

DESIGN SUPPORT FOR ICEBREAKING CRUISE SHIP CONVERSION

An offshoot of the general growth in the cruise industry is the demand for specialized adventure cruises to remote areas, including the Arctic and Antarctic. In many cases, former working vessels, such as icebreakers, are being converted to carry passengers to meet this demand. Unfortunately, icebreaker hull forms generally have unfavorable motion characteristics and modifications are required to make such vessels suitable for the cruising public.

Oceanic recently assessed the effect of adding bilge keels in the proposed conversion of a former Swedish icebreaker to an adventure cruise ship. Conducted using Oceanic's seakeeping software, MOTSIM, the analysis assessed the response of the vessel with two alternative bilge keel configurations and compared the roll reduction against the unmodified hull. A further investigation involved estimating the fuel consumption

penalty associated with fitting bilge keels. The results supported a decision to proceed with installation of the keels. A further study, which is being conducted by Dr. Don Bass of Memorial University, is underway to assess the merits of installing a passive anti-roll tank.

Oceanic's expertise in hydrodynamic performance evaluation, backed by capabilities and experience in understanding the conditions of the North Atlantic, provides clients with answers that assist them in making informed decisions about their designs. Background in assessing models for the severe conditions that structures face in the North Atlantic off the coast of Newfoundland is one of the reasons why marine systems designers and owners choose Oceanic for their performance evaluation services. *(For more information, contact Michael Doucet or Brad Rixmann)*

AMERICA WORLD CITY UPDATE

AMERICA WORLD CITY - a 378m, 250,000 tonne passenger vessel designed to accommodate 6,400 passengers and 2,200 crew members - has been constructed in model form and is now ready for performance evaluation. Testing is to include flow visualization, resistance and self-propulsion experiments. From these tests, the designers will be able to evaluate the final shape of the hull as well as the power required to propel the vessel at its desired operating speed.

The test model for *America World City* is 9.5 meters in length at a scale 1:40. As one of Oceanic's larger models, it is a fine example of the expert workmanship of the firm's design and fabrication specialists. *(For more information, contact Ron Drodge)*



▲ Model of cruise ship under construction



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making waves

NEWSLETTER OF OCEANIC CONSULTING CORPORATION

WINTER 2001

OCEANIC AND THE SWISS 2003 AMERICA'S CUP CHALLENGE

Oceanic Consulting Corporation is pleased to announce that it has been awarded the contract to evaluate the hull performance for the Swiss 2003 America's Cup Challenge. The contract will be ongoing until late 2001 with hull forms and appendage sets being model tested over the period.

The Swiss team chose Oceanic based on a proven background in performance evaluation of racing yachts and state-of-the-art data measurement capabilities. With the yacht dynamometer developed by the Institute for

Marine Dynamics (IMD), the Swiss have secured leading-edge technology for production of the most competitive hull for the next America's Cup challenge. In the 1995 America's Cup, one of the fastest challenger boats was designed using model test results produced at IMD.



▲ Oceanic's Dan Walker with Russell Coutts at Memorial University

Russell Coutts, 1995 winner of the America's Cup for New Zealand and the first non-U.S. skipper to successfully defend the title with his win in March 2000, will skipper the Swiss yacht in 2003. Coutts and members of the design team recently visited IMD and were impressed with the quality of the test facilities and the technical capabilities of the Oceanic team. *(For more information, contact Shawn Searle or Bruce Paterson)*

RUSSELL COUTTS AT MEMORIAL UNIVERSITY

While visiting St. John's, Russell Coutts thrilled the local yachting community with a talk he gave at Memorial University. Mr. Coutts spoke of his adventures in the yachting world as well as the history of the America's Cup competition. The talk was organized by the Canadian Atlantic Student Section of the Society of Naval Architects and Marine Engineers (SNAME). It was the pleasure of Dan Walker, President of Oceanic and Chair of the SNAME Canadian Atlantic Section, to introduce Mr. Coutts.

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A MODEL DISPLAY OF CLIENT SATISFACTION

In 1995, Sharp Design of San Diego, California used model-testing expertise of Oceanic to evaluate the design of a 160' motor yacht. Following recent full-scale trials of this vessel, senior personnel at Sharp Design observed that the yacht's speed/power curve closely matched the one predicted from the model test data. As company president Doug Sharp observed, "**This is the ultimate reproducibility of results!**"

Based on the relationship that developed from that initial work, Sharp Design brought its latest trawler yacht design to Oceanic for performance evaluation. The model test program included flow visualization, resistance and propulsion in calm water and in waves, and a seakeeping study. A follow-up investigation was carried out to determine the effect of a bow bulb on hull performance in calm water and in waves.

