

The Ohmsett Gazette

The National Oil Spill Response Research & Renewable Energy Test Facility

Tank Renovation Rescheduled

Due to the extensive preparations needed to initiate the four-month refurbishment of the Ohmsett test tank planned for the summer of 2020, the refurbishment is now rescheduled to take place in the summer of 2021.

During the project planning phase, a structural engineer will conduct an inspection of the facility to identify needs, infrastructure upgrades, and maintenance items.

If you have suggestions for facility improvements that can be incorporated into the refurbishment, please forward them to our facility manager, Len Zabilansky for consideration.

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Field Scale Sorbent Test Protocol

For more than a year, Ohmsett and the Bureau of Safety and Environmental Enforcement (BSEE) have been developing a field scale test protocol for full-scale and meso-scale sorbent materials to address the lack of a recognized test protocol for performance evaluation. Phase II of

testing the protocol took place February 25 - March 15, 2019 to build upon the data gathered during phase I, which was conducted in June 2018 (Gazette, Fall 2018).

The objective of phase II was

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A support rack was designed to provide consistent handling of the sorbents for minimal contact with the sample. It has the ability to support the sample horizontally and includes a digital weight measurement device.

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Sorbent Test Protocol

to develop an inclusive set of tests for evaluating fundamental sorbent performance comparable to practical use in the field. The set of tests focused on roll, mat, and pad sorbents, which are designated as Type I sorbents per the ASTM F726 Standard Test Method for Sorbent Performance of Adsorbents for use on Crude Oil and Related Spills.

“In the phase I set of tests, a large focus was on designing, fabricating, and evaluating the test apparatus. Based on the results, the test apparatus underwent some modifications including enlarging the drain holes and improving the structure of the test rack,” said Kristi McKinney, an engineer for the BSEE Oil Spill Preparedness Division. “In the phase II series of tests, the focus was on the test methods themselves. This involved exercising the test methods with multiple oils and multiple sorbent materials.”

Six types of sorbent were chosen

“Tests focused on functional characteristics that would be important for field use.”

to represent a wide variety of products with respect to base material and in varying quality. “The variety of sorbents tested led to valuable insights and data that continued to shape the methods throughout the test series,” McKinney said.

Two of the oils used during each test were oil types identified in the ASTM F726 standard; they included #2 fuel oil (light type) and mineral oil (medium type). “A small sample of tests was also conducted with crude oils having comparable viscosities to assess how a crude adsorption might compare to the fuel and mineral oil adsorption. This is an area that should be further investigated,” McKinney explained.

Tests focused on functional characteristics that would be important

for field use including: volume of oil recoverable by the sorbent; rate at which the sorbent will adsorb; amount of water the sorbent may adsorb; buoyancy; and the ability for the sorbent to be retrieved when fully saturated. “Other important aspects of this test series included comparative maximum adsorption testing to compare results from this test method to those obtained using the ASTM F726 test method, and a focus on using oils that are generally available and test equipment that can be easily fabricated so that this method is useful to a wide number of users.”

“Throughout the phase II test series, insights and knowledge gained were used to drive the evolution of the test methods. It has been socialized through the ASTM Committee F20 on Hazardous Substances and Oil Spill Response, and will continue to be discussed within the committee, with the goal of eventual incorporation as an ASTM standard,” McKinney commented.



Ohmsett Technician Allen Cannone prepares the support rack with a known quantity of oil where sorbent samples would be placed. Sorbents were tested for volume of oil recoverable, the rate at which it will adsorb; the amount of water it will adsorb; buoyancy; and the ability for it to be retrieved when fully saturated.

Visit Ohmsett at These Conferences

Clean Gulf 2019
October 28-30, 2019
New Orleans, LA
Booth #420
www.cleangulf.org

Clean Waterways 2020
April 7-9, 2020
Indianapolis, IN
Booth #314
<https://2020.cleanwaterwaysevent.org>

Mechanical Dispersion of Oil Without Chemicals

To remediate oil spills without the use of chemicals, Blue Impact, AS has developed a new mechanical dispersion technology that involves using high pressure water jets with enough energy to disperse oil into the water as tiny droplets. The goal is to have the dispersed oil remain suspended in the water column allowing it to be broken down by hydrocarbon-degrading flora naturally found in the ocean. The prototype system was recently tested at Ohmsett during the week of July 8, 2019.

