The NEWS LETTER

International Hydrofoil Society

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SHIP'S LEGACY COULD RISE AGAIN

By Cassandra Profita

Extracted with permission from *The Daily Astorian* of Astoria, Oregon

Volunteers are working on restoring the hydrofoil USS High Point docked at North Tongue Point.

In its heyday, the 115-foot USS High Point could track submarines and launch a torpedo while flying above the water at more than 40 knots.

It was the first in a series of four U.S. Navy hydrofoil vessels - "the lady of the fleet." And in 1974, it was the first of its kind to launch a harpoon missile, secretly testing and proving advanced anti-submarine technology.

After it was decommissioned in 1989, it quietly changed hands several times before coming to languish at Astoria's North Tongue Point around 2000.

High Point Sits at Astoria's North Tongue Point

Portland resident and military artifact collector Terence Orme rescued the ship from being scrapped in a 2005 lien sale. He has spent the past four years cleaning it out and drumming up support to revive the relic.

"They wanted to scrap it," said Orme. "I just thought that was a tragedy because it has such a great legacy. We had a different idea on preservation.

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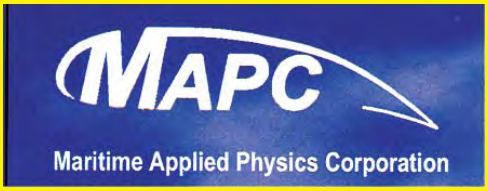
SUSTAINING MEMBERS



YOUR 2010 IHS DUES ARE DUE

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PRESIDENT'S COLUMN

To All IHS Members

I am saddened to report the loss of one of our members. Kenneth B. Spaulding passed away the day after Thanksgiving. He had been a member of the IHS for many years and served on the Board of Directors and as Secretary of the Society. Ken was a real treasure, not only to the IHS, but to everything and everyone he was associated with. He will be sorely missed. Please see page 4.

On a lighter note, I send you all somewhat belatedly, best wishes for a good Holiday Season and success in 2010. IHS can be proud of its accomplishments in 2009 thanks to the many members worldwide who have contributed their time and effort.

YOUR 2010 DUES ARE DUE IHS Membership options are: US$20 for 1 year, $38 for 2 years, and $54 for 3 years. Student membership is still only US$10. For payment of regular membership dues by credit card using PAYPAL, please go to the IHS Membership page at <http://www.Foils.org/member.htm> and follow the instructions.

IHS Members in the Washington, DC area were fortunate to be able to attend a Joint Meeting of the IHS and the SNAME SD-5 Panel on December 10, 2009 at the Army-Navy Country Club in Virginia.. The presentation was "Fast Track Amphibian", by Kenneth G. Wernicke of Fast Track Amphibian, LLC. Mr. Wernicke described a promising new amphibian that has been developed having a single power plant, employs tracks for propulsion on both land and water, and attains high speed on land and on water. A copy of the presentation is available on the IHS website.

IHS participated with a booth at the ASNE High Performance Marine Vehicles Symposium, 9-10 November 2009 at the Maritime Institute of Technology & Graduate Studies (MITAGS), Linthicum, MD. The table was manned by IHS members Frank Horn, John Monk, Joel Billingsley, and Dennis Clark. Please see write up on page 5.

During the last year or so, we have been developing, along with High Caliber Solutions, Inc. of New York, a significant addition to the IHS website. It is completed and called: **Hydrofoil World.** Please log onto the IHS website, and also spread the word by sending this information to family and friends.

I was pleased to have Vordaman Van Bibber write an article for the current Newsletter in response to Captain Frank Horn's article featured on the first page of the 4th Quarter 2009 NL; please see page 5.

The year 2009 started off with a flurry of new members; namely 10 in the first 4 months of the year, slowed down, and then picked up with several new members as a result of IHS' participation with ASNE in November and the Joint meeting in December, for a total of 28 for the year.

John R. Meyer, President

WELCOME NEW MEMBERS

J. C. (Kit) Ryan - Kit is the Chief Naval Architect at Alion Science and Technology. He has a B.S. in Naval Architecture and Marine Engineering from Webb Institute and a M.S. in Naval Architecture from MIT. After spending most of his career at NAVSEA in naval surface warship design, Kit is now with Alion Science and Technology and has been actively involved in high performance ship projects, acting as the Alion Program Manager for the ONR High Speed Sea Lift Program and more recently as Technical Director on the ONR T-Craft program.

Kevin Stone – Kevin is Vice President, Research, Development & Transition with QinetiQ, the UK company formed from the privatization of the British Ministry of Defence's R&D agency. After graduation from the US Naval Academy with a BS in Naval Architecture in 1976 he served in submarines. He later left active duty and worked as a naval architect for the next 25 years. He now works closely with QinetiQ's hydrodynamics group in the south of England in Haslar (Portsmouth) where all manner of conventional and high speed designs are tested in their 270m tow tank and 120m x 60m ocean basin. He said that it is the dream job for a naval architect: their Haslar offices are built on top of Robert Froude's original ship tank #1 which was decommissioned in 1956; consequently their hydrodynamicists are the keepers of "Froude water" from that tank which is sent to every model basin in the world. QinetiQ is

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SHIP'S LEGACY
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Things have been slowly falling into place ever since then."

Orme and about a dozen volunteers - including three Navy vets who once served on board the ship - are working on weekends to restore High Point and turn it into a floating museum.

Orme, his cousin Craig Orme, and Washington residents Jeff White and Al Carter have recently cleaned refrigerators, polished the galley and pointed out all the work that still needs to be done.

They've improved the ship's cooling and fuel systems and the hydraulic steering, but the ship is missing its turbine engines and service diesel, without which it can't operate.

"We still have a lot of work to do," Orme said. "We're looking for some skilled people who have some vision of what we're trying to do."

Built by Boeing Co. with a $2.08 million Navy contract in the early 1960s, High Point has a large foil in the back and one in front.

The High Point's success laid the foundation for the Navy's fleet of combat hydrofoils, Orme said, including six in the Pegasus class that were in service from 1977 to 1993.

Footprints, Artifacts Remain

When Orme bought High Point, it was full of trash, rotten carpeting and leaks. In the pilothouse, there were gaping holes and loose wires where monitors and gauges used to be; same with the monitoring center for the missing turbine engines.

But traces of its glory days were evident throughout the vessel, in the footprints of weapons that once sat on deck, charts of test schedules and artifacts of life on board.

"They needed three big racks of equipment to run the system," said White. "Now you can run it on your laptop."

They're piecing the story of High Point back together through photographs and anecdotes from veterans who worked on board. For example, they know the ship had a live-aboard cat for 12 years that loved to shred phone books and make other kinds of mischief. The cat would crouch in the wires on the ceiling, Orme said, and one time knocked off the admiral's hat as he was walking by.

Volunteers Needed

What the restoration team needs more than anything is some skilled hands to help fix the ship's many mechanical problems, Orme said.

The Port of Astoria, which recently took control of the North Tongue Point Industrial facility, could help by providing a power hook-up at the dock, he said. Orme said he's had some promising conversations with Rolls Royce about building new turbines for High Point that would run more efficiently than the originals on a digital platform. And he lucked out when he found the ship's turbine manifolds - basically stainless steel tubes - in a scrap pile at the Port of Astoria's Pier 3.

He pointed to the holes in the engine room where the manifolds can be reinstalled.

"I bought this not really realizing what I didn't have," he said. "Finding the originals will make it a lot easier to install new turbines. Those are monumental things to have."

Insight from the ship's last chief engineer, Fred Nachbar of Shelton, Wash., has been guiding the restoration process, Orme said.

He has also had help from veterans Randy Tacey of Bremerton, Wash., and Sumi Arima, of Redmond, Wash., who ran the Hydrofoil Special Trials Unit (HYSTU) for the Navy at one time.

Collecting stories and spending time with veterans who served on the ship has been a highlight of the effort, Orme said.

Veteran Dale Beresford told him about the day in 1966 during rough-water testing when the High Point crew found themselves being tracked by a Russian surface vessel.

"What's really great is being on the original High Point with other veterans watching World War II movies," Orme said. "The camaraderie that's developed with the vets and volunteers is really neat."

Every so often, vets and volunteers gather on the boat and watch movies in the galley, which is equipped with a large booth and a television with a VCR.

Orme is trying to start a nonprofit to oversee the restoration because, he said, "this is way too much for one individual to deal with." But he's pledged to continue the effort regardless.

"What we'd like to do is be an active museum on the Columbia River," he said. "We'd like to be able to go to Rose Festival in 2012 to celebrate the 30-year anniversary of the last time it was there."

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REMEMBERING KENNETH B. SPAULDING

Ken Spaulding was a member of the IHS for many years and served on the Board of Directors and as Secretary of the Society. We were saddened to receive the following message from his wife and son:

"I have sad news this day after Thanksgiving. My father passed away a few hours ago @ Sibley hospital. He had been on respirator support and semi conscious, with kidneys failing. Although dialysis had been improving his blood, his over all weakness, his anemia and cognitive responses had been deteriorating. We had been debating when to remove him from the respirator, as although he was breathing on his own, he was not "awake" enough to respond promptly to questions and commands. Around noon today, with my mom by his side, his heart stopped and she decided against resuscitation. One thing we did know is he hated being on the respirator, and he had already been on that for four days without showing signs of full consciousness. His long ordeal (6 weeks at the hospital has ended), and the sweet loving man that was my father and my mother's husband has passed onto his next great adventure. Your thoughts, prayers and well wishes for our family had been much appreciated by my mother and I, and passed on to our father. We are sorry we were unable to bring him to the phone more than we could, as communication for him was becoming more difficult. He is sorely missed and greatly loved. We will provide further information in the upcoming days regarding a memorial service and such, so please withhold any flowers/gifts/ contributions etc. till we can sort that all out. Thank you so much for your care and support. -- Athalie and Patrick Spaulding"

Here are several responses to Ken Spaulding's passing:

- Very sorry and pensive to hear of Ken's passing. He was outstanding for many reasons; especially he was well loved for being a gentle gentleman… the antithesis of the aggressive behavior, self-absorption, and grating noise pervasive in this area. The world needs more like him, the DC area in particular. It was a pleasure and a calming benefit to the soul to have known him as a friend over the years. – Barney Black

- I echo Barney's sentiments many times over. Ken was a real treasure, not only to the IHS, but to everything he was associated with. He will be sorely missed. - John Meyer

- This is indeed tragic news for all of us who knew Ken and treasured his wit, technical savvy, and calm judgment. He was a mentor for me dating back to the 1970s, and a good family friend. – Mark Bebar

- That is very sad. He was a great guy! - John Monk

- Sadness and melancholy confront me as I learn of Ken's passing. I have known and worked with Ken since the days of BUSHIPS and the Old Main Navy Bldg on the Mall. Throughout the days of small craft procurement for the Viet Nam war I found him to be wise in the many things we all found to be essential in fulfilling our collective mission of giving our sailors the best we could procure from industry in those days. I know that Ken recently received a model PBR from the River Patrol Forces Veterans Group and how pleased he was to be asked to become an honorary member of that organization. We have been friends for all those intervening years and I will miss him greatly. As you well know, Ken demonstrated the very best of human qualities which strengthened his contributions as a colleague and mentor to so many in our profession. - Jerry Gore

I have known Ken for many years while at NAVSEA and through the IHS. He always had my highest respect professionally and personally. Please take comfort that many of us who knew Ken share your loss, but we know now he is free of pain, sorrow, tears and death itself. – Joel Billingsley

COMMENTARY

By Vordaman Van Bibber, IHS Member

I refer to the article: *"If We Had PHMS Today"* by Captain Frank Horn, USN (Ret) appearing in the Fourth Quarter 2009 Newsletter. I wish to make the following comments that are in addition to those mentioned since these issues are very important in the design of future hydrofoils for military purposes.

The payload of the foilborne boat is very important and subsequent to the design of the PHM'S there are higher strength materials that can be utilized in constructing the craft. In non-corrosive steels for hydrofoils the yield strengths of Nitron-50 is 235K psi which could reduce hydrofoil construction weight by 10 to 25 percent. Also there are new aluminum extrusions that will reduce the hull structural weight considerably. The Hat-Type & Sandwich Type panels are relatively new. These are from the paper, Ultimate Strength and Optimization of Aluminum Extrusions by M. D. Collette (AM), X. Wang(M), J. Li(M), SNAME Proceedings Vol. 1. October 21-25, 2009.

Reviewing some of our PHM structure, it appears that a considerable weights savings could be accomplished. With overall weight savings of the PHM class hydrofoil ship it can be assured the ship would have a greater foilborne range. Construction of a larger hydrofoil with a greater payload and more shipboard crew amenities would provide the potential for remaining on station for longer periods of time.

The U.S. Navy is always looking for ships that have a multi-mission capability and a new version of a PHM could have numerous mission capabilities:

- A patrol craft for interdiction and rapid attack

- The craft could be utilized as a Littoral Patrol Ship (LPS) for mine countermeasures

- It could be used off shores patrols or rapid evacuations when needed

- The use against the modern day pirates and their fast boats and assisting the U.S. Coast Guard in encountering drug trafficking high-speed boats. The PHM'S were very effective in South Florida when a PHM was assigned to the Coast Guard.

The "comfort level" of a ship at high speed in a seaway is very important to a ships crew. When a crew is comfortable in, for instance, an interdiction operation, they are far more acute in their assigned duties, and the PHMs provided a superior "comfort level".

IHS AT ASNE

IHS was invited by American Society of Naval Engineers (ASNE) to participate with a booth at the ASNE High Performance Marine Vehicles Symposium, 9-10 November 2009 at the Maritime Institute of Technology & Graduate Studies (MITAGS), Linthicum, MD. The table was manned by IHS members Frank Horn, John Monk, Joel Billingsley, and Dennis Clark.

The booth was well equipped with the IHS banner, pictures of hydrofoils past and present, two lap tops displaying videos and slide shows, a tutorial handout, IHS brochures and application blanks for signing up new members. Many symposium attendees visited the IHS Booth and showed interest in the world of hydrofoils and the various displays available.

During the 2 day symposium four of the attendees who visited the booth joined the IHS. These new members included Kathleen Hinton, the ASNE President, Mr. Robert Wasalski,

John Monk III Shows His Hydrofoil Model while IHS Member, John Monk, looks on

Kevin Jones, and Capt. Peter Fanta.

Shown here is a picture of John Monk and his grandson John Monk III who became our youngest student member. He brought with him the hydrofoil he had constructed for his Junior High School science project. John Monk is holding a copy of the documentation of the performance and

Frank Horn, IHS Board Member, Presents John Monk III with IHS/SNAME Mug

TRAFFIC AND OPERATING COSTS FALL ON TURBOJET'S HONG KONG-MACAU ROUTE

Excerpts from Fast Ferry International October 2009

Reviewing the performance of its Turbojet fast ferry division during the first half of 2009, Hong Kong's Shun Tak Holdings has reported, "Challenged by a multitude of exogenous factors including the global recession, visa restrictions on Mainland travelers, stiff competition, and compounded by a widespread outbreak of swine flu pandemic, the transportation industry operated under immense pressure during the first half of 2009.

"During the period, the Group's transportation division recorded an operating loss of HK$14 million compared to a loss of HK$47 million for the same period last year. Turbojet's Hong Kong-Macau route, which contributed 89% of total revenue, experienced a 24% decline in passenger volume, mainly due to the substantial drop in the number of passengers leveraging on the individual traveler scheme.

"In spite of dampened demand, the reduction in operating losses for the period was attributable to declining oil prices and the Company's focused efforts in cost reduction and fleet optimization initiatives. Measures to manage capital expenditures and operating expenses were implemented, including a review of staff costs, sailing reductions, more flexible deployment of vessels, lay-up of spare vessels, and cooperative arrangements with PRC ferry operators to generate savings in operational costs.

"As part of the Group's commitment in solidifying its vision of forging an inter-modal transportation network in the Pearl River Delta, it has prioritized the deployment of its resources on routes with sustainable development potential. Two routes connecting Shenzhen were suspended in April 2009 [Hong Kong-Fuyong and Hong Kong Airport-Fuyong].

"On the other hand, a new route between Nansha and the Hong Kong International Airport, operated by Panyu Nansha Port Passenger Transport, was launched in June 2009, following the cooperative model adopted for the Shekou-Macau route launched in 2007 in association with Shenzhen Xunlong Shipping.

"The permanent SkyPier within the Hong Kong International Airport, which offers upgraded facilities and capacity for multi- modal transit passengers, is scheduled for completion by the end of 2009.

Boeing Jetfoil 929-115 Funchal Has Been Operating Turbojet's Premier Jetfoil Service Since March 2009

The Premier hydrofoil, Boeing Jetfoil 929-115 Funchal, is timetabled to complete four return crossings each day on the Hong Kong-Macau route.

Considering prospects for its TurboJet division during the second half of 2009, Shun Tak says, "With the impact of the swine flu pandemic subsiding, the transportation division recorded a strong rebound in volume and related revenue over the summer months.

"As 2009 marks the 60th Anniversary of The People's Republic of China and the 10th Anniversary of Macau Special Administrative Region, tourism businesses are expected to recover dramatically in the later half of the year, benefitting from the myriad of celebrations scheduled for the occasions.

"The transportation division will continue to forge its vision of an integrated multi- modal network within the Pearl River Delta via partnerships with Mainland ferry operators to expand route connectivity on fast-growing ports and destinations.

"With the completion of the new SkyPier by the end of this year, Turbojet airport routes will be able to benefit from the enhanced facilities, promoting new demand for the service.

"A second Premier Jetfoil will start service within the year following the successful launch of the luxury brand. The Premier Jetfoil has been well received by the trade and charter groups, fulfilling the needs of a niche segment of the market that seeks discerning products and services."

The second hydrofoil refurbished as a Premier Jetfoil, 929-115 Terceira, has now entered service on the Macau route. The TurboJet fleet includes three other Jetfoil 929-115s and seven Jetfoil 929-100s.

NEW ALASKAN OPERATOR TAKES DELIVERY OF FOIL ASSISTED CATAMARAN

From Fast Ferry International, September 2009

The latest Teknicraft Design 25m foil assisted catamaran built at the All American Marine yard in Bellingham, Washington, has been delivered to the Seldovia Village Tribe.

