



- 
- **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**

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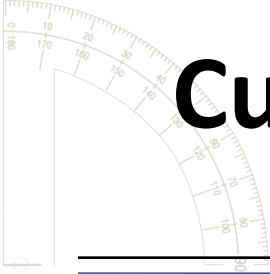
**Secure Energy for America**



# Contents

- RPSEA Organization
- Current Project Status
- UDW Program
- 2010 Requests For Proposals
- 2011 Draft Annual Plan
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# Current Program Structure/Funding



Program Funding From Federal Oil and Gas Royalties

Total Program: \$50 M/yr

Department of Energy

Fossil Energy Office

Program Consortium

NETL

In-House R&D Program

Unconventional  
\$16.25 M

Ultra-deepwater  
\$17.5 M

Small Producer Program  
\$3.75 M

Designed to be 10 year, \$500M directed spending.

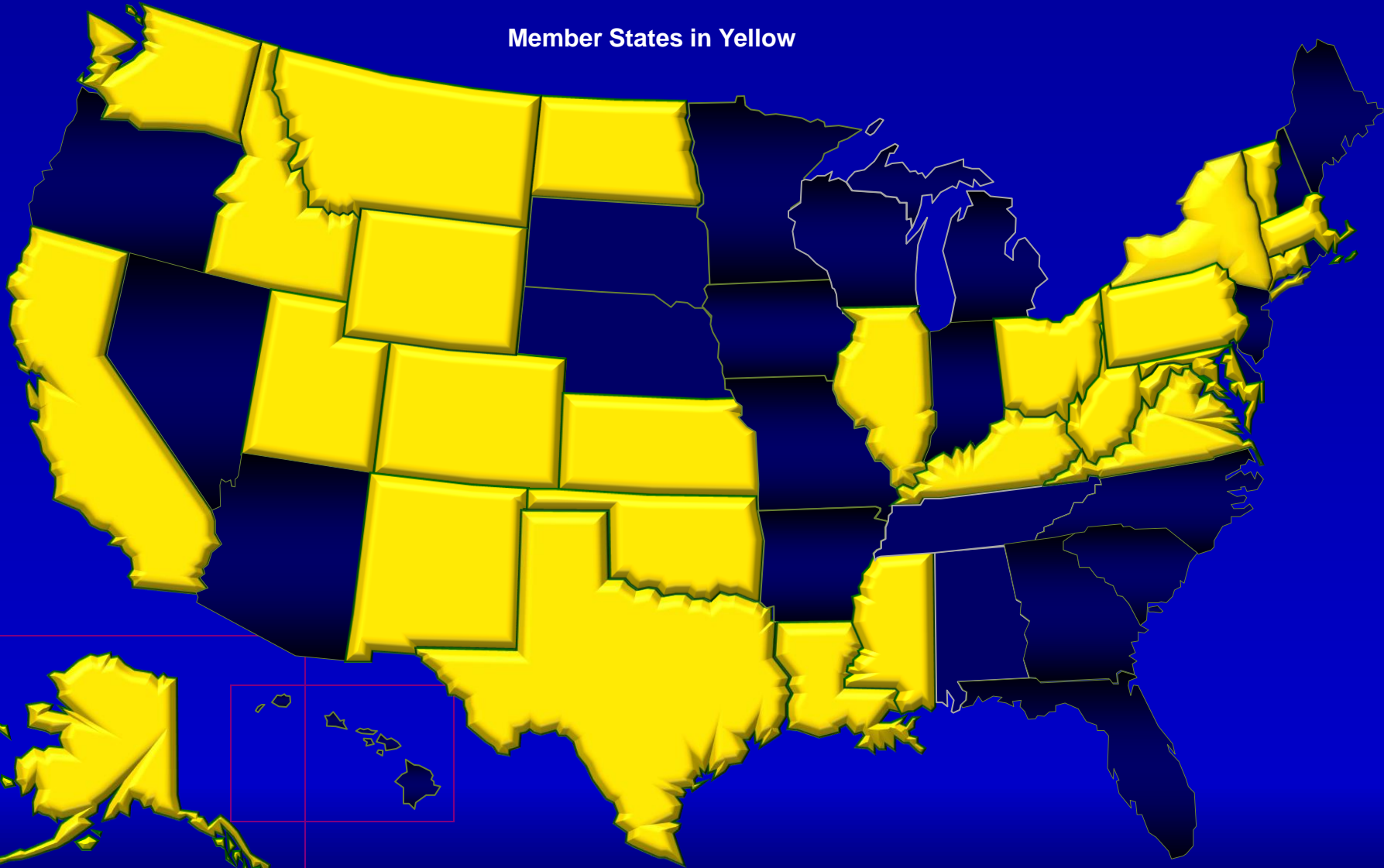
\$37.5 M

\$12.5 M



# RPSEA Members

Member States in Yellow



Members listed by state on reverse

**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

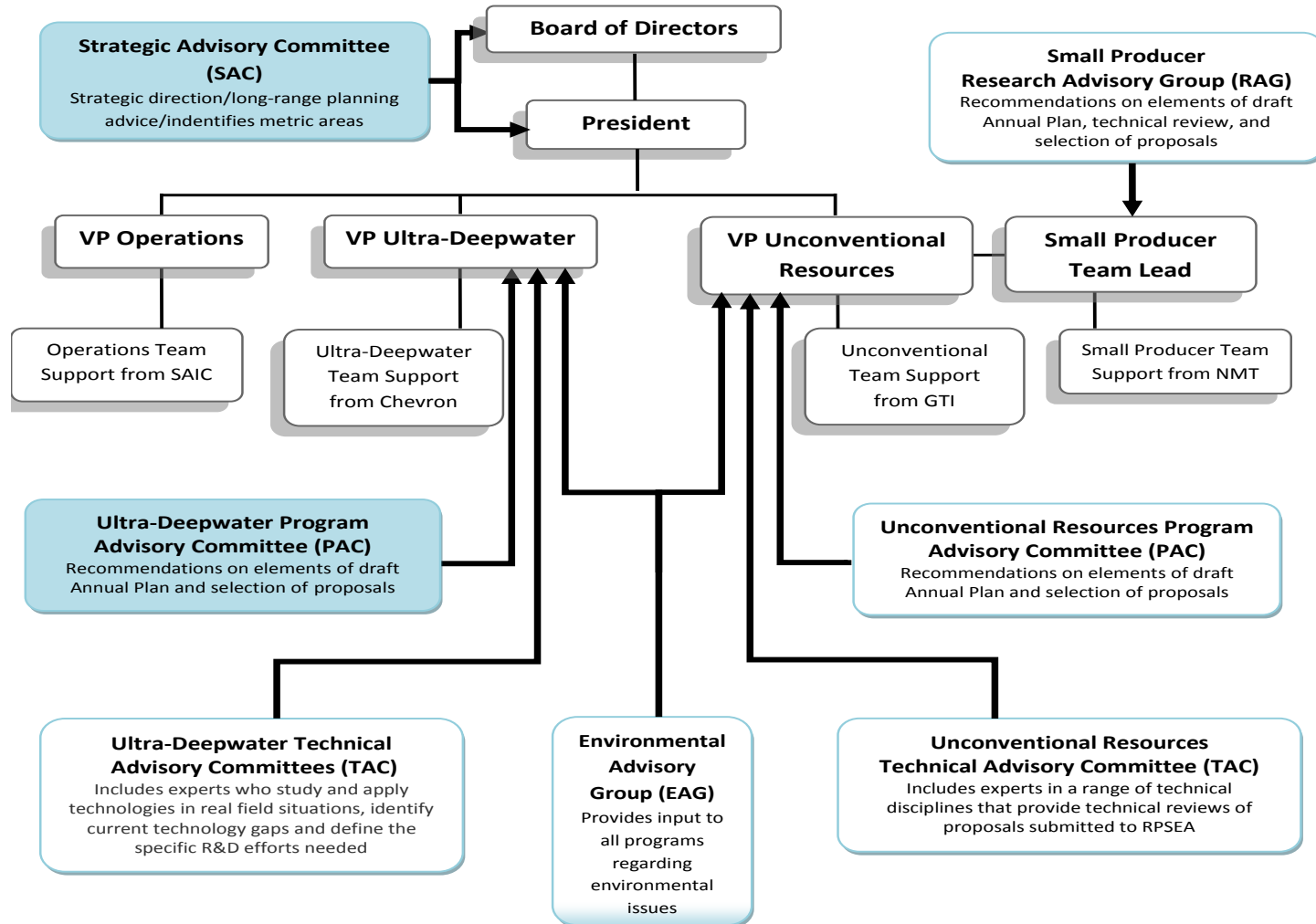
Det Norske Veritas (USA)  
Energy Valley, Inc.  
ExxonMobil Corporation  
GE Oil & Gas  
[General Marine Contractors, LLC](#)  
Granherne, Inc.  
Greater Fort Bend Economic Development Council  
GSI Environmental, Inc.  
Halliburton  
HIMA Americas, Inc  
Houston Advanced Research Center  
Houston Offshore 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

