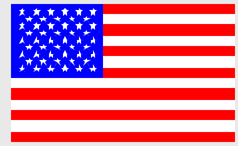
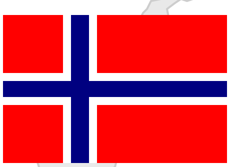
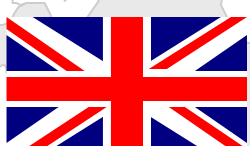
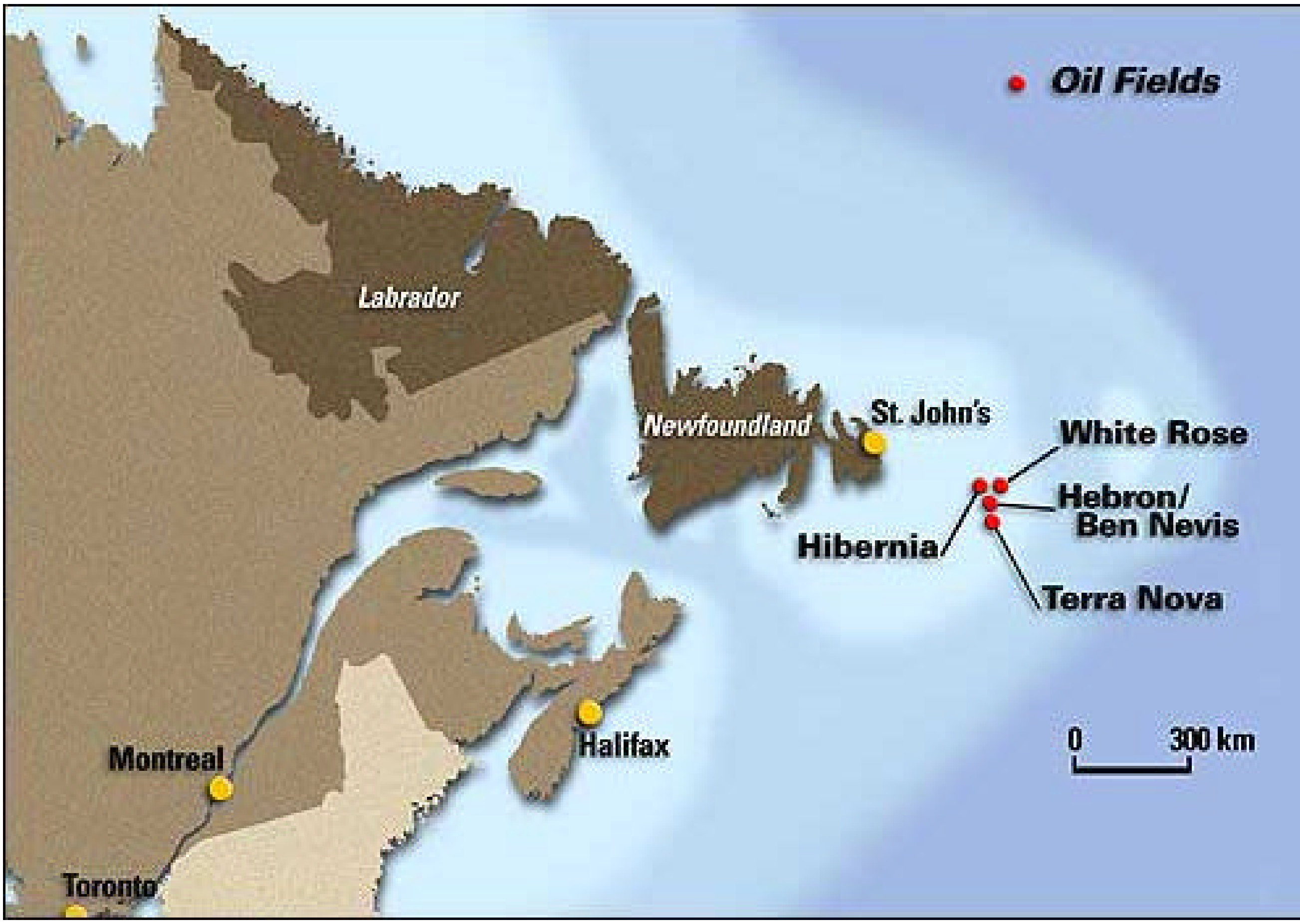


Minutes from the Seventh International Committee on Regulatory Authority Research and Development (ICRARD)

Hosted by
Minerals Management Service
April 12, 2002
Inter-Continental Hotel
Houston, Texas






Oil Fields
Labrador
Newfoundland
St. John's
White Rose
Hebron/
Ben Nevis
Hibernia
Terra Nova
0
300 km
Montreal
Halifax
Toronto


PETRO-CANADA
Terra Nova







Technology
Critical technology to enable or enhance deep and ultra-deep water systems
Balanced basic & applied research program
Core technical areas
Program balanced & optimized based on interests of industrial & government sponsors
Leverage
Synergy
Strong & flexible technology transfer program

Table of Contents

Minutes from the Seventh Meeting of ICRARD

MINUTES OF THE SEVENTH MEETING OF THE INTERNATIONAL COMMITTEE OF REGULATORY AUTHORITY RESEARCH AND DEVELOPMENT (ICRARD)

MINUTES OF MEETING

Friday, April 12, 2002
Inter-Continental Hotel
Houston, Texas

Present:

Dr. Charles Smith	Minerals Management Service, United States (Chairman)
Mr. Paul Martin	Minerals management Service, United States
Mr. Jim Lane	Minerals management Service, United States
Ms. Mary Ann Milosavich	Minerals management Service, United States
Mr. Nabil Masri	Minerals management Service, United States
Mr. Robert Smith	Minerals management Service, United States
Mr. Jim Magill	United States Coast Guard
Dr. Betty Felber	United States Department of Energy
Dr. Skip Ward	Offshore Technology Research Center, United States
Mrs. Carolita Kallaur	United States Private Citizen
Mr. Dominic Cattini	Ministry of Economic Affairs, The Netherlands
Mr. Howard Pike	Newfoundland Offshore Petroleum Board, Canada
Mr. Eduardo Santos	Agencia National do Petroleo (ANP), Brazil
Mr. Ricardo Rios	Agencia National do Petroleo (ANP), Brazil
Ing. Oscar Valle Molina	Instituto Mexicano del Petroleo, Mexico
Mr. Oyvind Tuntland	Norwegian Petroleum Directorate, Norway
Mr. Robert Miles	Health and Safety Executive, United Kingdom

1. Chairman's Welcome and Introductions

1.1 Dr. Charles Smith (MMS) welcomed everyone to Houston for the seventh annual meeting of ICRARD. Reminding everyone in attendance that ICRARD was an informal meeting, he stated the purpose of ICRARD was to exchange and coordinate worldwide information from research on offshore oil and gas operations.

1.2 Moving around the table, members introduced themselves and provided information on their involvement with offshore oil and gas operations. There was general consensus by members of the importance of ICRARD and each member relayed kind remarks for having the opportunity to be involved. *(See list above for those present)*

2. Welcoming Remarks

2.1 Mr. Paul Martin (Chief of the Engineering and Research, MMS) presented the official welcoming remarks on behalf of the MMS. Mr. Martin spoke on the international aspects of the offshore oil and gas industry. He noted that organizations such as ICRARD could play a major role in sharing of information on new technologies and/or gaps existing in current technological or regulatory efforts. He further stated that ICRARD's role should be in developing cooperation to address these gaps and the exchange of information related to offshore safety and pollution prevention.

2.2 Mrs. Carolita Kallaur (formerly Associate Director of MMS) was introduced by Mr. Martin and spoke of the role of international cooperation with the offshore industry. She mentioned that at the last International Regulators Forum (IRF) meeting in Perth there was a discussion of whether there should be a closer relationship between the IRF and ICRARD but it was decided that the current arrangement was satisfactory. She also noted that global topics should be sought for cooperative research and that many common values could be obtained when you link Regulators, Industry, and Academics worldwide. She further noted that a side benefit is the friendships developed from IRF and ICRARD participation and the appreciation of different cultures that come from those friendships. *(See Appendix for Mrs. Kallaur's remarks)*

3. Approval of Agenda /New Items

3.1 The agenda was approved for the seventh annual meeting of ICRARD. There were no comments from members about the agenda. *(See Appendix for copy of approved agenda)*

3.2 Dr. Smith noted that there would be a Box Lunch (hosted by OTRC) with an overview presentation of OTRC's Research Program by Dr. Skip Ward, Associate Director.

4. Review of ICRARD Membership and Correspondence

4.1 Dr. Smith relayed regrets from Richard Craddock (Australia), Steve Ovens (New Zealand), Ibrahim Konuk (Canada), and Rodney Cluck (MMS/U.S.) for not being able to attend. Dr. Smith also provided an overview of the membership of ICRARD. He noted that the membership requirements were changed a few years back to allow participation not only from representatives of national regulatory bodies, but also from representatives from national oil companies and/or their national research institutions that supported offshore research and development programs. The idea of inviting non-regulatory members into ICRARD sparked some debate between current members. Most agreed that information from Industry was valuable but maybe their membership was not appropriate. Additional discussion on this matter can be found in section 6 - Review of Terms Of Reference for ICRARD. *(Please see Appendix for letters of regret)*

5. Review and Approval of Last Meeting Minutes

5.1 The minutes of the previous meeting were distributed to those in attendance for review and comment. The minutes were accepted as correct from the sixth annual meeting of ICRARD. *(See Appendix for approved minutes)*

5.2 It was noted that having the ICRARD meeting in conjunction with a conference or other forum, as had been recommended at previous ICRARD meetings, was a very good concept. Such an arrangement allows international travelers the opportunity to make better use of their time and the costs associated with trips abroad. In 2002, ICRARD was held in conjunction with two other events held at the Houston Inter-Continental Hotel; the 2nd International Workshop on Human Factors in Offshore Operations and the MMS Industry Awards Program-2002.

6. Review of Terms Of Reference for ICRARD

6.1 Dr. Smith handed out and described changes that were made in the terms of reference, which was one of the action items from the last meeting of ICRARD. He explained that ICRARD usually meets every twelve to eighteen months and that membership was expanded to include National Oil Companies. He noted that IPM/PEMEX participation as well as the past participation by Petrobras was good examples. He further inquired if additional changes were needed or should the terms of reference remain unchanged. The group was asked to consider what should be the best mix of formal and informal discussions and what are the benefits or drawback of this idea for ICRARD. This question was opened up to the floor for comment.

6.2 Mr. Robert Miles (HSE) had a comment that better coordination was needed on global technical issues. There should be an effort to pick the most important technical issue and rally all international efforts to promote that agenda.

6.3 There was general consensus that each year, ICRARD should develop a technical theme that would be addressed by each member country and by having guest speakers/presenters that might cover these issues on a general basis. This would work to reduce worldwide duplication of research effort also having a main point of contact for each Regulator would streamline communicating these technical issues to ICRARD.

6.4 An Action Item for the next meeting will be to adjust the terms of reference to reflect that a member Regulators can invite a particular operator/vendor/academic (preferable through Associations) to a meeting of ICRARD to provide their knowledge/experience on a technical issue found to be of importance to the group. This access would be limited to the time duration allotted on the agenda for this presentation and not for attendance of the entire meeting. *(See Appendix to view the current Terms of Reference)*

7. Old Business

7.1 Dr. Smith handed out a copy of the Actions Items from the sixth meeting of ICRARD. He read each of the six items and illustrated that each one was achieved. Dr. Smith also noted that Action Item #5 should be carried over to the next meeting of ICRARD.

7.2 Completed Action Items from the ICRARD Meeting on June 9, 2000 were then approved. *(See Appendix for Action Items from the sixth meeting)*

8. Overview of Research from Participating Countries

8.1 A total of twelve presentations were presented following the order listed in the Agenda. The presentations (viewgraphs / written material and handouts) are presented as part of the Appendices to the minutes.

8.2 United States

8.2.1 Technology Assessment and Research Program, Minerals Management Service

Mr. Martin (MMS) presented an overview of the MMS Technology Assessment and Research Program to include both Operations Safety and Engineering Research (OSER) and Oil Spill Research (OSR) as well as a brief description of the OHMSETT (covered in more detail by Mr. Lane) facility that the MMS manages. He noted that the TA&R Program was composed of eight areas; Drilling, Workovers, and Completions; Production: Structures/Materials; Pipeline Operations/Fluid Flow; Oil Spill; Pipelines; Decommissioning; and Human Factors. He noted that individual members of his staff were assigned to each of these areas contained in the OSER and OSR programs. He proposed that each participating country provide a similar list of contacts. *(See Appendix for Mr. Martin's presentation)*

8.2.2 MMS Oil Spill Program, OHMSETT Facility and Testing Programs

Mr. Jim Lane (MMS) presented an overview of the MMS Oil Spill Research Program, the OHMSETT Facility and the research initiative underway known as the Mechanical Oil Recovery in Ice-Infested Waters testing program or MORICE. He cited several projects being sponsored to include remote sensing for detecting an oil spill, properties and behavior of oils, chemical treading agents, mechanical containment and cleanup and on in situ burning. He provided a detail account of the OHMSETT facility and the type of research being conducted at the test tank. He distributed several items to the participants that were made to advertise the facility. He noted the oil spill response training being conducted at OHMSETT and noted that if any one was interested or knew of someone, the course could be made available on a contract basis. *(See Appendix for Mr. Lane's presentation)*

8.2.3 Environmental Studies Program, Environmental, Minerals Management Service

Dr. Rodney Cluck (MMS) of the Environmental Studies Branch was not able to attend however he made his presentation available for the Proceedings. *(See Appendix for Dr. Cluck's presentation)*

8.2.4 International Activities & Marine Minerals Division, Minerals Management Service

Ms. Mary Ann Milosavich (MMS) gave an overview of the MMS International Activities and Marine Minerals Division (INTERMAR). She noted that the marine minerals part of INTERMAR provided policy for the development of non-energy minerals such as sand and gravel where the international activities part served a focal point within MMS to coordinate the Agency's international activities. She pointed out that the MMS was involved in international initiatives that promoted the integration of safety and environmental concerns. She noted that our international focus was in three main areas; standards, providing support to the U.S. State Department and by working directly with other countries. (See Appendix for Ms. Milosavich's remarks)

8.2.5 Overview of Offshore Oil and Gas Activities, United States Coast Guard (USCG)

Mr. James Magill (USCG) presented an overview of the USCG responsibilities in offshore oil and gas operations. He described their role in port and vessel security as well as other waterways of the Unites States. Mr. Magill mentioned that earlier in the day, the USCG and the MMS hosted a "Workshop on Transferring Responsibility for Inspection and Enforcement of U.S. Coast Guard Regulations for Fixed Facilities on the Outer Continental Shelf to the Minerals Management Service". The USCG is authorizing the MMS to perform inspections on fixed facilities engaged in Outer Continental Shelf activities and to enforce Coast Guard regulations applicable to those facilities. MMS already performs inspections on those facilities to determine whether they comply with MMS regulations. By authorizing MMS to also check for compliance with Coast Guard regulations, the Agencies are avoid duplicating functions, reducing Federal costs, and increasing oversight for Coast Guard compliance without increasing the frequency of inspections. *(See Appendix for Mr. Magill's presentation)*

8.2.6 National Petroleum Technology Office, United States Department of Energy

Dr. Betty Felber (US DOE) presented an overview of DOE's National Energy Technology Laboratories research program. She discussed how DOE's focus is for both onshore and offshore oil and gas operations. Their research program was set up as a catalyst for developing the technology needed to produce current hydrocarbon reserves. DOE focuses on long-term research projects that investigate new energy sources such as hydrates and energy cells and makes them marketable to consumers. *(See Appendix for Dr. Felber's presentation)*

8.2.7 Offshore Technology Research Center (OTRC), Texas A&M University

Over an informal lunch hosted by Offshore Technology Research center (OTRC), Dr. Skip Ward presented an overview of the Center's activities. He noted that it was initially funded in 1988 by the National Science Foundation with additional funding from over 35 industry participants and the State of Texas as members. He stated that the mission of OTRC was to conduct basic engineering research and test new technologies for deepwater oil and gas production and to educate students for the offshore industry. He noted that the Center had a world class wave basin to support it research mission. He reviewed OTRC's research theme topics for study; materials, structures, fluid/structures, seafloor engineering interaction, and training. *(See Appendix for Dr. Ward's presentation)*

8.3 **Brazil**

Mr. Ricardo Rios (ANP) and Mr. Eduardo Santos (ANP) gave an overview of the activities of the Agencia National do Petroleo (ANP). They provided an update for offshore operations in Brazil since the P-36 incident. They discussed the ongoing PROCAP-2000 research effort and that several manufactures (mention of Coflex) of flexible pipe were involved to investigate structural integrity issues. It was noted that the next step was to promote usage out to 3,000 meters off Brazil. They also mentioned that Petrobras was sponsoring a workshop on mooring issues. One main topic was the use of polyester ropes in single point or spread moorings for FPSO's. ANP was a primary sponsor of this workshop. They noted that Petrobras has informal research relationships with academia and that this relationship could be tapped to address technical issues relative to the mission of ICRARD. ANP noted that sometimes industry was quite open, but other times they were not so open to share technical knowledge.

8.4 **Mexico**

Mr. Oscar Valle Molina (IMP) presented recent research and technology issues from the Instituto Mexicano del Petroleo (IMP). He mentioned that there was a new organizational structure at IMP. He discussed the ongoing research programs and the technology developments and innovations needed for exploration and production of deepwater resources. He noted that there would be a greater push into deeper waters of the Mexican portion of the Gulf of Mexico. *(See Appendix for Mr.Valle's presentation)*

8.5 **Newfoundland**

Mr. Howard Pike (C-NOPB) gave an overview of activities occurring in the Newfoundland Offshore Petroleum Board, Canada. Mr. Pike described several

Federal programs, which cover a variety of technical issues. Some current issues of concern were ice mechanics, evacuation systems, and human factors in harsh environments. He mentioned that much had been learned since the Ocean Ranger accident but there were still many new questions that needed to be answered. Mr. Pike also mentioned that in Newfoundland, public involvement has a significant role in offshore development decisions. Because of this, he felt that the additional consultation has led to more success in a positive public perception of the offshore industry. Mr. Pike commented that there are limitations on human factors in harsh environments. The Petroleum Board is involved with academics for research and development as a springboard to international work. Currently he noted, there were concerns with human factors with shift work on FPSO's. More coordination internally is needed when organizing smaller scale focused workshops on this subject.

8.6 The Netherlands

Mr. Dominic Cattini gave an overview of the activities of the Ministry of Economic Affairs in The Netherlands. He stated that the Ministry seeks its technical knowledge from private technical institutions. Blast response is a considerable part of environmental impact assessments. Mr. Cattini noted that Ministry does not have a research budget. Moneys are sought on a case by case basis when a research topic is identified and needed. In The Netherlands, offshore petroleum activities occur in heavily traveled shipping lanes. Water depths range from 23 – 42 meters, so there is concern about potential damage to pipelines and other facilities. Mr. Cattini also noted that Green Water has been a problem as well with FPSOs. He discussed some academic efforts to use a forward thinking systems approach to help reduce incidents of human factor accidents. He noted that Shell is the main operator in The Netherlands and several of the larger reservoirs discovered and were directionally drilled and produced from onshore facilities. Currently, there is strong public pressure for the Ministry to ascertain any environmental or human safety issue of seismic activity tied to gas wells. Mr. Cattini noted that there was seismic activity registered up to 2.3 on the Richter scale and led the temporary shut in of their offshore gas wells.

8.7 Norway

Mr. Oyvind Tuntland (NPD) gave a presentation on current activities in the Norwegian Petroleum Directorate. He stated that the NPD does not do much Government sponsored research. If there were a problem, they would go to the industry. However, they do participate in Joint Industry Projects (JIP). He noted that they cooperate with the U.K. and other North Sea countries to improve safety offshore. Mr. Tuntland described their current technical issues to be fire and blast, directional drilling, underballanced drilling, aging pipeline and facilities, human factors and deepwater hydrocarbon releases. *(See Appendix for Mr. Tuntland's presentation)*

8.8 **United Kingdom**

Mr. Robert Miles (HSE) presented an overview of the current research strategy within the Offshore Safety Division of the Health and Safety Executive. He gave a thorough description of the structure of the HSE and how most issues revolve around labor and safety between the many sectors in the UK. Mr. Miles also discussed the newest research initiatives for 2002. Results from research and policy documents are available from a number of websites listed in his presentation. *(See Appendix for Mr. Miles's presentation)*

9. Other New Business

9.1 Dr. Smith asked of other new business. He handed out a copy of the following to the group: An announcement flyer for the International Workshop on Fire and Blast Considerations for the Future Design of Offshore Facilities; A JIP proposal on Deepwater Blowout Prevention; and information on how to get involved with the 2003 International Offshore Pipeline Workshop. *(See Appendix for copies of handouts)*

9.2 Dr. Smith listed the Action Items assembled over the course of the meeting. These Action Items were as follows:

Action Item 1: Carry over Action Item # 5 from last year's meeting which was that all members will distribute a corresponding list of contacts to the other members of ICRARD.

Action Item 2: Dr. Smith will send future MMS research Broad Agency Announcements to the members of ICRARD.

Action Item 3: Dr. Smith will send the proposed changes for the Terms of Reference for ICRARD, to the members for comment.

Action Item 4: Dr. Smith will distribute the proceedings from the seventh annual meeting of ICRARD to the members.

Action Item 5: Dr. Smith will update the MMS webpage for ICRARD (http://www.mms.gov/tarinternation/icrard.htm) with the web link to websites of all current members.

Action Item 6: Mr. Pike will check to see if it would be possible to have the eighth meeting of ICRARD for June 2003, in St. John's, Newfoundland, Canada.

Action Item 7: Mr. Santos will check to see if it would be possible to have the ninth meeting of ICRARD for September 2004, in Rio de Janeiro, Brazil.

10. Date and Venue for the Next Meeting

10.1 For the eighth meeting of ICRARD, Mr. Pike has tentatively volunteered to host it in June 2003, in St. John's, Newfoundland, Canada.

10.2 For the ninth meeting of ICRARD, Mr. Santos has tentatively volunteered to host it in September 2004, in Rio de Janeiro, Brazil.

11. Adjournment

11.1 Dr. Smith relayed thanks to all who attended and adjourned the meeting at 4:30 P.M.

Appendix A

Agenda

AGENDA

International Committee on Regulatory Authority Research and Development (ICRARD)

Inter-Continental Houston
2222 West Loop South
Houston, Texas 77027
Tel 713-627-7600
Fax 713-961-5575

Thursday, April 11, 2002

6:30 p.m.	Dinner (Hosted by the International Fire and Blast Workshop/MSL Engineering) (ICRARD participants to meet in hotel lobby at 6:30 p.m. to go to the restaurant) Sullivan's Restaurant Houston 4608 Westheimer Road Houston, Texas Tel 713-961-0333

Friday, April 12, 2002
Champions Room VI

8:30 - 9:00	Coffee and Refreshments

Session Moderator: Charles E. Smith
Engineering and Research Branch
Minerals Management Service

9:00 – 9:10	Introduction of Participants
9:10 – 9:15	Welcoming Remarks on Behalf of the MMS Paul Martin, Chief, Engineering and Research Branch, Minerals Management Service
9:15 – 9:20	Approval of Agenda/New Items
9:20 – 9:30	Review of ICRARD Membership and Correspondence
9:30 – 9:35	Review and Approval of Last Meeting Minutes
9:35 – 9:40	Review of Terms of Reference for ICRARD

9:40 – 10:00	Old Business
10:00 – 10:20	**BREAK** (Coffee and Refreshments)
10:20 – 12:00	Overview of Research Programs from Participating Countries (20 minutes each)
12:00 – 1:00	**BOX LUNCH** and Informal Discussions (Lunch will be hosted by OTRC) Luncheon presentation – Overview of OTRC's Research Program – Dr. Skip Ward, Associate Director, Offshore Technology Research Center, Texas A&M University
1:00 – 2:00	Overview of Research Programs from Participating Countries (Continued)
2:00– 2:30	MMS Oil Spill Program, OHMSETT Facility and Testing Programs, Jim Lane, Engineering and Research Branch, Minerals Management Service
2:30 – 3:00	Update on the MMS Environmental Studies Program Dr. Rodney Cluck, Environmental Studies Branch, Minerals Management Service
3:00 – 3:20	**BREAK** (Coffee and Refreshments)
3:20 – 3:30	Other MMS International Activities, Mary Ann Milosavich, International Activities & Marine Minerals Division, Minerals Management Service
3:30– 4:30	Presentations by Other Participants (US Coast Guard, Department of Energy, Office of Pipeline Safety)
4:30 – 4:50	Other New Business
4:50 – 5:00	Date and Venue for the Next meeting
5:00 p.m.	**Adjourn**
6:30 p.m.	Dutch Dinner at an area restaurant for those that would like to participate

Appendix B

Attendees

ICRARD ATTENDEES LIST

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Appendix C

Letters of Regret

Cheryl:

I apologize that I could not attend the this ICRARD meeting. I was send to Spain for few weeks, it is turning into Months.

I hope that meeting was successful. Please best by best wishes to your colleagues and my apologies.

Best regards;

Ibrahim Konuk

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Geological Survey of Canada
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Canada

Tel: (613) 992-1952
Fax: (613) 992-0190

-----Original Message-----
From: Cheryl D Smith [mailto:cherylsm@usgs.gov]
Sent: Friday, March 22, 2002 2:03 PM
To: ovalle@imp.mx; ovalle@imp.mx; christina.sames@rspa.dit.gov; powerr@neb.gc.ca; Rproctor@comdt.uscg.mil; radwanam@aramco.com.sa; d.cattini@minez.nl; peter.wilkinson@isr.gov.au; oyvind.tuntland@npd.na; pedrosa@anp.gov.br; rrios@anp.gov.br; peter.mills@hse.gsi.gov.uk; ian.whewell@hse.gsi.gov.uk; michael.lunt@hse.gsi.gov.uk; bob.miles@hse.gsi.gov.uk; elane.melchert@hq.doe.gov; bfelber@npto.doe.gov; jmagill@comdt.uscg.mil; IKonuk@NRCan.gc.ca; aclark@NRCan.gc.ca; aparker@cnsopb.ns.ca; hpike@cnopb.nf.ca; stephen.ovens@osh.dol.govt.nz; st@public.bta.net.cn; wangyx@cnooc.com.cn; somkietj@ptt-ep.com
Subject: 2002 ICRARD Meeting, Houston, Texas

TO All,

This is just to update you on the ICRARD meeting scheduled for April 12, 2002 in Houston Texas. See the attached draft agenda for your review. The MMS e-mail system is still down but I am sending this from my wife's computer at the USGS. If you have not yet done so, please let me know by Fax (703-787-15490 or by phone (703-787-1561) if you will attend the ICRARD Meeting.

For all national and international participants, we will meet at 6:30 p.m. on the evening of April 11 in the lobby of the Inter-Continental Hotel (2222 West Loop South to go to dinner at Sullivan's Restaurant. The dinner will be hosted on behalf of ICRARD by MSL Consulting Engineers of Houston, Texas. Please let know if you plan on attend so we will know how many reservations to make at the restaurant.

Also note that for our International Participants in ICRARD that are attending the MMS Awards Program on the 11th, that there will be no fee required. Please let me know if you are planning on attending and I will put you on the list to attend and you will be registered. We will reserve a table for all ICRARD participants so that the group may be acknowledged during the lunch program. Again, please let me know if you will attend.

Schedule of Events

April 8-10 Human Factors Workshop (www.hfw2002.com)
April 11 MMS Safe Awards Program

Charles

Thanks for your email.

I send my apologies - I will not be able to attend the ICRARD meeting in Houston.

I hope all is well. It is surprising that the MMS email is still down. Must be making communication difficult.

Keep in touch. PLease pass my regards onto the ICRARD members and your colleagues.

Regards and all the best
Steve

-----Original Message-----
From: Cheryl D Smith [mailto:cherylsm@usgs.gov]
Sent: Saturday, 23 March 2002 07:03
To: ovalle@imp.mx; ovalle@imp.mx; christina.sames@rspa.dit.gov; powerr@neb.gc.ca; Rproctor@comdt.uscg.mil; radwanam@aramco.com.sa; d.cattini@minez.nl; peter.wilkinson@isr.gov.au; oyvind.tuntland@npd.na; pedrosa@anp.gov.br; rrios@anp.gov.br; peter.mills@hse.gsi.gov.uk; ian.whewell@hse.gsi.gov.uk; michael.lunt@hse.gsi.gov.uk; bob.miles@hse.gsi.gov.uk; elane.melchert@hq.doe.gov; bfelber@npto.doe.gov; jmagill@comdt.uscg.mil; IKonuk@NRCan.gc.ca; aclark@nrcan.gc.ca; aparker@cnsopb.ns.ca; hpike@cnopb.nf.ca; stephen.ovens@osh.dol.govt.nz; st@public.bta.net.cn; wangyx@cnooc.com.cn; somkietj@ptt-ep.com
Subject: 2002 ICRARD Meeting, Houston, Texas

TO All,

This is just to update you on the ICRARD meeting scheduled for April 12, 2002 in Houston Texas. See the attached draft agenda for your review. The MMS e-mail system is still down but I am sending this from my wife's computer at the USGS. If you have not yet done so, please let me know by Fax (703-787-15490 or by phone (703-787-1561) if you will attend the ICRARD Meeting.

For all national and international participants, we will meet at 6:30 p.m. on the evening of April 11 in the lobby of the Inter-Continental Hotel (2222 West Loop South to go to dinner at Sullivan's Restaurant. The dinner will be hosted on behalf of ICRARD by MSL Consulting Engineers of Houston, Texas. Please let know if you plan on attend so we will know how many reservations to make at the restaurant.

Also note that for our International Participants in ICRARD that are attending the MMS Awards Program on the 11th, that there will be no fee required. Please let me know if you are planning on attending and I will put you on the list to attend and you will be registered. We will reserve a table for all ICRARD participants so that the group may be acknowledged during the lunch program. Again, please let me know if you will attend.

Schedule of Events

April 8-10	Human Factors Workshop (www.hfw2002.com)
April 11	MMS Safe Awards Program
April 11	ICRARD Dinner at 6:30 p.m. at Sullivan's
April 12	ICRARD Meeting
April 12	Dutch Dinner for those that would like to attend (restaurant to be determined)

luapnitram@comcast.net

From: "CRADDOCK, Richard" <richard.craddock@mpr.wa.gov.au>
To: <luapnitram@comcast.net>; "Charles Smith (E-mail)" <csmith@mms.gov>
Sent: Friday, March 01, 2002 12:05 AM
Subject: RE: E-mail from Charles Smith -- MMS - USA

Although I would love to attend the conference and the ICARD it is unlikely we can/will send someone this year. The conference is of particular interest as we arranged an S&E conference here last November to address the major issue that a survey of industry identified and that was "leadership (ownership) in safety performance". This was targeted at the people on the facilities and we got a (massive fo here) 220 attendees.

We have the SPE HSE biannual conference in Malaysia in March and the Australian Petroleum Producers and Explorers Association conference in Adelaide in April, and are sending delegates to both. Given this, the fact that the Government is targeting overseas and interstate travel, and that our safety group is at half staff at the moment are additional factors.

Apologies to Charles. Hope we can make the next one.

Richard Craddock
Acting Director
Petroleum Division

Appendix D

Minutes from the Sixth Meeting of ICRARD

MINUTES OF THE SIXTH MEETING OF THE INTERNATIONAL COMMITTEE ON REGULATORY AUTHORITY RESEARCH AND DEVELOPMENT (ICRARD)

MINUTES OF MEETING

Friday, June 9, 2000
College Station, Texas

Present:

Dr. Charles Smith	Minerals Management Service, United States (Chairman)
Mr. Paul Martin	Minerals Management Service, United States
Mr. Larry Ake	Minerals Management Service, United States
Mr. Jim Lane	Minerals Management Service, United States
Mr. Jim Regg	Minerals Management Service, United States
Mr. Jim Cimato	Minerals Management Service, United States
Ms. Mary Ann Milosavich	Minerals Management Service, United States
Ms. Terry Holman	Minerals Management Service, United States
Mr. Jim Magill	United State Coast Guard, United States
Mr. Russell Proctor	United States Coast Guard, United States
Dr. Skip Ward	Offshore Technology Research Center, United States
Dr. Ibrahim Konuk	Geological Survey of Canada, Canada
Mr. Howard Pike	Canada-Newfoundland Offshore Petroleum , Canada
Ms. Deborah M. Mattos	Petrobras Research and Development Center, Brazil
Mr. Adalberto Gomes	Agencia National do Petroleo (ANP), Brazil
Ing. Oscar Valle	Instituto Mexicano Del Petroleo, Mexico
Ing. Roberto Ortega	Instituto Mexicano Del Petroleo, Mexico
Mr. Oyvind Tuntland	Norwegian Petroleum Directorate, Norway
Mr. Stephen Ovens	Occupational Safety and Health Service, New Zealand
Mr. Peter Mills	Healty and Safety Executive. United Kingdom
Mr. Paul Finnigan	Department of Minerals and Energy(WA), Australia

1. <u>Chairman's Welcome and Introductions</u>

1.1 Dr. Smith (MMS) welcomed everyone to College Station for the sixth annual meeting of ICRARD. He congratulated those member that had participated in the International FPSOs Present and Future Workshop that was held in Houston, Texas on June 7 and 8.

1.2 The members were introduced and it was noted that this was the best attended ICRARD meeting to date as a result of planning it in conjunction with the FPSO workshop. The Chairman noted that the ICRARD meetings were to be annual but due to unforeseen circumstances it had been almost two years form the last meeting which was hosted by the UK and held in Aberdeen, Scotland on July 12, 1998.

2. Welcoming Remarks

2.1 Mr. Paul Martin, Chief of the Engineering and Research, Minerals Management Service presented the official welcoming remarks on behalf of the MMS. He again welcomed the participants to the Texas A&M campus and thanked Dr. Skip Ward, Associate Director, Offshore Technology Research (OTRC) center for hosting the meeting on ICRARD's behalf and the use of the OTRC conference facilities. Mr. Martin spoke of the international aspect of the offshore oil and gas industry and that organizations such as ICRARD could play a major role in sharing of information on new technologies and/or gaps existing in current technological or regulatory efforts. He further stated that ICRARD's role should be in developing cooperation to address these gaps and the exchange of information related to offshore safety and pollution prevention.

3. Approval of Agenda /New Items

3.1 The agenda was approved for the meeting. It was noted that a brief presentation would be given by Mr. Howard Pike on current offshore activities in Newfoundland following the presentations from the other countries.

3.2 It was noted that the OTRC would present an overview of the activities of the Center and provide a tour of its wave basin at the conclusion of the business meeting. Also information was distributed relative to the dinner and informal discussion for the evening session.

4. Review of ICRARD Membership and Correspondence

4.1 Dr. Smith provided an overview of the membership of ICRARD and noted that it was initially restricted to National Offshore Regulatory Authorities who supported R&D programs. He stated that ICRARD was initiated by staff members of the HSE, MMS, NPD, and NEB. The first meeting being hosted by the UK in 1994 with attendees from the UK, Norway, Canada, Denmark and the US; other meetings sense then have been attended by representative from Japan, China, Netherlands and Brazil. Dr. Smith noted that the membership requirements were changed a few years back to allow participation not only from representatives of national regulatory bodies, but also representatives from national oil companies and/or their national research institutions who support an offshore research and development program (the Membership Statement, Terms of References and Meeting Statement are attached to these minutes). Dr. Smith noted the excellent turn out for this meeting, as illustrated by the list of those present, could be related to the broadening of those able to participate.

4.2 Ing. Valle (IMP) noted that he felt that the efforts of ICRARD were very worthwhile and that he would inquire of PEMEX (National oil company of Mexico) interest in participating in the activities of ICRARD.

Action Item 1: Ing. Valle will inquire of PEMEX's interest in participating in future ICRARD meeting.

4.3 Mr. Magill (USCG) thanked the members of ICRARD for providing an invitation to participate in the ICRARD meeting. He noted the Coast Guard's interest in international activities, especially those relating to the certification of marine vessels and life safety. He also noted the USCG's work with SNAME relative to FPSO's and other oil and gas facilities.

Action Item 2: Dr. Smith will add the USCG to the ICRARD mailing list to receive correspondence and information relative future participation.

5. <u>Review and Approval of Last Meeting Minutes</u>

5.1 The minutes of the previous meeting were distributed to those in attendance for review and comment. The minutes were accepted as correct with one exception; Dr. Smith noted that it was the "Fifth" meeting and not the "Sixth" as stated in the minutes.

5.2 Dr. Smith stated that as he was the only participant from the last meeting, he felt that to the best of his knowledge all of the 'Action Items" had been completed and additional effort was not required for the items listed at this meeting.

5.3 It was noted that having the ICRARD meeting in conjunction with a conference or other forum, as had been recommended at previous ICRARD meetings, was a very good concept. Such an arrangement allows international travelers the opportunity to make better use of their time and the costs associated with trips abroad. It was further suggested and agreed to by those present that future ICRARD meeting should follow this practice.

6. <u>Review of Terms Of Reference for ICRARD</u>

6.1 The "Terms of Reference" for ICRARD membership was discussion relative to recent changes. These changes allow not only participation from representatives of national regulatory bodies, but also representatives from national oil companies and/or their national research institutions who support an offshore research and development program (A copy of the current Terms of Reference are attached to the Minutes). It was noted again that the good attendance at the current meeting was a direct result of those changes.

6.2 Mr. Gomes (INP) stated that the Agencia National do Petroleo, as the regulating agency of Brazil for oil and gas operations, would serve as the official contact for ICRARD with participation from the national oil company, Petrobras.

6.3 Mr. Martin (MMS) stated that he felt ICRARD offered an unique opportunity for countries to come together to discuss technology concerns and research goals beyond that which could be obtained at international conferences or other gatherings due to the common interests of the participants. All agreed that ICRARD offered the opportunity to discuss sensitive technology issues that might not be appropriate at other meetings and to exchange other information. It was further agreed that ICRARD allows the regulatory agencies and their representatives to openly address concerns and seek common areas of cooperation relative to research and technology developments.

7. Old Business

7.1 Dr. Smith stated that he had heard that the International Regulatory Forum (IRF) would have an agenda item at their next meeting to discuss ICRARD. The purpose of this point of discussion was to see whether ICRARD should be part of the IRF or by what means should IRF and ICRARD interact. Dr. Smith noted that ICRARD was formed in 1994 before the IRF was initiated. He further stated that the participants in ICRARD were those individuals with direct knowledge relative to current technology developments and research efforts (not individuals specifically involved in management) and as such, were in a better position to discuss the details of such issues and seek areas of cooperation.

Action Item 3: Dr. Smith to inform participants on the outcome of the IRF discussions relative to ICRARD and how the two forums should interact in the future.

(Note: At the time of distribution of the ICRARD Minutes, the IRF had met and agreed that ICRARD could maintain its current status and, as such, would not become part of the IRF. However, the IRF requested that ICRARD forward copies of their meeting Minutes to the IRF so that they might be made aware of current and planned activities of ICRARD.)

7.2 Dr. Smith inquired if there was additional "Old Business" to be discussed. There being none, the meeting moved forward to hear presentations from those present.

8. Overview of Research from Participating Countries

8.1 A total of twelve presentations were presented as following the order listed in the agenda. The presentations (viewgraphs / written material and handouts) are presented as part of the Appendices to the minutes.

8.2 **United States**

Mr. Martin (MMS) gave an overview of the MMS Technology Assessment and Research Program to include both Operations Safety and Engineering Research (OSER) and Oil Spill Research (OSR) as well as the OHMSETT facility that the MMS manages. He noted that the research emphasis had changed from structural initiatives to those more directly involved with operations. The major areas of research was directed at the deepwater Gulf of Mexico and the aging offshore infrastructure. He provided a breakdown of MMS funded research in terms of relative percentages on a pie chart. The rest of the presentation was directed at specific ongoing research initiatives from both OSER and OSR. He provided an overview of the research focus for the next five years. He presented information on current workshops being sponsored by the TA&R Program to include the very successful event address crane accidents and mitigation measures.

Action Item 4: Dr. Smith will send a copy of the Crane Workshop Proceedings to the ICARD membership.

He noted that the TA&R Program was composed of eight areas; Drilling, Workovers, and Completions; Production: Structures/Materials; Pipeline Operations/Fluid Flow; Oil Spill; Pipelines; Decommissioning ; and Human Factors. He noted that individuals members of his staff was assigned to each of these areas. He proposed that each participating country provide a similar list of contacts so as to facilitate making contacts and developing .

This item was discussed between the members present and all agreed that this would be excellent way to maintain contact between the working groups. Peter Mills (HSE) noted that this would assist in forming a network of appropriate people to contact concerning research or regulatory issues.

Action Item 5: All members will distribute a corresponding list of contacts to the other members of ICRARD

(A copy of the MMS Technical Team members is attached to these Minutes)

8.3 **Canada**

Dr. Konuk (NRC) gave a presentation on pipeline research being funded through the Geological Survey of Canada (GSC). He presented information on a major initiative in Canada on Global Soil-Pipe Interaction. The work includes research relative to slope failures and the effects on entrained pipelines. Additional information was presented on upheaval buckling, frost heave, ice scour, span problems, numerical modeling, and a framework for risk-based maintenance planning which included a pipeline structural-integrity assessment module. He continued his presentation by providing an overview of the research activities within the Terrain Science Division(TSD) of the GSC. This included the organization, their mandate, staff, projects and funding. He continued the presentation by providing information on the Program of Energy Research & Development (PERD) programs. He provided web page addresses for both the TSD and PERD activities.

8.4 **Mexico**

Mr. Ortega (IMP)gave a presentation on recent developments in the Bay of Campeche. The presentation provided information on the facilities installed in the Bay of Campeche noting that there were 200 existing platforms with 1200 miles of pipelines. These facilities produced over 2.1 million barrels of oil per day and 1,500 million cubic feet of gas. He presented information on a risk-based criteria, Transitory Criteria, developed by IMP for PEMEX. He demonstrated how this criterion was used to assess platform safety and assign a serviceability classification. Mr. Ortega outline future research to further enhance the Transitory Criteria.

Eng. Valle (IMP) continued the presentation by presented information on PEMEX's inspection and maintenance program for both platforms and pipelines. He also gave an overview of deepwater activities and what IMP was doing to facilitate this effort to include floating production systems.

8.5 **Brazil**

Mr. Comes (ANP) presented a presentation on the Brazilian National Plan for Development of Science and Technology for the Oil and Gas Sector (CTPETRO). He noted the challenge and stated that the Brazilian performance in deepwater was reached because of Petrobras' investments in research and development activities. He further stated that the Brazilian Government expects and encourages strong interaction among the Universities, Research Centers, Laboratories, oil companies and other entities. He stated that one of the main objectives of CTPETRO was to promote scientific and technological exchange in order to improve current knowledge.

Ms Mattos (Petrobras/CENPES) provide comments on Petrobras use of FPSO's in Brazil and noted the overall experience with that type of facility was excellent. She did noted some concerns with work and costs required to convert existing tankers to FPSO's.

8.6 **New Zealand**

Mr. Ovens gave a presentation relative to offshore oil and gas operations in New Zealand. He noted that the New Zealand government was not currently undertaking any projects relative to regulatory research and development. He stated that some research was carried out in house by the operating companies, however, if a safety or health concern was identified , they could request that the companies conduct research and develop a satisfactory solution. He did pose several issues resulting from their experiences that may be good research topics: Optimizing FPSO-Shuttle Tanker Separation Distances; Improvement in Survival Equipment; Evaluating Metal Loss During Drilling; Efficiencies in Mechanized Drilling; Tank Integrity Inspection Techniques; Seismic Design of Temporary

Offshore Structures; Verification of Hazard Models; Predicting the Integrity of Critical Hoisting Components; Assessment of Non-Pigable Pipelines; Improving the Reliability of Coflex Couplings; Improved Low Corrosion Steels; and the Structural Assessment of Older fixed Offshore Platforms.

8.7 Norway

Mr. Tuntland (NPD) gave a presentation on current activities in Norway. He stated that the NPD did not do research. If there was a problem, they would go to the industry. However, they do participate in Joint Industry Projects (JIP). He noted that they cooperate with the U.K. and other North Sea countries to improve safety offshore. He provided information on a major government/private sector initiative to develop new technology, DEMO 2000. He noted the resources available in the first phase (1999-2002) of this effort had an investment of about $50 million U.S. He presented information on the organization of DEMO 2000 as well as the participants. He presented what he viewed as the major technological leaps; yesterday – gravity based platforms; today - floating production systems and subsea systems; and tomorrow – seabed separation and extended well stream transfer to onshore plants.

8.8 United Kingdom

Mr. Peter Mills (HSE) gave an overview of the current research strategy within the Offshore Safety Division (OSD). He presented bar charts showing the percentage of funding for UK projects for 1999/2000. He further explained how the HSE currently addresses particular topics and how it fit into the goals of the Agency with Health and Safety being the number one priority. He provided a list of research efforts that were being conducted as international projects. He provided the HSE web site address (www.hse.gov.uk0 and that for the Offshore Research Focus (www.orf.co.uk). He distributed copies of past Offshore Research Focuses and a poster showing current and planned activities of the OSD.