The vessel, Kachemak Voyager, is virtually identical to Orca Voyager, which was delivered last year to Kenai Fjords Tours in Seward, Alaska. Kachemak Voyager will also be based on Alaska's Kenai Peninsula but will remain in Washington State until next summer.

KACHEMAK VOYAGER

Built to United States Coast Guard Subchapter T requirements, Kachemak Voyager has two Caterpillar C32 ACERT diesels, rated at 1,045 kW at 2,300 rpm, powering Osborne five bladed fixed pitch propellers via ZF 3000A gearboxes.

Seldonia Tribe's Fast Ferry

SERVICE

Kachemak Voyager is due to enter service in May 2010, when shore side infrastructure is completed, on a route across Kachemak Bay, at the mouth of Cook Inlet, between Seldovia and Homer.

Commenting on its decision to operate its own local seasonal ferry service, the Seldovia Village Tribe says, "This will be a very important step for the town of Homer and the village of Seldovia with the announcement that Holland America Line [cruises] will begin visiting Homer in 2010.

"The new catamaran is scheduled to make two daily runs between Homer and Seldovia during the busy tourism months between May and September. This will be a big boost for the tourism market in both Homer and Seldovia and will add a new and affordable way for Alaskan families to broaden their adventures in the Homer area."

At present, the only scheduled surface links between Homer and Seldovia are provided by the Alaska Marine Highway System and two local excursion companies. AMHS timetables a return service seven times a month during the summer and three times a month during the winter. Scheduled journey time is 1 hour 15 minutes. The local companies operate a daily return service between mid May and mid September. There is no other surface connection, the road stops at Homer.

NEW ZEALAND OPERATOR INTRODUCES FIFTH FOIL ASSISTED CATAMARAN

Extracted from Fast Ferry International, November 2009

A fifth Teknicraft Design 18m foil assisted catamaran has been delivered by Q-West Boat Builders to another company on New Zealand's South Island, Whale Watch Kaikoura. The operator describes its latest acquisition, Wawahia, as "a new generation whale watching vessel".

WAWAHIA

Built to Maritime New Zealand Restricted Limits Passenger Ship rules, Wawahia has the same overall dimensions as Whale Watch Kaikoura's earlier foil assisted catamarans coupled with a restyled superstructure, different main engines and a different generator.

Two Volvo Penta D16 MH diesels, rated at 551 kW at 1,900 rpm, each directly drive a Hamilton HJ 403 waterjet. Hamilton also supplied its blueArrow electric control system.

Whale Watch Kaikoura's Latest Vessel, Wawahia, Entered Service On November 5, 2009

The main engines each deliver 26 kW more power at 200 less rpm than those installed on the other catamarans in the Whale Watch Kaikoura fleet, giving Wawahia a 70% maximum continuous rating loaded ser-

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Interested in hydrofoil history, pioneers, photographs? Visit the history and photo gallery pages of the IHS website.
http://www.foils.org

NEW ZEALAND OPERATOR
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vice speed of 29 knots and maximum speed of 35 knots.

External stairs on the aft deck lead to an open viewing deck on the upper superstructure. The foredeck is also available as a viewing area when the vessel is operating at reduced speed.

WHALE WATCH KAIKOURA

Q-West delivered Whale Watch Kaikoura's first Teknicraft 18m foil assisted catamaran, Wheketere, in 1999. Three others entered service with the operator in 2000, 2004 and 2006. Now that Wawahia has been delivered, Wheketere will be sold.

Whale Watch Kaikoura schedules three daily whale watching excursions during April-October and four during November- March. Each one lasts up to 2 hours 30 minutes.

Trips are scheduled every day except December 25, although the company warns, "Whale Watch tours are always dependent on sea conditions. Whale Watch staff constantly monitor the weather and respond professionally to any changes. This may mean a tour is cancelled or safety restrictions are placed on children or passengers with medical problems."

WHALE WATCH

Whale Watch Kaikoura was established in 1987 by the indigenous Kati Kuri people, a Maori sub-tribe, and its growth during the past ten years has been spectacular.

Tracing its history, the company says "Whale Watch was formed at a time when Maori were casualties of Kaikoura's declining economy. At this time of difficulty, Kati Kuri leaders believed the local Sperm Whales held the answer to the unemployment problems of the Maori community.

"The founders of Whale Watch mortgaged their houses to secure a loan to start the business. In the early days, passengers traveled aboard a small inflatable vessel. In time, the inflatable was replaced by a larger boat with an upper viewing deck. Today, the Whale Watch fleet of modern catamarans is specially designed for whale watching.

NEW SERVICES PLANNED IN CAPE VERDE ISLANDS

From Fast Ferry International November 2009

A company in the Cape Verde Islands, Cape Verde Navalis, added a hydrofoil to its ferry fleet in October. The vessel, Morye Olympia Marine Princess, is based in Praia, Santiago, and operated to three other islands.

Morye Olympia Marine Princess Has Entered Service In The Cape Verde Islands

A return service to Fogo and Brava is timetabled every day except Saturday. Scheduled journey times are 90 minutes for Santiago-Fogo and 30 minutes for Fogo-Brava. A return crossing between Santiago and Maio, taking 30 minutes in each direction, has also been timetabled on three days each week.

Shortly after the hydrofoil entered service, Damen Shipyards announced that it was to supply two DFF 4512 catamarans to a new operator, Cabo Verde Fast Ferry. The vessels will be fitted out for 158 passengers and up to 20 cars or 16 vans, or three trucks plus a mix of cars and trucks. Delivery is due in mid 2010.

Cape Verde Navalis Operates Between The Southern Cape Verde Islands.

Despite the name of the operator, the DFF 4512s will not be fast ferries, they are designed to have a 100% maximum continuous rating speed of 19 knots. However, Cabo Verde Fast Ferry reports that their acquisition is the first phase of its business plan, which also includes the introduction of two 35 knot passenger catamarans and a third passenger/vehicle catamaran.

Another local transport operator in the Cape Verde Islands, Moura Company, started operating two Marinteknik Shipbuilders catamarans, 32m Auto Jet and 35m Jet Caribe, from Santiago and Sao Vicente in July 2007. Services were suspended a year later, although Moura Company still owns the vessels.

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THREE OF TIRRENIA'S LOCAL FERRY NETWORKS TRANSFERRED

From Fast Ferry International, November 2009

Italy's central government has reached agreement with regional governments in Tuscany, Sardinia and Campania on the transfer of the assets and liabilities of three of Tirrenia's local ferry companies. Toremar, Saremar and Caremar are due to be handed over at the beginning of 2010. However, the largest of the local companies, Siremar in Sicily, will remain part of Tirrenia.

Toremar, Saremar and Caremar will be gifted to the regional governments, and the central government will continue to pay operating subsidies, although at a significantly lower level than in recent years. Regionale Sicilia objected to the subsidy being offered for Siremar services and refused to accept the company.

Siremar's Fleet Includes Seven Rodriquez Foilmaster Hydrofoils

Transfer of the regional subsidiaries is part of the government's plan to privatize the state owned Tirrenia by the end of September 2010. The regional governments are now expected to issue tenders for the operation of Toremar, Saremar and Caremar services or sell shareholdings in the companies.

Central government will solicit bids for both Tirrenia and Siremar next year. In addition to its core services between the Italian mainland and islands, Tirrenia also includes an Adriatica division that is responsible for local services in the Adriatic.

Toremar, Saremar and Caremar currently operate a total of eight fast ferries and 20 conventional ferries. Seven of the fast ferries - three hydrofoils, one monohull, one catamaran and two passenger/vehicle monohulls - are part of the Caremar fleet. Toremar operates a single hydrofoil.

The Siremar fleet comprises 12 fast ferries and seven conventional ferries. The company operates nine hydrofoils and three high speed passenger/vehicle mono-hulls.

Tirrenia itself owns four high speed passenger/vehicle monohulls and 11 conventional ferries and its Adriatica division operates a single high speed passenger/ vehicle monohull and two conventional ferries.

USS ARIES HYDROFOIL MUSEUM UPDATE

By Eliot James, IHS Member

While work on the Aries has slowed to a standstill until we find a new home for the museum, we have been busy adding to our museum exhibits and have added a new hydrofoil to the fleet, a Hy-Foil. This hydrofoil was built in 1968 in England. We have not seen others like her, but that is not unusual in the small world of hydrofoils.

Bob and Bill Meinhardt outfitted her with a Johnson 25 hp outboard and we tested her out on Thomas Hill lake. There is no front foil mechanism to control foil depth, instead the inverted V acts as a surface piercing foil while the aft foil is fully submerged. There was no trouble getting up on the foils, but we found the craft a little unstable at speed. We believe some tweaking will significantly help and plan on that on our next test run.

This brings our hydrofoil fleet to 7 vessels including the Aries, 1 restored Dynafoil, 2 unrestored Dynafoils, a Waterspyder, President Nixon's Volga, and 1 Hy-Foil. We have flown all but the two unrestored Dynafoils and the Aries. The Aries is capable of traveling hullborne.

I have been keeping very close contact with Dave Symington who owns FRESH-1, since a local museum declined his donation, we are now again at the top of his list. He is reluctant to complete the transaction however, and I believe it has to do with being able to assure him of a proper home for the vessel. He knows we currently are not somewhere there is enough traffic for this type of display and worries the FRESH-1 will end up stashed away without much public access. This is of course a very understandable concern,

I want to call out to all the members of the IHS and plead for help in developing a business plan, and helping us find a new home. We are approaching another winter and desperately need to have the ship and the entire museum moved south out of the dangers of Missouri winters.

We are willing to do whatever we need to move ahead and establish a national hydrofoil museum. We have the technical ability; we lack the administrative and philanthropic talent to move the idea forward.

Eliot James; Curator USS Aries Hydrofoil Museum (660) 998-0801

SAILOR'S PAGE

L'HYDROPTÈRE TEAM FURTHER INCREASE THEIR NAUTICAL MILE SPEED SAILING RECORD

(Edited from reports on: www.Hydroptere.com)

In previous Newsletters, we reported speed sailing records achieved by the *l'Hydroptère* team.

On Sunday 8 November 2009, after a very windy night in Hyères, *l'Hydroptère's* record campaign in the Mediterranean ended in style as Alain Thébault and his ten crew members smashed their own speed record over one nautical mile and exceeded 50 knots with an average speed of 50.17 knots (92.91 km/h) over this distance, ratified by the WSSRC. This was the last day for the WSSRC- period of record attempts. Winds were around 30-35 knots.

Since April 2007, *l'Hydroptère* has improved the speed sailing record over this distance. Their previous record had been set on 4 September 2009 at 48.74 knots. And prior to this *l'Hydroptere* had held the record at 43.09 knots showing the team and boat are able to consistently achieve such records. Separately, *l'Hydroptère* holds the outright speed sailing record of 51.36 knots over 500 metres.

Following the completion of the current campaign for outright speed records over shorter distances the boat was dismantled and shipped back to Lorient last year where it will be re-configured for open seas sailing before challenging long distance sailing records off Brittany.

On 9th December, during the Nautic Show in Paris, Admiral Forissier, in the presence of Hubert Falco, junior minister of Defence, gave Alain Thébault the Chief of the Defence Staff's Reward. He congratulated the skipper and his team for their determination in achieving these records.

Admiral Forissier Awards Alain Thébault on 9th December in Paris

Meanwhile, the team has a separate project underway named *l'Hydroptere.ch* which is currently being built in France and Switzerland and will be launched in May on Lake Geneva. This will be reported on in a future Newsletter.

HYDROFOILS APPLIED TO CANTING-KEEL MAXI YACHTS

From original paper by Richard S. Milne and Phillip J. Helmore

This is a summary of an undergraduate engineering thesis project which investigated the feasibility of application of hydrofoils to a modern canting-keel maxi yacht undertaken by Richard Milne under the supervision of Phillip Helmore at the University of New South Wales (UNSW) in 2006. The work was later presented at the Pacific 2008 maritime conference in Sydney, Australia. A full copy of the paper can be downloaded from: http://unsworks.unsw.edu.au/vital/access/manager/Repository/unsworks:146

Project Origins

The introduction of canting keels on racing maxi yachts has brought a marked increase in their speed. The authors consider that hydrofoils could push monohull sailing speeds still higher. They therefore embarked on a testing program to investigate the feasibility of fitting foils to a modern canting-keel yacht.

Just as with canting keels, fitting foils to an ocean-racing maxi will not be without its problems. However, the results of this study showed a clear speed advantage for the foil-assisted maxi yacht. It is considered only a matter of time before someone sets a precedent with a full-scale foiling maxi yacht, which others will then follow.

Hullform Selection

Modern maxi-yachts with canting keels regularly achieve speeds of 15–25 knots. In this speed range a hydrofoil should be beneficial due to the higher lift/drag ratio and hence lower total drag that can be achieved in comparison with a planing hull.

The investigation commenced with development of a representative hullform for a modern canting-keel maxi yacht. This was based on the 30m maxi-yachts *Alfa Romeo* and *Wild Oats*, designed by Reichel-Pugh. The overall dimensions of these ves-

Continued on Page 11

sels are available on the web but, understandably, no lines plan was available from the designer. While not an exact replica of these yachts, the hullform developed for this project had the same overall dimensions, displacement and general form so was considered suitable to investigate the merits of adding hydrofoils to maxi yachts.

Foil Arrangement

The key to a successful foilborne vessel was seen as achieving a high power to weight ratio, which in turn is related to the righting moment to weight ratio. For foil equipped yachts, this is directly related to the span across the foils. The baseline foil arrangement for the project (Figure 1) was developed after considering previous foil-assisted sailing vessels with *L'Hydroptere* providing particular inspiration.

It is envisaged that the full scale yacht would incorporate active main foils to give a stable and smooth ride; much in the same way as Moth foilers. Retractable main foils would minimise foil resistance at low speeds and would also address berthing problems.

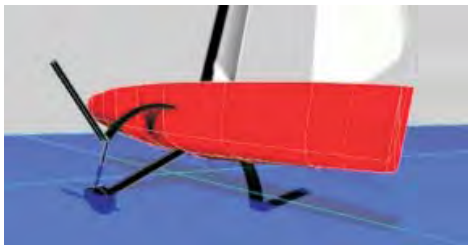

Figure 1: Concept of the Foil-Assisted Maxi-Yacht

Editors note: As the project evolved, and for practical reasons, the foil configuration used for towing tests and free sailing trials differed from one another and from that illustrated in Fig. 1.

Resistance Prediction

Preliminary resistance estimates were made using the Delft Systematic Yacht Series II (Gerritsma, J., Keuning, J.A. and Onnink in Proceedings Tenth Chesapeake Sailing Yacht Symposium, 1991) for the hull and 'Design Foil' software (www.dreescode.com) for the foil. Although not catering for modern vessels traveling at over 20 knots, the Delft Series predicted resistance up to the speed at which the foils would support the yacht. Beyond 20 knots the yacht would become foilborne for which the 'Design Foil' program was used to calculate resistance. Design Foil is a two dimensional CFD program that proved useful in selecting the foil geometry. A NACA4412 foil was chosen for this project.

While the numerical predictions did not account for all the forces which act on a foil-assisted yacht, they have been useful in the design of the concept gave an indication of the viability of a foil supported maxi.

Model Construction

Following hullform development and numerical resistance predictions, model testing was undertaken. A scale ratio of 1:25 was selected for the models, giving a length of 1.2m.

Building models within the required scale displacement was a most challenging task. The racing displacement of the basis maxi-yachts is 26 tonnes, which translates to 1.664 kg at model scale. The model was required to be light yet strong enough to handle the sailing forces. GRP composite sandwich construction was adopted.

The weight budget for the model was as follows:

Item	Mass(kg)
Keel	0.915
Fin and rudder	0.130
Sails and rig	0.110
Deck and support structure	0.110
Radio-control unit	0.140
Hull	0.259
Total	1.664

In all, 7 hulls were produced however only one was light and strong enough to be used as a sailing model (Fig. 2). Another slightly heavier model was used for towing tests fitted with a canting keel to allow the model to run at the desired angle of heel (Fig. 3). The models were all produced using a mould that in turn had been built using a male plug.

Figure 2: Sailing Model Showing Nomex Honeycomb Core. The Main Foils on this Model were Later Moved to a Lower Position.

Figure 3: Towing model with Canting Keel. Note Foils on Centerline in this Case.

To Be Continued in Next IHS Newsletter

WELCOME NEW MEMBERS
(Continued From Page 2)

currently developing a hybrid SES/ catamaran for the Ministry of Defence for possible application as a high speed landing craft.

Trevor Wakeley - Trevor is from Shelton, Connecticut and graduated from the University of New Orleans in May 2009. He graduated with a BS in Naval Architecture and Marine Engineering and a minor in finance. His interest in the advanced marine vehicles field stemmed from a class taught at U.N.O. by Chris McKesson which led to his research into high speed vehicles for his senior design project. Currently Mr. Wakeley is working for the Naval Surface Warfare Center, Carderock Division at the Center for Innovation in Ship Design. He recently finished a project investigating the application of high speed technologies to surface combatants and plans to continue to expand his knowledge of AMVs.

NEW BENEFIT

IHS provides a free link from the IHS website to members' personal and/or corporate site. To request your link, contact William White, IHS Home Page Editor at webmaster@foils.org

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TENNESSEE RIVER GORGE

By **John "Jack" McDonald**

You can have no idea how instrumental IHS was in the creation of the Tennessee Aquarium's "River Gorge Explorer". The idea came from a desire to "activate" Chattanooga's waterfront and the knowledge that about 15-20 miles downstream from the city center was one of the most glorious of nature's creations - the Tennessee River Gorge. The only problem was that you couldn't reach the Gorge - that is, unless you had a high-speed craft. That brought us to the idea of a foil assisted catamaran - and your web site which was invaluable in our research and learning about such.

That was five years ago. Thanks to the IHS organization, the vessel exists, and is being enjoyed by tens of thousands of people who are unilaterally amazed by its capabilities.

NEW HYDROFOIL OPERATOR IN THAILAND

From Fast Ferry International
October 2009

A newly established operator, Phuket Hydrofoil, has announced that it will introduce services in the Andaman Sea. The company's vessel, the first of a planned fleet of three, is a Kometa hydrofoil purchased from Hellenic Seaways that is currently being refurbished in Thailand.

