

NEWS RELEASE

Billy Pieper
Vice President, Makai Ocean Engineering
(808) 259-8871 or (808) 561-8139
Billy.Pieper@makai.com
www.makai.com



For Immediate Release:

HAWAII-BASED MAKAI OCEAN ENGINEERING RECEIVES U.S. PATENT APPROVALS

Next Generation of Systems For Ocean Engineering Developed By Local Hawaii Company

Honolulu, Hawaii (October 31, 2012) - Makai Ocean Engineering is happy to announce the recent approval of three of its patent applications by the United States Patent and Trademark Office (USPTO). "We're excited about the development of these technologies by our hardworking team which led to these three patents," said Billy Pieper, Makai Ocean Engineering Vice President. "And we're especially excited because this was achieved right here in Hawaii. Our goal continues to be to help the state become a global leader in ocean engineering development and technology."

The Makai Ocean Engineering patents that were approved are for three very unique systems:

- Autonomous Underwater Array Burial System®
- Mist Lift®
- Flange Protection System®

The **Autonomous Underwater Array Burial System**® provides an efficient means of burying submarine cables to protect them from damage by trawling, ship anchors, and other bottom threats. A new generation of arrays is being developed for applications ranging from environmental monitoring, scientific observations of the ocean in littoral areas, sub-bottom mapping for hydrocarbon search and well-depletion monitoring, and military and other surveillance applications. A typical array is usually 100 meters to 2000 meters long and contains multiple in-line sensors along its length. The goal is to increase the survivability of these arrays by burying them several inches below the ocean floor surface.

Conventional cable burial techniques using plows and ROVs require very large amounts of energy and an expensive surface vessel to support operations.

The Array Burial Vehicle (ABV), which is a critical component of the recently patented system, can reduce the energy required to bury an array by 2 to 3 orders of magnitude when compared with conventional methods, and eliminates the need for a surface vessel. Makai Ocean Engineering's unique and compact ABV design is a cost-effective and energy-efficient autonomous vehicle that uses optimized jetting and propulsion techniques to reliably bury a cable up to twelve inches below the ocean surface.

Mist Lift® is an advanced Ocean Thermal Energy Conversion concept that simplifies the extraction of energy from the ocean's tropical thermal gradient and reduces energy production costs. This patent also covers some of the techniques for controlling and building a Mist Lift® process on a dynamic at-sea platform.

Flange Protection System® protects against failure of large High Density Polyethylene (HDPE) pipes that are used in many marine applications and are used for most deep water intake pipelines for projects such as Seawater Air Conditioning (SWAC). The most common point of failure for these pipelines during deep water deployments is at the flange connection. The newly patented Flange Protection System® prevents high strains in the flanges and greatly decreases the risk of failure during pipe installation.

"These USTPO patent approvals of Makai Ocean Engineering's inventions are a grant of intellectual property rights to our local Hawaii-based company," said Pieper. "We want to attract investment that will not only further our research and development, but help to position Hawaii as the world leader when it comes to solving challenges or problems in the ocean."

Makai Ocean Engineering was founded in 1973 as a diversified ocean engineering company providing services to include international clientele focusing on engineering for ocean based renewable energy (OTEC and SWAC), large underwater pipelines, software for planning, simulation, installation and recovery of submarine cables and arrays, and software for visualizing scientific 4D/5D data. Makai Ocean Engineering takes pride in successfully achieving innovative solutions to difficult problems for a broad range of clientele which has included private, industrial, and commercial firms nationally and internationally; federal, state and local governments and Pacific Island Nations.

###

Media may email Billy.Pieper@makai.com for digital images and to schedule a demonstration of the recent patent-approved systems.