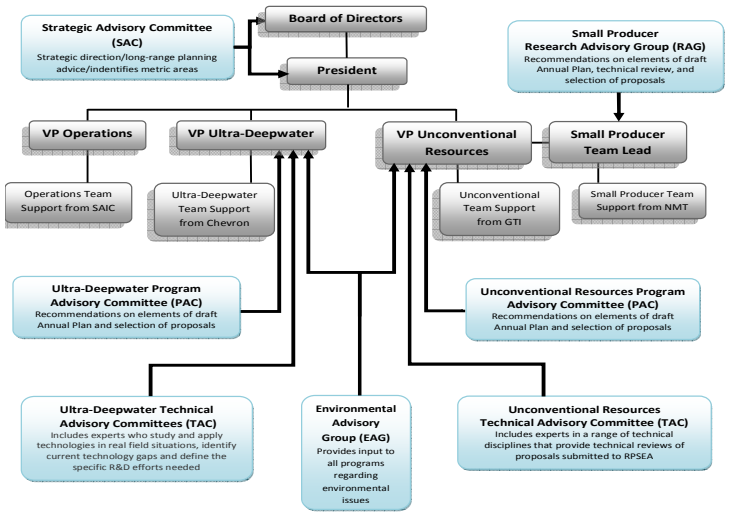


Alaska
University of Alaska Fairbanks
California
AeroVironment , Inc.
Campbell Applied Physics
Chevron Corporation
Conservation Committee of California Oil & Gas Producers
Drilling & Production Company
Jacobs Engineering Group Inc.
Lawrence Berkeley National Laboratory
Lawrence Livermore National Laboratory
Natural Carbon, LLC
Paulsson, Inc.
Stanford University
University of Southern California
Watt Mineral Holdings, LLC
Colorado
Altira Group LLC
Bill Barrett Corporation
Brownstein Hyatt Farber Schreck, LLP
Colorado Oil & Gas Association
Colorado School of Mines
DCP Midstream, LLC
EnCana Corporation
Energy Corporation of America
Foro Energy
Gunnison Energy Corporation
HW Process Technologies, Inc.
Leede Operating Company
NiCo Resources
Noble Energy, Inc.
Robert L. Bayless, Producer LLC
Spatial Energy
The Discovery Group, Inc.
University of Colorado at Boulder
Western Energy Alliance
Connecticut
APS Technology, Inc.
Idaho
Idaho National Laboratory
U.S. Geothermal Inc.
Illinois
Gas Technology Institute
Kansas
The University of Kansas
Kentucky
Greensburg Oil, LLC
NGAS Resources, Inc.
Louisiana
Louisiana State University
Maryland
Lockheed Martin Corporation
Massachusetts
Entropy Limited
Massachusetts Institute of Technology
Woods Hole Oceanographic Institution
Mississippi
Jackson State University
Mississippi State University
Montana
Nance Resources
New Mexico
Correlations Company
Harvard Petroleum Corporation
Independent Petroleum Association of New Mexico
Los Alamos National Laboratory
New Mexico Institute of Mining and Technology
Sandia National Laboratories
Strata Production Company
New York
Hess Corporation
North Dakota
Laserlith Corporation
Western Standard Energy Corporation
Ohio
MesoCoat, Ltd.
NGO Development Corporation
The Ohio State University
Wright State University
Oklahoma
Chesapeake Energy Corporation
Devon Energy Corporation
Interstate Oil and Gas Compact Commission
Oklahoma Independent Petroleum Association
MAP Royalty, Inc.
Panther Energy Company, LLC.
Petroleum Technology Transfer Council
The Fleischaker Companies
The University of Oklahoma
The University of Tulsa
The Williams Companies, Inc.
Pennsylvania
The Pennsylvania State University
Vista Resources, Inc.
Texas
Acute Technological Services, Inc.
Advantek International Corp.
AGR Subsea, Inc.
Alcoa Oil and Gas
AMOG Consulting, Inc.
Anadarko Petroleum Corporation
Apache Corporation
At Balance Americas L.L.C.
Athens Group
Baker Hughes Incorporated
Blade Energy Partners, Ltd.
BJ Services Company
BP America, Inc.
BMT Scientific Marine Services Inc.
Cameron/Curtiss-Wright EMD
Capstone Turbine Corporation
CARBO Ceramics, Inc.
City of Sugar Land
ConocoPhillips Company
Consumer Energy Alliance
CSI Technologies,Inc.
Cubility
DeepFlex Inc.
Deepwater Structures, Inc.
Deepwater XLP Technology, LLP
Det Norske Veritas (USA)
Energy Valley, Inc.
ExxonMobil Corporation
GE Oil & Gas
General Marine Contractors, LLC
Granherne, Inc.
Greater Fort Bend Economic Development Council
GSI Environmental, Inc.
Halliburton
HIMA Americas, Inc
Houston Advanced Research Center
Houston Offshore Engineering, LLC
Houston Technology Center
Intelligent Agent Corporation
Knowledge Reservoir, LLC
Konsberg Oil & Gas Technologies Inc.
Letton-Hall Group
Marathon Oil Corporation
M&H Energy Services
Merrick Systems, Inc.
Nalco Company
NanoRidge Materials, Inc.
National Oilwell Varco, Inc.
Nautilus International, LLC
Neptec USA
Nexen Petroleum USA Inc.
Oceaneering International, Inc.
OTM Consulting Ltd.
Oxane Materials, Inc.
Peritus International Inc.
Petris Technology, Inc.
Petrobras America, Inc.
Pioneer Natural Resources Company
QO Inc.
Quanelle, LLC
Quest Offshore Resources
Rice University
Rock Solid Images
RTI Energy Systems
Schlumberger Limited
Shell International Exploration & Production
Simmons & Company International
SiteLark, LLC
Southern Methodist University
Southwest Research Institute
Statoil
Stress Engineering Services, Inc.
Subsea Riser Products
Technip
Technology International
Tejas Research & Engineering, LP
Tenaris
Texas A&M University
Texas Energy Center
Texas Independent Producers and Royalty Owners Association
Texas Tech University
The Research Valley Partnership, Inc.
The University of Texas at Austin
Titanium Engineers, Inc.
TOTAL E&P USA, Inc.
Tubel Energy LLC
University of Houston
VersaMarine Engineering, LLC
Weatherford International Ltd.
WFS Energy & Environment
Ziebel
2H Offshore Inc.
Utah
Novatek, LLC
The University of Utah
Vermont
New England Research, Inc.
Virginia
Advanced Resources International, Inc.
American Gas Association
Independent Petroleum Association of America
Integrated Ocean Drilling Program
Washington
BlueView Technologies, Inc.
Quest Integrated, Inc.
Washington D.C.
Consortium for Ocean Leadership
West Virginia
West Virginia University
Wyoming
Big Cat Energy Corporation
EnerCrest, Inc.
WellDog, Inc.

