

INTERNATIONAL SUBMARINE RACES™

NEWS:

For Immediate Release

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HUMAN-POWERED SUBMARINES COMPETE AT PREMIER NAVY TEST FACILITY

BETHESDA, MD. June 27, 2003 – High-tech met low-tech, and college engineers competed against standout high school students in the 7th running of the International Submarine Races, the biennial human-powered engineering design competition at the world's largest indoor tank, the Naval Surface Warfare Center's Carderock Division David Taylor Model Basin June 23-27.

Drawing upon both brain and brawn, the scuba-clad future engineers and design entrepreneurs produced a range of submarines from the sublime to the surreal.

The team chosen by the judges to receive the top award for Overall Performance was OMER of Ecole de Technologie Superieure, Montreal, Canada. "OMER 5", the team's remarkably sleek 16-foot two-person submarine, won the Absolute Speed Award with a sprint of 6.814 knots and also won the prize for Best Use of Composites. The Overall Performance Award, sponsored by the IEEE Oceanic Engineering Society, carries a cash prize of \$1,000 and a trophy.

The Spirit of the Races Award went to the team from Florida Institute of Technology, whose submarine was "Miss FIT", a bright red 16-foot-long six-sided torpedo. This award recognizes overall spirit, gusto, fortitude and support of other teams and is given to honor the late ISR contestant Steve Barton of Spring Hill, FL.

Judges awarded the Best Design Outline and Report prize to Sussex County Technical School of Sparta, N.J., whose first-time entry, "Umptysquatch-1" was completely designed, built and operated by high school students. A new prize, the Smooth Operator Award, went to "Sirius" from the University of Washington. The award recognizes team efficiency.

The competition featured 19 submarines from teams throughout the U.S., Canada and Mexico, including two high schools and several independents. More than 150 volunteers provided the resources required to conduct the races, including U.S. Navy safety divers and experts from the Carderock Division staff.

Other speed awards:

One-person propeller, academic, first place: RSR Fourier, University of Maryland, 4.916 knots; second place, Hullabaloo, Texas A&M, 4.835; third place, Phantom 4, Virginia Tech, 4.516 knots. One-person propeller independent, first place: Scuba Doo, Wheaton Submarine Works, Wheaton, MD, 4.875 knots. One-person, non-propeller, academic, first place: Specter 1, Virginia Tech, 3.520 knots. Two-person propeller, academic, first place: Omer 5, 6.814 knots; second place, Terpedo, Univeresity of Maryland, 3.149 knots; third place, Umptysquatch, Sussex Technical School, Sparta, NJ, 2.517 knots. Two persons, non-propeller, academic, first place: Miss FIT, Florida Institute of Technology, 3.417 knots.

Competition began early Monday morning with a major surprise: the first submarine in the water ready for safety checks was "Sublime II" from Springstead High School in Spring Hill, FL. Taking its first run, the Florida team made it to the starting gate, only to run out of air. But they were soon back in the racing, finishing with a number of successful runs and achieving a speed of 2.19 knots.

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Crashing into walls due to navigation mishaps was not uncommon, occurring to the sleek sub named "Invicid" from the University of California at San Diego, which on one of its runs veered sharply and broke its nosecone. But in the spirit of the race, other teams came forward with offers of help and the sub was back and running again within hours.

At the ISR, propellers break, shear pins snap, hatches float off, guidance fins don't work and control mechanisms jam or break. A frequent challenge is the achievement of neutral buoyancy, permitting the sub to attain a level position to start its run. These were some of the mishaps and learning experiences that befell the teams as they sought to take their inventions from classroom, laboratory and workbench into the unforgiving underwater environment of the test tank.

During the week, the teams went through safety and engineering examinations, including formal presentations to an expert panel of judges on all aspects of the preparation of their submarines. Most boats made successful runs over the entire course. Some did not and withdrew.

Jerry Rovner, race director, said the ISR operations team conducted 189 individual submarine runs during the five-day event. "Our record for 100 percent safety remains intact," he said. Mr. Rovner manages the process of all race operations including diving, safety, emergency procedures, course lighting, underwater video and timing. "This was the smoothest operation we've ever run. We owe a huge debt of thanks to the Navy, to our volunteers and to the submarine teams."

The team holding the world's record for speed, just over 8 mph, "Omer 5" from Montreal, Quebec, was unable to make its first run until Thursday, due to computer problems, but then achieved a blistering record speed of 6.814 knots. Omer 5 is an incredibly sleek, two-person submarine outfitted with sophisticated, computer-driven speed and directional aids for the propulsor and navigator, both of whom provide the human power.

