During oil spill incidents at sea, wind velocity and sea surface conditions may vary continuously for several days. These are variables that will greatly impact the success of any response measures including, and especially, the use of oil spill dispersants.

The environmental conditions at the time dispersants are applied may not be the prevailing conditions the spill will be subjected to days or even hours later. This fact may be used to an advantage.

For instance, dispersant could be applied to an oil spill during calm conditions prior to predicted weather that calls for higher energy wind and sea conditions some time after the application. In this way, the dispersant application could be conducted under operationally favorable conditions, as long as the dispersant treated oil slick subsequently sees energetic conditions favorable to mixing and adequate dispersion.

“The theory is: If a dispersant is sprayed on an oil slick during calm seas, which is the best situation for operations, how far in advance can you spray the dispersant and it still remain effective before wind and waves pick up,” said Randy Belore of S.L. Ross.

For the first time ever, OPA Engineers and others involved in emergency planning and preparedness met as a group. In August 2005, David M. Moore, of the Minerals Management Service (MMS) hosted a three-day conference at Ohmsett, with a focus on the Oil Pollution Act, 1990 (OPA '90). Over thirty people participated, including staff from MMS Headquarters, the Pacific Region, Alaska Region, Gulf of Mexico Region, the U.S. Coast Guard, and the Navy, culminating in a hands-on Incident Command System (ICS) tabletop exercise.

The conference highlighted oil spill planning, preparedness, and response for oil and gas facilities, as well as other emergency management roles located seaward of the coastline of the United States. The training focused on the new National Response Plan, the National Incident Management System (NIMS), and the Incident Command System (ICS), all new requirements initiated by Homeland Security Presidential Directive Number Five.

Training included presentations by David M. Moore on the National OCS Oil Spill Program, as well as Rusty Wright and Alton Bates on the Gulf of Mexico Region Oil Spill Program, and Chrisy Bohl on the Alaska Region Oil Spill Program.

Additional sessions included Regional Oil Spill Response Plans and response equipment and resources, presented by Jodie Connor, J. Connor Consulting; classroom instruction on the Incident Command System was provided by Randy Ashmore, USCG Atlantic Strike Force and supported by Mr. Bill Whitson, USCG Training Center; the National Response Plan (NRP) was presented by Lieutenant Commander Mark.
Cunningham, USCG Headquarters; and off-shore security awareness by Victor Vella, Naval Facilities Engineering Service Center.

Following the MMS Oil Spill Program, NRP, NIMS, and ICS training, was a table top exercise involving a simulated oil spill. Ms. Conner provided expertise in the design of the table top exercise with the support of Commander James Hanzalik, Lieutenant JG Amber Jack, and Lee Foresman from the USCG National Strike Force Coordination Center.

For the drill, the Ohmsett training room was transformed into a realistic Incident Command Post (ICP), complete with telephones, fax machines, conference calling capabilities, computer equipment, security check-in desk, oil spill response plans, Incident Management Handbooks, guidebooks, and wall-mounted status charts and maps.

The participants were assigned roles in Command, Planning, Logistics, Operations, and Finance/Administration, and each group had their own area in the ICP. At the start of the drill, a live conference call was received notifying the ICP of an oil spill in the Gulf of Mexico, probably from a submerged pipeline. Participants had to call other agencies making them aware of the situation, and that it was a drill. They also had to collect information such as weather data to predict the path of the spill and plan for its impact, locate resources such as planes that could over-fly the area and determine the size of spill, and plan for staging areas for crews that would be involved in the cleanup. The drill was carried out as close as possible to an actual spill. As information came in, it was posted on the status board, and regular briefings were held. At the end of the exercise, the instructors gave their evaluations of how the class did, and reviewed lessons learned in going through the exercise. The success of this exercise has prompted talks of another exercise in 2007.

With this in mind, research took place at Ohmsett in June, July, and August 2005 to determine the “long-term” effectiveness of dispersants initially applied to spilled oil in a calm sea. The project was sponsored by the Mineral Management Service, and conducted with Alun Lewis Oil Spill Consultancy and S.L. Ross Environment Research.

Two main factors may cause a dispersant to lose effectiveness after application to an oil slick with time. One is the loss of dispersant due to partitioning between the oil phase and the water phase. The other is the evaporation of volatile oil components with time, the phenomenon known as weathering. Studies have shown there is most likely a period of time before the surfactants have leached out and before the oil viscosity has increased due to weathering when the dispersant would still be effective in waves.

“We are learning more about the processes that effect dispersants such as weathering and stripping of dispersant. These are factors that come into play in more realistic-scale testing,” said Alan Guarino, project engineer for Ohmsett.