Newfoundland, Canada
Propel Inc.

Pending Member - company name in green

RPSEA Organization



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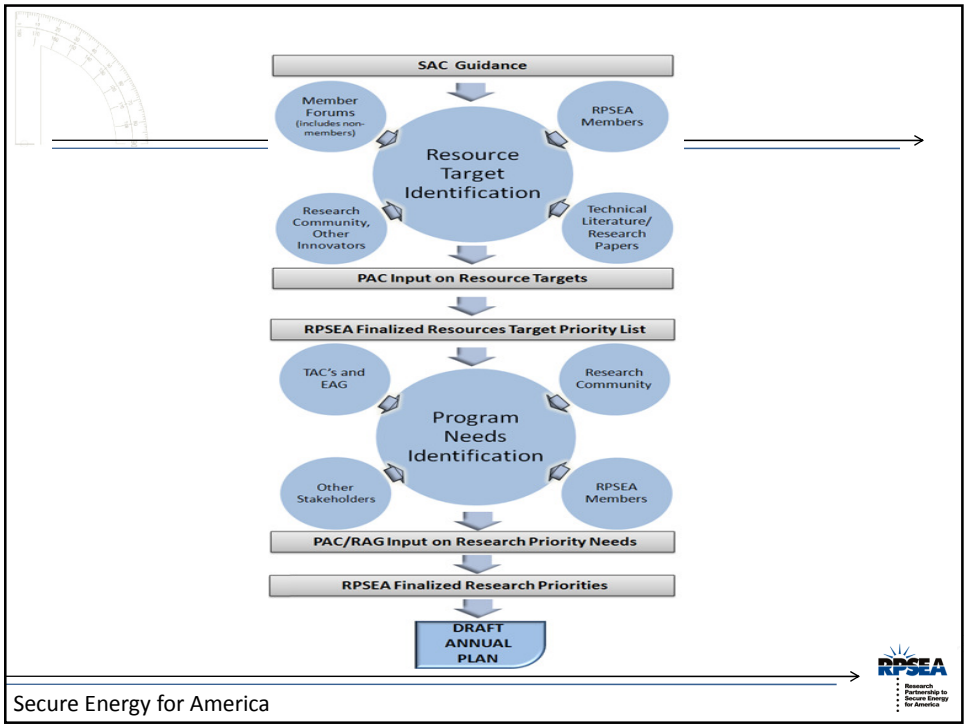
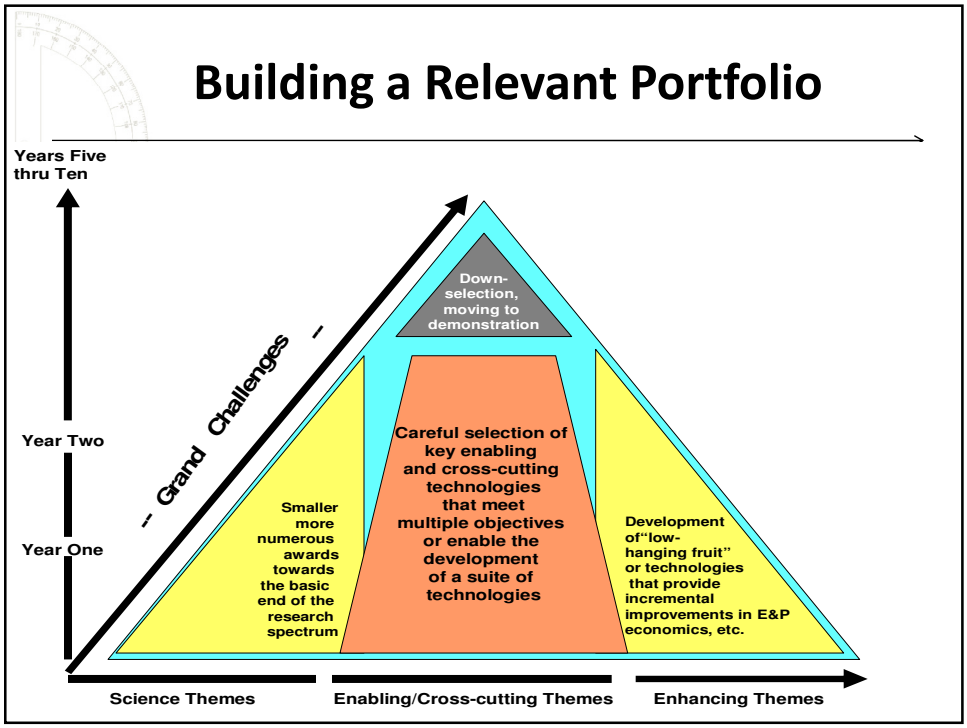

SAC Guidance
Member Forums (includes non-members)
RPSEA Members
Resource Target Identification
Research Community, Other Innovators
Technical Literature/ Research Papers
PAC Input on Resource Targets
RPSEA Finalized Resources Target Priority List
TAC's and EAG
Research Community
Program Needs Identification
Other Stakeholders
RPSEA Members
PAC/RAG Input on Research Priority Needs
RPSEA Finalized Research Priorities
DRAFT ANNUAL PLAN
Secure Energy for America


Building a Relevant Portfolio
Years Five thru Ten
Year Two
Year One
Grand Challenges
Down-selection, moving to demonstration
Careful selection of key enabling and cross-cutting technologies that meet multiple objectives or enable the development of a suite of technologies
Smaller more numerous awards towards the basic end of the research spectrum
Development of "low-hanging fruit" or technologies that provide incremental improvements in E&P economics, etc.
Science Themes
Enabling/Cross-cutting Themes
Enhancing Themes