Initial services will be operated between Phuket, Phi Phi and Lanta islands. Anticipated trip times are 40 minutes for Phuket-Phi Phi and 20 minutes for Phi PhiLanta. The first Kometa will be based in Ao Makham on the southeast coast of Phuket. As the fleet increases, Phuket Hydrofoil plans to introduce services between the west coast of Phuket and the Similan islands.

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The NEWS LETTER

International Hydrofoil Society
PO Box 51 - Cabin John MD 20818 - USA

Editor: John Meyer | Second Quarter 2010 | Sailing Editor: Martin Grimm

RECENT TALARIA IV DEVELOPMENTS

By Harry Larsen, IHS Member

Several technologies are necessary to develop a submerged foil computer controlled hydrofoil, e.g. the control law mathematics, software, digital and analogue electronics, hydraulics, structural, mechanical and hydrodynamic design. A background in most of these can be obtained though academic study, however I have found that little seems to be available to aid in the choice of specific components for such a system. In this note I would like to describe a set of component choices, enablers, and construction details not found in engineering texts that have produced a functioning system for the height control of Talaria IV.

Talaria IV is a canard configured submerged foil hydrofoil with its steering and flying height controlled by a bow strut and foil. From its first flight in 1992 to 2008 it utilized for height control, a mechanical surface follower. A surface skimming plate was projected forward from the bow strut 3 feet using a four bar linkage. It was attached to the bow foil, changing its angle of attack as a function of the boat's height above the water surface. The mechanism's feedback was set at 0.1 radian foil angle per foot of height variation. Via the four-bar linkage the angle of the skimmer plate was set to

Talaria IV Foilborne

See TALARIA IV DEVELOPMENTS , Page 3

SUSTAINING MEMBERS

YOUR 2010 IHS DUES ARE DUE

See Full Announcement on Page 2

INSIDE THIS ISSUE

PRESIDENT'S COLUMN

To All IHS Members

IHS Members in the Washington, DC area were fortunate to be able to attend a Joint Meeting of the IHS and the SNAME SD-5 Panel on the subject of "Hydrofoils & Chesapeake Ferries" by Mark Rice, President and Jeanne Torstenson, Naval Architect, Maritime Applied Physics Corp (MAPC). Mark pointed out that non-traditional transportation solutions have been growing, driven by increasing energy costs and emissions constraints, and water transportation itself is increasingly seen as part of the solution to land transportation problems. He related that new technologies receive much attention, but some that have been around awhile are particularly relevant now. The hydrofoil is a prime example. It can substantially reduce the power and fuel consumption to make a respectable speed and can be highly cost-effective. Mark and Jeanne presented both their hydrofoil designs and their concepts for hydrofoil passenger services on the Chesapeake. A copy of the presentation is available on the IHS website.

As in November 2009, IHS participated with a booth at another ASNE function. This time at ASNE Day 2010 "Engineering the Affordable Global Navy Through Innovation" on April 8-9, 2010 at the Hyatt Regency Crystal City, Arlington, Virginia. The table was manned by IHS members Frank Horn, Joel Billingsley, and Dennis Clark.

As I reported in the last NL, we have developed, along with High Caliber Solutions, Inc. of New York, a significant addition to the IHS website. It is called: **Hydrofoil World.** The site is designed to be instructive and informative to a wide audience, particularly those not familiar with hydrofoils and the technology, along with others who are interested in the history of hydrofoils. Please log onto the IHS website. Hope you find it interesting. Also, please spread the word by sending this message to family and friends.

YOUR 2010 DUES ARE DUE IHS Membership options are: US$20 for 1 year, $38 for 2 years, and $54 for 3 years. Student membership is still only US$10. For payment of regular membership dues by credit card using PAYPAL, please go to the IHS Membership page at <http://www.Foils.org/member.htm> and follow the instructions.

I want to remind you that you can view the Membership List by logging onto the IHS website and put in the proper password. It is advisable for all to check the information on the List. If it is incorrect, please send changes to: Steve Chorney: schorney@comcast.net

As your President and Newsletter Editor, I continue my plea for volunteers to provide articles that may be of interest to our members and readers. Please send material to me (president@foils.org), I will be pleased to hear from you.

John Meyer, President

WELCOME NEW MEMBERS

Ted Raitch - Ted is vice president, ITE Inc is responsible for business development; a graduate of the University of Maryland Baltimore County with a degree in Economics; spent five years in the USAF in aircraft maintenance and two years with the USCG shipyard in Curtis Bay, MD; his business career has been in business development & program management in electronics, and development of commercial nuclear power plant simulators, ship - air and submarine simulators, naval and army tactical simulators; control automation systems development including the Navy Smart Ship, on site program management of sea trials for the electro optical fire control system on the Taiwan Navy's Off Shore Patrol Vessels, HPAC & AC plant simulation as a defacto hot plant for ICAS at NAVSSES; CAD-Physics integration on DDG 1000 and NSRP – ISE demo of CAD integration of Simsmart with CATIA , AutoCAD Ship Constructor & Intergraph 3D.

Bob Wasalaski - Bob went to the University of Michigan and studied Naval Architecture and Marine Engineering and Aerospace Engineering for a combined BSE degree for high performance marine craft and high speed boats. He did some model testing on multi hull ship designs. Upon graduation, he was commissioned in the US Navy and served on destroyers. When released from active service, Bob interviewed with both Grumman and Boeing for working on their hydrofoil programs. But they had all the

Continued on Page 12

Talaria IV Developments
(Continued From Page 1)

pierce the upper portion of a steep wave rather than ride over it causing the boat to fly through a steep wave rather than attempting to lift itself over. This feature was intended to increase the likelihood that the bow foil would not fly out the far side of a wave, ventilate, and subsequently fall into the next wave. This mechanism performed very well. It was however technologically inconsistent with the boat's analog computer based roll control system and detracting from the boat's image. Thus a computer controlled height control system has been installed.

The new or replaced components are the bow strut, digital computer, its software in C++, the control law, ultrasonic height sensor, vertical accelerometer, foil position sensor, knotmeter, bow foil actuator, servo valve/manifold and electronic interface to the computer.

Bow Strut

Several years ago Tom Speer introduced me to XFOIL, a DOS computational fluid dynamics program, downloadable from the NET. With it, a new bow strut was designed.

TALARIA IV Bow Strut and Foil

The leading 9" of its 13" cord is cast of 535 aluminum. The trailing edge, housing the bow foil actuator and linkage, is of fiberglass. The casting pattern included a 1.3% allowance for shrinkage. The resulting casting was within a 10 thousands of the design dimensions.

Hydraulics and Foil Position Sensor

An additional Moog 62 series servo valve was added to the hydraulic manifold to control the angle of attack of the bow foil. It is controlled by the computer's D to A output, using a LT1010 amp. The bow foil is actuated by a 1" ID, 2" throw cylinder milled from 1.25" x 1.5" aluminum and anodized. Inserted into the cylinder is a 2.5" variable impedance position transducer spool. It is wrapped with about 10,000 turns of .008 diameter wire set in epoxy on a plastic spool such that it yields an approximately linear response. It is further linearized within the computer with a polynomial fit. The transducer is driven by a 1500hz +/- 15 volt square wave, via a LM324 amp, rectified and smoothed for input to the computer's A to D..

Software

The 1500 lines of source code are in C++. About half are for the display, the rest, the control algorithm and interfacing subroutines. A Borland C++ 5.02 compiler generates the executable code. The executable code is transferred to the SBC0489 flash memory through its floppy drive.

Sensors

TALARIA's maximum banking angle is about 35 degrees. Thus a fixed ultrasonic transducer, measuring height, must return a measurement when directed up 35 degrees off axis. In addition, the wave surface angle can further increases the off axis return requirement. There a many ultrasonic transducers available, however, they are nearly all designed to produce a narrow beam. The Matbotix XL-MaxSonar-WR1, encased in PVC, has a narrow eight degree beam, however by removing its cone to within .15 inch of the transducer face the beam width becomes very wide. It samples at 10 Hz. The accelerometer is an ADXL05, mounted inside the boat's bow. It uses 5V power and produces a voltage signal.

Because many of the control parameters vary with speed, a knotmeter is fitted to the bottom of the bow foil. A frequency to voltage converter feeds an A to D channel the speed signal. The speed input is also used to reduce the boat's pitch during takeoff.

The replaced mechanical height control mechanism did not have a damper, consequently, when traveling over wavelets, it tended to bounce. The bouncing induced a low frequency vertical vibration at the boat's bow. With the electronic system the ride is smooth. Also because the height control parameters are speed variable a constant height is maintained across its flying speed range. There is a 7 minute video of TALARIA IV produced by Ray Vellinga flying with its new system on YouTube entitled "Hydrofoil Dreamin".

****

SAM BRADFIELD RECEIVES IHS AWARD

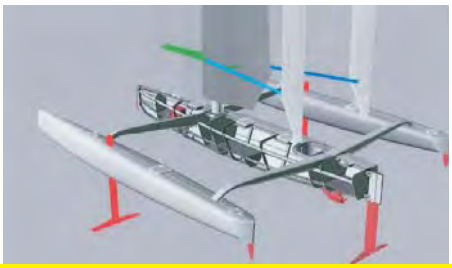
By Tom Haman, IHS Member

Shown here is a picture of Sam receiving his IHS award. The award citation is reproduced on page 5.

Tom Haman Presents the Award to Sam Bradfield

As for what HydroSail is doing these days, we are still working with the team in Hawaii to develop Harbor Wing, a 45 ft trimaran with a wing sail and hydrofoils that will be autonomous. We are also working on a racing tri that will be all carbon fiber and 18 ft long.

The Harbor Wing Autonomous Unmanned Surface Vehicle (AUSV) is unique. It is defined by three innovative components: the Wing- Sail™, hydrofoils, and the guidance system and will perform a range of critical missions.



A Sketch of the HWT X-3.

Harbor Wing has now completed the initial design for the production level prototype of our open ocean Trimaran vessel, the HWT X-3. It will incorporate technology proven by rigorous testing of our HWT X-1 prototype. This vessel will integrate highly developed unmanned guidance and control systems, sophisticated long range communications and powerful radar and telemetry capabilities with the robust tri-hull design.

RODRIQUEZ UPDATE

By Lorenzo Bonasera, IHS Member

One of my Sicilian friends just published the picture shown below in the "Naviearmatori.net" site.

It is the first Rodriquez experimental T-foil (ex HF-1), just painted in a new livery, and ready to be exposed at the next "Nautic show" in Italy (as yet I do not know exactly where). The name is "**Seagull**".

Rodriquez T-Foil HF-1

I do not know exactly if, in the future, the HF-1 Seagull, will be operated in regular service. For the time being it is only a prototype, and … as usual … it is equipped with a plenty of testing equipment.

They are used to carry out the trials out of the Strait of Messina, to avoid the restrictions of the "channel" authority.... as you know there are several maritime link between Messina and Italy's mainland, and moreover there is a strong commercial (and military) traffic through the Strait, linking the east and west Mediterranean sides, and the Tyrrhenian sea with Aegean Sea. Normally they go out toward the north reaching the free Tyrrhenian Sea. Due to this area of operation, it is difficult to take photos! However, there is one shown here in the foilborne mode.

Rodriquez T-Foil HF-1 on Trials

HYDROFOIL MODEL 'EL FOIL'

By Hans Jorgen Hansen, IHS Member

The radio-controlled model named 'El Foil' designed and built by Hans Jorgen Hansen of Espergaerde near Copenhagen, Denmark, does not represent any real hydrofoil type. Rather it is to an original design portraying a small hydrofoil motorboat. The hull is around 400 mm long and 135 mm wide. It is fabricated of light aluminium alloy sheeting. The cabin top and aft deck can easily be removed to gain access to the battery pack and radio control gear. The model has a mass of about 880 grams when complete with battery.

The bow foil is of surface piercing '_/' configuration with an overall span of 260 mm and chord length

Continued on Page 6

International Hydrofoil Society

Award Citation
Dr. Sam Bradfield

The International Hydrofoil Society congratulates Dr. Sam Bradfield for his remarkable achievements and honors him for his valuable contributions, over many years, to the technical development and promotion of hydrofoil sailing craft.

In recognition of those contributions, the Board of Directors and members of the International Hydrofoil Society hereby present Dr. Sam Bradfield the award of "Honorary Life Member".

Long before the flight of man-made heavier-than-air vehicles, aerodynamic lift powered windmills. Many years later, the same principle allowed an aircraft with a crew of two to fly around the world non-stop.

Dynamic lift is also the underlying basis for hydrofoils. First demonstrated over a hundred years ago, and matured over the last fifty years, hydrofoils have successfully demonstrated their applicability for both commercial operation and naval missions. While there is currently limited development of hydrofoils for these applications, sailing craft are seeing a renaissance for hydrofoils.

Technology in general, and hydrofoil technology in particular, appear to advance on the labor of men of vision who pioneer the technology and push forward setting their own direction rather than following convention. Dr. Sam Bradfield is such a man.

Dr. Bradfield has over 50 years experience designing and sailing hydrofoils. His designs are unique, and the elegance of his passion is unmistakable – the use of wind-generated aerodynamic lift to pull a hydrodynamically supported vehicle over ocean waves.

Many of Dr. Bradfield's associates have pursued hydrofoil technology for military purposes. In contrast, he has dedicated his career to a commercial market of his own creation – hydrofoils for everyday sailors and racers. As president of HydroSail Inc., Dr. Bradfield has developed a product line of exciting watercraft including coastal and ocean racers up to 37 feet in length.

The International Hydrofoil Society takes great pleasure in presenting this award to Dr. Sam Bradfield, who has devoted a significant part of his life and energies to the advancement of hydrofoil sailing.

FOUNDED 1970 LONDON

Feb. 25, 2010
Date

John R. Meyer
John R. Meyer, President

"El Foil"
(Continued From Page 4)

varying from 40 mm at the centre to 12 mm at the foil tips. When foilborne, the submerged portion of that foil would have a span of about 180 mm. The bow foil provides the longitudinal and lateral stability for the model. It also incorporates a small fixed rudder projecting vertically up from the foil at its centreline. The stern foil is a fully submerged type without any dihedral and has a rectangular planform of 160 mm span and 14 mm chord length. Both the bow and stern foils are of solid aluminium alloy strips filed back to form streamlined hydrofoil profiles.

"El Foil" On Stand
Photo: Hans Jorgen Hansen

The design of the foil units is such that there is an absolute minimum of resistance. The bow foil is connected to the hull only via two thin struts, which in any case are out of the water when the model is running fully foilborne. The aft foil is likewise supported by a pair of thin struts connected to both sides of the hull aft. The single centreline rudder is relatively short and is mounted below the aft foil. The rudder stock is a thin wire running down from the hull and is supported by the aft foil. This arrangement means that there is no inefficient section of the rudder near the water surface. That approach also avoids the tendency to draw down air when in a turn and reduces un-necessary drag when traveling straight ahead. The model has a very rapid turning response with this rudder arrangement.

"El Foil" Underway.
Photo: Hans Jorgen Hansen

A single 2-blade propeller of 30 mm diameter and a relatively low pitch propels "El Foil'. This is driven by a 12V Buehler type electric motor through a thin inclined drive shaft. Ten 1.2V Sanyo 1 Amp batteries in series supply power. The shaft is only supported as it passes through the hull and at the aft foil. The shaft extends past the aft foil so that the propeller is well immersed and does not suffer from any ventilation problems when the model is underway.

Control of the model is through a two-channel Futaba radio control unit, one channel for speed control the other for steering. The receiver is a Futaba FP-R102JE type, this being powered by the same battery pack as for propulsion using battery elimination circuitry (BEC).

'El Foil' was built in 1986 but continues to run very well. For a model of its small size and moderate motor rating it has considerable speed and endurance, running for up to an hour on a straight course. I estimate the foilborne speed to be about 8 knots (4 m/s). The wide bow foil gives the model good lateral stability so it can make rapid turns without resulting in any significant heel angle, let alone risk of capsizing. The model has never had any problems associated with foil ventilation and does not require any fences. This is the smallest of the radio controlled hydrofoil models that I have built, the other model, 'Carton Ondule' based on the PT 150 can run foilborne at a displacement of 12,000 grams, more than 13 times the displacement of the little 'El Foil'.

HYDROFOIL SHIP MODELS

Although this may sound like an advertisement, I thought our members should be aware of the availability of such a beautiful hydrofoil model.

Rick Tyson advises that he has now in stock 1/100th scale LOA: 15.90" full hull display models of the PEGASUS CLASS VESSELS, specifically the U.S.S. TAURUS PHM-3, shown here. He can do other ships of this class or any other type of U.S. NAVY hydrofoil vessel. Just e-mail to: racetrack@erinet.com. The price for U.S.S. TAURUS PHM-3 is $850.00 (includes display case and standard, insured shipping to anywhere in the USA.) Also see website: www.replicasbytyson.com for other U.S. NAVY or USCG ship models.

***TAURUS* PHM-3 Model**

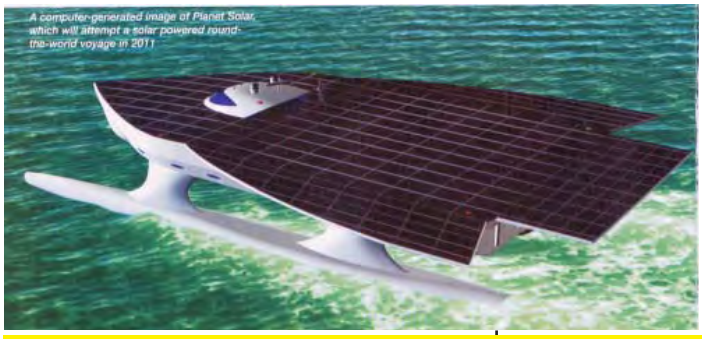
HERE COMES THE SUN!

From Passenger Ship Technology, August/September 2009

By Dag Pike

In order to demonstrate the benefits of solar power, a French team is planning a round-the-world voyage in a vessel powered only by this energy source. The 30m long *Planet Solar* is under construction in Germany and, after proving trials in European waters, the voyage is planned to start in 2011. If this concept is successful, it could point the way for a new generation of passenger vessels powered by solar power.

The *Planet Solar* project has been under development for several years and is the dream of Raphael Domjan. "During the round-the-world attempt we will have to manage on whatever energy nature gives us," explains Mr Domjan. "We will have to optimise the route and speed constantly, in line with the available sunshine and the medium range weather forecast."



