

Million Dollar Winner

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ORR above 2,500 gallons per minute (gpm) and an oil recovery efficiency (ORE) of greater than 70 percent oil-to-water ratio.

This competition required the largest volume of oil ever used in more than four decades of testing at Ohmsett.

The \$1 million First Place prize winner, Elastec/American Marine, is a manufacturer of oil spill and environmental equipment with a reputation for innovation in machinery design and has grown to become one of the largest manufacturers of oil spill equipment in North America. Their oil-skimming system with four rows of rapidly spinning grooved discs achieved 4,670 gallons of oil per minute at 89.5 percent efficiency - a recovery rate that was three times more efficient than the industry's previous best oil recovery rate, tested under controlled conditions. The team members were: Don Johnson, Donnie Wilson, Jeff Cantrell, Stewart Ellis, Charles Storey, Brian Orr, and the Glosten Associates, Inc.

Coming in as the \$300,000 Second Place prize winner, Team NOFI tested their single vessel unit called the Current Buster 6, which collects, separates and stores oil in an alleged current up to five knots. Their system incorporated a flexible v-shaped surface boom towed between two vessels or alongside one (via an overhead arm), which cor-



Second Prize winner, Team NOFI with their single vessel unit, the Current Buster 6. The system's recovery rate was 2,712 gpm at 83 percent efficiency.

als oil down to the end of the V where a separator removes it from the water. Their system's recovery rate was 2,712 gpm at 83 percent efficiency. The team members were: Dag Nilsen, Øystein Woie, Tor Kristian Fagerheim, and Birgit Pedersen.

The 10 teams that competed at Ohmsett were: CRUCIAL, Elastec/American Marine, Koseq, Lamor, NOFI, OilShaver, OilWhale, PPR, Voraxial, and Vor-Tek.

For more details on the competition and the 10 final teams, visit the Wendy Schmidt Oil Cleanup X CHALLENGE website www.iprizecleanoceans.org.

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Herding Agents Persistence in Waves

Over the course of one week in May 2011, S.L. Ross Environmental Research, Ltd. came to Ohmsett to continue the Bureau of Safety and Environmental Enforcement (BSEE) funded research on chemical herder persistence in waves. This particular portion of the research focused on using oil herding agents for rapid response *in-situ* burning of slicks on open water.

The objective of the seven-day research was to determine how long the monolayer surfactant film will last as a function of sea state, and to what degree periodically replenishing the film can counteract the oil's tendency of spreading into a thin layer.

During the tests, small amounts of U.S. Navy (USN) herder, Silsurf A108 herder, and Silsurf A004-D herder were used. The test area consisted of a floating plastic ring placed in a boomed area of the tank. The herding agent was carefully placed on the water surface within the ring and oil was gently poured onto the surface inside the ring. As the waves started, the containment ring was lifted to allow the slick to drift as long as possible, until it reached the tank wall or the containment boom.

At the end of each test, the residual herder from the water surface inside the boomed area was dispersed by running a train of breaking waves down the tank for several minutes and using the Main Bridge fire hoses to disperse the herder into the water column.

For more information and the final report, visit <http://www.boemre.gov/tarprojectcategories/ohmsett.htm>.

The Wendy Schmidt X CHALLENGE Million Dollar Winner



The Wendy Schmidt Oil Cleanup X CHALLENGE First Place prize winner Elastec/American Marine oil-skimming system with four rows of rapidly spinning grooved discs achieved 4,670 gallons of oil per minute at 89.5 percent efficiency.

At the end of three grueling months of testing and with all the data collected, the X PRIZE Foundation announced the winners of the Wendy Schmidt Oil Cleanup X CHALLENGE at a ceremony on October 11, 2011 in New York City. The first place team, Elastec/American Marine, from Illinois, and the second place team, NOFI from Tromsø, Norway emerged from 10 finalists selected out of more than 350 entries from around the world in the competition.

The 10 finalists demonstrated their cleanup systems during rigorous testing at Ohmsett throughout July, August and Sep-

tember, where they each demonstrated their individual technology in the Ohmsett test tank.

The X CHALLENGE set bold and achievable targets raising the bar of oil spill cleanup in order to inspire breakthrough innovation. In the case of this competition, the final teams were asked to more than double the industry's previous best oil recovery rate (ORR) tested in controlled conditions by requiring them to demonstrate the ability to recover oil from the water's surface at an

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X CHALLENGE COMPETITION: Meet the Teams

VorTek: California

Vor-Tek Recovery Solutions LLC is based in Southern California and is focused on new technology development and recovery methods for marine based applications suited for oil spill and marine plastics recovery. The Emergency Extraction Line (EEL) system is capable of surrounding large areas to extract oil/water mixtures into boats or barges for further separation. It functions not only as a containment boom/barrier but also as an effective integrated extraction line capable of removing contaminants (oil) from water for processing through specialized separation systems. The EEL system primarily can be described as a segmented oil boom that doubles as a high efficiency induction line capable of trapping and siphoning hazardous waste from surface and sub surface water. The system works in concert with the most current state of the art pumps and the latest oil/water separators current technology has to offer. The EEL system is a green technology and does not use burning or any chemicals for extraction. Team members: Ashley Day, Fred Giovannitti, Dan Creighton, Ryan Njavro, Greg Cicero, Cliff Newbie.