Upon completion of the two projects, Sharp requested that their test models be shipped to San Diego for public display. Oceanic is proud to have these models on display as they are evidence of the firm's ability to provide the best possible prediction of vessel performance for clients. *(For more information, contact Carl Harris)*



▲ Model of motor yacht on display by Sharp Design in San Diego

A HISTORY WITH FARR YACHT DESIGN

Oceanic recently completed a hull performance evaluation for Farr Yacht Design of Annapolis, Maryland in support of the Volvo Ocean Race. The yacht dynamometer at IMD was used to provide accurate data

on subtle variations in canoe-body design. This contract followed earlier evaluation programs conducted at IMD on Farr's designs for the 1997 Whitbread Round-The-World Race. *(For more information, contact Carl Harris)*

BRINGING A NOVEL DESIGN TO COMPLETION DRAWS ATTENTION

Last October, Seascope 2000 Limited of St. John's, Newfoundland saw 15 years of effort pay off as model testing of its novel rescue craft (the final critical

component of the Seascope Evacuation System) was carried out by Oceanic. Known as the *Life Rescue Craft*, Oceanic constructed a 1:4 scale model and subjected it to a complete program of performance testing. The test results were then used as a benchmark for numerical modeling with Oceanic's seakeeping program, MOTSIM, to evaluate the performance over an expanded set of realistic wave conditions and to assess the habitability characteristics of the craft.

Bringing the *Life Rescue Craft* design to completion has attracted the attention of the marine industry. Commercial organizations have since expressed interest in seeing the development of the *Life Rescue Craft* progress further through a Joint Industry Project. *(For more information, contact Ron Drodge)*



▲ Model of Seascope's *Life Rescue Craft*

SAFETY OF FERRY STRUCTURES: THE INVESTIGATION CONTINUES

An experimental research project is underway at IMD to investigate wave impact loads on the bow visor structure of RO/RO (Roll On/Roll Off) Ferries. As a continuation of a research program initiated after the 1994 *Estonia* ferry disaster in the Baltic Sea, the project



▲ Experiment in irregular waves

involves testing of a self-propelled, free-running model in regular and irregular waves in IMD's offshore engineering basin and 200m towing tank. The overall impact force on the bow visor, local pressures and model motions are being measured. In addition to being used for numerical code validation, the collected data will be used to predict design loads for bow visors as a function of a ship's operational profile. *(For more information, contact Greg Hermanski, IMD, or Carl Harris)*

HIGHLY-SKEWED ICE-CLASS PROPELLERS: A JOINT RESEARCH PROJECT

The alliance members of Oceanic Consulting Corporation, along with Transport Canada and Lloyd's Register of Shipping, successfully conducted a research project that investigated the regulatory issues associated with the design of highly-skewed ice-class propellers. These propellers are commonly used on ships with a low ice class, such as those in the cruise ship and ferry industries. A model test program was designed to investigate propeller blade loading on highly-skewed propellers during interaction with ice. A major focus was to install an innovative custom-designed blade load dynamometer to measure all six components of the forces acting on an individual propeller blade. The test results will be used to extend existing draft regulations so that they incorporate this type of propeller geometry. On a national basis, the project will aid

Transport Canada in its effort to update regulations concerning ship safety and pollution regulation in polar regions. *(For more information, contact Shawn Searle)*



▲ Highly-skewed propeller on new dynamometer tested in IMD ice tank

NEW DIRECTORS APPOINTED AT MARINE INSTITUTE

Oceanic Consulting Corporation is pleased to note that the Fisheries and Marine Institute of Memorial University, a member of the Oceanic alliance, has appointed new directors for two of its research and training units.

Mr. Glenn Blackwood has been appointed **Director of the Centre for Sustainable Aquatic Resources**, and **Captain Anthony Patterson** has been appointed **Director of the Centre for Marine Simulation**.

Mr. Blackwood has an honors degree in science and a masters degree in fisheries resource management from Memorial University. Before taking on his new position at the Marine Institute, he was Director of the Canadian Centre for Fisheries Innovation. Captain Patterson is a

graduate of the Coast Guard College in Sydney, Nova Scotia and has a lengthy background in search and rescue, research, and training with the Canadian Coast Guard.

Before accepting his new position at the Marine Institute, he was based in Newfoundland as the Regional Superintendent for Maritime Search and Rescue.



▲ Glenn Blackwood



▲ Anthony Patterson