

The *Ohmsett* Gazette

Leonardo, New Jersey

Test with oil. Train with oil.

Fall/Winter 2009

Ohmsett Makes Better Waves

During the summer, the Minerals Management Service (MMS) funded upgrades to the Ohmsett wave generator to improve the quality of waves so they more closely simulate ocean waves. While the old wave forms were adequate for testing oil spill response equipment, the waves were not close enough to ocean waves to satisfactorily evaluate alternative energy devices which are now being tested at Ohmsett.

The overall objective was to enhance the existing wave generator capabilities to produce wave spectra (frequency and amplitude) by varying stroke acceleration and speed instantaneously.

This effort included retrofitting the existing wave generator system with dual action hydraulic actuators to drive wave flaps, programming the computer to create wave spectra, and in the future, upgrading the existing beaches.

The wave flap frequency and amplitude can be varied on each stroke by following a computer-generated, random wave spectra that more closely approximate waves in the ocean.

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Students Practice Hands-on Fast Water and River Spill Response



With the help of instructor John Joe Dec, students deploy the V-Sweep system into the Ohmsett tank to observe how it reacts with oil in currents during the Fast Water and River Response course at Ohmsett.

Oil has been spilled into the bay and response personnel have been called to protect the outfall from being impinged with oil. The steps the responders take are critical in protecting the outfall before it discharges back into the bay. What strategies do they use? What equipment should be deployed?

Responders deployed two layers of boom and placed them across the mouth of the

outfall and used a deflection boom in a cascading strategy to divert the oil away from the outfall. The first boom section was anchored to the shore and the other section was anchored beyond the first section, again to divert the oil away.

This is the scenario that took place on the shoreline of the Sandy Hook Bay during one of the hands-on exercises at the Fast Water and River Response course held at Ohmsett,

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Fast Water Response Training

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August 18-20, 2009.

CHS Inc., a cooperative refiner located in Laurel, Montana, arranged the course at Ohmsett to train members of its emergency response teams (ERT). CHS manufactures Cenex brand gasoline and diesel products at its refineries in Laurel, Montana and McPherson, Kansas.

"Even though we don't have an ocean and rarely practice in bays in Montana, it's good to see how water behaves and how the boom reacts to it during the exercise," said Josh Brown of ConocoPhillips, one of CHS's cooperative partners.

The three-day course concentrated on oil spill response in fast water and river environments. The classroom session was taught by Ohmsett instructors and experienced responders, Alex Alenitsch and John Joe Dec, and included oil properties, equipment performance and choice, booming strategies, collection and storage.

"It was designed as an entry level course with a basic intro to oil spills," said Alex Alenitsch, lead instructor. "We went over booming 101 and oil 101. However, we also adjusted the program based on the experience level of the attendees."

Out on the Ohmsett tank, which had been adapted with small turbines to simulate fast water, the students experienced advancing boom and skimmer operations providing each of them with the opportunity to collect spilled oil. They also performed exercises in river boom positioning, stringing and anchoring. During these exercises, the boom system configurations were tested with oil in a direct current where they could observe boom failure including entrainment, planing, splash-over and submergence.

"This facility is great for seeing entrainment of oil under the boom because of the tank's underwater windows," commented Dennis Fleming, a member of the CHS ERT. "We could see how [the boom] would be affected at different speeds of water. The skimming exercise was a blast, being able to see what we recover. We don't have that type of skimmer, but if they do decide to purchase one, we will already have the experience."

The final hands-on tank exercise incorpo-

rated everything they learned during the three days of training. The tank scenario involved oil being released into a current of water. Students had to protect a water intake, which was the half circle boom strategy against the side of the tank. A student was tasked to herd the oil away from the protection boom, as several teams deployed boom in a deflection strategy to force or direct the oil into the corner of the tank where a skimmer was positioned to recover oil. The deflection strategy involved cascading

boom. According to the exercise team leader, Josh Brown, managing nine people to accomplish a relatively simple deployment in a test tank was far more difficult than he thought.

"A lot of [the training] we get is classroom theory. I would recommend this class because it's a good mix of classroom and hands on," said Brown. "What we do on the river gets redundant. Here you can see all aspects of the exercise; from the leader's stand point to the guys on the river."



Emergency Response Technicians from the CHS Cooperative deploy boom at the mouth of the outfall to divert oil during the hands-on bay spill scenario.



Schedule a Test Today!