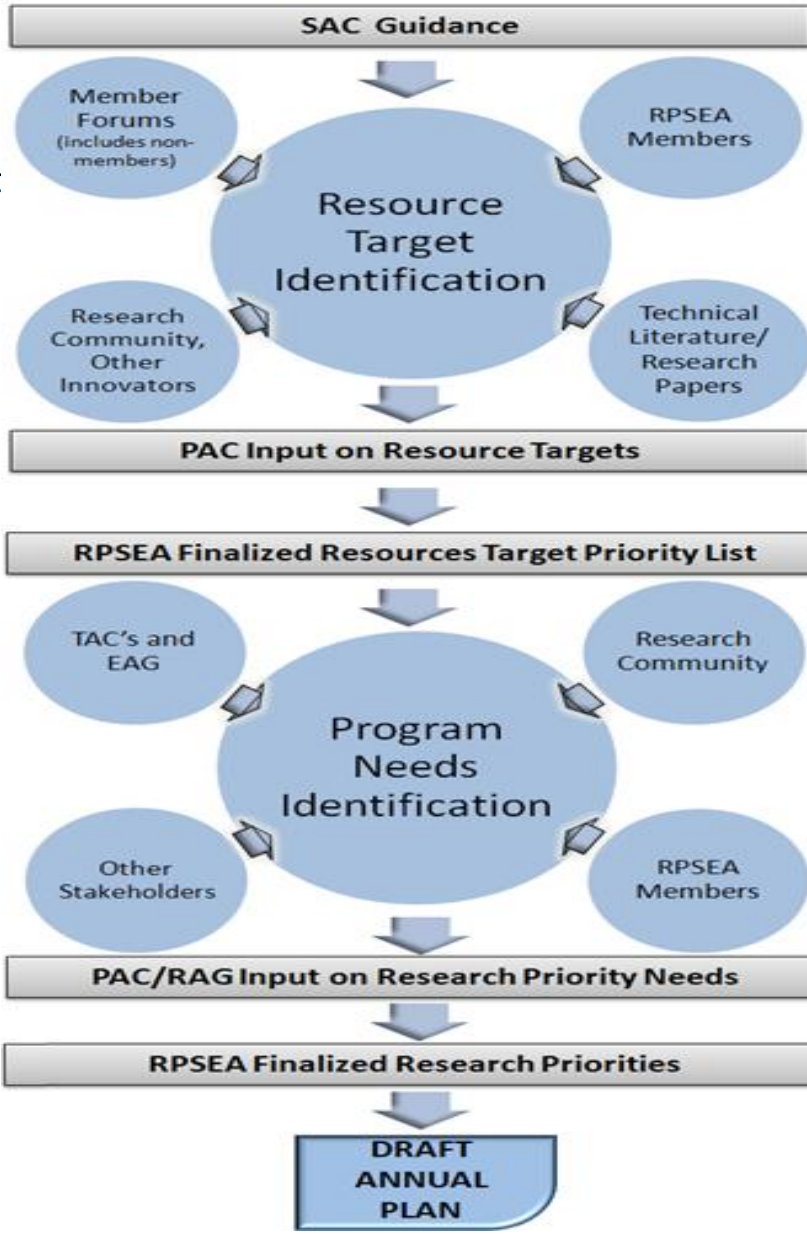
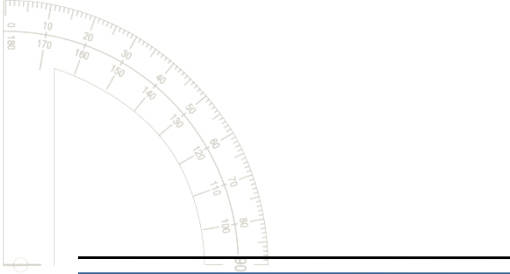
VersaMarine Engineering, LLC  
Weatherford International Ltd.  
[WFS Energy & Environment](#)  
Ziebel  
[2H Offshore Inc.](#)  
**Utah**  
Novatek, LLC  
The University of Utah  
**Vermont**  
New England Research, Inc.  
**Virginia**  
Advanced Resources International, Inc.  
American Gas Association  
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**