"We've seen some excellent designs from the student teams," said chief judge Claude Brancart, a retired expert in autonomous underwater vehicles from Draper Laboratories. "We anticipated lively competition and that's exactly what we got." Mr. Brancart and the other judges remarked on the significant progress being made in engineering and design capability by many of the nation's technical high schools.

Among those competing here for the first time was Sussex County Technical School from New Jersey. The team designed and built a 12-foot, two-person sub that not only moved successfully through the course but achieved a speed of 2.32 knots from its twin propeller propulsion system. The team achieved such popularity that race officials engineered a special challenge contest, giving U.S. Navy divers a chance to operate the sub and see if they could match the time of the students. To the good-natured gibes of spectators, the veteran Navy divers failed to finish the course.

One of the most innovative entries was a team from Virginia Polytechnic Institute, Specter 1, which featured a composite nosecone wrapped around a one-person propulsor who provided thrust with a dolphin-like fin attached to the legs. It was the first half-human, half-fish entry seen in the 15-year history of the ISR. It achieved a speed of 3.52 knots Thursday and claimed a new world's speed record for human-powered alternative propulsion submarines. Virginia Tech's more traditional one-person sub, Phantom 4, made a speed of 3.858 knots.

This was the fourth time that the event was staged in the 3200-foot-long David Taylor test tank at NSWC. The ISR was created in 1988 with an open invitation to inventors and entrepreneurs of all stripes, and the first race was held in Florida the following year. It left the open ocean in 1995 and moved to Carderock, growing to include the participation of universities, colleges, corporations, research centers, high schools and privately sponsored teams from the United States, Canada, Mexico and Europe. Typical teams consist of student athlete/engineers, wearing scuba gear, who provide propulsion and navigation as their subs run against the clock along a fixed underwater course. The principal objective of the competition is education: encouraging innovation in the use of materials, hydrodynamic design, buoyancy, propulsion and underwater life support. Many team participants have gone on to professional engineering careers in the Navy and other ocean technology organizations.

"The increasing interest among young people to compete in educational arena of human-powered submarines is gratifying," said Nancy Hussey, chairman of the Foundation for Underwater Research and Education, parent organization of the ISR. "To design and complete a racing submarine is a very difficult challenge. Taking an idea from paper and classroom theory to actual practice in the water demands the very best minds and ultimately, good teamwork and experience. We look forward to our next competition in 2005 and are delighted at the success of our partnership with the U. S. Navy here at the Naval Surface Warfare Center's Carderock Division."

“The Naval Surface Warfare Center has been proud to host the 2003 International Submarine Races at its David Taylor Model Basin,” said Captain Steven Petri, USN, Division Commander. “We are pleased to be able to continue our support of such an outstanding educational and engineering endeavor.”

Chief Judge Brancart said the week’s results demonstrated that experience generally results in an improved product. “As teams learn, they get better. Newcomers to submarine competition are on the learning curve. Fortunately, they all experience the same problems—drive train failures, guidance difficulties, problems with their safety buoy, flimsy control surface actuators, too little practice time in the water, and little to no experience in the frigid conditions of the test tank. It is gratifying to see these teams react, respond, repair and get back in the competition.” .

Participating teams:

Texas A&M University (Hullabaloo)	University of Washington (Sirius)
Virginia Tech University (Specter 1)	Virginia Tech University (Phantom 4)
University of Michigan (Mercury)	University of Quebec, Canada (Archimede 2)
University of Maryland (RSR Fourier)	University of Maryland (Terpedo)
Merchant Marine Academy (Jonah)	University of Veracruzana, Mexico (Archangelo III)
Millersville University, PA (Redemption)	Springstead High Schools, FL (Sublime)
Lafayette College, PA (Triakis)	Sussex County Tech High School, NJ (Umptysquatch-1)
Florida Institute of Technology (Miss FIT)	University of California at San Diego (Inviscid)
Ecole Polytechnique de Montreal, Canada (Omer 5)	Wheaton Submarine Works, Md. (Scuba Doo)
Bruce Plazyk, Wheaton, IL (Faux Fish)	

The building of human-powered submarines dates back more than 200 years. Contemporary ISR submarines represent many months, if not years, of effort in labs, workshops and garages by engineering students or individual entrepreneurs. The goal is to design an underwater vehicle that can be powered successfully through the course without malfunctioning, crashing into the bottom, popping to the surface or simply failing to move through the water.

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