The initial concept of mechanical dispersion was developed in 2011 by SINTEF, an independent research organization headquartered in Norway. In 2016 Blue Impact was created to commercialize the technology. “We have worked on the technology on a daily basis to make it what it is today,” said Karl Fjelde Nevland, business development manager and in charge of the testing for Blue Impact.

In 2018 the mechanical dispersion technology was integrated into an unmanned surface vessel (USV) prototype called the Vorax. The 18 feet long, 7 feet wide catamaran was designed for near shore, and harbors and can disperse at speeds of 1-5 knots. “As Vorax uses water to disperse the oil, there is no need to refill chemicals or transport recovered oil to shore. Since the vessel is unmanned, there is no need to risk putting personnel in the polluted area,” Nevland said. “We tested it in the oil seeps outside Santa Barbara, California together with the California Department of Fish and Wildlife Office of Spill Prevention and Response (CDFW-OSPR), U.S. Coast Guard, Marine Spill Response Corporation, The National Oceanic and Atmospheric Administration, and others. Now we have been to Ohmsett to collect quantitative data on the performance of



The Blue Impact mechanical dispersion technology uses high pressure water jets instead of chemicals to disperse oil into the water as tiny droplets.

this USV.”

According to Nevland, the objective was to test the prototype Vorax USV as an integrated unit at TRL Level 8 using Bureau of Safety and Environmental Enforcement’s (BSEE) Technology Readiness Levels for Oil Spill Response Technologies and Equipment. “We wanted to conduct a realistic operation with a fully integrated system in a relevant environment. The testing was designed to collect reproducible data about the dispersion efficiency and operational performance of the USV.”

During the test program, oil slicks of HOOPS and Oseberg crude oils (weathered, and emulsified) in known volumes were applied in a controlled area of the tank without using solid barriers. The controlled area was created using near-surface horizontal fan spray nozzles, directed fire monitor broadcast, and subsurface turbines. This setup helped avoid the tendency for barriers such as booms, skirts, and the tank walls to impede the natural spatial

characteristics of a free slick. Test instrumentation for data collection and measurements included LISST, SilCam, and the Polaris Polarized Thermal Imaging System.

“Using thermal cameras and different types of underwater instrumentation, data was recorded about the oil on the surface and droplet size distribution of the dispersed oil in the water column,” Nevland said. “We had access to a solution-oriented and flexible crew, and a facility with state-of-the-art instruments. The initial results look promising, and we are very happy. The documentation will be used to verify mechanical dispersion as a viable option for modern oil spill response and we have already started the market introduction.”

Workshop Enhances Understanding of Dispersant Use During Spill Operations

To facilitate communication between academia, industry, and oil spill responders, ExxonMobil hosted a two-day dispersant workshop at Ohmsett, June 25 and 26, 2019. Forty invited participants with varying levels of experience and work affiliations from around the world attended the event.

“The workshop was designed to cover a range of topics on the science of dispersant use, while providing attendees the unique opportunity to observe the effect of dispersants when applied to crude oil in the wave tank,” said Tim Nedwed, ExxonMobil Oil Spill Response Senior Technical Professional Advisor.

Subject matter experts from organizations including the International Tanker Owners Pollution Federation Ltd. (ITOPF), Marine Spill Response Corporation (MSRC), National Oceanic and Atmospheric Administration (NOAA) Sea Grant program, the oil industry, and academic researchers from the United States, United Kingdom, and Canada provided engaging presentations on the use of dispersants in support of spill response efforts.

Topics included Aerial Dispersant Operations from an oil spill removal organization (OSRO) perspective, Effects of Photo-oxidation on Oil Chemistry, an overview of the 2019 National Academies of Sciences, Engineering, and Medicine (NASEM) report: *The Use of Dispersants in Marine Oil Spill Response, Toxicity Testing Protocols, and Oil Fate and Exposure Modeling of a Subsea Blowout*.