8.9 Australia

Mr. Paul Finnigan (DME) gave a presentation on offshore research in Australia. He noted that the Western Australian Department of Minerals and Energy did not fund research and noted that it was the policy there for the industry to identify problem areas and then to propose and fund the solution(s) which may include appropriate research. He further noted the principal research bodies were the Commonwealth Scientific & Industrial Research (CSIRO) , Australian Petroleum Production and Exploration Association (APPEA) and certain oil companies. He also provided information on the use of Safety Cases and how FPSO's were viewed in Australia.

8.10 **Newfoundland**

Mr. Howard Pike (C-NOPB) made a brief presentation on current work underway in Newfoundland relative to offshore oil and gas operations.

9. Presentations by Invited Guests

9.1 Mr. Jim Lane (MMS) provided an overview of the MMS Oil Spill Research Program, the OHMSETT Facility and the research initiative underway known as Project deep Spill. He cited several projects being sponsored to include remote sensing for detecting an oil spill, properties and behavior of oils , chemical treading agent, mechanical containment and cleanup and on in situ burning. He provide a detail account of the OHMSETT facility and the type of research being conducted at the test tank. He distributed several items to the participants that were made to advertise the facility. He noted the oil spill response training being conducted at OHMSETT and noted that it any one was interested or knew of someone, the course could be made available on a contract basis. He completed his presentation by giving a detailed report on the efforts that the MMS and industry were undertaking in Project Deep Spill to combat deepwater blowouts and the resulting release of hydrocarbons.

9.2 Mr. James Cimato (MMS) provided an overview of the MMS Environmental Studies Program (ESP). He provided information on how the ESP fit into the context of the MMS responsibilities for managing the OCS. He noted that the MMS addressed it environmental responsibilities through the preparation of environmental impact statements (EIS) and conducting environmental and socioeconomic research. He noted the budget for the ESP was approximately $19.5 million for FY 2000. He noted some of the ESP deepwater concerns relative to unique benthic communities, oil spill and chemical discharges, geohazards, fisheries, marine mammals and socioeconomic effects. He listed several questions that needed to be addressed: fate of oil released from a subsea blowouts; fate and effects of discharged synthetic based muds; characteristics of deepwater currents; risk from use of flowline enhancers; environmental processes affecting deepwater benthic communities; and socioeconomic impacts. He distributed several documents citing work of the ESP and future plans.

9.3 Ms. Mary Ann Milosavich (MMS) gave an overview of the MMS International Activities and Marine Minerals Division (INTERMAR). She noted that the marine minerals part of INTERMAR provided policy for the development of non-energy minerals such as sand and gravel where the international activities part served a focal point within MMS to coordinate the Agency’s international activities. She pointed out that the MMS was involved in international initiatives that promoted the integration of safety and environmental concerns. She noted that our international focus was in three main areas, standards, providing support to the U.S. State Department and by working directly with other countries. She note that the MMS had Memoranda of Understanding with Norway, China, Australia, Indonesia, and Russia. She also noted several workshops that the MMS had assisted with in cooperation with APEC and the US Agency for International Development.

9.4 Dr. Skip Ward (OTRC) gave an overview of the activities of the Offshore Technology Research Center (OTRC). He noted that it was funded in 1988 by the National Science Foundation, over 35 industry participants, and the State of Texas. He stated that the mission of OTRC was to conduct basic engineering research and test new technologies for deepwater oil and gas production and to educate students for the offshore industry. He noted that the center had a world class wave basin to support it research mission. He reviewed OTRC's several theme topics for study; materials, structures, fluid/structures, and seafloor engineering interaction. He noted the new association with the MMS and reviewed some of the projects being conducted at the Center for the MMS. He invited those present at the conclusion og the meeting to take a tour of the wave basin.

10. <u>Other New Business</u>

10.1 Dr. Smith asked of other new business and there being none, made the motion to go forth and set the location for and who would host the next meeting.

11. <u>Date and Venue for the Next Meeting</u>

11.1 It was suggest that either Canada or Brazil host the next meeting. Dr. Konuk stated that he would be happy to organize the next meeting. Mr. Gomes said that he would also like to host the next meeting if it proved to be not in conflict with other efforts in Brazil. Dr. Smith made the motion to have Mr. Gomes check to see if it was possible to hold the meeting in Brazil and if not then we would accept Canada's desire to host the meeting.

(In the interim, Brazil was not able to host the meeting due to other priorities this year and stated that they would prefer to host at a later date. Thus, Dr. Konuk has agreed to host the meeting in Ottawa, Canada during the summer. He will provide the date and place at a later time this spring.)

Action Item 6: Dr. Konuk will coordinate the planning and arrangements for the next ICRARD meeting.

12. <u>Adjournment</u>

12.1 Meeting was adjourned at 4:00 p.m.

Appendix E

Terms of Reference of ICRARD

International Committee on Regulatory Authority Research & Development (ICRARD)

MEMBERSHIP

The International Committee on Regulatory Authority Research and Development (ICRARD) is open to membership to national offshore regulatory authorities, national offshore research institutions and national oil companies who support an offshore research and development program.

TERMS OF REFERENCE

* To provide a forum to advise on research and development activities funded by Offshore Regulatory Bodies, their Representative Research Bodies or National Oil Company that support offshore research and development programs;

* To exchange details of current research and development programs on a regular basis;

* To make available reports from completed research and development program to other members, as appropriate;

* To co-sponsor research and development project, when appropriate; and

* To exchange information on research and development strategies.

MEETINGS OF ICRARD

The meetings of ICRARD are to be held annually. The "host" country will Chair the meetings, provide meting facilities and Secretariat support. Proceedings/minutes shall be published and distributed to those participating in the meeting.

Appendix F

Action Items from the Sixth Meeting of ICRARD

Action Items
ICRARD Meeting
June 9, 2000

Action Item 1: Ing. Valle will inquire of PEMEX's interest in participating in future ICRARD meetings.

Action Item 2: Dr. Smith will add the USCG to the ICRARD mailing list to receive correspondence and information relative future participation.

Action Item 3: Dr. Smith to inform participants on the outcome of the IRF discussions relative to ICRARD and how the two forums should interact in the future.

Action Item 4: Dr. Smith will send a copy of the Crane Workshop Proceedings to the ICRARD membership.

Action Item 5: All members will distribute a corresponding list of contacts to the other members of ICARD.

Action Item 6: Dr. Konuk will coordinate the planning and arrangements for the next ICRARD meeting.

Appendix G

Presentations

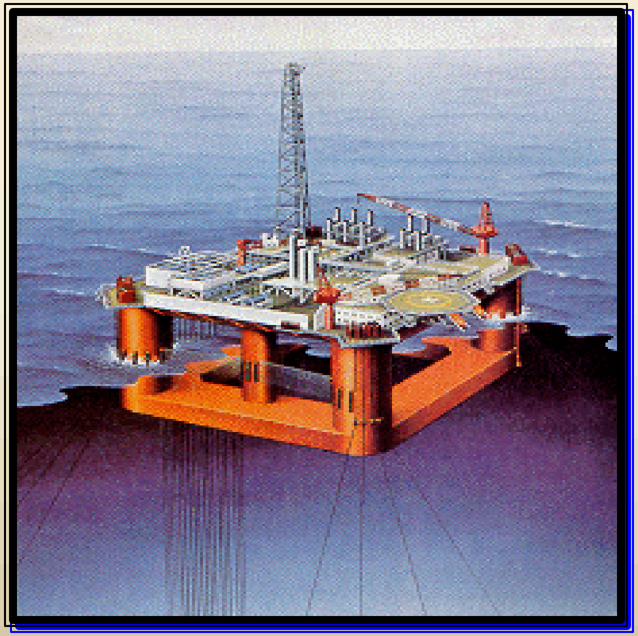
Appendix G-1

United States
Mr. Paul Martin

Technology Assessment and Research Program

Technology Assessment and Research (TAR)

- Operations Safety and Engineering Research (OSER)
- Oil Spill Response Research (OSRR)



TAR Program Objectives

Identify and Fund Research Projects:

- Provide Direct Technical Support for MMS Regulatory Decisions
- Review Industry Innovations and Ensure Regulatory Compliance
- Catalyst for Industry Research - Operational Safety and Oil Spill Prevention and Clean Up Capabilities
- Support International Cooperation in Operational Safety and Oil Spill Prevention and Clean Up Capabilities.

FY 2002 - Funding Appropriations

TAR	$885,000
OTRC	$899,000
OPA-90	$3,115,000
	$4,899,000

Ohmsett:

The National Oil Spill Response Test Facility

Operated by the Department of the Interior, Minerals Management Service

Unique Capabilities

•Largest oil spill test tank in North America

- Tank dimensions

667 feet long

65 feet wide

8 feet deep

Full Scale Training*, Testing, Evaluation, & Research and Development with *oil

Tow bridge capable of speeds up to 6.5 knots

Wave generator can produce 3-foot waves and harbor chop waves

Spill up to *1500 gallons of oil* at 300 gpm per run

Types of Testing & Training



- Training Sessions
- Booms & Skimmers
- In-Situ Burns
- Oil Spill Treating Agents (Sorbents)
- Research and Development
- Oil/Water Separator & Decant Experiments
- Dispersant Feasibility Test
- Remote Sensing

- **COLD WATER TESTING (New in FY2002)**

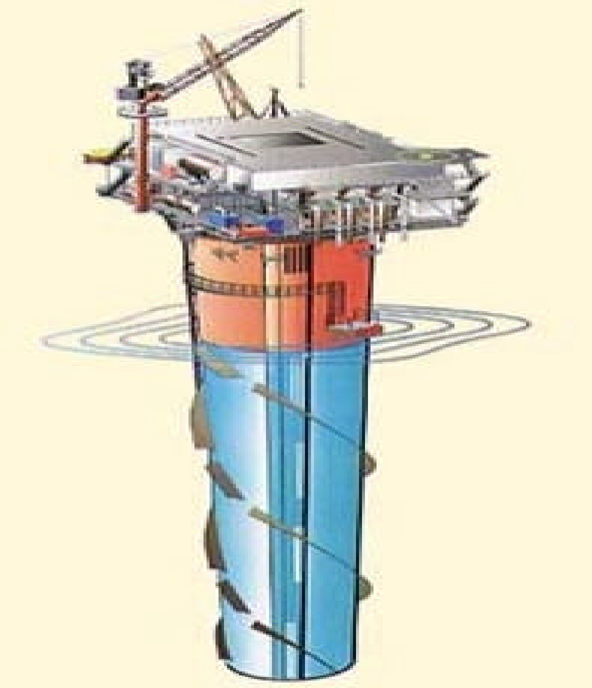
Texas A&M and University of Texas

OTRC

<u>Mission</u>

- **Conduct Basic Engineering Research and Test Technology for Deepwater Oil and Gas Production**
- **Educate engineering students for the offshore industry**

<u>Principal Research Focus Areas</u>

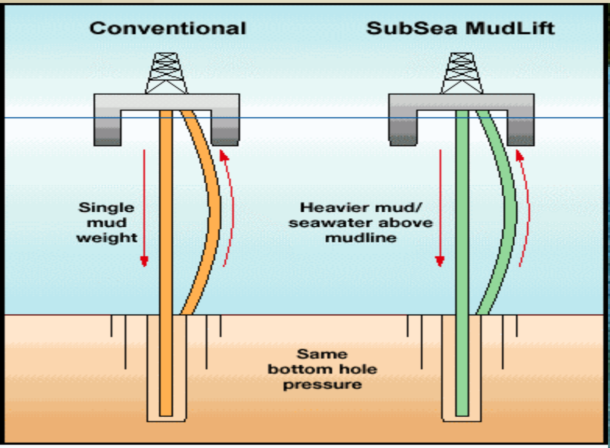


- **Fluid / Structure Interaction**
- **Materials**
- **Seafloor Engineering**

Factors Influencing MMS Research 2002 and Beyond

- *Technology*
- *Operating Environments*
  - *Deep Water Marine*
  - *Arctic*
- *Aging Infrastructure*
- *Regulatory Support*

Drilling, Workovers & Completions



Single vs. dual-gradient mud system. From the perspective of the well, there is no mud above the mudline in a SubSea MudLift system.

Recently Completed Projects for Years 2000-01

- Reliability of Deepwater Subsea BOP Systems
- Performance of Deepwater BOP equipment during well control events
- Deepwater Geohazards Workshop
- Manual for Sound Coiled Tubing Drilling Practices

Current Research Projects

- Deepwater Riser Wear Technology
- Evaluation of Secondary Intervention Methods in Well Control
- Experimental Validation of Well Control Procedures in Deepwater
- Regional Synthesis of Sedimentary and Hydrocarbon History-GOM

Production



<u>Recently Completed Projects for Years 2000-01</u>

- Investigation of Hybrid Deep Water Production Systems
- Lifetime Cost of Subsea Production Systems
- Mitigating the Problem of Gas Migration after Primary Cementing
- Assessment Risks Associated w/ CO Gas During Well Perforation

<u>Current Research Projects</u>

- Repeatability & Effectiveness of Subsurface-Controlled Safety Valves

Structures / Materials

Recently Completed Projects for Years 2000-01

- Structural Integrity Assessment & Repair Corrosion Damaged Tubulars
- Reliability Analysis of DeepWater Plate Anchors
- Risk Assessment for Ice Damage to Seabed Facilities
- Determine Interim Criteria-Replace Damaged Polyester Rope Moorings

Current Research Projects

- Underwater Wet Welding Process for Offshore Facilities
- International Workshop Fire & Blast Engineering of Offshore Facilities
- Offloading Operability (JIP) - FPSOs
- Measurement of Wind Load Resistance on Drilling Structures

Pipelines / Pipeline Operations



<u>Recently Completed Projects for Years 2000-01</u>

- Paraffin Deposition Prediction in Multiphase Flowlines & Wellbores
- Retrofit Cathodic Protection Marine Pipelines Assoc w/ Petro. Prod.
- Real-Time Reliability Assessment of Pipelines
- Develop Industry-Wide Practice on Assessment of Spans on Pipelines

<u>Current Research Projects</u>

- Evaluate Methods Detecting&Monitoring Corrosion Damage on Risers
- Strain-Based Design of Pipelines
- Continued Study of Paraffin Deposition in Multiphase Flowlines
- Severe Slugging Elimination Ultra-Deep Water Tiebacks and Risers

Decommissioning

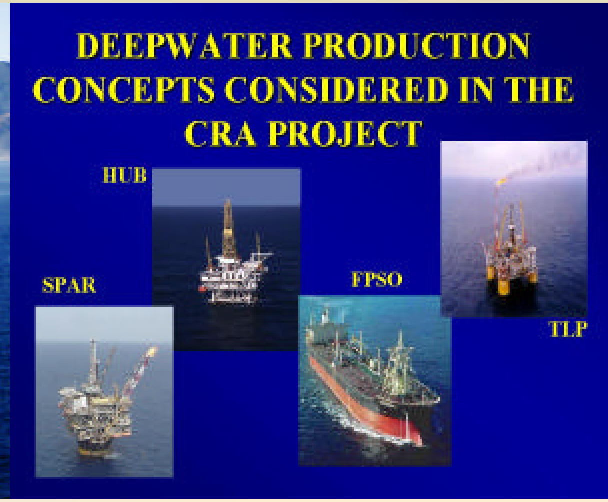
Recently Completed Projects for Years 2000-01

- State of the Art of Removing Large Platforms Located in DeepWater
- Using Satellite Radar Imagery to Detect Leaking Abandoned Wells
- Risk Assessment of Temporarily Abandoned or Shut-in Wells

Current Research Projects

- Oil Platform Removal Using Engineered Charges: In Situ Comparsion of Engineered and Bulk Explosive Charges

Risk Assessment / Human & Organizational Factors



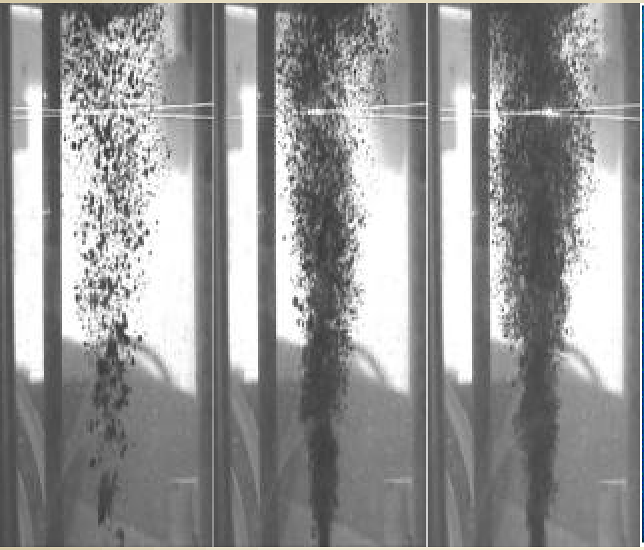
Recently Completed Projects for Years 2000-01

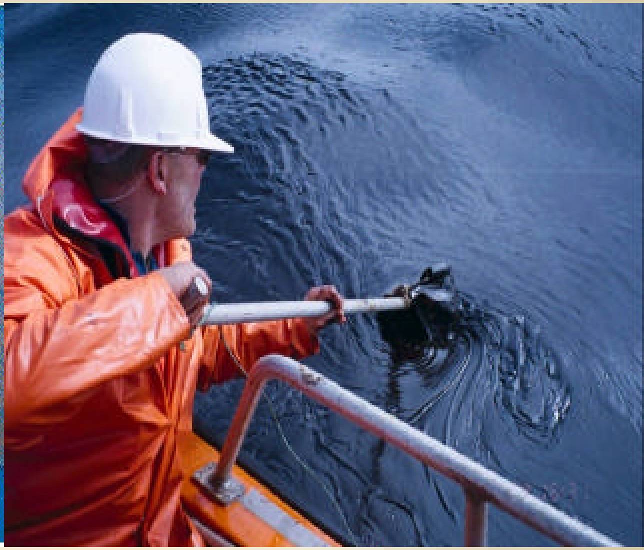
- Reliability-Based Reassessment of Jacket Platforms
- Assessment and Reliability of Production and Tubing Design
- Integrity Assessment of Aging Structures-Evaluation of Ultrasonic Tests
- Assessment of Control of Natural Gas Hydrates

Current Research Projects

- 2nd International Workshop on Human Factors in Offshore Operations
- Long Term Integrity of DeepWater Cement Systems

Deepwater Releases / Behavior





<u>Recently Completed Projects for Years 2000-01</u>

- Project “Deep Spill”
- Experimental & Analytical Study of Multiphase Plumes in a Stratified Ocean with Application to Deep Ocean Spills
- Containment, Sensing and Tracking DeepWater Blowouts; Status of Existing and Emerging Technologies

Clean-up Techniques in Ice Environments

Recently Completed Projects for Years 2000-01

- Detection and Tracking of Oil Under Ice
- Use of Ice Booms Recovery of Oil Spills from Ice Infested Waters
- International Oil and Ice Workshop

Current Research Projects

- Mechanical Oil Recovery in Ice Infested Waters(MORICE) Phase 5

Alternative Response Countermeasures



Recently Completed Projects for Years 2000-01

- Development of an Airborne Oil Spill Thickness Sensor
- Development of a New Generation Laser Fluorosensor
- Fire Boom Testing at Ohmsett

Current Research Projects

- Development of an Airborne Oil Spill Thickness Sensor
- Analysis of Oil-Slick Combustion
- Testing and Evaluation of Sorbents
- Study of Oil Spill Chemical Treating Agents

Fate and Behavior of Spilled Oil

Recently Completed Projects for Years 2000-01

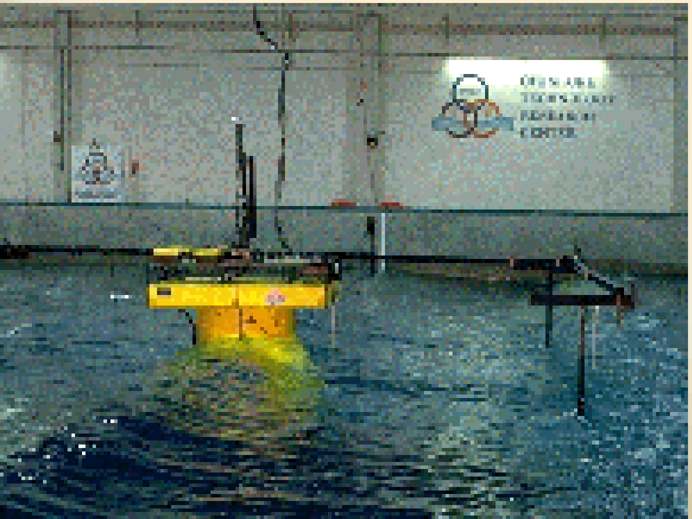
- Emulsions Formed at Sea and in Test Tanks
- Chemical Response to Oil Spill; Ecological Effects Research Forum

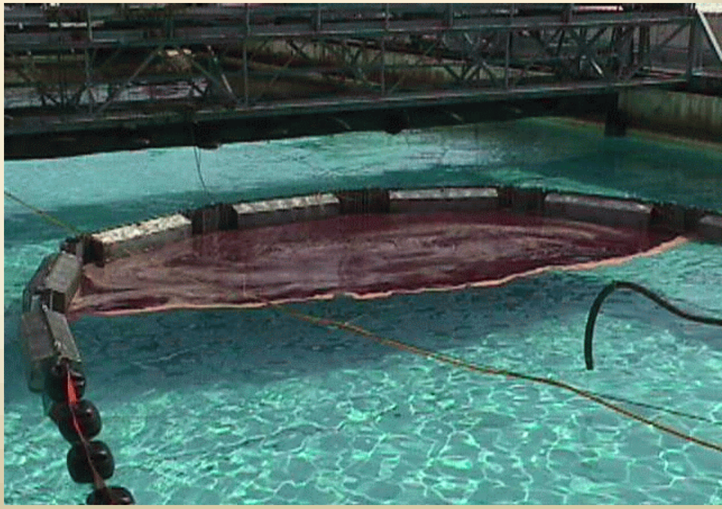
Current Research Projects

- Physical Behavior of Oil in the Ocean
- Applied Chemistry & Well flow Dynamics-Method to Determine Worst Case Discharges from Facilities that Produce/Transport Oil - U.S. Outer Continental Shelf (OCS)

MMS TA&R Program

WWW.MMS.GOV/TARPHOME





Appendix G-2

United States
Mrs. Carolita Kallaur

I appreciate the opportunity to be with you this morning.

As Charles and Paul know, I have always been a strong supporter of international cooperation.

We share common interests in finding ways to develop offshore oil and gas resources without harm to the environment or offshore workers.

On a global basis the offshore contains 50% of remaining oil and gas resources and will play an important role in meeting the need for energy.

MMS has been an active member of both the International Regulators Forum and this committee since their inception.

As many of you know, the focus of the IRF is to work cooperatively on health and safety issues. Clearly the work of this group is complimentary to the IRF.

At the last meeting of the IRF in Perth, Australia, there was a discussion of whether there should be a closer linkage between the 2 groups and it was decided that the current arrangement should continue.

Several members of the IRF are participating in this meeting which will facilitate cooperation between the 2 groups if common themes develop.

I think one of the strong points of ICRARD is that it not only brings regulators together, but also other agencies that

play a role in the offshore such as the Coast Guard and the Department of Energy in the U.S.

Everyone is pleased that there are representatives from these agencies with an interest in cooperative research.

ICRARD also provides a link to the academic sector by providing access to groups such as OTRC which will speak at lunch today.

By working together you are made aware of research initiatives, are able to leverage funds and expertise and share results in a way that benefits a broader audience.

I am familiar with a number of success stories tied to the work of this group. These include the work between MMS and Mexico on pipelines and recertification.

The numerous oilspill projects MMS has been able to conduct with the Canadian government, some of which we would not be permitted to do in our waters.

Yet they are essential to understanding the effectiveness of containment measures and the fates and effects of spilled oil.

The deepspill experiment conducted off the coast of Norway has greatly enhanced the ability to model oilspill trajectories from a deepwater spill.

And the work MMS has done with Brazil on polyester moorings and riser instrumentation for deepwater operations. MMS has clearly benefited from Brazil 's extensive experience in deepwater.

None of these projects could easily have been done by one Nation, but by working together you are able to improve operational integrity and enhance public confidence in offshore operations.

I think we all realize that with global communications, a serious incident any place in the world undermines public confidence in the ability to tap these resources safely.

By working together with this group and the IRF and committing the necessary resources to be effective, you can help make offshore operations safer and environmentally friendly.

A side benefit is the friendships that are made and the appreciation of different cultures that comes from those friendships.

We are living right now in extremely turbulent times and cooperation among Nations on any front adds to world peace.

Thank you

Appendix G-3

United States
Mr. Jim Lane

Ohmsett

The National Oil Spill Response Test Facility

James Lane

MMS Technical Representative

ICRARD Meeting

Houston, TX

April 12, 2002

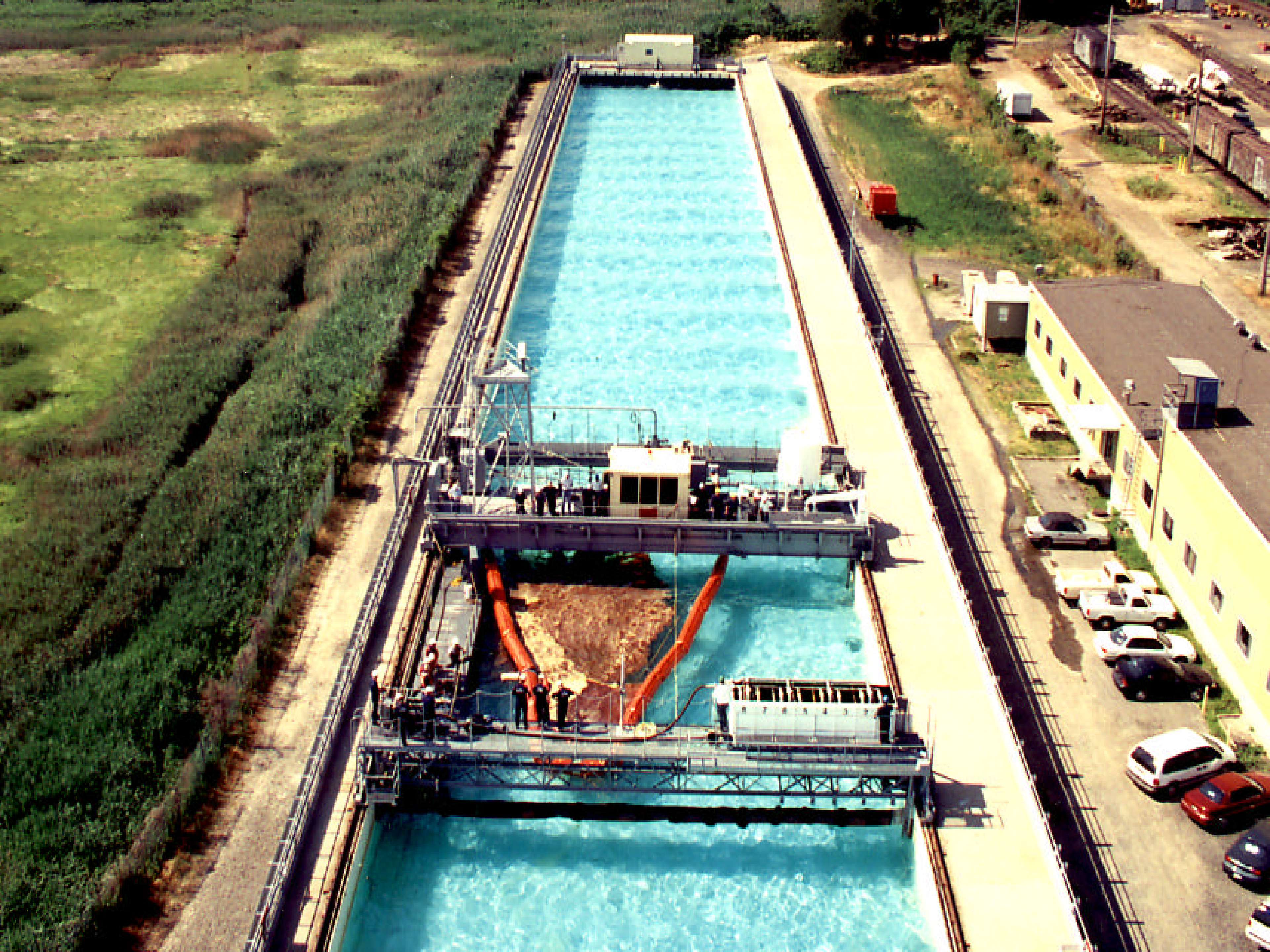
Ohmsett’s Mission

Ohmsett is utilized by both the public and private sector to test the ability of full scale oil spill response equipment; conduct research to improve spill response technology; and hold training sessions with oil in a simulated marine environment under controlled conditions.

Ohmsett:

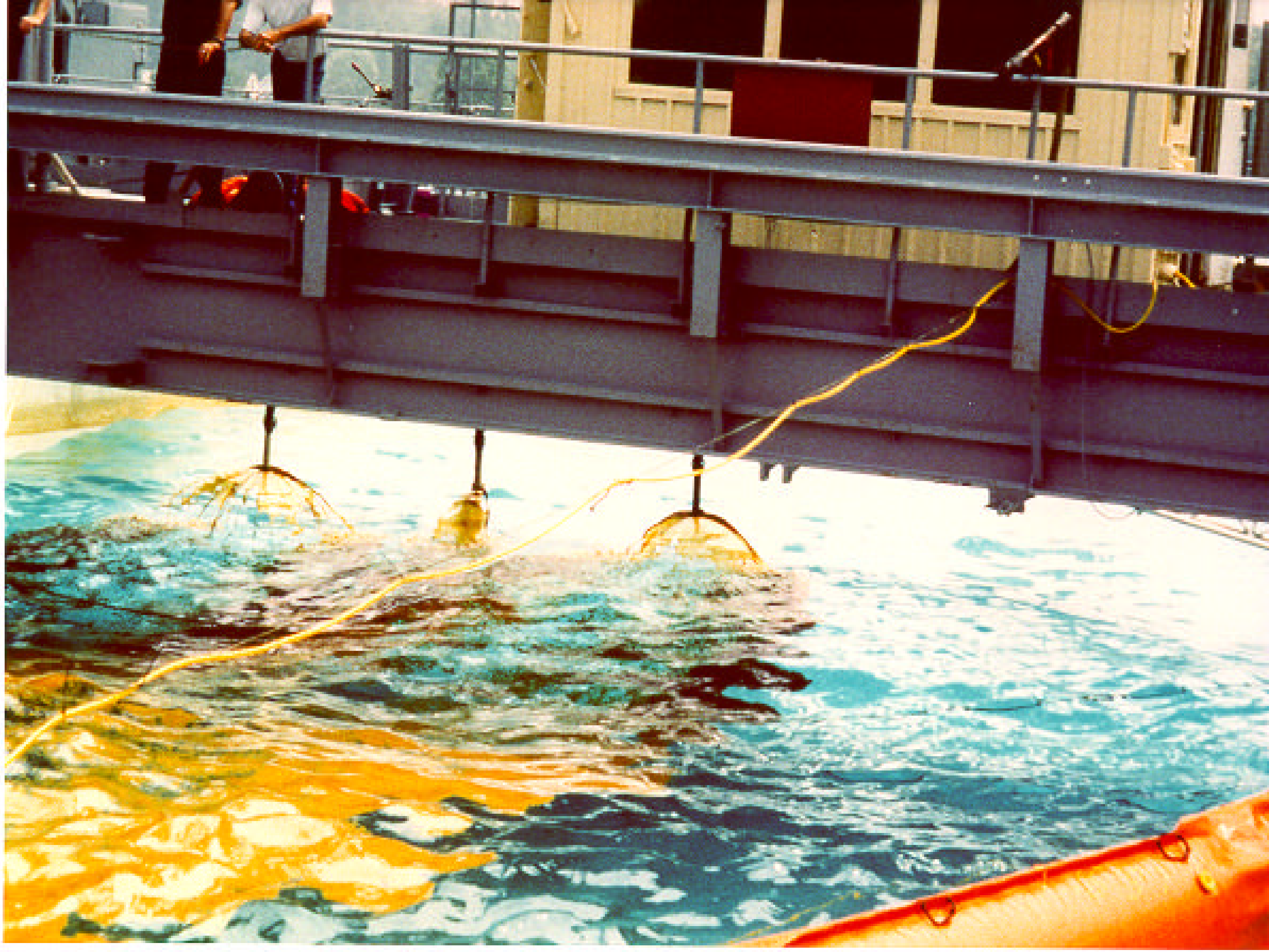
The National Oil Spill Response Test Facility

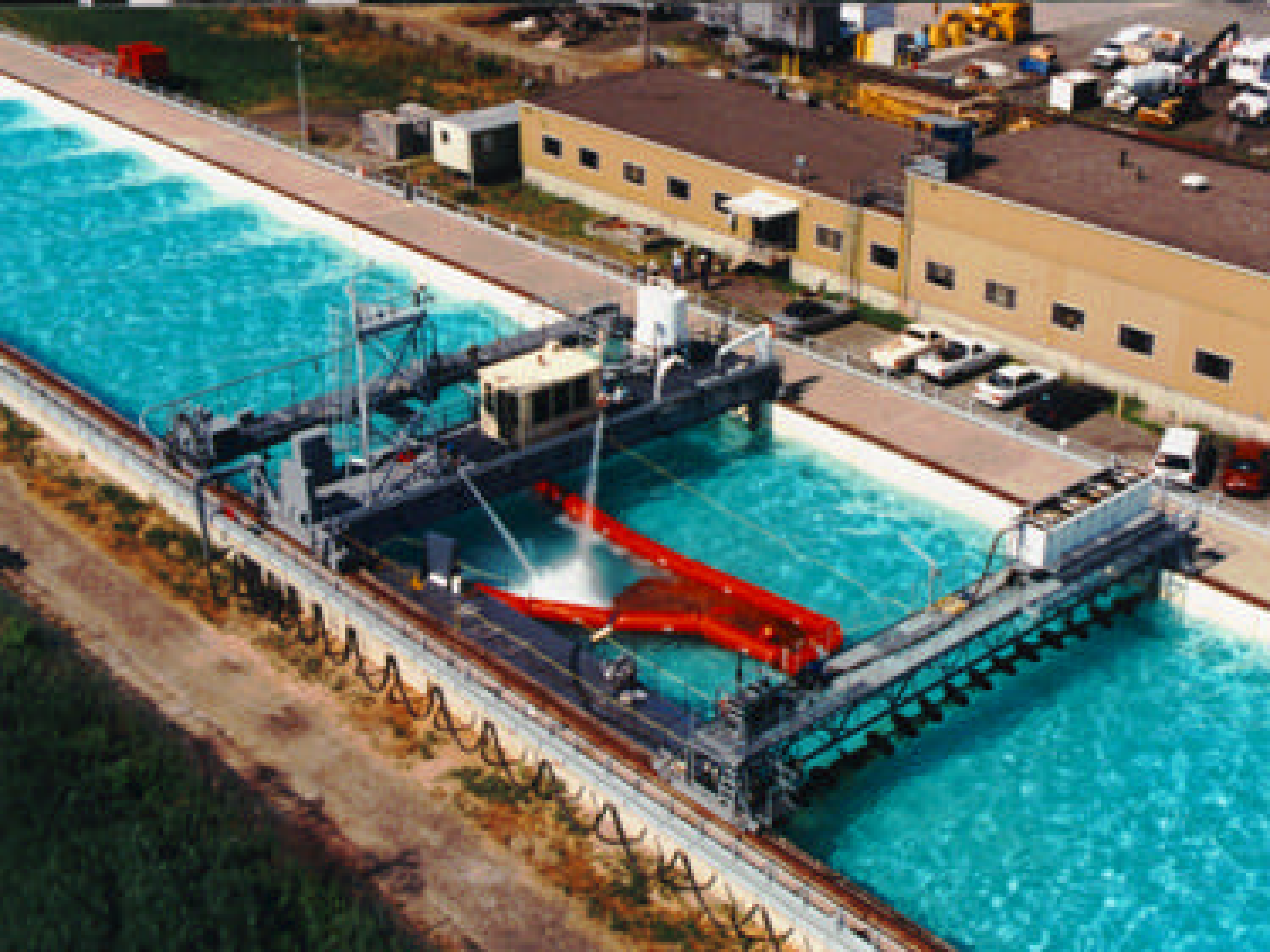
- Large outdoor, a pile-supported, concrete tank 203 meters long by 20 meters wide with a water depth of 2.4 meters
- The tank is filled with 9.84 million liters of crystal clear water maintained at open ocean salinity
- The tank has a movable, cable-drawn tow bridge capable of towing floating test equipment at graduated speeds up to 3.3 meters/second
- Modern classroom facility for up to 30 students at a time
- Underwater video systems



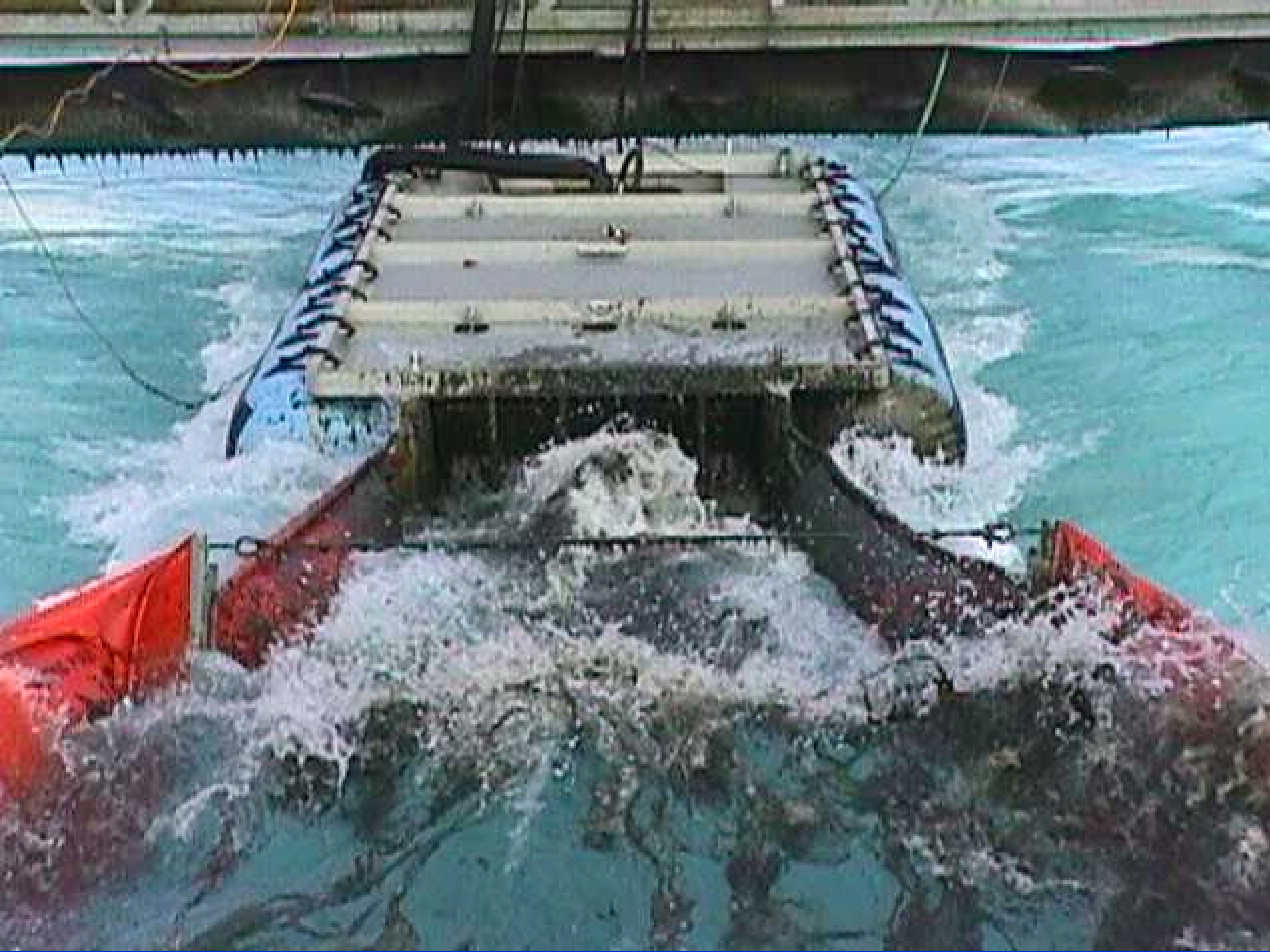
Types of Testing & Training

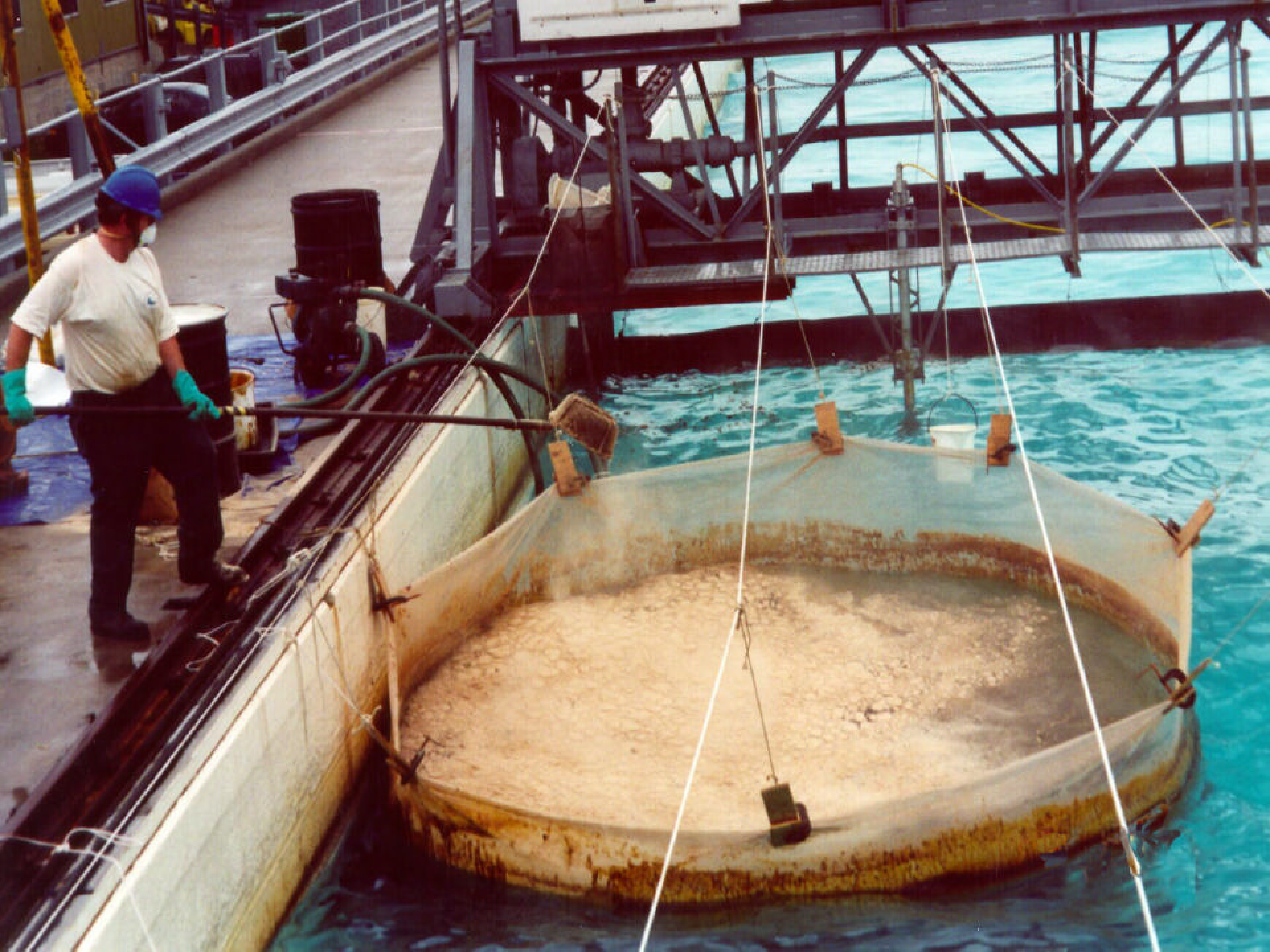
- Training Sessions
- Booms & Skimmers
- In-Situ Burns
- Oil Spill Treating Agents (Sorbents)
- Research and Development
- Oil/Water Separator & Decant Experiments
- Dispersant Feasibility Test
- Remote Sensing






