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June 9, 2003

Navatek Launches *HYSWAC* “Lifting Body” Technology Demonstrator Craft



HYSWAC in drydock before launch



170-ton Navatek lifting body below HYSWAC

Honolulu, Hi. – Navatek Ltd. has launched a large-scale, U.S. Navy technology demonstrator craft incorporating the company’s proprietary, underwater “lifting body” technology. The Office of Naval Research, Arlington, VA., is funding the \$18 million project, begun in 2000. The 160-foot, 30+ knot craft, called *HYSWAC*, has a full-load displacement of 340 LT. Sea trials of the new craft are expected to begin later this summer in waters off Hawaii.

The *HYSWAC* is designed to confirm on a large scale the three major benefits of underwater lifting bodies verified on an earlier, small-scale 65-foot, 50 LT Navatek lifting body demonstrator craft called *MIDFOIL*, as well as through extensive computational fluid dynamics (CFD) studies. These identified benefits include superior ride in all seas, all headings and all speeds (including zero/loiter to maximum speed); higher transport efficiency at all speeds; and extended range/payload.

A former U.S. Navy Surface Effect Ship (SES-200) provided the parent hull of the *HYSWAC*, reducing project costs. During the two-year project, Navatek removed the existing SES air lift system and all related components, and installed a 170-ton Navatek underwater lifting body incorporating a new propulsion drivetrain (engines, gearboxes, shafts and propellers) within the lifting body. This allows the craft to be operated with variable immersion as speed increases with the parent hull fully out of the water at maximum speed. An aft crossfoil was also added for pitch stabilization and control, along with a proprietary advanced ride control system (ARCS).

In addition to the multi-hull *HYSWAC* lifting body demonstrator craft, Navatek is currently building a second large-scale, lifting body technology demonstrator craft, the *HDV 100*. The 100-foot, 100-ton, 50-knot *HDV 100* employs an anti-slamming, deep-vee monohull as the parent hull, mated to a Navatek “blended-wing” underwater lifting body. Scheduled launch date for the *HDV® 100* is the end of 2003. A portion of the funding for the *HDV 100* craft is coming from the Office of Naval Research, with additional support coming from the federally-funded Center for the Commercial Deployment of Transportation Technologies (CCDoTT) and Navatek Ltd. corporate investment.

Navatek, Ltd., a wholly-owned subsidiary of Pacific Marine, operates out of offices in Honolulu, Hawaii. It’s primary government customer is the U.S. Navy’s Office of Naval Research (ONR). Through its work on advanced hull forms for the U.S. military, the company has helped develop advanced Computational Fluid Dynamics software and become a world leader in the design, construction and testing of underwater lifting bodies that can make a broad range of conventional hull forms (including monohulls, catamarans, trimarans, small waterplane area ships as well as deep-vee, partial hydrofoil and hydrofoil hull forms) more stable at zero speed, more efficient at higher speeds, as well as giving them extended range.

The company’s novel hull form bodies are tested large-scale in open-ocean conditions in waters off the Hawaiian Islands. Navatek owns and operates both small (6 ton) and large (50 and 85 ton) high-speed, ocean-going test craft. They are used to test candidate hull form bodies, ride control systems and hull components. Tank tests are also conducted at small scale to evaluate concepts

Navatek Ltd. performs some of its CFD analyses using the Maui High Performance Computing Center supercomputer. The MHPCC is the 12th largest computing center in the world. Navatek also operates a 128-processor Linux cluster at the Navatek headquarters in Honolulu. Navatek, Ltd. often partners with other private companies, universities, government agencies and consortia in its R&D work. These include corporations Lockheed Martin, Northrop Grumman, General Dynamics, Electric Boat, SAIC, Cortana and Bath Iron Works; educational institutions like the Massachusetts Institute of Technology (MIT), California State University-Long Beach, Mississippi State, Penn State, U. of Maine and U. of Hawaii; and government agencies such as the U.S. Navy, the Office of Naval Research, the U.S. Dept. of Defense, the Defense Advanced Research Projects Agency (DARPA), the Center for the Commercial Deployment of Transportation Technologies (CCDOTT), and the Center for Excellence in Research in Ocean Sciences (CEROS).

Navatek Ltd. parent company Pacific Marine, founded in 1944, is a privately-owned Hawaii corporation with 400 employees and annual sales of \$60 million. Pacific Marine is majority partner in Pacific Shipyards International LLC, Hawaii’s largest commercial ship repair facility.