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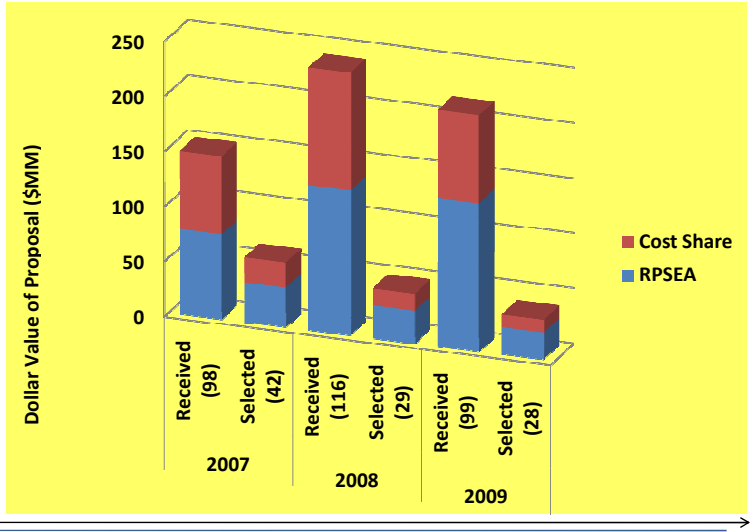
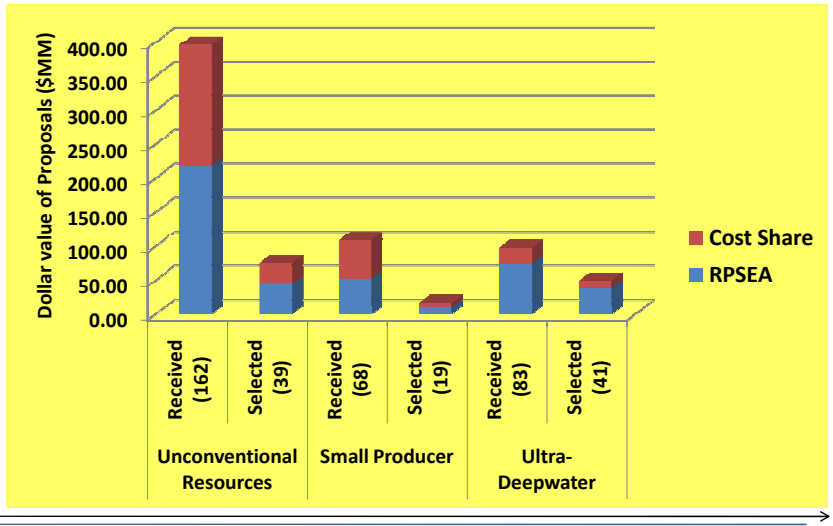
Summary of Proposals 2007-2009



2007-2009 Proposals



Secure Energy for America

Portfolio Overview

RPSEA Program Selections 2007-2009				
	Small Producer	Unconventional Resources	Ultra-Deepwater	Total
Universities	14	25	10	49
For Profits	4	4	25	33
Non-Profits	0	4	5	9
National Labs	1	3	1	5
State Agencies	0	3	0	3
Total Selected	19	39	41	99

Secure Energy for America

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UDW Mission

Identify and develop technologies, architectures, and methods that ensure safe and environmentally responsible exploration and production of hydrocarbons from the ultra-deepwater (UDW) portion of the Outer Continental Shelf (OCS) in an economically viable (full life cycle) manner

UDW Program is "Technology and Architecture Focus"

Ultra-Deepwater Resources. Awards from allocations under section 999H(d)(1) shall focus on the development and demonstration of individual exploration and production technologies as well as integrated systems technologies including new architectures for production in ultra-deepwater.

Secure Energy for America

RPSEA UDW Structure PAC and TACs

Resource of >700 SMEs from industry, academia and government!

Program Advisory Committee "PAC"

- Regulatory TAC — 51 Active Members
- Flow Assurance TAC — 100 Active Members
- Subsea Systems TAC — 138 Active Members
- Floating Facilities TAC — 150 Active Members
- Drilling & Completions TAC — 66 Active Members
- Reservoir Engineering TAC — 44 Active Members
- Met Ocean TAC — 55 Active Members
- Systems Engineering TAC — 76 Active Members
- Geosciences TAC — 15 Active Members

Secure Energy for America

UDW Technology Development Goals

- Extend basic scientific understanding of various processes and phenomena directly impacting UDW production system design and reliable operation of a ultra-deepwater production system
- Develop “enabling” technologies
- Enhance existing technologies to help lower overall cost and risks
- Pursue new technologies which, if successfully developed, are capable of “leapfrogging” over conventional pathways

Achieving the UDW Goals

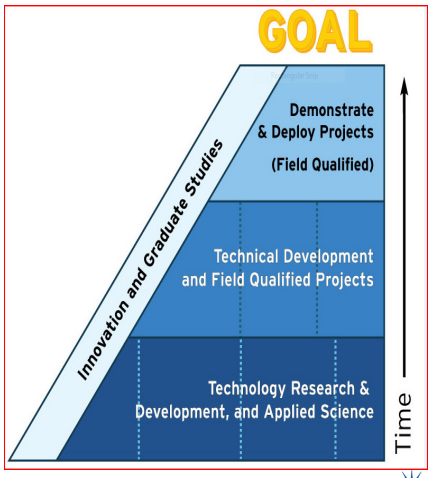
Maximize the Value of Domestic Resources:

- Increase production of ultra-deepwater oil and gas resources
- Reduce costs to find, develop, and produce such resources
- Increase efficiency of exploitation of such resources
- Increase production efficiency and ultimate recovery of such resources
- Increase safety and environmental awareness by addressing safety and environmental focus impacts associated with ultra-deepwater exploration and production, and technology development.

Objectives

To meet the UDW Program goals, **6 objectives** were identified:

1. Technology Needs
2. Technology Research & Development, and Applied Science
3. Awareness and Cost-Share Development
4. Technical Development and Field Qualified
5. Environmental and Safety Technology Development and Deployment
6. Technology Demonstration



Objective 1

1. Technology Needs Assessment
   - The 2007 - 2010 Annual Plans capitalized on DeepStar Systems Engineering Studies
     - Identified specific technology gaps that hinder UDW development
   - Proposals solicited to address identified gaps
   - These gaps have been and will continue to be periodically revisited
     - With UDW TAC input
     - With UDW PAC input
     - By RPSEA
     - With BOD direction

Objective 2

2. Technology Research & Development, and Applied Science
   - The early years of the UDW formed base of the technology development triangle
   - Subsequent years will fund additional technical development, demonstration, and potential commercialization of promising technologies
     - Multiple rounds of solicitations for R&D contracts designed to meet the stated goal and identified "Needs"
     - Current funding limits = project prioritization and selection likely to result in most significant increases in value
     - Funding directed to innovative and novel projects as well as graduate study proposals

Objective 3

3. Awareness and Cost-Share Development
   - Network with academia, industry, and other key stakeholders
     - Increase its awareness
     - Promote involvement
     - Identify cost-share funding for development of new technologies