3 4 5 6 7 8





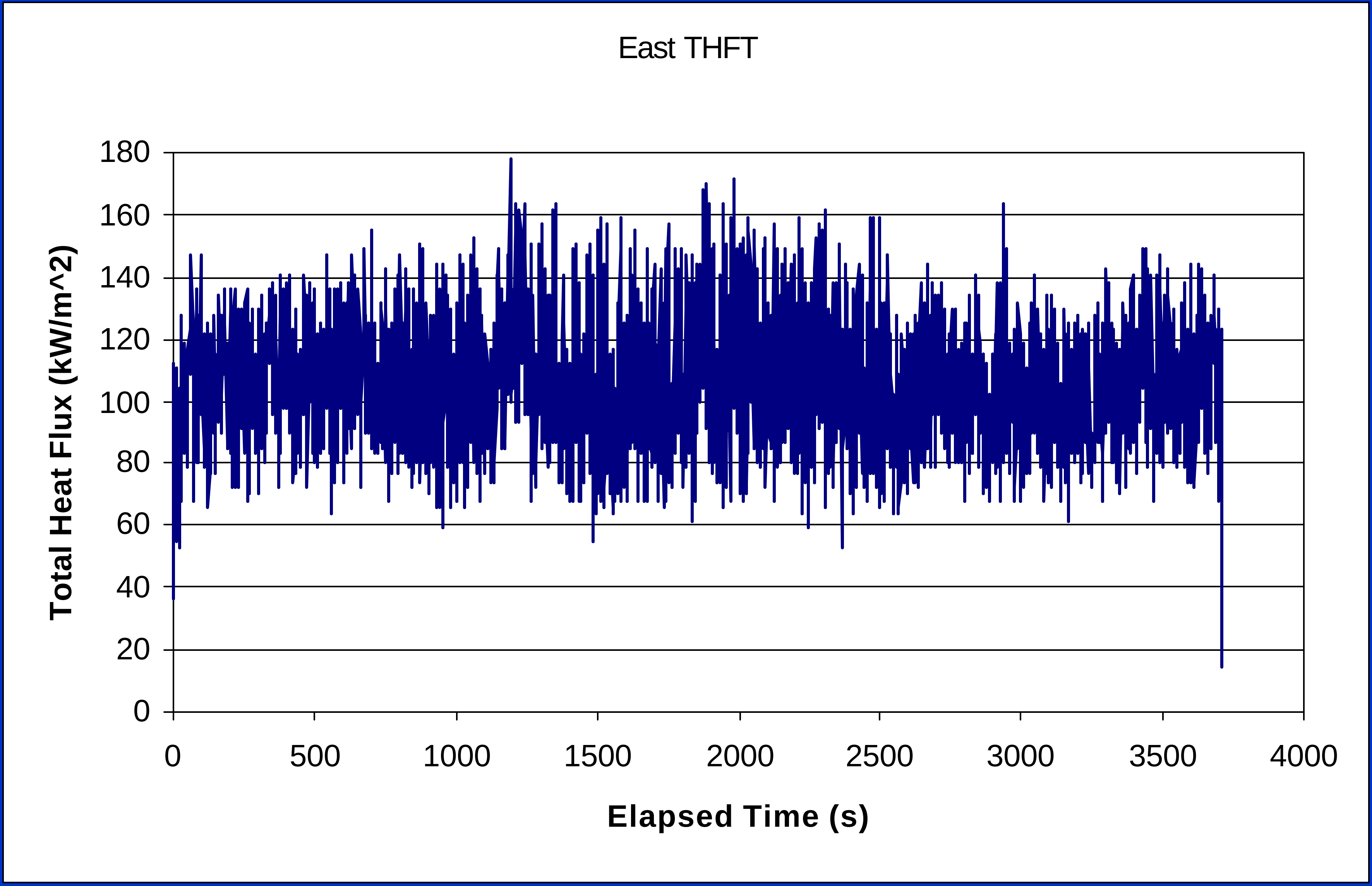
Fire Boom Testing with Propane

Propane Supply Tankers

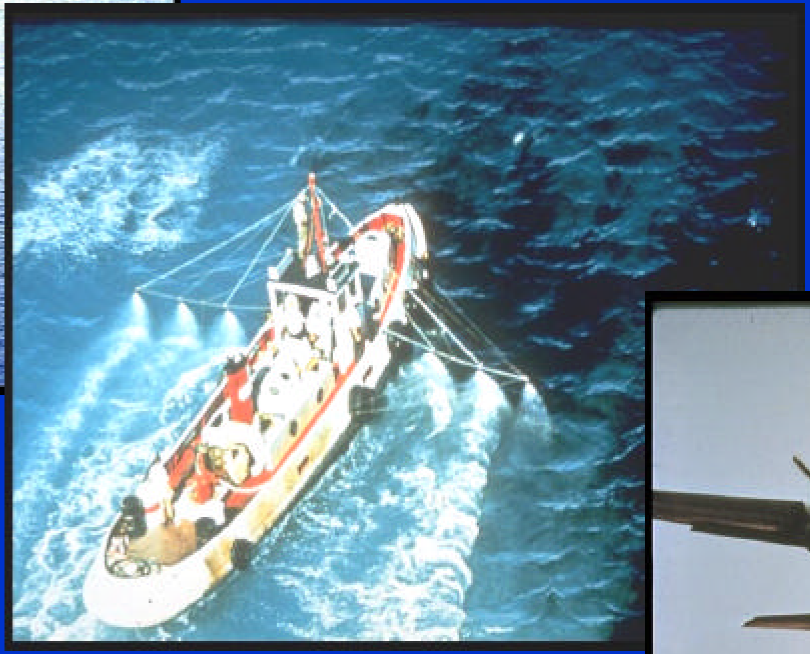


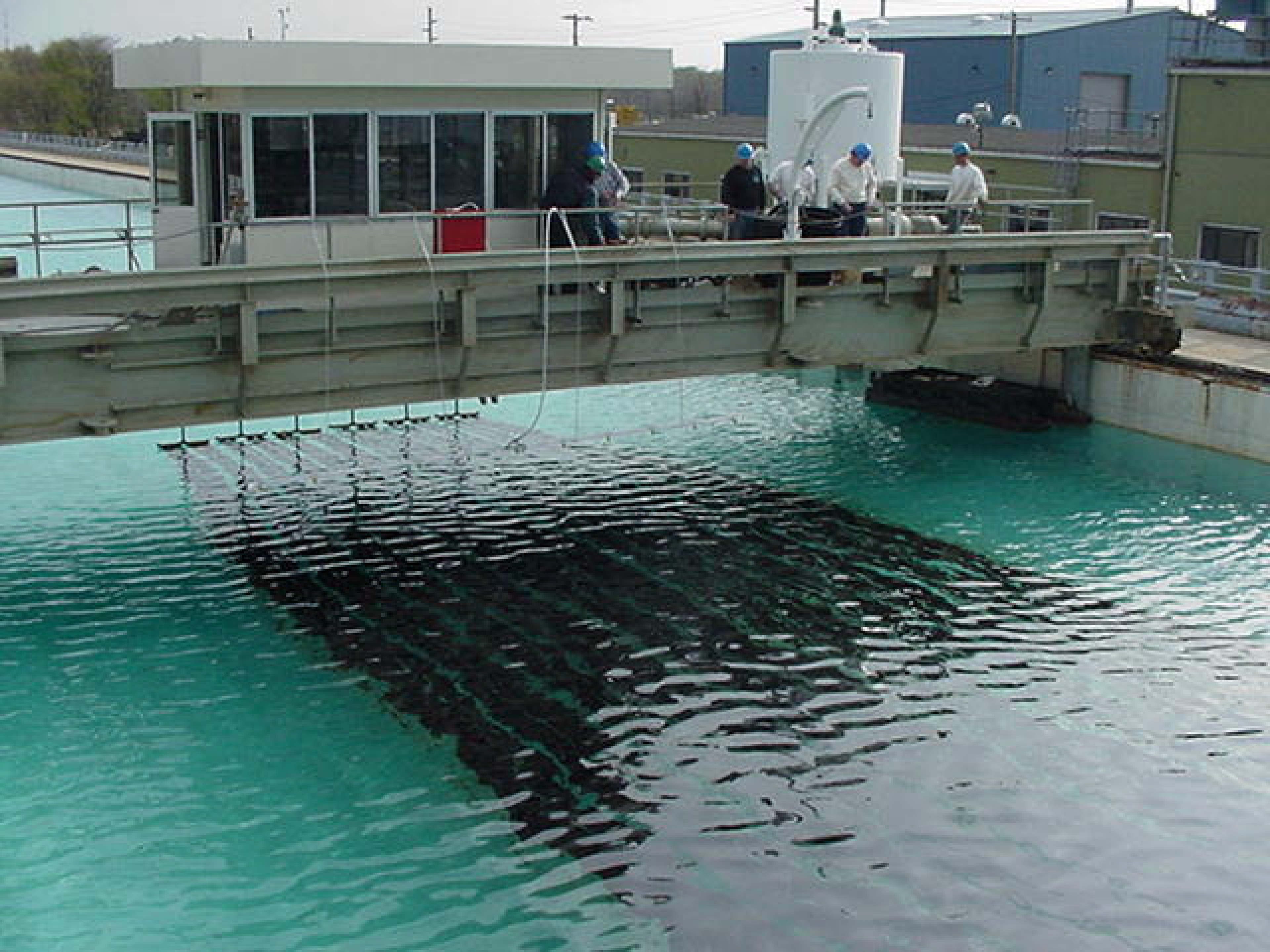

Test of Oil Stop Blanket

Results of SWEPI Boom Tests



Dispersant Test Protocol





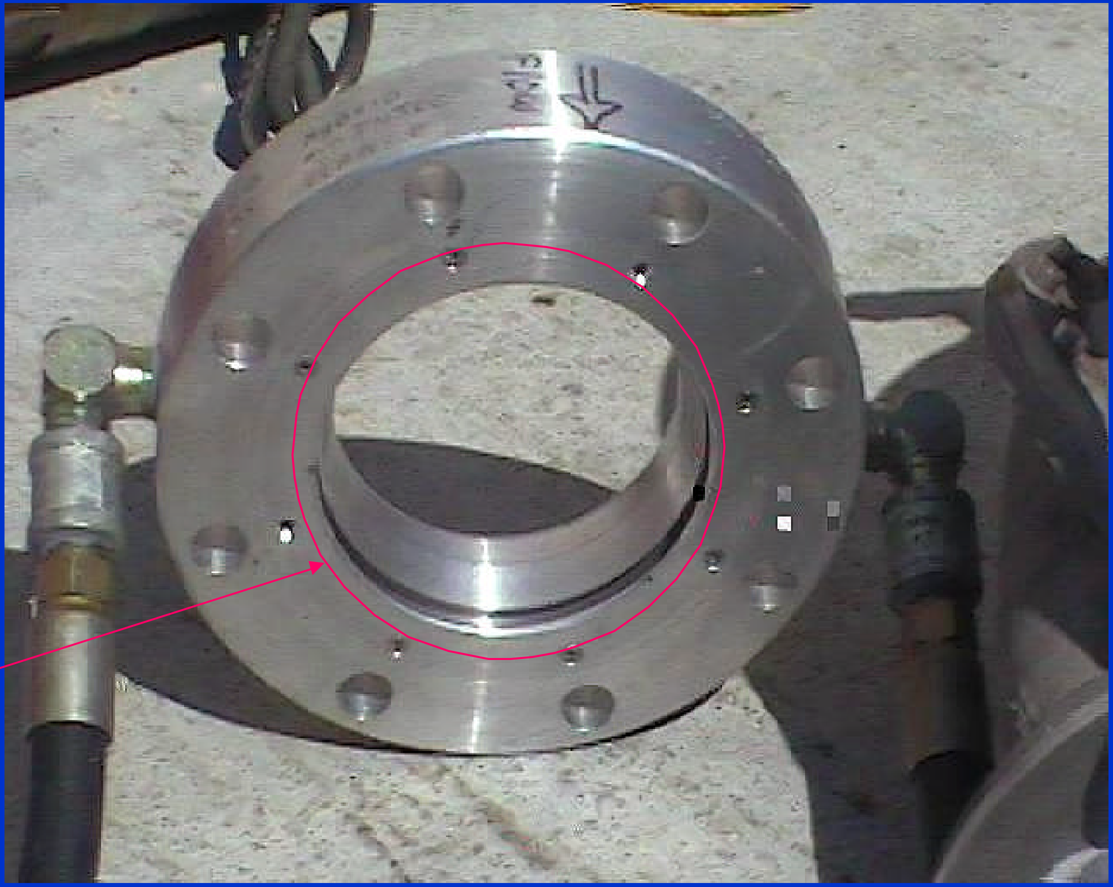
Elastic-American Marine Neat Sweep Test


1 2 3 4 5 6 7 8
1

Viscous Oil Pumping System Tests

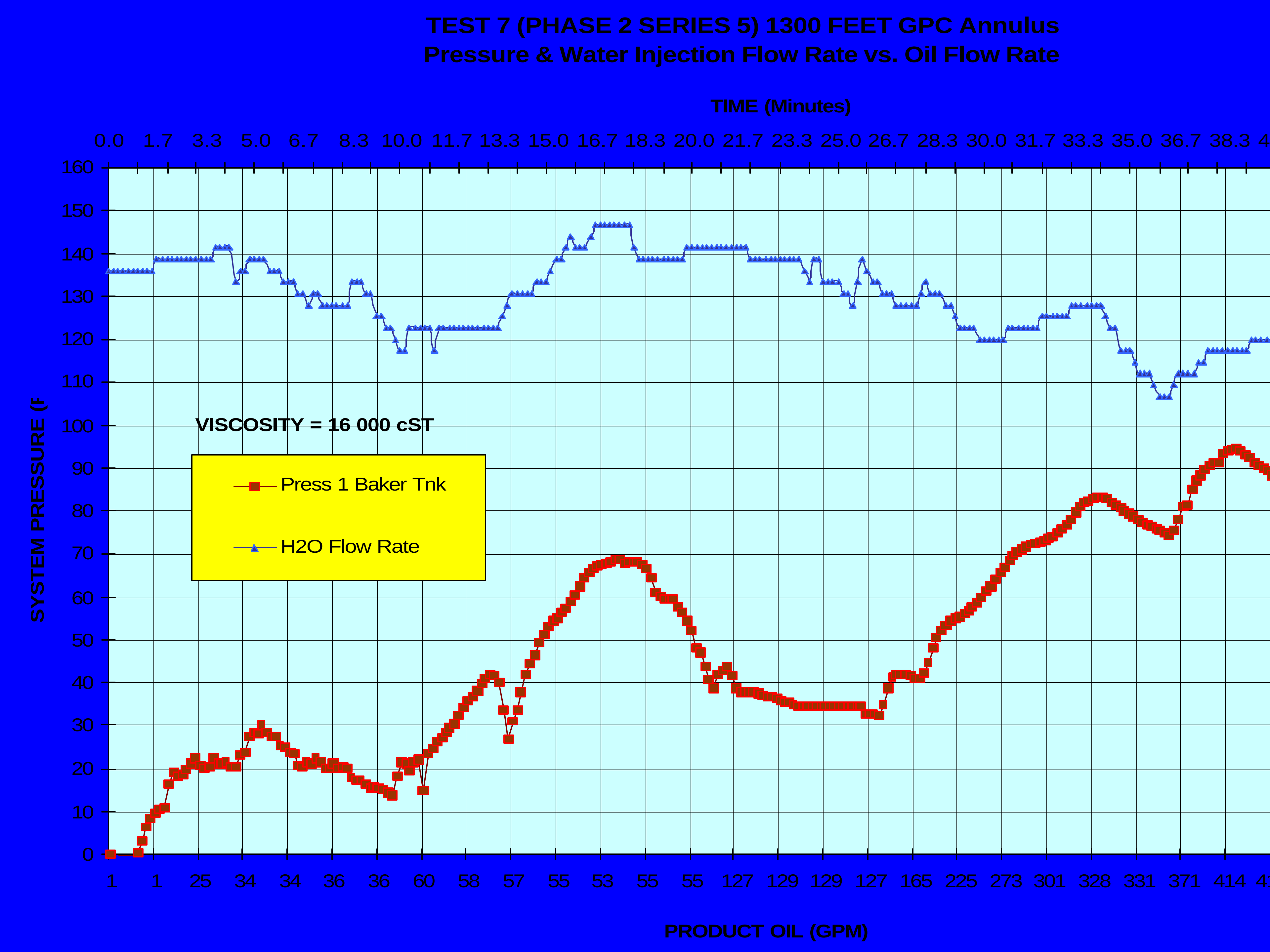
VOPS Components

Water Injection Flange



Removable Ring for easy Cleaning


3M
6%
AFFF



TEST 7 (PHASE 2 SERIES 5) 1300 FEET GPC Annulus
Pressure & Water Injection Flow Rate vs. Oil Flow Rate
TIME (Minutes)
0.0 1.7 3.3 5.0 6.7 8.3 10.0 11.7 13.3 15.0 16.7 18.3 20.0 21.7 23.3 25.0 26.7 28.3 30.0 31.7 33.3 35.0 36.7 38.3
160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
SYSTEM PRESSURE (F
VISCOSITY = 16 000 cST
Press 1 Baker Tnk
H2O Flow Rate
1 1 25 34 34 36 36 60 58 57 55 53 55 55 127 129 129 127 165 225 273 301 328 331 371 414
PRODUCT OIL (GPM)

MORICE Testing Program
January 14-25 2002


2 9:15AM

Chilling unit maintained water temperature in tank at 30.5 degrees F throughout tests.


14 9:59AM

Ohmsett
The National Oil Spill Response Test Facility

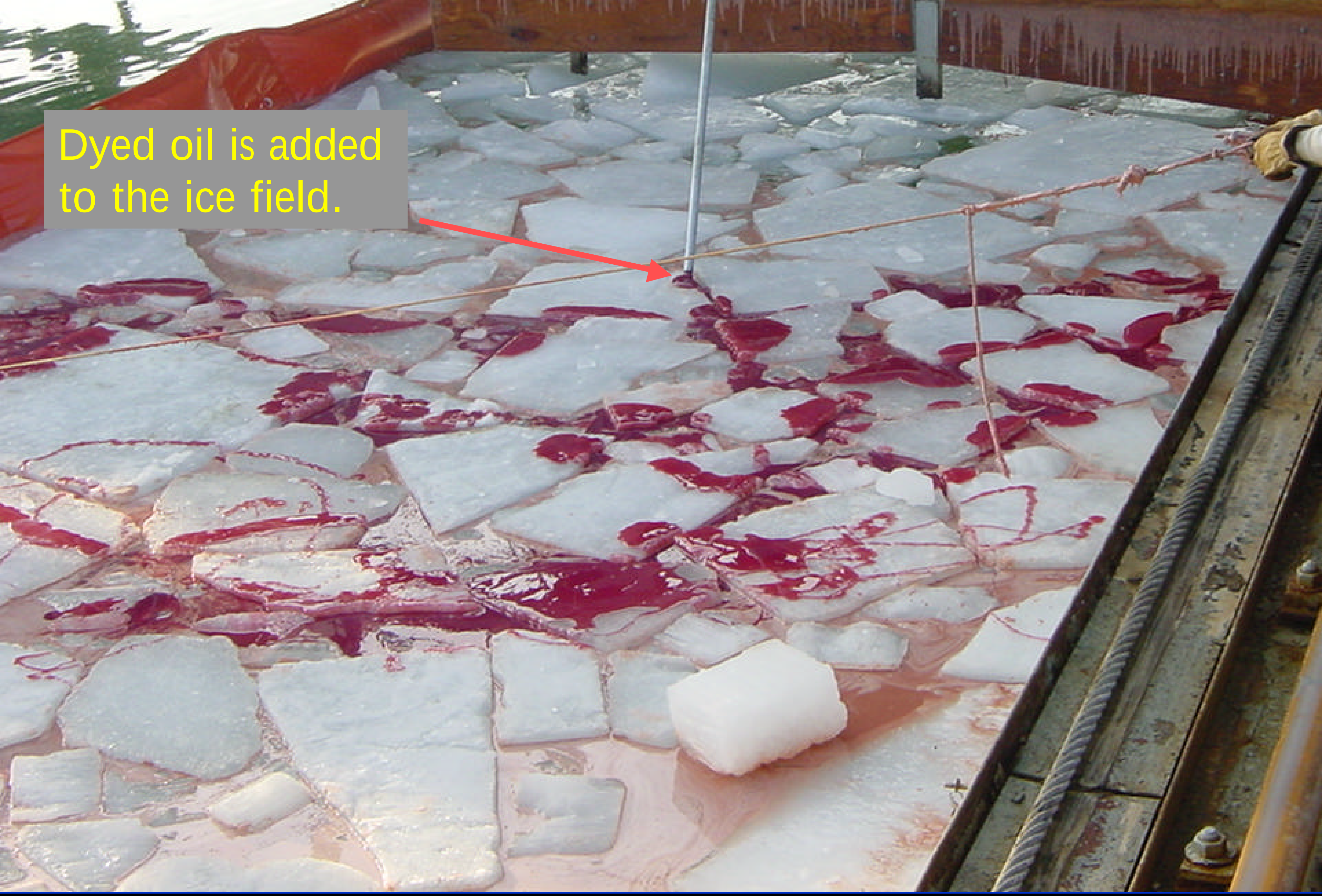
Ohmsett tank is 667 feet long, 65 feet wide, and 8 feet deep and holds over 26 million gallons of water.

Ice with characteristics similar to that found in the Arctic was grown and then stored in refrigerated containers until ready for use in testing MORICE in the Ohmsett tank.

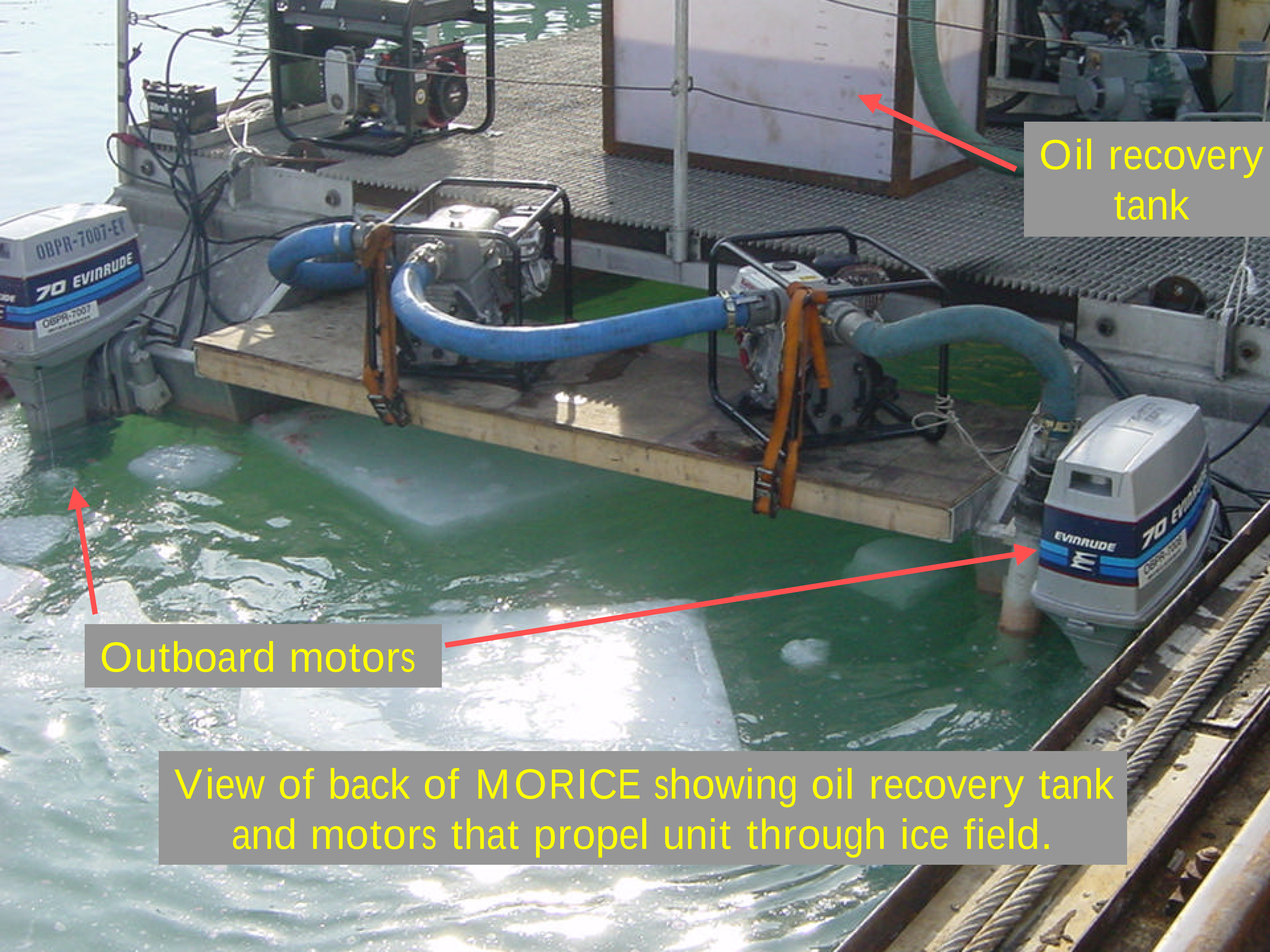
Ice blocks, each weighing 600 pounds, are loaded onto a specially designed lifting frame.

Ice blocks are broken into random configurations in order to create a realistic ice field for system testing.

Using a fork lift, broken ice blocks are lifted to the tank and then slide from the lifting frame onto a ramp.

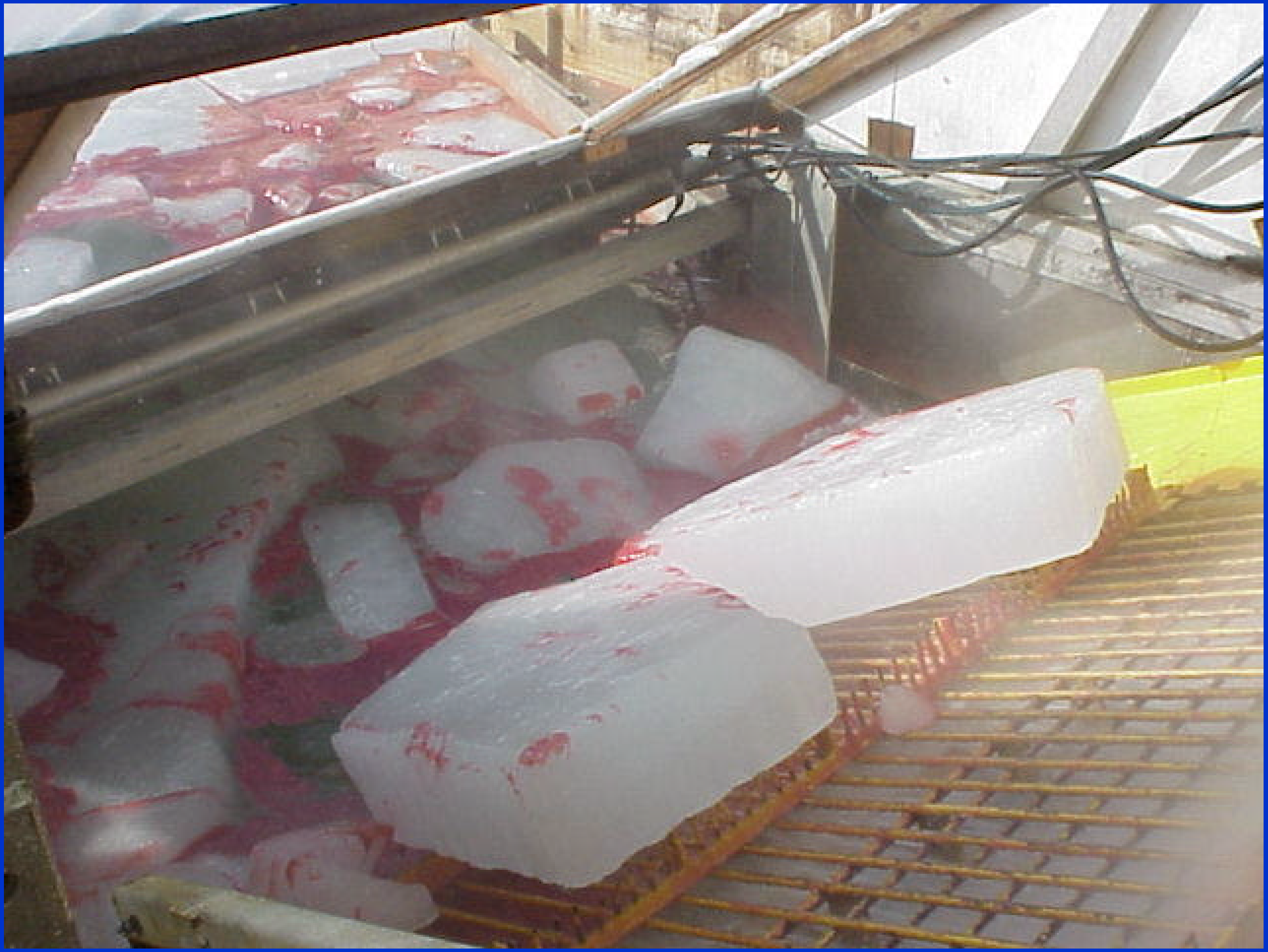

Dyed oil is added
to the ice field.

Oil has been added along the entire length of the ice field prior to test initiation.


Oil recovery tank
Outboard motors
View of back of MORICE showing oil recovery tank and motors that propel unit through ice field.
OBPR-7007-EY
70 EVINRUDE
EVINRUDE


Entire block of ice moves easily through MORICE.

Oiled ice moves up the conveyor system immediately prior to the high pressure jet wash operation.



High pressure water nozzles jet oil off of the ice.

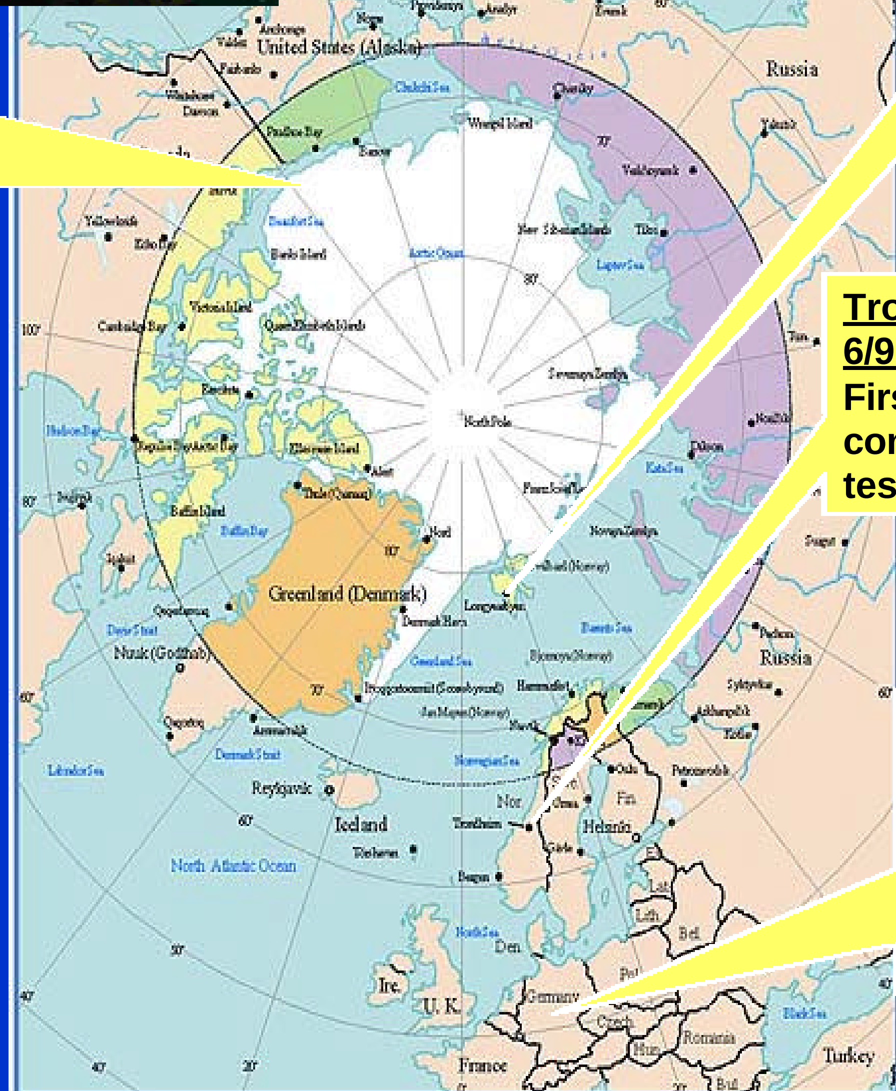
Oleophilic brush drums collect oil from the water’s surface.

Clean ice floats behind MORICE after it has moved through the conveyor and been pressure washed.

Alaskan
Beaufort
Prudhoe Bay:
10/99
Entire unit:
Ice processing,
no oil

We are here now:
Ohmsett - 1/02

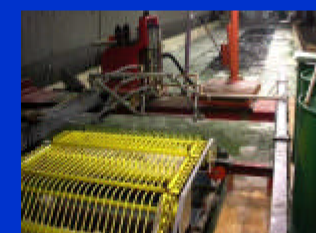
Entire unit:
Final Oil/Ice test



<u>Svalbard</u>
<u>5/01</u>

Planned oil/ice test

<u>Trondheim</u>
<u>6/97</u>
First component testing



Hamburg Ship Model Basin: 10/98

- Ice processing (belt)
- 4 oil recovery units

What this Program Means for Ohmsett

New Ohmsett Capabilities:

- Ability to remain operational year round
- Ability to evaluate mechanical response equipment in broken ice
- Cold water oil spill response training
- On and under ice remote sensing experiments
- Fireboom tests in cold water/broken ice

Training at Ohmsett

Current Course Offerings

- Hands on Spill Response and Safety Courses
- USCG VOSS & lightering course
- National Interagency Incident Management System and Incident Command System
- Confined space entry training
- OSHA/RCRA 8 hour refresher HAZWOPER Courses in accordance with 29CFR 1910.120

TOPICS COVERED IN HANDS ON COURSE

- National Interagency Incident Management System
- Incident Command
- Assigning Roles and Responsibilities in the ICS
- Personal Liabilities of the Qualified Individual
- Spill Discovery and Notification Procedures
- How to Establish a Command Post
- Site Characterization and Site control
- Site Safety Planning

TOPICS COVERED IN HANDS ON COURSE (CONTINUED)

- Physical and Chemical Properties of Oil
- Oil Spill Movement, containment, Control and Disposal
- Alternate Response Techniques – Dispersants/In Situ Burns/Bioremediation
- Ecological Impacts of Oil Spills
- Shoreline Impacts and Cleanup Procedures
- National Pollution Fund
- Spill Management Team Table Top Exercises

PROPOSED COASTAL OIL SPILL RESPONSE & SAFETY TRAINING

- HAZWOPER Safety for Oil Spill Responders
- Small Boat Handling
- Spilled Oil Recovery (Tank)
- Boom Deployment and Recovery (Bay)
- Pump and Skimmer Operations (Bay)
- Simulated Dispersant Application
- Shoreline Cleanup Exercise (Shore)


U.S. COAST GUARD


U.S. COAST GUARD


MING SYSTEM
FWD
11300 LBS

Benefits of Training at ***Ohmsett***

- Emphasis on practical hands-on use of response equipment with oil and waves.
- Students review their performance
  - Through video recording of each training session
  - Using oil recovery effectiveness measurements

- *Typically students improve their oil recovery effectiveness by <u>80%</u>*
- Cost is $995 dollars per student for a 5-day class.
- Possible new course offering - dispersant training

WEB SITES TO REMEMBER

- ww.mms.gov/tarphome
- www.ohmsett.com
- www. fire.nist.gov
- www.etcentre.org/spills

Appendix G-4

United States
Mr. Rodney Cluck

Towards a Multi-Level Social Assessment Framework: Effects and Responses to Change in the Gulf of Mexico

Dr. Rodney E. Cluck, Social Scientist
Dr. Harry Luton, Social Scientist
Department of the Interior
Minerals Management Service
Environmental Science Branch

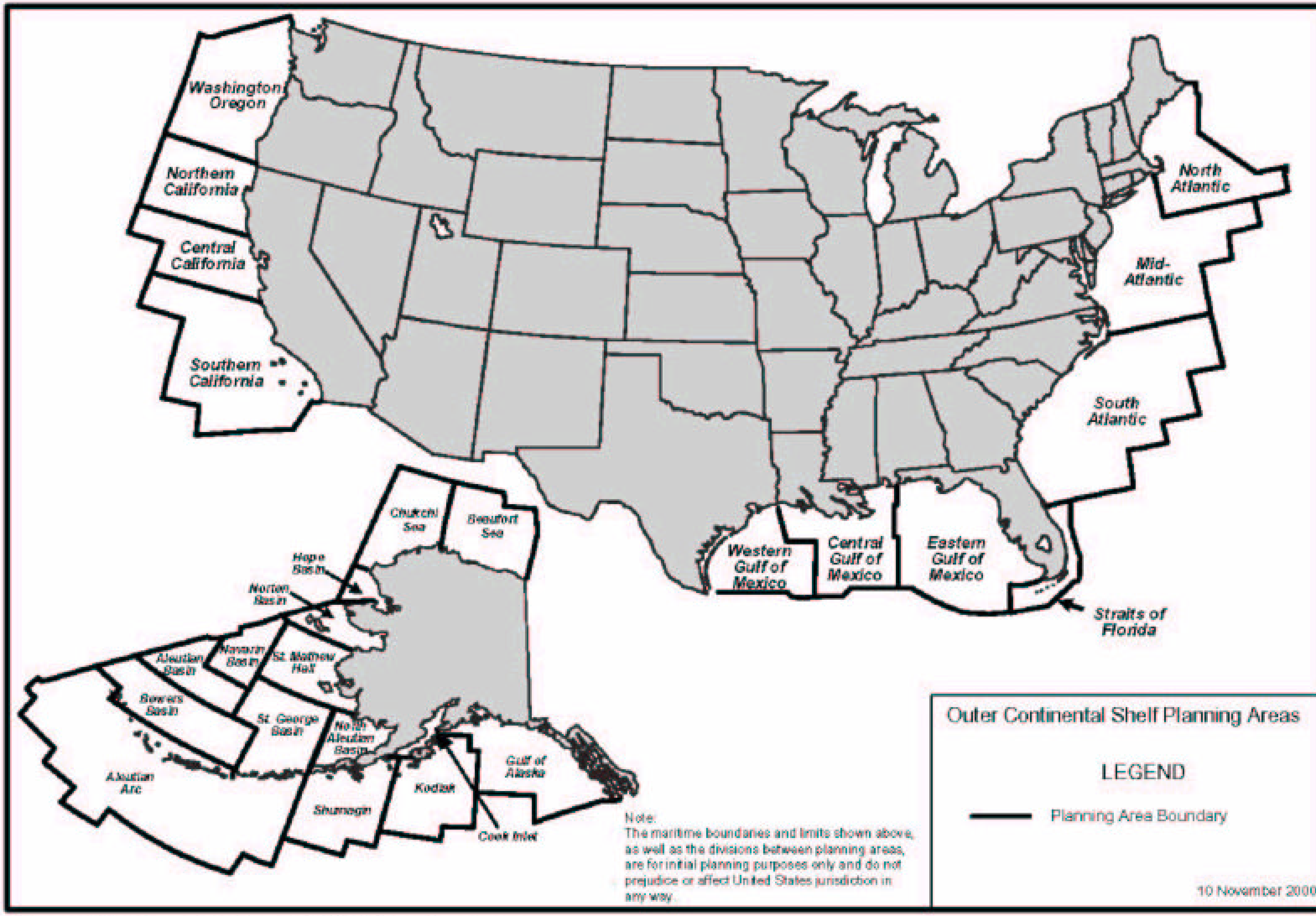


Figure 1-1. Outer Continental Shelf Planning Areas

The Gulf, The Industry, and Socioeconomic Effects

- Challenges
  - Baseline
  - Affected Area
  - Offshore Oil Industry

Boomtowns and “Classic” Social Impact Assessment (SIA)

- Boomtowns shaped “classic” SIA approach including an emphasis on demographic effects
- The magnitude of demographic effects became synonymous with all impacts
- These studies articulated a logic that still underlies current SIA analysis

Levels of Analysis- Effects as a Layer Cake

- National/International
- Regional/State/Regional subarea
- Community/Group-Individual

Developing a Multilevel Social Assessment Framework

- The Integration of Levels
- Structuration Theory (Giddens)
- Social Structure (society) and Social Agency (consciousness)
  - reflexive and dialectical
  - people engage in practice that shapes both consciousness and produces society
  - macro/micro linkage

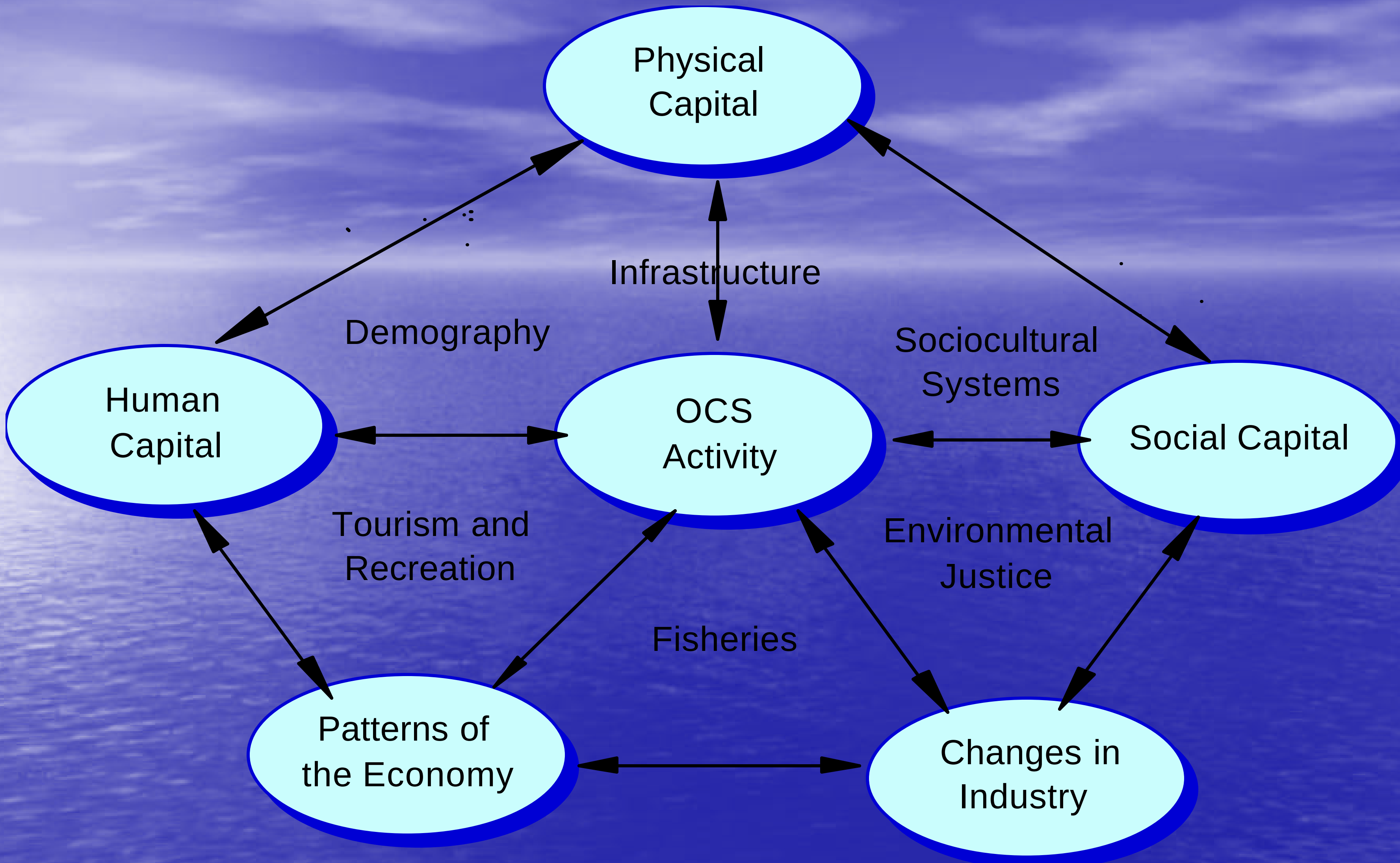


Fig. 1 Construct Levels of Social Analysis Related to OCS Activity

Effects and Responses

- How people and places respond to change is a social phenomena

Table 1. Micro/Macro Economic and Social Effects and Responses from OCS Activity

CATEGORY	EFFECT		RESPONSE	
	Micro	Macro	Micro	Macro
Infrastructure and Land Use	Decisionmaking	Physical expansion	Community capacity for change	Industry change
Sociocultural Systems	Perceptions of and actions of social change	Culture, norms, values	Patterns of behavior	Social structural change
Environmental Justice	Individual health and environmental effects	Civil rights (Executive Order)	NIMBY, LULU, plea for justice	Civil justice
Demographics and Employment	Social network and livelihood changes	Population change/ ethnic/racial change/ economic shifts	Changing belief/ behavioral systems	Changing norms and values/structural functions
Fisheries	Change where/how fishing takes place	Biological change	Change livelihood	Change regional economic systems
Tourism and Recreation	Economic/sectoral change	Perceived negation of tourism industry	Perceptions of environmental and economic risk	Change social and economic business patterns

Conclusion

- Multilevel Approach allows for:
  - explicit conceptual framework inclusive of all aspects of social change and development
  - more complete understanding of effects and responses from different perspectives (ind., gov't, community)
  - proactive planning

SPE 74099

Towards a Multi-Level Social Assessment Framework: Effects and Responses to Change in the Gulf of Mexico

Rodney E. Cluck, Ph.D., Minerals Management Service and Harry Luton, Ph.D., Minerals Management Service

Abstract

This paper discusses social impacts of offshore oil and gas development on human communities, families, and individuals in the Gulf of Mexico. It will describe the findings of selected Minerals Management Service research efforts. Impacts from oil and gas development on communities, families, and individuals are difficult to identify for several reasons. First, many social forces impinge on the family and individual such as mass communication, changes in education, and increasing community heterogeneity, just to name a few. Second, most impacts of oil and gas are not unique to that industry. Even the effects of fly-in/fly-out shift work are found in other industries. Finally, the oil and gas industry is not a single entity. It is a complex array of different operators, local business people, port directors, fabrication operators, etc. Therefore, change and effects vary from one community to the next in the same geographic region. However, commonalties do exist. The nature of these effects suggest that "classic" social impact assessment techniques can be improved and made more explicit by developing a "multilevel" conceptual framework.