If you would like to test your skimmer system to the new ASTM Protocol, please call us at 732-866-7183 ext. 11

Visit our website at www.ohmsett.com to view the Ohmsett testing and training schedule.

MMS to Develop Tank Protocols for Testing Wave Energy Devices

The marine renewable energy industry is growing with the development of new marine hydrokinetic (MHK) device concepts and designs for extracting energy from waves, tides, ocean and river currents, and ocean thermal gradients. In an effort to accelerate the development, deployment and maturity of MHK devices, the National Renewable Energy Laboratory (NREL) has announced a partnership with the Minerals Management Service (MMS) to develop test

tank protocols at the Ohmsett facility.

Based upon NREL's research, there is no agreement on the best use of wave tank testing in support of wave energy devices, what the minimum requirements are for advancing a scale-model device to the test tank, or if tank testing is even required. However, it has been NREL's experience that small-scale testing is valuable before going to full scale field testing. The development of the tank testing protocols can be used to guide future projects conducted at the Ohmsett facility.

"It is important to develop better methods for testing and verifying designs and concepts for these devices prior to open ocean testing," said Robert LaBelle, deputy associate director, Offshore Energy and Minerals Management.

According to the agreement, the development of the tank testing protocols will be written jointly by NREL and MMS using the existing protocols from the European Marine Energy Center, University College Cork, Det Norske Veritas, Germanischer Lloyd, and others as guidance. The goal of the protocol is to identify the relevance of the test tank facility to the overall technology advancements for ocean wave and tidal current devices and will be used internally at Ohmsett or as a possible precursor to international standards work being planned under the International Electrotechnical Commission (IEC) technical committee, TC 114, Marine Energy - Wave and Tidal Energy Converters.

"The resulting protocols would benefit MMS in their incorporation of MHK testing into the Ohmsett repertoire and benefit, as well, the overall development of U.S. and International MHK research," said LaBelle.

The Ohmsett test tank has several industry tests planned over the next year, and provides a platform for these devices. The partnership gives NREL the opportunity to observe current industry tank use, and develop the knowledge needed to refine the design and evaluation process of tank testing.

Program Announcement Number: DE-FOA-0000070, Project Summary National Renewable Energy Laboratory.



Walter Musial (right) from the National Renewable Energy Lab (NREL) and Sean O'Neal of Ocean Renewable Energy Coalition visited Ohmsett in July 2009.

Ohmsett Expands Capabilities with Renewable Energy Testing

Updated Tag Line Represents New Offering

Ohmsett has expanded its testing capabilities to incorporate renewable energy initiatives, specifically the testing of hydrokinetic (wave and current) devices. With this new capability, the tag line will be changed to Ohmsett - The National Oil Spill Response Research & Renewable Energy Test Facility to effectively represent the full range of testing and research opportunities available at Ohmsett.

"Renewable energy testing complements Ohmsett's existing services by enabling us to now offer our test tank to the expanding energy market," said William Schmidt, MAR Incorporated Program Manager for Ohmsett. "The recent initiatives in developing renew-

able energy technologies have created a need for facilities where meso-scale devices can be tested in an environment that can simulate waves and currents. We have the facility that can meet those needs."

In business for more than 35 years,



Ohmsett is a recognized leader in training, research, and the validation of test data for technologies and equipment for the oil spill response industry. In addition, Ohmsett is now the forum for manufacturers to test their equipment to the ASTM protocol standard, which the Ohmsett engineering staff assisted in its development.

This change in branding represents an important extension of Ohmsett's research and testing services in the marine markets it serves. Although the facility has adopted the new tag line and updated logo, the process of converting its various marketing items will take some time. Expect to see this transformation over the course of several months.

SMART Training with the U.S. Coast Guard

In September, the U.S. Coast Guard (USCG) held a three-day training class at Ohmsett for their Special Monitoring of Applied Response Technologies (SMART) protocol using the USCG oil detection and monitoring systems. The class was attended by personnel from the three USCG National Strike Force Strike Teams (Pacific, Atlantic, and Gulf) and the Coordination Center, Environmental Protection Agency (EPA) and National Oceanic and Atmospheric Administration (NOAA).

The SMART Protocol is a monitoring program for in-situ burning and dispersants, and relies on small, highly mobile teams that collect real-time data using portable, rugged, and easy-to-use instruments during dispersant operations. The SMART protocol was developed by the USCG, NOAA, EPA's Environmental Response Team and the Centers for Disease Control's Emergency Preparedness and Response Branch.