Objective 4

4. Technical Development and Field Qualified Projects
   - Continue to develop and mature most promising technologies
   - Strong focus on field qualifying projects with greatest potential
     - Project results assessment
     - Additional solicitations as needed

Objective 5

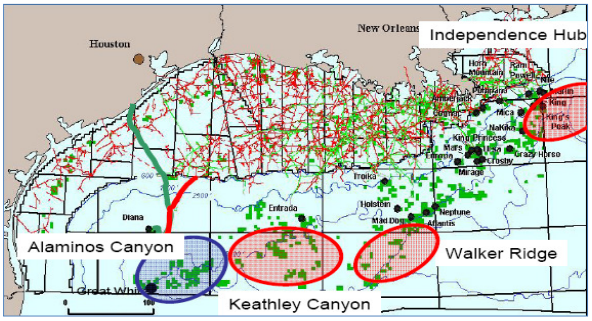
5. Environmental and Safety Technology Development and Deployment
   - Assess environmental and safety impact of all projects
   - Forms
     - Individual solicitations
     - Elements of more extensive project-based solicitations

Objective 6

6. Technology Demonstration
   - Work with industry, appropriate regulatory agencies, and other key stakeholders to provide seed-level funding and other incentives
     - New technologies demonstration
     - New technologies validation

UDW Program Approach

Four base-case field development scenarios



The Challenges

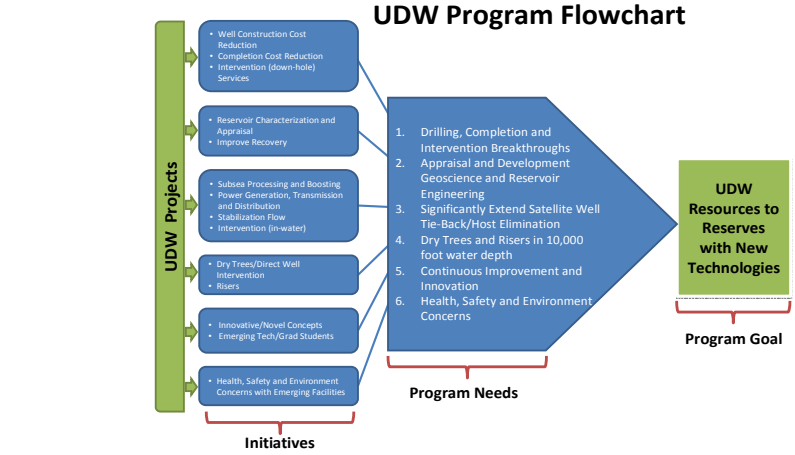
Walker Ridge/Keathley Canyon
- subsalt
- deeper wells
- tight formations

Alaminos Canyon
- viscous crude
- lacking infrastructure

Eastern Gulf – Gas Independence Hub
- higher pressure & temperature
- CO_2/H_2S

Overall
- higher drilling costs
- challenging economics

UDW Program Flowchart



2007
UDW Projects

Project	Project Title	Contracted; lead	Award (RPSEA portion)
1201	Wax Control	University of Utah	$400,000
1301	Improvements to Deepwater subsea measurements	Letton Hall Group	$3,600,126
1302	High Conductivity Umbilicals	Technip	$448,000
1401	Composite Riser for UDW High Pressure Wells	Lincoln Composites	$1,678,411
1402	Deepwater dry tree system for drilling production	FloTec / Houston Offshore	$1,090,728
1403	Fatigue Performance of High Strength Riser Materials	SwRI	$800,000
1501	Extreme Reach Development	Tejas **(unable to contract -** $200,000)	
1603a	Hydrate Plugging Risk	Tulsa Univ.	$120,000
1603b	Hydrate Characterization & Dissociation Strategies	Tulsa Univ.	$120,000
1603c	Design investigation xHPHT, SSSV	Rice Univ.	$120,000
1603d	Robotic MFL Sensor; monitoring & inspecting risers	Rice Univ.	$120,000
1701	Improved Recovery	Knowledge Reservoir	$1,599,722
1801	Effect of Global Warming on Hurricane Activity	NCAR	$544,085
1901	Subsea processing System Integration	GE Research	$1,200,000
1902	Deep Sea Hybrid Power Systems:	HARC	$480,000
2001	Geophysical Modeling Methods	SEG	$2,633,364
	15 awarded		**$15,104,426**

2008
UDW Projects

Project	Project Title	Selected: lead	Award (RPSEA portion)
2101-02	New Safety Barrier Testing Methods	Southwest Research Institute	$128,000
1202	EOS improvement for xHPHT	NETL ($1,600, 000)	
2201-02	Heavy Viscous Oils PVT for Ultra-Deepwater	Schlumberger Limited	$458,455
2301-03	Riserless Intervention System (RIS)	DTC International	$3,382,017
1502-01	Coil Tubing, Drilling and Intervention Systems Using Cost Effective Vessel	Nautilus International, LLC	$820,000
2501 -02	Early Reservoir Appraisal, Utilizing a Well Testing System	Nautilus International, LLC	$820,000
2502-01	MPD; Advanced Steady-State and Transient, Three-Dimensional, Single and Multiphase, Non-Newtonian Simulation System for Managed Pressure Drilling	Stratamagnetic Software, LLC	$360,000
2701-03	Resources to Reserves Development and Acceleration through Appraisal	The University of Texas at Austin	$197,824
2801-02	Gulf 3-D Operational Current Model Pilot	Portland State University	$1,248,000
2901-01	Ultra-Reliable Deepwater Electrical Power Distribution System and Power Components	GE Global Research	$4,999,994
2902-02	Technologies of the Future for Pipeline Monitoring and Inspection	University of Tulsa	$120,000
2902-03	Wireless Subsea Communications Systems	GE Global Research	$120,000
2902-04	Replacing Chemical Biocides with Targeted Bacteriophages in Deepwater Pipelines and Reservoirs	Phage Biocontrol, LLC	$120,000
2902-06	Enumerating Bacteria in Deepwater Pipelines in Real-Time at a Negligible Marginal Cost Per Analysis: A Proof of Concept Study	Livermore Instruments, Inc.	$119,730
2902-07	Fiber Containing Sweep Fluids for Ultra-Deepwater Drilling Applications	University of Oklahoma	$119,972
15 Projects		**14 Awarded**	**$13,013,992**