Of equal importance, the attendees included graduate students and post-graduate researchers from Dalhousie University (Nova Scotia) and Texas A&M Galveston. They were able to work with ExxonMobil to use the Ohmsett facility over the two-week period, which included the two-day workshop, in order to perform experiments studying oil biodegradation and the use of a remotely operated vehicle to characterize submerged oil plumes.

“Most importantly, workshop attendees were able to observe a number of demonstrations in the tank itself. These included releasing oil on and below the surface of the water, both with and without the addition

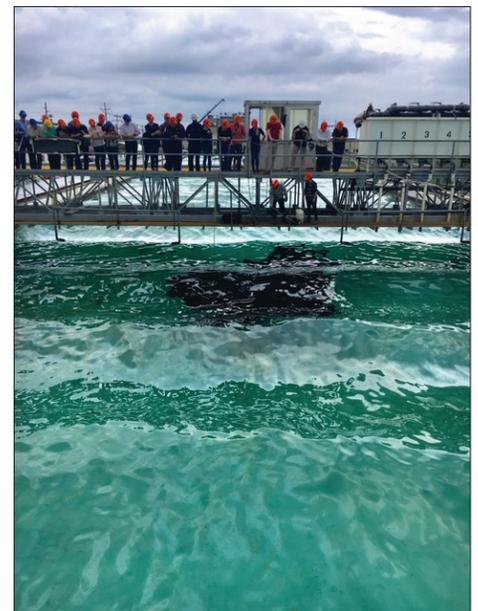
of a dispersant,” commented Tom Coolbaugh, ExxonMobil Technology and Advocacy Advisor. “For most of the attendees, it was the first time they were able to see what oil looks like on the water and how it reacts to the application of a dispersant.”

According to Nedwed, other demonstrations included testing of a new containment boom configuration that allows oil to be released from the apex of the boom as it moves through the water. “Early results indicate that the released oil stays in a narrow ribbon on the water’s surface where it may be amenable to burning without the use of a specifically designed fire boom.”

“From the feedback that we received, we were happy to hear that the attendees found the workshop to be informative, interesting, and a great opportunity to make new contacts during the multiple networking sessions that were available during the two day period,” Coolbaugh added.



Workshop attendees observe the testing of a new containment boom configuration that directs the oil into a narrow channel of the boom to facilitate in-situ burning without the use of a fire boom.



For many of the ExxonMobil workshop attendees, this was the first time they were able to observe oil on water and how it reacts to the application of a dispersant.

Polarized Measurements of Oil Spills

Over the past seven years, Polaris Sensor Technologies, Inc. of Huntsville, Alabama has been developing an infrared polarimetric sensor called the Pyxis, to passively measure not only the conventional thermal intensity of a scene, but also the polarized nature of the infrared (IR) scene. The Pyxis was previously tested at Ohmsett (Gazette, Fall 2016) and in the field for measuring oil spills with an operator on-site monitoring the oil detection imagery.

“The measurement of the polarization gives details in a scene that are not readily apparent when using conventional thermal imagers alone due to differences in the optical properties (refractive index) and surface roughness of the oil and water,” said



David Chenault, president of Polaris. “In fact, polarization measurement works well even if the oil and water are at the same temperature, which makes the oil invisible in the IR. Further, the fact that the polarization signal is based on emission means that the polarization signal is available for day/night operations.”

Building on the success of the Pyxis, Polaris developed autonomous detection algorithms that are integrated into the sensor. The system was installed at Ohmsett this summer to collect imagery on a variety of oil spill response scenarios to exercise and improve the algorithms. The sensor head is installed on the crow’s nest with a display located in the bridge house. “We typically collect the imagery as the oil is placed in the tank and then again when the recovery operation is initiated, whether the recovery is mechanical or chemical,” Chenault said. “The collected data is sent to Polaris where the autonomous detection algorithms are tested. The sensor operation is monitored from the Ohmsett bridge and remotely at Polaris’ headquarters.”

“The camera, installed since June, has already seen several interesting spill response and clean up tests by Ohmsett customers. It will remain in place possibly until November to be used during the workshop on Comparing Recent Advances in Estimating and Measuring Oil Slick Thickness sponsored by NOAA Office of Response and Restoration, BSEE Oil Spill Preparedness Division, and hosted by the Coastal Response Research Center, University of New Hampshire.”