How communities and industry are affected and respond to social change represents key factors in community development strategies. These factors are pieces of a larger historical context of industrial development and social change, but they are manifested in a unique area and people that have been involved in the offshore oil industry since its birth. The authors use Structuration Theory to argue that it is important for industry, community, people as well as government to understand the complexities of this change and its integration, which ultimately effects the dynamics of social institutions. This paper discusses these changes, along with responses to these changes that can be used and developed by government, the oil and gas industry and local communities.

Introduction

This paper considers the effects of Gulf of Mexico offshore oil and gas development on the "human community"—people, families, towns, cities, and states. It does this from the viewpoint of the National Environmental Policy Act (NEPA)-defined requirement that the Minerals Management Service (MMS) assess the socioeconomic impacts of the Outer Continental Shelf (OCS) lease sales.

The first section of this paper outlines some of the challenges inherent in doing social impact assessment (SIA) for lease sales in the Gulf of Mexico Region (GOMR). It discusses challenges associated with "baseline" data, defining the "affected area" as well as the vast multitude of enterprises known as the "offshore oil industry."

Section two describes the underlying logic of what we term the "classic" SIA and the analytical relationship this approach has to "boomtowns." We then argue that this logic is not generally applicable to the effects of offshore oil and gas development in the GOMR, even though, in contemporary SIA the "boomtown" framework is still largely conceptualized and employed. However, with offshore development in the GOMR, the source of disruption is not located in the community. Instead oil development is a source of social and economic change that affects communities, the region, the nation and to a certain extent the world. It is not possible or practical to study every community in the GOMR. Therefore, we must understand larger level trends while simultaneously pinpointing likely community-level effects. Pieces of the puzzle are present throughout existing literature. We are merely attempting to make explicit the various levels of analysis needed to comprehend the multitude of effects.

The third section looks at the Region's current "layer cake" approach to SIA and suggests that it might be used to reframe the classic logic more appropriately. We call this the "levels of analysis."

The next section takes up the "structuration" theory of Giddens to put the levels back together again into a "multilevel conceptual framework." Our levels are abstractions, different ways of viewing the same effects or outcomes. We then deal with these effects and responses to these effects through a macro/micro or structure/agency integration.

In many respects, Gulf coast people, their communities, the offshore oil industry, and even MMS face many of the same issues, although from different perspectives. The MMS approaches industry from the need to assess impacts, but states, communities, and the industry have other reasons to thoughtfully consider the complexities of oil in the Gulf. Examples from MMS research efforts are used throughout.

The Gulf, The Industry, and Socioeconomic Effects

The MMS Science Committee tells the agency that the social and economic impacts from oil and gas activities are often the first felt and the most difficult to understand.[1] A National Research Council (NRC) panel noted that the 100-year history of industry operations in the Gulf makes the region a ready-made "laboratory" for researching petroleum's social and economic effects.[2] The NRC reasoned that, because the Gulf offshore industry is homegrown, long-lived, widespread, and includes the complete range of upstream and downstream oil-related activities, most social or economic impacts that the industry does have are likely to have occurred there.

The OCS program for the GOMR is large, long term, and cumulative. OCS leasing has been ongoing for 50 years, and it was initiated after decades of industry acclimatization to Louisiana's coastal wetlands and after it had moved out onto the continental shelf. Substantial OCS leasing has occurred off Texas, Louisiana, Mississippi, and Alabama. These states host such program-related upstream activities as platform and ship fabrication. Texas and Louisiana are also heavily involved in such support activities as platform-related transportation, and in downstream activities such as refining. Since the establishment of the Federal OCS program, the offshore industry has evolved from a local undertaking into a worldwide industry undertaking and strategy.

The NRC advice has influenced GOMR research. Recently, for example, MMS-sponsored research on coastal Alabama's gas industry produced a baseline[3] and sale-scenario projections[4] designed to support the OCS Lease Sale 181 Environmental Impact Statement (EIS). These are typical assessment products. However, the study also analyzed the Alabama industry's past development.[5] The GOMR reasoned that this "frontier" might exemplify the kinds of outcomes that would occur should the industry develop gas-prone prospects off the East Coast. Clearly the GOMR's petroleum-industry core is not a good analogy for characterizing these effects. As amply demonstrated in Mexico and Alaska, its massive fabrication and support infrastructure would not be duplicated. Also, many onshore impacts in the GOMR occurred prior to modern technology and environmental controls. However, Alabama's offshore industry is "new"; it developed using modern technology and management practices, governed by modern regulatory practices, and within the context of a large, complex economy.

The MMS has accepted the NRC's challenge; it supports research on the Gulf's "dynamic baseline" aimed at understanding the offshore industry's short- and long-term effects.[6] However, the same qualities that make the Gulf a good laboratory for the study of offshore oil's effects raise challenges for GOMR impact assessment at the lease-sale level.

First is the challenge of the "baseline." Under NEPA, the difference between an area with and without the proposed action is the proposal's effects. The area *sans* proposal is the "baseline." However, since the industry has operated in the Gulf for decades, there is no "unaffected environment," and in a sense, no baseline. This has led some to conclude that the program has no socioeconomic effects, or at least none that can be separated from past effects. Using this logic, MMS's predecessor, the Bureau of Land Management OCS Office, resisted funding any socioeconomic studies in the GOMR even as it initiated a sizable socioeconomic studies program in Alaska, a real oil frontier. On the other hand, this same lack of "baseline" has led others to ascribe all problems faced by oil-involved Gulf communities to the industry. This tendency was evident in much of the MMS-funded research that followed the 1980's oil price bust, leading one frustrated oil executive to observe that, even if southern Louisiana had never had oil, it would not have remained an untouched Arcadia of fisherfolk and trappers.[7]

The task of separating the effects of oil from other regional influences and from larger national and worldwide trends is neither easy nor certain. For example, consider the always-sensitive issue of race and racism. To show racial discrimination in the oil industry in the 1920's, 40's, or 60's is not to prove an effect, rather it supports the unsurprising conclusion that this industry often reflects the imperfections of the society in which it operates. An "effect" would be a change in racial outcomes. Some evidence from the 1940's[8,9] and the 1990's[10] suggests that job-creation by the petroleum industry opened up opportunities for African Americans and other minorities in south Louisiana that did not exist in other rural areas of the state. This positive effect is likely, and it is predicted by labor-queuing theory, but how could it be proven in the mishmash of history?

As this example suggests, the past effects of oil and gas development on communities, families, and individuals are bound up in other "baseline" trends. Many social forces impinge on communities, families, and individuals such as mass communication, changes in education, and increasing community heterogeneity, to name a few. Often, even in oil-involved areas, the industry is just one of many causes of a particular effect.[11] Identifying oil's share of socioeconomic impacts is made more difficult because most of these impacts are not unique to that industry. Even the effects of fly-in/fly-out shift work are found in other industries.[12]

<u>Second is the challenge of the "affected area."</u> The GOMR is vast, covering Texas, Louisiana, Mississippi, Alabama, and parts of Florida. Its 56 coastal zone counties and parishes include the extremes of social, economic, cultural, and institutional variation. The task of providing a detailed assessment of industry effects across the Gulf would be enormous. Economic effects are difficult enough since oil's impacts are shaped by state fiscal and tax policies, the distribution of other industries, and the industry's own purchasing and hiring patterns.[4, 13-15] Other social and infrastructural effects are often shaped even more by specific local conditions—the unused capacity of a certain school district, the growing demands on a particular water system, or the condition of a specific road connecting a port and highway.[16]

The task of identifying the salient variation within this wide-ranging "affected area" is daunting enough. This problem is magnified by MMS's need to assess socioeconomic effects for lease sales. Lease sales only create opportunities for petroleum industry actions; they do not determine what kinds of actions the industry will take or where these actions will take place. Sale-level analyses do not address the act of leasing; they analyze the potential effects of a series of future industry actions projected to occur on leases issued from a particular lease sale. These projections are necessarily general and difficult to contextualize within the socioeconomic variation of the GOMR.

<u>Third is the challenge of the "offshore oil industry."</u> This is not an industry, it is a multitude of various types of enterprises that are involved in the processes of finding, extracting, refining, and bringing petroleum-based products to market. The numbers of enterprises required and the variability in their sizes, organization, and interactions make projecting the effects of onshore oil development difficult.[17] The support and transportation requirements for offshore operations add substantially to the complexities and variabilities of the "oil industry." Indeed, these offshore requirements are what give the GOMR industry its unique effects.[18, 19]

Each industry has its own structure, economic dynamics, technologies, infrastructure requirements, labor organization and demands, community, and place in the U.S. economy, etc. For each industry, these attributes are changing over time. For each, its relationship to the petroleum industry varies from place to place. Even in the case of Louisiana communities heavily involved in offshore oil, the mix of industries noticeably affected socioeconomic outcomes during the 1980's price bust.[10,20]

Boomtowns and the "Classic" Social Impact Assessment (SIA)

When oil was discovered at Pithole, Pennsylvania, a boomtown sprang up overnight. Pithole exists now as a memory and roadside marker.[21] Oil discoveries at Spindletop, and then in Louisiana and Arkansas, were marked by a progression of boomtowns—Beaumont, Oil City, Vivian, Jennings, and others.[22] The industry is still making enormous discoveries off the Louisiana and Texas coasts, but when was the last coastal boomtown?

We label as "classic SIA" a group of social impact assessments from the 1970's and 1980's because they developed and refined many of the techniques and tools that are still basic to the field today. Regional input-output (I/O) models are a case in point.[23]

Boomtowns shaped this "classic" SIA approach including its emphasis on demographic effects. For example, F. Larry Leistritz,[24] a pioneer and leader in the assessment field, writes that determining demographic effects of project development "is one of the most important steps in the socioeconomic assessment process because estimating demographic impacts is essential for assessing other population-related effects such as public service demands and fiscal impacts. In fact, to many planners and decisionmakers, the magnitude of population impacts is synonymous with the magnitude of all impacts."

Wilkinson et. al.[25] notes that these studies articulated a logic that still underlies current analyses. This approach—and its strong demographic focus—continues to influence GOMR socioeconomic analysis. We will note two of the many examples. First, demography tends to be emphasized even when there are no population effects. The Mobile, Alabama, area hosts a large population and complex economy. The excellent study of its gas industry (mentioned above) carefully reports the industry's annual demographic impacts to the tenth of a person even though the numbers are only artifacts of an economic projection, and any in-migration would be lost in the noise[5]. Second, analysis sometimes equates demographic impacts with social ones. Echoing Leistritz, an MMS study of the social costs of the 5-Year OCS Leasing Program argues that, since the program has no population effects, it has no infrastructure costs.[26]

However, the lack of new Gulf coast boomtowns is not happenstance, and while GOMR analysis may exhibit the influence of the demographic engine of classic SIA, the realities of the offshore industry has moved EIS analysis in other directions. Here we clarify differences between classic SIA and Gulf realities as a way of explaining the direction GOMR assessments have taken and must take.

Classic SIA was a response to the boom-bust effects of large-scale, energy-related projects, many in the Rocky Mountain West. Typical "boomtowns" were small, often shrinking, homogenous, rural communities situated near the site of a project such as a hydroelectric dam, coal-fired power plant, or coal-gassification project.[27, 28]

This boomtown experience led classic SIA to focus analysis on rapid *demographic change*. It is project centered. A project's labor demand would cause rapid in-migration and create a "boom." Project completion would end labor demand, causing out-migration and a "bust." While these projects were energy related, their construction phase and the construction industry actually produced the boom and bust. The construction phase was compressed in time, which magnified the effects of demographic change. Classic SIA is also community centered, and in- and out-migration caused other effects because they were concentrated in a small geographic space. The local labor market was small, and the size and isolation of the community limited the available infrastructure and housing stock.

Demographic change concentrated in time and space was a key effect because it caused many other economic, infrastructure, fiscal, and social-psychological effects. For example, rapid in-migration would create a housing boom that not only increased the tax base, but also created demands for roads, schools, and police protection. New people meant new ideas, but also social conflict. Conversely, the bust brought empty housing, a shrinking tax base, overbuilt schools, and lingering bonded indebtedness.

The effects of the offshore petroleum industry are often compared to those of classic SIA boomtowns because the oil industry is cyclic. In fact, the industry's unique mix of economic (e.g., elasticity of demand) and geopolitical issues (e.g., OPEC influence on supply) makes the industry more volitile than many. These cycles impact states, communities, and individuals. They raise issues EIS analyses should assess. However, the question here is whether the classic SIA model sheds much light on these issues. Prior to the traumatic mid-1980's oil-price crash, this question was under debate.[29, 30] After the bust, this boomtown model seems to have been generally accepted in the assessment literature.[31-37]

We agree with Gramling and Brabant's original contention[29] that the classic boomtown model does not reflect the realities of the offshore industry. Using Morgan City, Louisiana, as their example, they argued that the slow evolution of the offshore industry gave communities time to adjust and that the concentrated schedule of offshore work encouraged long-distance commuting, which mitigated demographic effects. Gramling concludes that, as classic SIA predicts, the industry created labor demand in a small rural town and raised housing demand, but demand developed over time and did not outstrip the area's ability to respond.[38]

This conclusion should be generalized. In classic SIA, a project's demographic effects are significant because they are compressed in time. In the Gulf, no such compression can be observed. First, the onset of project labor demand is not new to the community. The 50 years of offshore operations in the Gulf means that communities are poised to meet it. Also, oil-involved communities do not confront labor demand compressed into a short construction phase. Second, while OCS projects, like classic SIA projects, have a highly labor intensive exploration phase followed by a less intensive production phase, differences in labor demand are not as extreme. The production phase also involves drilling over water and complex supply operations. Moreover, phases tend to overlap. For example, exploratory drilling often occurs on producing platforms. Even more important, oil-involved communities do not experience a project's labor demand as discrete. Fabrication yards bid on jobs. Labor demand from one successful bid blends into the next. The yard, its workers, and the community in which it is located are affected by the industry's business cycles and by changes in the industry that makes one yard more or less competitive than another. However, they are not affected by the compression of construction-phase labor envisioned by classic SIA.

Earlier we asked when was the last oil boomtown on the Texas or Louisiana coast. The answer is never. Gramling and Brabant's example of Morgan City is the best contender, for it lies in the heart of the oil patch and hosts fabrication yards — the most labor intensive and oil-price-sensitive sector of the offshore industry.[39] Morgan City experienced an elevated household demand as the industry grew in the 1940's through the early 1980's, but any shortage was reported as being due to limited space (from agriculture and wetlands) and to bank and builder unwillingness to construct blue-collar housing.[40-42] The decades-long growth and long distance commuting mitigated any housing "boom."[14, 40]

The 1980's oil-price crash came at the end of a decades-long expansion of a massive industry that extended from Texas to Alabama, after OPEC actions had heated that expansion to a boiling point, and after a growing recession elsewhere in the country set droves of laid-off workers south to find work. The causes and effects of this bust underscore another basic difference between classic SIA and GOMR realities. In the Gulf, just as the industry's effects are not compressed in time, they are not compressed in space. In the mid-1980's, Morgan City's businesses closed, workers lost jobs or took paycuts, and people left. However, these events were not the result of the completion of a project or a group of projects, and they were not the result of happenings in Morgan City. Rather, Morgan City was at the heart of a region wide economic depression that rolled through Louisiana, Texas, and Oklahoma as oil prices collapsed and exploration almost stopped. The cause was a downturn in a massive, regionally dominant industry.

Morgan City is no more a classic boomtown than is Flint, Michigan, which suffered through plant closures when the regionally dominant automobile industry reorganized in the face of Japanese competition. Actually, the 1980's oil price bust inverts the causal relationships postulated by the classic SIA. Effects occurred because the industry labor demand was long term and widespread, not compressed in time and within a few communities. Out-migration occurred as oil's downturn brought down other sectors of the economy; outmigration was not the cause of this downturn. Similarly, social services were overloaded because of a shrinking state tax base, not because of local demand. Causes were manifestations of larger-scale processes, and many of the drivers were unrelated to governmental or community actions.

Here, we reiterate several points germane to the following discussions:

- The GOMR petroleum industry has significant social and economic effects, as exemplified by demographic changes in the 1980's.
- While classic SIA techniques focused on the construction phase of energy-developments, the energy business itself is a significant factor in MMS assessments.
- While socioeconomic effects occur in the GOMR, demographic impacts from project- or sale-created labor demand are not usually their primary causes. The demand is not new, discontinuous, or confined to a few locations.
- For the same reason, demographic effects cannot be linked to the labor demand generated by specific sales or projects. Rather, they are a composite of the demands of many projects operating on lease blocks from many sales.
- Similarly, most onshore effects cannot be linked to specific sales but are aggregations of sale effects.
- Finally, just as onshore effects cannot be linked to specific sales, effects of a sale are difficult to link to specific onshore locations. The MMS assessments must address the problem of analyzing unlocalized, local effects.

Levels of Analysis—Effects as a Layer Cake

The MMS has not resolved these issues. However, the current MMS EIS approach provides a framework for resolving them. The current MMS EIS approach evolved as an ad hoc response to the difficulties of conducting a socioeconomic assessment for five states, the need to report effects for various geopolitical entities (e.g., states, counties), the requirements of economic projection models, and the need to assess environmental justice and other scoping concerns. However, the fact that this approach provides a useful framework is not simply good fortune, for it developed as a response (sometimes conscious, sometimes not) to the assessment problems noted above.

The current EIS approach might be described as a layer cake pattern to assessment. Beginning with national-level effects, MMS analyzes effects at various levels down to several local places and localized groups (e.g., Port Fourchon, Louisiana, and the Houma Indians).

<u>National-level</u> effects are analyzed by MMS Headquarters and are reported in the 5-Year OCS Leasing Program EIS. These effects are primarily economic and fiscal, although the EIS includes an analysis of the economic benefits and costs of the program by planning area. The GOMR does not address national effects in its IMPLAN (Impact Analysis for Planning software). The GOMR categorizes all effects outside of the region as "other."

<u>Regional-level</u>, <u>state-level</u>, and <u>regional subarea-level</u> effects are analyzed by the GOMR. The Gulf Region includes Texas, Louisiana, Mississippi, Alabama, and Gulf coastal Florida, although all of Florida is included in the agency's socioeconomic analysis. Subareas include all coastal zone counties and all counties in Metropolitan Statistical Areas (MSA's) that include a coastal zone county. Subareas are designed to facilitate GOMR and Headquarters IMPLAN projections.

Currently, most socioeconomic analyses are conducted at the subarea level. Direct industry economic and demographic effects are calculated from knowledge of past industry behavior and are used as variables for IMPLAN to calculate indirect industry effects. IMPLAN is used to calculate the costs of oil spills at the subarea level. The distribution of industry-related infrastructure is also analyzed at this level. The results of these analyses are aggregated to report state- and region-level socioeconomic effects.

Community-level and group/individual-level effects are also analyzed by the GOMR. Community-level analyses discuss infrastructure problems related to port areas as vectors of onshore effects, such as the issue of Port Fourchon and LA Highway 1.[14, 16] Environmental justice issues have been highlighted and discussed as a group/individual-level effect. The socioeconomic assessment issue facing the Gulf is to develop a systematic approach to linking community or individual-level effects to its overall assessment. Classic SIA, with its link between an action and localized demographic effects, does not serve as a guide. The same problems arise when applying IMPLAN at the county level.

We will make several points about these levels. Program effects are sufficiently large to measurably affect the Nation's economy. Kinds of effects vary by level. Groups and individuals are subject to a different spectrum of physical, economic, social, and psychological effects than are businesses.

At all levels, effects are distributed unevenly. Geographically, the activities that cause effects are also distributed unevenly. Platform fabrication occurs at some ports and not at others. In general, this unevenness is more difficult to assess and consequential at the lower levels. This is partly a data aggregation problem. County and sub-county data are difficult to obtain and/or often inaccurate, but, while state-level data are more accurate, they tend to "average out" significant local events such as plant closings. However, the uneven distribution of many effects is due to their causes. Even with commuting, offshore industry's effects of labor demand are more localized than are the national- or state-level fiscal benefits. Infrastructure effects are even more specific to local conditions.

These levels are somewhat arbitrary; hence, program effects at one level can affect others. For example, exploration and development resulting from a sale can increase construction employment in a Morgan City, Louisiana, shipyard, thus raising tax revenues for the city, parish, and state.

Finally, one must remember that, at any of these levels, the effects of the program are woven into other trends, events, changes, and effects. This is obvious considering the enormous effects that worldwide events have on industry oil prices. Indeed, this can increase or decrease activity in the Gulf. However, even the breakdown of an important highway connection—a very local effect—can close down a port and affect state revenues.

Developing a Multilevel Conceptual Framework

How communities and industry view and respond to change is a key to community development strategies. Communities must respond to changes in population, infrastructure needs, and local businesses. Industry must also respond to these changes, although from a different perspective. Falling oil patch employment in the mid-1980's and its continuing uncertainty have led to falling budgets for communities, job seeking and belt tightening for households, and the industry's experiences of diminishing worker loyalty.[43, 44] These varied experiences are pieces of the larger context of industrial development and social change, but they are manifestations unique to an area and people involved in the offshore oil industry since its birth. Taking these experiences apart—separating specific causes of change from this complex whole and analyzing the relationships among actions and outcomes —is the hallmark of SIA.

This section moves in the opposite direction, it attempts to put these parts back together again to show that effects to individuals, communities, and the industry are aspects of the same history. It uses Structuration Theory, along with human/social and physical capital, to develop a conceptual framework that links regional or larger level effects—macro-level analysis—to community or smaller level effects—micro-level analysis. (Table 1 may be helpful in this conceptualization.)

Several characteristics of the GOMR make this framework particularly useful in explaining impacts from offshore oil and gas development. First is the integration of the oil and gas industry with the GOMR.[11] Second is the multifaceted nature of the oil and gas industry. It is not one industry; it is a vast array of operators, fabrication facilities, ports, etc. These characteristics have created a network of industry, community, family, and individual dependence on the OCS that is affected by business cycles in a multitude of direct and indirect ways. For example, to adjust to with these cycles or shifts, people have developed safeguards through social networks that help them move into commercial fishing or new employment during industrial downturns. Third, these socioeconomic effects are centered toward the family and individual. Adaptations to these fluctuations not only affect income, they affect the directions in which families change. Families, individuals, and communities of course, experience a conundrum of different forces that contribute to social and economic change.

Social sciences tend to divide the world into agency and structure, or micro and macro levels (e.g., individual vs. society, or motives vs. economy). Anthony Giddens' Structuration Theory attempts to integrate social agency and social structure within a historical or processual dynamic. People express themselves through actions. Giddens argues that, by acting, people engage in practice that shapes both their consciousness (agency) and produces society (structure).[45] This infinitely iterative, reflexive process is "dialectical." Structure is reproduced and changed through practice; practices are motivated and changed by structure.

Structuration Theory, by insisting that macro and micro levels are linked, provides an important corrective to the schematic aspects of our levels-of-analysis approach. If we consider levels of social analysis as divided into macro and micro extremes, an obvious gap exists. However, if we consider macro constructs (such as law, bureaucracy, culture or values) as intertwined or integrated with micro phenomena (such as actions, or perceptions of reality), a linkage emerges.[45]

The macro-economic system affects the collective order of large geographic areas in quantitatively measurable ways. These effects are dispersed across an area and, in turn, facilitate certain economic behaviors, provide certain incentives, and encourage certain values and norms. All this is framed in rational action and voluntary agency. Therefore, the patterns of the economy, in part dependent on the geography and natural resources of the area itself, influence the community, its social networks (social capital), and the individual (including certain determinant factors of human capital such as education, income, etc.).

In Fig. 1, the components affecting OCS activity are framed in terms of physical (both environment and infrastructure), human, and social capital; economic patterns; and changes in industry. These components can be understood by analyzing the issues usually addressed in EIS's, such as infrastructure, demography, sociocultural systems, environmental justice, fisheries, tourism, and recreation. A full range of sociological and economic tools can then be used in this process.

For example, under the heading *Land Use and Infrastructure*, a GOMR EIS might address the expansion of oil- and gas-related industrial development in several communities across the region. Pipeline construction, highway deterioration, and refinery technology upgrades are all large macro phenomena that are part of industry expansion and that orient the analysis towards such macro constructs as economic development patterns. Nonetheless, in specific "places," these macro constructs are manifested as social constructs, such as decisions made at the micro level to expand a port or to house new migrants. The ability of a place to respond to these issues (e.g., to expand a port or make room for new workers) is the "capacity for change," another concept current in SIA.

Environmental Justice (EJ) issues provide another example of this link between macro and micro. Legally, EJ is defined as "disproportionate impacts on low-income or minority peoples," and is considered under civil rights legislation (Title 6). Executive Order 12898 directs government agencies to address it; the topic is wrapped in bureaucratic language and engulfed by the injustice of income and racial inequality. Yet, these macro institutions affect particular people and places. EJ is often heard as a plea by a community who may be getting "dumped on" as Bullard suggest, by industrial development or a polluting industry.[46] It is a Not In My Back Yard (NIMBY) or Locally Unaccepted Land Use (LULU) response. It is a community, individual, or social action made as an attempt to spare citizens from real or perceived adverse health and environmental impacts.

Our multilevel SIA approach is an attempt to address the realities of a region-wide industry by breaking the phenomenon into pieces and then putting them back together again. From these examples, it seems almost obvious that consideration of linkages between the macro and micro levels is vital in order to understand social and economic impacts of this industry. Indeed, the GOMR's offshore oil and gas development raises an interesting opportunity. This industry is located both onshore and offshore, composed of a vast array of companies, subcontractors, operators, fabricators, merchants, and others, tied into regional, national, and global trends not centered in any one community but with community effects. This is indeed the laboratory the NRC identified. It is a natural experiment to link levels of analysis and improve the "classic social assessment" methodology.

The GOMR's current levels of analysis approach is somewhat arbitrary. One key to improving GOMR socioeconomic assessment is to rationalize this system into a clear and effective analytical approach. This approach assumes that, within each level, each effect has its own set of significant causal relationships and its own geographic, demographic, and/or socioeconomic distribution. One problem is to determine which causal relationships and distributions should be pursued. For example, if the possible effects on education are to be examined, should they be analyzed in light of national trends, and if so, in what detail? Current documents gloss over the connections between the projections of economic and demographic effects and all other social and economic effects. The multilevel approach highlights these analytical problems in an attempt to identify and implement a solution.

A related problem is how, in a sale-level EIS, to rationally address localized effects. In our layer cake of effects, the links between subregion and counties and communities are the most difficult ones to determine, and, again, current documents tend to gloss over them. SIA should not repeat the mistakes of "modernization theory" and treat every "place" the same. Development is "place" specific. A broad, all-encompassing strategy will not work across time and space. To understand the effects of the offshore industry, we should determine the historical business context of the region and patterns of the economy, as well as the local decisionmaking processes and fiscal regimes. Again, the multilevel approach suggested by Giddens might prove useful for determining impacts, as well as for providing "places" with helpful information for making informed proactive decisions when responding to change since this process involves relating community stability and change to an understanding of global, national, and regional trends.[47]

Effects and Responses

The synthesis suggested by Giddens may improve GOMR social and economic assessment in another area. Except in the case of economic impacts (e.g., jobs, taxes, and household incomes), many studies of offshore oil tend to approach the effects as negatives. In a sense, they ask leading questions. They consider what people don't like about working in the oil industry, not what they don't like about working, or what they do like about working in their hometown, or do like about working on a platform rather than in a cane field. For example, the MMS family study[44] touches on the oil industry's threat to "Cajunism," citing its early (1940's) insistence on an English-speaking workforce. However, the United States has many once-ethnic rural areas that are now depopulated or homogenized commuting zones and few where English is not spoken. Contemporary "Cajunism" is not Frankophone swamp-life of the 1940's and, doubtlessly, oil has played its role. However, one might ask how the industry helped maintain this ethnic population and facilitated the development of current Cajunism, a point the Cajun scholar Brassieur makes in passing.[48]

How people and places respond to change is a social phenomenon. These places are not the small, rural, isolated, resource-dependent communities addressed by classic SIA. Instead, these communities are engaged in long-term global competition with other servicing oil and gas areas. They are exporters of technology and expertise—to the North Sea, Mexico, Africa, and Indonesia. This enormous expansion has developed with little information.

Most studies on resource-dependent communities have not examined a broad range of geographic locations and temporal variations with explicit comparisons across these variations.[49] There is a need to study oil-dependent communities not only over time but also in comparative and regional terms. The MMS offshore employment study examines international effects of offshore employment.[12] Community studies comparing the GOMR with Scotland, for example, could prove to be valuable in determining effects and responses to these effects. This comparative analysis would need to consider the various macro/micro levels of social analysis along with specific areas of investigation. These effects and responses to them may be empirically examined through certain identified categories, such as those shown in Table 1.

If the locations impacted by oil and gas development hope to be competitive in the global market, they must understand their community capacity for change. Success in dealing with powerful economic forces, such as the oil and gas industry, is more closely linked to the quality of human resources (human and social capital) than anything else. Sound education, first-rate health care, supportive social systems, industry responsiveness to family and community needs and change, employee training programs, high school apprenticeship programs, environmental information, and other elements attributed to high quality, human resources are fundamental to an adequate response to economic and social changes by both industry and communities.

Conclusion

The MMS has increased its emphasis on social and economic research over the last several years to obtain the necessary information for EIS's, as well as to contribute to outreach efforts by providing valuable information to states, counties, communities and industry. As a consequence of social science research, geographic locations in the GOMR have been able to use MMS research in a proactive fashion to aid its decisionmaking processes. This use of research enables communities, counties, and states to avoid self-subversion. That is, it allows local governments to better "plan change" rather than be at the mercy of global and industrial shifts. This grassroots form of outreach empowers places in proximity to offshore oil and gas and enables them to determine where economic development would be most beneficial to the locality as a whole.

Information exchange among industry representatives, community leaders, and government is important in order to address their concerns and allow all parties to be proactive in shaping their futures. By promoting safe and sustainable development, training programs, apprenticeship programs, etc., industry is able to create a high quality workforce for the future.

We argue that responding to social change and avoiding self-subversion requires a multilevel approach, an understanding of the complexities and dynamics of social institutions and their integration. Knowledge and research at different levels of analysis alerts us to the fact that we are all subject to "effects." These effects are perceived differently; thus, their complexities and dynamics are experienced differently. This perception depends on one's social construction and social institutional (educational, familial, political, economic, and religious) affiliation. Structuration theory provides a link needed to develop applied methodologies to understand multilevel social assessment.

Although government, industry, and local communities perceive these effects and responses differently, it is important that they understand one another's perspective. Utilizing *the sociological imagination*[50] to comprehend another's position in terms of OCS activity may be beneficial to all parties involved. This will allow perspectives to flow while understanding current dynamics of social and economic change at various levels of aggregation, and will ultimately allow development to become more sustainable.

The sharing of knowledge and the communicative process would certainly benefit from an explicit, conceptual, multilevel assessment framework that takes into account social institutions and the forces affecting them. Social change is an iterative process fueled by expressions of consciousness that can lead to beneficial responses on the part of industry, government, and communities. Providing an assessment through the integrative approach provided here allows for multilevel proactive planning.

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Table 1. Micro/Macro Economic and Social Effects and Responses from OCS Activity

CATEGORY	EFFECT		RESPONSE	
	Micro	Macro	Micro	Macro
Infrastructure and Land Use	Decisionmaking	Physical expansion	Community capacity for change	Industry change
Sociocultural Systems	Perceptions of and actions of social change	Culture, norms, values	Patterns of behavior	Social structural change
Environmental Justice	Individual health and environmental effects	Civil rights (Executive Order)	NIMBY, LULU, plea for justice	Civil justice
Demographics and Employment	Social network and livelihood changes	Population change/ ethnic/racial change/ economic shifts	Changing belief/ behavioral systems	Changing norms and values/structural functions
Fisheries	Change where/how fishing takes place	Biological change	Change livelihood	Change regional economic systems
Tourism and Recreation	Economic/sectoral change	Perceived negation of tourism industry	Perceptions of environmental and economic risk	Change social and economic business patterns

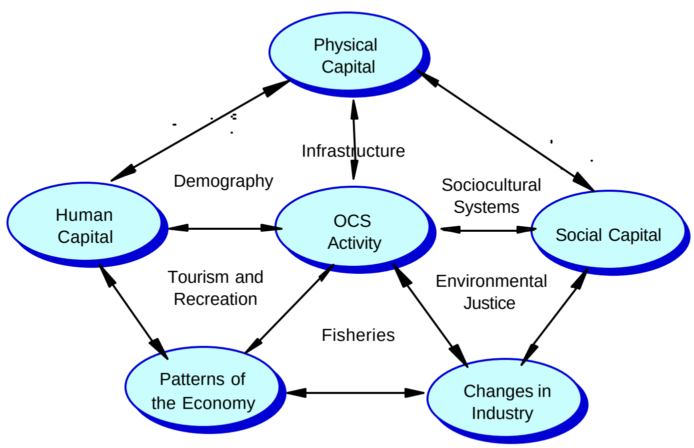


Fig. 1 Construct Levels of Social Analysis Related to OCS Activity

Appendix G-5

United States
Ms. Mary Ann Milosavich

MMS INTERNATIONAL PROGRAM

MONITOR AND INFLUENCE

- International Organization for Standardization
- Department of State (LOS, MARPOL, LC)
- World Summit on Sustainable Development

WORK DIRECTLY WITH COUNTRIES

- Share information/conduct projects
- Participate in workshops and conferences
- Provide technical assistance and training

SHARE INFORMATION/CONDUCT PROJECTS

- **CANADA**
- **MEXICO**
- **BRAZIL**
- **IRF and ARCTIC COUNCIL**
- **AUSTRALIA**

PARTICIPATE IN WORKSHOPS AND CONFERENCES

- **INTERSPILL – UK**

- **DEEP SPILL – NORWAY**

- **CHINA**

  Simulated Lease sale
  APEC workshop on structural integrity
  Followup workshop on oil spill response
  Ministry of Land and Resources

- **PHILIPPINES**

- **INDIA**

PROVIDE TECHNICAL ASSISTANCE AND TRAINING

- **RUSSIA**
- **CASPIAN**

  Turkmenistan
  Kazakhstan
  Georgia

- **BANGLADESH**

My name is Mary Ann Milosavich. I am in the International Activities and Marine Minerals Division of the MMS. I had the pleasure of speaking to many of you at the ICRARD meeting in June 2000. I'd like to pick up from there and tell you some of the things MMS has been doing internationally since then.

The MMS is active in international issues concerning offshore oil and gas because decisions made in the international community impact our domestic mission. We try to monitor and influence some of these decisions. One way is by participating in the U.S. Technical Advisory Group to the International Organization for Standardization. Another is by providing technical advice to the U.S. Department of State on international conventions such as the Law of the Sea, the Convention for the Prevention of Pollution from Ships (MARPOL), and the London Convention of 1972.

The MMS is also preparing deliverables for this summer's World Summit on Sustainable Development in Johannesburg, South Africa. MMS socioeconomic and environmental studies will contribute to a better understanding of how oil and gas resources can be developed in a sustainable manner.

Our international program also involves working directly with other countries on several different levels. With some countries we share information and conduct joint projects; with others, we conduct or participate in workshops and conferences; and with others we provide technical assistance and training in support of U.S. foreign policy.

We have a cooperative relationship with Canada to share information on issues such as oil spill response and research and the impact of seismic exploration on fisheries and with Mexico on the integrity of pipelines and on underwater welding for repair of offshore facilities.

We're also working with Mexico on a joint oil spill response drill which will be conducted in May 2002. The drill is an effort to identify potential problems with a U.S./Mexican response to an oil spill.

With Brazil, we share concerns about safety and environmental issues in deep-water and exchange information on deep-water technology, well abandonment, regulatory roles, and other important issues.

We meet regularly with Norway, Australia, Canada and the UK as members of the International Regulators Forum (IRF) and with Norway and Canada on the Arctic Council which addresses environmental issues of concern to Arctic nations.

The MMS had an opportunity to send one of our employees to Australia for six months to work with the Department of Industry, Science, and Resources to initiate an international program that measures the safety and environmental performance of the offshore oil and gas industry.

Since the last ICRARD meeting we participated in several interesting workshops and conferences including the first INTERSPILL Conference on oil spill research which was held in the UK. We were also present to observe the “Deep Spill” experiments in Norway.

In China, the MMS participates on the China/U.S. Oil and Gas Industry Forum. At the September 2000 Forum meeting, MMS and the National Ocean Industries Association conducted a simulated lease sale. It was an exercise where participants evaluated and formulated bids for the rights to explore for oil and gas under the requirements of U.S. offshore leasing regulations. It was valuable in illustrating the principles that apply to the U.S. conveyance of oil and gas rights offshore.

Also in China in October 2000, MMS conducted an Asia Pacific Economic Cooperation (APEC)-sponsored workshop in Beijing on assessing and maintaining the integrity of offshore oil and gas facilities (including pipelines, FPSO’s and fixed platforms).

We are currently discussing a possible follow up APEC workshop that would focus on oil spill response. It would be held somewhere in the Asia Pacific area perhaps in the next year.

We continue to work with the Chinese Ministry of Land and Resources on issues of common concern relating to minerals management. A delegation from the Ministry attended a lease sale in the Gulf of Mexico in March.

Also in March 2002, we participated in an energy seminar in the Philippines to share information on the best practices for natural gas regulation in the United States. The Philippine government is in the process of establishing a regulatory regime for managing its gas resources.

In mid April, we will join the Department of Energy in a conference in New Delhi, India, on Building Natural Gas Markets in India. The MMS will discuss upstream oil and natural gas regulation.

Regarding our technical assistance efforts, we conducted workshops in Russia on the U.S. regulatory program for offshore oil and gas development and on environmental management.

Since 1998 we have been working in the Caspian area under the USAID-funded Caspian Partnership for Regulatory Cooperation. In Turkmenistan, we conducted a series of workshops on developing a regulatory regime and on implementing the recently promulgated oil and gas regulations.

In Kazakhstan, we participated in a seminar on the air emissions permitting process and, in the coming months, will conduct training on MMS' approach to resource evaluation and its relations to assuring fair market return on oil and gas resources.

In Georgia, we participated in a workshop on legal and legislative issues associated with implementing national and regional oil spill response systems.

And, finally, in Bangladesh MMS provided technical assistance on the role of a regulatory agency to assist the government in restructuring the mineral development responsibilities of its Ministry of Energy and the national oil company Petrobangla.

That’s an overview of some of the international work we are doing at MMS.

I invite you to visit our web site at www.mms.gov. Click on Offshore Program, then International Activities.

If you have questions, you can send me an e-mail at mary.ann.milosavich@mms.gov.

Thank you

Appendix G-6

United States
Mr. Jim Magill

ICRARD MEETING
Houston, Texas
April 12, 2002

Jim Magill
United States Coast Guard
Washington DC

USCG OFFSHORE ACTIVITIES

- Maritime Security
- MMS/USCG Fixed Platform Inspection
- CG Crew Endurance Management Program
- FPSOs in the G. O. M.
- Liftboats – NOSAC Subcommittee
- LNG Terminals
- Polyester Moorings for FPSs & MODUs

Maritime Security

IMO Code for Security of Ships, MODUs Fixed & Floating Platforms

(CG position papers for MSC /75)

- **Vessels**
- **Port Facilities to include Fixed & Floating Platforms and MODUs while on location**

(CG Domestic Regulations)

- **Will generally follow IMO Code**

MMS/USCG Fixed Platform Inspection Program

- **MMS & CG share safety for 3,600 OCS fixed platforms**
- **CG uses Self-inspection program with unannounced inspections for CG area**
- **New rulemaking will give MMS authority to perform CG spot checks**

USCG Crew Endurance Management (CEM)Program

- **Developed by CG team from HQTRS & R&D center**
- **Non-regulatory approach**
- **Improves mariner alertness & reduces fatigue thru good CEM management**
- **Conducting Crew Alertness Campaign which supports/trains industry**
- **CG engaged in working these issues at IMO**

FPSOs in the GOM

None yet, but industry has "green light"

MMS Record of Decision (12/31/01):

- Applies to GOM Central/Western Planning Areas
- <u>Finding</u>: FPSOs don't pose any greater threat than current development & production systems
- MMS will evaluate FPSO proposals case-by-case
- USCG revising Offshore Activities Regs (Sub N)

FPSO in operation

Liftboats – NOSAC Subcommittee

- **Lost two new large liftboats within last two years - no casualties**
- **Structural leg failures and operational issues**
- **Setting up a NOSAC subcommittee to partner with industry to address operational issues**
- **May also use SNAME and RINA**

LNG Deepwater Ports

- **Currently Legislation in Congress that would revise the Deepwater Ports Act to include gas as well as oil**
- **May necessitate the revision of the Deepwater Ports regulations to include LNG**

Polyester Moorings for FPSs & MODUs

- **CG just received first submittal of an FPS using poleyster mooring**
- **MMS/USCG combined review**
- **MMS conducting R & D programs on polyester mooring**

More Info ?

General Policy Questions:

- Commandant (USCG HQ)
  - Mr. Jim Magill
  - (202) 267-1082
  - email: JMagill@comdt.uscg.mil
- USCG 8th District (New Orleans)
  - Lieutenant Commander John Cushing
  - (504) 589-6260
  - email: JCushing@d8.uscg.mil

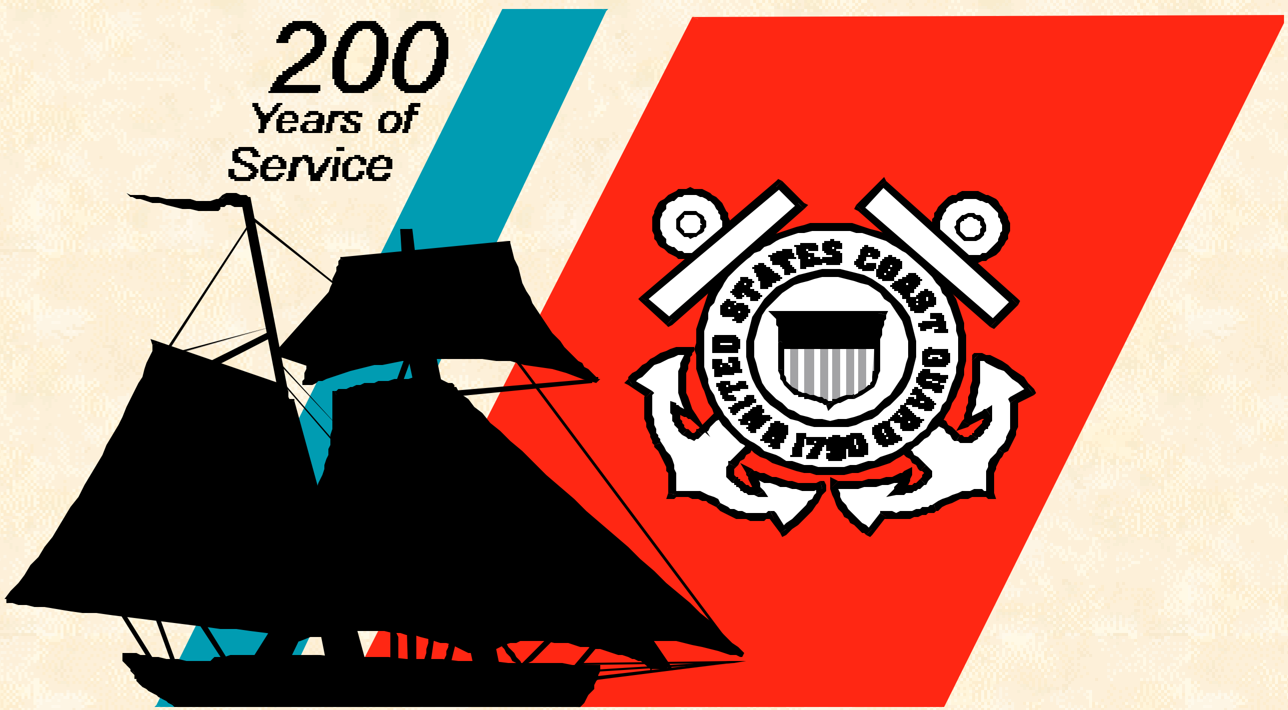
More Info ?

Technical (design) Questions:

Marine Safety Center (Washington, D.C.)