2009
UDW Projects

Project	Project Title	Selected: lead	Approx. RPSEA share
3100-01	Ultra Deepwater Seabed Discharge of Produced Water and/or Salts	Fluor	$ 448,956
3300-02	Displacement and Mixing in Subsea Jumpers: Experimental Data and CFD Simulations	Univ of Tulsa	$ 254,952
3300-05	Autonomous Inspection of Subsea Facilities	Lockheed Martin	$ 994,020
3300-06	High Resolution 3D Laser Imaging for Inspection, Maintenance, Repair, and Operations	3D at Depth, LLC	$ 498,898
3300-08	Sensors and Processing for Pipe, Riser, Structure, and Equipment Inspection to Provide Detailed Measurements, Corrosion Detection, Leak Detection, and/or Detection of Heat Plumes from Degraded Pipeline Insulation	Blueview Technologies	$ 468,463
3300-10	Development of Carbon Nanotube Composite Cables for Ultra Deepwater Oil and Gas Fields	Los Alamos National Laboratory	$2,000,000
3500-01	Intelligent Production System for Ultra Deepwater with Short Hop Wireless Power and Wireless Data Transfer for Lateral Production Control and Optimization	Tubel LLC	$1,103,000
3500-02	Fatigue Testing of Shrink-fit Riser Connection for High Pressure Ultra Deepwater Risers	Subsea Riser Products	$ 349,806
3500-07	Deepwater Subsea Test Tree and Intervention Riser System	DTC International, Inc.	$1,551,239
3500-10	Gyroscope Guidance Sensor for Ultra Deepwater Applications	Laserlith Corporation	$ 489,346
3700-02	A 1,000-Level Drill Pipe Deployed Fiber Optic 3C Receiver Array for Deep Boreholes	Paulsson, Inc	$1,994,329
11 Projects			**$10,153,009**

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2010 UDW Plan Strategy

- 6 Initiative-based RFPs (6 to 10 project awards)
- UDW TACs have voted for individual projects.
- This input was evaluated by the PAC to decide appropriate balance for 2010 UDW program.
- UDW 2010 RFPs to consist of both specific projects and broader initiative-based requests.
- Timing: Anticipated release of RFPs September 2010 with 60-day clock, selection and awards 1Q2011. Now 1Q2011 release & awards in 2Q2011.

2010 UDW Funding by Need

	Title / Description	TAC Recommended Topics	Total Project Cost	Phase 1 Cost (First Year)	Phase 2+ Cost
Need #1	Drilling Completion and Intervention Breakthroughs		$ 2,000,000	$ 2,000,000	$ -
Need # 2	Appraisal & development geoscience and reservoir engineering		$ 1,500,000	$ 1,500,000	
Need #3	Significantly extend subsea tieback distances / surface host elimination		$ 4,217,000	$ 1,967,000	$ 2,250,000
Need #4	Dry trees / Direct well intervention and risers in 10,000' wd.		$ 3,890,000	$ 3,890,000	$ -
Need #5	Continuous Improvement / Optimize field development		$ -	$ -	
Need #6	Associated Safety and Environmental Concerns		$ 33,203,000	$ 17,928,000	$ 15,275,000
			$ 44,810,000	$ 27,285,000	$ 17,525,000
			Total	1st Year (FY2010)	Future Year

Secure Energy for America

2010 UDW Funding by Sub-Need

	Title / Description	TAC Recommended Topics	Total Project Cost	Phase 1 Cost (First Year)	Phase 2+ Cost	Schedule (Months)
Need #1	Drilling Completion and Intervention Breakthroughs		$ 2,000,000	$ 2,000,000	$ -	
	Drilling		0	0		
	Completions		0	0		
	Intervention (Downole Services)	Coil Tubing Drilling and Intervention System Using a Cost Effective Vessel	2,000,000	2,000,000		12
	Intervention (In-Water IMR)		0	0		
	Extended Well Testing		0	0		
Need # 2	Appraisal & development geoscience and reservoir engineering		$ 1,500,000	$ 1,500,000		
	Reservoir Surveilance	Reservoir IOR	1,500,000	1,500,000		12
Need #3	Significantly extend subsea tieback distances / surface host elimination		$ 4,217,000	$ 1,967,000	$ 2,250,000	
	Stabilized Flow		0	0		
	Subsea Power	Subsea Electrical Penetrators Phase 1 - Connectors Technology Workshop to identify needs, gaps and strategies Phase 2 - Connector Qualification Testing and Development	335,000	$ 85,000	$ 250,000	18
	Subsea Power	Ultra-High Conductivity Umbilicals	3,000,000	$ 1,000,000	$ 2,000,000	36
	Subsea Power	Subsea Power Modeling Tool Verification	$ 882,000	$ 882,000		12
	Subsea Processing, Pressure Boosting, Instrumentation and Controls	All Electric Subsea Autonomous HIPPS Architecture	$ 250,000	$ 250,000		12

	Title / Description	TAC Recommended Topics	Total Project Cost	Phase 1 Cost (First Year)	Phase 2+ Cost	Schedule (Months)
Need #4	Dry trees / Direct well intervention and risers in 10,000' wd.		$ 3,890,000	$ 3,890,000	$ -	
	Riser Systems		0	0		
	Dry Tree Structures	Ultra-deepwater Dry Tree System for Drilling and Production in GOM, Phase 2	1,280,000	1,280,000		12
	Dry Tree Structures	Affect of Fiber Rope Seabed contact on Subsequent Rope Integrity	1,750,000	1,750,000		12
	Dry Tree Structures	Direct Offloading System - Phase 1	860,000	860,000		12
Need #5	Continuous Improvement / Optimize field development		$ -	$ -		
	Long Term Research and Development and Graduate Student Program		0	0		
	Sensors, tools and Inspection Processes		0	0		
	Bridging and Contingency		0	0		

Secure Energy for America

2010 UDW Funding by Sub-Need

	Title / Description	TAC Recommended Topics	Total Project Cost	Phase 1 Cost (First Year)	Phase 2+ Cost	Schedule (Months)
Need #6	Associated Safety and Environmental Concerns		$ 33,203,000	$ 17,928,000	$ 15,275,000	
	Environmental Issues: Met-Ocean	Hurricane Impact on Infrastructure & Environment	1,000,000	1,000,000		
	Environmental Issues: Met-Ocean	Climate Change Impact on Future Hurricanes (1801 Phase 2)	350,000	350,000		
	Safety Issues: Drilling	Wellbore Integrity Improvement & Strengthening Methods	3,750,000	750,000	3,000,000	36
	Environmental Issues: Drilling	Deepwater Reverse Circulation Primary Cementing & Wellbore Integrity	1,080,000	1,080,000		18
	Environmental Issues: Drilling	Ahead of the Bit & pre-drill Hazzard Identification; Tar Detection	3,500,000	500,000	3,000,000	36
	Safety Issues: Production/Completion	Intelligent Casing to minimize intervention	500,000	500,000		12
	Environmental Issues: Facilities	Early Production System (EPS) FEED and critical component prototype design	2,000,000	2,000,000		12
	Safety Issues: Reservoir/Production	Equation of State Development for Extreme High Pressure and High Temperature	900,000	300,000	600,000	36
	Safety Issues: Production/Facilities	Hydrates in Gas Dominated Systems	850,000	450,000	400,000	24