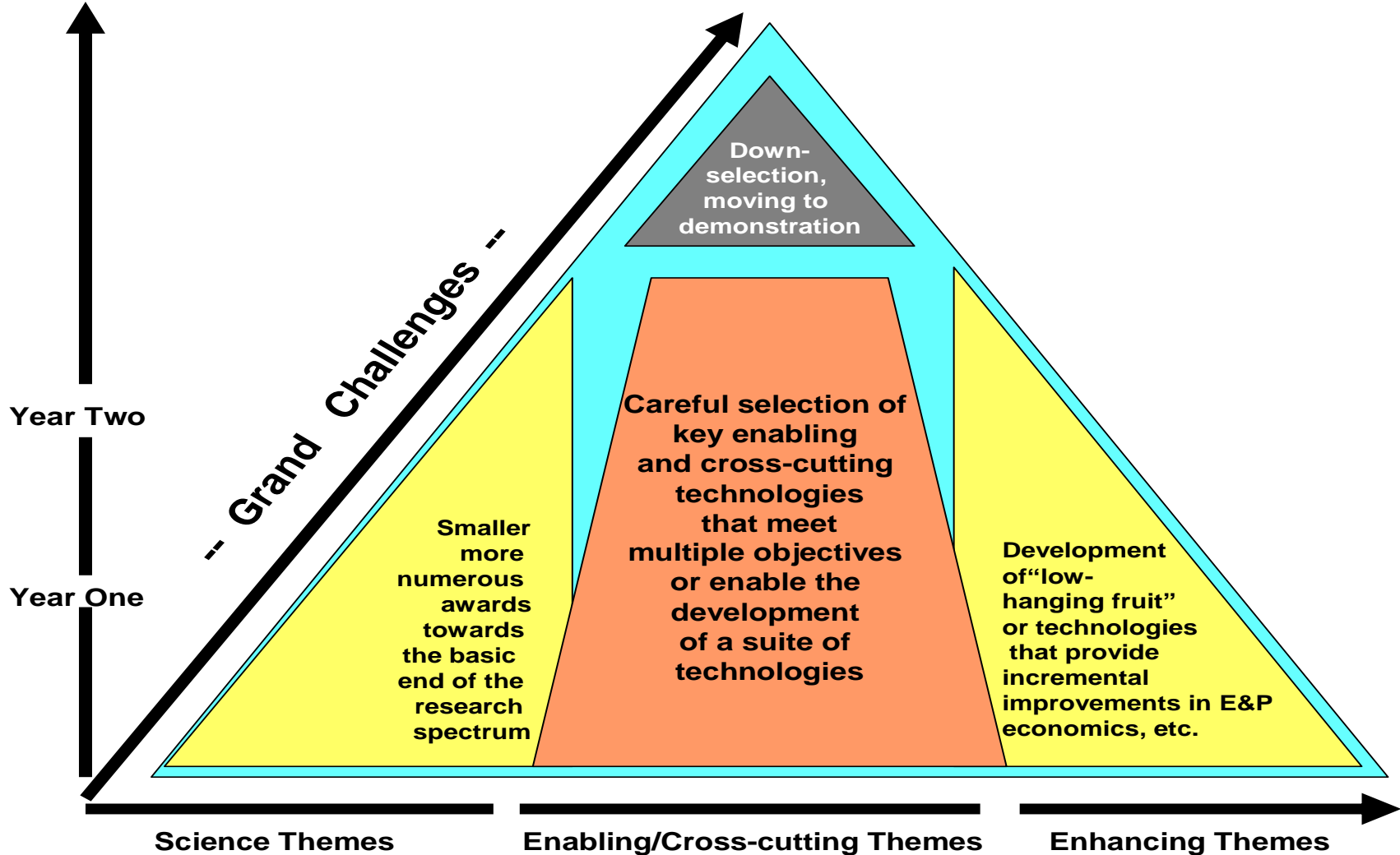
# RPSEA Organization





# Building a Relevant Portfolio

Years Five  
thru Ten





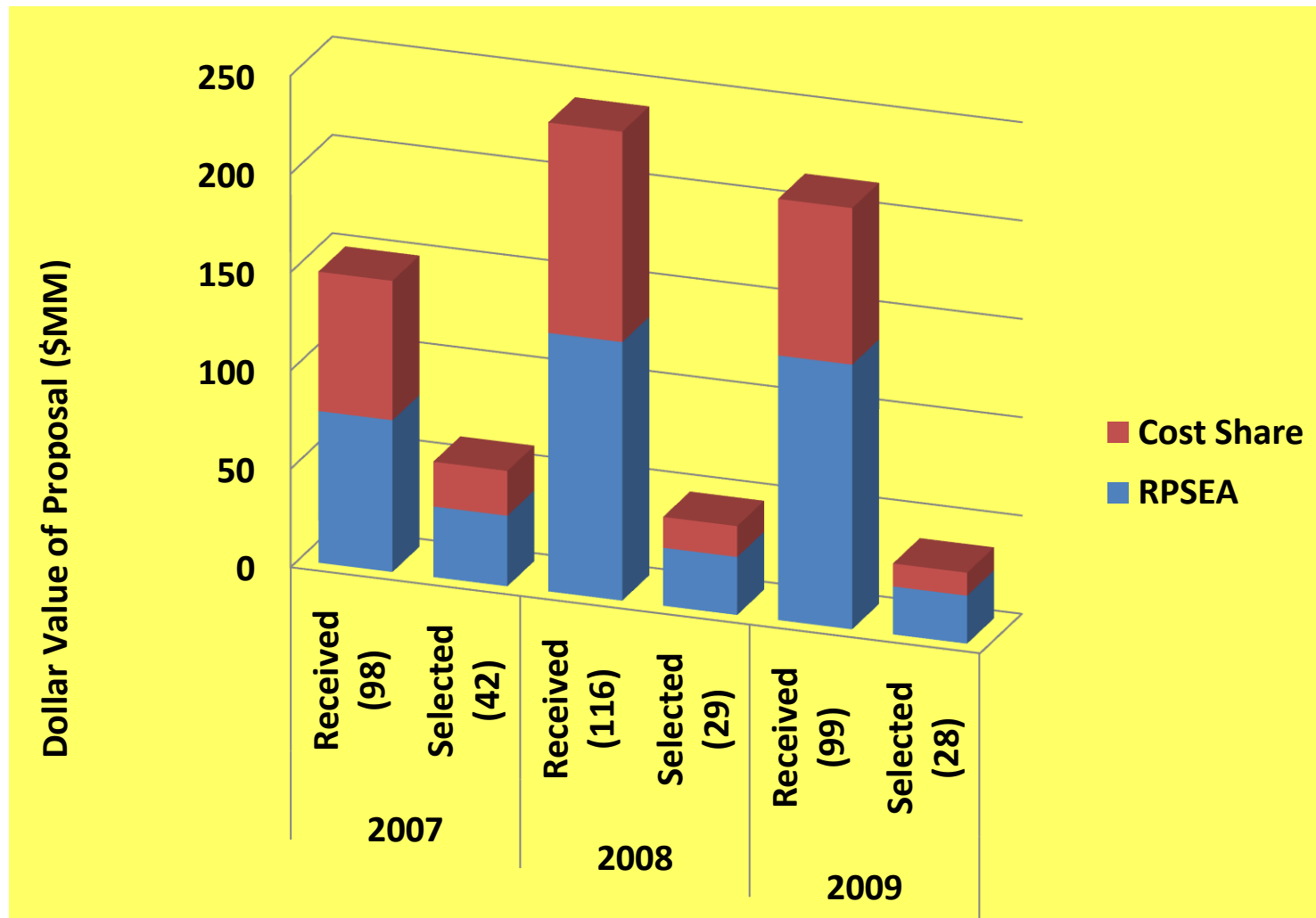


# Contents

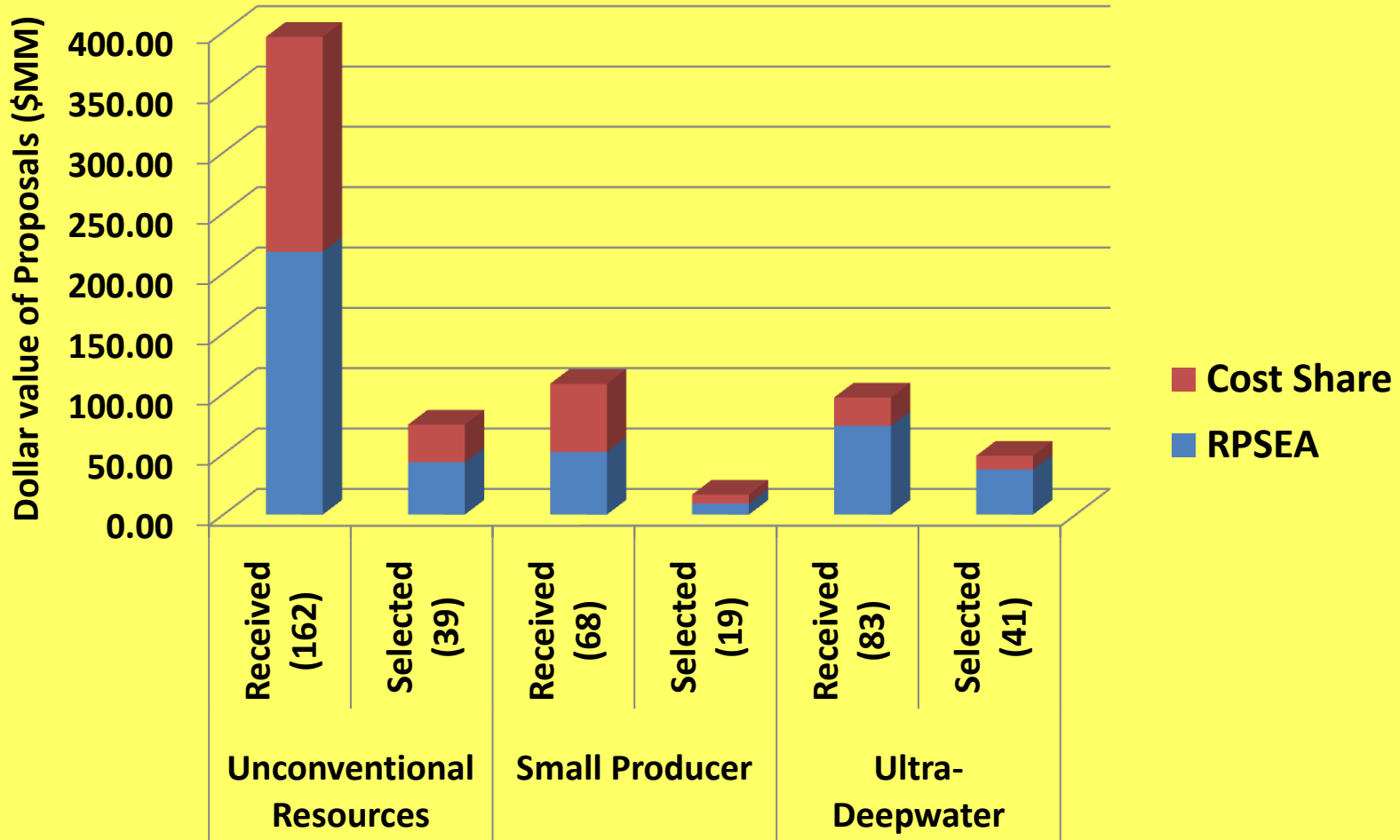
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# Summary of Proposals 2007-2009



# 2007-2009 Proposals





# Portfolio Overview

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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
<b>Total Selected</b>	<b>19</b>	<b>39</b>	<b>41</b>	<b>99</b>



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# UDW Mission

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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”

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# RPSEA UDW Structure

## PAC and TACs

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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





# UDW Technology Development Goals

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- Extend basic scientific understanding of various processes and phenomena directly impacting UDW production system design and reliable operation of an 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

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## 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.