The training curriculum included classroom instruction where students learned the fundamentals of the overall SMART protocol (which includes in-situ burn monitoring and dispersant monitoring), as well as hands-on training that included actual set-up, cali-

bration, deployment, and dispersant detection and monitoring using the USCG's newly purchased Turner C-3 fluorometers.

"The training gave the students an understanding of the overall SMART protocol, provided the USCG the opportunity to beta test the three newly developed Turner C-3 fluorometry systems, and most importantly, provided the end-users with an operational working knowledge of the system," said Mike Crickard, Logistics Management Specialist at the USCG National Strike Force Coordination Center. "It was also an opportunity for the developers of the new system to adjust the actual end-user guide."

The first day of training consisted of classroom instruction during which Ed Levine, Scientific Support Coordinator at NOAA, provided the history and specifics of the SMART Protocol, as well as an overview of the basics of dispersant operations during an oil spill. Also during the classroom instruction, Scott Miles, a Louisiana State University contractor to NOAA, provided an overview of fluorometry systems. This was followed by the developers of the C-3 system (CWO Luis "Manny" Munoz, Deck Officer, USCG Pacific Strike Team and

Brian Parscal, Project Specialist for Clean Island Council) introducing the students to the new system. This included reviewing the contents that comprise the SMART fluorometry kit as well as instruction on the calibration and operation of the unit, data acquisition and interpretation.

On the second day, students were divided into three groups for hands-on exercises where they operated the three fluorometers in separate fast tanks. The fast tanks provided the students with an opportunity to calibrate and operate their fluorometers in a small-scale, controlled environment.

"In the [Ohmsett facility] high bay, two fast tanks were set up. The Strike Teams calibrated the C-3s in one tank and used fluorescein to standardize the instruments," said Leigh DeHaven, an environmental scientist with the EPA. "In another tank, four instruments were positioned (two sensors were on the bottom and two were just below the water surface) and a Norwegian crude oil was placed in the tank. We watched to see if we got a reading. Then a dispersant was applied and the dispersant and oil were agitated. We could see how the oil dispersed into the water column on top, then on the bottom of the tank. We received consistent readings, every five seconds, which were incorporated into points on graphs. With these readings, we could make a comparison between the dispersing oil and the two depths of the fluorometer locations in the water."

Due to severe storm warnings (high winds) in New Jersey, the third day of training had to continue indoors in the two fast tanks. "Everything was set up again in the fast tanks so everyone had a turn at using the software and got the experience on how to place the fluorometers in the water," commented Ms. DeHaven. "The Ohmsett staff was very accommodating due to the weather and we never had to wait for equipment."

"The facility was a great training ground for both classroom and the in-water portion of the class. Folks got a lot of knowledge and hands-on use of the instruments," stated Mr. Levine. "We're looking forward to future collaborations with the USCG. We are developing a NOAA training program for the Strike Teams and hope to incorporate more hands-on activities including using the test tank to a greater extent."



Ohmsett Test Engineer, Alan Guarino (right) demonstrates when the dispersant is applied to the oil and mixed, the oil is dispersed into the water column.

ECO-Auger™ Tidal Energy Device is Put to the Test

In a small workshop in Juno Beach, FL Scott Anderson of Smart Product Innovations (SPI) came up with an idea for an environmentally friendly tidal hydrokinetic system that would convert moving water to usable renewable electric energy - the ECO-Auger™ was born. The device is a bi-directional tapered helical auger that does not have to be in a pipe or shroud to concentrate the flow of water. It is designed to glance off or push the debris aside as it rotates.

Mr. Anderson first tested the theory of the ECO-Auger™ with an eight-inch computer model in Juno Beach, FL where SPI has offices. After the test, he made modifications to the design and felt he was ready to test its sea-worthiness, and fish friendly design. This modified design was tested with 200 live fingerling trout. They swam through the turning ECO-Auger™ at 100 RPM's and not one fish was harmed.

"I decided to test it myself," said Mr. Anderson. "I put the eight-inch modified design in the water in Key West, FL. "It turned so fast it was difficult to hold on to it." So he went back to the workshop to build a two-foot model and looked for a test tank where he could test the modified version and record important data.

He heard about the Ohmsett facility from a company he was working with for the hydraulics on the two-foot prototype. He felt that it would be the perfect venue to test the ECO-Auger™. With the ECO-Auger™ loaded onto a trailer, Mr. Anderson headed to New Jersey.