A Computer-Generated Image of *Planet Solar*

The design is based on a unique catamaran that has been developed by a wave piercing design expert, LOM Ocean in New Zealand — the same design team that developed Earthrace, the craft that currently holds the powerboat circumnavigation record. On Planet Solar, the main centre hull will be supported on two pontoon hulls, with the only connection between the main and supporting sections being a series of side struts.

The pontoon hulls are around 2m in diameter and are formed for minimum resistance. They will act in a semi-submerged mode so that the vessel is in effect a semi-SWATH (small waterplane area, twin hull) design. Tank testing is said to have shown that the hull has the smallest resistance of any of its size.

Accommodation is in the centre hull and the main solar panels are located on the top deck. Folding wings and a stern panel have additional solar panels, to give a total panel area of 470 square meters. These wing flaps add 8m to the 15m beam of the vessel while the stern flap adds another 5m to the length. These panels are estimated to produce an energy output of around 120kW in bright sunlight.

Two electric propulsion motors will have an average consumption of 20kW and will allow Planet Solar to operate at a speed of between 8 to 12 knots. When using the batteries that are charged by the solar panels, it is estimated the vessel will be able to travel up to 1,000km, even when the panels are not supplying power. The craft will thus be able to keep going during the hours of darkness.

Planet Solar, the largest solar powered craft to be built to date, is under construction in the Knierim shipyard in Kiel and already the two pontoon hulls have been completed. These have been constructed from a carbon fibre laminate to keep weight to a minimum.

The launch and initial testing is planned for the beginning of 2010, and during the summer of that year the vessel will undertake a European tour. Departure on the round-the-world voyage is scheduled for April 2011 from Marseille, with the vessel taking a westerly route. There will be stopovers in various ports such as New York, Miami, San Francisco, Cairns, Singapore and Dubai within the 40,000km voyage, which is expected to take 140 days to complete.

One of the main sponsors of this ambitious project is Swiss watchmaker, Candino, and *Planet Solar* will fly the Swiss flag during a voyage that could see it become the first to circumnavigate the world by solar power. It will also become the first to cross the Pacific and the Indian Oceans by this means.

The design concept of *Planet Solar* incorporates a potential to carry up to 60 passengers. This could be a viable payload for a vessel that would have

Continued on Next Page

Disclaimer

IHS chooses articles and photos for potential interest to IHS members, but does not endorse products or necessarily agree with the authors' opinions or claims.

Interested in hydrofoil history, pioneers, photographs? Visit the history and photo gallery pages of the IHS website. http://www.foils.org

PLANET SOLAR

(Continued From Previous Page)

no fuel bills. Add to this the stability offered by the catamaran/SWATH concept and the silent operation offered by electric propulsion, and this concept could be ideal for wildlife cruises and whale watching.

There are some issues to resolve to offer passengers a good outside view and incorporate sufficient lifesaving equipment. However, Planet Solar appears to offer considerable potential for passenger transport — although the prototype is expected to be converted to a luxury yacht after the record attempt. Existing vessels such as Solar Sailor, operating in Sydney Harbour (PST Aug/Sep 08), have already demonstrated the feasibility of solar powered passenger vessels; this new design takes the solar concept a significant stage further.

IHS AT ASNE DAY

Again IHS had an opportunity to participate in ASNE Day in the Washington DC area. A modest booth was manned by Frank Horn, Dennis Clark, and Joel Billingsley.

In the photo with Frank Horn and Joel Billingsley, is Dr. Leigh McCue (IHS Member), a Virginia Tech professor who was recognized at the head table.

Dr. Leigh paid her 2010 dues and signed her husband up to become a new member, i.e. Charles Weil. Frank was successful in signing up several members, one of which had dropped out of the IHS, but has returned to the fold.

The ASNE event was attended by about 700 people. Frank reports that they had a wide diversity of visitors to the booth many of whom passed by and stopped to see the various hydrofoil videos and slide shows. Also, one of the attractions was a raffle each day for one of the IHS/SNAME mugs. Shown here, with Frank Horn, is one of the drawings at the end of the day.

OPTIONS FOR RAISING PROPULSIVE EFFICIENCY

Excerpts From Marine Propulsion, August/Sept 2009; By Prof Dr. Volker Bertram, Former IHS Member

Improved propulsion efficiency can be pursued through a variety of means:

Operating the propeller at the optimum efficiency point: propeller efficiency depends, among other factors, on rpm and pitch. Fixed pitch propellers are cheaper and, for a given operating point, have a better efficiency than CP propellers; and they can be replaced if the operator decides to deploy the ship long term at lower speeds.

Example of device available to recover rotational energy lost in the propeller stream

An adaptable pitch means that CP propellers offer advantages for ships operating over wider ranges of operational points. Several refit projects have been reported, with savings up to 17 per cent quoted from new blades.

Reducing rotational losses: for most ships a substantial rotational energy is lost in the propeller stream, and many devices have been proposed to recover some of this energy. These can be categorised into pre-swirl (upstream of the propeller) and post-swirl (downstream of the propeller) systems.

Pre-swirl devices - such as the SVA Potsdam pre-swirl fin, pre-swirl stator blades and asymmetric aftbodies - are generally easier to integrate with the hull structure. Rudders behind the propeller automatically recover some of the rotational energy so potential gains should always be considered with the rudder behind the propeller to avoid over-optimistic estimates.

Perhaps the best known pre-swirl device, the Grim vane wheel, was originally located immediately behind the propeller to generate extra thrust. The vane wheel comprises a turbine section inside the propeller slipstream and a propeller section (vane tips) outside the slipstream.

Continued on Next Page

PROPULSIVE EFFICIENCY
(Continued From Previous Page)

Contra-rotating propellers (CRP) are further traditional solutions for recovering rotational energy losses. More recently, podded propulsors and conventional propellers have been combined in hybrid CRP - pod configurations to achieve claimed fuel savings of 13 per cent.

Reducing frictional losses: smaller blades with higher blade loading decrease frictional losses, albeit at the expense of increased cavitation problems. A suitable trade-off should be found using experienced propeller designers and numerical analyses.

Reducing tip vortex losses: the pressure difference between the suction and pressure sides of the propeller blade induces a vortex at the tip of the propeller. This vortex (and the associated energy losses) can be suppressed — at least partially — by tip fins similar to those seen on aircraft wings.

The general idea has resulted in various implementations differing in the actual geometric form of the tip fin, such as contracted and loaded tip (CLT) propellers (with blade tips bent sharply towards the rudder), Sparenberg DeJong propellers (with two-sided shifted end plates) and Kappel propellers (with integrated fins in the tip region).

Reducing hub vortex losses: devices added to the propeller hub may offer cost-effective fuel savings. Propeller boss cap fins (PBCF) developed in Japan by Mitsui OSK are claimed to deliver 3-7 per cent gains in propeller efficiency in model testing and 4 per cent at full scale. Many are in service.

Reported gains should be considered with caution, however, one specialist noting that 'the presence of the rudder significantly reduces the strength of the hub vortex and hence the gain in propeller efficiency due to PBCFs can be lowered by 10-30 per cent.'

Operating the propeller in a better wake: a propeller operates in an inhomogeneous wake behind a ship, which induces pressure fluctuations on the propeller and the hull above the propeller, in turn exciting vibrations. The magnitude of these vibrations poses more or less restrictive constraints on the propeller design. A more homogeneous wake translates

An IHI Contra-rotating Propeller (CRP) Installation

into potentially better propeller efficiency from, for example, a larger propeller diameter or larger blade loading on the outer radii.

For new designs, wake equalising devices such as the Schneekluth nozzles (also known as wake equalising ducts (WEDs), Grothues spoilers and vortex generators may therefore improve propulsion and save fuel. For existing ships, despite several refits, more recent independent analyses cast doubt on the effectiveness of WEDs, one conclusion being that 'partial ducts may result in energy saving at full scale but this was not, and probably cannot be proven, by model tests.'

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30 YEARS AGO

THE FINAL ISSUE

From Fast Ferry International September 2009

The September 1979 issue of Hovering Craft & Hydrofoil was the last to appear under that title. The opening pages were devoted to an obituary for Peter Dorey, who in 1964 co-founded Condor Ferries to run the first commercial hydrofoil passenger service in Britain. Peter Dorey was lost at sea while taking part in the 1979 Fastnet Race in his yacht Cavale.

Hydrofoils

One article in the issue reviewed the first ten years of hydrofoil services between Southampton and West Cowes. Red Funnel, possibly prompted by the opening of the British Rail Seaspeed SR.N6 service from Cowes to Southampton in July 1966, had started examining the possibility of a fast passenger link for businessmen, commuters and tourists in 1967.

Less than three years later, "The decision by Red Funnel Steamers to augment its conventional ferry services appeared to be a mistake. By the end of 1971, craft reliability was falling alarmingly and traffic figures reflected this." The engines in the H.57 were designed to operate in warm climates, not the lower air and water temperatures of the Solent, and there was a serious problem of non-availability of spares.

Action had to be taken. "An order was placed with Rodriquez Shipyard for an RHS 70. The first of the type

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SAILOR'S PAGE

HYDROFOILS APPLIED TO CANTING-KEEL MAXI YACHTS

This is the second part of the article under the same subject by Milne and Helmore from the First Quarter 2010 Newsletter.

Towing Rig and Towing Tests

No towing-tank was readily available for the project so a towing rig was designed and built to measure the resistance of the model over a range of speeds while providing the motive force to bring the vessel to the foilborne condition. This rig proved to be reliable and easy to use.

The model would be pulled through the water by a light nylon fishing line which was wound in by the towing rig. The rig additionally provided towing line tension measurements. Although the nylon line in the water added a small component of resistance, this was disregarded.

A speed controller that regulated voltage output was built with readily available commercial components allowing the model to be towed at a constant velocity across a range of speeds.

Tow force measurements relatively free of friction from the towing rig were achieved using a vertical mast perpendicular to the incoming nylon line. The tow line travels over a lightweight pulley mounted on top of the mast and down parallel to the mast onto the winding spool. The mast is able to rotate about its base and move in the direction of the incoming line. A linear spring gauge is attached to one side of the mast to give readings of line tension.

A radio-controlled rudder on the model enabled it to be steered in a straight line towards the towing rig. A slight deviation off course (5^{o} or less) would not significantly influence the resistance measurements. An advantage of using the nylon line is that there is a small amount of elasticity in it whereby any small waves or any slight deviation of the model does not instantly translate into a significant change in line tension. Thus a relatively constant tension could be measured while the model is still some distance from the towing rig.

A preliminary set of trials with the towing rig was conducted in open water in order to refine the process and iron out any bugs. After a period of trial and error, these tests proved successful and the model was then tested in a more controlled environment using swimming pool at UNSW. Many towing runs were conducted after hours with and without foils fitted to the model and speeds and resistances were measured. An example run is shown in Figure 4.

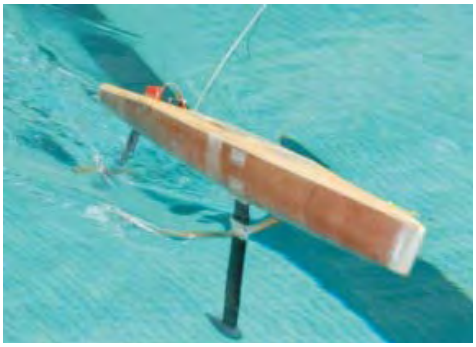

Figure 4: Towed model foilborne with foil tips just breaking the surface at 1.74 m/s.

Once the model was foilborne, any small waves which were present in the pool had very little impact on the way the vessel behaved. Such conditions in any case simulate the operating environment of an ocean-going yacht.

The model required a speed of around 1.74 m/s (16.9 knots full scale) to become foilborne. However, once foilborne the speed could be slowed to 1.55 m/s (15.0 knots full scale) and the model would remain foilborne. The resistance results from the tests are shown in Figure 5.

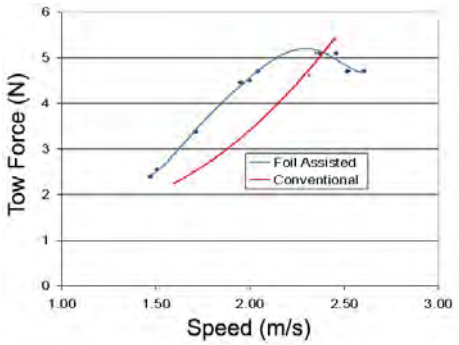

Figure 5: Resistance results for conventional and foil-supported models

Sailing Tests

Finally, a radio-controlled sailing model was tested in both configurations to obtain qualitative comparisons.

A set of sails (main and Genoa) and rig was designed, built and fitted to the vessel, as well as radio-control gear. The overall displacement in this configuration was approximately 130 g (or 8%) over the scaled design displacement.

Scaling of the wind strength plays a part in modeling sailing trials. A maxi-yacht is able to sail in winds of up to 40 or 50 knots, so, based on Froude scaling, the model could be expected to sail in 10 knot winds with average wind speeds of 5–6 knots.

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HYDROFOILS APPLIED TO CANTING-KEEL MAXI YACHTS
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This is a light breeze, and there are often periods of associated calm in such conditions. The mast on the model is only 1.5 m tall, and the wind gradient can be extreme at this level, complicating the extrapolation of the performance from any such model tests.

In all, five sailing trials were conducted, each one an improvement on the previous trials and with many lessons being learned along the way. The first trail was a near-disaster, with the model almost sinking! However the fifth trial was the most successful with the model becoming foilborne at about the same speed as the towed model (speed estimated rather than measured for sailing trials). Figure 6 shows the model up on the foils.

Figure 6: Model Reaching on Foils

Conclusions

This project demonstrated that a 30 m maxi yacht could achieve a speed advantages at higher speeds. However implementation at full scale may not be easy; there will be problems with structure, control and berthing arrangements. Some of the problems can be solved relatively easily while others will be more difficult to address. However, canting keels were not without their problems either yet these are now firmly entrenched in high performance maxi yachts. It is the author's belief that when one enthusiast takes the plunge and fits hydrofoils to a full-sized yacht, then the speeds achieved will convince more to follow.

L'HYDROPTÈRE.Ch TRANSITIONING FROM CONCEPT TO REALITY

(Edited from reports on: www.hydroptere.com)

In April 2009, during a press conference on the campus of the Swiss Federal Institute of Technology (EPFL) in Lausanne, Alain Thébault and some of his team unveiled the drawings of a new project, *l'Hydroptère.ch*. This new sailing hydrofoil is intended to serve as a scaled down trial platform for a future maxi sailing hydrofoil.

The building of such a scale prototype is consistent with the previous practice of Alain Thébault who built three models before the construction of the 60 ft (18.3m) speed record holding trimaran *l'Hydroptère*. The main purpose of *l'Hydroptère.ch* will be to assess the behavior of alternative arrangements in real conditions in order to design a maxi sailing hydrofoil intended for attempts at oceanic records (Atlantic and Pacific) or the Jules Verne Trophy for fastest circumnavigation of the world by a yacht.

The design studies for *l'Hydroptère.ch* were carried out jointly by the engineers of the EPFL- laboratories and the *l'Hydroptère* design team.

l'Hydroptère.ch is a 35 ft (10.7m) catamaran with a central structural peak and inclined surface piercing bow foils and two aft T foils known as 'rudder-elevators'. This arrangement is aimed at improving balance in flight. For low wind conditions, she will be equipped with a centerboard during which time the foils will be retracted from the water. The rigging is designed to meet a wide range of weather conditions. The central structural peak will not touch the water.

CAD Image of *l'Hydroptère.ch*

l'Hydrotpère.ch aims to validate the choice of this new geometry as well as permitting the effects of numerous parameter combinations to be evaluated based on the boat's performance. The boat will serve as a floating laboratory, equipped with systems that will enable a multitude of adjustments whilst sailing and multiple sensors enabling performance and load measurements to be made. The technologies tested on *l'Hydroptère.ch* should be transferable to the maxi.

Construction of *l'Hydrotpère.ch* has been underway since the project was announced with two yards manufacturing parts of the boat. The shipyard Décision SA, located in Ecublens

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Welcome New Members
(Continued From Page 2)

engineers that they needed at the time so he worked for Ingalls Shipbuilding in Pascagoula, Miss on the USS SPRUANCE -DD-963 program. Then he was employed by M. Rosenblatt and Son in Arlington, VA working on ship motions and sea keeping studies, and then the Stability Division of the Naval Sea Systems Command as the Branch Head for Amphibious and High Performance Ships. Here he worked on PHMs, the LCACs and SWATH ship designs, and was involved in stability, inclining experiments and hull surveys. On the PHMs, Bob did some work on speed weight ratios for ability to fly and loading on struts. Since retiring from NAVSEA as a Ship Design Manager, he has become a docking expert and a heavy lift transport expert. Bob was the person who went to rescue and heavy lift transport home of the USS COLE in Oct/Nov 2000. He also retired from the US Naval Reserve as a Captain with a designator for Engineering Duty. He is a practicing Naval Architect and Marine Engineer in the Hampton Roads, VA area, and has worked on some high-speed monohulls for both combatant ships, patrol craft, corvette and destroyer designs, and high speed container ships.

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30 YEARS AGO
(Continued From Page 9)

went into service in the summer of 1972 and proved considerably more reliable than the H.57. It was also now possible to substitute some British equipment when necessary.

"With the arrival of the second RHS 70, the service settled down to an average of 7,200 to 7,600 journeys a year. The number of passengers has increased consistently each year. In the first four months of 1979, 68,868 passengers were carried, more than in any twelve-month period during 1969-73."

In 'People and Projects', it was reported that Jetlink Ferries had introduced a second Boeing Jetfoil on its Seajet route between Dieppe and Brighton. The craft, a 929-100 model, had been offered by Boeing Marine Systems as a back up for the 929-115 *Normandy Princess* but increasing traffic resulted in extra services being operated during peak periods. The availability of the second hydrofoil, *Flying Princess,* had also allowed some charter work to be undertaken.

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L'HYDROPTÈRE.Ch
(Continued From Previous Page)

close to Lausanne, in Switzerland is responsible for construction of the composite central structural peak and the hulls, both of which are under construction. The shipyard B&B based in La Trinité sur Mer has already manufactured the cross beams.