Oil Spill Response Strategies & Tactics Training

March 24-27, 2020

October 27-30, 2020 (Tentative)

Ohmsett, in partnership with Texas A&M National Spill Control School, offers the hands-on training course you can’t afford to miss! In three and a half days you will learn the strategies and tactics for successful spill response operations.

Course Topics:

- Fates & effects of spilled oil
- Oil skimmer & containment boom selection, use & recovery strategies
- Factors affecting oil spill movement
- Incident Command System (ICS)
- Shoreline Characterization (Introduction to SCAT)
- River & tidal inlet strategies
- Hands-on skimmer operations
- And More!

Register online at www.ohmsett.com/registration.html

Email: jdelgado@ohmsettnj

Phone: 908-601-7082

www.ohmsett.com

Marine Salvage Training

March 9-11, 2020

In the classroom and on the tank. Join us for this new hands-on Marine Salvage training course. In partnership with T&T Salvage, we offer a unique course where you will learn effective operational planning and equipment deployment for successful Marine Salvage Response Operations. Classroom and exercises in the Ohmsett tank include:

Course Topics:

- Salvage Operational Planning
- Emergency Lightering and Viscous Oil Pumping Operations and Exercise
- Subsea Hot-Tapping and Pumping
- Heavy Lift and Rigging Demonstration with Pumping Package Set-up
- US Coast Guard Special Teams Overview
- Marine Salvage Table-top Exercise
- 8 Hour HAZWOPER Refresher
- And More!

For more information:

Email: jdelgado@ohmsettnj

Phone: 908-601-7082

www.ohmsett.com

U.S. Coast Guard Trains Personnel for Oil Spill Recovery Operations

To achieve a state of readiness to respond to oil spills, the U.S. Coast Guard provides its personnel with a hands-on Oil Spill Recovery Technician (OSRT) course twice a year at the Ohmsett facility. The OSRT course is the only one of its kind where training combines classroom and hands-on exercises to teach personnel how to effectively and safely deploy vessel-based oil skimming and recovery systems. In April and August 2019, more than 40 students from the Coast Guard Strike Teams, Incident Management Division, and WLB 225 Buoy Tenders attended the course.

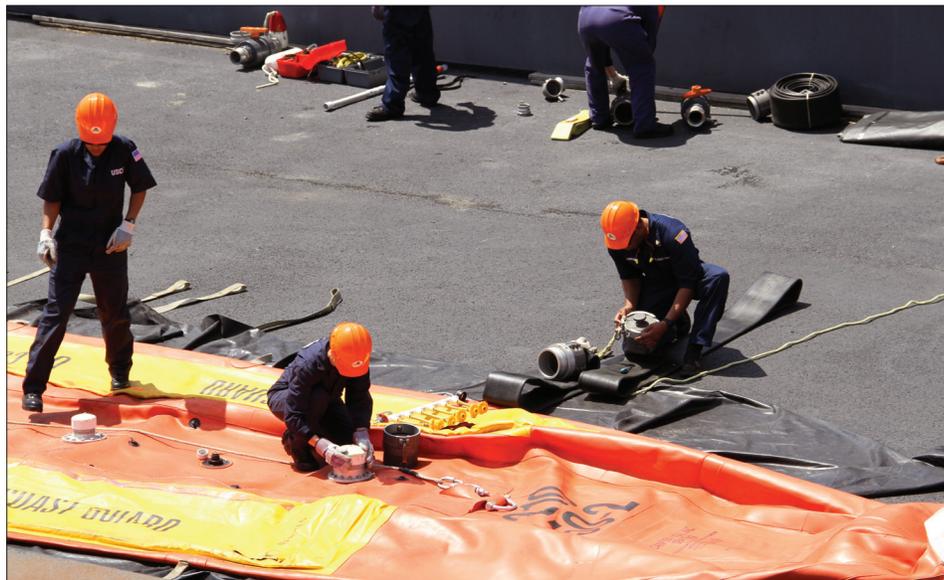
The five-day course is based on National Strike Force (NSF) qualification requirements providing Coast Guard personnel with instruction on the use of oil spill response equipment systems onboard JUNIPER Class WLB's Spilled Oil Recovery System (SORS) and District Response Advisory Team /NSF Strike Team Vessel of Opportunity Skimming System (VOSS) equipment.