- Engineering Division
- (202) 366-6440
- email: msc-ehead@msc.uscg.mil

Coast Guard Headquarters
Washington DC



Appendix G-7

United States
Dr. Betty Felber

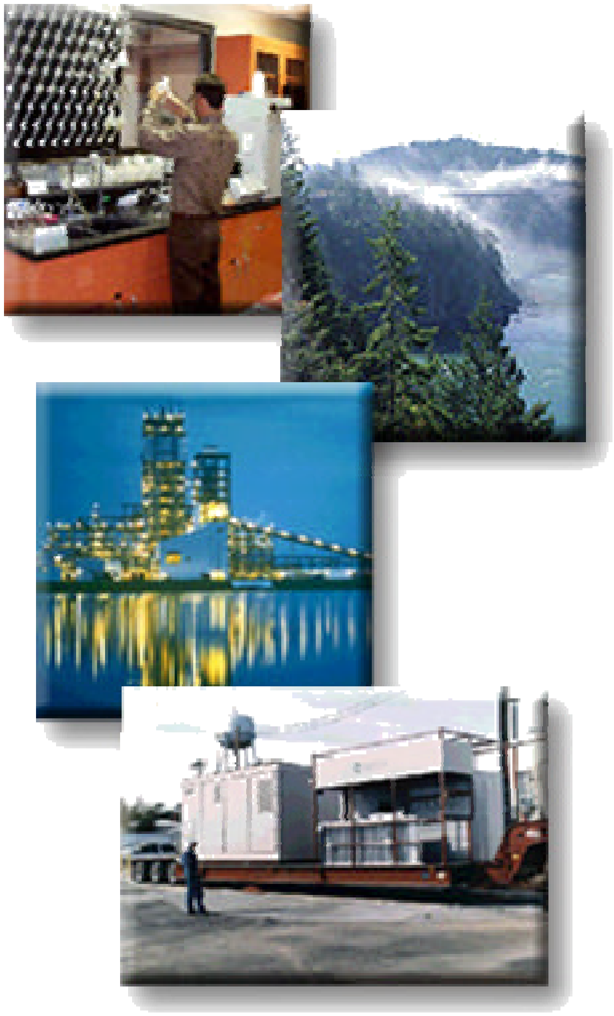
National Energy Technology Laboratory

DOE Initiatives in Offshore Technology Development

April 12, 2002

Betty Felber, Senior Scientist
National Petroleum Technology Office

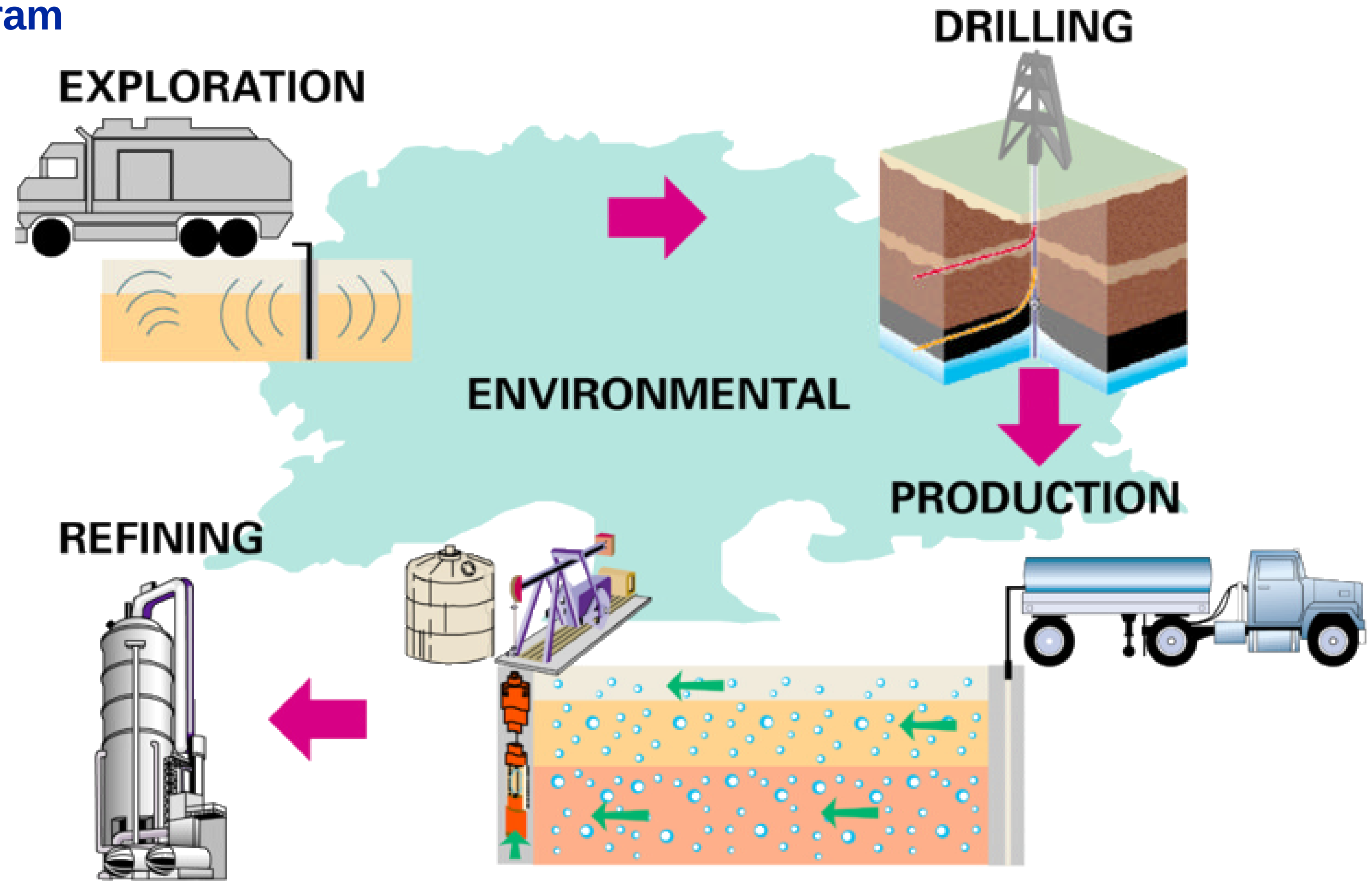
What We Are



- One of DOE's 15 National Laboratories
- Government Owned and Operated
- Sites in Oklahoma, Pennsylvania, West Virginia
- 1150 Federal and Support Contractor Employees

National
Petroleum
Technology
Program

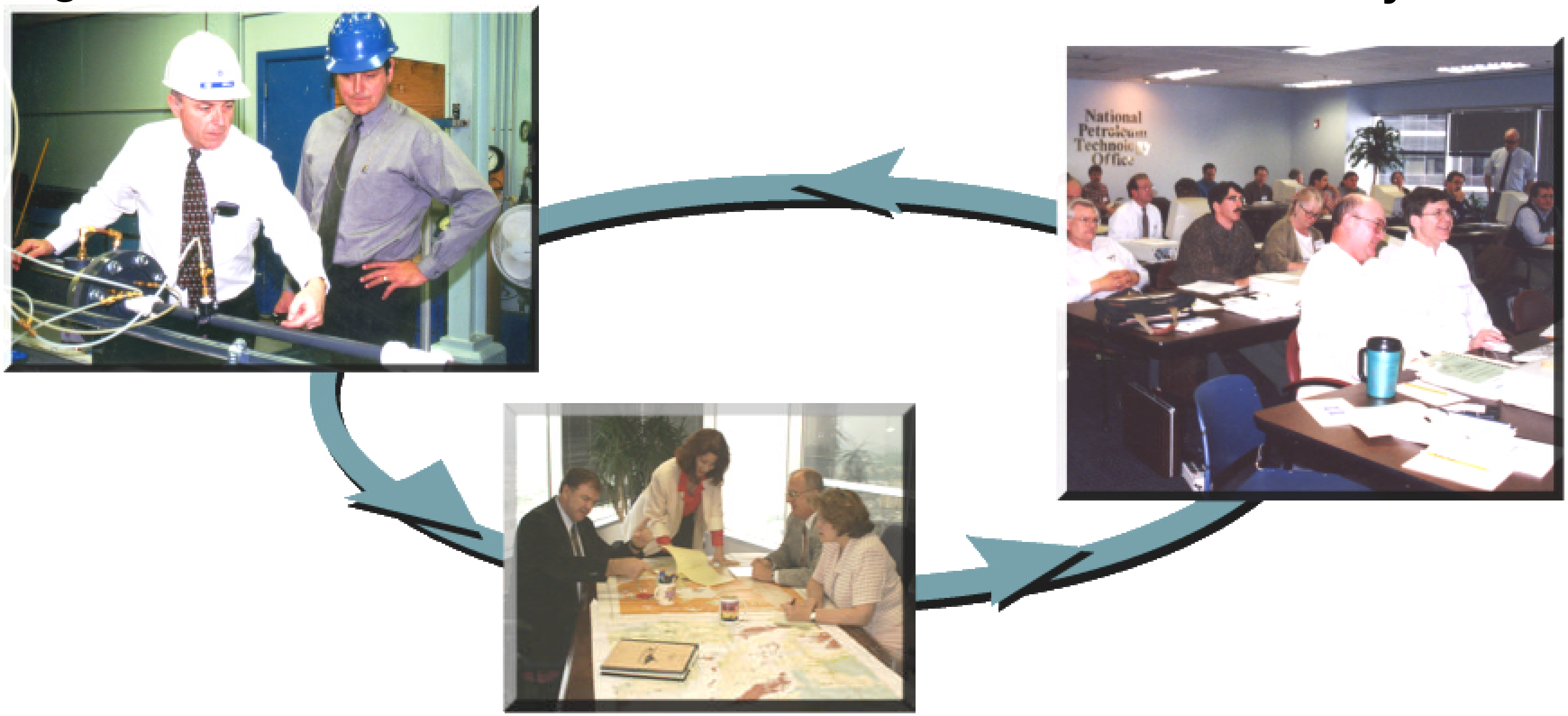
Oil and Gas Program Areas



Partnerships Leverage Scarce R&D Funds

National Lab, Other Agencies & Universities

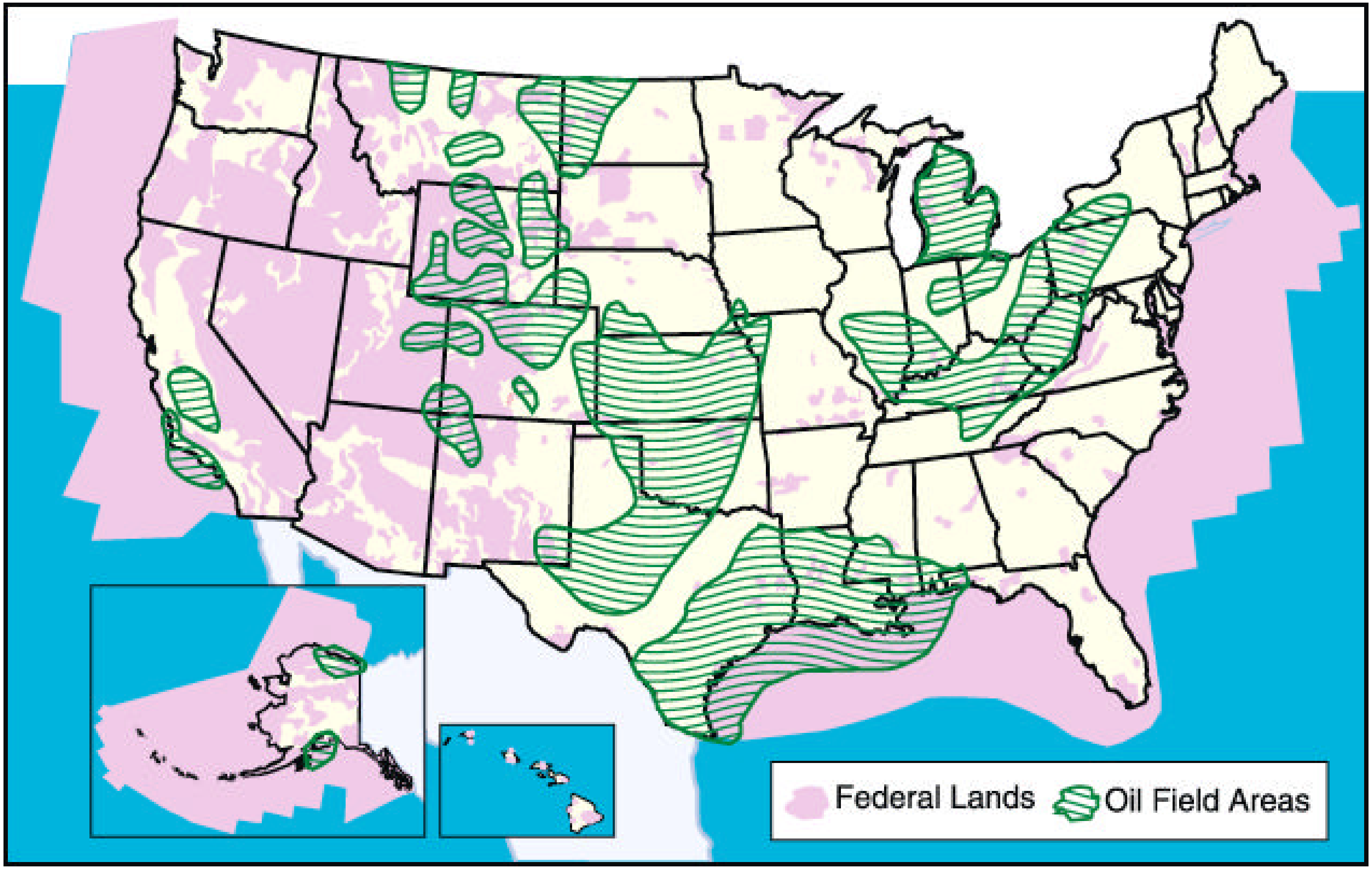
Industry



National Petroleum Technology Program

✓ **Working with industry and academia to enhance oil technology development.**

Federal Lands Produce One-Fifth of America's Oil



Status Ultra-deep Water

Ultra-deep Water Technology Development Program Areas

- **High Intensity Design**
- **Accelerated Reservoir Exploitation**
- **Rigs/Reach/Riserless**
- **Energy to Market**
- **Environmental Management**

Ultra-deep Water Technology Program Status

Follow-up Meeting Held on May 4, 2001.

Voted on Five Major Areas.

Results Are

- **Energy to Market**

- **Rigs/Reach/Riserless**

Partners—210 Companies and Organizations, DOE, and MMS.

Policy Studies

Produced Water Discharge Study—Shallow and Deep

Shallow Water Marginal Properties

LNG Import/Export

Status of Work

- Partners—API, NOIA, EPA, MMS, DOE.
- API Reviewed Submitted Proposed Disposal Cost Structure.
- Updated GIS GOM Database. Includes Production, Re-completions Since January 2000, New Wells Drilled and the Like.
- Partners Must Agree to Proposed Model Run Parameters, Modeling Can Begin. Expect to Complete Analysis by End of Calendar Year 2002.

The Offshore Shallow Water Study

- **Scope:**
  - Federal Offshore
  - Gulf of Mexico
  - Oil & Gas Properties
  - Water Depth Less Than 200 Meters

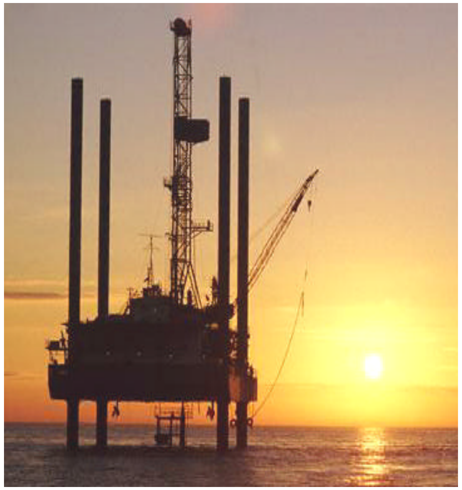
- **Objective:**
  - Evaluate Alternative Royalty Programs To Extend Marginal Properties Economic Life

End Product

- **“Marginal Properties” Definition:**
  - BOE (or MCFE) Per Lease
  - Function of Readily Available Information
  - Example; Oil & Gas Prices, Water Depth, No. of Wells, etc.

- **Economic Analysis of Royalty Relief Impact:**
  - Measure Benefit: Increase Production, Delay Abandonment
  - Measure Cost: Foregone Royalty Payments to Treasury
  - Evaluate Cost vs. Benefit

Project Status



- **Study Completed June 2001**
- **Data Compilation**
  - Model Development
  - All Analysis
- **Entire Methodology & Rationale Examined by Industry Peer Review Committee**
- **DOE Published Final Report September 2001**

Definition of Marginal Lease

- **IF GOR < 5,000 Scf/Bbl**

  MBOE = *b1* * (1/OP) * (WC) + *b2* * (TD) + *b3* * (WD) * (CC)

- **IF GOR $\geq$ 5,000 Scf/Bbl**

  MMCFE = *b1* * (1/GP) * (WC) + *b2* * (TD) + *b3* * (WD) * (CC)

Constants	Oil (GOR < 5,000)			Gas (GOR $\geq$ 5,000)		
	1.00*	1.05*	1.10*	1.00*	1.05*	1.10*
b1	1008.8	1070.7	1124.2	1228.4	1279.2	1338.6
b2	0.00359	0.00357	0.00355	0.00905	0.00922	0.00975
b3	0.933	0.889	0.930	4.729	5.059	5.061
R^2 **	0.949	0.949	0.947	0.938	0.938	0.938`

* Rev/Cost
** R^2 - Test of Statistical Correlation

Summary Shallow Water Study

- Simple Correlations Developed to Define Marginal Leases in Gulf of Mexico (< 200 Meters)
- Statistical Correlations Have Some Impact in Overall Cost and Benefit of Incentive
- Targeted Royalty Relief Yields Additional Production of up to 1.7 TCFE or 309 MMBOE
- Cost or Gain to Treasury Depends Very Strongly on Extent of Royalty Relief Implementation Criteria

LNG in the U. S. Study

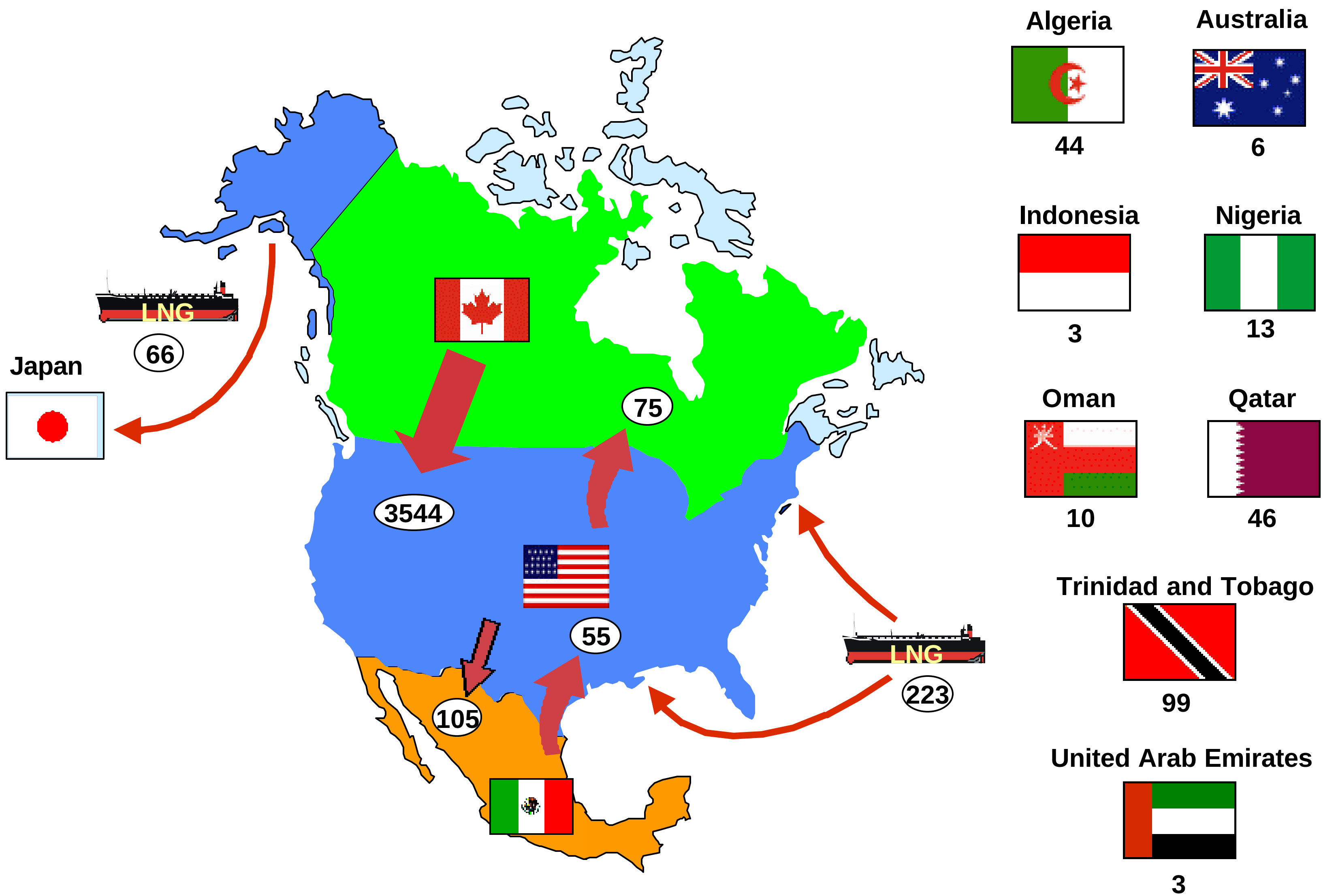
Partners:

- FERC, DOE - Security and Operations, DOC, NOAA, USGS

Focus:

- U.S. Natural Gas Imports and Exports
- LNG Marine Transport Issues
- LNG's Role in the U.S. Market
- Projections of Market Growth

2000 Natural Gas Imports & Exports, (Bcf)



LNG in the U. S. Study

LNG in the U. S. Study Results

- Importing LNG Key Element in U. S. Energy Supply
- Assessing Hazards
  - Manageable Per Testing and Lloyd's Report
- Assessing Risk
  - Scenarios Do Not Produce Results Outside of Those When Siting Facilities
- Assessing Security
  - U. S. Coast Guard Addressed

Technology Development

Topic Areas of Offshore Research

- MOU with MMS
- Composites for Offshore
  - –Drill Pipe
  - –Mooring Ropes
- Deepwater Production System Development
- Deep Reservoirs >15,000’—On and Offshore
- Drilling, Completion and Stimulation
  - –Synthetic Muds—MMS
  - –Cuttings Transport
  - –Compact Separators

Topic Areas of Offshore Research

- Reservoir Characterization
  - Subsalt Imaging
  - Fault Identification
- Water Treatment
  - New Catalyst Development
  - Science-based Policy Recommendations
- Carbon Sequestration
- Safety—Department of Transportation
- Sea Floor Stability

Fire in the Ice
Methane Hydrates

- Program Elements
  - Resource Characterization
  - Safety & Seafloor Stability
  - Global Climate Change
  - Production

New Program Areas for FY2002

- Deep Trek
- Gulf of Mexico
- PRIME
- Advanced Technology Development With Independents


Any
Questions??
www.npto.doe.gov

Appendix G-8

United States
Dr. Skip Ward

Offshore Technology Research Center

A World Leader in Offshore Technology, Research,
Education and Testing

Offshore Technology Research Center

About The OTRC

The Offshore Technology Research Center (OTRC) is a graduated National Science Foundation (NSF) Engineering Research Center supporting the offshore oil and gas industry. It is jointly operated by Texas A&M University and the University of Texas at Austin.

Established in 1988 with funding from the NSF and industry, the Center was created to conduct basic engineering research and develop systems for the economical and reliable recovery of hydrocarbons and other energy sources at ocean depths of 3,000 feet or more. During its first decade, the OTRC achieved a leadership role in cutting-edge research on critical elements of the deepwater production problem. The OTRC has approximately 26 investigators in several departments at the two campuses, performing interdisciplinary research in five principal areas: Floating Structures, Risers and Moorings, Materials, Seafloor Engineering, and Subsea Systems.

In the past few years, gas and petroleum reserves under ultra-deep water (6,000 to 10,000 feet) on the continental slopes of the Gulf of Mexico have been demonstrated to be of enormous economic and strategic significance to the United States. The OTRC is playing a pivotal role in the development of these reserves and is continually seeking to expand its wave tank capabilities to accommodate testing for greater depths.

The wave tank, or model basin, is the most prominent symbol of the OTRC. Researchers use the tank to develop high-quality data sets against which sponsors can validate their models. A three-dimensional wave maker along with wind and current generators simulate the conditions facing deepwater structures. The facility has tested models of structures ranging from Tension Leg Platforms and Spars to Remotely Operated Vehicles for the petroleum industry and an Assured Crew Return Vehicle designed by NASA for the international space station.

New technologies have contributed to the rising interest in exploration and development in the deepwater Gulf of Mexico. This interest is evidenced by the recent offshore natural gas and oil lease sales in the Western Gulf of Mexico.

Deepwater operations, however, are significantly different from conventional operations in more shallow waters of the continental shelf. As the industry moves into deeper water, new technical, safety and environmental challenges will arise. The OTRC has already demonstrated research strength in areas such as wave, current and wind loading on floating structures, application of high-performance composite materials to offshore structures and advanced techniques to explore and characterize the engineering properties of the largely unknown, deep seafloor of the Gulf of Mexico.

The Center now stands ready with the expertise to address the need for new and evolving technologies, larger and more complex facilities, modification of procedures and additional environmental protection issues.

Offshore Technology Research Center

OTRC MISSION

The OTRC's mission is to provide technology, expertise, and services needed for the development of drilling, production, and transportation systems that enable the safe and economically viable exploitation of hydrocarbon resources in deep and ultra-deep water.

The OTRC develops technology through a balanced program of basic and applied research projects that is focused in the following core technical areas:

- characterization of the ocean environment
- characterization of the seafloor environment
- environmental forces on structures and foundation systems,
- structural responses and integrity, and
- advanced composite materials.

The research program is balanced and optimized based on the interests and needs of OTRC's sponsors, and emphasizes areas of common interest that provide opportunities for leveraging resources. In executing this program the OTRC seeks to maximize sponsor interaction in order to enhance the effectiveness of the research.

The OTRC conducts the research through Principal Investigators that are primarily located at Texas A&M University and University of Texas. However OTRC reaches out to external organizations to access necessary skills as appropriate.

The OTRC is committed to effective technology transfer to sponsors and the global offshore community.

The OTRC develops expertise by participating in the recruitment and education of engineering students, and by providing opportunities for engineers to enhance their skills throughout their career. The OTRC promotes the development of Texas A&M University and University of Texas faculty and student expertise in offshore engineering topics through sponsored research projects and by facilitating interaction with industry. National and international collaborations through visiting scholars, industry fellows, and outreach programs are promoted as a means to enhance the research program. Interactions between students and sponsors are promoted in order to familiarize students with the industry and the sponsors' organization, and to enhance sponsors' familiarity of students as recruiting prospects. These interactions include internships, lectures, field trips, and participation in OTRC projects in the wave basin and other laboratories.

The OTRC offers a variety of services to the offshore industry. In particular, the OTRC

- maintains and operates a world-class wave basin and offers model testing services on a commercial basis to support concept development though final design validation,
- conducts or supports Joint Industry Projects to advance first-time or novel technology applications,
- provides continuing education courses in offshore engineering to help practicing engineers maintain or enhance their skills, and
- facilitates interactions between industry, government agencies, and academia to discuss important relationships between technology and regulations, define and assess technology needs, or transfer technology.

In addition the OTRC staff leverage their expertise by participating in various forums sponsored by industry, government, and standards organizations.

In fulfilling its core mission of providing technology, expertise and services, the OTRC's focus evolves with the needs and interests of its sponsors. Historically the OTRC has focused on technology to enable the development of the deepwater Gulf of Mexico. However the recent interest in ultra-deepwater (> 1500 m water depth), the increasing remoteness of new developments from existing infrastructure, and the continued globalization of the offshore industry has motivated OTRC sponsors to consider a larger variety of deep and ultra-deepwater systems and components. As sponsor interests evolve, the OTRC will continue to strengthen and advance its core technical areas through research programs that address the changing technology needs for systems and components that include:

- structures for floating drilling and/or production systems,
- risers, pipelines, flowlines, and umbilicals,
- permanent and temporary stationkeeping systems,
- hydrocarbon offloading and storage systems, and
- subsea well and production systems.

The OTRC is focused on technology needed for deployment of such systems and components in the ultra-deepwater Gulf of Mexico. However as the Gulf of Mexico environment has many similarities with other harsh and remote deepwater regions of the world, it is recognized that technology developed by the OTRC has broad applications worldwide.

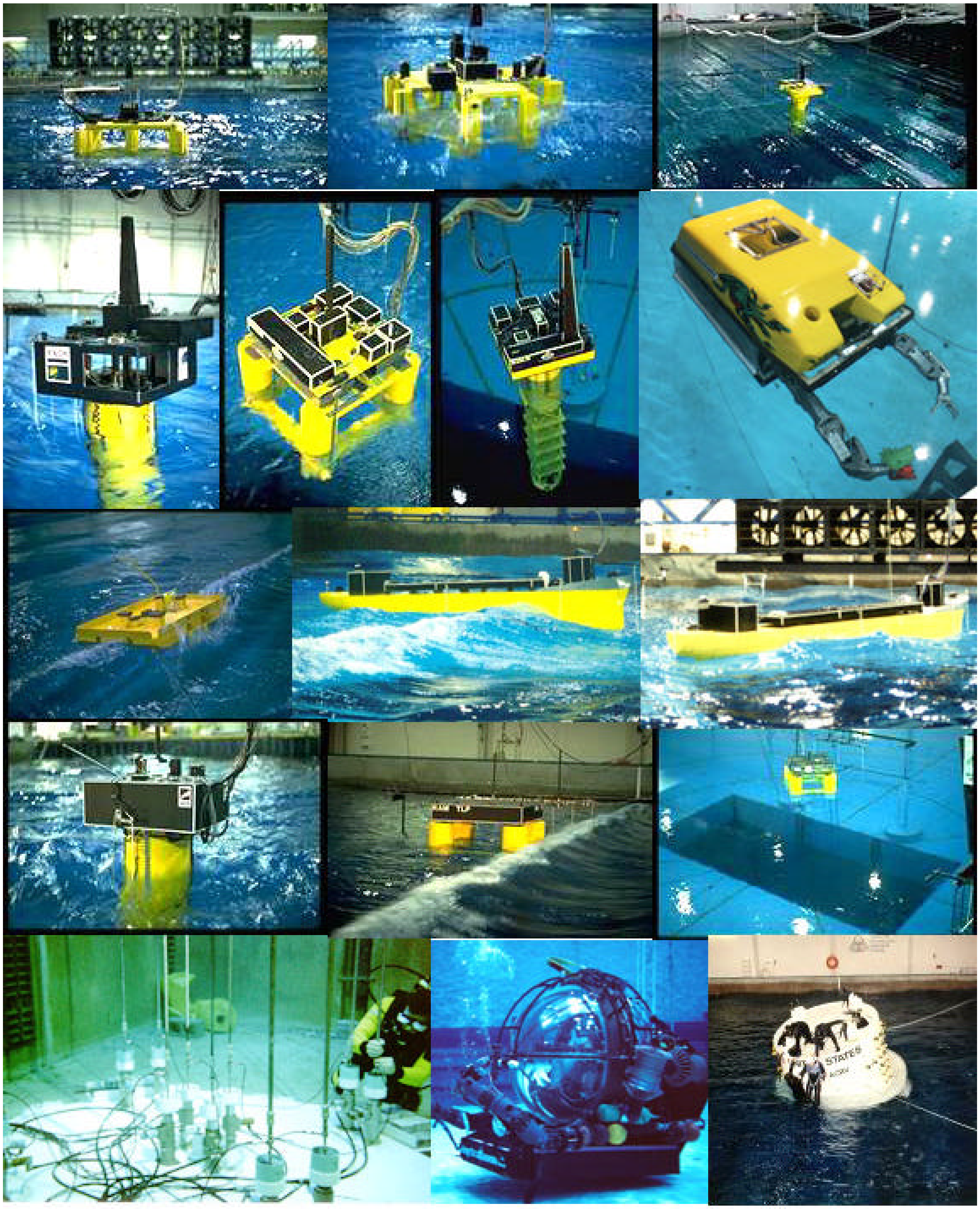
Offshore Technology Research Center

The OTRC operates a unique model basin at its headquarters in College Station that has enabled OTRC to become a world leader for offshore technology, education, research, and testing. The wave basin has played a vital role in suppo of OTRC's endeavor to help U.S. oil producers reach new depths in the Gulf of Mexico's deepwater frontier. Most of the deepwater structures planned or installe in the Gulf of Mexico have been tested in the OTRC model wave basin.

The OTRC model basin is capable of large scale simulations of the effects of win waves, and currents on fixed, floating and moored floating structures.

The wave basin is 150 ft long and 100 ft wide, with a depth of 19 ft. The pit locate in the center of the basin has a depth of 55 ft. With 48 individual controlled paddles, the wavemaker can generate a variety of wave conditions, including unidirectional and multidirectional regular and irregular (random) waves. Sixteen dynamically controlled fans can generate prescribed gusty wind conditions from any direction. A modular current generation system consisting of banks of submerged jets can generate sheared current profiles from any direction. The data acquisition system can record up to 96 channels of information.

Experiment Pictures



Offshore Technology Research Center

Research

The OTRC is a joint venture of Texas' two leading research universities -- Texas A&M University and the University of Texas at Austin -- and a center of the Texas Engineering Experiment Station, a state research agency.

A focused, cross-disciplinary research program has been developed utilizing faculty from both universities and outreach to several other institutions outside of Texas. The five major research areas of current concern are:

- **Floating Structures**
- **Risers and Moorings**
- **Materials**
- **Seafloor Engineering**
- **Subsea Systems**
- **Other Projects**

Applied research programs sponsored by the industry consortia complement the basic research programs funded by the government and the offshore petroleum industry.

Please see our Technology Transfer page to view a complete listing of publications and technical reports written by OTRC researchers.

Click here for a listing of Researchers.

FLOATING STRUCTURES

Technological Challenge: Floating structures research continues to evolve to support the technical challenges posed by the economic and safe development of oil and gas reserves in ever-increasing water depths and at locations remote from existing infrastructure. Research projects are focusing on the design and operation of Tanker-Based FPSO's in the hurricane and loop current environments in the Gulf of Mexico. Research projects are also addressing the use of a Spar as an alternative FPSO, and the overall safety of deepwater production systems. Needs and the availability of field data to improve and validate analytical models used to predict the responses of deepwater structures and components (moorings, risers) are being assessed.

Ongoing Projects:

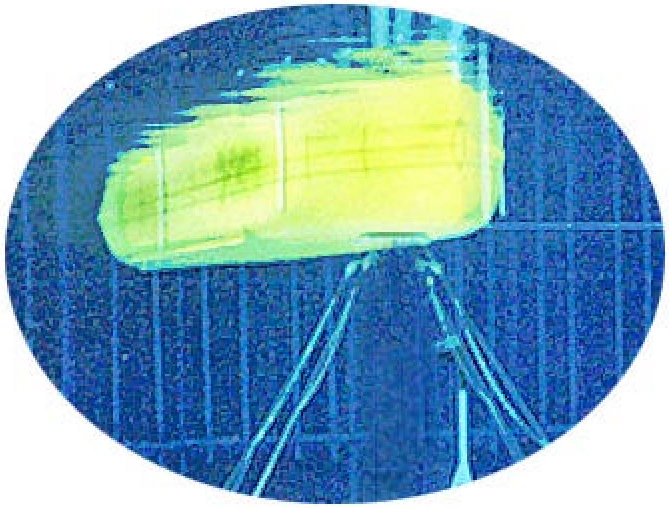
- FPSO and Shuttle Tanker Responses in Wave and Current Environments
- FPSO Global Response Analysis
- FPSO Responses in the Gulf of Mexico Environments
- FPSO Roll Motions
- Deepwater Field Measurements
- Comparative Risk Analysis of Spar-Based FPSO's
- Human Factors Workshop

Past Projects:

- Dynamic Analysis Tool for Moored Tanker-based FPSO's Including Large Yaw Motions
- Responses of a Tanker Based FPSO to Hurricanes in the Gulf of Mexico
- Qualification of Nonlinear Fluid/Structure Interactions via Higher-Order Statistics
- Predictions of Short-Crested Irregular Ocean Waves
- Nonlinear Dynamic Response of Spars
- Nonlinear Coupled Motion Analysis of Spar Platforms
- Reliability Analysis of Deep-Water Floating Structures
- Nonstationary Wave Spectra Analysis

New Projects:

- Greenwater Mitigation
- CFD Simulation of Ocean Turbulence Interactions With Spar Platforms
- Ocean Turbulence Loads and Effects On Offshore Structures



Risers and Moorings

Technological Challenge: Technical challenges for risers and moorings continue to grow with increasing water depth. Research projects are focused on improving analysis tools to predict the dynamics of mooring lines and risers, and to predict the forces and responses of risers experiencing vortex-induced vibrations due to strong currents (high Reynolds numbers). The reliability of the overall mooring/foundation system is being studied to provide additional insight for the separate designs of the mooring and foundation elements.

Past Research:

- Interactive Response Behavior of Tendon Groups
- Numerical Modeling of Vortex-Induced Vibration (VIV) Forces and Response of Flexible Offshore Structures
- Vortex Induced Vibration in Waves and Currents

Ongoing Projects:

- Numerical Prediction of the Nonlinear Hydrodynamic Forces and Responses of Flexible Offshore Structures (VIV)
- Deepwater Riser and Mooring Analysis
- Reliability of Mooring and Foundation System for Floating Production Systems
- Riser Interaction Model: A Combined T/F Domain Model

Materials

Technological Challenge: The use of high strength, light weight materials for deepwater systems can help decrease the costs of deepwater floating structures, and likely is necessary to enable the use of some floating structure concepts in ever-increasing depths. Current research is focused on the impact of installation and in-service damage to the serviceability of polyester mooring lines.

Ongoing Projects:

- Polyester Rope Analysis Tool
- Damaged Polyester Rope Large Scale Experiments

New Projects:

- Qualifying New Technologies for Deepwater Oil and Gas Development
- NDE Evaluation Methods for Inspecting Offshore Composite Structures

Past Projects:

- Interdisciplinary Design for Composite Coiled Tubulars
- Ultrasonic NDE of Spoolable Composite Tubulars
- Interdisciplinary Design for Composite Coiled Tubulars: Effects of Viscoelasticity
- Performance Evaluation of Containment Booms (MSRC & TGLO sponsorship)
- Offshore Oil Composite Drilling Riser
- Hybrid Composites: Similitude and Performance
- Finite Element Analysis of Composite Risers
- Structural Testing of Composite Tubes
- Analysis of Hybrid Joints for Composite Tubulars
- Effect of Seawater on Corrosion Fatigue Behavior of Filament Wound Tubes
- Time-Dependent and Nonlinear Effects in Composites for Deepwater Application
- Ultrasonic NDE of Offshore Structures with Curved Surfaces
- Acoustic Emission
- Corrosion Fatigue Behavior of Offshore Structural Materials Under Combined Hydrostatic and Axial Loading
- Fracture Mechanics Calculation of Elastomeric Components
- Homopolar Offshore Pipeline Welding Research Program (JIP)

SEAFLOOR ENGINEERING

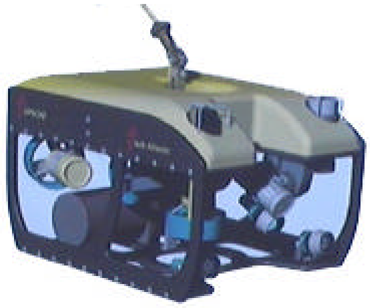
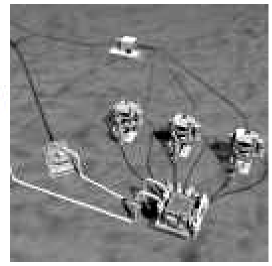
Technological Challenge: Research is focused on developing analytical models and experimental data to provide a reliable technology basis for designing suction caissons and vertically loaded anchors, which are attractive foundation concepts for deepwater structures. The characterization and variability of the seafloor properties important for foundation design are being studied to develop a reliability-based approach for foundation design and assessing geotechnical data needs. Development of a reliability-based method to predict slope stability is being initiated, and the impact of earthquakes on subsea production systems is being assessed.

Ongoing Projects:

- Suction Caisson and VLA Design Tools: Capacity and Installation
- Performance of Suction Caissons Used to Anchor Structures in Very Deep Water
- Seafloor Characterization for Deepwater Production Systems
- Seafloor Slope Stability Under Static & Seismic Loading Conditions
- Assessment of Seismic Risk for Subsea Production Systems in the Gulf of Mexico
- Suction Caissons: Finite Element Modeling
- Seafloor Characterization - Central and Eastern Gulf of Mexico

Past Projects:

- Deepwater Anchors
- Continental Slope Innovative Foundations - Geological Oceanography Support
- Deepwater Sediment Characterization
- Acoustic Characterization of the Seafloor
- Spatial Profiling of the Sub bottom with Interface Waves
- Spatial Profiling/Inference of Subsurface Conditions From Seafloor Observations
- Reliability of Foundations for Deep Water Facilities
- Innovative Foundations in Deepwater
- Electrokinetic Strengthening of Marine Sediments Around Foundations

Technological Challenge: Subsea wells and production systems are becoming increasingly important components of production systems with increasing water depths and the remoteness of development wells from production infrastructure. And the costs and difficulties in operating pipelines from subsea and floating production systems increases with depths. Research projects are focused on detecting leaks in single and multiphase pipelines, and completing an overall technical assessment of subsea production systems. In addition, as ROV/AUV technology evolves research will be conducted to assess the future capabilities of ROV/AUV use with subsea production systems.

Subsea Systems

New Projects:

- ROV/AUV Capabilities

Past Projects:

· Worldwide Assessment of Industry Leak Detection Capabilities for Single and Multiphase Pipelines

Ongoing Projects:

· Assessment of Subsea Production and Well Systems

Education

The OTRC develops expertise by participating in the recruitment and education of engineering students, and by providing opportunities for engineers to enhance their skills throughout their career. The OTRC promotes the development of Texas A&M University and University of Texas faculty and student expertise in offshore engineering topics through sponsored research projects and by facilitating interaction with industry. National and international collaborations through visiting scholars, industry fellows, and outreach programs are promoted as a means to enhance the research program. Interactions between students and sponsors are promoted in order to familiarize students with the industry and the sponsors' organization, and to enhance sponsors' familiarity of students as recruiting prospects. These interactions include internships, lectures, field trips, and participation in OTRC projects in the wave basin and other laboratories.

The following continuing education courses are offered on an annual basis.