The objective of sailing around the world implied the development of a versatile platform. During a circumnavigation, weather conditions can vary enormously and history has shown that on this route, speed records are very often achieved or lost in the zones that habitually experience lighter winds. Thus the design of *l'Hydroptère.ch* was focused on the desire to maintain and optimize the equipment related to the boat's speed and behavior "in flight" while also providing the versatility for sailing in light winds.

WEB BENEFIT

IHS provides a free link from the IHS website to members' personal and/or corporate site. To request your link, contact William White, IHS Home Page Editor at webmaster@foils.org

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The NEWS LETTER

International Hydrofoil Society
PO Box 51 - Cabin John MD 20818 - USA

Editor: John Meyer | Third Quarter 2010 | Sailing Editor: Martin Grimm

RODRIQUEZ REPORTS ON FULLY SUBMERGED HYDROFOIL TRIALS

Excerpted From Fast Ferry International, April 2010

Rodriquez Cantieri Navali has completed the first phase of sea trials of its first FSH-38 fully submerged hydrofoil. The company has built two 38m vessels with different propulsion systems at its yard in Messina, Sicily, as part of a research project that has been jointly financed by Ministero dell'Istruzione, dell'Universita e della Ricerca (Italy's Ministry of Education, Universities and Research) and by the European Union. Rodriquez reports, "The aim is to produce a more efficient type of hydrofoil to replace surface piercing designs. A hydrofoil with fully submerged foils is suitable for use on both short and medium range routes. Higher speeds, lower fuel consumption and greater operational capability will give operators higher financial returns."

FSH-38 Foilborne in the Strait of Messina

See Fully-Submerged Hydrofoil, Page 3

SUSTAINING MEMBERS

ARE *YOUR* 2010 IHS DUES STILL DUE? PLEASE REMIT!

See Full Announcement on Page 2

INSIDE THIS ISSUE

PRESIDENT'S COLUMN

To All IHS Members

IHS Members in the Washington, DC area were fortunate to be able to attend a Joint Meeting of the IHS and the SNAME SD-5 Panel on the subject of "Stabilization and Motion Control of Advanced Ships & Craft" by J. William McFann - President, Island Engineering, Inc. Island Engineering is one of few companies that specialize in providing the stabilization and motion control of a marine craft. That may involve ensuring a ship-launched weapon will hit its target, or a helo or RHIB (Rigid Hull Inflatable Boat) can be deployed safely. Requirements and solutions can vary widely from one case to the next, and Bill discussed some of the more interesting ones his company has dealt with . Island Engineering handles all aspects of this work, from basic analysis to design and engineering, fabrication and shipboard installation. A copy of the presentation is available on the IHS website.

As in November 2009 and April 8-9, 2010, IHS participated with a booth at another ASNE function. This time at ASNE **Engineering the Total Ship (ETS)** 2010 Symposium at the Westin Tysons, Virginia, July 14-15, 2010. The table was manned by IHS members Frank Horn and Joel Billingsley.

YOUR 2010 DUES ARE DUE
IHS Membership options are: US$20 for 1 year, $38 for 2 years, and $54 for 3 years. Student membership is still only US$10. For payment of regular membership dues by credit card using PAYPAL, please go to the IHS Membership page www. Foils.org/member.htm and follow the instructions.

As I reported in the last NL, we have developed, along with High Caliber Solutions, Inc. of New York, a significant addition to the IHS website. It is called: **Hydrofoil World.** The site is designed to be instructive and informative to a wide audience, particularly those not familiar with hydrofoils and the technology, along with others who are interested in the history of hydrofoils. Please log onto the IHS website: www.foils.org and click on: New! Visit Our Virtual Hydrofoil Museum.. Hope you find it interesting. Also, please spread the word by sending this message to family and friends.

Sign-up of new members has slowed down to a trickle, so, all members are asked to encourage colleagues to join. Please make them aware of the IHS website and the features regarding membership.

I want to remind you that you can view the Membership List by logging onto the IHS website and put in the proper password. All IHS members have been informed of this password. If you have been missed, please contact the webmaster (webmaster @foils.org). It is advisable for all to check the information on the List. If it is incorrect, please send changes to: Steve Chorney: schorney @comcast.net

John Meyer, President

WELCOME NEW MEMBERS

William D. (Will) O'Neil - Since 2006 Will O'Neil has been a consultant on defense technology and acquisition living in Northern Virginia. He found the IHS in the course of research for a study of acquisition and technology management practices he is conducting, in which the PHM and SES programs are among the case studies. Between 1969 and 1984 he served as a civilian in the Pentagon, first on the staff of the Secretary of the Navy and then in the office of the Director of Defense Research and Engineering and Under Secretary of Defense (Research and Engineering). In these positions he had the responsibility for all advanced naval vehicle programs, including hydrofoils, and played a key role in the Department of Defense's direction of the PHM program.

Will was famous (or infamous) as the author of "Advanced Naval Vehicles: Who Needs Them?". Throughout the 1970s he consistently advocated development of larger hydrofoils as a more practical and cost-effective alternative to the Navy's over-ambitious SES program. He was also directly responsible for initiation of the Advanced Naval Vehicle Concepts Evaluation, conceived as an effort to focus attention on viable advanced-vehicle options for the Navy.

Will received an BA in mathematics from UCLA in 1960 and an M.S. in quantitative methods in 1968. After attending Navy OCS in 1960 he

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Fully Submerged Hydrofoil
(Continued From Page 1)

Design

Michele Sferrazza, the research and development manager at Rodriquez Marine System, adds, "The most outstanding feature is the fact that the foil surfaces are completely below the water surface, which greatly reduces their sensitivity to wave motion.

"The result is improved passenger comfort in all sea states and, by reducing the vessel's resistance to the water, higher speed with the same installed power, as well as greater ability to deal with adverse weather conditions."

The FSH-38 hulls are built entirely of welded aluminium alloy, the foils are high tensile steel. Two MTU 16V 4000 M70 diesels rated at 2,320 kW at 2,000 rpm power each vessel. The first hydrofoil has conventional propellers, the second will be fitted with azimuth pod systems featuring contra-rotating propellers.

Describing the propulsion system installed on the first FSH-38, Michele Sferrazza says, "This has traditional fixed pitch propellers and a two-speed gearbox. The first gear serves to reach the speed required for take-off, 24-30 knots within 15-20 seconds, allowing the hull to emerge from the water without overloading the engines, while the second gear exploits all the available power."

When the first FSH-38 is fully fitted out, the vessel is expected to have a fuel consumption of 950 litres per hour when operating at 46 knots. Rodriquez points out that this equates to 20.6 litres per knot, which is 10-20% better than existing fast ferry designs.

The company says that vertical acceleration levels of 0.07g RMS in 1.5m significant wave heights, or Beaufort Force 3-4 conditions, will result in "very good comfort on board". Anticipated limiting conditions for passenger service are Beaufort Force 5-6.

As to how the upper passenger deck might be fitted out, standard capacity is likely to be 155 in the upper saloons and 88 in the lower saloons at a seat pitch of 820 mm.

Trials

Rodriquez has been working on the fully submerged hydrofoil project for the past six years. The hulls of the two FSH-38s were built in 2005 and stored in Messina pending the completion of the research programme and manufacture of the foil systems.

Trials of the first FSH-38 started last September. Initial testing was concentrated on evaluating the strength of the foils, rudders and flaps, and manoeuvrability. A maximum speed of 26 knots was achieved in hullborne mode, with most of the bow foil out of the water but with the stabilization system set to avoid planing, before fine tuning of the height sensor system commenced.

Since then, Rodriquez reports, foilborne speed has reached 41 knots while carrying a simulated half load and will increase further when the fixed pitch propellers and stabilization system have been optimized and other modifications are carried out in the coming months.

During the summer, the four passenger saloons of the first FSH-38 will be fitted out with just under 250 seats. At present, there are no windows in the lower saloons, which has allowed Rodriquez to apply very striking graphics to the sides of the hull. Further trials are scheduled to be conducted in October, after which Rodriquez plans to lease the vessel to a local operator for in-service testing.

First trials of the second FSH-38 are also due to take place in October. The hull has been painted, the foils have been attached and the propulsion pods are awaiting installation. The adoption of a more efficient propulsion system is expected to result in a performance that is even better than that of the first FSH-38.

AliSwath

Rodriquez Marine System in Sarzana and Rodriquez Cantieri Navali in Messina continue to work on another research and development project for a revolutionary passenger/car fast ferry, the 63m x 15.5m AliSwath.

Rendering of the Completed AliSwath

The design combines a catamaran hull, single torpedo hull or gondola, fully submerged foils and podded propulsion. The main components

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AliSwath
(Continued From Previous Page)

of the vessel are complete in Messina, although the catamaran hull, gondola and the strut between the two have yet to be mated.

Rodriquez has described the vessel as "a hybrid between a hydrofoil and a Small Waterplane Area Twin Hull" developed in cooperation with the University of Genoa, RINA and the Krylov Institute of St Petersburg.

"During navigation, 20% of lift will come from foils and 80% from gondola buoyancy. Active flaps on the foils are used for ship stabilization. Engines are installed inside the gondola, coupled to a single propeller. A smaller engine is installed in each hull, coupled to a pod."

The engines in the gondola are two MTU 16V 4000 M70s, the podded units are MTU 16V 2000 M70 diesels. Anticipated speed with all four engines operating is 28 knots at 90% MCR (Maximum Continuous Rating) and 31 knots at 100% MCR.

HYDROFOIL VESSEL, A LONGTIME BREMERTON FIXTURE, FINDS HOME IN MISSOURI

By Ed Friedrich

Courtesy of the Kitsap Sun (www.kitsapsun.com)

BREMERTON — The FRESH-1 will fly again. That's the plan, anyway, for the once-fastest hydrofoil in the world.

But the record was 47 years ago. For much of the time since then, the Navy research vessel sat, getting abused by vandals and nature.

FRESH-1 Ready for Transport

Recently, workers partly disassembled the craft, hoisted it onto a flatbed truck and headed for Brunswick, Mo.

The hull and massive jet engine of the former U.S. Navy hydrofoil FRESH-1 were trucked to the USS Aries Hydrofoil Museum in Missouri. (Derek Sheppard | Kitsap Sun).

"We're going to start restoring it immediately," museum founder Eliot James said by phone from Calgary, Alberta, where he is chief operations officer for Bonnybrook Steel Fabricators. "We'll start putting it back to its former glory. Our intention is to have it operating and flying again." It flew on an underwater wing — a hydrofoil — that lifted the hull out of the water.

On May 3, 1963, a turbine engine pushed the 59-foot, 17-ton catamaran to 96.7 mph on Puget Sound, a hydrofoil record. On July 18 of that same year, FRESH-1 — Fresh was a sort-of acronym for Foil Research Hydrofoil — rolled while going 80 mph off Vashon Island. It was rebuilt for about $500,000, completed its trials and was accepted by the Navy, but the wipeout was the beginning of the end.

The Navy shifted its focus to designing reliable 50-knot vessels instead of 100-knot hydrofoils. FRESH-1 was mothballed and eventually sold at auction.

Jet Engine Secured on Truck

Above: Rick Kirkwood of Kirkwood Trucking is shown securing the jet engine on the truck. He drove parts of the ship to a museum in Missouri. It was previously stored behind a trucking company near Bremerton's auto center. (Derek Sheppard | Kitsap Sun)

A Los Angeles surplus dealer bought it from the Navy in 1982 for $12,900. While trying to resell it, he allowed it to be displayed near the battleship USS Missouri along Navy Yard Highway. Dave Symington, a Seattle businessman who developed the Lake Symington housing area in Central Kitsap, eventually bought it. He doesn't remember when, but he's been leasing a space to store it behind Peninsula Trucking for a long time. He doesn't want to add up the cost. "What good would it do? It'll just make me feel bad," he said.

Symington, age 91, had the money to store the FRESH-1, but not to restore it. He'd been trying for years to find a Northwest home, and a few times thought he had. "I'd rather see it out here," he said.

After none of the sites worked out, Symington figured Missouri was better than the scrap yard.

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FRESH-1
(Continued From Previous Page)

"I've been talking to him over the last five years," James said. "Dave has always had an interest in seeing the FRESH-1 preserved, and he decided we were the best candidates for doing that."

The museum might not stay in the Show Me State for long. James said he'll probably move it south, near the Gulf of Mexico.

Dedicated to preserving hydrofoils of all types, the museum is centered around the Pegasus-Class hydrofoil Boeing developed for the Navy in the early 1980s. After serving for 11 years, all 6 PHMs were retired in 1993. James, knowing nothing about hydrofoils, bought the 133-foot craft for scrap. Finding it in good shape, he sailed from Charleston, S.C., to Missouri, and decided to restore it. He has since added more hydrofoil craft and hopes to create a national hydrofoil museum.

They'll move around under their own power to waterfront festivals and other events.

"Our intention is not to just have static displays," said Eliot, 47. "We're all about making hydrofoils fly."

For Those Who May Have Forgotten What FRESH-1 Looked Like Foilborne

CHANGE IN OWNERSHIP OF FRESH-1

By Eliot James

As of May 27, 2010 there is a new owner of FRESH-1. Your author, Eliot James of Aries Hydrofoil Museum, has come to terms with David Symington to take over the ownership of FRESH-1. My partners the two Meinhardt brothers - Bill and Bob - traveled to Bremerton to work out the logistics and prepare the ship for transport to Missouri. Meanwhile, I have been talking to Corpus Christi, Texas and Key West, Florida for relocating their Aries Hydrofoil Museum.

I wanted to let IHS know that everything and everyone made it back safe, if not a bit worn. To recap, Bill and Bob drove 30 hours to Seattle, and I met them out in Seattle during an extended layover on my way to Calgary. We got together late Friday night and early Saturday we loaded up the foils onto the trailer they brought with them. We worked till we couldn't see, then hit it hard Sunday morning and worked all day,

I had to leave out for Calgary Sunday evening. Bill and Bob worked on. Monday the crane came in and they loaded out the Cabin and the Engine on the first truck. Then on Tuesday they loaded out the Pontoons on the second truck. They had to load up all the tools and after a short rest and some food headed back to Missouri so they could beat the trucks home. Another 30 hours straight through. Friday morning, they unloaded both the trucks at the shop near Salisbury, MO where we will begin restoration.

During the process, Bill and Bob were visited by a reporter who had heard what was happening. Being under a time crunch, they didn't have time for the reporter. The reporter did call me, and as usual, I tried to give as much credit to both Bill and Bob Meinhardt since they do most of the work, and have for several years with the museum. When the reporter wrote the article however, he must have been ticked off that the brothers didn't have time for him and in revenge eliminated any and all reference to them in the article! Fortunately, the Brothers Meinhardt could care less what reporters think and don't hold it against me.

It turns out that Bill was involved in an accident. One of the mounts that holds the strut trusses to the pontoons fell and sliced his leg open. It resulted in a trip to the emergency room and several internal and external stitches. (I am beginning to think he is accident prone.) When we were trying to get the Aries ready to sail home, he nearly sliced his hand in two working on a lathe, then while on the trip home, he was run over while riding his bike into town for supplies, both of which necessitated hospital visits! I know Bill isn't clumsy, and very competent on machines including lathes and bicycles so it must be a jinx. Then they met with John Symington and had the opportunity to go to his place to view the transit foils. They brought back many pictures, and a firm belief that they are in much better shape than the original foils, and include all the actuation cylinders. It will be much easier to get them installed than the old set that we have. Unfortunately, we couldn't bring them back yet since Dave is convinced of their significant value. We will have to wait and see. We have much else to do before we are ready for the foils anyway.

USTICA LINES INTRODUCES NEW ROUTES THIS SUMMER

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From Fast Ferry International, April 2010

In April of this year, approximately one-third of all current fast ferry orders worldwide had been placed by one company, Ustica Lines. This is partly due to the low number of contracts placed in the past 18 months. However, it is also due to Ustica Lines having confirmed contracts for a total of 12 Air Naval 38m monohulls since the end of 2009.

Having won all the concessions for subsidized services in Sicily awarded since October 2008, the operator is now able to plan for a relatively stable few years.

This has not always been the case. When the last review of Ustica Lines was published in November 2007, it was reported, "The latest concessions to operate public interest services between Sicily and most of its neighboring islands are due to come into effect on June 1 2008.

Rodriquez Foilmaster Hydrofoil Mirella Morace is One of Five Currently Operated by Ustica

"However, the current operator of the fast ferry services, Ustica Lines, says that new terms and conditions must be introduced to make the concessions more financially attractive to potential operators. What will happen next year is not clear."

What happened was that six month extensions were agreed with Regionale Sicilia for the routes between Trapani and the Egadi Islands and between Milazzo and the Eolie Islands. No agreement was reached concerning seasonal services operated each summer, and in 2008 Ustica Lines suspended operations on four routes and continued to schedule only a winter frequency on a fifth.

Current routes

Normal circumstances resumed in October 2008, when Regionale Sicilia awarded Ustica Lines contracts to operate services for five years from Milazzo, Reggio Calabria, Messina, Palermo and Cefalu to the Eolie Islands and from Trapani and Marsala to the Egadi Islands.

This was followed last November by five year contracts from June 1, 2010 for services between Porto Empedocle, Linosa and Lampedusa, a route already operated by Ustica Lines, between Palermo and Ustica, and seasonal services on two routes, Mazara del Vallo-Pantelleria and Pantelleria-Lampedusa-Linosa.

From this summer, Ustica Lines will be operating a total of eight year-round routes and five seasonal routes. The shortest sector is 10 minutes between the Egadi Islands of Favignana and Levanzo, the longest is 4 hours between Ustica and Naples.

Passenger traffic in 2008, the year when Ustica Lines suspended four routes, fell for the first time in the company's 15 year history but still totaled 1.2 million passengers. Turnover was €47 million.

Figures for last year have yet to be released but Ustica Lines reports, "In 2009, we had a significant increase in passengers and turnover". The company currently employs about 340 seagoing and administrative personnel.

Ustica Lines passenger figures and turnover continue to increase. A dip in passenger traffic in 2008 followed the company's suspension of services on four summer routes when agreement could not be reached with Regionale Sicilia about new operating contracts.

Current fleet

There have been a few changes in Ustica Lines' fast ferry fleet in the past two years. Two Kvaerner Fjellstrand Flying Cat 40m catamarans that had been operated in the Canary Islands since 2002 returned to Sicily last year.

