

Renewable Energy Testing Capabilities at Ohmsett

Ocean Wave
Tidal Flow
Marine Current



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Ohmsett

MMS

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MAR
INCORPORATED

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The U.S. Minerals Management Service (MMS) is collaborating with research institutions and industry on testing wave and current energy systems. Ohmsett, The National Oil Spill Response Research & Renewable Energy Test Facility, is one of the largest outdoor saltwater tank in North America and is designed to evaluate the performance of meso-scale sized equipment under realistic but safe environmental conditions. The facility, managed by MMS and operated by Mar, Incorporated, is located at the Naval Weapons Station Earle Waterfront in Leonardo, New Jersey (about one hour drive south of New York City).

At the heart of Ohmsett is a large outdoor, above ground concrete test tank that is 203 meters long, 20 meters wide 3.5 meters deep and holds 10 million liters of crystal clear salt water. The facility is equipped with a wave generator capable of producing different wave types to create realistic sea environments for testing, ranging from 2 to 3 foot $H^{1/3}$ harbor chop to 1.5 foot sinusoidal waves with periods from 1.5 to 5 seconds. ($H^{1/3}$ is the average 1/3 height from peak to trough.)

The Ohmsett tank is equipped with three movable bridges with tow speeds of up to 6.5 knots and can be adjusted by 1/100 knot increments to simulate ocean current flow. The Control Tower is fully computerized and data from various sensors and video cameras are collected for synthesis and analysis.

Tank water is clarified through a diatomaceous earth filter system capable of processing the entire tank in 24-hours. The filter system keeps the water clear to permit the use of a sophisticated underwater photography and video imaging system during testing. An electrolytic chlorinator is used to control biological activity.

Support facilities at Ohmsett include a Machine Shop that provides a complete range of materials fabrication and welding services to support testing. We have the ability to lift various devices with the availability of a 75-ton crane and an onsite deck crane that can lift up to 1500 lbs with a 42 foot reach. A vast amount of indoor and outdoor work space can be found here to prepare, modify and clean test equipment. There is an on-site Chemistry Laboratory and a complete meteorological station for continuous weather measurements. The Ohmsett training facility and classroom can accommodate over 25 personnel and includes state-of-the-art multimedia and audio-visual equipment.

Why Ohmsett

Ohmsett provides a facility for research and development, and testing of meso-scale equipment for ocean wave and current technologies. Ohmsett has 15 years experience working with customers on research projects that include testing concepts for new products not yet in production and innovative studies for technologies to include wave modeling, remote microwave wind vector sensing, and mast wake characteristics with waves and calm surface. The experienced staff members are available to help with acceptance testing of equipment and assist in existing product evaluation and improvement recommendations. For more information contact Matthew Quinney at 732-866-7055 or email Matthew.Quinney@mms.gov.

Facility Specifications

Currently, MMS is in the process of upgrading the wave generator to more closely simulate ocean waves. This will enhance the existing wave generator capabilities to produce wave spectra (frequency and amplitude) by varying stroke acceleration and speed instantaneously. This effort includes retrofitting the existing wave generator system with dual action hydraulic actuators to drive wave flaps, programming the computer to create wave spectra, and upgrading the existing beaches.

Wave Tank:

- 203 meters (667 feet) long
- 20 meters (65 feet) wide
- 3.5 meters (11 feet) deep
- 10 million liters of water maintained at open ocean salinity (35 ppt)
- Tow bridge capable of speeds up to 12 km/hr (6.5 knots)
- Computerized drive system
- Equipment tow bridges

Wave Characteristics:

- Regular waves as high as one meter (3 feet)
- Simulated harbor chop waves (randomized waves)
- A movable, wave-damping artificial beach

Facility:

- Controlled reproducible conditions
- Test protocol development
- Underwater viewing/filming capabilities
- Data collection and video system
- Fully equipped Machine Shop
- On-site Chemistry Laboratory
- Meteorological station
- 15,000 lb forklift