· Design of Floating Production Systems

· Fundamentals of Offshore Structures and Design of Fixed Offshore Platforms

· OTRC Summer Institute on Offshore Field Development

· Introduction to Human Factors Engineering Short Course

Appendix G-9

Mexico
Ing. Oscar Valle Molina

Research and Technology

Oscar Valle Molina
Ernesto Heredia Zavoni

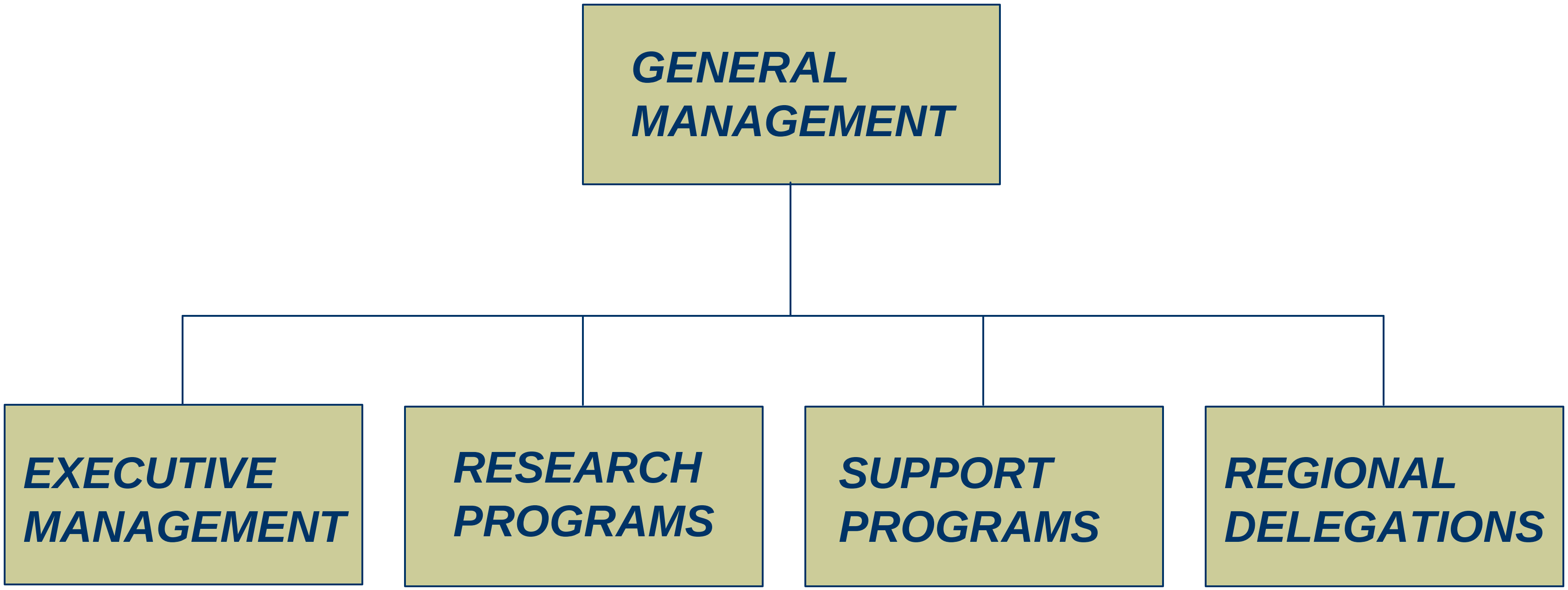
Instituto Mexicano del Petroleo

ICRARD Meeting
April 12, 2002

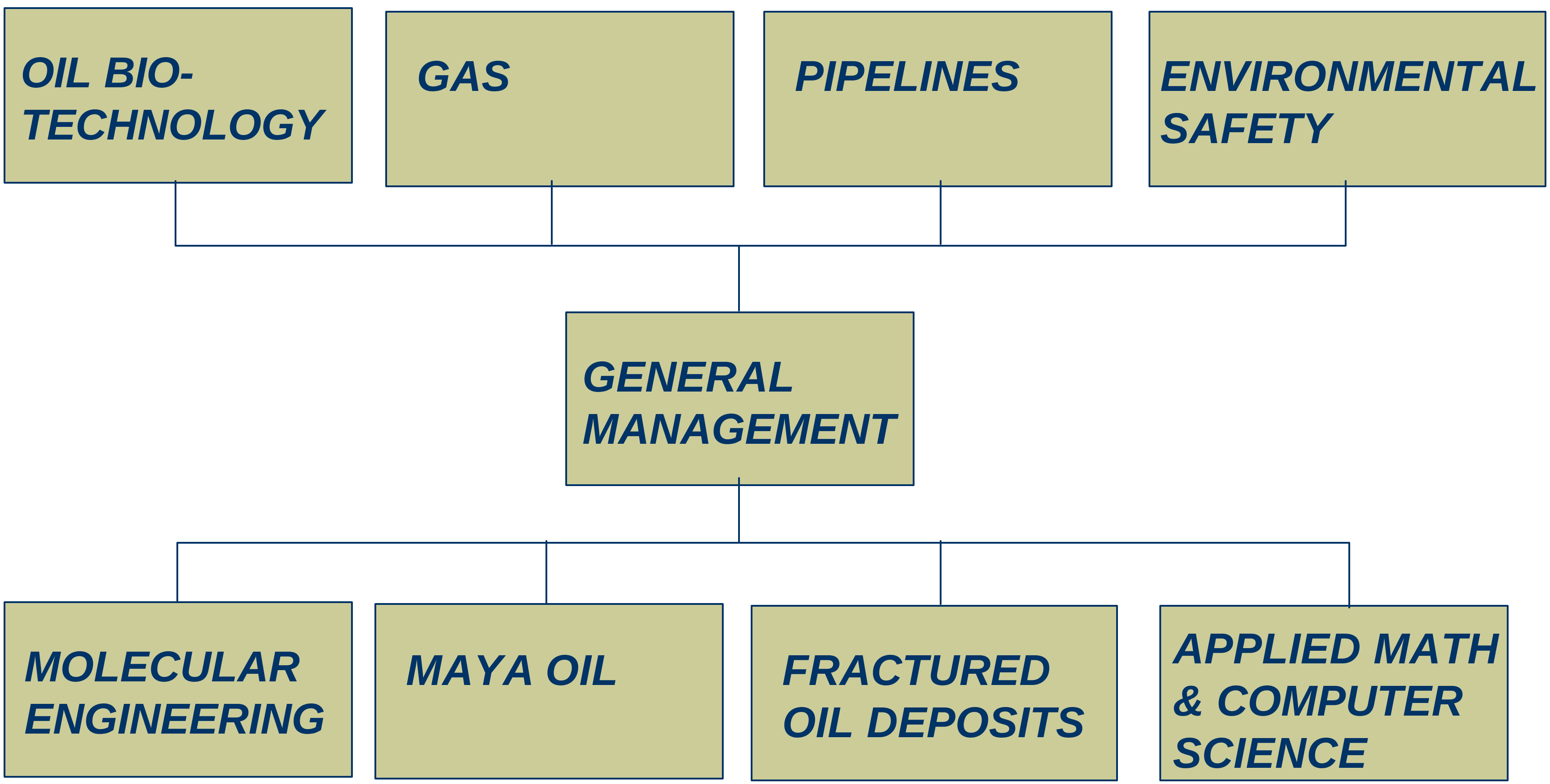
OUTLINE

- *New organizational structure at IMP*
- *Research programs at IMP*
- *Technology development and innovation*
- *Research and development in engineering*
- *Research and technology development program for exploration and production in deep waters*
- *Conclusions*

NEW ORGANIZATION AT IMP



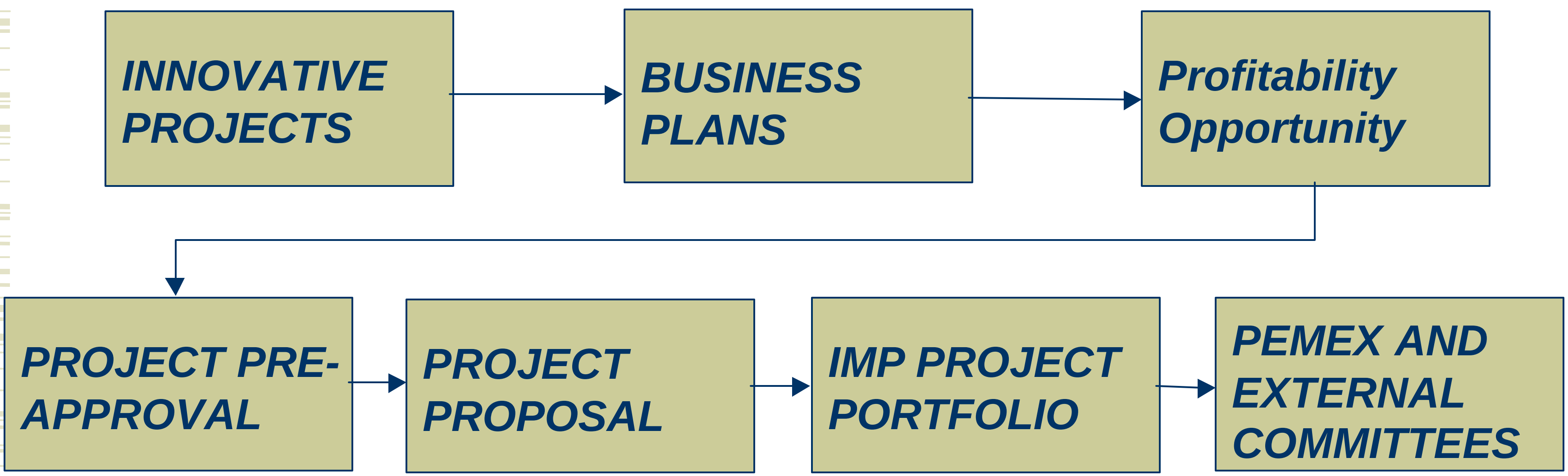
RESEARCH PROGRAMS



TECHNOLOGY DEVELOPMENT AND INNOVATION

Committee for Research and Development

- *Link between the research programs and the technology service divisions*
- *Promote that research results in new technologies and products consistent with the business plans of IMP*



RESEARCH AND DEVELOPMENT IN ENGINEERING

Risk and Reliability

- *Risk-based design and assessment codes for jacket platforms and submarine pipelines*
- *Reliability assessment of deck elevations for jacket platforms*
- *Bayesian methods for updating uncertainties in fatigue damage and models based on inspection results*
- *Wave attenuation due to soft sea bottom and reliability assessment*

RESEARCH AND DEVELOPMENT IN ENGINEERING

Inspection and Maintenance

- *Inspection criteria and methods for jacket platforms*

- *Extension of fatigue-life for marine structures*

- *Risk-based inspection planning*

RESEARCH AND DEVELOPMENT IN ENGINEERING

Deep Water Technology

Large Oil Prospects in Mexico in Deep Waters:

- *Potential oil production volumes from offshore fields*

  Water depths < 200m : 34%

  Water depths > 200m : 66%

- *4,000 millions of barrels discovered in 1998 in water depths > 900m*

RESEARCH AND DEVELOPMENT IN ENGINEERING

Deep Water Technology

Technology Transfer at IMP since 1984

Joint Industry Projects

- *Studies for technology feasibility of flexible tower (Fluor Daniel and C.G. Doris) and mini-TLP (IMODCO Inc)*
- *Studies on deep water technologies (University College London)*

Projects

- *Design of the Zazil-ha platform, water depths < 200m (Brown & Root)*
- *System selection for deep water fields in the Bay of Campeche(Intec)*
- *Design of early production systems for the Ayin field (Intec)*
- *Technology assessment (e.g. ROV´s)*

RESEARCH AND TECHNOLOGY DEVELOPMENT PROGRAM FOR EXPLORATION AND PRODUCTION IN DEEP WATERS

•*Established in February, 2002*

•*Objectives:*

- *To carry research and develop technology for an efficient exploitation of hydrocarbons in the deep water deposits of Mexico*

- *To be able to provide the industry with the required technological services for all of the activities related with hydrocarbons exploitation in deep waters, such as: exploration, production, engineering, management,operation, processing and transport*

RESEARCH AND TECHNOLOGY DEVELOPMENT PROGRAM FOR EXPLORATION AND PRODUCTION IN DEEP WATERS

IMP Committee of the R&D program for Deep Water

- *Created March 2002*
- *Multidisciplinary team of researchers and specialists*
- *Short term goal:*
  - *Design of a technology transfer plan consistent with PEMEX field development program in deep waters*
- *Long term goals:*
  - *Establishment of R&D programs for deep water exploration and production in Mexico*

CONCLUSIONS

- *IMP has designed a new organizational structure oriented towards:*
  - *Research programs on areas of strategic and economic interest for the Mexican oil industry*
  - *Technological services to the industry as a line of business*
  - *Innovation of technology through research to meet future industry needs by means of new technologies and products*

CONCLUSIONS

- *Main areas of progress in applied research and development in engineering have been:*
    - *Risk and reliability*
    - *Inspection and maintenance*

- *IMP has started to address future developments in deep waters*
    - *R&D program on exploration and production in deep waters*
    - *Initial phase: technology transfer*
    - *Long term: R&D for deep water technology*

Appendix G-10

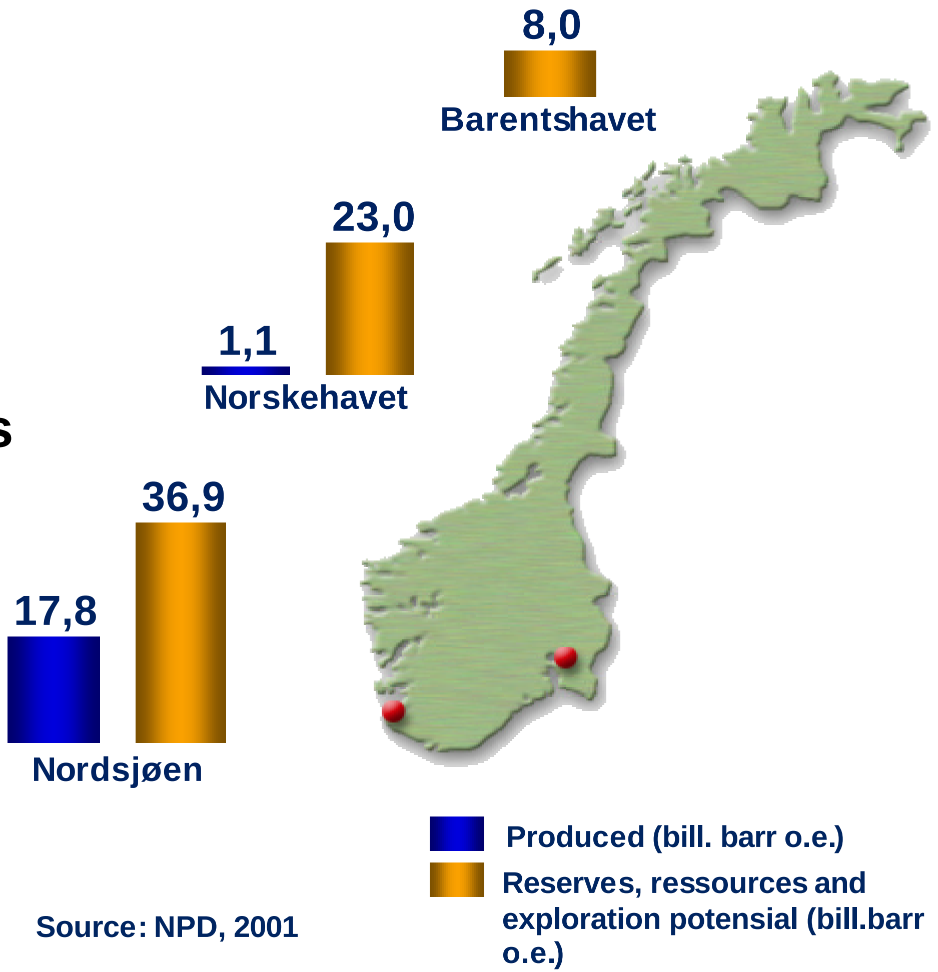
Norway
Mr. Oyvind Tuntland

Status and Future
of
Petroleum Research
in
Norway

Resources on the Norwegian shelf

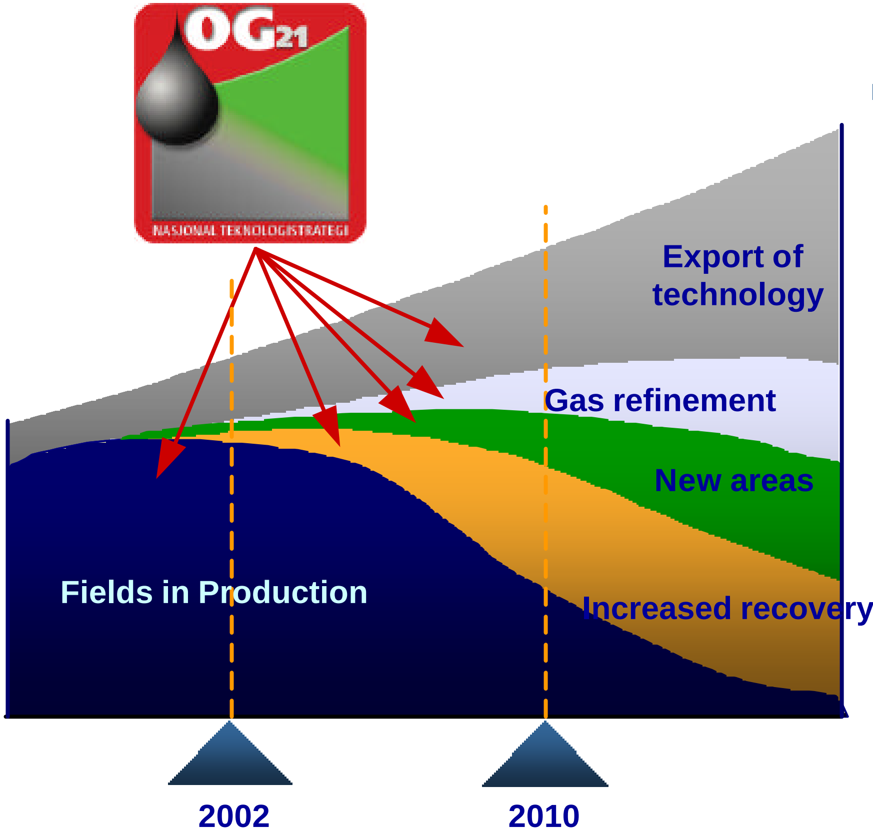
- Only 22% of the resources are produced
- Todays expected recovery rate is ca. 44%
- NPD's target is 50% recovery of oil and 75% gas

”This can only be achieved through a significant effort within research and technology development.”



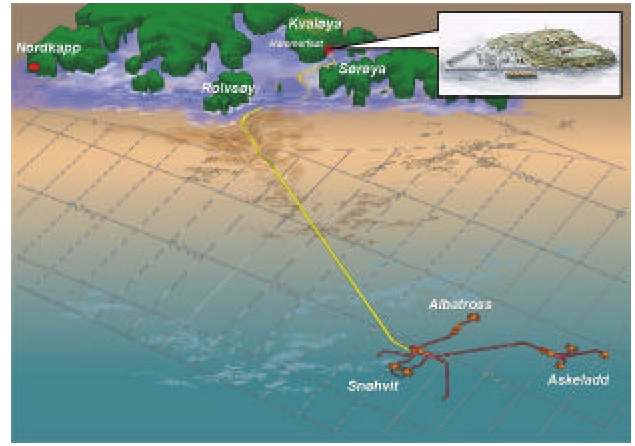
Source: NPD, 2001

National program for research and development within Oil & Gas



- The Petroleum industry may be the most important in the new century
- Norwegian petroleum industry is entering a new phase
  - ✓ mature shelf
  - ✓ increased environmental challenges/opportunities
  - ✓ more demanding developments
  - ✓ every barrel is more knowledge intensive
  - ✓ structural changes in the industry
  - ✓ internationalisation

Experiences from establishing Norway as an oil nation



Active governmental participation in R & D

- **Goodwill deals**
- **Large research programs**
- **User governed research**

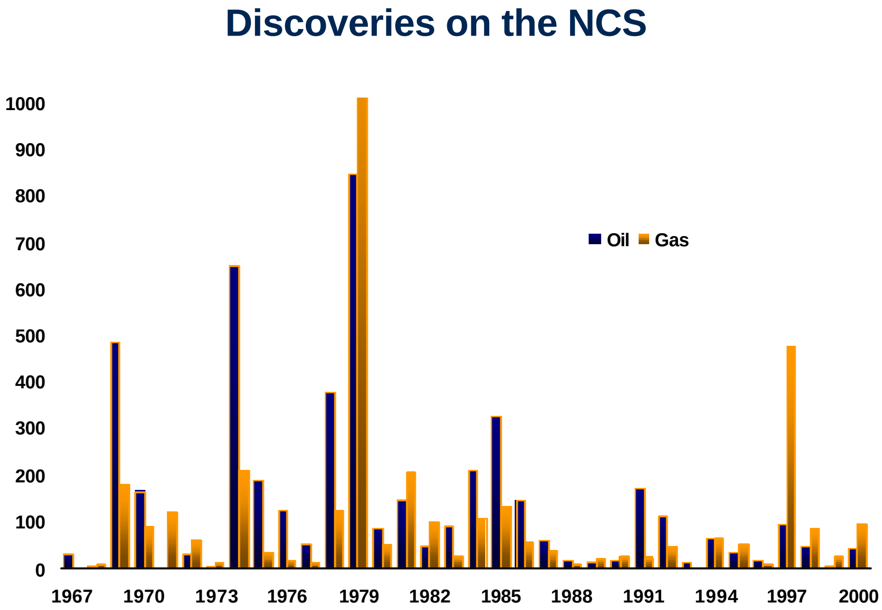
”Governmental funding has released capital from the industry and caused large added value.”

Changes and challenges – Norwegian shelf

- More demanding to make new discoveries
- Production from small fields
- Discoveries in deep water (+1000m)
- Increased recovery
- Larger share of gas
- Increased environmental challenges
- Cost and robustness versus lower oil price

”Results take time”

” The challenges are time critical!”



Changes and challenges - Environment

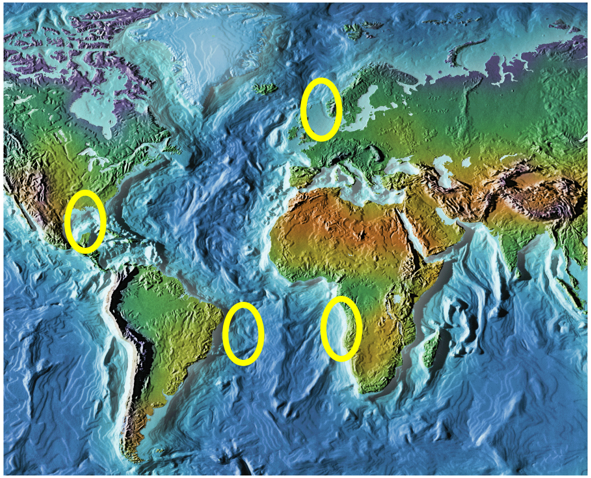
Increasing international focus

- International leadership within environmental issues creates export potential
- ✓ Subsea plants implies cleaner production
  - produced water
  - electric power from onshore
  - pipeline transport
- ✓ New energy effective production
- ✓ Sleipner CO_2-injection
- ✓ Snøhvit

Changes and challenges - internationalisation

The position of the petroleum cluster regarding technology and competence is vulnerable

- **The industry is global and ”transparent”**
  - **strong international competition**
  - **Norwegian service and oil companies base their international activity on Norwegian technology and competence**
  - **The Norwegian competence base is ”challenged”**
  - **The Deep water R&D front is moved outside Norway**

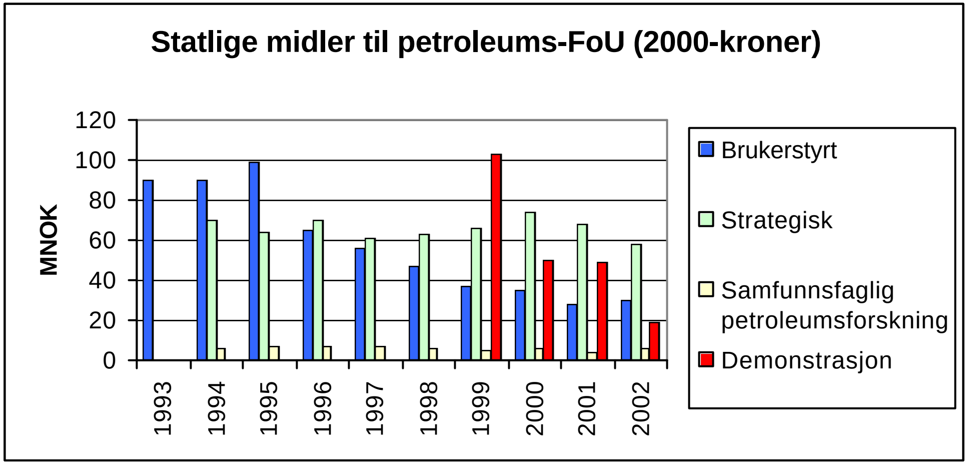


”We must make it attractive for the Norwegian petroleum industry to do research and technology development in Norway.”

The Government has an important role

- **Government must stimulate where it is necessary:**
  - **Longterm strategic research and education**
  - **Stimulate user driven R&D**

*



Kilde: Norges Forskningsråd

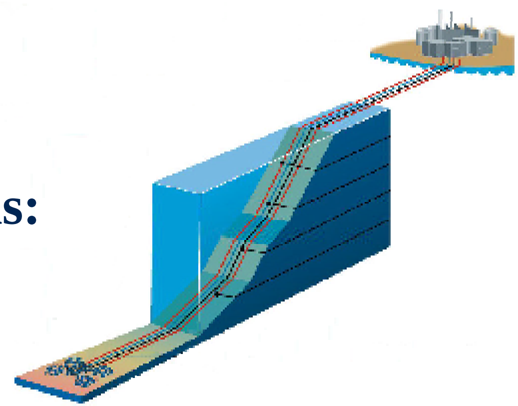
”Demo 2000 has been a great success”

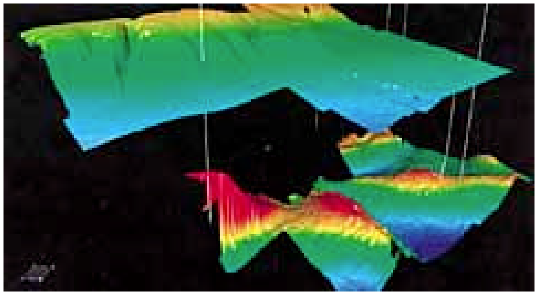
“R&D is decisive in maintaining the Norwegian competence base and for the competetiveness of the service industry.”

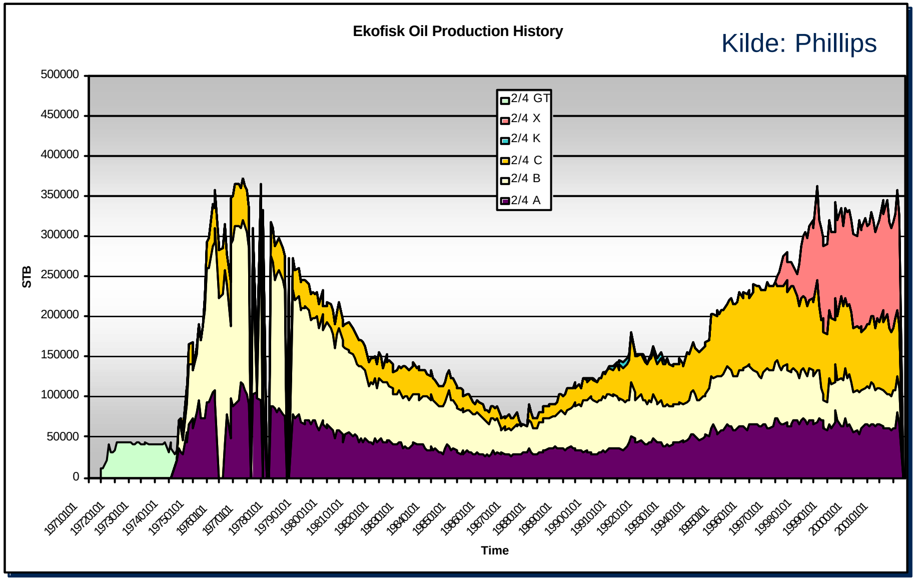
National action-plan

OG21 has defined five important focus areas:

- **Environment**
- **Increased recovery**
- **Deep water**
- **Small fields**
- **Gas value-chain**



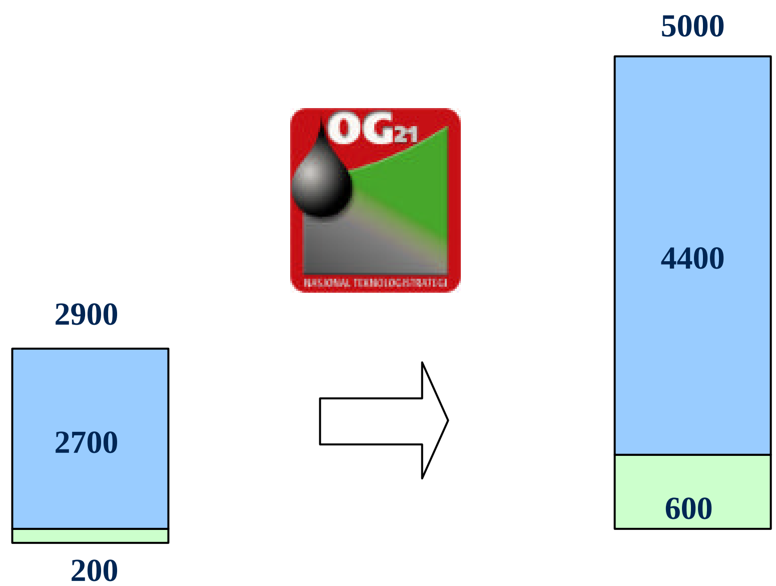




National action-plan

A national common effort in order to double the activity within petroleum research and technolgy development.

- **Longterm view**
- **1 MNOK from the government releases a minimum of 3-4 MNOK from the industry**
- **Securing a Norwegian competence base**
- **Secure value adding in Norway**



”Need a governmental step up to 600 MNOK next 2-3 years.”

OG21 National Technology strategi

Target	Process with Topplederforum (TF)
• Establish a doubled effort within petroleum R&D in Norway (5 mrd. NOK) • Establish a technology basis for increasing recovery to 57% (500 mrd. NOK) • Develop competence and technology which will enable increased export of technolgy worth 50 bill. NOK	• Develop and update a national strategy for petroleum R&D • Describe future challenges in Norwegian petroleum industry and the industry responsibility towards the society. • Show were Norwegian competence and technology is leading and facilitate further growth. • Describe and implement actions for relevant competence and recruitment. • Develop processes for implementation of the strategy

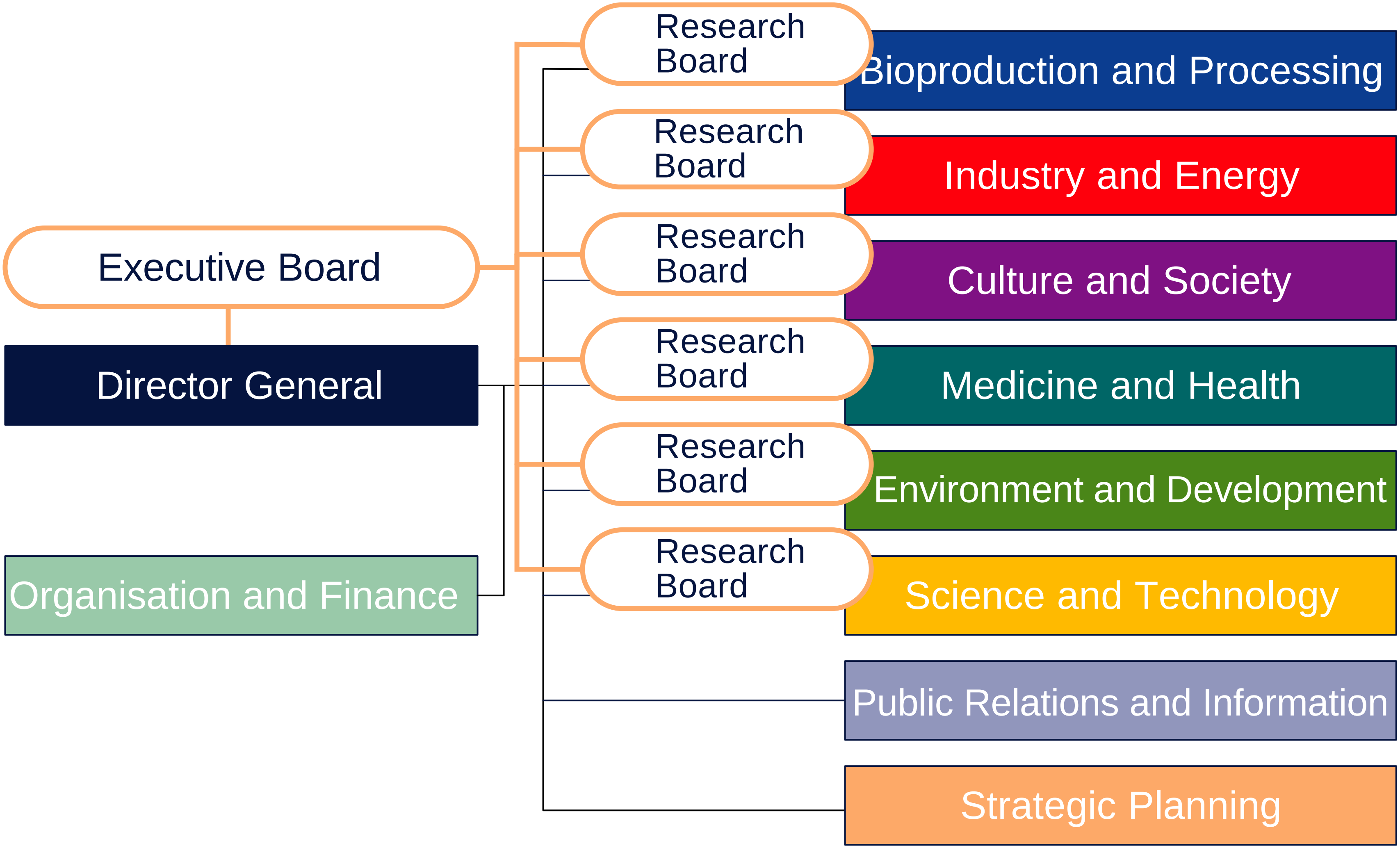
Stortingsmelding nr. 7 (2001 - 2002) Om helse, miljø og sikkerhet i petroleumsvirksomheten

HMS forskning i vid forstand og på ulike nivå med vekt på forebygging av alvorlige personskader og storulykker, herunder produksjon- og leveranseavbrudd.

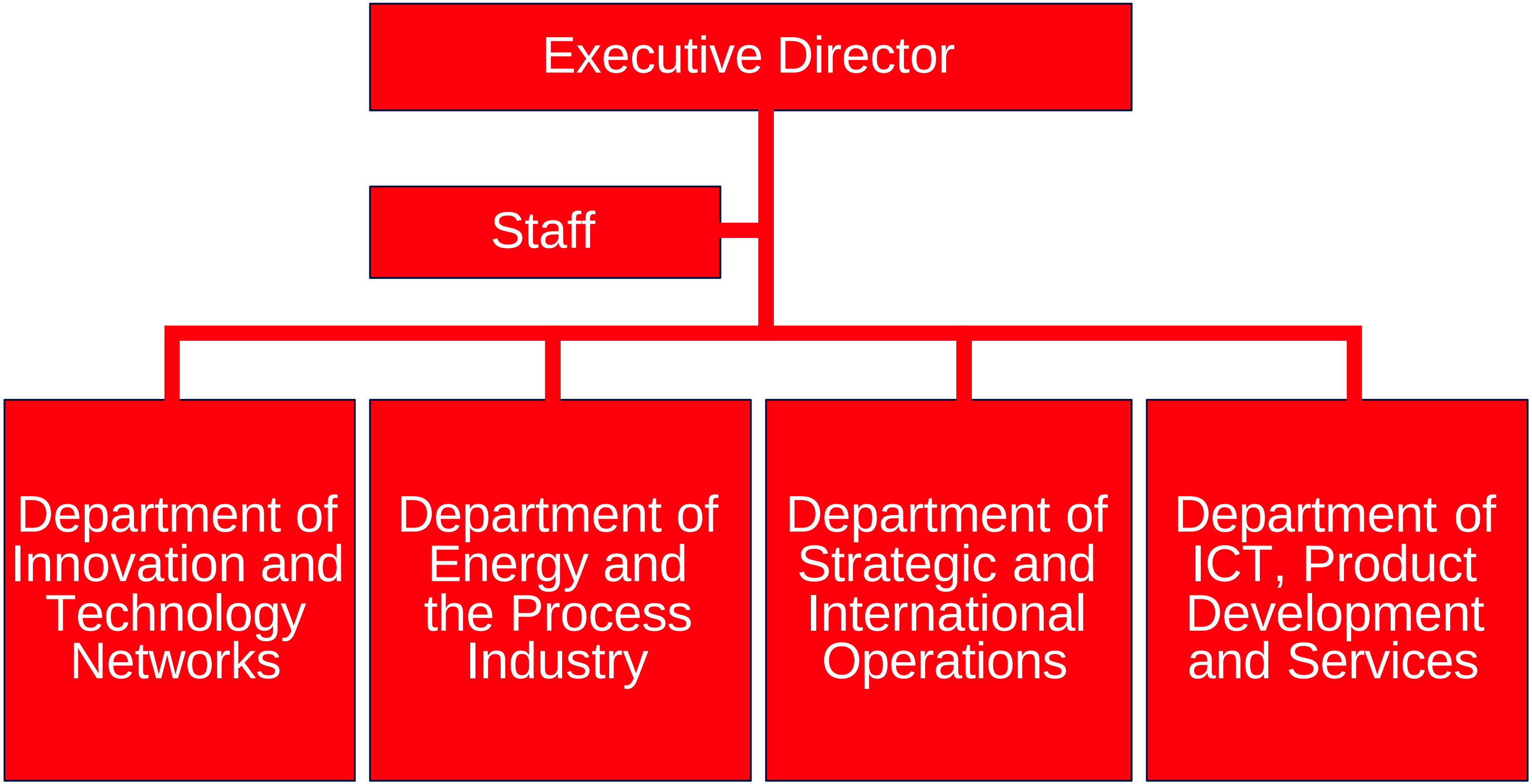
- Metoder og verktøy for å styre HMS arbeidet i dynamiske endring- og beslutningsprosesser
- Risikobasert styring av komplekse teknologiske og organisatoriske systemer
- Forvaltning av HMS-kompetanse og risikokommunikasjon
- Prosjekt for å identifisere målrettede tiltak for at FoU-resultatene tas i bruk

AAD har satt av 15 mill. kr til FoU i petroleumsnæringen pr. år.

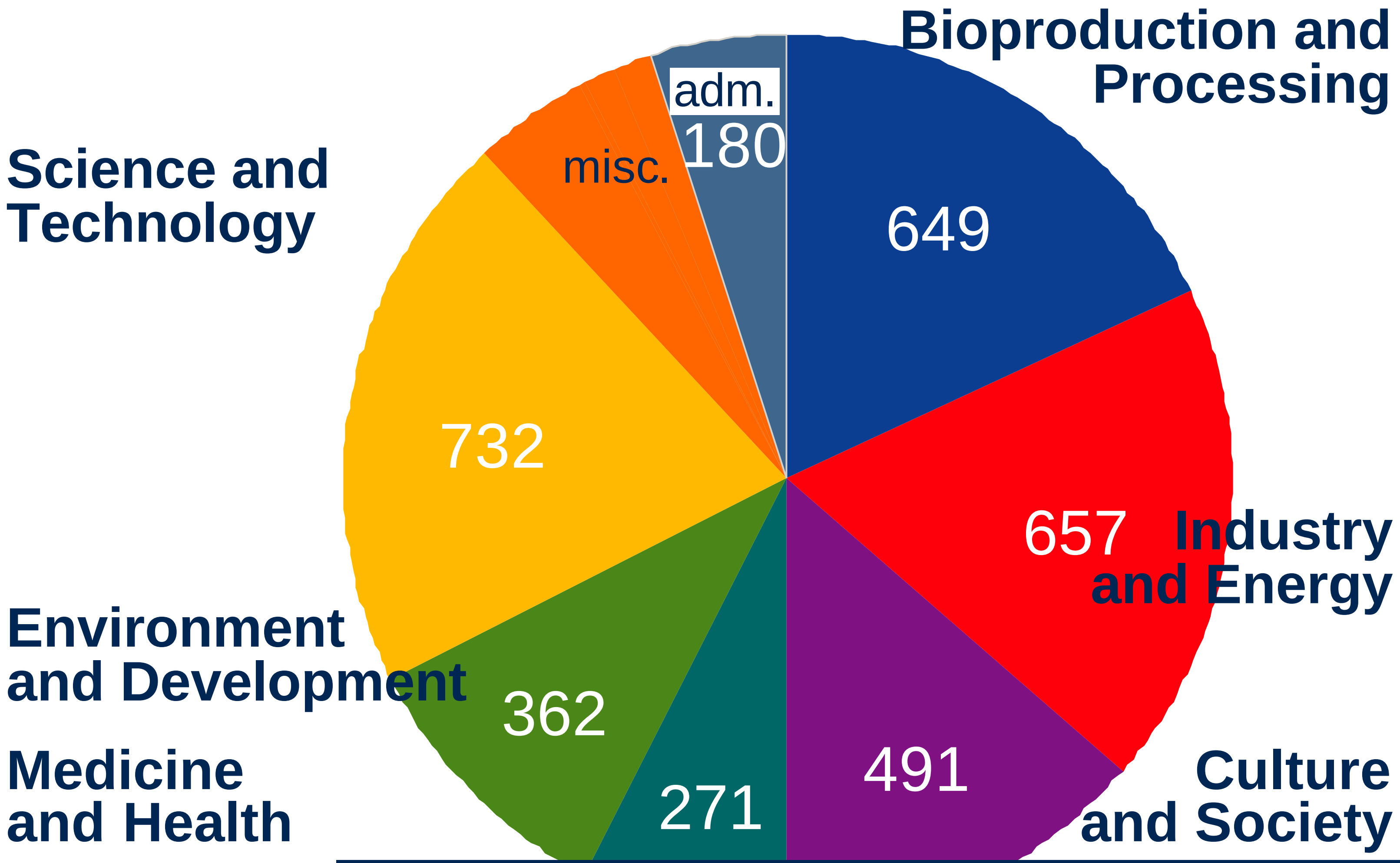
The Research Council's system of governing bodies



Industry and Energy



Total budget by divisions, NOK mill. (2002)



Total NOK 3 595 million (administration incl

Objectives for Energy RD&D

- Contribute to security and diversity of energy supply.
- Promote economic growth and the competitiveness of industry
- Reduce the environmental impact of energy supply and use

Objectives for Petroleum RD&D

- Optimum resource management
- International competitiveness of industry
- High competence and knowledge
- New industry development based on oil and natural gas

National Funding of oil- and gas research 2002

Ministries: Ministry of Petroleum and Energy, Ministry of Trade and Industry, Ministry of the Environment, Ministry of Education and Research, Ministry of Labour and Government Administration

The Research Council of Norway

Strategic and basic petroleum research

Basic funding
Petroforsk
SIP/SUP

69 MNOK

Social science research on petroleum related issues

Petropol

6 MNOK

Userdriven oil- and gas research

Olje- og gass

35 MNOK

Qualifying new technology trough pilot demon-strations

DEMO2000

20 MNOK

Effects of discharges to sea

2 MNOK

HSE
in the petroleum sector
15 MNOK

Gas power with CO2 capture and disposal
50 MNOK

The new innovation programme ”Olje og gass”

- Innovation projects (2/3)

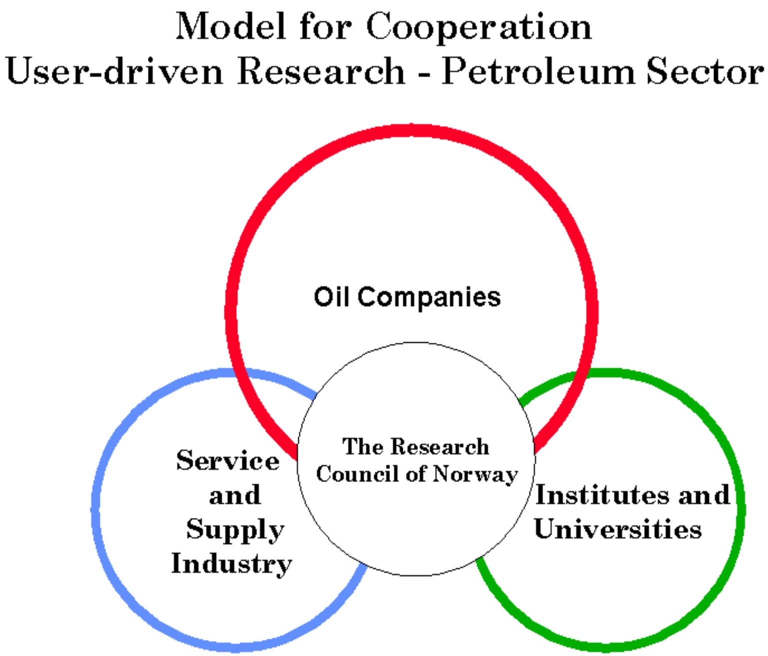
  Enabling strategic projects (1/3)

- The programme shall focus on thematic areas within the OG21 strategy and adress challenges on the NCS to secure competitiveness of the industry, economic growth and welfare.

Links to other RD&D programmes and activities

- Up to now the area was covered by the programmes:
    - OFFSHORE 2010 (downhole and subsea processing, multiphase transport, SME)
    - NATURGASS (conversion of natural gas)
- Links to
    - PETROFORSK – a basic petroleum research programme (Science and Technology)
    - PETROPOL – a social science research programme focusing on petroleum-related issues (Culture and Society)
    - Pollution programme – effects of discharges to marine environment (Environment and Developement)
    - DEMO2000 – a demonstration programme (separately funded by the Ministry of Petroleum and Energy)
    - KLIMATEK – reduced emissions of GHG (Industry and Energy)
    - MARITIME – maritime and offshore operations (Industry and Energy)
- International Cooperation: EU, IEA, Eureka etc.

Value is created by cooperation



The autorities are an important stakeholder due to their ownership of both resources and operating oil and gas companies

Governmental funded RD&D has been and is essential to build the Norwegian petroleum sector, comprising oil- and gas producers, service- and supply enterprises and the institutes and universities.