Garajonay Exprés, an associate company of Ustica Lines, had withdrawn the vessels in November 2008 when the local authority failed to issue a new service tender. A contract was eventually awarded to Garajonay Exprés three months later but by then Ustica Lines required the vessels for its own services. A second monohull, Air Naval 38m Laura, was also added to the Ustica Lines fleet at the beginning of 2009. On the debit side, Ustica Lines sold an Austal Auto Express 48 catamaran to an operator in Angola in 2008 and the company's newest hydrofoil was declared a constructive total loss after running aground off the island of Salina in November 2007.

The Rodriquez Foilmaster, which had been delivered only five months

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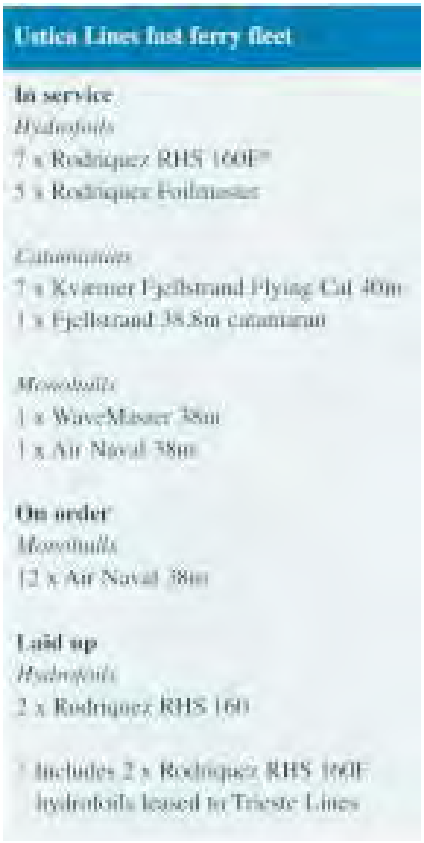
USTICA LINES
(Continued From Previous Page)

earlier, was stranded on rocks for two months. By the time it was recovered, the damage caused by winter storms had made repair impossible.

Another Foilmaster ran aground while entering Trapani harbour in August 2008. The impact split the forward hull and superstructure just in front of and beneath the wheelhouse. However, the vessel was recovered to the Ustica Lines' yard in Trapani and the company has repaired it. The entire forward structure has been rebuilt, a new bow foil was awaiting fitting last month, and the Foilmaster is due to return to service in May.

By then, Ustica Lines should have received the first of 12 Air Naval 38m monohulls ordered for delivery between 2010 and 2014. Another is due to be handed over in June. Ustica Lines has ordered the monohulls to position itself for the start of the next round of tender awards by Regionale Sicilia in 2013.

The company's RHS 160F hydrofoils and several of its catamarans, principally the vessels acquired by Ustica Lines when it took over SNAV's Sicilian operations in 2004, will be too old for future tenders. In addition to specifying a minimum service speed requirement of 30 knots, Regionale Sicilia also specifies a minimum age for fast ferries operating subsidized services. Two of Ustica Lines' original hydrofoils, Rodriquez RHS 160s, are already too old for the subsidized services and have been laid up for several years. One may return to service this summer however, Ustica Lines is considering the introduction of a route to the Eolie Islands from a port that does not currently have a ferry service. Ustica Line's current fleet is summarized in the following table.



FROM THE BOARD ROOM

The IHS Board of Directors met on June 23, 2010 for their annual meeting. Several items of note are:

BOARD ELECTION RESULTS – John Monk reported the election results for the Board of Directors. The general membership voted for Sumi Arima, John Meyer, Joel Roberts, and William White to serve for the class of 2010 – 2013.

ELECTION OF OFFICERS – The board accepted a motion to re-appoint the existing officers. Officers for 2010 are President – John Meyer, Vice President – Mark Bebar, Treasurer – Frank Horn, and Secretary – Joel Billingsley. The vote was unanimous.

MEMBERSHIP SURVEY/DATABASE – George Jenkins reported that 113 members have responded since the database was established 3 years ago. He suggested going through the biographies published in recent newsletters to further enhance this resource.

PUBLIC RELATIONS – Frank Horn suggested that IHS exhibit at an upcoming ASNE conference July 14 &15 themed Engineering the Total Ship. Joel Billingsley took action to contact ASNE for a complimentary booth.

AUSTAL AUTO EXPRESS HAS FOILS

Extracted From Fast Ferry International, May 2010

A comprehensive article describing Austal Auto Express 102 Trimaran trials mentions that a new ride control system has been incorporated. The system includes a 10 square meter T-foil on the main hull forward and a 2.5 square meter T-foil aft on each of the side hulls. All the

Continued on Next Page

Interested in hydrofoil history, pioneers, photographs? Visit the history and photo gallery pages of the IHS website. http://www.foils.org

AUSTAL AUTO EXPRESS HAS FOILS
(Continued From Previous Page)

foils have been designed to permit removal and servicing without the need to dry-dock the vessel. However a picture of the installation was not shown. The article provides graphics showing the comparison of average reductions in roll and lateral force in beam and average reduction in motion sickness in head seas. The reductions are up to 36% in roll, 39% in lateral force, and 56% in motion sickness. During trials the Austal Auto Express 102 Trimaran achieved a maximum speed of 45 knots.

At the end of April, the company's sales and Australian operations director confirmed that the decision to speculatively build the vessel was driven by Austal's confidence in its patented trimaran technology and the exciting benefits that it offers the commercial ferry industry. It is anticipated that the vessel will, however be delivered and put into service within a month or so.

[Ed Note: It is particularly interesting to us hydrofoilers that such a large vessel is benefitting from the application of foils, albeit as only control surfaces rather that 100% lifting surfaces.]

DYNAMICS OF HIGH SPEED MARINE CRAFT

By Leigh McCue-Weil, New IHS Member

Virginia Tech is gearing up for its second ever offering of a course on the dynamics of high speed marine craft during the Spring term of 2011. The class is taught following Faltinsen's *Hydrodynamics of High Speed Marine Vehicles*, and hydrofoils feature prominently. Highlights from the student projects during the last course offering included a look at Navatek's *Sea Flyer*, efforts towards improved prediction of porpoising behavior, experimental and numerical work to better understand the seakeeping and maneuvering of an Agile Surface Combatant, SES studies including numerical simulation, a parametric study of a hydrofoil fast ferry, a history of hydrofoils, and a preliminary hydrofoil design.

The semester is broken into components focusing on different ship types, including surface effect ships and air cushion vehicles, hydrofoils, semi-displacement vessels, and planing vessels, with additional sections on slamming effects and maneuvering dynamics. The class is available for traditional on-campus students as well as online students. Indeed, one need not even be registered as a Virginia Tech student to take the course—instead it is feasible to participate as a "Commonwealth Campus" student: . IHS Member Leigh McCue, who will be teaching the course, eagerly invites guest lecturer experts from the IHS community. Anyone interested in guest lecturing, or taking the course, is encouraged to contact Leigh directly at: mccue@vt.edu

NIRVANA - THE ALL-NEW HOUSE BOAT

[Ed Note: This may not be a hydrofoil, but it could be, or at least a hybrid.]

A renowned French shipbuilder and one of Monaco's affluent yacht- maker joined hands to build this yacht with enormous dimensions and comfort.

Stern View of Nirvana

This yacht built by "WHY" (Wally-Hermes Yachts - a new company created by French luxury brand, Hermes and Monaco based yacht-maker, Wally) is 58 meters long by 38 meters wide. These are the first pictures of the yacht.

Three decks, a 25 meter long pool, a spa, a helipad, a 100m^2 with hammam (Arabic bath), sauna, gym and massage room, a 130 meter promenade, a music room, a dining room, a cinema, sun decks, suites, terraces, a lounge, a Bibby (a Stateroom) . The decks are connected by stairs but there is also an elevator.

Eagle's Eye View of Nirvana

Wally et Hermès use green energy to produce up to 50% electricity on board with 20 to 30% fuel savings. There are 900 m^2 of solar panels, producing a daily output of 500 kW.

Here's what Wally's President and CEO has to say …
"Everyone's dream is to live on an is-

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NIRVANA
(Continued From Previous Page)

land, in complete freedom, without constraint, with the independence that only self-sufficiency can provide. a piece of land with a beautiful villa partly fulfils this aspiration because it is static. A yacht offers the freedom to move, but does not have the space of a property. WHY has it all: space, stability, movement, independence, and peace. WHY goes even further.

This revolutionary concept of the moving island is developed with the latest and most advanced sustainable technologies, recycling thermal energy, as well as any organic and inorganic waste. The architecture of the whole project fits perfectly in the environment. There are no excesses, nothing is superfluous, the impact on the sea is minimum; a new and unique way to live on the sea while caring about it, protecting it, and loving it. All this has always been my dream too, and when I met Pierre-Alexis Dumas I realised that this dream could come true thanks to the common values and ethical principles we share."

Ed Note: This is the Perfect Hull to Add a Foil

Luca Bassani Antivari, President and CEO of Wally Hermes Artistic Director adds …
"From the invention of the compass to block capitals, from the rudder to the first steps on the moon, man discovers and pursues his dreams. with its feet on the ground and its head in the stars, Hermès, since its creation in 1837, has grown, generation after generation, through innovative projects, executed with high standards and an artisan spirit. I have always thrived on the dreams of great visionaries like Magellan, Jules Verne, and Paul Klee. Like theirs, the path of Hermès is to pursue its dreams and excelling itself, learning, pushing ever further the quest for excellence and the celebration of beauty in the world. A world we must protect today, Hermès steps into the marine world with Wally. We quickly recognised our common values, the values of well-made, singular, functional, refined and elegant objects. This encounter was just what we needed to inspire us to brave the open seas. Together, with Luca Bassani Antivari, we hope to open a new path, to offer a new lifestyle that is different, serene, contemplative and respectful of the environment, moving slowly on the water, combining the pleasure of sailing and absolute comfort. Wally Hermès Yachts WHY is the union of our dreams, the green path that carries us away in its wake."

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THE OTHER HYDROFOIL YARD IN MESSINA

Extracted from Fast Ferry International, April 2010

The Rodriquez yard in Messina has been associated with hydrofoils for the past 54 years, since the first Supramar PT20 was launched and entered service between Messina and Reggio Calabria in August 1956. But there is another yard in the city with a role in keeping local hydrofoils operating, the bilingually named Cantiere Navale Diesel Engineering Assistance.

The company provides maintenance support for fast ferries, other ferries, excursion vessels and privately owned pleasure boats. With Siremar and SNAV replacing its older vessels in recent years, it has also provided storage facilities for hydrofoils pending their sale or scrapping. To date, few have been resold.

The majority of Siremar's original hydrofoil fleet, two Rodriquez RHS 140s and three RHS 160s, are currently laid up at the yard. They were replaced by Rodriquez Foilmaster hydrofoils in 2005-2006. Similarly, two of Ustica Lines' earliest hydrofoils, an RHS 140 and an RHS 160, have been ashore for five years. The RHS 140 was sold to Alimare in 2004 and the RHS 160 was leased to the same company for operation between Reggio Calabria airport and Sicily but the service was short lived.

Two hydrofoils were undergoing maintenance at the yard in March though, Rodriquez RHS 160Fs that will be reentering service this summer on Ustica Lines' Eolie Islands route network.

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SAILOR'S PAGE

BMW ORACLE RACING USA TAKES 33RD AMERICA'S CUP RACE – PART 1

Source, including images: bmworacleracing.com

The 33rd Americas Cup Challenge was held in Valencia, Spain during February this year. The race, between the catamaran *Alinghi 5* representing the defender and the trimaran *USA* of the challenger, BMW Oracle Racing, under the flag of the Golden Gate Yacht Club, was based on the Deed of Gift for the America's Cup in which the first team to win two races is the winner of the Cup.

Both yachts at various stages of their development featured curved dagger boards, which, when underway, provided significant dynamic lift as well as the normal lateral resistance to the sail force.

Aerial View Of *USA* And *Alinghi* During Race 1

Race 1

The first race was held on 12 February. Racing was postponed for four and a half hours before the start signal in a 4 to 5 knot southerly wind. After both boats entered the start box, *USA* skipper James Spithill was able to speed deep into the box on starboard tack, preventing *Alinghi* from crossing ahead. As the boats turned into the wind, it was judged *Alinghi* hadn't done enough to keep clear and the Swiss team was penalized, however they made a good recovery. With both teams to windward of the start line, the Swiss made a quick return to start ahead. By the time *USA* crossed the starting line, it was over 600m behind *Alinghi*. But then *USA* started to outpace *Alinghi* by sailing higher (closer to the wind) and slightly faster. The deficit was soon erased, and *USA* went on to lead by 3:21 around the top mark. Downwind, the advantage to the *USA* was even more pronounced as it added to its lead all the way to the finish line. The difference in finishing times, factoring in the penalty turn for *Alinghi* was 15:28.

Race 2

The 2nd race was held on Sunday 14 February. Racing started at 16:25 in 7-8 knots of wind. *Alinghi* entering the start box very late still being on the wrong side of the start box at the 5-minute gun, forcing the umpires to assess a penalty. *USA* started with more speed, but *Alinghi* held the right hand side of the race course and prospered early when the wind shifted to the right. At one point, the advantage was as large as 600m to the Swiss team.

But before the top mark, *USA* made a perfect layline call. After tacking on the line to the mark, *USA* saw *Alinghi* cross ahead, but cede the inside position at the mark to *USA*, and that was all the advantage needed to lead around the mark by 28 seconds. From then onwards *USA* extended its lead, to cross the finishing line ahead by 5:26. At one point, *Alinghi* was flying a red protest flag, but the team quickly confirmed after finishing there would be no protest.

***USA* Frontal View Showing C-Shaped Daggerboard Retracted On Windward Side And Lowered On Lee Side**

With the win, BMW Oracle Racing becomes the first US challenger to win the match since Dennis Conner regained the Cup with his *Stars & Stripes* team in Fremantle, Australia in 1987 and also marks the first win for an American team since 1992 when Bill Koch's *America 3* successfully defended the Cup in San Diego.

BMW Oracle Racing *USA*

BMW Oracle racing was formed by the CEO and founder of Oracle Corporation Larry Ellison in the Spring of 2000. At the 2003 America's Cup challenger series in Auckland the team, in an earlier yacht design, reached the finals of the Louis Vuitton Cup but were beaten by

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ORACLE RACING USA
(Continued From Previous Page)

Alinghi, who went on to win the America's Cup. The team continued to compete in subsequent years but in 2007 in Valencia BMW Oracle was eliminated in the semi-finals of the Louis Vuitton Cup. In July 2007, the team presented a formal challenge for the 33rd America's Cup to the Société Nautique Genève. Soon afterwards, three times America's Cup winner Russell Coutts (NZL) was announced as the team's CEO and skipper.

USA Sailing On One Ama During Race 2

USA was designed and built by a team of around 150 people over three years requiring 150,000 manhours to complete. Design work was by the BMW Oracle Racing Design Team consisting of Director, Mike Drummond, along with 30 designers and scientists. Principal Naval Architects were Van Peteghem and Lauriot Prévost (VPLP). The yacht, initially launched in August 2008, was subject to a number of modifications during its development trials, covering changes in mast, sails, daggerboards and rudders.

The trimaran hull is of carbon composite construction and was built by Core Builders, Anacortes, WA, USA. The amas (or outriggers) of the trimaran are actually longer than the centre hull with an overall length of 114ft (34m). This is also the effective waterline length of the vessel when sailing with only a single ama in the water. When floating in an upright condition on the centre hull, the waterline length is only 90ft (27m) to comply with the rules of the Deed of Gift. The overall beam is likewise 90ft (27m). The amas are connected to the central hull via a pair of cross beams. The yacht is helmed from either of a pair of platforms mounted on either side of the aft cross beam.

Daggerboard On *USA* In Proportion To A Crewman

Rather than a traditional sail as was used for earlier trials of the boat, leading up to the race, a wing sail with full length flap was fitted. This consists of a main element and a flap element. The main element is a single piece that rotates around the mast step. Nine flaps rotate around the trailing edge of the main element. Both elements are separated by a small gap and linked together by hinges. The main wing sail and flaps are trimmed separately giving precise control over the rig in comparison to a conventional sail and can power the boat at up to three times the speed of the prevailing wind.

According to Joseph Ozanne, an aeronautical specialist with the BMW Oracle Racing design team, the ability to trim the wing sail easily is one of its big advantages over a soft sail. "With a soft sail, it's so big, it's difficult to shape as you only have control over three points (head, tack, clew). You need massive tension to trim the soft sail," he says. "With a wing sail, you can get the shape you want much more easily". The main trim parameters are: master wing rotation (similar to mast rotation on a conventional rig); master camber control (general rotation of the flap element); flap twist control (each flap can have a specific angle of rotation). "On paper, it's a clear advantage over the soft sail," Ozanne says. However prior to the race win he noted: "It's on such a different scale to what has been done before, it was hard not to have some uncertainty. But we are more and more confident… I think it's going to be a strong addition for us."

Happy *USA* Team After Completing Race 2

To Be Continued in Next NL

Welcome New Members
(Continued From Page 2)

served for five years on active duty at sea and then at the then-Navy Electronics Lab in San Diego. After working on command and control, acoustics, and ship design programs in the Southern California defense industry he was recruited for a job in the Pentagon. Following his service there he worked in fighter, patrol aircraft and advanced avionics system development at Lockheed before becoming a vice president and division director in the Center for Naval Analyses. He retired as a captain in the Naval Reserve in 1990.

Charles Weil – Charlie began his nautical career while commercial fishing for salmon in Alaska. After graduating from the University of Alaska Anchorage with a BS in Civil Engineering, he worked aboard various private yachts as mate and master. This eventually led to a Masters degree in Naval Architecture & Marine Engineering from the University of Michigan in 2002.

His early naval architecture career in accident reconstruction frequently involved small high-speed craft where analytical challenges were addressed with controlled testing scenarios.

Charlie has lectured a variety of undergraduate courses at Virginia Tech Department of Aerospace and Ocean Engineering and worked as a laboratory engineer at the Center for Vehicle Systems and Safety.