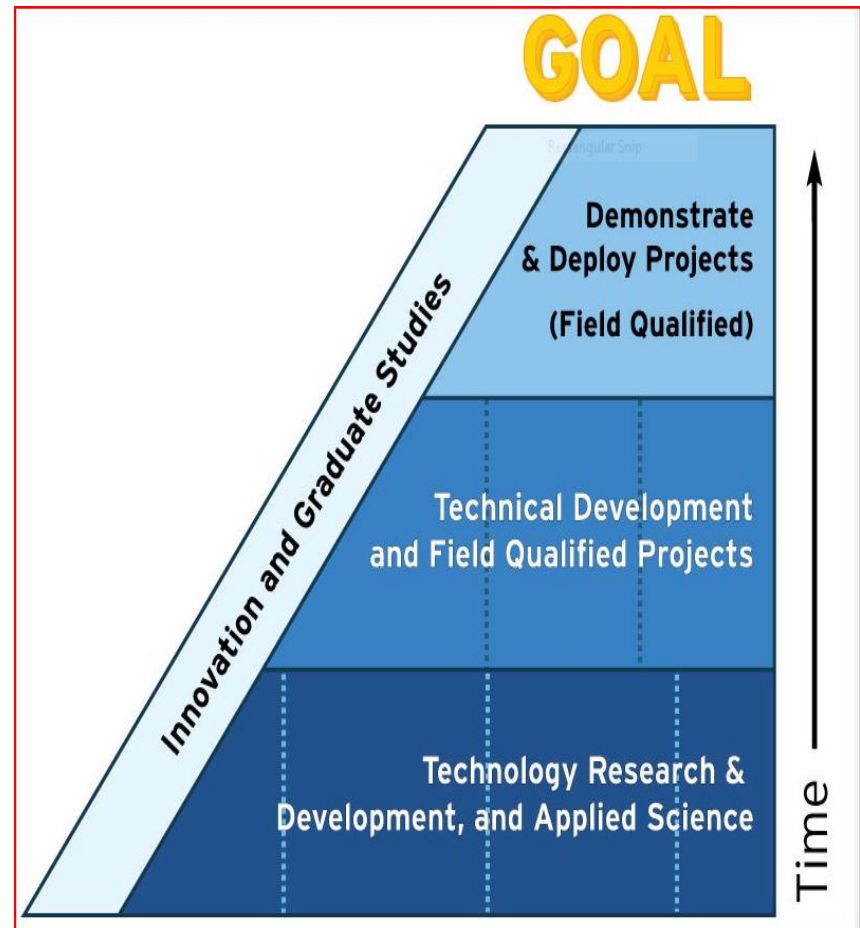


# Objectives



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

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## 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

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## 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

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## 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





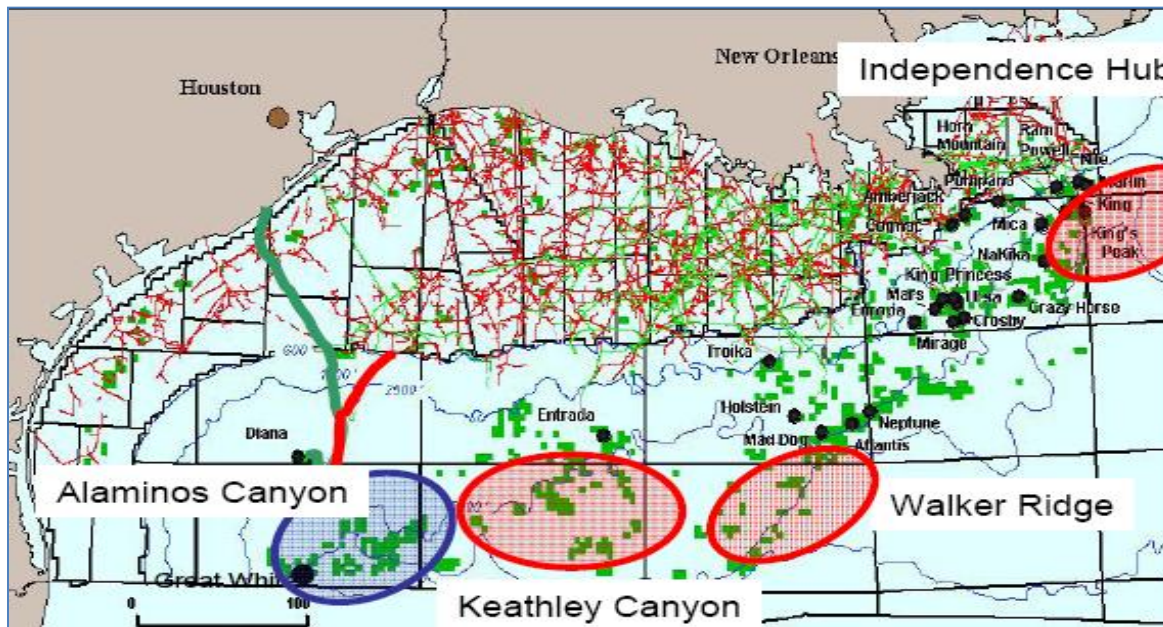
# Objective 6

## 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

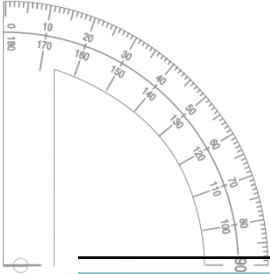
- viscous crude
- lacking infrastructure