Three oils were used during testing at the Ohmsett Facility, two crude oils and one fuel oil. Galveston 209, a light viscosity crude, was used to represent oil that would lose volatile components with time, but would remain fluid enough to allow for transport of applied dispersant. Ewing Bank 873, a medium viscosity crude, was used to represent oil that would exhibit significant viscosity change with weathering. IFO-30, an intermediate fuel oil, was used to represent oil that would not be significantly affected by weathering.
Experiments to Determine Oil Viscosity Limits for Dispersion in Non-Breaking Waves

During recent viscous oil dispersion studies at the Ohmsett facility, funded by Minerals Management Service (MMS) and conducted by S.L. Ross Environmental Research Ltd., it was demonstrated that breaking waves play a critical role in providing energy for dispersion.

It was found that in the presence of breaking waves viscous oils were amenable to greater or lesser extents, to chemical dispersion. However, in the absence of breaking wave energy, the viscous oils tested displayed very little tendency for dispersion. Even the least viscous of these oils was recalcitrant to dispersion when applied during situations when there were no breaking waves.

In July 2005, Randy Belore of S.L. Ross and Alun Lewis of Alun Lewis Oil Spill Consultancy returned to Ohmsett with a team of researchers to answer questions that arose from the previous study: Is chemical dispersion a viable oil spill response alternative in the absence of breaking waves? Is there an oil viscosity limit to chemical dispersion in non-breaking waves? While there are credible observations that show some oils will disperse in non-breaking waves, the available information is limited and inconsistent.

“A fair amount of research has been completed in breaking waves and viscosity ranges,” said Randy Belore of S.L. Ross. “Now we want to study non-breaking waves and how lower viscosity oils could be treated and applied to allow dispersant use on different types of oil and of different viscosities.”

Preliminary research was conducted at S.L. Ross in Ottawa, Canada to determine which oils would be used. Also, evolving real-time experimental results at Ohmsett inspired the study of additional oils. Test oils included crudes such as Galveston GA209, West Delta 30, Ewing Bank 873, and Harmony. IFO-30 was also included to complement the variety of viscosities tested.

For larger-scale tests, researchers chose the Ohmsett test basin because of the ability to create non-breaking waves.

During the oil viscosity dispersion in non-breaking waves test, researchers chose Ohmsett because of the ability to create non-breaking waves.

During the tests, researchers used a dispersant, known to be highly effective, at a high dispersant-to-oil ratio. For each test run, prior to dispersing the oil, the waves would be brought to an appropriate level of energy just below breaking. Technicians would then distribute the oil at an application rate that would achieve a particular thickness of oil. Dispersant was applied at various surface dose rates according to the slick thickness, width, and coverage density. The objective was to determine the limits of viscosity and dispersant dose rate for effective dispersion in low energy, or non-breaking waves.

JBF Skimmer Modification

The U.S. Coast Guard (USCG) requested another modification to a JBF DIP-600 high speed skimming unit in their current inventory. Based on previous work by Ohmsett engineers, a standard alteration design package was established to modify the remaining units.

Ohmsett has completed the fabrication and installation of a baffle plate which has been proven to increase the recovery efficiency of the skimmer. Additionally, a major modification to the belt system was performed to correct a stalling problem when in use.

The modified JBF skimmer has been shipped to the U.S. Coast Guard for use on the west coast.
In May 2005 Ohmsett staff spent a week in lively Miami Beach to participate in the 2005 International Oil Spill Conference (IOSC). Program Manager Bill Schmidt, Test Engineer Dave DeVitis, and Marketing Specialist Jane Delgado, greeted visitors at the Ohmsett booth, providing information on testing, training and research capabilities at Ohmsett.

For Ohmsett, the highlight of the conference was a customer reception hosted by the Minerals Management Service (MMS), MAR Incorporated, and Ohmsett staff on May 18 at the legendary Fontainebleau Hotel’s Siesta Court.

During the customer reception, MAR Inc. Chairman and CEO Mike Norcio introduced new members of the oil spill industry to the Ohmsett testing, training and research facility and expressed thanks to current customers and friends for their continued support. In addition, MMS introduced Matthew Quinney as the future Ohmsett Contracting Officer and Technical Representative (COTR).

Joe Mullin of MMS gave a special presentation to Lee Majors of Alaska Clean Seas (ACS) in recognition for outstanding and dedicated services in testing, training and research. ACS has supported research at Ohmsett by providing crude oils for several test programs.

The event was such a success that MAR/Ohmsett and MMS are still hearing rave reviews.

“It was a fantastic evening and great to meet you and all your people. You were all wonderful hosts! ” said Archie Smith, chief executive and director of Oil Spill Response Ltd & East Asia Response Ltd Alliance.

