

Making Waves

Newsletter of Oceanic Consulting Corporation
Fall 2007

CONGRATULATIONS ALINGHI!

ALINGHI WINS THE 2007 AMERICA'S CUP 5-2

In a race where there is no second...every second counts. Race 7 of the 32nd America's Cup, held in Valencia, Spain, demonstrated just that. Alinghi finished just one second ahead of challenger Emirates Team New Zealand to successfully defend the Auld Mug. This is the closest finish in the 150-year history of the America's Cup and Oceanic Consulting Corporation is very proud to have been part of it.

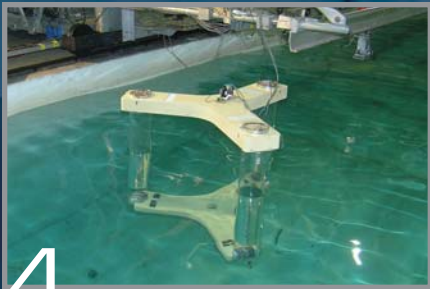
The Alinghi victory in the 32nd America's Cup marks the second time that the team defeated the former New Zealand champions. As the sole provider of hydrodynamic model evaluation services to Alinghi for both the 2003 and 2007 successful America's Cup campaigns, Oceanic Consulting Corporation has established a solid working relationship with the Swiss syndicate. Oceanic is pleased to announce that Alinghi has once again retained the firm in their quest for a third consecutive victory in the upcoming 2009 33rd America's Cup Challenge.

One second. One second on the water made the difference between owning the Cup and just wishing for it. Congratulations Alinghi! Your passion, pursuit of excellence, and dedication to being the best are inspiring. ●

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CHARTING THE COURSE



Passion is a word that one seldom hears in everyday conversation, but the America's Cup Challenge has a way of reminding us what it can mean. Those unfamiliar with the America's Cup experience might think it's about the glory of winning, but what really drives the participants is the motivation to succeed and the compelling passion for the sport.



Passion enables us to overcome obstacles and to visualize potential. It shapes our existence and illuminates our path. We see it on the faces of those racing for the Auld Mug, and, at Oceanic, we see passion's extravagant drive in those who have worked with syndicates Alinghi, BMW Oracle Racing, and Mascalzone Latino-Capitalia Team. Page 7 of this newsletter introduces Oceanic Project Managers Keith Downey and Jason Davis, both of whom performed model hull testing for the 2003 and 2007 America's Cup teams. Passion has inspired these men to focus on the unexplored, and it has earned them the respect of both their peers and their respective syndicate teams.

As President of Oceanic, I was proud to see Alinghi successfully defend its second America's Cup title by winning the best of nine series, 5-2. For Oceanic, Alinghi's crossing of the finish line with a 1-second lead in Race 7 was a culmination of more than three years of testing and yacht development. I am also proud to announce that Alinghi has re-signed with Oceanic in their journey to once again defend their title in the upcoming 33rd America's Cup challenge in Valencia, Spain.

On this occasion, I would like to extend to Alinghi our congratulations and our very best wishes. We salute them for their technical skill, their incredible dedication, their passion to excel, and their continued success.

In this edition, we also take a closer look at the fervent quest for Olympic Gold. Aerosports Research, working with NIKE Inc., has been testing high-performance swimsuits at the Ocean Engineering Centre. The hydrodynamic testing performed on these suits enables the world's top athletes to perform at their best in the world's most recognized athletic event.

Another example of passion for excellence in the field of naval architecture is Gregory C. Marshall Naval Architects Ltd., a team which continues to produce designs that balance art and science, creativity and technology, along with appearance and performance.