### Eastern Gulf – Gas Independence Hub

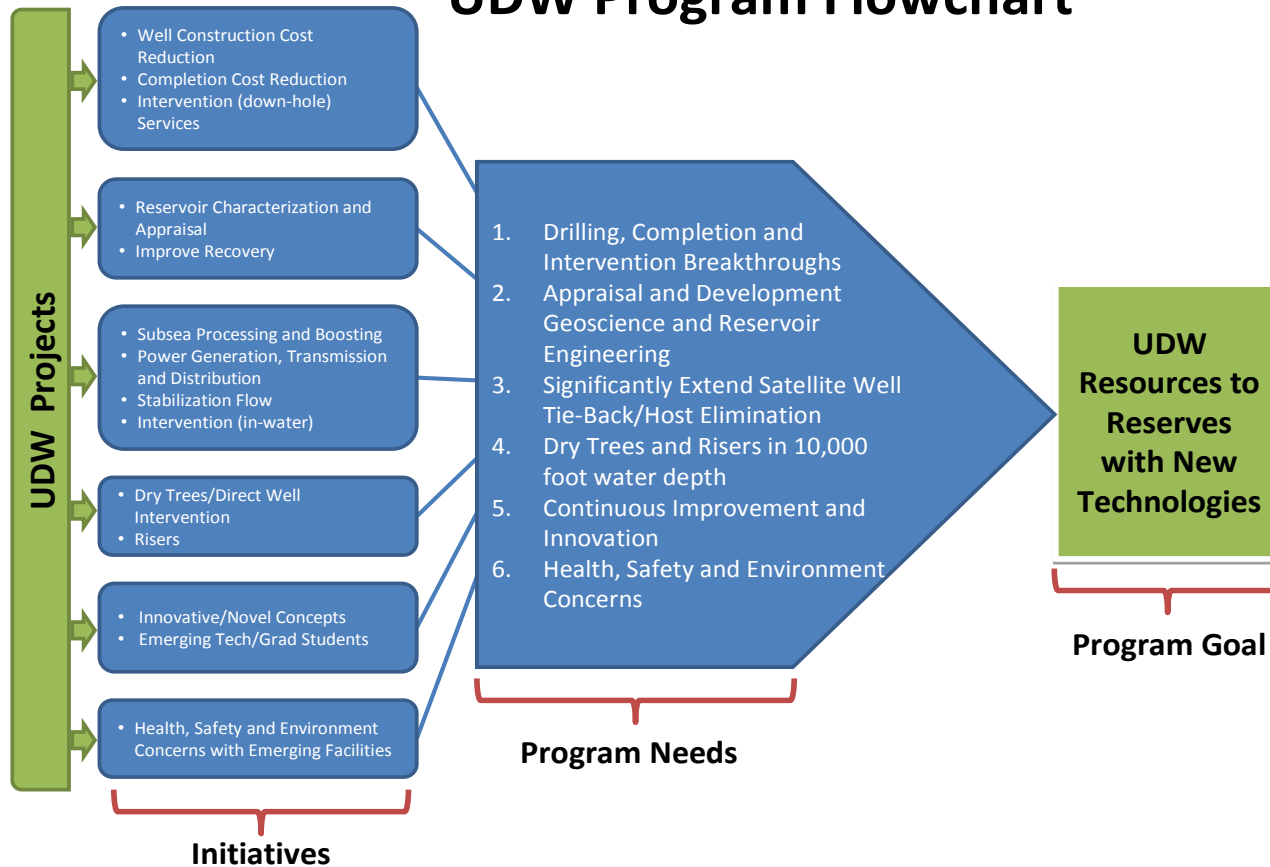
- higher pressure & temperature
- CO<sub>2</sub>/H<sub>2</sub>S

### Overall

- higher drilling costs
- challenging economics



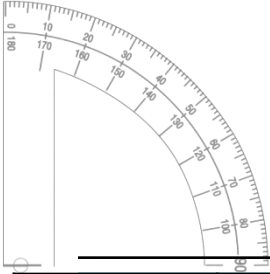
## UDW Program Flowchart



# 2007 UDW Projects

<u>Project</u>	<u>Project Title</u>	<u>Contracted; lead</u>	<u>Award (RPSEA portion)</u>
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
<b>15 awarded</b>			<b>\$15,104,426</b>

# 2008 UDW Projects



<u>Project</u>	<u>Project Title</u>	<u>Selected; lead</u>	<u>Award (RPSEA portion)</u>
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
<b>15 Projects</b>		<b>14 Awarded</b>	<b>\$13,013,992</b>

# 2009 UDW Projects

<u>Project</u>	<u>Project Title</u>	<u>Selected; lead</u>	<u>Approx. RPSEA share</u>
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
<b>11 Projects</b>			<b>\$10,153,009</b>



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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.

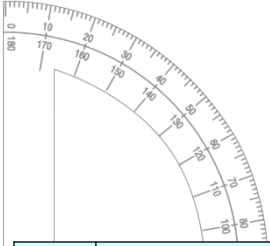




# 2010 UDW Funding by Need

	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
			<b>Total</b>	<b>1st Year (FY2010)</b>	<b>Future Year</b>

# 2010 UDW Funding by Sub-Need

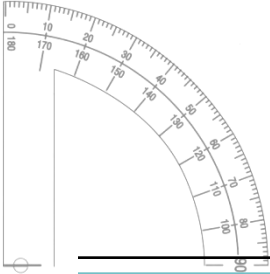


	Title / Description	TAC Recommended Topics	Total Project Cost	Phase 1 Cost (First Year)	Phase 2+ Cost	Schedule (Months)
<b>Need #1</b>	<b>Drilling Completion and Intervention Breakthroughs</b>		\$ 2,000,000	\$ 2,000,000	\$ -	
	Drilling		0	0		
	Completions		0	0		
	Intervention (Downhole Services)	Coil 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		
<b>Need #2</b>	<b>Appraisal &amp; development geoscience and reservoir engineering</b>		\$ 1,500,000	\$ 1,500,000		
	Reservoir Surveillance	Reservoir IOR	1,500,000	1,500,000		12
<b>Need #3</b>	<b>Significantly extend subsea tieback distances / surface host elimination</b>		\$ 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)
<b>Need #4</b>	<b>Dry trees / Direct well intervention and risers in 10,000' wd.</b>		\$ 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
<b>Need #5</b>	<b>Continuous Improvement / Optimize field development</b>		\$ -	\$ -		
	Long Term Research and Development and Graduate Student Program		0	0		
	Sensors, tools and Inspection Processes		0	0		
	Bridging and Contingency		0	0		