	Title / Description	TAC Recommended Topics	Total Project Cost	Phase 1 Cost (First Year)	Phase 2+ Cost	Schedule (Months)
	Safety Issues: Production/Facilities	Development of HPHT Viscosity Standards	3,000,000	1,000,000	2,000,000	36
	Safety Issues: Production/Facilities	Corrosion and Scale Detection and Mitigation at Extreme Temperature and Pressure	3,500,000	1,500,000	2,000,000	36
	Environmental Issues: Production/Facilities	Improvements to Deepwater Subsea Measurement	3,000,000	1,500,000	1,500,000	24
	Environmental Issues: Production	Subsea Water Quality Management	435,000	260,000	175,000	9
	Safety Issues: Facilities	Ultra-deepwater Riser Concepts for High Motion Vessels	1,500,000	500,000	1,000,000	18
	Safety Issues: Facilities	Qualification of Flexible Fiber Reinforced Pipe (for high motion vessels)	1,300,000	300,000	1,000,000	12
	Safety Issues: Production	Full Scale testing of T&C Top Tension Riser Connectors in air, Brine and H2S	1,600,000	1,600,000		12
	Environmental Issues: Facilities	Flexible Low Cost Early Production Systems - Concept Comparison Study	1,500,000	900,000	600,000	24
	Safety Issues: Facilities	Strake designs for deep draft semi VIM suppression	1,000,000	1,000,000		24
	Safety or Environmental Issues	INNOVATION Program	1,500,000	1,500,000		24
	Safety Issues: Facilities	Long Range/High Resolution 3-D UW Laser Inspection Sensor	938,000	938,000		12
			$ 42,810,000 Total	$ 25,285,000 1st Year (FY2010)	$ 17,525,000 Future Year	

Secure Energy for America

RPSEA Research Partnership to Secure Energy for America

Contents

- RPSEA Organization
- Current Project Status
- UDW Program
- 2010 Requests For Proposals
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Secure Energy for America

RPSEA Research Partnership to Secure Energy for America

DW Horizon

Deepwater Horizon Incident Results

- Industry must re-evaluate risk management approach
- Components
  - Conduct research necessary to ensure UDW risks are fully understood
  - Conduct research to ensure means are available to fully mitigate those risks
- Focus
  - Spill prevention
  - Spill recovery
  - Risk assessment, mitigation, elimination

2011 Solicitations

- **What has not changed**
  - Technical and architecture needs still exist
  - Prioritize technology needs
  - Continue to develop and mature selected projects
  - Accelerate resources to reserves
- **What has changed**
  - Added emphasis on environmental and safety issues
  - Needs identified as result of analysis of the Deepwater Horizon incident

2011 Solicitations: Accelerating Reserves

- Strategically begin combining previously developed technologies
  - Establish cohesive and comprehensive systems
  - Systems to address overall needs
  - To lead toward field demonstrations and ultimately to commercialization
- UDW program
  - Fewer and larger projects
  - Emphasize cross-cutting projects

2011 Solicitations: Environmental and Safety Emphasis

- To include:
  - Analyses of systems integrity in UDW environments
  - Environmental studies regarding the potential impact of UDW operations
  - Specific technology developments aimed at increasing the safety of offshore operations

2011 Solicitations: Environmental and Safety Specifics

- Embedded in DAP and cross-cutting all Program elements is a focus on the environment:
  - Minimize or mitigate environmental impact or risk
  - Mitigate water usage
  - Reduce “footprint”
  - Lower emissions

Environmental and Safety Common Elements

- Common element focal points:
  - Understand risks associated with oil and gas development operations
  - Develop technologies to mitigate those risks
  - All projects in the Program evaluated:
    - For potential and ongoing environmental impacts as applicable
    - To ensure that impacts are fully understood during project selection and management

2011 Solicitations: General Themes

- Emergency prevention, preparedness, response and recovery
- Next phase projects based on completed projects from the 2007 and 2008 program
- Specific project ideas to fill-in identified technical gaps
- Graduate Student and Innovative/Novel projects

2011 Solicitations: Objective 7

NEW …

7. Emergency Prevention, Preparedness, Response and Recovery
   - Work with appropriate regulatory agencies, industry, and other key stakeholders
     - Identify technology needs arising from the Deepwater Horizon incident
     - July RPSEA Forum: *"Research & Technology Needs for Deepwater Development: Addressing Oil Recovery & Effective Cleanup of Oil Spills"*

2011 Solicitations: Objectives

To meet the 2011 UDW Program goals, there are now 7 objectives:

1. Technology Needs
2. Technology Research & Development, and Applied Science
3. Awareness and Cost-Share Development
4. Technical Development and Field Qualified
5. Environmental and Safety Technology Development and Deployment
6. Technology Demonstration
7. **Emergency Prevention, Preparedness, Response and Recovery**

2011 Solicitation Needs

Subject to guidance from UDW PAC, funding timing, BOD direction, and other relevant factors such as results from the President's commission on the Deepwater Horizon incident.

1. Drilling, Completion, and Intervention Breakthroughs
2. Appraisal and 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' Water Depth
5. Continuous Improvement and Innovation
6. Associated Safety and Environmental Concerns

2011 Solicitation Need 1

1. **<u>Drilling, Completion, and Intervention Breakthroughs</u>**
   - Proposals to identify novel ideas to reduce well construction and completion costs
   - Funding follow-on recommendations from 2007 and 2008 projects

2011 Solicitation Need 2

2. **Appraisal and Development Geoscience and Reservoir Engineering**
   - Proposals in the area of formation and reservoir characterization and/or surveillance
   - Goal - Improve recovery and thus reduce the amount of unproduced hydrocarbons upon well or field abandonment

2011 Solicitation Need 3

3. **Significantly Extend Subsea Tieback Distances/Surface Host Elimination**
   - Proposals addressing follow-on recommendations from 2007 and 2008 projects.
   - New proposals may be requested in one or more of the following areas:
     - UDW flow assurance, especially for the areas of solids (asphaltenes, hydrates, waxes, and scale) deposition and plug formation management
     - Pressure boosting
     - Autonomous underwater vehicles and intervention
     - Subsea processing/produced water treatment