While the word passion may not be spoken often, passion abounds in everyday life as it is the driving force behind many successful ventures, whether personal or in business. As a final word in this address, I would like to encourage you all to pursue your passion, whatever it may be. ●

For Oceanic Consulting Corporation,
and with best regards,

Dan Walker, Ph.D, P.Eng.
President

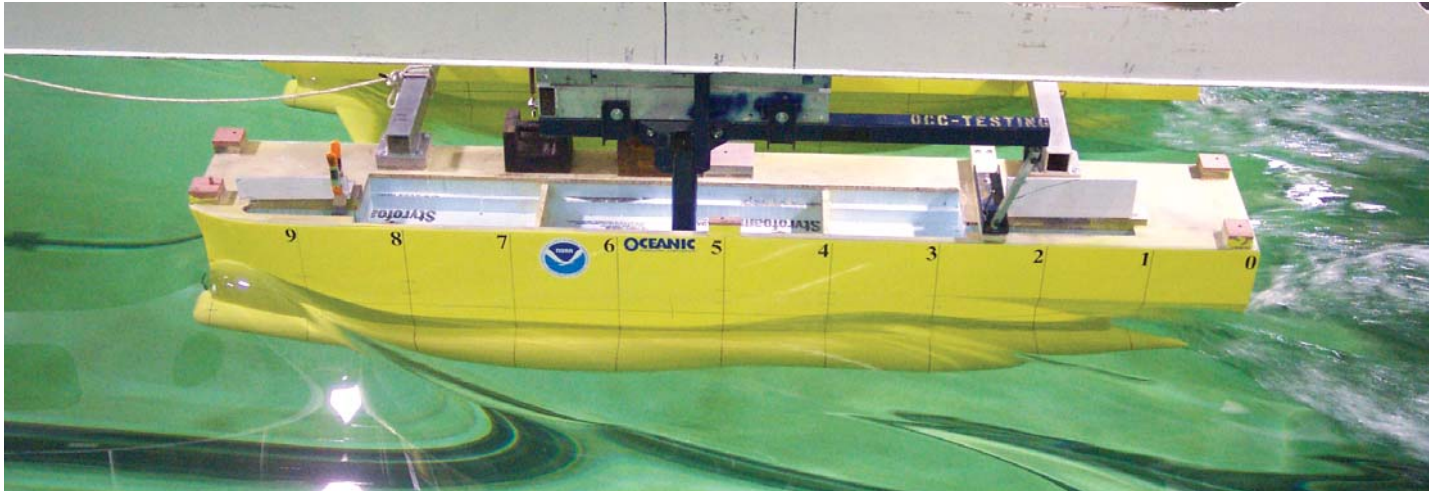
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OCEANIC TESTS DESIGN OF NOAA SWATH COASTAL MAPPING VESSEL



SWATH model being towed during a resistance experiment.

The National Oceanic and Atmospheric Administration (NOAA), an agency of the U.S. Department of Commerce, is presently undertaking an active fleet replacement program. Highly specialized NOAA ships and aircraft acquire research and survey data to support the agency's environmental science mission. NOAA supplies environmental information products (such as weather forecasts and nautical charts), provides environmental stewardship services (marine sanctuaries, coastal resource management, sustainable fisheries), and is a leader in applied scientific research (ecosystems, weather, climate, commerce, and transportation). NOAA recently contracted VT Halter Marine Inc. of Pascagoula, Mississippi, to construct a SWATH (Small Waterplane Area Twin Hull) Coastal Mapping Vessel. The vessel will perform hydrographic survey missions and support research in improved hydrographic systems and technology. The vessel is expected to be delivered in mid-2008.

VT Halter Marine also completed the vessel's preliminary design under Phase I of the contract. The vessel, which will be capable of mapping the seafloor in coastal areas using side scan and multi-beam sonar technologies, is expected to operate in waterways along the Atlantic and Gulf coasts, the Caribbean Sea, and the Great Lakes. During the design process, Oceanic Consulting Corporation assisted with various performance evaluation tasks. Oceanic's evaluation employed both physical test facilities and numerical tools to assess the design.

Physical tests were completed in calm water with a 1:11.8 scale model to determine the resistance and effective power of the hull, both without and with canards and stabilizer fins. A sinkage and trim sensitivity study was included in order to determine the optimum angles for the canards and stabilizers. The test results confirmed that the wave-making resistance of the evolved hull design had been improved over earlier hullform concepts.

Also included in the work was a numerical assessment of vessel maneuverability, which was completed using Oceanic's maneuvering code *SML* (Ship Maneuvering Laboratory). Using maneuvering coefficients estimated from similar hulls that were tested previously by Oceanic, along with the resistance test results for the current hull, basic maneuvers were completed to assess the vessel's turning performance for various rudder deflections.