Currently, Charlie Weil is a naval architect with the NAVSEA Carderock Combatant Craft Division, Test and Evaluation Branch in Norfolk, Virginia. His work involves collaborating with academia on novel craft platforms with active suspensions systems to control motions. He is also serving as a US delegation member to the ABCD Working Group on Human Performance at Sea.

MESSINA
(Continued From Page 9)

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Three of Siremar's Original Hydrofoils, Rodriquez RHS 140 Albireo and RHS 160s Algol and Alioth at the Cantiere Navale Diesel

Two of Ustica Lines's First 3 Hydrofoils, RHS 140 Spargi (Sold to Alimar in 2004) and RHS 160 Linosa. Beyond Them is Rodriquez RHS 160F Moretto Primo Being Prepared for Service this Summer

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The NEWS LETTER

International Hydrofoil Society

PO Box 51 - Cabin John MD 20818 - USA

Editor: John Meyer | Fourth Quarter 2010 | Sailing Editor: Martin Grimm

CROSSING THE COLUMBIA RIVER BAR ON HIGH POINT

By Joel Roberts, IHS Member

Sailors have many memories of the ships on which they serve. This remembrance, of 39 years ago, is written to share a defining moment that occurred during my command of High Point – one singular moment when her ship design characteristics were put to the test by a chance and violent encounter with "mother nature".

Background – Prior to Crossing the Bar, High Point conducted local operations out of San Diego, CA from 15 January to 7 March 1971. The mission objectives which took her away from her home port of Bremerton, Washington, were to participate in local First Fleet operations, expose rank and file operating forces to hydrofoil mission capability, and to test uniquely configured mission equipments under the auspices of the Naval Electronics Laboratory Command (NELC).

It was now Sunday, 14 March 1971 in Crescent City, California, and High Point was leisurely making her way North to Bremerton. The return transit from San Diego included overnight stops at Port Hueneme, San Francisco, Crescent City, and Astoria, Oregon. These ports were selected because they provided High Point daylight foilborne transit between ports, fuel, and pier-side overnight berthing. This SOCAL (Southern California) deployment had been successful by all measures, and the crew of High Point was in a buoy-

High Point PCH-1 in her heyday

See HIGH POINT, Page 3

SUSTAINING MEMBERS

ARE YOUR 2010 IHS DUES OVERDUE?

See Full Announcement on Page 2

INSIDE THIS ISSUE

PRESIDENT'S COLUMN

To All IHS Members

I mentioned in this column of the 3rd quarter 2010 Newsletter the participation of the IHS in the ASNE **Engineering the Total Ship (ETS)** 2010 Symposium at the Westin Tysons Corner Hotel, Virginia on July 14 and 15, 2010. Captain Frank Horn has provided a report, including a picture of the IHS booth – see page 6. Many thanks to Frank for taking on this task and exposing the Society to such a wide audience.

I cannot over-emphasize the development, along with High Caliber Solutions, Inc. of New York, of a significant addition to the IHS website. It is called: **Hydrofoil World.** The site is designed to be instructive and informative to a wide audience, particularly those not familiar with hydrofoils and the technology, along with others who are interested in the history of hydrofoils. Please log onto the IHS website: and click on: Virtual Hydrofoil Museum. Hope you find it interesting. Also, please spread the word by sending this message to family and friends.

Several months ago the Board of Directors voted to increase IHS annual dues to $30 effective 1 January 2011. This was done at the recommendation of our Treasurer, Captain Frank Horn. We will be still offering multi-year dues payments: $56 for 2 years and $82 for 3 years. In the meantime all members can still take advantage of the current multi-year payment arrangement until December 31, 2010. There is no change in the Student annual dues of $10. A full explanation of the need for a dues increase is provided by Frank on Page 7.

Sign-up of new members has slowed down, so, all members are asked to encourage colleagues to join. Please make them aware of the IHS website and the features regarding membership.

I want to remind you that you can view the Membership List by logging onto the IHS website and put in the proper password. All IHS members have been informed of this password. If you have been missed, please contact the webmaster (webmaster@foils.org). It is advisable for all to check the information on the List. If it is incorrect, please send changes to: Steve Chorney: schorney@comcast.net

As your President and Newsletter Editor, I continue my plea for volunteers to provide articles that may be of interest to our members and readers. Please send material to me (editor@foils.org). I will be pleased to hear from you.

John Meyer, President

ARE YOUR 2010 DUES OVERDUE?

IHS Membership options are: US$20 for 1 year, $38 for 2 years, $54 for 3 years. Student membership is still only US$10. To pay regular membership dues by credit card using PAYPAL, please go to the IHS Membership page at www. foils.org/member.htm and follow the instructions.

WELCOME NEW MEMBERS

CAPTAIN (RET) DAVID M. LEE - Captain Lee is a 1968 graduate of the U.S. Naval Academy. Sea tours include Combat Information Center and Missile Officer, USS JOHN PAUL JONES (DDG 32); Chief Engineer, USS LLOYD THOMAS (DD 764); and Executive Officer, USS BRONSTEIN (FF 1037). He was the commissioning Commanding officer of USS AQUILA (PHM 4) from 1982- 1984. From 1987-1989 he commanded USS Paul (FF 1080). From 1990-1992 he served as Assistant Chief of Staff for Operations and Plans for Commander Cruiser- Destroyer Group Three/NIMITZ Battle Group. He commanded destroyer Squadron TWENTY- ONE from 1992-1994.

Ashore Captain Lee has served at the U.S. Naval Academy as Instructor, Computer Science Department as well as Chairman, Seamanship/Navigation Department. He has also served in the Tactical Embedded Computer Program Office, Staff of the Chief of Naval Material, Washington, D.C and in the office of the Chief of Naval Operations as Deputy Director, CINC Liaison Division and Deputy Director, Assessment Division.

In 1998 he joined the federal consulting company of Whitney, Bradley & Brown, Inc. where he is presently a Vice President. He has led numerous high level studies on defense issues and headed the Operations Analysis Business Sector.

Captain Lee has a Master of Science degree in Computer Systems Management from the Naval Postgradu-

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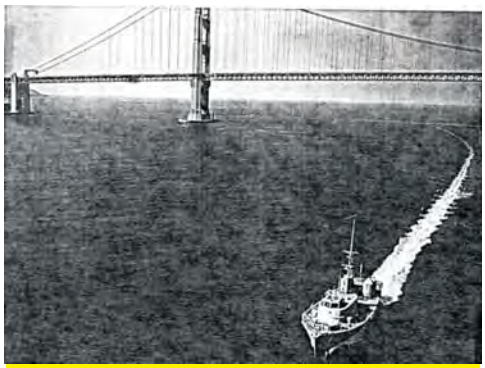
HIGH POINT
(Continued From Page 1)

ant mood, and anxious to rejoin their loved ones back home.

The Omen – High Point had arrived in San Francisco on Tuesday, 9 March. The plan was for the ship to spend the following day in port to provide the crew a day of sightseeing, and depart the following Wednesday. On Wednesday morning, 11 March, High Point made an early foilborne departure and passed under the spectacular Golden Gate Bridge into the open reaches of the Pacific.



***High Point* flying under the Golden Gate Bridge**

The seas we encountered west of the Golden Gate were like a "Brick-Yard". Wind was blowing at 20 to 30 knots out of the west, and the waves were big, and cresting. No combination of foilborne throttle or northward course alterations could prevent the ship's forward foil from flying out the side of a wave and diving to the trough below. There was no danger to the ship or her crew in these seas; however, pounding the ship for the 285 NM to Crescent City did not seem prudent. High Point was granted permission to return to Hunter's Point Shipyard and await a break in the weather.

San Francisco to Crescent City – High Point was underway early Saturday morning, and foilborne on a Northwesterly course. Large ocean swells were encountered out of the west. The wind was strong, but much less than on the day of our aborted Wednesday departure. The transit of 285 NM to Crescent City was uneventful, and completed with a foilborne SOA (Speed of Advance) of 38.85 knots.

Crescent City to Astoria (The BAR) – Sunday morning reveille (no holiday routine here) was at 6 AM. Following breakfast, the crew busied themselves with sea and anchor detail checklists while awaiting more daylight. High Point was underway from Crescent City at 8 am. Once clear of Round Rock and Mussel Rock (two rocks that flank the harbor entrance), the ship came right to a course of 298 degrees to distance itself from the coast, and then to 348 degrees for our first major foilborne leg of 58 nm. As the ship settled in on course, our attention shifted to wind and sea state. Seas were coming from about 30 deg off the port bow. The waves were large with a long distance between crests relative to their height. This "stretched out" wave shape allowed High Point to plunge ahead and contour the waves. Their long distance between crests suggested that they were caused by winds of long duration. Periodically the front foil would fly out of a wave's backside and the ship would plunge downward until the foil regained its wetted surface. The effect was not unpleasant, and the crew seemed to revel in their ship's confident coupling with the rhythms of the sea. Our best guess was that the waves ranged from 12 to 18 feet. Given wind speed and wave height, we estimated that we were in lower Beaufort Sea State 6. As a joke, I asked Petty Officer Zwieg, High Point's Master Chef and Morale Builder, to bring up a small bowl of ocean delicacies to the pilot house as a snack for the watch. Zwieg responded with a good-sized soup bowl of canned squid, octopus, and clams. Some of the watch enjoyed the little morsels, but most declined in favor of lunch below at the end of their watch.

It was now almost 10 AM and we began a series of small course changes to the right as we rounded Cape Blanco. A radar fix marked our location as we rounded the cape. Speed along track was 36 kts. Once around, our base course for the next 198 nm was 004 deg. This leg would put us 4 nm southwest of the buoy marking the seaward approach to the Columbia River Bar. At 15:35 hours we had reached the end of our 198 nm leg and came right to course 053 deg to approach the buoy marking the entrance to the channel across the bar. Several (2.5) minutes (time now is 15:37.5) later we landed ship and began to taxi towards the entrance to get a closer look at sea conditions on the bar. Water depth was 30 fathoms and we were 4 nm from the 10-fathom curve. The bottom was coming up fast. By this time, waves were overtaking us from astern. We were about to experience classic "wave diffraction phenomena" up "close and personal". As the ocean waves passed under us and into shallower water of the shoreline, they slowed down, rose in height, and became steeper as the distance between their crests diminished. We peered ahead towards Cape Disappointment – this was our approach course to the bar.

Upper most in the minds of everyone in the pilot house were sea conditions

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REMEMBERING JAMES H. KING

All of us in the International Hydrofoil Society were shocked to hear about Jim King who passed away after a long illness in June. He has been a member of the IHS for many years and served on the Board of Directors. Many of us who worked with and knew him have fond memories over a period of many years starting with his arrival at the Naval Surface Warfare Center (then known as the David Taylor Model Basin) sometime around the early 1970s. He had just graduated from Webb Institute of Naval Architecture and joined the Advanced Concepts Office working under Bob Stevens.

Jim found his way to the Hydrofoil Office (Code 115) headed up by Bob Johnston where he made his mark in the hydrofoil arena. In 1979, he joined the Advanced Hydrofoil Development Office, replacing Dennis Clark who was reassigned to the new DDX program. Jim assumed the duties of the Manager of Systems Integration. A key program in the office was the completion of an advanced evaluation tool that would be used to calculated the impact of new technologies and understand the interactions between systems and technologies. The tool was called HANDE (**H**ydrofoil **An**alysis and **De**sign) program. It was a joint program between Carderock and Boeing Computer Services who had assembled a high caliber team of naval architects. Jim's excellent naval architectural background made him an ideal choice to complete the development of this state-of-the-art advanced interactive computer program. In 1981, Jim authored a paper describing HANDE in the Naval Engineer's Journal. He also presented a paper about the NIBBIO Class hydrofoil at the first International Society Conference in Nova Scotia, Canada (1982). While Jim's stay in the hydrofoil world was short it made a true contribution that still goes on. Because of the unique architecture of the HANDE program, it was used as a prototype and adapted for a wide array of naval ship types, both advanced and conventional, in a program called ASSET (**A**dvanced **S**urface **S**hip **E**valuation **T**ool). Today, ASSET is the Navy's primary early stage ship design tool and is use by many of our allies and at MIT and the Naval Post Graduate School.

Mark Bebar noted that he was blessed to work with Jim on a number of early hydrofoil studies, including DEH (Deepwater Escort Hydrofoil) and Hydrofoil Ocean Combatant (HOC) in the early-mid 1970s. Jim also collaborated with Mark on several Surface Ship CONFORM studies in the mid-1980s, including Corvette Escort Hydrofoil (KEX). Jim and Mark met with SPAWAR (then NAVELEX) in San Diego and had some great discussions with Dave Washburn and some of his folks, including Rick Epstein, on mission systems. Jim was the consummate naval architect and advanced ship advocate, with immense personal interest in future high-performance ships and the technologies embodied in these ships.

As the hydrofoil program came to a close, Jim entered the world of Acoustics and Ship Signatures at the Center where he rapidly climbed the professional ladder. It was during this time that he held positions at the Office of Naval Research and later at the Naval Sea Systems Command involved with the same technology. Jim later returned to the Center serving in a supervisory capacity in the Signatures Department where he continued advancements this important technical area.

There was a commemorative ceremony held for Jim held at the Carderock Division, Naval Surface Warfare Center in July. Later the family came to Carderock and the Commanding Officer presented to Mrs. King the flag that had flown at Carderock during the ceremony.

HIGH POINT
(Continued From Page 3)

on the bar. We were fortunate in having a gyro stabilized 20 power monocular provided us by our friends in the aviation community. Imagine an elongated box about 1.5 times the size of a loaf of bread with an eyepiece on one end and an objective lens on the other. What we saw with it was sobering. The waves on the bar were magnified the same amount relative to the trees, rocks, and navigation hazards behind them – they were breath taking.

We watched as a 180-foot Coast Guard buoy tender entered the channel ahead of us, It bounced around like a cork. We passed the gyro monocular around to everyone in the pilot house. There was a period of silence as each viewed the waves cresting on the bar and silently wondered what we would encounter if we followed the buoy tender across the bar. We briefly discussed the prospect of spending the night at sea and waiting till morning to cross the bar. The thought of wallowing around hullborne overnight held little appeal. The next decision was on the merits of crossing the bar hullborne on turbine power or foilborne. If we went in hullborne, we would be kicked around quite a bit and our deeper draft hullborne would provide stability beyond our size at the expense of added navigation draft. Our 600 horsepower outboard drive would be of little use in these sea conditions. We needed our gas turbines. It was now time to relieve the regular underway watch with the special sea and anchor detail in preparation for crossing the bar.

Part 2 of this article will appear in the First Quarter 2011 Newsletter.

RESTORATION OF HIGH POINT

By Terry Orme and Sumi Arima, IHS Members

Since the present owner, Terry Orme, acquired the HIGH POINT, his intent is to restore the ship as much as he can in Mod 1 condition. Most of the work so far has been accomplished with volunteers that include friends, previous HIGH POINT crew members, and retired Navy personnel. Initially, considerable amount of time was spent cleaning out the extraneous material hauled onboard by previous owners. Each previous owner had different goals for the use of the ship and thus brought aboard equipment and material to be used towards their outfitting. Along with the clean up work, items that hindered the integrity of the ship such as cleaning and repairing drains, resealing hatches, and fixing damages to the hull were accomplished.

The present goal is to get the 450 volt 3 phase electrical system working. Power presently onboard is provided by a Perkins diesel generator providing 120 volt power. The original power plant and auxiliary power plant were removed by the Navy prior to the ship being sold. The auxiliary unit, a John Deere diesel with 40 KW 450 Volt 3 phase generator has been located and is being prepared for delivery. Meanwhile, a 6V71 Detroit Diesel is being prepared with a 100 KW 450 Volt 3 phase generator. It is hoped that these items could be installed this fall. The ship's fuel system and sea-water systems has been inspected and either repaired or put on the work list to supply the power plants. At one time, the ship was broken into, and the major wiring including the battery cables were cut and removed for the copper by some thieves. This wiring requires replacement before power can be restored. The sub-bases that adapted the John Deere and Detroit Diesel to the original foundations are required. Seattle Columbia-Sentinel Engineers is planning on providing these assemblies if the drawings can be located. Drawings for, or the gearbox itself that mounted on the front of the 6V71 to power the hydraulic pumps are needed. Any help from somebody with some knowledge in this area would be appreciated.

***High Point* at Tongue Point, Astoria, Oregon**

The ship's drawings in microfiche were finally obtained from a previous owner. A company that can convert the microfiche to digital has been located and key drawings are being converted. This has been an enormous help in going through the ship systems. It appears this set of drawings, which were originally held onboard is not complete.

The emergency hydraulic power supply originally fabricated by the crew for hullborne operations is still on the ship sans a pump. A pump has now been located that is believed to be suitable for this installation. Since the 12V71 Detroit Diesel is still in place

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RESTORATION OF HIGH POINT
(Continued From Previous Page)

on the ship, getting the hullborne hydraulics operational would be a major step in getting the ship underway hullborne. It should be noted that the foil system is intact and in the retracted position. It is estimated that the hull draft is between 3 and 4 feet.

At this time, volunteers familiar with shipboard electrical systems are needed to reassemble the ship's switchboard and the instrumentation to monitor and control the diesels, pumps, and other shipboard equipment. Volunteers in other areas such hydraulic piping will also be greatly appreciated. Others with information and any pictures of the equipment on the ship could be of great help in this restoration project.

THE BOEING HYDRODYNAMIC TEST SYSTEM

Contributed by Martinn Mandles (IHS Member) and Bruce Bryant (IHS Member) another HTS pilot/co-pilot who provided the photo.

The Boeing "HTS," also known as the "AQUA-JET", was a 38 foot long, 16,000 lb., jet-propelled research hydroplane privately developed and operated by the Boeing Company in Seattle, where she operated on Lake Washington from 1961-1966. Unlike the somewhat similar "unlimited class" of racing hydroplanes at that time, HTS was powered by a pure turbojet rather than an internal combustion engine, and the area between the sponsons (sometimes referred to as her "pickle fork" or "lobster claws") was fitted with a test apparatus instead of an airfoil, which therefore created a water tunnel in which to evaluate the dynamics of scale model hydrofoils running fully-submerged (like an aircraft wing) under water. In the following photo, George Adams is in the starboard cockpit, with Martinn Mandles on the port side.