The Oil and Gas Programme
&
Challenges on the NCS

•Annual oil production is greater than new oil discoveries

•Reserve growth is dominated by increased recovery rate from old fields and new large gas discoveries

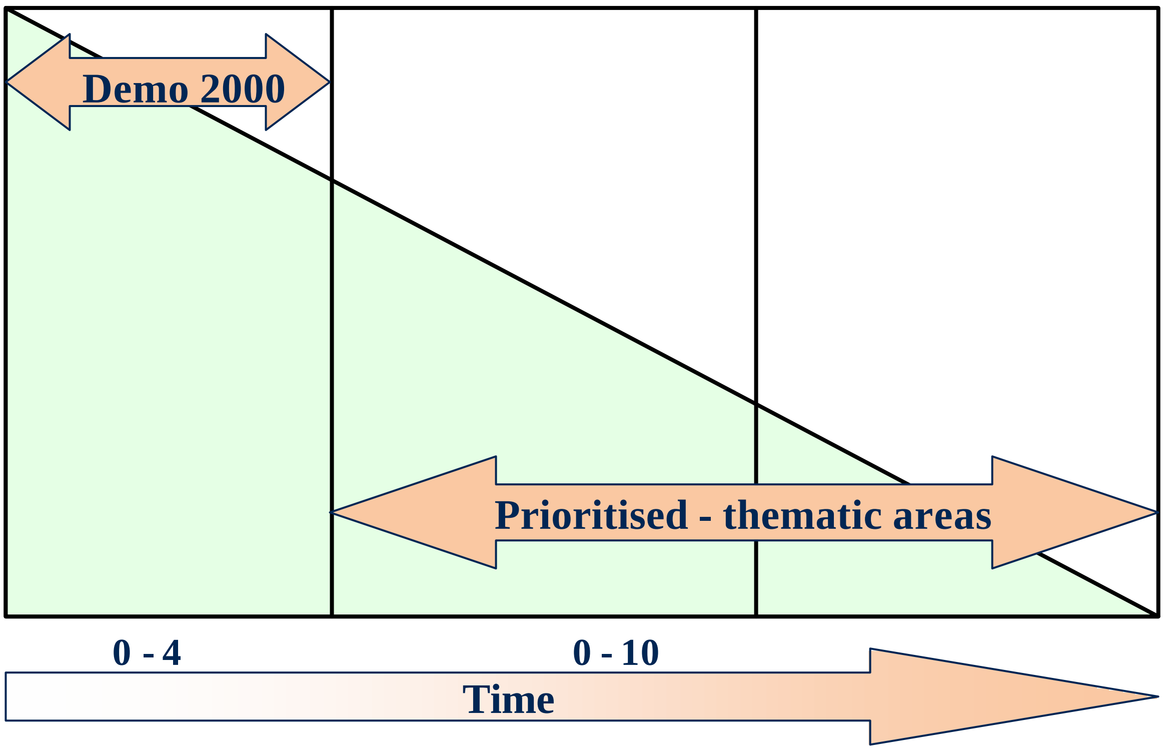
•Many, but small, oil discoveries

•Increasing water production

•Increased gas sales are needed in order to develop new gas fields

National Technology Strategy

Demonstration   Useroriented R&D   Strategic kompetence /Education



Governmental funding

Industry funding

Value added through:
Increased Recovery
Reduced CostEP - Export Potential

OG_{21} Vision and Objectives

Vision

We want -

World class competence

a leading global industry

We want to be -

the most productive

continental shelf

Main Objectives

Ensure most profitable and environmentaly friendly development of the resources of the Norwegian Continental Shelf

Strengthen the industry's international competitivenes

Appendix G-11

United Kingdom
Mr. Robert Miles

Overview of Offshore Research for 2002 ICRARD

Bob Miles
Offshore Division
HSE
bob.miles@hse.gsi.gov.uk

Health & Safety Executive

The (UK) Health and Safety Executive

- Land based safety regulator for people in industrial employment
- Hazardous Installations Directorate (Inc Offshore Safety Division
- Nuclear Inspectorate
- Railways Inspectorate
- Field Operations Directorate (factories, health workers, farms etc)

Offshore Safety Division

- Inherited safety from Dept of Energy, conflict of interest after Piper Alpha
- Develop legislation
- Assess safety cases (permissioning regime)
- approx.. 40 case assessors
- Inspect and enforce
- approx.. 80 offshore inspectors
- we charge for these activities!

Research

- Policy; evaluation of regulations/ legislation
- Enforcement; effectiveness of inspection and other enforcement
- Technology; by Division and Directorate and cross cutting by scientific discipline
- No environmental responsibility
- No product development
- the challenge function
- the advisory function

Strategic review

- New Director General
- move to 4 blocks:
- Key programmes
- Major hazards*
- Health and occupational safety
- Mandatory activity; investigations
- New S&T strategy, on web.

- Overall HSE spend circa £20m/year
- Offshore circa £3m/year (was £5m)
- Topic strategies
- Open tender, UK contractors
- Many JIP’s
- Annual Competition of Ideas (web) £100k/project

- reports are openly published
- OTO series; Offshore reports
- CRR; Contract research reports
- Back catalogue added to web
- New research reports will be free downloads
- Other priced publications; i.e. HSG 65 Successful Health and Safety Management, HSG 48, Human Factors

Sources

- Offshore research focus ORF
- www.orf.co.uk
- HSE web site www.hse.gov.uk
- “research”
- HSE bookfinder, www.hsebooks.co.uk
- STEP initiative:www.stepchangeinsafety.net
- CAA helicopter safety

Mature areas?

- structures
- oceanography
- corrosion
- pipelines
- EER
- diving
- health (?) challenging

Targets

- dropped objects
- hydrocarbon leaks
- slips and falls
- health surveillance
- LTI's

Developing areas

- FPSO’s / marinisation*
- HF and organizational factors*
- new technologies* (on going)
- organizational structures* (ie work groups)
- new employment trends (i.e. call centres)
- cost benefits (i.e. of HF)
- public attitudes to risk
- *offshore

Human Factors

- extensive back catalogue; CD
- fatigue/shiftwork
- procedures / violation
- design management
- safety culture / climate
- behavioral safety

Hot topics in HF

- competence
- trust
- leadership
- accountability
- corporate governance
- HF engineering / integration (barriers to)
- crime?

Non-research hot topics

- ALARP - good Vs best practice (web)
- public demands / expectations (i.e. stress)
- how to be more effective - exert influence
- making safety cases work; permissioning
  - concept selection
  - workforce involvement/relevance

Non-HSE research

- Other Regulators; CAA, MCA
- Other programmes, ie FABIG
- UKOOA
- STEP
- E&P forum
- Inst. Petroleum
- ITF Industry Technology Facilitator
- Dept Trade and Industry
- Science Funding Councils SRC’s (Gov’t funded Ph’Ds etc)
- EU framework

Challenges for OSD research

- competition for funds, research vs. inspection
- allocation of resources between sectors
- offshore is mature / in decline
- i.e. Railways (25,000 work offshore, 200,000 work in rail)
- Rehabilitation, musculo-sceletal; 2m workforce
- UK plc

Appendix H

Handouts

JIP Proposal for Deepwater Blowout Prevention
Flyer for the International Fire & Blast Workshop
Flyer for the 2003 International Offshore Pipeline Workshop
Ohmsett Gazette

Smith, Charles E

To: Hauser, William
Subject: RE: Interest in JIP to look at Deepwater Blowout Intervention

-----Original Message-----
From: Hauser, William
Sent: Thursday, November 15, 2001 4:43 PM
To: 'Mike Lunt'; 'Oyvind Tuntland'; 'Oscar L. Valle Molina'; 'Deborah M. Mattos'; 'Ricardo Rios de Campos Rosa'
Cc: Smith, Charles E; Martin, Paul; 'Jerome Schubert'; 'Curtis Weddle'
Subject: Interest in JIP to look at Deepwater Blowout Intervention

The Minerals Management Service is looking for partners to join in the joint industry research project titled "DEVELOPMENT OF A BLOWOUT INTERVENTION METHOD AND DYNAMIC KILL SIMULATOR FOR BLOWOUTS OCCURRING IN ULTRA-DEEPWATER." This project, conducted by Texas A&M University and Cherokee Engineering, is the highest priority for MMS' drilling research program. This project will:

- Update deepwater blowout intervention methods. This includes updating the intervention methods discussed in Drilling Engineers Association's JIP number 63.
- Identify and develop the tools/models needed to simulate ultradeep blowouts.
- Investigate use of dual density drilling methods in killing ultradeep blowouts. This includes intervening in wells drilled using convention methods as well as those drilled using dual density methods. Develop tools/models needed to simulate these methods.
- Investigate bridging tendencies for deepwater blowouts.
- Develop cost estimates for ultra-deepwater blowout intervention.

MMS requests your consideration of this JIP (proposal attached). MMS is funding approximately half of the $820,000 project. We are working with industry to obtain additional support for the JIP and would like have support from the international oil and gas community. Please feel free to call or email me if you have any questions about joining the project. You may also contact Dr. Jerome J. Schubert or Mr. Curtis E. Weddle (email addresses in the cc line and in the proposal) directly if you have specific questions about the project. I believe this project will help industry and MMS become better prepared for the deepwater blowout that we all hope never occurs. I look forward to your favorable response to this project.

<< File: DW intervention.doc >>

Bill Hauser
Minerals Management Service
Engineering and Research Branch
Drilling Research Coordinator
(703) 787-1613
william.hauser@mms.gov

SUMMARY PLAN
2001-2002 OTRC PROJECT

DEVELOPMENT OF A BLOWOUT INTERVENTION METHOD AND DYNAMIC KILL SIMULATOR FOR BLOWOUTS OCCURRING IN ULTRA-DEEPWATER

OBJECTIVE: Ultra-Deepwater drilling activity has increased dramatically in the last two years. Operations that were once exceptional and characterized by several man-years of well and operations planning, equipment qualification and contingency planning are now being done routinely several times each rig year.

DEA – 63, Floating Vessel Blowout Control, completed in the early 90's did not contemplate operations in water as deep as we commonly operate in now. While the project did contain a good deal of information, it was not widely available or read within the industry. One reason for this was massive restructuring that continues to take place within the oil business and lack of a publication mechanism to make it available to a wide audience

We propose a project to expand DEA – 63 for application into ultra-deepwater, develop a Visual Basic / Spreadsheet based dynamic kill program for ultra-deepwater and make the document available through the Texas A&M University Press, the International Association of Drilling Contractors, or other means of publication that would best reach the intended audience as either a technical report or handbooks for end users or both.

We propose to expand on DEA – 63 in the following areas:

1) Mechanical intervention – We would update the deepwater intervention methods proposed in DEA – 63 taking into account advancements made in deepwater construction since the late 80's. We would also evaluate the hydraulic requirements for methods that have been proposed in the past now taking into account the very long sections of pipe necessary to reach the sea bed.

Additional new work would be done in the following areas:

1) Bridging tendencies in ultra-deepwater blowouts – Gulf of Mexico and other ultra-deepwater sediments are generally poorly consolidated. Many believe that a high rate ultra-deepwater blowout will bridge and self kill. We will investigate the likelihood of this and define the parameters for evaluation of bridging including conditions with open hole drilling and cased hole completions.
2) Dynamic kill investigation of ultra-deepwater blowouts – we would develop a dynamic kill model for deepwater blowouts and investigate methods and pump rates necessary to kill the blowout from the existing well bore or from one or more relief wells.
3) Development of Dual Density blowout control methods – In the event that a deepwater blowout results in loss of the riser or a disconnect it may not be possible or safe to reconnect the riser and divert flow to the surface. If that is the case, dynamic kill could only be accomplished from a relief well using Dual Density mud weights. Furthermore, Dual Density drilling methods are likely to become commercially available in the next two years. It is likely that a well drilled to a formation using Dual Density methods could not be killed by a relief well using any other drilling method. Investigation of dynamic kill with Dual Density drilling will be included in the proposed study.
4) Costs of intervention – We propose to develop a cost estimate template for ultra-deepwater blowout intervention.

APPROACH: The proposed work is a multi-year project and has been broken down into five separate tasks, some of which could be performed independently of each other. Tasks 1, and 2 could be performed concurrently, while Task 3 cannot begin until Task 2 is sufficiently complete so that the model could be utilized to validate the methods developed in Task 3. Task 4 cannot be completed until Task 3 is nearly complete. Task 5 will be completed after Tasks 1-4 are complete.

The timing of each task is negotiable, and is dependent upon funding from the MMS/OTRC and Industry.

Task 1 – Bridging of blowouts in the GOM and tools for evaluation.

High flow rate blowouts sometimes cause the wellbore to collapse and bridge. When this occurs the well will often self kill, resulting in probably the fastest and least expensive method of blowout containment. Bridging usually occurs in poorly consolidated sandstones, and reactive shales, which are common in the Gulf of Mexico. This project proposes to study the formations likely to be encountered in ultra-deepwaters of the GOM to determine the conditions in which wellbores will collapse and bridge. The project will also determine if there are ways in which the likelihood of bridging could be increased. We will also investigate the cases with long open hole intervals where bridging high in the hole may not be advisable because of the possibility for cross flow below the bridge.

Task 2 – Dynamic kill model for conventional and dual density DeepWater Blowouts (surface and underground) and investigation of pump rates to kill wells.

Dynamic kill models have been developed in the past, however these models may not be adequate for blowouts in water depths as great as 10,000 feet, nor are they designed to model dual density operations. A dynamic kill model will be developed which can be used for both conventional drilling and dual density operations. Both cases will have the capability of predicting kill rates for circulation through the drillstring in the blowout well as well as from relief wells. Returns will be modeled for circulation up the marine riser, choke or kill line, through seafloor pumps and return line (for dual density) all back to the surface, as well as exiting the wellbore into the water column at the seafloor. The model will also have the ability to analyze underground blowouts. Modeling of underground blowouts with consideration for thief zone characteristics is not available in many current dynamic kill models.

Task 3 - Develop blowout control methods based on Task 2 to include mechanical hookup alternatives.

A study will be made of the state of the art in blowout containment methods and equipment that is presently available. The results of this study will by catalogued and included in the final report. The dynamic kill simulator will be used to evaluate the hydraulic requirements needed to dynamically kill ultra-deepwater blowouts. From this analysis, dual density blowout control methods will be developed and made available to the MMS and the petroleum industry.

Task 4 - Cost estimate for deepwater intervention.

After Tasks 1-3 are nearing completion, work will begin on a cost estimation for deepwater intervention based on the results of these first three tasks. This cost estimation will aid the industry on the risk and consequences of ultra deepwater blowout. This cost estimate will be included in the final report.

Task 5 - Final report and administrative meetings.

Administrative meetings and workshops will be conducted throughout the project. The MMS, DOE, EPA, and individuals from the petroleum industry will be invited to the workshops, where the results of the research will be presented. Input from the attendees will be used to guide the research team in completing the individual tasks outlined above. After all the tasks are completed, a written report and dynamic kill simulator will be published in an electronic format and made available to the MMS (free of charge), to industry participants on a cost of publication basis and to industry non-participants on a fee basis.

DEPLOYMENT OF RESULTS: MMS would have in hand a useful document for evaluation of ultra-deepwater well control risk and knowledge of methods necessary for successful intervention.

Industry would have access to a document that could guide well planning, contingency plan development and ultra-deepwater blowout intervention operations should that ever become necessary.

At the completion of this project, the following deliverables will have been met.

- The industry will be provided with a study which will determine the likelihood of a well bridging during a deepwater blowout, and ways to induce bridging and the consequences of undesirable bridging that may result in cross flows below the bridge.
- A dynamic kill simulator with the ability to model:
  - conventional and dual density wells
  - circulation paths through the a drillstring located in the blowout well and relief wells
  - returns to the surface via the drilling riser, choke and kill line, seafloor pumps and return line, or returns to the ocean at the seafloor,
  - and underground blowouts.
- A manual cataloging the state of the art in blowout containment equipment and methodology. This will include mechanical hookup alternatives.

- Blowout control methods for dual density wells.
- Cost estimate for deepwater intervention.
- A final report in electronic format which can be used in risk analysis, contingency planning, and as a manual for containment of deepwater blowouts.

During the project a series of forums will be held with representatives from the industry sponsors, MMS, and OTRC, as well as others with a vested interest in the results of the project.

ANTICIPATED PROJECT DURATION: 27 to 33 months depending on the scheduling of the tasks and the level of effort of each member of the team for each task during each budget period. The total man-months will not change.

PROJECT PLAN FOR YEAR 1 (2000-2001):

Scope of Work: For fiscal year 2000-2001 we intend to begin work on Tasks 1 and 2.

Task 1: Bridging tendencies, we will start our literature search for pertinent publications on wellbore bridging. We will also begin to gather data from operators active in the deepwaters of the Gulf of Mexico so that we can begin our study of the wellbore stability of the anticipated formations that would be encountered in the ultra-deep waters.

Task 2: We will begin the literature search to find the current status on dynamic kill models. We will also begin to develop the framework of the dynamic kill simulator which will not only have the capability of modeling conventionally drilled wells, but also wells drilled utilizing dual gradient technology.

Anticipated Results*:* At the end of fiscal year 2000-2001 most of the literature search for Tasks 1 and 2 should be complete, and work should have begun on development of the dynamic kill simulator (Task 2), and the study of the bridging tendencies of the formations that operators and drilling contractors are likely to drill through in the ultra-deep waters of the Gulf of Mexico

Proposed Budget: Total \$114,160 OTRC \$134,160 Industry \$0

PROJECT PLAN FOR YEAR 2 (2001-2002):

Scope of Work: For fiscal year 2001-2002 we will complete Task 1(bridging tendencies) continue with Task 2 (dynamic kill simulator) and begin Tasks 3 and 5 (Blowout control methods and Final Report respectively)

Task 1: The study of bridging tendencies will be completed by the end of this fiscal year.

Task 2: During this fiscal year, the rheological models and multiphase flow models that will be utilized in the dynamic kill model will have be developed programmed into the dynamic kill simulator.

Task 3: A literature search for the current state of blowout control will be conducted, and work will begin on development of new blowout control methods will begin. The dynamic kill simulator will be utilized to validate the procedures that are included in the blowout control methods.

Task 5: The writing of the final report will begin with completion of Task 1. There will also be workshops held to report and discuss the progress of the project.

Anticipated Results: By the end of this fiscal year, the results Task 1 (bridging tendencies) will be complete and made available to the sponsors, and will be utilized in the development of blowout control methods being developed in Task 3. The dynamic kill simulator being developed in Task 2 will be complete enough that it will be available for use in validating the procedures involved in blowout control methods in Task 3.

Proposed Budget: Total \$354,537 OTRC \$200,000 Industry \$154,537

PROJECT PLAN FOR YEAR 3 (2002-2003):

Scope of Work: For fiscal year 2002-2003 we will complete Tasks 2 through 5.

Task 2: We will complete the dynamic kill simulator. It will include any needed changes that may be identified in the development of blowout control methods in Task 3.

Task 3: We will complete the blowout control methods for wells being drilled in ultra-deep waters, and will have validated them with the dynamic kill simulator developed in Task 2.

Task 4: We will begin and complete a template for cost estimations of deepwater intervention of blowout wells. The results from Tasks 1-3 will be utilized in this task.

Task 5: We will complete the final report and manual and make the results available to the sponsors as well as the rest of the industry. The results of Tasks 1-4 will be reported and discussed in a series of workshops with guests invited from the sponsoiring entities.

Anticipated Results: The final product of this project is described above in the section entitled "Deployment of Results."

Proposed Budget: Total $352,285 OTRC $65,840 Industry $266,445

PRINCIPAL INVESTIGATOR (S) & OTHERS INVOLVED IN PROJECT:

Following is a brief description of the qualifications of the key personnel and a description of their role in the project.

Mr. Curtis Weddle, III, P.E. – Cherokee Offshore Engineering

Curtis E. Weddle, III, PE, has 22 years of drilling and well control experience. Mr. Weddle will be the industry advisor and co-author of this study. He is currently team leader for well control methods development in the MudLift Drilling JIP, a project to develop a dual density drilling system for ultra-deepwater. He is a principal of Cherokee Offshore Engineering, a consulting firm for well control, project management and drilling. Prior to that he was responsible for well control operations worldwide for BP Exploration. His experience includes specification, design, commissioning and trouble shooting of ultra-deepwater BOP systems and several kick control operations in ultra-deepwater. He is currently on the executive committee for the IADC DeepWater Well Control Guidelines publication and was a founder of that ongoing project. He has been a member and chair of for projects such as BOP Test Frequency Justification, Sustained Annular Pressure Mitigation, DeepWater Rig Availability for Relief Wells and Prevention of Unplanned Disconnects. He has been chair of the IADC DeepWater Well Control Conference on two occasions and spoken or presented papers at that meeting for the last 5 years. Other experience includes major ultra-deepwater project development and evaluation in the Gulf of Mexico, deep high pressure gas drilling in the United States and work in Colombia, Venezuela, Alaska, Papua New Guinea, Indonesia, Vietnam, North Sea, NW Australia, Algeria and Azerbijan.

Mr. Weddle will work on deepwater intervention methods and case simulations for deepwater blowouts. He will also provide industry liaison and focus to complete a final product that is useful to the industry. For the five Tasks in the project he will work as follows:

- Task 1 – Peer review of work, creation of cases for evaluation, contribution to report as to practicality of encouraging bridging and problems with cross flows that may be created by bridging.
- Task 2 – User input and output development, quality assurance and proofing of the model, representation of the end user.
- Task 3 – Peer review of current practice, sorting of successful vs. unsuccessful practices, incorporation of current deepwater construction practice into a collection of options for mudline intervention in the event of a blowout, hydraulic modeling, rig requirements for deepwater intervention, incorporate dual density equipment requirements and capabilities into the final report.
- Task 4 – Aid in creation of the cost estimate template and population of same.
- Task 5 – Co-author of final report as well as co-chair of industry meetings with Dr. Schubert.

Jerome J. Schubert, Ph.D., P.E. – Texas A&M University, Harold Vance Department of Petroleum Engineering

Dr. Jerome J. Schubert, P.E. will be the Principal Investigator for this project. Dr. Schubert has a B.S. (1978), M.Eng. (1995), and Ph.D. (1999) all in Petroleum Engineering from Texas A&M University, and is currently employed as Lecturer/Assistant Research Engineer by the Harold Vance Department of Petroleum Engineering at Texas A&M University. Dr. Schubert has worked as a Drilling Engineer for over eight years with Pennzoil Company and Enron Oil & Gas, over four years as a Well Control Instructor with the University of Houston/Victoria, and as a faculty member at Texas A&M University for over six years. At Texas A&M University, Dr. Schubert is involved in teaching graduate and undergraduate drilling courses and in drilling research. Related research activities that Dr. Schubert has been involved with are kick detection, shallow water flows, and development of well control procedures for the MudLift Drilling JIP. He also serves on the IADC Training and Well Control Committees, and on the IADC WellCAP Review Panel.

Dr. Schubert will provide supervision of graduate students working on this project. He will provide guidance in their research and will evaluate the results of their work. Dr. Schubert will co-author all papers, reports and manuals developed from the project.

- Task 1 - Dr. Schubert will provide input to Dr. Valko as to blowout behavior. He will aid Dr. Valko in supervising his graduate student that will be working on this project.
- Task 2 - Dr. Schubert will supervise a graduate student in development of the Dynamic Kill model, and will provide insight into dual gradient drilling, and blowout behavior.
- Task 3 - Dr. Schubert will supervise a graduate student in gathering and cataloguing the current state of the art in blowout containment methods and equipment. He will work with Mr. Weddle in developing new blowout containment methods for ultra deepwater blowouts and dual density blowout control methods.
- Task 4 - Dr. Schubert will work with Mr. Weddle in estimating the containment cost of ultra deepwater blowouts.
- Task 5 - Dr. Schubert will help prepare the final report, and organize all meetings and workshops.

Peter P. Valko, Ph.D. – Texas A&M University, Harold Vance Department of Petroleum Engineering

Dr. Peter Valko will be a co-PI for Task 1 – Bridging of blowouts in the GOM and tools for evaluation. Dr. Valko has a B.S. in Chemical Engineering from Veszprem University (1973) in Hungary, an M.S. in Applied Mathematics from Veszprem University (1975), and a Ph.D. in Chemical Engineering from the Institute of Catalysis (1981), in Novosibirsk, Russia. Dr. Valko has extensive teaching and research experience in Petroleum Engineering, in the areas of hydraulic fracturing and sand control, where he studied wellbore mechanics, rock mechanics, and wellbore stability, all useful in determining caving and bridging tendencies during extended periods of pressure drawdown as during blowouts.

Dr. Valko' role in this project will be to co-supervise his graduate student along with Dr. Schubert in the study of bridging tendencies. This task will determine the parameters in which bridging is likely.

Contacts:

Dr. Jerome J. Schubert
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Mr. Curtis E. Weddle, III
Cherokee Offshore Engineering
28403 Teal Court
Magnolia, TX 77355
281/356-9139, cweddle@kropla.com

SUMMARY PLAN
2001-2002 OTRC PROJECT

	Texas Engineering Experiment Station **Budget Page** (See reverse for Instructions)				Year 1 FY 2000-01	
ORGANIZATION Texas Engineering Experiment Station/ Cherokee Offshore Engineering					Budget Page No:	
PRINCIPAL INVESTIGATOR(PI)/PROJECT DIRECTOR (PD) PI: Jerome J. Schubert, TEES PD: Curtis Weddle, III, Cherokee Offshore Engineering					Requested Duration: _____ (Months)	
A. SENIOR PERSONNEL: PI/PD, Co-PI□s, Faculty and Other Senior Associates (List each separately with title, A-7 show number in bracket(s))		DOE Funded Person - mos			Funds Requested	Funds Granted
	CAL	ACAD	SUMR		by Applicant	by DOE
1. Dr. Jerome J. Schubert	3				15,270	
2. Dr. Peter Valko	1				5,090	
3.						
4.						
5.						
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)						
7. ( ) TOTAL SENIOR PERSONNEL (1-6)						
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)						
1. ( ) POST DOCTORAL ASSOCIATES						
2. ( ) OTHER PROFESSIONALS TECHNICIAN, PROGRAMMER, ETC.)						
3. (2) GRADUATE STUDENTS (6 mos at 1/2 time ea)					8,034	
4. ( ) UNDERGRADUATE STUDENTS						
5. ( ) SECRETARIAL - CLERICAL						
6. ( ) OTHER						
TOTAL SALARIES AND WAGES (A+B)					28,394	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)					7,099	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)					35,493	
D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM) Computer					2,000	
TOTAL PERMANENT EQUIPMENT						
E. TRAVEL	1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS)				1,450	
	2. FOREIGN					
TOTAL TRAVEL						
F. TRAINEE/PARTICIPANT COSTS						
1. STIPENDS (itemized levels, types						
+totals on budget justification page						
2. TUITION & FEES						
3. TRAINEE TRAVEL						
4. OTHER (fully explain on justification page)						
TOTAL PARTICIPANTS ( ) TOTAL COST						
G. OTHER DIRECT COSTS						
1. MATERIALS AND SUPPLIES					550	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION						
3. CONSULTANT SERVICES						
4. COMPUTER (ADP) SERVICES						
5. SUBCONTRACTS					65,000	
6. OTHER						
TOTAL OTHER DIRECT COSTS						
H. TOTAL DIRECT COSTS (A THROUGH G)					104,493	
I. INDIRECT COSTS (SPECIFY RATE AND BASE) (46% of the total direct costs limited to the first $25,000 for the subcontractor)					29,667	
TOTAL INDIRECT COSTS						
J. TOTAL COST OF PROJECT					134,160	

	Texas Engineering Experiment Station **Budget Page** (See reverse for Instructions)	Year 2 FY 2001-02
ORGANIZATION Texas Engineering Experiment Station/ Cherokee Offshore Engineering		Budget Page No:
PRINCIPAL INVESTIGATOR(PI)/PROJECT DIRECTOR (PD) PI: Jerome J. Schubert, TEES PD: Curtis Weddle, III, Cherokee Offshore Engineering		Requested Duration: _____ (Months)

A. SENIOR PERSONNEL: PI/PD, Co-PI□s, Faculty and Other Senior Associates (List each separately with title, A-7 show number in bracket(s))	DOE Funded Person - mos CAL	ACAD	SUMR	Funds Requested by Applicant	Funds Granted by DOE
1. Dr. Jerome J. Schubert	7			36,701	
2.					
3.					
4.					
5.					
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)					
7. ( ) TOTAL SENIOR PERSONNEL (1-6)					
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. ( ) POST DOCTORAL ASSOCIATES					
2. ( ) OTHER PROFESSIONALS TECHNICIAN, PROGRAMMER, ETC.)					
3. (2) GRADUATE STUDENTS (12 mos at 1/2 time ea)				33,096	
4. ( ) UNDERGRADUATE STUDENTS					
5. ( ) SECRETARIAL - CLERICAL					
6. ( ) OTHER					
TOTAL SALARIES AND WAGES (A+B)				69,797	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				17,449	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)				87,246	
D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM) Computer				2,000	
TOTAL PERMANENT EQUIPMENT					
E. TRAVEL 1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS)				28,100	
2. FOREIGN					
TOTAL TRAVEL					
F. TRAINEE/PARTICIPANT COSTS					
1. STIPENDS (itemized levels, types +totals on budget justification page					
2. TUITION & FEES					
3. TRAINEE TRAVEL					
4. OTHER (fully explain on justification page)					
TOTAL PARTICIPANTS ( ) TOTAL COST					
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				2,200	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION					
3. CONSULTANT SERVICES					
4. COMPUTER (ADP) SERVICES					
5. SUBCONTRACTS				180,000	
6. OTHER					
TOTAL OTHER DIRECT COSTS					
H. TOTAL DIRECT COSTS (A THROUGH G)				299,546	
I. INDIRECT COSTS (SPECIFY RATE AND BASE) (46% of the total direct costs limited to the first $25,000 for the subcontractor) TOTAL INDIRECT COSTS				54,991	
J. TOTAL COST OF PROJECT				354,537	

	Texas Engineering Experiment Station **Budget Page** (See reverse for Instructions)				Year 3 FY 2002-03	
ORGANIZATION Texas Engineering Experiment Station/ Cherokee Offshore Engineering					Budget Page No:	
PRINCIPAL INVESTIGATOR(PI)/PROJECT DIRECTOR (PD) PI: Jerome J. Schubert, TEES PD: Curtis Weddle, III, Cherokee Offshore Engineering					Requested Duration: _____ (Months)	
A. SENIOR PERSONNEL: PI/PD, Co-PI[]s, Faculty and Other Senior Associates (List each separately with title, A-7 show number in bracket(s))		DOE Funded Person - mos			Funds Requested	Funds Granted
		CAL	ACAD	SUMR	by Applicant	by DOE
1. Dr. Jerome J. Schubert		8			43,200	
2.						
3.						
4.						
5.						
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)						
7. ( ) TOTAL SENIOR PERSONNEL (1-6)						
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)						
1. ( ) POST DOCTORAL ASSOCIATES						
2. ( ) OTHER PROFESSIONALS TECHNICIAN, PROGRAMMER, ETC.)						
3. (1) GRADUATE STUDENTS (12 mos at 1/2 time)					17,052	
4. ( ) UNDERGRADUATE STUDENTS						
5. ( ) SECRETARIAL - CLERICAL						
6. ( ) OTHER						
TOTAL SALARIES AND WAGES (A+B)					60,252	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)					15,063	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)					75,315	
D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM) Computer						
TOTAL PERMANENT EQUIPMENT						
E. TRAVEL	1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS)				24,050	
	2. FOREIGN					
TOTAL TRAVEL						
F. TRAINEE/PARTICIPANT COSTS						
1. STIPENDS (itemized levels, types +totals on budget justification page						
2. TUITION & FEES						
3. TRAINEE TRAVEL						
4. OTHER (fully explain on justification page)						
TOTAL PARTICIPANTS ( ) TOTAL COST						
G. OTHER DIRECT COSTS						
1. MATERIALS AND SUPPLIES					2,200	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION						
3. CONSULTANT SERVICES						
4. COMPUTER (ADP) SERVICES						
5. SUBCONTRACTS					184,000	
6. OTHER						
TOTAL OTHER DIRECT COSTS						
H. TOTAL DIRECT COSTS (A THROUGH G)					285,565	
I. INDIRECT COSTS (SPECIFY RATE AND BASE) (46% of the total direct costs limited to the first $25,000 for the subcontractor)					46,720	
TOTAL INDIRECT COSTS						
J. TOTAL COST OF PROJECT					332,285	

	Texas Engineering Experiment Station **Budget Page** (See reverse for Instructions)				Total	
ORGANIZATION Texas Engineering Experiment Station/ Cherokee Offshore Engineering					Budget Page No:	
PRINCIPAL INVESTIGATOR(PI)/PROJECT DIRECTOR (PD) PI: Jerome J. Schubert, TEES PD: Curtis Weddle, III, Cherokee Offshore Engineering					Requested Duration: _____ (Months)	
A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A-7 show number in bracket(s))		DOE Funded Person - mos			Funds Requested by Applicant	Funds Granted by DOE
		CAL	ACAD	SUMR		
1. Dr. Jerome J. Schubert		18			95,171	
2. Dr. Peter Valko		1			5,090	
3.						
4.						
5.						
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)						
7. ( ) TOTAL SENIOR PERSONNEL (1-6)						
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)						
1. ( ) POST DOCTORAL ASSOCIATES						
2. ( ) OTHER PROFESSIONALS TECHNICIAN, PROGRAMMER, ETC.)						
3. (1) GRADUATE STUDENTS					58,182	
4. ( ) UNDERGRADUATE STUDENTS						
5. ( ) SECRETARIAL - CLERICAL						
6. ( ) OTHER						
TOTAL SALARIES AND WAGES (A+B)					158,443	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)					39,611	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A+B+C)					198,054	
D. PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM) Computer					4000	
TOTAL PERMANENT EQUIPMENT						
E. TRAVEL	1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS)				53,600	
	2. FOREIGN					
TOTAL TRAVEL						
F. TRAINEE/PARTICIPANT COSTS						
1. STIPENDS (itemized levels, types +totals on budget justification page						
2. TUITION & FEES						
3. TRAINEE TRAVEL						
4. OTHER (fully explain on justification page)						
TOTAL PARTICIPANTS ( ) TOTAL COST						
G. OTHER DIRECT COSTS						
1. MATERIALS AND SUPPLIES					4,950	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION						
3. CONSULTANT SERVICES						
4. COMPUTER (ADP) SERVICES						
5. SUBCONTRACTS					429,000	
6. OTHER						
TOTAL OTHER DIRECT COSTS						
H. TOTAL DIRECT COSTS (A THROUGH G)					689,604	
I. INDIRECT COSTS (SPECIFY RATE AND BASE) (46% of the total direct costs limited to the first $25,000 for the subcontractor) TOTAL INDIRECT COSTS					131,378	
J. TOTAL COST OF PROJECT					820,982	

INTERNATIONAL WORKSHOP

FIRE & BLAST CONSIDERATIONS IN THE FUTURE DESIGN OF OFFSHORE FACILITIES

JUNE 12-14, 2002 - HOUSTON, TEXAS

INTERNATIONA

Fire & Blast Considerations in the Future Design of O

Introduction and Background

Over the past decade, the offshore industry has expended much effort understanding the causes and severity of explosions in offshore facilities, and the resistance of these facilities to blast overpressures and to different types of hydrocarbon fires. For some fixed platforms and many floating facilities, such as TLPs, SPARs and FPSOs, the hydrocarbon inventory is such that due care is required in the design of safety systems to reduce the risk of fires and blasts and/or reduce their impact to acceptable levels.

The offshore engineering community relies on recommended practices and standards to characterize and design for hydrocarbon explosions and fires. It becomes clear from an examination of various practices and public domain research and technical papers in this field that a vast amount of diverse research has been carried out, leading, in some instances, to fire and blast design practices, which are significantly different. It also becomes clear that much of the existing research/development efforts are yet to be incorporated into design practice.

Worldwide developments indicate a move towards a more code-based approach, as the field of Fire and Blast Engineering matures. Recently, initiatives have begun to update existing API guidance relating to Fire and Blast to include technological advancements over the last ten years and to encompass deepwater, floating and moored structures.

It is against this background and recent development activity in the deepwater Gulf of Mexico that the MMS and wider industry has felt it timely to support a Workshop as a forum for sharing of knowledge and experience and to explore present state-of-practice and influence future developments in Management Processes, Safe Design Practice and Fire and Blast Engineering.

Objectives of the Workshop

The objectives of the Workshop are as follows:

- To provide a forum for contributions by industry, regulatory agencies and certification organizations for the consideration of fire and blast in the future design of offshore installations.
- To compare and contrast present day technology and state-of-practice in areas of:
  - *Philosophy and management processes*
  - *Safe design practice*
  - *Fire and blast loading and resistance*
- To identify if and where future research and development may assist industry.
- To produce a record of the proceedings and a web site for dissemination of the shared learning to interested parties

Workshop Format and Schedule

The Workshop will be a 2 ½ day event, in a format consistent with that successfully used for numerous similar workshops supported by MMS over the past 20 years. The format has been found to be effective in the dissemination of knowledge across the Industry.

Day 1:

The Workshop will start with a number of keynote speeches by representatives from Industry and International Regulatory and Certification Authorities followed by Theme papers to set the scene on current Philosophy and Management Processes, Safe Design Practice and Fire and Blast Engineering.

The afternoon of the first day will be devoted to Working Group discussions in seven groups. Working Group Chairs will guide the discussion topics and organize the presentation of 'White Papers' as basis for discussion.

Day 2:

The second full day will start with the presentation of a Theme Paper followed by a topical keynote speech.

The main Workgroup Sessions will then continue for the rest of the day. Participants may attend more than one Workgroup session, changing during session breaks.

Day 3:

The final half-day will start with the presentation of a topical Theme Paper of general interest. The main event in the morning of the third day will consist of presentations by nominated representatives of the Working Groups, who will report the conclusions and recommendations arising out of the deliberations in each Working Group.

AL WORKSHOP

fshore Facilities • June 12-14, 2002 • Houston, Texas

Technical Advisory Panel

The Technical Advisory Panel (TAP) consists of representatives from each of the sponsoring organizations. The TAP decides the organization and content of the Workshop including the choice of venue, selection of speakers and topics for Working Group discussion. Sponsoring organizations represented on the TAP include:

- *Regulatory Authorities*
- *The Minerals Management Service*
- *Oil and Gas Companies*
- *Classification Societies*
- *Engineering Contractors*
- *Other Industry Bodies*
- *Research Organizations and Universities*

Working Groups

The TAP has agreed a number of Working Groups. The Groups will address the different subject areas within the overall theme of the Workshop.

WG 1: Philosophy and Management Processes

WG1 will consider hazard management systems for fire and blast during the life cycle of a facility including the establishment of performance criteria and the relationship between hazard analysis and risk management.

WG 2: Safe Design Practice

WG2 will consider the implementation of hazard management systems for fire and blast on a particular project or facility, including the selection/design of process layout, safety systems and operational procedures and the definition of credible release scenarios for consideration in design.

WG 3: Blast — Load and Response

WG3 will consider methods for the determination of blast loads on structures and equipment and calculation of their response, including consideration of best practice in design to meet performance criteria.

WG 4: Fire — Load and Response

WG4 will consider methods for the determination of fire loads on structures and equipment and calculation of their response, including consideration of best practice in design to meet performance criteria.

WG 5: Floating, Production and Storage Systems

WG5 will consider fire and blast issues specific to floating production facilities, including TLPs, SPARs, Semi-subs and FPSOs.

WG 6: Exploration and Drilling Operations

WG6 will consider fire and blast issues relating specifically to exploration and drilling operations including design of MODUs and other drilling units as well as design considerations for simultaneous operations.

WG 7: Regulation and Certification

WG7 will explore existing worldwide practice for the regulation and certification of fire and blast design of offshore facilities, comparing different approaches and recent initiatives/opportunities for greater consistency or harmonization.

The Working Groups, under the guidance of the TAP, will be responsible for identifying and addressing the critical interfaces between the various groups.

White Papers

The discussion 'White Papers' will be prepared by each of the Working Group committees, under the stewardship of the Chair, and agreed by the TAP in advance of the Workshop. The agreed 'White papers' will be made available to attendees at the Workshop. The Working Group Chairs will arrange for presentation of the material in the White paper at the Working Group sessions, soliciting input from attendees, which shall be captured and recorded.

Reporting

Proceedings will be prepared for Participants of the Workshop documenting the original White Papers and the discussions and conclusions of each of the Working Groups. The Proceedings will take the form of a bound document and/or CD-ROM and be distributed to Sponsors and other participating organizations.

Proceedings will include:

- *The Theme Papers and extended versions of the Keynote Speeches*
- *The discussion White Papers from the Working Groups*
- *Position Papers from each Working Group prepared at the conclusion of the Working Group Sessions*

Sponsorship

Sponsorships are tax deductible and are available at two levels:

Primary Sponsorship: At a cost of \$10,000 is invited from Oil and Gas Companies, Governmental and Regulatory Organizations, Classification Societies and Industry Bodies.

Supporting Sponsorship: At a cost of \$5,000 is invited from Engineering Contractors and Consulting Companies.

Special arrangements are available for Research Organizations and Universities who supply speakers and assistance in paper preparation and workshop organization.

Benefits of Sponsorship:

- Participation in the Technical Advisory Panel meetings.
- Pre-prints of the Working Group White Papers issued before the Workshop.
- Advertising/exposure on all marketing and program material
- Exposure on the Workshop web site with links to the Sponsor's web-site
- Free entry to the Workshop for Company representatives
- Copies of the Proceedings

Coordination and Contacts

MSL Services Corporation is responsible for the coordination and administration of the Workshop. Please contact the nominated Workshop coordinator, Justin Bucknell or alternatively Milan Chakravorty for further information related to the Workshop.

Contact Details:

MSL Consulting Engineers

11111 Katy Freeway, Suite 620
Houston, TX 77079
Tel.: 713-463-6180
Fax.: 713-463-6557

Justin Bucknell
E-mail: jbucknell@mslengineering.com

Milan Chakravorty
E-mail: mchakravorty@mslengineering.com

www.mslengineering.com

Preliminary Program

DAY 1 - *June 12, 2002*

7:30 – 9:00	Registration (Coffee & Pastries)
9:00 – 9:10	Welcome Remarks (J. Bucknell, MSL)
9:10 – 9:30	Keynote speech*: Minerals Management Service
9:30 – 9:50	Keynote speech: Industry Representative
9:50 – 10:10	Keynote speech: Certification Body
10:10 – 10:30	**BREAK**
10:30 – 11:00	Theme paper**: Design Philosophy and Management Processes
11:00 – 11:30	Theme paper: Safe Design Practice
11:30 – 12:00	Theme paper: Fire & Blast Design - State of Practice
12:00 – 1:30	**LUNCH** (Presentation: Petrobras P36 Accident Investigation) R. Rios, Brazilian National Petroleum Agency (ANP)
1:30 – 2:00	Theme paper: International Perspective - UKOOA/HSE
2:00 – 3:00	Introduction to the Working Groups – (J. Bucknell, MSL) *Brief overview from Work Group Chairs:*

WG 1: Philosophy and Management Processes (D. Carter, BP)
WG 2: Safe Design Practice (J. Wishart, CSO-Aker)
WG 3: Blast - Loads and Response (D. Angevine, ExxonMobil)
WG 4: Fire - Loads and Response (J. Krueger, BP)
WG 5: Floating, Production and Storage Systems (R. Aggarwall, ABB)
WG 6: Exploration and Drilling Operations (M. Sharples, ABS)
WG 7: Regulation and Certification (K. Dangtron, ABS)

3:00 – 3:30	**BREAK**
3:30 – 5:00	Working Groups 1st Session
Evening	**RECEPTION (Celebrity speaker)**

DAY 2 - *June 13, 2002*

8:00 – 8:30	Coffee & Pastries
8:30 – 9:00	Keynote speech: United states Coast Guard (USCG)
9:00 – 9:30	Theme paper: Large Scale Testing - Jet Fires
9:30 – 10:00	Theme paper: Large Scale Testing - Explosions
10:00 – 10:30	**BREAK**
10:30 – 12:00	Working Groups 2nd Session
12:00 – 1:00	**LUNCH** (Presentation: Petrobras P36 Accident Investigation)
1:00 – 3:00	Working Groups 3rd Session
3:00 – 3:30	**BREAK**
3:30 – 5:00	Working Groups Final Session
Evening	**DINNER (sponsor speaker)**

DAY 3 - *June 14, 2002*

7:30 – 9:00	Coffee & Pastries
9:00 – 9:30	Discussion paper:Deepwater Project Presentation (US Facility)
9:30 – 10:00	Discussion paper: Deepwater Project Presentation (FPSO)
10:00 – 10:30	**BREAK**
10:30 – 12:00	Reports of Working Groups (Group Chairs)
	ADJOURN

Notes:

* The Keynote Speeches will be included in the Proceedings. There will be an opportunity for questions and discussion from the floor.

** Theme papers will be published in the proceedings. The presentations will be a summary of the published version.

The 2003 International Offshore Pipeline Workshop

www.projectconsulting.com/workshop2003

New Orleans Marriott Hotel

February 26 - 28, 2003

Project Consulting Services, Inc.

INTRODUCTION

The International Offshore Pipeline Workshop 2003 will be held on February 26 – 28, 2003 at the New Orleans Marriott Hotel. The workshop is being hosted by the Minerals Management Service (MMS) and the U.S. Department of Transportation, Office of Pipeline Safety (DOT) and organized by Project Consulting Services, Inc. Sponsors include major oil and gas companies, offshore pipeline contractors, offshore service companies, and other related entities. The workshop is a true joint industry project (JIP) with a technical program being developed by a dedicated workshop steering committee. Representation on the steering committee includes MMS, DOT, primary sponsors, and industry experts.