A significant portion of Oceanic's participation in this work was related to the assessment of the vessel's seakeeping ability. As a stable platform is necessary for operating the hydrographic equipment, the SWATH was subject to a stringent set of seakeeping criteria. Oceanic initially completed a set of simulations using its time-domain seakeeping code *MOTSIM*. Various speed, heading, and sea state combinations were examined in order to assess the various mission profiles defined in the specification. A method was devised to calculate the vessel's Percent Time Operability factor and then used to assess its compliance with the specification.

As initial seakeeping results predicted that the vessel may be prone to some undesirable pitch motions in certain conditions, it was decided that a limited set of physical seakeeping tests would be undertaken to confirm the numerical results. Tests were completed at zero speed, both without and with canards and stabilizer fins, in following and stern quartering seas. The results provided useful validation data for the seakeeping code. New seakeeping predictions were then completed to re-assess the hull for a new load condition. The combination of seakeeping simulations and experiments provided results which ultimately illustrated that the vessel would be able to perform its various mission profiles within the requirements of the NOAA seakeeping specification. Animations were also produced for certain numerical results in order to qualitatively illustrate the seakeeping response of the vessel.

All told, this design was successful in meeting the stringent criteria identified in the design specification. Oceanic is pleased to have assisted both VT Halter Marine and NOAA with this project and we wish them success with the construction and launching of this new ship. ●



SWATH model during a zero-speed seakeeping test.

MULTIDISCIPLINARY GLOBAL OBSERVING PLATFORM EVALUATED



Technip EDP model with ocean tug model by Burchett Marine.

Oceanic Consulting Corporation has recently completed testing for The Glosten Associates, working on behalf of Scripps Institution of Oceanography, to assess a proposed design of a floating platform for the Ocean Observatories Initiative (OOI) project. OOI is a multi-disciplinary global observing system effort funded by the U.S. National Science Foundation (NSF) through the Joint Oceanographic Institutions, Inc. (JOI). OOI, with a budget of \$331.5M over five years, is working to establish permanent observatories in mid-ocean regions to measure physical, chemical, biological, and

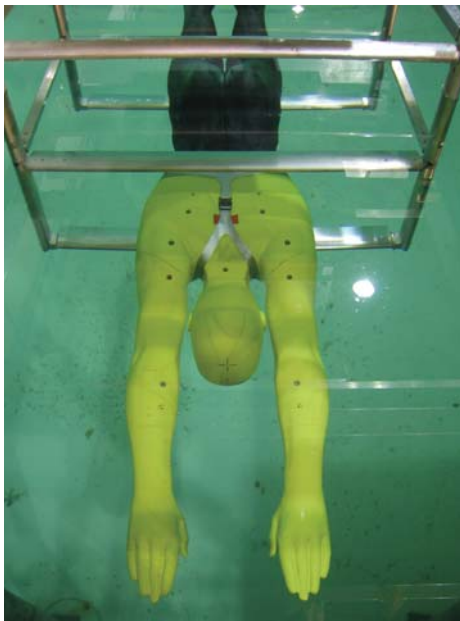
geological parameters over large spatial and temporal scales. The observatory comprises multiple sensor modules deployed at sea, ranging from the air-sea interface through to the deep ocean, and into the ocean floor itself. The goal of the observatory is to provide scientists with real time access to these sensors, both to upload instructions to the modules and to download measured data.

A floating buoy provides the critical link between the remote instruments and the scientists operating from their bases around the world.

This floating platform will provide power to the observatory array and two-way communications between the instruments and scientists through the Internet via a satellite link. The Scripps Institution of Oceanography, a member of JOI, is the project lead for the cyber-infrastructure components of the OOI project and is a member of a consortium to build the coastal and global nodes.

The Woods Hole Oceanographic Institution (lead), Scripps, and Oregon State University consortium is investigating with Scripps and Glosten a proposed floating buoy design developed by Technip. Technip's proposed prototype buoy is based on their Extended Draft Platform (EDP) technology. This design, a three-column buoy, provides complete dockside outfitting, an efficient tow-out configuration, and self-deployment to the deep-draft installed condition. The columnar design of the buoy provides relatively small response to waves due to the low water plane area.