The Boeing Hydrodynamic Test System

When powered as pictured by her original Allison J-33 turbojet with maximum thrust of 4,600 lbs., HTS was capable of speeds approaching 80 knots, which was subsequently increased to almost 150 knots when HTS was redesigned, and piloted by Bruce Bryant, with a Westinghouse J-48 turbojet producing up to 7,200 lbs. of thrust.

The instrumentation mounted on the hydrofoil test apparatus and recorded aboard HTS was such that a complete polar plot (lift and drag versus angle of attack) at any combination of depth and speed could be obtained in a run time of only 30 seconds. Therefore, the HTS proved indispensable to the evolution and testing of numerous fully-submerged hydrofoil designs that soon gave flight to many military and civilian applications of this advanced marine technology, including the Boeing-built PCH, PGH, PHMs and Jetfoils.

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INTERNATIONAL HYDROFOIL SOCIETY ASNE EXHIBITS 2010

By Capt. Frank Horn

The IHS participated as an exhibitor in the Engineering the Total Ship Symposium 2010 at the Westin Tysons Corner Hotel in Virginia on 14 and 15 July. Our exhibit is mostly a laptop presentation of a variety of military, sailing, recreational, human, powered and commercial hydrofoils. They are always well attended during program breaks at which time we can provide to those who are interested our fliers, tutorial overview pamphlets and membership applications. Kathleen Hinton, President of ASNE, has been very supportive of our efforts to keep IHS front and center. We are also very grateful to ASNE for their generosity in making it possible for IHS to participate as an exhibitor in their professional activities.

Standing at our booth with Frank Horn is Kathleen Hinton

The IHS also participated in the September 14-15 ASNE's "Fleet Maintenance & Modernization Symposium (FMMS) held in Virginia Beach, Virginia. As before the IHS exhibit was mostly a presentation of a variety of hydrofoils on two laptops with many handouts. The IHS booth was well-attended and considerable inter-

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IHS ASNE EXHIBITS 2010
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est shown in a subject not well-known to many in the audience.

There were 175 Exhibitor Booths and an estimated 1500 attendees, which gave wide exposure to the IHS. It was estimated that about half this number passed by the IHS booth.

During the main sessions, speakers included the CNO, Admiral Gary Roughead; Commander US Fleet Forces Command, Admiral John C. Harvey; and the Assistant Secretary of the Navy (R&D and Acquisition), the Honorable Sean J. Stackley. Pic-

tured here is Cameron Ingram (on the left) who joined as a new member. He was the Executive Officer of the USS Aquila (PHM 4). Also shown is Teresa Denchfield a very helpful member of the ASNE staff.

MEMBERSHIP DUES INCREASE

By IHS Treasurer, Captain Frank Horn

Due to our steadily increasing expenses and the cost of doing IHS business, we are announcing a membership dues increase effective 1 January 2011. IHS annual dues will increase to $30 for 1 year, $56 for 2 years, and $82 for 3 years. Student dues will remain at $10 and the Sustaining Membership Dues will remain at $250.

Our dues have remained at $20 for over 30 years and have been adequate for sustaining our bank balance at a relatively level position after all the end of year bills were paid. That is no longer the case. For the past 3 years our balance has sustained a negative financial growth. The primary areas that have contributed to increasing our costs include: the establishment of a dynamic virtual museum web site which provides hydrofoil basics and history in a multimedia format; increased our participation as an exhibitor at various ASNE symposiums that have resulted in a growth to our membership and a greater exposure to the IHS and it's mission; and costs of Information Technology such as web site management, digital hardware and software procurement, and related costs such a audio visual equipment.

Accordingly, the Board approved an increase in the dues so as to maintain a level bank balance and continue our ongoing hydrofoil projects for our members.

BOEING JETFOIL UPDATE

The Jetfoil, a passenger-carrying waterjet-propelled hydrofoil, design by Boeing has seen quite a long history and been operated worldwide for more than 35 years.

Boeing launched its first Jetfoil in April 1974. It could carry from 167 to 400 passengers. It was based on the same technology pioneered by

the patrol hydrofoil, and used some of the same technology used in the PEGASUS Class U.S. Navy patrol hydrofoils. Rights to build Jetfoils were sold to the Japanese company Kawasaki Heavy Industries.

Over the years, about two dozen Boeing Jetfoils saw service in many places around the world.

In 1979, the Royal Navy purchased a Boeing Jetfoil, HMS "Speedy", to provide the Royal Navy with an opportunity to gain practical experience in the operation of a hydrofoil in the Fishery Protection Squadron.

In North America, the Boeing Jetfoil saw regularly scheduled service between Seattle, WA and Victoria, BC during the summer tourist season of 1980.

Currently about 14 Jetfoils see service in and around Japan carrying over 2 million passengers annually. One service provides a 115 nautical mile route between Fukuoka and Busan, South Korea.

[Editor's Note: For a comprehensive treatment of Jetfoils in Japan, the reader is referred to the June 2010 issue of Fast Ferry International.]

Interested in hydrofoil history, pioneers, photographs? Visit the history and photo gallery pages of the IHS website. http://www.foils.org

ISLAND ENGINEERING UPDATE

As a Sustaining Member of the IHS, an update on Island Engineering's activities is provided each year. William McFann, president of Island Engineering, located in Piney Point, MD, has provided the following information.

Island Engineering is one of a very few companies that specialize in providing the stabilization and motion control a ship or craft requires in order to be able to accomplish its purposes. That may involve ensuring a ship-launched weapon will hit its target, or a helicopter or Rigid Hull Inflatable Boat can be deployed safely, or a yacht owner's martini won't spill. Requirements and solutions can vary widely from one case to the next, and company has dealt with a variety of ships, craft and equipment involved in such solutions.

Island Engineering handles all aspects of this work, from basic analysis to design and engineering, all the way to fabrication and shipboard installation of stabilization systems. Moreover, the company is well known for its ability and willingness to tackle all manner of unusual and challenging engineering projects.

HYDROPTERE VIDEO

By Claus-C. Plaass (IHS Member)

I wanted to inform you that I have uploaded my video on the speed record holder *Hydroptere* to http://www.youtube.com/watch?v=KSzaQob8GVA If this link does not work, search for "hydroptere kiel ihs"

As a multihull, hydrofoiler, test platform and unique thing, she surely is of interest for most "seafolks" and me too, so before sailing I took some shots of her. Currently 39 images with captions are in the album. For photos, check on this link from time to time. Http://picasaweb.google.de/scrapheaper/HydroptereAtKielNorthernGermany#

Your comments are welcomed. Claus-C. Plaass is a Freelance Journalist & Correspondent, located in Pickertstr 10, 24143 Kiel, Germany. Tel: +49 431 36 800; plaass@foni.net

REMEMBERING DAVE KEIPER AND *WILLIWAW*

By Jim Wrenn

In March 2000, Jim Wrenn had posted a memorable recollection of his time with Dave Keiper and the sailing trimaran *Williwaw* on the IHS website. Having spotted that posting, more recently Jim Rudd posted a further memoir related to *Williwaw* on IHS Bulletin Board. Jim Wren's are repeated below for IHS members who haven't already found these entries on the IHS Bulletin Board. Jim Rudd's memoirs will appear in the next NL.

"I was lucky enough in life to have sailed with Dave Keiper in the summer of 1971 on the most incredible boat I have ever sailed on. We were anchored in the middle of Hanalei Bay on the island of Kauai, Hawaii, when Dave came in and dropped anchor. We had seen *Williwaw* flying around Waikiki a month or so before and were surprised to see her here. I had sailed over with a man named Gordy Gladson on his tri, and as all trimaran sailors in those days knew each other, we swam over to have a visit. Of course Dave (most gracious) had to show off the boat.

Williwaw Foilborne

We put out to sea in about a 15 knot trade wind on a beam reach. The boat started heeling like a monohull, and then the foils got a bite and the boat came up out of the water and accelerated like a car...what a rush!!! The boat was so fast and stable Dave could walk away from the tiller and she would run like she was on rails. This was truly one of the most memorable days of my sailing life of 35 years. I'm sorry to learn that Dave has joined my friend Gordy where ever sailors go when they leave us. Someday I hope to sail with them again. I may have some super eight film of *Williwaw* that was shot that day. The footage is probably not very good; I haven't seen it in years."

Jim Wrenn, 29 March 2000

LITTLE SQUIRT REVISITED

By Ray Vellinga, IHS Member

In August, Harry Larsen and Ray Vellinga inspected the Boeing Company's first hydrofoil prototype, Little Squirt. She is alone, uncared for, and unprotected in a grassy field next to the Museum of Flight Restoration Facility, Paine Field, Everett, Washington. The damp climate has not been kind to her.

View of port side show Harry on the left and Ray to the right.

However, help is on the way. There is talk of restoring this former powerhouse and displaying her in one of several museums.

Stern view shows the jet that spews 3,600 gallons per minute. The water intake is a rectangular opening at the bottom-front of the strut (not in view).

Her history is colorful. In 1960 Boeing *Aircraft* executives turned down a request to build what was first called the "20-foot pump jet", but Bob Bateman, then head of Boeing Marine Systems, believed in the project and resubmitted his request in three smaller parts: hull, control system, and gas turbine. The items looked enough like airplane parts to gain approval, but when Bateman's boss discovered the "misunderstanding" he remained agitated until a demonstration flight over 2.5' waves made him as calm as the un-spilled glass of water resting on the dashboard.

Not all flights were so tranquil. The first test by pilot ex-Marine Colonel Vern Salisbury pitch-poled at high speed, reminding him why springtime swimming is so unpopular in Lake Washington.

Downward view into the interior of Little Squirt

Any polar bear reading this might ask, "What's the big deal about a cool dip?" Consider, Mr. Bear, this small craft weighs 2.65 tons, flies 2.5 feet high, has 450 hp, is propelled by a 30' jet of water, and (when crashing) goes from 45 to 0 mph very quickly.

Front view of Little Squirt

The front view above has been Photo-Shopped to remove clutter, shows three foils. The combined area of the two forward foils equals the area of the one at the stern. The stern foil rotates to steer.

The downward view into the interior of the boat shows the gas-turbine engine, gear box, double-suction centrifugal pump, and the piping going over the transom (subsequent models, if built, would have used a straight pipe piercing the transom).

Anyone wishing receive an email of the 107 photos taken of Little Squirt may send their request to: rvell@hotmail.com Be certain to put "Hydrofoils" in the subject box.

[Editor's Note: Ray Vellinga is Author of *Hydrofoils: Design, Build, Fly.* It is available at Amazon.com]

SAILOR'S PAGE

BMW ORACLE RACING USA TAKES 33RD AMERICA'S CUP RACE – PART 2

[This is a continuation of the article that appeared in the Third Quarter 2010 Newsletter.]

The wing sail is 68m (223ft) high. In comparison, the wingspan of a Boeing 747 is 64.4m (210ft). The chord ranges from 3m to 14m (10ft to 45ft) and has a planform area of 650m^2 (7,000ft^2) making it the largest wing sail ever built. A small engine below deck in the central hull is used to power the hydraulics to control the wing sail. Weight of the sail is approximately 3.5 tonnes (7700 lbs). The wing sail is primarily constructed from carbon fibre and Kevlar covered with a light, shrinkable aeronautical film material over this frame. The wing sail is ball jointed to the hull and is held in place with conventional stays.

***USA* during training run**

Apart from the wing sail, *USA* is also equipped with a 620m^2 (6,700ft^2) Genoa and a 780m^2 (8,400 ft^2) Gennaker for downwind sailing.

***USA* profile against a scale plan view of Airbus A380**

USA has more than 250 sensors, including strain gauges, feeding performance and wind speed information to a central database, collecting more than 26,000 data points per second.

DAGGERBOARD

Both amas on *USA* support a rudder and a retractable C-shaped daggerboard. The daggerboards provide vertical lift as well as sideforce. The centre hull was originally fitted with a daggerboard and rudder however these were subsequently removed to reduce drag as the centre hull would typically fly above the water surface in moderate wind conditions. As the daggerboard is lowered, an increasing component of its area provides vertical lift. While racing, the daggerboard of the windward ama is raised to ensure it is clear of the water. Support pillars help to raise and lower the daggerboards. The daggerboard underwent some evolution and at an earlier stage were of a J-shaped geometry.

ALINGHI 5

[Based on description provided in Wikipedia]

As with the trimaran *USA 17*, the defending yacht for the 33rd America's cup, *Alinghi 5* was also a 90ft (~27.4m) waterline length (still water) and 90ft beam yacht however instead a sloop-rigged catamaran. Due to the shape of the hulls waterline length when sailing increases to around 110 feet (34 m).

Alinghi 5 was launched on 8 July 2009 at the facility of Alinghi-Décision in Villeneuve, Switzerland, before being airlifted by a heavy lift helicopter to Lake Geneva and subsequently again to Genoa, Italy. After a dispute over the originally proposed venue, Société Nautique de Genève (SNG), the defending club, agreed that the venue would be Valencia, Spain and the boat was finally shipped to Valencia, where it arrived on 5 January 2010, only a little over a month from the date of the first race.

The catamaran was designed by Rolf Vrolijk and the Alinghi design team headed by Grant Simmer with Nigel Irens, Benoît Cabaret and Alain Gautier also consulted. The design of the yacht was apparently influenced by that of racing catamarans developed for regattas on Lake Geneva.

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BMW ORACLE RACING USA TAKES 33RD AMERICA'S CUP RACE

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Construction is primarily of carbon composite, and is reported to have taken over 100,000 man-hours to build. Displacement without rigging is reported to be only about 11 tons.

The mast on *Alinghi 5* is approximately 62 meters tall, this being larger than the one originally fitted.

***Alinghi 5* sailing with straight centreboards as seen retracted on the windward hull**

As with *USA*, an engine provides power for the winch equipment. Sail areas (as of August 2009) were reported as: Mainsail: ~6,000 sq.ft (~560 m^2); Headsail: ~4,000 sq.ft (~370 m^2); Gennaker: ~11,800 sq.ft (~1,100 m^2).

When sailing upwind, the boat can sail at less than 20 degrees off the apparent wind. During a training run, the boat achieved around 16 knots in 8-9 knot winds, or about 1.9 times wind speed in a combination of windward and downwind sailing. The boat reportedly sails so fast in near downwind conditions that the apparent wind it generates is only 5-6 degrees different to that when it is racing upwind; that is, the boat is always sailing upwind with respect to the apparent wind.

As with the BMW Oracle Racing team, the design team of *Alinghi 5* experimented with at least two different centreboard configurations including both straight and curved S-shaped configurations when viewed from ahead.

The S-shaped boards of *Alinghi 5* are considered to act like the circularly curved boards of *USA 17* at medium extension, providing both lift and sideforce but rotate to a more vertical position when in their fully lowered position. This is achieved by having an inflection point and reverse curvature in the top part of the board as can be seen in the image of the S-shaped board. It could be expected that there would be some additional wetted area and perhaps greater induced drag from the S-shaped foil in its fully lowered position compared to a straight centreboard so it is likely the straight foils would have an edge in light wind conditions, whereas the curved foil should perform better in heavy conditions.

It is understood that the centreboards could be changed to suit the wind conditions and that this choice could be made based on weather forecasts ahead of the races. Video footage indicates that the Alinghi team finally adopted the straight centreboards for the two cup races while *USA 17* utilised its C-shaped curved daggerboard for the races.

With winds of only between 4-12 knots during the two match races, it appears the preferred option for *Alinghi 5* was to maximise the efficiency of generating sideforce in the light air rather than attempting to provide foil-assisted lift for the boat.

An S-shaped centreboard fitted to *Alinghi 5* shown in the retracted position on the windward hull

WELCOME NEW MEMBERS

(Continued From Page 2)

ate School and graduated with distinction from the U.S. Naval War College. He is married to the former Nancy Joanne Matsen of Fairfield, Connecticut, and have four children, one of whom is serving in the Navy.

DR. DAVID "DAVE" STEVENSON, ABD – Dave is currently a senior engineer at CGI (formerly Stanley Associates) where he supports the U.S. Navy's towed array research and development efforts. He is also the current chairman of the American Society of Naval Engineers (ASNE) Flagship Section. Previous to this assignment he was the ASNE fifth Technical Director from 2005 until 2010. Before this he spent sixteen years as a Navy Contractor supporting the Naval Sea Systems Command and ten years in the U.S. Navy. As a Surface Warfare Officer, he held a variety of shipboard and staff positions on two U.S. Navy ships and a Reserve Unit. He was the Training Officer of the Naval Control of Shipping reserve unit, was the Engineer Officer in USS *Bristol County* (LST 1198) and the Electronic Warfare Officer on USS *John Young* (DD 973). Dr. Stevenson was a Program Manager and Project Engineer at ROH, Incorporated where he supported the U.S. Navy acquisition, modernization and support of the MCM, MHC, AOE, T-AGOS, DDG Class ships, and the operation of Diving & Salvage, NAVSEA 00C. At Technology, Management & Analysis he was a Project Manager and supported the LCAC and JCC(X) programs of PMS377. He qualified as a Surface Warfare Officer, Officer of the Deck and Engineering Watch Officer in USS *John Young* (DD 973). Though he has no hydrofoil experience he does have an interest in ships that can go fast. Born in Newport, Rhode Island, Dr. Stevenson is a 1984 graduate of the Virginia Military Institute with a Bachelors of Science degree in Civil Engineering and holds a Masters of Business Administration from Averett University obtained in 1995. He also completed the non-resident degree program from the Naval War College in 1992. He is currently a doctorate candidate working on a doctoral degree in Engineering and Technology Management from Northcentral University and has completed all course work and has begun his dissertation effort. The ABD after his name means all but dissertation. He is researching certified professional development programs for naval engineers. If you should have anything to provide for his research, he requests that you contact him at (703) 403-0531 or e-mail: dave.stevenson@stanleyassociates.com

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RODRIQUEZ UPDATE

By Lorenzo Bonasera, IHS Member

I recently received the picture below showing the current status of the Rodriquez yard's different products. The original has been already published on the Naviearmatori.net site.

In the photo, you can note the dimensions difference among the big AliSWATH (still on the dock), the Tmv50-TindariJet (in normal maintenance), and the T-foil hydrofoil "Seagull" (ex HF-1).

NEW BENEFIT

IHS provides a free link from the IHS website to members' personal and/or corporate site. To request your link, contact William White, IHS Home Page Editor at webmaster@foils.org

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