Team PPR with their open water skimming system.

OilShaver: Norway

The technology is based on a shaving process where the oil spill film is shaved off the surface before it is exposed to the turbulence induced by the collection device. The shaved off oil is then led into a containment volume between two long pontoons where it forms a river powered by inertia towards the collection unit with a hydraulic pump. The pontoons are spread out from the ship side at 45 degrees to the towing direction without the aid of paravanes or other spreading devices. The collection unit with the pump is therefore close to the stern of the towing vessel, requiring only a short pumping line. A Norwegian patent application is filed for the system. Team members: Ingvar Huse, Terje Hemnes, Jorunn Sanden, Jarle Einar Gundersen.



Team OilShaver system.

PPR: Washington

The PPR open water skimming system is a long standing concept of PPR and was built to respond to the Deepwater Horizon disaster. The system is based on materials and technology currently in use in other maritime applications. It is extremely robust, scalable and capable of high recovery and

continuous operation. It can be deployed and operated simply, and its use will be understandable to the industry. Team members: Rich Morgan, Kevin Kennedy, Bruce Thiffault.

CRUCIAL Inc.: Louisiana

Started in 1991, CRUCIAL, Inc. is a worldwide distributor and manufacturer of a full range of oil spill response and environmental control products and equipment. They entered this competition to share their new concept of containment and recovery of oil spills in order to prevent and/or control catastrophic events such as the Deepwater Horizon disaster. Team members: Wally Landry, Richard Forbes, Debbie Alberto, Jody Trapani.



Jody Trapani, Wally Landry and Richard Forbes of Team CRUCIAL.

Voraxial: Florida

The Voraxial® Separator was originally designed in the aftermath of the Valdez Oil Spill in 1989. It is a high "g" force, continuous flow machine that separates large volumes of fluids based on their different densities. The Voraxial® impeller is a non-clogging, low shear device designed to produce a vortex in the fluids flowing through the unit with the heavier fluids (water) being drawn to the outside of the vortex, while the lighter materials (oil) are drawn to form a central core. A specially designed manifold at the exit of the separation chamber is utilized to collect the separated streams. The oil re-



The Voraxial Separator during the competition.

covery system including the Voraxial® Separator is compact and scaleable to recover oil close to shore or at out at sea.

The systems are designed so that multiple units can be installed on a single vessel either aboveboard or submerged below the water surface on an open-water or a shallow draft vessel. The system includes a skimmer to collect the oil/water mixture from the surface water, a hose to channel the captured liquids to a positive displacement transfer pump and then to the Voraxial® Separator for separation. Team members: Laura Di Bella, Alberto Di Bella, John Di Bella.

Koseq: Netherlands



Koseq's floating steel system with a V-shaped arm is towed through the water.

Koseq has designed and produced oil recovery equipment for over 30 years. The rigid sweeping arm concept has proven to be very successful in recovering oil from the sea surface at large oil spills, much like the Prestige disaster near Spain in 2002.

The goal was the make a mechanical oil recovery device for being able to remove large

quantities of oil from the North Sea in case an oil tanker would get in trouble. This device is a floating steel construction, to be towed through the water at a certain angle. This special arm is V-shaped. When towed through the water, the oil is concentrated in the bottom of its V, from where the oil is pumped to the storage. Team members: Tom Achterberg, Gert Kampers, Ary van den Adel, Frank Hoos, Wierd Koops, Yvonne van Heijningen-Bank, Erik van Nieuwenhuyze, Edwin Reppel.

Lamor: Finland

Lamor has been in the oil spill response business since 1982 and is continuously developing new concepts, technologies, methods and products for efficient oil spill response in all kinds of environments. They have an extensive practical experience of real oil spills covering three decades of operations, and were heavily involved in the Deep Water Horizon oil spill in 2010. The Wendy Schmidt Oil Cleanup X CHALLENGE gave them an opportunity to demonstrate practical and efficient recovery technologies with a worldwide interest. Team members: Jari Ahoranta, Fred Larsen, Rasmus Guldbrand, Rune Högström, John Kolonyi, Dan Beyer, Vince Mitchell.



Team Lamor's skimmer system in the test tank.

OilWhale: Finland

The team has worked on the OilWhale project for four years, developing and testing the method, and building the prototype of the model. The OilWhale is a unique recovery method. Material properties like viscosity, temperature, pumpability or stiffness does not prevent the procedure of functioning nor decrease its performance. OilWhale can operate at remarkable higher speeds than traditional methods and it has a high recovery capacity and efficiency. Team members: Markku Järvinen, Markku Lehtinen, Heikki Järvinen, Sampsa Veijalainen, Aki Veijalainen.



The OilWhale's unique oil recovery method.

Source: Photos and team profiles from the Wendy Schmidt Oil Cleanup X CHALLENGE website www.iprizecleanoceans.org