The model tests, conducted by Oceanic at the Ocean Engineering Centre (OEC) in Vancouver, BC, were attended by representatives of Glosten and Technip. These tests determined towing resistance, wave response, and directional stability of the buoy in the tow-out configuration. Further tests measured the wave response of the buoy in the installed condition. An important aspect of the model tests was to determine the serviceability of the buoy in the installed condition. Tests with a similarly scaled ocean tug model (supplied and operated by Burchett Marine Inc.) simulated the approach, mooring, and station-keeping of a service vessel to the buoy in wave conditions typical of the installation area. ●

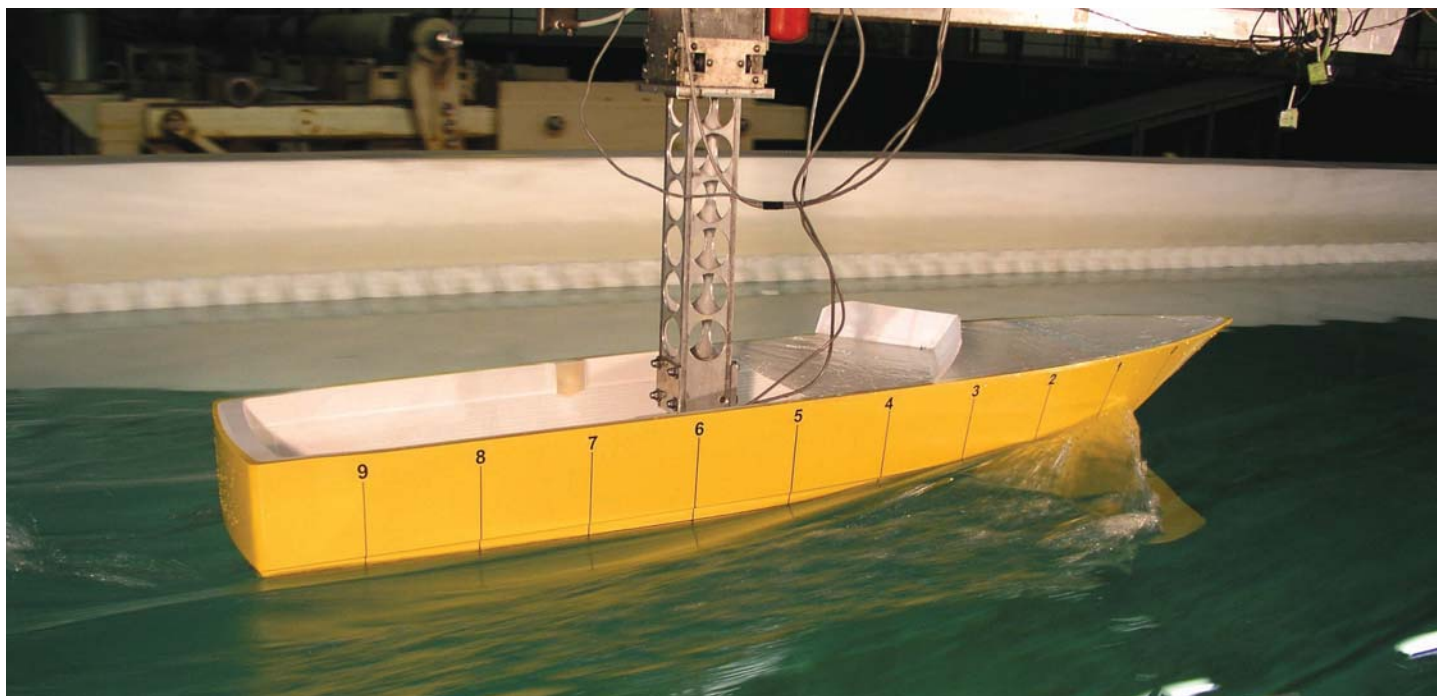


THE QUEST FOR OLYMPIC GOLD BEGINS IN THE TOWING TANK

In international swimming competitions, small differences in time, often less than 0.5%, separate the top performances. Beyond differences in training, technique, and genetic make-up, whether a swimmer wins the race or finishes second may be influenced by the hydrodynamic drag of the swimmer's suit. Aerosports Research, an aero/hydrodynamics consultancy that works with NIKE Inc., uses a custom-built full-scale mannequin attached to the towing carriage at the Ocean Engineering Centre in Vancouver, BC, to measure the drag of new, high performance full-body swimsuits.