The prototype was tested in the Ohmsett wave tank during the last week in September 2009 to determine the torque or power that the unit will generate from 1.5 to 6.0 knot currents.

"We don't fully understand how much energy this unique design could capture, that's why we came here," said Mr. Anderson. "We are recording hydraulic pressure, speed through the water, and RPM of the auger. It is a very simple test. After this test, I may be back to test an alternate version that generates power."

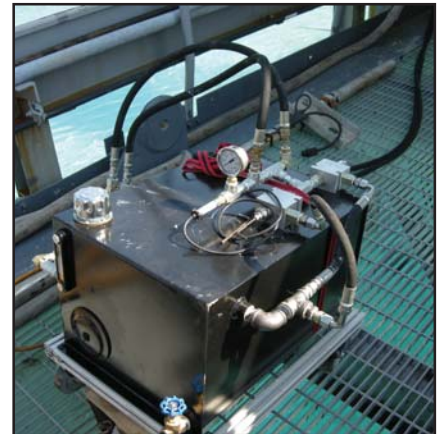
Eventually he wants to go to a four- or six-foot diameter model for the next series of tests. "The power generated with the ECO-Auger™ increases by the square of its diameter. Can

you imagine the power that can be generated with a larger, say 12-foot model?"

The goal is to have 10,000 units along the East coast of the U.S. "As long as there is a tidal current, over 1.5 knots, it can be attached to a boat house, a bridge in an inlet."



Using a crane, the ECO-Auger™ was positioned in the tank, then mounted below the main bridge and towed through the water.



The gage on the hydraulic motor's return line measures the amount of pressure the ECO-Auger™ produces.



The ECO-Auger™ was mounted to the Ohmsett main bridge and towed through the water. Bridge speed, auger RPM and hydraulic pressure, were measured to calculate horsepower available to drive a generator.

News Briefs

Ohmsett Presents Papers at the Clean Pacific Conference & Exhibition

Clean Pacific Conference & Exhibition held its second biennial meeting September 14-16, 2009 at the Oregon Conventions Center in Portland. Clean Pacific's theme "20/20 - Building on the Past and Charting the Way Forward" highlighted the past success and continued progress towards future challenges in oil spill prevention, preparedness, response and restoration. The conference was co-hosted by the Pacific States/British Columbia Oil Spill Task Force and its member agencies.

Ohmsett Program Manager Bill Schmidt, Mechanical Engineer Paul Meyer, and Marketing Specialist Jane Delgado greeted visitors at the Ohmsett booth, where they exhibited the latest in full-scale dispersant effectiveness testing and research conducted at Ohmsett, as well as the current oil spill responder training courses.

During the conference session proceedings, Bill Schmidt, Paul Meyer, along with Mike Crickard of the U.S. Coast Guard National Strike Force Coordination Center, had the distinguished pleasure of presenting technical papers on Ohmsett's most recent skimmer testing results and training activities. During the Response Technologies (Equipment) session, Mr. Meyer presented

"Application of the American Society of Testing and Materials' (ASTM) New Skimmer Test Protocol." In the session for Look-

ing Forward, Mr. Schmidt and Mr. Crickard presented the paper "Ohmsett Trains Oil Spill Responders."

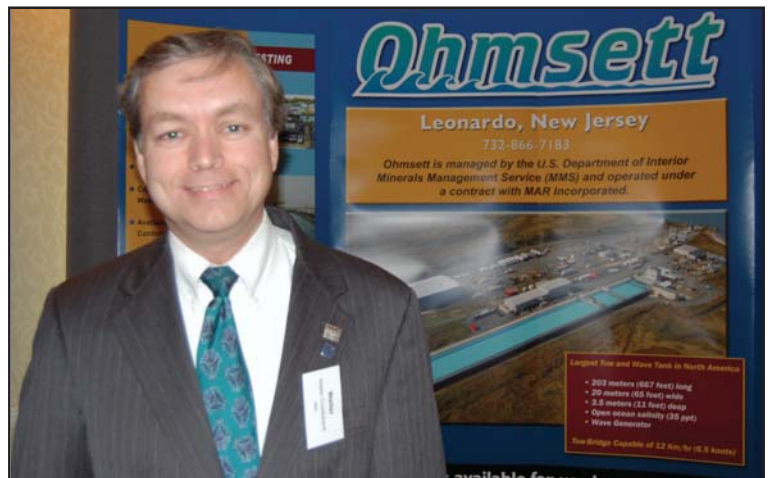


Dr. Jan Svejksky of Ocean Imaging Corporation discusses testing opportunities at the facility with Ohmsett Mechanical Engineer, Paul Meyer and Ohmsett Marketing Specialist, Jane-Ellen Delgado.