CDR Michael Drieu, commanding officer of MSO Savannah said, “I have always supported the work your facility and staff has completed, and am very proud the U.S. has a recognized leader in the response business that helps pursue the best technologies to be used for spills. Keep up the great work!”
During the week of June 20, 2005, eleven oil spill responders from all over the world attended Ohmsett training taught by Texas A&M University Corpus Christi National Spill Control School.

Traveling far from his home in Fujairah, United Arab Emirates, Viju Govind, service manager for Seacor Environmental Services Middle East Ltd. (SESME), came to Ohmsett to learn how to arrange his response teams so they can respond more efficiently to spills.

“I will take back the experience and knowledge gained here, to train our employees and other member companies to work with spill teams,” said Govind.

SESME provides oil spill response, hazardous waste removal, security consultancy, oil spill training, marine fenders and oil spill equipment sales and services, and offshore operations support throughout the Gulf States and the Caspian Sea. Working with Independent Contract Network (ICN) companies, SESME trains and integrates these companies on spill teams.

“We would like most of our senior level managers and supervisors to get used to [working with] skimmers and booms so they can take over operations and get involved in activities,” said Govind. “We want to be able to split-up the managers and senior technicians to work [in teams] with ICNs on simultaneous spills.”

The Ohmsett training program is divided into two parts: classroom and tank exercises. Classroom instruction was taught using the National Incident Management System which was broken down into three modules: Management and safety, GIS/GPS documentation and planning, and a Table Top drill which is a culmination of all classroom work.

During the tank training students experienced the challenges of removing spilled oil in currents and waves, and collecting and measuring recovered oil while using several skimmer systems. During these exercises, the students deployed a boom and operated a skimmer in the tank, testing their ability to handle the equipment as well as how much oil they are able to skim.

“It becomes a little competition among the students to see who picks up the most oil,” said Dr. Steven Barnes, Texas A&M Corpus Christi instructor.

Barnes has been coming to Ohmsett to teach the training course for almost eight years. He says the draw is being able to use real oil, as well as the state of the art classroom.

“Over the 25 years I’ve been associated with the spill school, it has one of the best classrooms,” said Barnes. “Ohmsett ranks in the top group, with the convenience of the multimedia and the best place to train with oil and skimmers/booms.”

Ohmsett’s training facility includes a 25-seat classroom with state-of-the-art audio-visual equipment. Following classroom instruction, students receive hands-on training in the tank where they practice recovering oil, using real equipment under conditions that simulate an actual oil spill. Afterwards, they can then review their performance by comparing actual calculated oil recovery rates and efficiencies.

Training sessions can be configured to meet your specific needs. Hands-on training sessions are available with or without classroom instruction, and can accommodate up to 40 students. Tank training can even be conducted using your own equipment. Contact us to design a class for you!

Recent Training Sessions at Ohmsett

U.S. Coast Guard (USCG) oil spill responders returned to Ohmsett three times this year – in May, June, and August – for five-day Oil Spill Recovery Equipment Operator Training (OSRT) sessions using Coast Guard oil spill recovery equipment stored at the Ohmsett facility.

In partnership with the USCG, Ohmsett has developed a comprehensive course program that has led to USCG Class C training. Training emphasizes classroom exercises and practical hands-on use of the oil spill equipment in realistic conditions.
Dispersant Effectiveness on U.S. OCS Oils Tested at Ohmsett

In April 2005, researchers, spill responders, and regulators assembled at Ohmsett – The National Oil Spill Response Test Facility in Leonardo, N.J. to test dispersant effectiveness on U.S. Outer Continental Shelf (OCS) heavy crude oils. The experiment was funded by the U.S. Minerals Management Service (MMS), and conducted by S.L. Ross Environmental Research Ltd. of Ottawa, Canada, and MAR Incorporated.

The objective of the experiment was to determine the viscosity limit for the effectiveness of chemical dispersants applied to viscous crude oils of varied origins. The experiment conducted at Ohmsett provides valuable insight into the dispersibility of viscous crude oils and could possibly extend the range of oils that would be considered candidates for dispersant application.

The experiment focused on high dose application of dispersants in moderate breaking wave conditions on fresh oil. “We wanted to investigate the effect of oil viscosity on the effectiveness of chemical dispersants. Oils with viscosities less than 2000 cP are generally considered dispersible; whereas oils greater than 2000 cP are less likely to be chemically dispersed.” said Randy Belore of S.L. Ross Environmental Research Ltd. “We used six crude oils with viscosities ranging from 1,500-40,000 cP. Our goal was to determine where the viscosity cut-off is using Ohmsett’s large scale dispersant effectiveness testing protocol that has been developed over the past four years.”