Training activities for the week included: classroom curriculum focusing on general Coast Guard oil spill response, safety briefing, and specific SORS and VOSS oil spill response equipment systems; hands-on practical training on specific SORS and VOSS equipment systems; and finally, students are divided into groups and rotated through five engineering and deck equipment stations. According to Dale Hemenway, OSRT Manager at the National Strike Force Coordination Center, each station has specific tasks the students need to successfully complete:

Station 1 Half Hull:

Set-up of the outriggers, and discuss rigging for the VOSS and SORS components and how they are different.

Station 2 Pumps, Skimmers,



U.S. Coast Guard personnel work through tasks on Station 4, Temporary Storage during the OSRT course. They unpacked, setup, inventoried parts, discussed each component, and repacked the equipment.

and Prime Movers:

Set-up and operate the different skimmers with their perspective control stand, operate the Deutz Hydraulic Prime Mover (HPU), hook-up the hydraulic lines, and learn how to perform minor trouble shooting.

Station 3 Boom Deployment:

Demonstrate the deployment of the Fast Sweep Boom from the SORS Pan or the Fast Sweep reel.

Station 4 Temporary Storage:

Unpack, set-up, inventory, discuss each component, and repack equipment.

Station 5 Tank Exercises:

Recover oil in calm and wave conditions to determine students skimming efficiencies.

"Students say the most beneficial part of this course is the ability to actually skim oil in a realistic environment, and the practical with set-up and operating USCG VOSS/SORS systems," Hemenway said.



U.S. Coast Guard personnel practice skimming oil on Station 5 during the OSRT course. Students say this is the most beneficial part of the course.

Welcome Ohmsett's New Engineer Grant Coolbaugh

We are pleased to announce the addition of Grant Coolbaugh, senior mechanical engineer, to the Ohmsett team. Grant comes to us with more than nine years of experience in design, layout, and detail for products, tooling and fixturing. Most recently he developed customized testing methods and fabricated solutions for customers while improving design and quotation methods.



As the Ohmsett Senior Mechanical Engineer, Grant will be the principal investigator for developing mechanical oil spill recovery and oil boom testing, working with customers to accurately scope their specific test objectives, prepare final test reports, and provide peer review for other Ohmsett reports. He will be instrumental in developing wave/tow tank testing including hydrokinetic systems, ROV testing, remote water surface sensors, and vessel mobility.

Grant holds a Bachelor of Science degree in Mechanical Engineering and a Certificate in Nuclear Engineering from the University of Pittsburgh.

NWS Earle Youth Summer Camp Educational Tour

On July 10, 2019 the Ohmsett staff had the privilege of providing an educational tour of the facility to children from the U.S. Naval Weapons Station Earle Morale Welfare and Recreation's Youth Center Summer Program. During the tour, Senior Technician Tom Schmidt explained the purpose of the equipment used on the main bridge as the group took a ride along the tank's length.



The Ohmsett Gazette is published biannually to update our readers on testing, training, and research activities at the facility.

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Ohmsett will be open for Testing, Training, and Research in the Summer of 2020!

Good News!

The Ohmsett tank renovation planned for the summer of 2020 is rescheduled for the summer of 2021.

There are now 17 weeks of testing available May - September 2020!

Book your project today to lock in your preferred dates. Contact Len Zabilansky at 732-866-7285 or lzabilansky@ohmsettj.com.

Facility Capabilities:

- ◇ Independent and objective testing
- ◇ Measurable & repeatable test parameters
- ◇ Full-scale testing and research with real oil
- ◇ Wave/tow tank testing for testing MHK and marine debris recovery systems
- ◇ Testing of amphibious vehicles in flat water and waves
- ◇ Testing of Underwater Autonomous Vehicles (UAV)
- ◇ Evaluation of security barriers
- ◇ ASTM Standards testing
- ◇ Chemical treating agents and dispersant effectiveness
- ◇ Emulsion formation
- ◇ Oil recovery in broken ice
- ◇ Evaluation of remote sensing systems for oil and non-oil surfaces
- ◇ Hands-on training for fast water and oil spill response

Contact us now to schedule your project!
732-866-8285



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