Ohmsett Attends the MTS Offshore Wind Power Workshop

Ohmsett staff attended the Marine Technology Society Offshore Wind Power Workshop, June 29-30 in Crystal City, VA. The workshop presented a unique technology-focused program addressing the real-world engineering experiences in installing wind turbines offshore in Europe and to understand how the application of those experiences are consistent with the rules published by MMS for offshore renewable energy development. Attendees gained a better understanding of how the technical decisions and approaches to investigation, siting, design and installation can either compromise or enhance the economics of offshore wind development.

Dr. Walter Cruickshank, Deputy Director, MMS was a keynote speaker at the Marine Technology Society Offshore Wind Power Workshop.



News Briefs

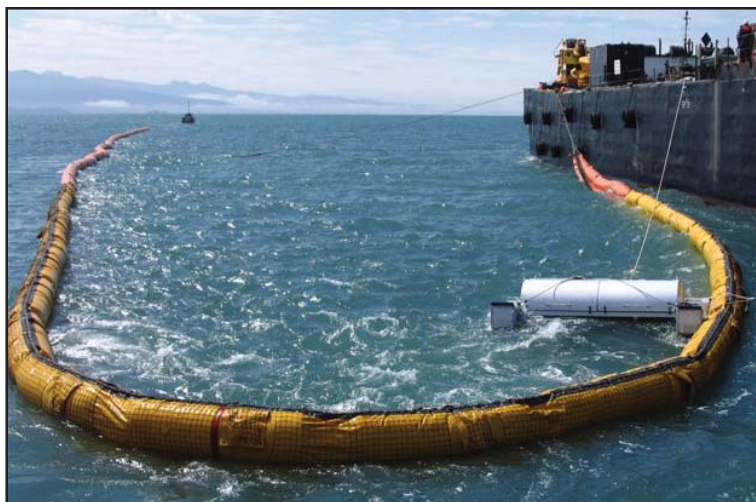
Crucial Skimmer Goes to Sea Trials in Alaska

After testing at the Ohmsett test tank, the Prince William Sound Shippers held sea trials for the Crucial disc skimmer in Kachemak Bay, Alaska the week of July 12, 2009.

Prince William Sound Regional Citizens Advisory Council, the Cook Inlet Regional Citizens Advisory Council and Ohmsett staff, along with officials from the U.S. Coast Guard and the State of Alaska attended the trials. Cook Inlet Spill Prevention and Response Inc. (CISPRI) provided the barge and offshore vessels from which the equipment was deployed. Ship Escort/Response Vessel System (SERVS)/Alyeska provided the Ocean Buster and one of their Ocean Boom Vanes. Quali Tech Environmental provided another Ocean Boom Vane and the technical expertise for the deployment of both boom vanes towing EFC Ocean Boom.

Steve Potter of SL Ross Environmental Research, Ltd was on hand to validate the sea trials, capture the speed through the water, and to make sure each containment system was put through the same procedures for comparison purposes.

"The Crucial Disc Skimmer worked well with both the Norwegian Oil Trawl and the Ocean Buster," said Eric Haugstad, Tesoro. "The shippers and visitors were very pleased with the sea trials and will be working to better refine the overall systems approach based on these trials.



The Crucial skimmer and v-sweep tested during sea trials in Kachemak Bay, Alaska.

New MMS Director Visits Ohmsett



Minerals Management Service's (MMS) new Director visited Ohmsett on October 6, 2009 for a tour of the facility and to observe mechanical recovery systems being used for Alaska Clean Seas Training Course. Pictured from left to right is Bill Schmidt, Program Manager, Ohmsett; Keith Good, Acting Chief of Staff, MMS; Liz Birnbaum, Director, MMS.

The Ohmsett Gazette is published by Ohmsett -The National Oil Spill Response Test Facility to update our readers on activities at the facility.

Editor & Graphics Jane Delgado
Technical Editors Dave DeVitis,
.....Alan Guarino, Paul Meyer,
.....Susan Cunneff

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