

Wave Power Tests Enhance Port's Green Image

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NEWBURYPORT - Tests begin today of an innovative wave energy converter two miles east of the northern tip of Plum Island. The device is the result of six months of R&D lead by Ocean Farm Technologies, Inc. (OFT), a company based in Searsmont, ME that manufactures aquaculture systems for open-ocean fish farming.

Much of the system was built locally, with the system's housing and float fabricated at Wilson Welding in Salisbury where final assembly has taken place. Local trawler Captain Jim Ford and commercial diver Mike Goodridge are assisting in the deployment and retrieval of the system.

This project has been supported by a Phase I Small Business Innovation Research (SBIR) grant from the National Oceanic and Atmospheric Administration (NOAA). Partnering with OFT in the project is Resolute Marine Energy, Inc. (RME) of Watertown, MA and the Massachusetts Institute of Technology in Cambridge, MA. The goal of this project is to demonstrate the feasibility of the device for its initial application, which is providing compressed air for use in operating offshore fish farms.

The Newburyport test site was selected because of its proximity to support facilities in Newburyport Harbor and for its unencumbered exposure to the waves of the Gulf of Maine. The timing of the tests is due to the project's six-month time frame. According to OFT president Steve Page, "We'd much prefer to be doing this testing in the summer, but the grant started in July, and we need to wrap up this initial phase by January 15th."

The system has two parts; a disc-shaped buoy that rises and falls with the waves and a submerged cylindrical housing that remains relatively stable. The buoy is 54 inches in diameter and is topped by a navigation light and an antenna for communications to shore. The submerged housing is a slender 23-foot-tall cylinder with an enlarged portion towards its base, where the drive mechanism, compressor, air storage tanks, and electronics are housed. The housing also has an eight-foot diameter damper plate for added stability. The two components are connected by a hollow rod that reciprocates in and out of the housing through a watertight seal.

Local engineer Cliff Goudey, who directs the Offshore Aquaculture Engineering Center at the MIT Sea Grant College Program, designed much of the system and supervised its construction. Because of the short duration of the project, much of the system has been assembled from off-the-shelf components. According to Goudey, "We knew it was going to be challenging to go from a concept drawing to a deployed prototype in under six months. These sea trials will help us identify areas for improvement."

The basic design is an adaptation of systems being developed by RME for various offshore power applications. Normally, such systems are designed to generate electricity, so the air compressor feature of this project is unusual and based on the unique needs of offshore aquaculture for air to control the buoyancy and position of submerged fish cages. Bill Staby, CEO of RME, sees the new device as an important step forward for wave power. "It would be easy to take the device built for this application and adapt it to produce electricity or other more suitable forms of power."

Newburyport is becoming a hub for renewable power. The idea of extracting energy from the sea is just one more example that complements recent wind-power and solar projects. The trend is no accident, according to Newburyport Mayor John Moak. "We have been proactive in encouraging these projects. We are serious about reducing the carbon footprint of our community and excited about the economic opportunities that can accompany growth in the development and adoption of renewables."

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