OBJECTIVES

The workshop will provide a forum for the open and frank discussion of topics related to offshore pipelines. Major issues that will be addressed include:

- Security
- Regulatory
- Permitting
- Deepwater
- Arctic
- Manufacturing
- Abandonment
- Design / Standards
- Construction / Installation
- Integrity / Risk Assessment
- Operation
- Maintenance
- Repair
- Other Related Topics

The workshop will be structured to allow maximum interface among industry experts and general attendees to discuss major issues that affect the offshore pipeline industry worldwide. This will be accomplished by breaking out the attendees into various working groups to facilitate parallel discussions of all major industry issues. Working groups will be further broken down into sub-groups to maximize the coverage of major issues. This will allow individual attendees ample opportunity to provide their input and insights to actively participate in workgroup discussion. All efforts of the individual working groups will culminate into an open panel Issues Conference that will meet in general session on the last day of the workshop. The panel will assimilate the results of each workgroup and provide direction for future discussion and research and practice.

WORKING GROUPS

At the heart of the workshop format is the Working Groups. Multiple Working Groups provide efficient use of workshop time by allowing simultaneous discussion on a variety of offshore pipeline issues. Each working group is tasked with answering the following questions:

- What are the most significant improvements / successes in the last five (5) years
- What is the present state-of-practice?
- What are the most significant problems / issues that currently limit project successes in applications of technology.
- What improvements can be made?
- What research is necessary?
- What interfaces are there with other working group topics, and how can these be dealt with?
- Are current codes and standards adequate?
- What are the regulatory implications of the working group's conclusions?
- What preventative measures or safeguards can be implemented to protect information and site security?

Each Working Group is designed to allow maximum interface between workshop registrants and industry experts leading the working group discussions. The following working groups are proposed to cover the widest range of topics during the workshop:

- Working Group 1 – Design / Certification
- Working Group 2 – Installation
- Working Group 3 – Risk
- Working Group 4 – Inspection / Leak Detection
- Working Group 5 – Maintenance
- Working Group 6 – Repair / Integrity Assessment
- Working Group 7 – Permitting

Participants are encouraged to attend more than one working group session during the course of the workshop as their interest dictates. Several Working Groups will have multiple round table discussions within a session to further maximize issue coverage and participation from registrants.

WORKSHOP FORMAT AND ITINERARY

The International Offshore Pipeline Workshop 2003 will be a 2 ½ day event that will be modeled after the successful pipeline workshops supported by the MMS over the last decade. The format is designed for maximum interface between participants and workgroup leaders, maximum coverage of issues, and efficient transfer of knowledge between Working Groups.

TENTATIVE PROGRAM:

WEDNESDAY FEBRUARY 26, 2003

07:30am.– 09:00am.	Registration
09:00am.– 09:10am.	Welcome / Introduction – Ken Breaux – Project Consulting Services Inc. – Executive Vice President
09:10am.– 09:30am.	Opening Remarks – Chris Oynes Minerals Management Service –GOM Regional Director
09:30am.– 09:50am.	Opening Remarks – James O'Steen – U.S. Department of Transportation RSPA OPS Deputy Administrator for Pipeline Safety
09:50am.–10:10am.	Opening Remarks –Dick Van Laere – Shell Pipeline Co.LLP Offshore Business Manager
10:10am.– 10:30am.	Break
10:30am.– 11:00am.	Keynote Address – John Somerhalder – El Paso Corp – President – Pipeline Perspective from a Global Viewpoint
11:00am.– 12:00pm.	Introduction to Working Groups – Working Group Chairs
12:00pm.– 01:30pm.	Lunch Break
01:30pm.– 03:30pm.	Working Group Breakout Sessions
03:30pm.– 04:00pm.	Break
04:00pm.– 04:30pm.	Keynote Address – David McKeehan – INTEC Engineering Senior Vice President
04:30pm.– 05:00pm.	Keynote Address – Jerry Wenzel BP Mardi Gras Transportation System, Inc Project Manger – Mardi Gras Pipeline
06:00pm.– 08:00pm.	BP Mardi Gras Transportation System Networking Event

THURSDAY, FEBRUARY 27, 2003

08:00am.– 08:30am.	Coffee
08:30am.– 08:40am.	Introduction - Ken Breaux - Project Consulting Services, Inc Executive Vice President
08:40am.– 09:00am.	Opening Remarks – James A. Slutz U.S. Department of Energy Deputy Assistant Secretary for Natural Gas and Petroleum Technology
09:00am.– 09:30am.	Theme Presentation – Lawrence Tebboth – BP – Flowline Coordinator – High Temperature Tie-Backs
09:30am.– 10:00am	Theme Presentation – Dr. Tim Ingram U.K. Health and Safety Executive UK Pipeline Safety Post Piper Alpha

10:00am.– 10:30am.	Break
10:30am.– 12:00pm.	Working Group Breakout Sessions
12:00pm.– 01:30pm.	Lunch Break
01:30pm.– 03:00pm.	Working Groups Breakout Sessions
03:00pm.– 03:30pm.	Break
03:30pm.– 05:00pm.	Working Group Breakout Sessions

FRIDAY, FEBRUARY 28, 2003

08:00am.– 08:30am.	Coffee
08:30am.– 09:00am.	Theme Presentation – Dr. William H. Hartt Florida Atlantic University Center for Marine Materials Critical Cathodic Protection Issues for Deepwater Pipelines
09:00am.– 09:30am.	Keynote Address – Thor A. Tangen – Norsk Hydro Senior Vice President / Project Director – Ormen Lange
09:30am.– 10:00am.	Keynote Address – Jack Lucido – El Paso Blue Atlantic Pipeline System
10:00am.– 10:30am.	Break
10:30am.– 12:00pm.	Working Group Report-Outs

WHERE AND WHEN

Where: New Orleans Marriott Hotel in the historic
French Quarter, 555 Canal Street
New Orleans, LA

When: February 26 – 28, 2003

SPONSORSHIP

Sponsorships are currently being solicited to help fund the cost of organizing and conducting this workshop. Listed below are ways that you can contribute to the success of the workshop and the benefits associated with each level:

General Sponsorship

Primary Sponsor - Minimum contribution of $10,000

- Prominently listed on the workshop web page with a link to your company's web site
- Prominently listed on all workshop promotional material and program material
- Prominently displayed as a sponsor during the event
- Prominently listed in the workshop proceedings
- Guaranteed participation in the Workshop Steering Committee
- Four (4) complimentary registrations
- Exhibit space

Supporting Sponsor - Minimum contribution of $5,000

- Listed on the workshop web page with a link to your company's web site
- Listed on all workshop promotional material and program material
- Displayed as a sponsor during the event
- Listed in the workshop proceedings
- Two (2) complimentary registrations
- Exhibit space

Workshop Exhibitor - Minimum contribution $3,200

- Acknowledgement in workshop proceedings
- One (1) complimentary registration
- Exhibit space

Workshop Benefactor - Minimum contribution $1,000

- Acknowledgement in workshop proceedings
- Every $3,000 earns two (2) complimentary registrations

FOR MORE INFORMATION

If you would like to learn more about the workshop and how to become a workshop sponsor please contact:

International Offshore Pipeline Workshop 2003
c/o Project Consulting Services, Inc.
3300 W. Esplanade Ave. S., Suite 500
Metairie, LA 70002
Phone (504) 833-5321 Fax: (504) 833-4940
Email: workshop2003@projectconsulting.com
www.projectconsulting.com/workshop2003

A Ten Year Retrospective

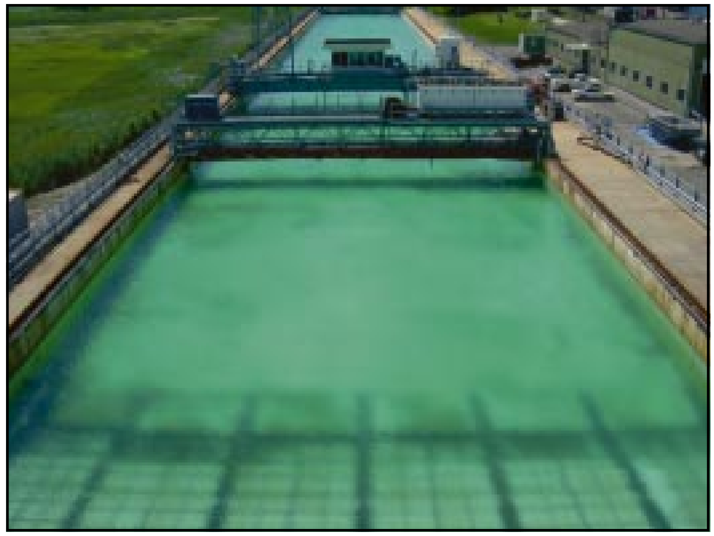
Ohmsett--The N Test Facility

Ohmsett Gazette

Leonardo, New Jersey | Train with oil. Test with oil. | Fall/Winter 2001

That was then... this is now.

The Ohmsett test basin in 1991



The test basin in 2001

1992: the MMS sign goes up on the Ohmsett control tower.

The year was 1992. The Ohmsett program manager wanted a red, white, and blue ribbon for a ribbon cutting ceremony.

Minerals Management Service had just awarded Mar, Inc. a contract to operate the Ohmsett facility--and the occasion for the ribbon cutting ceremony was the official rededication of the Ohmsett test basin.

The July 1992 ceremony marked the completion of a two year restoration effort that made Ohmsett a useable test facility again. The 1.5 million dollar restoration was initiated and funded by Minerals Management Service, with additional financial support from the U.S. Coast Guard and Environment Canada.

Dozens of state and federal officials attended the ceremony, and New Jersey state senator Frank Lautenberg cut the ribbon. Speaking at the ceremony, assistant secretary of the Navy Jaqueline Schafer said, “Ohmsett will once again be an important part of the nation’s environmental protection arsenal.”

It was hard to believe that just two years before, the Ohmsett test basin had lain abandoned and decrepit.

The First Years

The Ohmsett facility (Ohmsett is an acronym for Oil and Hazardous Materials Simulated Environmental Test Tank) was built in the early 1970’s by the U.S. EPA.

Continued on page 3

In the aftermath of the tragic events of September 11, 2001, our hearts and prayers are with all those who have lost so much, and with those who have faced the disaster with unwavering courage.

We at Ohmsett appreciate all of the customers who have come to us for testing and training throughout the years.

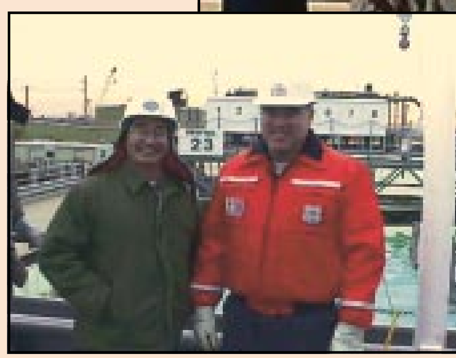
Thank you, customers!
- The Ohmsett Staff

Government Agencies

- Alaska Department of Environmental Conservation
- Canadian Coast Guard
- Environment Canada
- National Oceanic & Atmospheric Administration
- New Jersey Department of Environmental Protection
- US Army, Cold Regions Research and Engineering Laboratory, Corps of Engineers
- US Coast Guard - National Strike Force
- US Coast Guard - Headquarters
- US Coast Guard - Research and Development Center
- US Department of Interior, Minerals Management Service
- US Navy
- US Navy, Naval Facilities Engineering Services Center (NFESC)
- US Navy, Naval Weapons Station Earle
- US Navy, Space and Naval Warfare Command (SPAWAR)
- US Navy, Supervisor of Salvage (SUPSALV)

Universities

- Massachusetts Institute of Technology, Lincoln Laboratory
- Texas A&M University, National Spill Control School
- University of Miami
- University of New Hampshire
- University of Rhode Island



Manufacturers / Private Industry

- Alaska Clean Seas
- Applied Fabric
- Canflex Inc.
- Costner Industry Nevada Corp.
- Computer Science Corp.
- Douglas Engineering
- Earth Canada
- Ericam Entertainment
- Engineered Fabrics Corp.
- Elastec / American Marine Inc.
- Exxon-Mobil Corp.
- FibreSorb
- Frank Mohn AS
- Foilex
- Goo-Gobbler
- HESB
- Hyde Marine
- HydroGrowth
- JBF Environmental Systems, Inc.
- Kepner Plastics Fabricators, Inc.
- Lancer Industries Inc.
- LPI Corp.
- MAR, Inc.
- Marine Spill Response Corporation
- MARCO Pollution Control
- Mycelx Technologies
- NOFI Tromsø AS
- Oil Stop, Inc.
- OSR Systems LTD
- Pacific Link Environmental, Inc.
- PCCI/GPC
- Product Services Marketing Group
- PTC Enterprises
- Qualitec
- Slickbar Inc.
- SL Ross Environmental Research
- Spilled Recovery Systems (SRS)
- Spill-Tain DIV-M.C.D. Company
- Spiltec
- Radar Systems Technology
- RO Clean Desmi
- Webster Barnes Inc.

That was then...

Continued from page 1

From 1974 to 1987 the facility saw extensive use. But, by the late 1980's, interest in oil spill response technology diminished and testing at Ohmsett waned. Finally, the EPA closed the facility in September 1988.

Then, in March 1989, just a few months after Ohmsett closed, the Exxon Valdez ran aground in Prince William Sound, Alaska. That oil spill was one of the largest in U.S. history, in one of the nation's most environmentally sensitive areas.

Suddenly, everyone was aware of the need for continuing oil spill technology development.

In 1990, Minerals Management Service began the restoration of Ohmsett, and the Oil Pollution Control Act of 1990 formalized and mandated the use of Ohmsett as a testing facility.

By July 1992, Ohmsett was up and running again.

The Next Ten Years

In the ten years following Ohmsett's reopening, the facility has seen several further refurbishments, a multitude of new testing capabilities, and a steady increase in the number of testing days.

A month after the July 1992 rededication ceremony, a skimmer was tested in the test basin, followed by another skimmer test in October. Both tests were for the US Coast Guard.

In 1993, two skimming systems were tested. The 1994 testing season included two tests: an inflatable barge and a frequency-scanning radiometer.

And, in 1994, Ohmsett performed a test on itself, studying the effects of clearance between test basin side walls and booms being tested.

In 1995, five systems were evaluated in 80 days of testing. And for the first time since the refurbishment, a private company, HydroGrowth International, used the Ohmsett test basin to demonstrate their sorbent system.

In 1996, MMS again awarded Mar, Inc. the contract to operate the Ohmsett facility. The Ohmsett program manager who had been with the facility since 1992 left, and a new program manager came on board.

The pace picked up. Six tests were performed in the Ohmsett test basin that year, and eight were performed the next, 1997.

1997 was the year a 30-seat classroom was added and both USCG and Texas A&M National Spill Control School classes were offered at Ohmsett for the first time.

1998 brought more exciting developments. SL Ross Environmental Research, GPC, and Ohmsett technicians rigged an underwater propane bubbling system in the test basin, allowing first-ever tests of boom blankets in actual flames.

Ohmsett representatives began the long process of developing a standard testing protocol for spill control equipment to be presented to (and ultimately approved by) the American Society for Testing and Materials Committee on Hazardous Substances and Oil Spill Response.

Ohmsett's program manager earned a corporate leadership award for improving the safety, efficiency, and environmental sensitivity of Ohmsett operations.

And the first issue of the Ohmsett Gazette, featuring an aerial photo of the test basin, went out to over 3000 people involved in the oil spill response industry.

During the following year, 1999, MMS presented Ohmsett with a safety award for no accident-related lost work days for seventeen months.

Ohmsett and SL Ross Environmental Research began an MMS-funded study to explore the feasibility of using the Ohmsett test basin to test dispersants.

The old bridge house was removed and replaced with a brand new one, and Ohmsett purchased a new oil/water separator.

And, in November 1999, an international cadre of oil spill professionals descended upon Ohmsett for a viscous oil pumping workshop to explore the issues presented when lightering viscous oil from ship to shore.

In 2000, a report authored by SL Ross and Mar, Inc. reported that dispersant testing is feasible at Ohmsett. For the first time, a test involving dispersants was performed in the test basin. Also, Ohmsett test basin wavemakers created emulsions for an emulsion behavior study.

Ohmsett marked the millenium with 131 test days, the maximum to date.

What does the future hold for Ohmsett? Ohmsett electronics technician Don Backer, who's been with the facility for ten years, put it like this: "We've been changing since we've been here, and possibly always will. And the place needs to be that way."

Award-Winning Ohmsett

Ohmsett Wins Safety Award...

For the second year in a row, the US Department of the Interior has awarded the Ohmsett facility with a Safety Award of Merit.

The award recognized Ohmsett's outstanding safety and occupational health program.

The Ohmsett staff's daily work is inherently dangerous. Staff manipulate heavy equipment, work with various oils, and operate a propane burning system.

In addition, an increase in the number of Ohmsett test days means that staff have worked under these conditions for an increasingly greater number of days during the year.

Yet, despite these risks, Ohmsett staff have incurred no lost time injuries for almost three and a half years, thanks to an aggressive safety program at the facility.

Staff time is dedicated on an ongoing basis to reviewing safety procedures, and facility safety committee meetings are held monthly. A licensed industrial hygienist briefs staff before particularly dangerous tests, and reviews new testing procedures.

... And Wins Environmental Award

In a ceremony planned for September 20, 2001, in Washington, DC, representatives from the US Department of the Interior presented Ohmsett staff with a 2001 Environmental Achievement Award.

The award recognizes organizations for their environmentally aware policies and contributions. Ohmsett was recognized for its oil and scrap metal recycling programs.

The Ohmsett staff are proud of this achievement and will continue their environmentally friendly procedures!

Ohmsett

Oil Pollution Act of 1990 mandates the use of Ohmsett as a testing facility for oil spill control technology.

Ohmsett holds a rededication ceremony and operations at the facility begin again!

Ohmsett operators receive a US Department of the Interior safety management award.

MAR, Inc. wins recompe
to operate the Ohmsett
facility for another 5 ye

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1990 1992 1994 1996

1991 1993 1995

MAR Inc. is contracted by MMS to operate Ohmsett.

Ohmsett operators upgrade the facility's systems.

US Department of the Interior Minerals Management Service begins a 1.5 million dollar refurbishment effort at Ohmsett.

(Photo courtesy of USCG)

Ohmsett studies test basin sidewall effects.

Milestones

BillThomas--MMS CO, Jim Lane--MMS COTR, and Bill Schmidt--Ohmsett program manager

tition

ears

sett's computer data
ction systems are
aded. Facility buildings
test basin undergo major
rbishments.

For the first time, Ohmsett staff plan, organize, and implement a US Coast Guard indoctrination "boot-camp" training program.

ASTM F-20 committee approves a new ASTM standard guide, developed by Ohmsett staff, for evaluation of oil boom performance in controlled environments.

Ohmsett conducts its first test with dispersants in the test basin.

1998

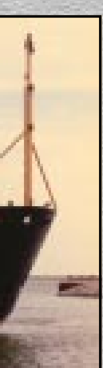
2000

2002

1997

1999

2001



In another first, Ohmsett evaluates the oil containment pumping systems on the USCG cutter Juniper. Ohmsett staff provide system training with oil for the Juniper crew on site at the end of a pier.

Ohmsett sees 131 testing days this year. The most to date!

Ohmsett evaluates a fire blanket using a new propane burn system. Another Ohmsett first!

Ohmsett receives another US Department of the Interior safety management award.

Ready, Set, *Test!*

First, Maintenance

Months of heavy testing with waves, crude oil, and dispersants left the Ohmsett test basin in need of serious cleaning.

Last winter, USCG Atlantic Strike Team members and Ohmsett staff emptied the test basin to power-wash the basin walls and repair cracks in the basin.

They also gave the bridges a fresh coat of paint and replaced the bridge cables and wheels.

At the test basin, they replaced the wave flaps, cleaned the filter, and updated the underwater camera equipment.

That done, water pumped in from Sandy Hook Bay refilled the tank in time to resume a busy testing schedule in May 2001.

Down to EARTH

EARTH Canada tested its TORR (Total Oil Removal and Recovery) system at Ohmsett in July 2001, in conjunction with SL Ross Environmental Research of Ottawa, Canada.

The TORR is a filter system designed to effectively reduce the oil content of fluids recovered during oil spill cleanup operations.

Reducing the oil content of recovered fluids to permissible discharge limits increases recovery effectiveness and frees up scarce space in on-site storage tanks.

The system worked so well, Ohmsett staff asked to keep the unit at the facility for a few more weeks to help filter the test basin water.

The TORR unit

On Spill Watch

In May 2001, John Andrews of the US Navy SPAWAR Systems Center in San Diego returned to test the Navy's Spill Watch Sensor at Ohmsett.

The Spill Watch Sensor uses an ultraviolet fluorometer in a floating buoy to detect petroleum-based material upon or within a 12-inch water column.

When it detects petroleum, the sensor "tells" a base computer to telephone a list of users. The system sends data on the nature and extent of the spill when the phone call is answered.

Andrews evaluated the Spill Watch Sentry #8017 in the Ohmsett test basin, allowing the sensor to detect and report on several petroleum product spills in varying wave conditions.

For more information about the Spill Watch Sentry, see Applied Microsystems' website at www.appliedmicrosystems.com.

More Emulsions

Environment Canada researchers came to Ohmsett in July and August 2001 for Phase III of emulsion tests begun a year ago at the facility. (See *The Ohmsett Gazette*, Fall/Winter 2000.) They will be back in October 2001 for Phase IV.

The aim is to learn more about the emulsification process at sea. Ohmsett's test basin waves, which simulate conditions in the open ocean, mixed oil into an emulsion. Researchers took samples at specified times to identify changes in oil/emulsion properties. Phase III and IV of the tests will complete Environment Canada's emulsion testing.

USCG Trains Again

For many years now, the US Coast Guard has used the Ohmsett facility to conduct training sessions for its oil spill response crew.

Once again, in June and August 2001, the Coast Guard held its Oil Spill Responder Training, and, in September 2001, will conduct an indoctrination and lightering course as a sort of "boot camp" for incoming National Strike Force personnel.

Decant, Phase II

In July 2001, SL Ross Environmental Research came to Ohmsett for Phase II of an MMS-funded decant study.

During oil spill cleanup, water recovered along with the oil reduces the available capacity of storage tanks, slowing operations and increasing the amount of fluid to be disposed of. The goal of the research is to optimize storage capacity by minimizing the volume of free water.

Phase I of the study was reported on in *The Ohmsett Gazette*, Spring/Summer 1999 issue. In Phase II, researchers added an emulsion breaker to the skimmed oil and water to speed up primary break and allow more water to be decanted.

Through an agreement with SL Ross, EARTH Canada also evaluated their TORR unit (see *Down to EARTH*, this issue) during this test. The water separated by the emulsion breaker was sent to the TORR unit for further filtering.

Navy Back to Test

The United States Naval Facilities Engineering Services (NFESC) continued its skimmer evaluations at Ohmsett in the spring and summer of 2001.

The NFESC tests will help the Naval Facilities Engineering Command (NAVFAC) Oil Spill Response Program become savvy skimmer shoppers as they consider skimmers to buy and distribute to naval shore facilities.

The Navy is particularly interested in finding skimmers suited for typical Navy oil spills, which usually are relatively small, involve light fuel oils, and tend to occur around piers.

NFESC tested five other candidate skimmers at Ohmsett last year. (See *The Ohmsett Gazette*, Fall/Winter 2000)

In May and August 2001, NFESC tested the HIB R-20, the Marco, and the Kepner Sea Vac. Douglas Engineering, and Applied Fabrics, performed additional tests concurrently.

In September 2001, NFESC will test a redesigned, advancing Goo Gobbler (a stationary version was tested last year.)

MORICE Skimmer To Be Tested

The Program for Mechanical Oil Recovery in Ice-Infested Waters (MORICE) was initiated in 1995 to develop technologies for the effective recovery of oil spills in ice infested waters. MORICE is a multinational effort involving Norwegian, Canadian, and American researchers.

Four different recovery units have been tested with the Lifting Grated Belt in oil and ice at the Hamburg Ship Model basin, Germany, in May 2000. Later on, in October 2000, during freeze-up in Prudhoe Bay, Alaska, the ice processing capability was tested for the entire MORICE prototype, including three different recovery units.

In May 2001, the MORICE prototype was field tested in Svea, Norway, and now plans are underway to test and evaluate the skimmer at Ohmsett with the test basin blanketed in ice. The Minerals Management Service (MMS) is currently expanding and upgrading the capabilities of Ohmsett to offer cold water testing and training.

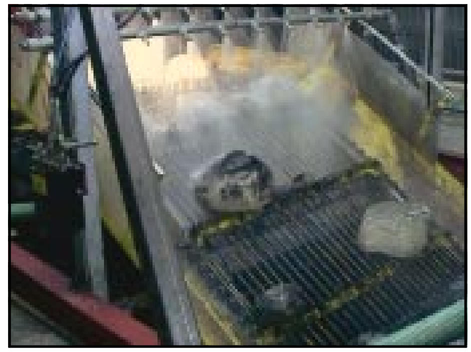
Developing these capabilities will enable Ohmsett to stay operational year round, which is the main objective for the MMS. We will be able to provide a controlled environment simulating cold water and/or realistic broken ice conditions.

Successful simulation of ice environments at Ohmsett presents new testing capabilities and could open the way for testing on- and under-ice remote sensing, in-situ burning in broken ice, and dispersant effectiveness testing in cold water.

The Ohmsett test engineers and specialized consultants will define the testing parameters and incorporate them into a standard test protocol and plan for use during the testing of the MORICE prototype and the three recovery units.

The MORICE test is scheduled for January 2002. This is the best time to perform the tests and the chilliest for the Ohmsett staff to be working outside. Staff will be educated on health and safety issues to prepare for working in the harsh winter weather. Oil in ice testing will be another new and exciting test capability for Ohmsett.

This article was written and contributed by Joseph Mullin, of the Minerals Management Service



MORICE prototype is evauluated

News Briefs

High Tech

Each summer, Ohmsett staff become teachers when they participate in the Monmouth County, New Jersey, High Technology High School summer program for seventh and eighth grade students.

Students are selected for the program based on their high academic achievement and interest in the technology sciences.

High Tech students observe testing

Ohmsett staff visit the school to present a lecture on Ohmsett and oil spill cleanup. Later, students tour the Ohmsett facility and see spill equipment testing for themselves.

Shortly after the tour, students devise working models of oil containment booms and skimmers, then present their research results to teachers, parents, and those who've helped with the program.

Ohmsett also participates in High Tech High's mentorship program. Seniors from the high school are assigned to various organizations where they are guided by staff as they work part-time for a semester and receive class credit.

The Ohmsett staff are pleased to be involved with these bright, motivated students and anticipate participating in the program for years to come.

NJDEP Reps Visit

Ohmsett program manager Bill Schmidt gave officials from the New Jersey Department of Environmental Protection a tour of the Ohmsett facility in July 2001.

Commissioner of the NJDEP Robert Shinn, and NJDEP director of program coordination Lawrence Schmidt, NJDEP director of discharge response Robert Van Fossen, and NJDEP discharge prevention chief Robert Kotch toured the facility, and observed Environment Canada's emulsion experiments in the Ohmsett test basin.

Furniture and Ficus

After so many years of use, if the walls of the Ohmsett conference rooms and classrooms could talk, they would probably say, "Paint me!"

In late August, upgrades to those rooms began. The walls got that paint job, the tired out furnishings were replaced, and a new carpet was installed.

To top it off, a couple of ficus trees now enliven the atmosphere.

To reserve a space for your meeting in the refurbished conference and training rooms, call the Ohmsett facility at 732-866-7183.

The Ohmsett Gazette is published by Ohmsett--The National Oil Spill Response Test Facility--to update our readers on activities at the facility. For more information, call: (732) 866-7183.

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Visit Ohmsett: The National Oil Spill Response Test Facility

For more information about testing and training at Ohmsett, or to schedule a tour of the facility, call

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Visit our web page @ http://www.ohmsett.com

Train with oil

Test with oil

Ohmsett Facility
MAR, Inc.
PO Box 473
Atlantic Highlands, NJ 07716
(732) 866-7183

Ohmsett--The National Oil Spill Response Test Facility

The Ohmsett Gazette

Leonardo, New Jersey | Train with oil. Test with oil. | Spring/Summer 2002

U.S. Minerals Management Service Awards Ohmsett Contract to MAR

On January 28, 2002, the Department of the Interior, Minerals Management Service announced the award of the contract to operate Ohmsett (from February 2002 through 2005) to MAR, Incorporated.

MAR is a professional services firm based in Rockville, MD. The company specializes in engineering, marine services, biotechnology, facilities management, and information technology.

This is the third successive time that MMS has awarded MAR a contract to operate the Ohmsett facility. MMS also awarded MAR the contract to operate Ohmsett for 1992 through 1996, and 1996 through January 2002.

Ohmsett, the National Oil Spill Response Test Facility, is located in Leonardo, NJ. The facility consists of a large test basin (667 feet long by 65 feet wide by 8 feet deep), offices, maintenance shop, and classrooms.

Ohmsett was originally built and maintained by the EPA. Shortly after the EPA discontinued the operation of the facility, the Department of the Interior contracted MAR in 1991 to refurbish and continue operation of the facility.

Continued on page 6

What's Inside

Weather Report: Ice, Ice, and MORICE

The MORICE skimmer awaits testing at the edge of the Ohmsett test basin.

One cool day last January, researchers and technicians surveyed enormous blocks of ice floating in the water of the Ohmsett test basin.

Blocks of ice in the water are not a usual sight at the Ohmsett test basin. Researchers were, in fact, conducting a first time ever winter test at Ohmsett with MORICE, a skimmer designed to recover oil in ice infested waters.

Oil recovery in ice infested waters can be difficult. Conventional booms and skimmers just push the oil out of the way along with the ice.

The MORICE (for Mechanical Oil Recovery in Ice Infested Waters) skimmer moves pieces of ice out of the way, then recovers the oil left behind.

Spray jets wash the ice chunks clean of oil as they move along a conveyor.

The ice pieces themselves are "washed" to recover the oil coating them.

The MORICE skimmer is lowered into the water between two pontoons, like a catamaran. As the skimmer moves through the

Continued on page 2

MORICE
Continued from page 1

water, it pulls the pieces of oily ice (some weighing as much as a thousand pounds) onto a belt like a hay bale conveyor.

Jets of water clean the oil off the ice as the chunks move along the conveyor, and the clean ice is propelled out the back of the skimmer into the water.

Hans Jensen, project manager, watches as the ice passes on the conveyor.

With the ice out of the way, a recovery unit under the conveyor picks up oil that was between the ice chunks. That oil, and the oil sprayed off the ice, is recovered by brushes on the bottom of the skimmer and pumped into tanks.

The Ohmsett MORICE tests marked the first time Ohmsett's test basin has been used during the winter months, and the first time the MORICE unit has been tested with oil in broken ice in the controlled conditions of an outdoor test basin.

Previous MORICE prototype tests took place at a smaller indoor tank in Hamburg, Germany and in Prudhoe Bay, Alaska.

The results of the MORICE prototype tests were "encouraging", according to Joseph Mullin, MMS's senior technical advisor for oil spill response research.

MORICE's development has been the result of a multinational effort involving Norwegian, Canadian, American and German researchers.

Hans Jensen, from SINTEF Applied Chemistry, is the project manager. SINTEF Applied Chemistry, a research organization based in Trondheim, Norway, specializes in environmental engineering and helped design and test the original MORICE unit.

Currently, the MORICE project is funded by the US Department of the Interior Minerals Management Service, Alaska Clean Seas, the Prince William Sound Oil Spill Recovery Institute, BP Exploration Alaska, Phillips Alaska, Inc., Store Norske Spitsbergen Kulkompani, and Norsk Hydro.

MORICE researchers initially developed ten concepts with the potential to recover oil in ice, and evaluated these concepts at laboratories in Trondheim, Norway and Hamburg, Germany in 1996.

Between 1997 and 2001, researchers tested various configurations and prototype recovery systems in Norway, Germany, and Alaska.

Testing of the full-scale prototype and two internal recovery systems (the MORICE unit and the LORI brush skimmer) at Ohmsett in January 2002 was the culmination of five years of international research.

Testing at Ohmsett allowed all MORICE subcomponents to be integrated and tested together with oil and ice for the first time.

Joe Mullin of MMS, Andre Chen of Exxon-Mobil, and Bill Schmidt, Ohmsett program manager, on site at the MORICE tests

The tested prototypes showed potential for development into efficient oil-in-ice recovery equipment.

While testing did not indicate how severe ice conditions might be handled, scaling up the concepts tested could increase the capacity to process ice and recover oil, as well as work in more severe ice conditions.

Results of the MORICE tests were presented in June 2002 at the Arctic and Marine Oil Spill Technical Seminar (AMOP), and will be presented at the International Oil Spill Conference (IOSC) in Vancouver, Canada in April 2003.

The Big Chill: Preparing for Cold Water Testing

The ice blocks used in the MORICE tests were created at the US Army Corps of Engineers Cold Regions Research and Engineering Lab (CRREL) in Hanover, New Hampshire.

It takes four or five days to "grow" a sheet of ice at the CRREL basin. When the sheet destined for Ohmsett was the right thickness, it was cut into slabs weighing 480 pounds each.

The slabs were then stacked, wrapped, and loaded onto a refrigerated tractor-trailer for shipment. Upon arrival at Ohmsett, the ice was forklifted into refrigerated containers.

Meanwhile, Ohmsett staff got to work cooling the test basin water.

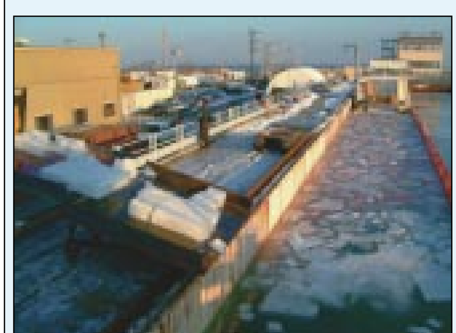
A 525-ton portable chiller was installed. Basin water taken from the filter discharge was piped through the chiller and returned to the tank. Within a few days, the system cooled the water to 0 degrees centigrade.

Ohmsett technicians adjusted the chiller temperature daily. Despite unusually warm air temperatures, the water temperature consistently remained around 0 degrees centigrade.

Getting the ice into the test basin was the next challenge. The ice slabs were loaded onto a specially designed platform fitted to a forklift, and taken to the side of the test basin.

There, Ohmsett staff chopped the slabs into 2-foot by 2-foot chunks, and smashed some slabs into smaller pieces.

Finally, the mix of ice pieces was lifted and tipped onto a steel chute--sliding, at last, into the Ohmsett test basin water.



Making a splash ... ice chunks slide down a metal chute into the test basin.

"Real Life. Real Problems. Real Solutions."

BP Alaska Trains at Ohmsett

In April 2002, BP Alaska oil spill responders (along with a student from Alyeska Pipeline Service Co.) came to New Jersey for a five-day spill response training in the Ohmsett test basin.

The course curriculum was modified to meet the needs of BP Eastern Operational Area and Western Operational Area staff who specialize in both inland (pipeline and rivers) and ocean (buffered and open seas) oil spills.

This course offered students hands-on training with full-scale skimming equipment in the test basin using light and heavy oils, as well as classroom lectures.

The course also included a field trip to the Clean Harbors Cooperative in Linden, New Jersey.

Ohmsett runs customized training courses of this type on a regular basis. Feedback from students is invaluable when planning the curriculum for future training courses. Ohmsett staff are always interested to hear students' reactions to the training classes.

In this case, BP Alaska responders said that just getting into the test basin with real oil, real waves, and real equipment provided a great experience.

"The ability to utilize the wavemaker while skimming oil in the tank was beneficial," commented one student. "Flat water is ideal for skimming, but that's not always reality!"

"The hands-on oil spill experience was great," said another student. "There is real value in doing both light and heavy oil. The equipment that skimmed light oil did not work on heavy oil and it was great to physically demonstrate this."

Some students particularly appreciated that this customized course included a lecture by NOAA officials, and a tour of the Clean Harbors Coop.

"The NOAA lecture was very interesting," commented a student. "And the tour to the Clean Harbors facility was awesome."

The Ohmsett staff thank these students for making that work week so much fun. We encourage interested parties to contact us for information about training at Ohmsett.

As part of the hands-on training portion of the course, BP Alaska students set up a pump...

Assembling a hydraulic power pack

"The hands-on oil spill experience was great. The equipment that skimmed light oil did not work on heavy oil and it was great to demonstrate this."

- BP Alaska student

... and get to work pumping oil out of a boomed area.

**During a test or training session, the Ohmsett facility is alive wit
Here's a glimpse at what goes on .....**

Behind the Scenes at Ohmsett

Maintenance

Keeping the facility in top shape is an on going project. A computer software program that dictates what maintenance must be done, and when, helps.

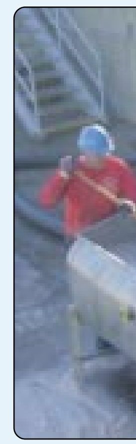
Ohmsett technician John McCall, IV removes the test basin water filter leaves for cleaning.

The test basin is emptied of water so Ohmsett staff can make repairs and clean the tank walls.

Test Preparation

**Before a test can begin, Ohmsett sta
calibrate instruments, monitor test b
and receive, inspect, and set up equ
Ohmsett for the test.**

Dave Knapp, Ohmsett technician, readies a skimmer belt drive pulley for a test.



**Ohmsett te
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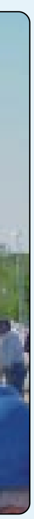
brine to adjust the test basin water



When testing is over, technicians recycle the used oil, remove and power-wash the equipment, and filter the test basin water.

Technicians hoist a skimmer above the test basin with the aid of a crane.

Community Outreach

From tours of the facility and mentorship programs for high school students...

Ohmsett program manager Bill Schmidt conducts a facility tour for junior high school students.

Frank Arban, an Ohmsett mentorship student, talks about oil spills to a class.

... to making presentations at marine and oil spill conferences and exhibitions around the world...

Joe Mullin, from MMS, and Bill Schmidt, Ohmsett program manager, man the Ohmsett booth at the Interspill 2002 Trade Show in Brest, France.

... Ohmsett staff regularly move outside the realm of the facility into the community.

Dispersants Tested in Cold Water

In February and March, following the MORICE testing, researchers took advantage of the icy waters of the Ohmsett test basin to run cold water dispersant tests.

There are concerns that dispersants may not be effective on oil spills, especially those that could take place in the colder months. Oil spills in cold water/ice prone environments pose particular challenges.

Concern over the safe exploration, production and transport of oil in Arctic environments has led to increased interest in the use of dispersants for spill response.

Between February 25 and March 14, 2002, the US Minerals Management Service and Exxon-Mobil Research and Engineering Co. contracted SL Ross Environmental Research Ltd. of Ottawa, Canada to conduct a series of dispersant tests at Ohmsett.

The purpose of the tests was to evaluate the effectiveness of Corexit 9500 and Corexit 9527 dispersants on Hibernia and Alaska North Slope (ANS) crude oils in cold water/broken ice conditions. These oils are commonly transported in cold waters, and thus likely to be the type of oil involved in a cold water spill.

Small scale test results show that dispersants should be effective on Alaska North Slope crude oil even in the cold waters of Prince William Sound in winter months. Results from small scale testing, however, do not incorporate sufficient real-world situations.

Controlled field studies, while valuable for realism, are expensive and often very difficult to implement because of regulatory barriers.

Large scale tank studies, conducted at Ohmsett, provide a critical link between small-scale laboratory and field studies because they can simulate real-world exposures without the cost and consequences of a field experiment.

In the Ohmsett experiments, both crudes were evaluated in a fresh state (0% evaporated) and at two weathered conditions. The evaporations were prepared using air sparging. Oil was discharged and dispersant sprayed in a single pass of the main bridge. Water temperature was maintained at 1 degree centigrade.

The Ohmsett tests were significant because they demonstrate that Corexit 9500 and Corexit 9527 are effective in dispersing Hibernia and ANS crude oils in cold water and verify the results from laboratory and small scale tests.

Final results were presented in June 2002 at the Arctic and Marine Oil Spill Technical Seminar in Calgary, Canada and will be presented at the International Oil Spill Conference in Vancouver, Canada in April 2003.

Nozzles are positioned for applying dispersants during testing.

The dispersants are sprayed on the oil slick.

Ohmsett test basin waves mix oil with dispersants.

Contract Award

Continued from page 1

According to Joseph Mullin, Senior Technical Advisor for the MMS Oil Spill Research Program, "MAR prepared a superior technical proposal."

"That, and their successful track record in managing the Ohmsett facility for the past ten years, were crucial in the decision to award a third successive five-year contract to MAR," said Mullin. "They were the clear choice."

Mike Norcio, MAR chairman and CEO, with Bill Schmidt, Ohmsett program manager, at the contract award dinner.

Under the new contract, MAR will continue to conduct oil spill response technology evaluation, research, and training for private companies, government agencies, and universities.

The Ohmsett facility plays a critical role in developing the most effective response technologies as well as preparing responders with the most realistic training before an actual spill.

Testing and research at Ohmsett provides the opportunity to evaluate oil recovery and containment capabilities, sea keeping abilities,and performance of various oil spill response equipment in repeatable conditions.

Information derived from Ohmsett tests is used in making regulatory decisions pertaining to permit and plan approvals, safety and pollution inspections, enforcement actions, and training requirements.

Interested in learning more about the facility? Contact Bill Schmidt, Ohmsett's program manager, at (732) 866-7183, or by e-mail at ohmsettnj@monmouth.com.

News Briefs

NOAA/MMS Conduct Oil Weathering Workshop

On April 17 and 18, 2002, representatives from the U.S. Department of the Interior Minerals Management Service , along with representatives from the Office of Response and Restoration of the National Oceanic and Atmospheric Administration, conducted a joint workshop on longer term weathering behavior of oil slicks.

Joining MMS and NOAA at the workshop were representatives from government agencies, universities, and private companies. Spill experts from the US Environmental Protection Agency, Fisheries and Oceans Canada, Environment Canada, the Skidaway Institute of Technology, Louisiana State University, Exxon-Mobil, Payne Environmental Consultants, AEA Technology, and Innovative Ventures participated.

Recently, as the oil and gas industry rapidly expand operations into deep waters, government and private agencies have become aware that more attention must be paid to what would happen in the event of a deepwater spill.

The MMS/NOAA workshop served to initiate discussion among participating spill experts about the behavior of large open water slicks, what is known about long term weathering predictions, and prioritizing research.

Through panel discussions, experts discussed such issues as emulsion formation, photo-oxidation, biodegradation, and contamination of shores and wetlands.

The two days ended with discussion of workshop research recommendations.

The Ohmsett Gazette is published by Ohmsett--The National Oil Spill Response Test Facility--to update our readers on activities at the facility. For more information, call: (732) 866-7183.

Editor .... Laurie Coyne
Technical Editor .... Kathleen Nolan
Graphic Designer .... Phillip Coyne
Contributing Author .... Frank Arban

Ohmsett Facility Wins NJDEP Environmental Excellence Award

The Ohmsett facility received a New Jersey Department of Environmental Protection (NJDEP) Environmental Excellence Award in recognition of the comprehensive oil spill cleanup training and research conducted there.

Ohmsett was one of five New Jersey organizations receiving the award at a ceremony held on November 13, 2001 at the Eco-Complex in Columbus, New Jersey. NJDEP commissioner Robert Shinn presented the awards.

A team of high level managers from the NJDEP selected award winners based on how well the organizations' efforts met the NJDEP's goals for open space, clean air and water, and effective government.

NJDEP commissioner Robert Shinn presents the Environmental Excellence Award to Ohmsett program manager Bill Schmidt.

Catch Us At These Conferences!

Clean Gulf 2002
November 5 and 6, 2002
Galveston, Texas

International Oil Spill Conference
April 7 - 10, 2003
Vancouver, BC

MMS Renovates Ohmsett Building for Expansion

Minerals Management Service has agreed to fund renovation of a building at the Ohmsett facility complex to provide Ohmsett with expanded working and storage space. The project, which is funded in part by the US Navy, includes an upgraded conference center.

In late 2001, the Navy gave Ohmsett full use of building R-24 at the Naval Weapons Station Earle, (as well as use of a boathouse and the land around the test basin.)

In a May 14, 2002 meeting, MMS okayed plans for renovations to be performed by Ohmsett staff and outside contractors. Funding also includes the purchase of new, high-tech, multi-media equipment.

The extensive renovations include expanding the current conference and training room, building a new kitchen area, installing an HVAC system, renovating bathrooms, and re-doing the floors. In addition, new windows will be installed, the roof will be replaced, and the building will be painted inside and out.

Work will commence in early July and is expected to be completed by early Fall. Visit our website at www.ohmsett.com for news of the unveiling celebration, or stop by for a tour of the refurbished building.

Ohmsett Goes to France

Ohmsett recently was one of more than 800 organizations participating in the Interspill 2002 Trade Show and Exhibition in Brest, France.

The show, which took place from March 11 to 16, 2002, is an international exhibition for the marine industry. Ohmsett staff members Kathleen Nolan and Bill Schmidt, along with Joe Mullin of Minerals Management Service, attended. Joe Mullin presented a scientific paper on in-situ burns.

This was the second such event organized by SYCOPOL, the French Oil Spill Control Association, in association with BOSCA, the British Oil Spill Control Association and NOSCA, the Norwegian Oil Spill Control Association.

The next Interspill is scheduled for 2004 in Trondheim, Norway.

Train with oil

Test with oil

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