2011 Solicitation Need 4

4. **Dry Trees/Direct Well Intervention and Risers in 10,000' Water Depth**
   - Need area was addressed in 2007 and 2008 UDW program
   - Next Phase proposals may be requested addressing recommendations from 2007 and 2008 projects

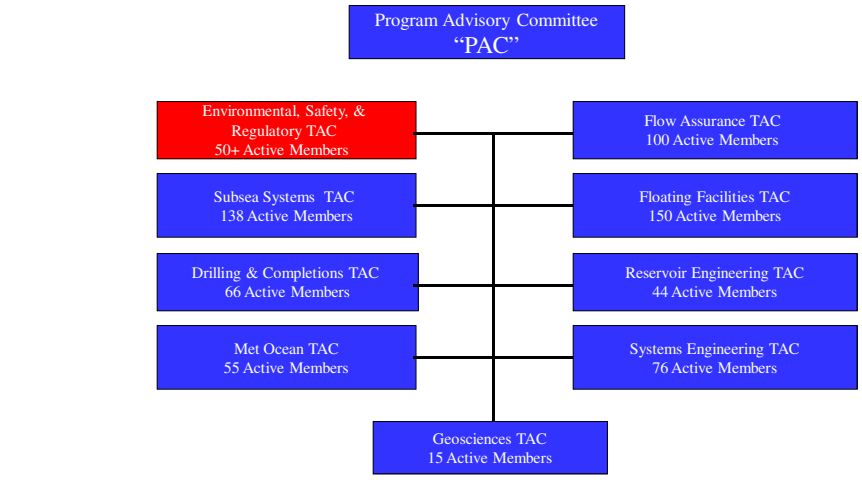
2011 Solicitation Need 5

5. **Continuous Improvement and Innovation**
   - Proposals may include:
     - Novel safety or environmental improvement techniques or processes
     - Advancing industry understanding of phenomena and science impacting UDW operations
     - Improvements in integrity management and reliability
     - Additional graduate student and project funding
     - Innovative technology high risk, high reward "long-shot "opportunities

2011 Solicitation Need 6

6. **Associated Safety and Environmental Concerns**
   - Work with appropriate regulatory agencies, industry, and other key stakeholders to identify emergency prevention, preparedness, response, and recovery technology needs suitable for UDW operations
   - May include findings arising from Deepwater Horizon incident
   - Focus:
     - Spill prevention
     - Spill mitigation
     - Ecosystems identification and valuation

2011 Proposed RPSEA UDW Structure: PAC and TACs



Anticipated Awards

- Carry-over = $21 million available
- Project count = 4 multi-project awards &
  4 continuation projects
  - $1 – 5 million each
- Project duration = 1 – 3 years
- Stage-gate approach to funding
  - Decision points for additional funding
  - Program close-out date of fiscal year 2014

Ongoing Activities

- Administration of current contracts
- Solicitation of new proposals
- Planning for the following year(s)
- Specifics:
  - Develop and release RFPs
  - Select, negotiate, and award subcontracts
  - Perform project management functions for current contracts and for future award
    - Emphasis on combination of increased number and size of ongoing R&D efforts and their fit, in terms of both timing and funding, with planned future efforts and direction

Technology Transfer Approaches

- Engagement of PAC and TAC Members
  - Project selection and review
  - Participation in field tests as "early adopters"
  - Quarterly TAC meetings are an important aspect of ongoing tech transfer
  - Working Committee (cost share partners)
- Active Coordination with NETL on Knowledge Management Database (KMD)
- RPSEA Website Enhancement
  - Project information
  - Program direction
- 2.5% set-aside for each subcontract
  - 1.5% Project Level
  - 1% Program Level

Project-Level Technology Transfer

- Funded by 1.5% Set-aside
- Managed by subcontractors (with RPSEA final approval)
  - Project-specific websites
  - Participation in conferences, workshops
  - Preparation of articles for journals, trade publications

Program-Level Technology Transfer

- Funded by 1% Set-aside
- Managed by RPSEA
  - Website Enhancements
  - Coordination with NETL KMD,
  - Events at Major Technical Conferences (SPE, OTC, SEG, etc.)
    - Poster sessions
    - PI / PM booth presentations & discussions

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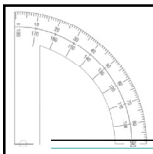


Final Thoughts

- Our world has changed
- Effects on UDW
- Opportunity is knocking
- RPSEA and UDW Program, coordinated with NETL, will respond

Attachment 8

UDW Federal Advisory Committee
"Program Implementation"

John R. Duda

February 23, 2011

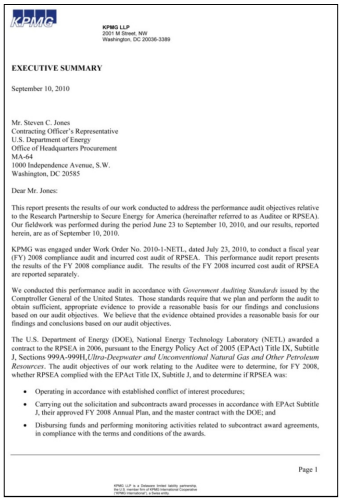
Contract (Status)

DEAR and FAR

National Environmental Policy Act

Images by JRDuda

Audits



KPMG LLP
2001 M Street, NW
Washington, DC 20036-3389

EXECUTIVE SUMMARY

September 10, 2010

Mr. Steven C. Jones
Contracting Officer's Representative
U.S. Department of Energy
Office of Headquarters Procurement
MA-64
1000 Independence Avenue, S.W.
Washington, DC 20585

Dear Mr. Jones:

This report presents the results of our work conducted to address the performance audit objectives relative to the Research Partnership to Secure Energy for America (hereinafter referred to as Auditee or RPSEA). Our fieldwork was performed during the period June 23 to September 10, 2010, and our results, reported herein, are as of September 10, 2010.

KPMG was engaged under Work Order No. 2010-1-NETL, dated July 23, 2010, to conduct a fiscal year (FY) 2008 compliance audit and incurred cost audit of RPSEA. This performance audit report presents the results of the FY 2008 compliance audit. The results of the FY 2008 incurred cost audit of RPSEA are reported separately.