# 2010 UDW Funding by Sub-Need



	Title / Description	TAC Recommended Topics	Total Project Cost	Phase 1 Cost (First Year)	Phase 2+ Cost	Schedule (Months)
<b>Need #6</b>	<b>Associated Safety and Environmental Concerns</b>		<b>\$ 33,203,000</b>	<b>\$ 17,928,000</b>	<b>\$ 15,275,000</b>	
	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 Hazard 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 UDW Laser Inspection Sensor	938,000	938,000		12

<b>\$ 42,810,000</b>	<b>\$ 25,285,000</b>	<b>\$ 17,525,000</b>
<b>Total</b>	<b>1st Year (FY2010)</b>	<b>Future Year</b>

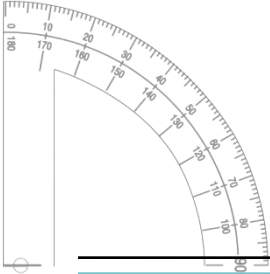




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# DW Horizon



**Deepwater Horizon's 11 Dead Remembered**

U.S. Coast Guard Eighth District External Affairs





# 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

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- 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

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- 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

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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

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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

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## **1. Drilling, Completion, and Intervention Breakthroughs**

- 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

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## **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

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## **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

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## **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

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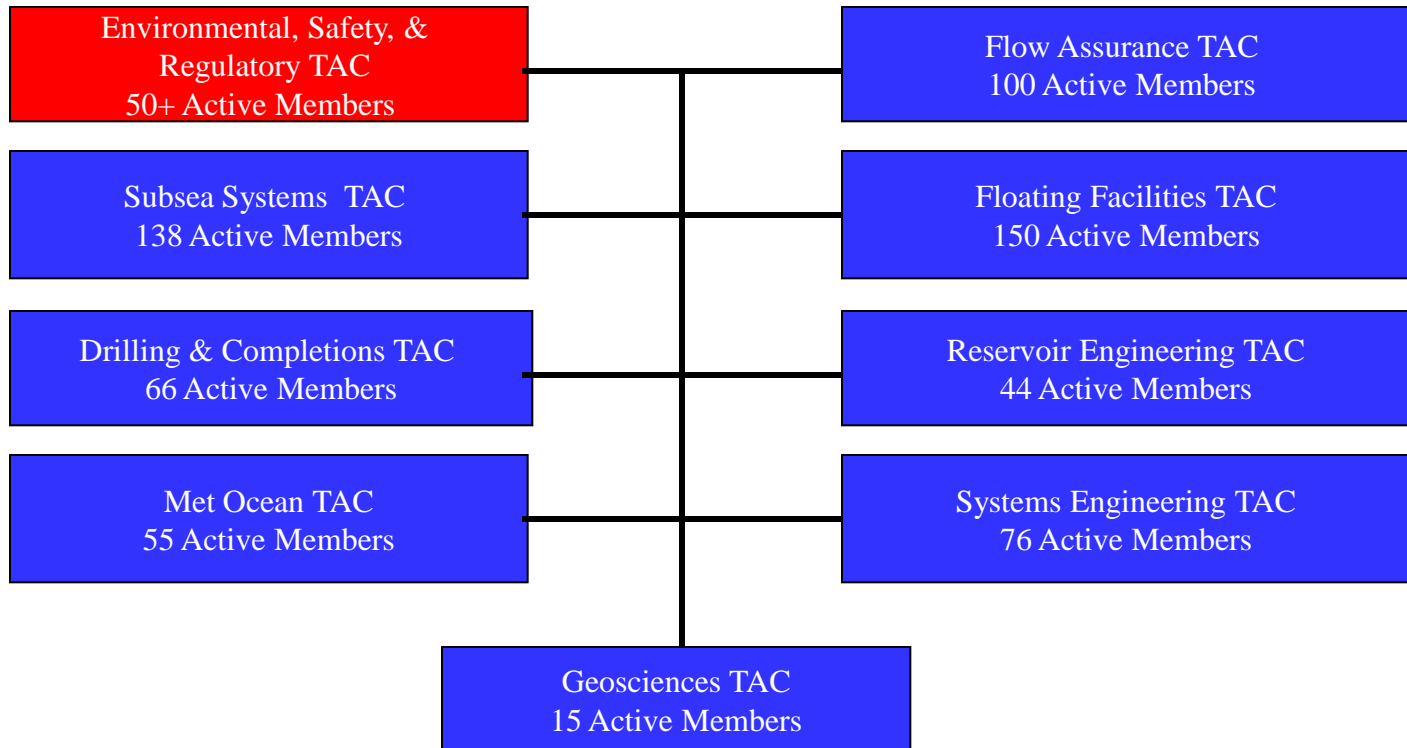
## 6. Associated Safety and Environmental Concerns

- 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

Program Advisory Committee  
“PAC”





# Anticipated Awards

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- 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

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- 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

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- 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

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- 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