According to Len Brownlie, President of Aerosports Research, "we've found that swimsuits composed of different fabrics have as much as a 6% difference in drag between the best and worst, even for the same cut and fit". Brownlie likes the OEC tank because, compared to other facilities like swimming flumes, "it offers precise velocity control and excellent repeatability on drag measurements. The OEC Tow Tank helps us to design technically advanced apparel and equipment that allow the world's best athletes to perform at their best". ●

GREGORY C. MARSHALL TESTING AT THE OCEAN ENGINEERING CENTRE



Resistance testing of a Gregory C. Marshall hull design at the Ocean Engineering Centre.

Over the last few months, Gregory C. Marshall Naval Architects Ltd. (GCMNA) has been very busy at Oceanic's Ocean Engineering Centre in Vancouver, BC, with performance evaluation tests.

Oceanic undertook testing of a 1:20 scale model of the 35-meter *Horizon 110* design to determine powering requirements and to observe motions in head seas. Seakeeping, resistance, and calm-water resistance testing was performed for both 120- and 140-tonne-vessel loading conditions. The *Horizon 110*, a 110- by 24-foot raised pilot house motor yacht, is the latest project designed by GCMNA for the Kaohsiung, Taiwan, based Horizon Group. Overall, the testing demonstrated a very clean running hull with superior resistance and motion performance.

The ultramodern and minimalist 45-meter *Big Fish* was also tested by Oceanic. Model Tests of this hull were conducted at a 1:26 scale at Oceanic's west coast facility, the Ocean Engineering Centre. Calm water resistance tests as well as seakeeping tests in head seas demonstrated that the hull was efficient and seakindly. Addition of a bulbous bow was shown to reduce both calm water resistance as well as resistance in waves at cruising speeds. When completed this vessel will incorporate more than 60 feet of hydraulically actuated beach platforms in the hull, floor-to-ceiling curved glass, and drop-down recessed deck spaces.

Oceanic carried out testing on the model for three vessel loading conditions. Two different bow configurations, a conventional bow and a

bulbous bow, were also evaluated as part of the test program. The testing objectives were to determine powering requirements in calm water and to observe motions in head seas.

Based on the data collected for the calm-water resistance tests, the differences measured between the two configurations yielded a mixed range of increase or decrease in effective power (EHP) for the bow configurations tested. In general, the lighter displacement showed a greater reduction in EHP with the bulbous bow, but this reduction decreased as the displacement and speed increased.

Resistance tests were also performed on a 1:28 scale model of a 47.25-meter hull in 415- and

440-tonne-vessel loading conditions. The main objectives of these tests were also to determine powering requirements and to observe motions in head seas.

To evaluate the relative calm-water efficiency of the hull, a quasi-non-dimensional "performance comparison" was prepared in which the efficiency of the subject hull was compared with that of hulls previously tested at the Ocean Engineering Centre.

Gregory C. Marshall Naval Architects Ltd. has recently brought other creative and exciting projects the Ocean Engineering Centre including designs for a 70-meter and a 45-meter motor yacht. ●



Rendering of a Gregory C. Marshall design.

NOVEL RIVER SKIMMER VESSELS DELIVERED TO THAMES WATER UTILITIES LIMITED



Thames Clearwater II on the River Thames.

In 2005, Oceanic Consulting Corporation undertook a model test evaluation program to provide "proof of concept" for the basic design philosophy of a river skimmer vessel. As the principal naval architectural design authority for the project, Keel Marine Limited was tasked with designing a vessel for Thames Water Utilities Limited that would be used to collect Consented Storm Outfall litter and other debris from the surface of the River Thames in the United Kingdom.

In this unique design, a catamaran vessel was outfitted with the screening technology currently employed in land-based facilities. The screens, located near midships, are designed to pick up

small debris which then is deposited into storage containers located on deck. Larger debris is captured at the bow in coarse mesh buckets which also allows the smaller items to pass through and move towards the finer debris screens that are found near midships.