We conducted this performance audit in accordance with *Government Auditing Standards* issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The U.S. Department of Energy (DOE), National Energy Technology Laboratory (NETL) awarded a contract to the RPSEA in 2006, pursuant to the Energy Policy Act of 2005 (EPAct) Title IX, Subtitle J, Sections 999A-999H,*Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Resources*. The audit objectives of our work relating to the Auditee were to determine, for FY 2008, whether RPSEA complied with the EPAct Title IX, Subtitle J, and to determine if RPSEA was:

- Operating in accordance with established conflict of interest procedures;
- Carrying out the solicitation and subcontracts award processes in accordance with EPAct Subtitle J, their approved FY 2008 Annual Plan, and the master contract with the DOE; and
- Disbursing funds and performing monitoring activities related to subcontract award agreements, in compliance with the terms and conditions of the awards.

Page 1

Technical Committee

Government Accountability Office

GAO

United States Government Accountability Office
Report to the Chairman, Subcommittee on Energy and Water Development, Committee on Appropriations, U.S. Senate

December 2008

RESEARCH AND DEVELOPMENT

DOE Could Enhance the Project Selection Process for Government Oil and Natural Gas Research

GAO

Technology Transfer

KMD

Conference Exhibits

Presentations

Newsletters

NETL Website

Small Producers

Cost Share

~~80/20~~ 20/50

Streamlined Process

Research Partnership to Secure Energy for America

Robert W. Siegfried II
President

Subcontract Notification and Certification Form under Prime Contract DE-AC26-07NT42677

In accordance with the Energy Policy Act of 2005 (EPAct 2005), RPSEA shall oversee the implementation of subcontracts under Section 999 of EPAct 2005, consistent with Subtitle J, Section 999, the Annual Plan, including disbursing funds and monitoring activities carried out under such subcontracts for compliance with the terms and conditions of the prime contract.

Subcontractor Name:			
Subcontractor's Address:			
Consortium Partners:			
Title of the Project:			
Access ID:			
Subcontract No:			
Subcontract Technical Representative:			
RPSEA Technical Representative:			
Technical Readiness and Compliance with EPAct 2005, Section 999:			
Subcontract Amount:	RPSEA Share		
Harvard Petroleum, Well Enhancement	Industry Cost Share		
	Total Project Cost		
RPSEA has reviewed and analyzed all proposed cost share. To the best of my knowledge, the cost share as reviewed and analyzed is allowable, allocable, verifiable, appropriately valued and from non-Federal sources.			
Industry Cost Share:			
Source (Name of the Organization):	Amount:	Nature: (Cash or In-kind)* Source:	
NM Institute of Mining and Technology		In-Kind	
Harvard Petroleum			
Well Enhancement Services			
RPSEA has included in the subcontract all prime contract award flow down requirements including Intellectual Property Provisions as appropriate.			
All negotiation issues were reviewed, discussed and mitigated.			

09123-03- New Mexico Institute of Mining and Technology
Notification and Consent Form

Research Partnership to Secure Energy for America

Department of Energy (DOE) Environmental Questionnaire (NETL Form 451.1-1/3) has been submitted to the NETL Contracting Officer's Representative for the proposed Subcontractor [as well as for any lower tier Subcontractor(s)].

In accordance with EPAct 2005, Section 999(c), 2.5% of the total amount of the subcontract has been designated for technology transfer and outreach activities.

*An in-kind contribution is a non-cash input which can be given a cash value. Examples include but are not limited to personnel, fringe benefits, travel, etc.

Attached is the approved Scope of Work for the above referenced project. Attached is a full listing of anticipated Subcontractor acquired property.

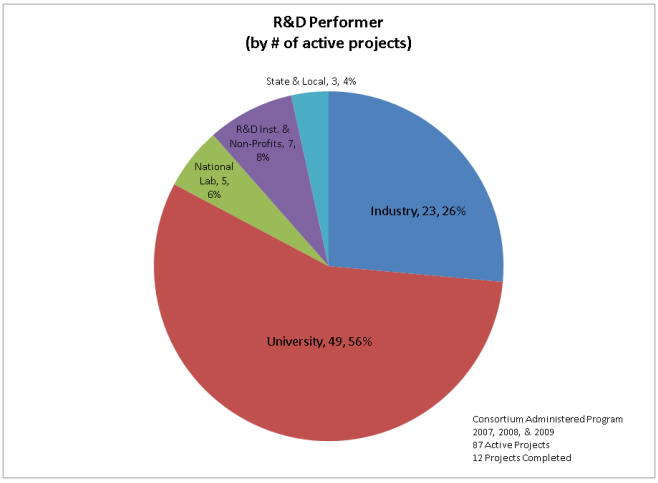
I, Robert W. Siegfried II, President of RPSEA, hereby certify that the information outlined above is current, accurate and factual. I request DOE's approval to enter into a binding subcontract with the New Mexico Institute of Mining and Technology.

Sincerely,

Robert W. Siegfried II
Date:

09123-03- New Mexico Institute of Mining and Technology
Notification and Consent Form

Performing Organizations



Attachment 9

U.S. DEPARTMENT OF ENERGY
Oil and Natural Gas

UDAC Calendar and Next Steps

Elena Melchert
Committee Manager
Ultra-Deepwater Advisory Committee

February 23, 2011

Ultra-Deepwater Advisory Committee

- **Committee Calendar**
  - **February/March 2011: Subcommittee meetings**
  - **April 6-7, 2011, 8am-5pm, 15th UDAC Meeting in Houston, TX**
  - **April 8, 2011: Editing Subcommittee meets to prepare final report of UDAC comments and recommendations**
  - **April 16, 2011, Editing Subcommittee sends final report to the Committee Manager for distribution to the UDAC members**
  - **April 19, 2011, 10:00 am CDT, 16th UDAC Meeting, Conference Call in Washington, DC to vote on Editing Subcommittee report**
  - **April 26, 2011 Chair sends UDAC final report of comments & recommendations to the Designated Federal Officer for delivery to the Secretary of Energy**

2

Ultra-Deepwater Advisory Committee

- **Action Steps: April 6-7, 2011, UDAC 15th Meeting**
  - Subcommittee Chairs present comments, findings and draft recommendations at UDAC meeting in Houston on April 6-7, 2011.
  - UDAC discusses subcommittee reports and reaches consensus on final findings and recommendations
  - Chair appoints Editing Subcommittee. Meeting on April 8, 2011
- **Action Steps by April 16, 2011**
  - Editing Subcommittee prepares final report and sends report to Committee Manager via email
  - Committee Manager forwards final report to members.

3

Ultra-Deepwater Advisory Committee

- **Action Steps: April 19, 2011, 10:00 am CDT**
  - Teleconference in Washington, DC
  - UDAC votes to accept Editing Subcommittee report
- **Action Steps: April 26, 2011**
  - UDAC Chair sends final report to the Designated Federal Officer

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