Working with Ohmsett, S.L. Ross has developed a dispersant effectiveness testing protocol making a useful venue for determining the field effectiveness of dispersants on heavy crude oils.

The dispersant effectiveness experiment also provided an opportunity for the MMS to conduct training exercises and to invite visitors to observe realistic testing in the test basin. The US Coast Guard-Atlantic Strike Team (USCG AST) and the US Environmental Protection Agency-Emergency Response Team (EPA ERT) used the experiment as an operational training exercise for the SMART (Special Monitoring of Applied Research Technologies) monitoring protocol.

The visitors group was comprised of representatives from ExxonMobil who supplied several of the different types of crude oils being tested, California Department of Fish and Game, Harbour Petroleum, USCG AST, EPA ERT, and Navel Weapons Station Base Commander, Captain William Robertson. This was a first visit for some, while others have observed other experiments conducted at Ohmsett.

Accompanied by MMS’s Joe Mullin and Ohmsett Facility Manager Bill Schmidt, the visitors received a tour of the facility and first-hand look at the test. During the tour, Mullin discussed the facility’s capabilities, testing, and training activities, as well as spill response devices and equipment, while Schmidt gave an overview of the test basin and its systems.

From the deck of the Ohmsett facility, observers saw the crude oil being sprayed onto the waters surface and then watched as dispersant was applied. Observers watched the interaction of the applied dispersant and the oil slick. They could actually see the effect of wave action dispersing crude oil from the waters surface into the

NWS Earle Base Commander, Government Scientists & Industry Reps Visit Ohmsett

On April 19, 2005, visitors gathered at Ohmsett to observe dispersant effectiveness testing on U.S. Outer Continental Shelf heavy crude oils. The experiments were funded by the U.S. Minerals Management Service (MMS) and conducted by S.L. Ross Environmental Research Ltd. of Ottawa, Canada. The U.S. Coast Guard-Atlantic Strike Team (USCG AST) and the U.S. Environmental Protection Agency-Emergency Response Team (EPA ERT) used the experiment as an operational training exercise for the SMART (Special Monitoring of Applied Research Technologies) monitoring protocol.

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Commander Visits Ohmsett
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Captain Robertson, whose background is diving and salvage with some oil spill response experience acquired during the Gulf War, was amazed at Ohmsett’s capabilities.

“It is incredible what can be done with real-world testing. The opportunity to test equipment and get real answers to the questions is extremely valuable,” said Robertson.

“This is a great facility for the Coast Guard and EPA to train using the SMART monitoring protocol,” said Anita George-Ares of ExxonMobil, who has observed previous dispersant effectiveness experiments at Ohmsett.

NWS Earle Base Commander William Robertson visits Ohmsett. Joe Mullin of MMS and Mike Crickard of the U.S. Coast Guard National Strike Force Coordination Center discuss the SMART technology and dispersant tests being conducted at Ohmsett.

Community Relations

Science Symposium Visit
On a warm spring day in April 2005, students and teachers from the Monmouth Junior Science Symposium visited Ohmsett to tour the facility and test tank.

With recent news stories covering local oil spills, the students came to Ohmsett to learn about the importance of being prepared in the event of an oil spill, as well as the training and testing responders go through to clean up spills.

Ohmsett’s Health & Safety Specialist, Rich Naples, presented a video and answered a few of the student’s questions. Afterwards, the group toured the test tank where Naples gave an overview of the test basin and its systems. The students also had a chance to look under water through the viewing windows during the tank tour.

Pakistani Delegation Visits Ohmsett
Ten representatives from the government of Pakistan visited the Ohmsett Facility on May 9, 2005 to learn about oil spill response and recovery techniques. The tour was sponsored by the U.S. Trade and Development Agency (USTDA) and escorted by Decision Analysis Partners representatives Rebecca Gil, regional manager and logistics coordinator, and Joseph Duffy J.D., marine environment consultant.

Ohmsett’s Health & Safety Specialist, Rich Naples, showed the attendees a video of the facility and answered questions. Afterwards, Naples gave them a tour of the test tank.

Before returning to Pakistan, the delegation also attended the International Oil Spill Conference in Miami Beach, FL on May 18, 2005.

Ohmsett Goes High Tech
On July 12, 2005, Ohmsett’s Rich Naples and Paul Meyer visited High Tech High School at the Brookdale Community College Campus in Lincroft, New Jersey. They addressed a science class consisting of 13- and 14-year-old students. During the fifty minute seminar, Rich and Paul showed them a video of Ohmsett, and described how booms and skimmers work. The students asked them thought-provoking questions regarding the Ohmsett test tank.

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