Two river skimmer vessels have now been delivered to Thames Water Utilities Limited and Oceanic is pleased to learn that they have been deployed operationally with great success. Keel Marine stated that the qualitative and quantitative flow studies completed at model scale were of great assistance in finalizing the design.

A principal concern related to the arrangement was the possibility that debris might flow under, rather than into, the debris screens. Various scenarios were examined at model scale and considered, amongst other things, bow shape and flow channeling. Using a base plate between the catamaran hulls to channel flow into the debris screens was considered, but tests indicated that most debris tended to remain at the surface and would not flow under the screens. The final design did not include the base plate and subsequent operational experience has demonstrated that the model test conclusions were accurate as minimal debris passes under the vessel. ●

UNIVERSITY OF BRITISH COLUMBIA RESEARCHER WORKING WITH THE OCEAN ENGINEERING CENTRE



Mr. Jon Mikkelsen, M.A.Sc., P.Eng.

Oceanic Consulting Corporation is pleased to work with Mr. Jon Mikkelsen, Senior Instructor and Undergraduate Advisor at the University of British Columbia. Mr. Mikkelsen has been working with Oceanic as the liaison for student and academic research conducted by the University of British Columbia at Oceanic's Ocean Engineering Centre in Vancouver, BC.

A researcher at heart, Mr. Mikkelsen and his team at UBC have developed an extensive testing platform for model testing ocean energy devices at the Ocean Engineering Centre. Extensive computational fluid dynamics modeling has been used to optimize the design of turbine blades and related support structures.

As coordinator of the ME45X Capstone Design Program and faculty advisor to several undergraduate design competition teams, Mr. Mikkelsen is directly involved with design

teaching in such diverse areas as naval architecture, mechanical systems, and vehicle design. His recent accomplishments include having his design, the Supermileage Vehicle, *Mark V*, selected by TIME Magazine as a top invention for 2006, and his UBC Sailboat team winning the inaugural Autonomous Sailboat Design Challenge.

Mr. Mikkelsen's work has been disseminated in several publications including the Second Canadian Design Engineering Network (CDEN) International Conference on Design Education, Innovation, and Practice; Proceedings, 23rd Offshore Mechanics and Arctic Engineering Conference, American Society of Mechanical Engineers; and the Journal of Experimental Biology.

Mr. Mikkelsen is a Professional Engineer and received both his B.A.Sc. and M.A.Sc. from the University of British Columbia. ●

PROFILE: KEITH DOWNEY AND JASON DAVIS



L-R: Jason Davis and Keith Downey.

Oceanic is pleased to introduce Project Managers Keith Downey and Jason Davis.

Mr. Downey and Mr. Davis both joined Oceanic upon graduation and hold Bachelor of Engineering degrees in Ocean Engineering and Naval Architecture from Memorial University of Newfoundland. From working as test engineers and project managers with Oceanic, Mr. Downey and Mr. Davis have been exposed to a wide variety of challenges within many sectors of the

marine industry and both have gained a significant understanding of the issues surrounding the accurate replication of “real world” marine systems in an experimental environment.

An area of particular interest to both has been the evaluation of sailing yachts where each has had the opportunity to work as part of the testing teams for many of the world’s top yacht designers. Oceanic and the Institute for Ocean Technology have collaborated for many years to provide world class sailing yacht testing services to the industry. Mr. Downey and Mr. Davis

have been working alongside of and learning from world-class experts on the hydrodynamic evaluation of sailing yachts at the Institute for Ocean Technology as they develop test programs, set up and conduct the experiments, and analyze the results from many vastly differing yacht programs.

Since joining Oceanic in 2003, Mr. Downey has worked with Alinghi performing hydrodynamic testing of various hull designs in preparation for

their successful defense of the 2007 America’s Cup. Mr. Downey has also performed testing for Farr Yacht Design’s Volvo Open 70 designs for the 2005-2006 Volvo Ocean Race, and for Reichel Pugh’s Alfa Romeo 30-meter racer in 2004. He also was involved in a test program focused on the legendary 12-meter, *Kiwi Magic*. Mr. Downey became interested in ships as a child while spending time with his father on Marine Atlantic ferries operating out of Port-aux-Basques, NL.

Mr. Davis began working with Oceanic as a work-term student through Memorial University in 2001. Since joining Oceanic full-time post-graduation in 2004, he has assisted American team BMW Oracle Racing with hydrodynamic testing in their effort to capture the Auld Mug. His interest in naval architecture and sailing developed while growing up along the shoreline in Hare Bay, NL.

Mr. Downey and Mr. Davis are members of the Professional Engineers and Geoscientists of Newfoundland and Labrador (PEGNL) as well as the Society of Naval Architects and Marine Engineers (SNAME). ●

NEWS

OCEANIC/RINA PRESENTS SCHOLARSHIP AWARD TO MEMORIAL UNIVERSITY STUDENT

For the fourth time in as many years, Oceanic has presented its annual scholarship award to a Naval Architecture student at Memorial University’s Marine Institute. This year’s recipient, Mr. Calvin Kew, was awarded a \$700 grant for his project entitled “MI-BOAT: a maritime-training/fisheries-research vessel for the Marine Institute”.

Organized by The Royal Institution of Naval Architects (RINA) and sponsored by Oceanic Consulting Corporation, the Award is made annually to a student who is studying naval architecture or a related subject and is adjudged to have given the best presentation of the final year project.

This year’s judging panel included Oceanic’s Mr. Michael Doucet, Mr. Leonard Pecore of Genoa Design, and Dr. Brian Veitch of Memorial University on behalf of RINA.

Oceanic is proud to jointly sponsor the Award as this program provides an excellent synthesis of the various factors that are required in vessel

design. Mr. Doucet comments that “through their design projects, the students are exposed to similar situations that designers would encounter and they must, by employing the knowledge they have accumulated in the program, be able to weigh the pros and cons of competing design criteria while still making the necessary decisions to devise a suitable design”.

The Award and a cheque were presented to Mr. Kew in August by Oceanic’s president, Dr. Dan Walker, along with Dr. Brian Veitch, Mr. Michael Doucet, and on behalf of the Marine Institute, Ms. Catherine Dutton and Mr. Bruce Whitelaw. ●



L-R: Dr. Brian Veitch, Ms. Catherine Dutton, Mr. Calvin Kew, Mr. Bruce Whitelaw, and Dr. Dan Walker.

Yacht Dynamometer Specifications:

Forces and moments are measured using strain-gauge based load cells.

Cross-talk between load cells is minimized by means of flexures, which are 22,000 times stiffer axially than transversely.

Carriage speed variation is less than 0.08% (2 x std dev/mean).

Related facility testing experience:

- America's Cup
 - Alinghi (2007)
 - BMW Oracle Racing (2007)
 - Mascalzone Latino Capitalia (2007)
 - Alinghi (2003)
 - oneAustralia (1995)
- Volvo Ocean 70 – 2005
 - Appendage variation
- Volvo Ocean 60 – 2001
 - 2 sessions
- IMS – 1996 – 2003
 - Keel variations with "Numbers" Taylor 49
 - Hull modifications to "Numbers"
 - USSA/IMD model series (9 models)
 - Rudder Span Variation series
- Whitbread 60 – 1997
 - 3 sessions
- Supplied/installed/operated dynamometer system for Young America (2000) and Oracle BMW Racing (2003) at David Taylor Model Basin.

Parameter	Range	Units
Drag	± 2200 at 0° leeway	N
Side Force	± 4400 at zero yaw moment	N
Roll Moment	± 16000	Nm
Yaw Moment	± 3300	Nm
Pitch (trim)	± 12.5	Deg
Sinkage	± 300	mm

Specification Sheets are Available for All Major Facilities, Including:

- Offshore Engineering Basin • 200-meter Wave/Towing Tank
- 58-meter Wave/Towing Tank • 90-meter Ice/Towing Tank
- Cavitation Tunnel • 22-meter Flume Tank
- Centre for Marine Simulation • VIV Test Apparatus • MOTSIM

Specification sheets can be obtained from the Oceanic website or by contacting our office.



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ISO 9001-2000



Meet us at:

October 25-29
Fort Lauderdale, FL

November 14-16
Fort Lauderdale, FL

November 28-30
New Orleans, LA