THE NEWSLETTER

INTERNATIONAL HYDROFOIL SOCIETY

Post Office Box 51, Cabin John, Maryland 20818, USA

Editor: Barney C. Black | SPRING 1996 | Co-Editor: John R. Meyer

IN THIS ISSUE.....

ANNOUNCEMENT

25TH ANNIVERSARY CELEBRATION AND CONFERENCE PROCEEDINGS STILL AVAILABLE

PLEASE SEE PAGE 4 OF SUMMER 1995 NEWSLETTER FOR LIST OF PAPERS

Anyone who was not able to attend the 25th Anniversary Celebration and Conference in June may obtain a copy of the Proceedings containing a complete collection of papers presented. Please send $15 plus $3.50 to cover handling and mailing costs to:

CDR George Jenkins USN (Ret.)
713 S. Overlook Drive
Alexandria, VA 22305 USA

1996 DUES

ALL MEMBERS ARE ADVISED THAT INVOICES FOR 1996 DUES HAVE BEEN MAILED. IF YOU HAVE NOT PAID

Please send your $20.00 check made out to IHS to:

CDR George Jenkins USN (Ret.)
713 S. Overlook Drive
Alexandria, VA 22305 USA

THE PRESIDENT'S COLUMN

We again regret to report on the passing of several of our fellow hydrofoilers. There isn't enough space in a ten page Newsletter to fully express how grateful the IHS is for their contributions to the hydrofoil community.

As we mentioned on page 8 of the Winter 1995 Newsletter, IHS has acquired the 1995 Fast Ferry Database from Fast Ferry International. Barney Black has been running it on his computer and produced a sample of what can be done, and is summarized on page 7. This is only a small sample of the wondrous works that Barney can perform - so please challenge him to greater heights with your requests for fast ferry information.

Isn't it interesting to see, from Barney's article, that the combined total of hydrofoil catamarans, fully-submerged, and surface-piercing types is 344 craft - just a little behind catamarans and far ahead of cushionborne vehicles!. So who said hydrofoils are dead? And notice that the number of foil-assisted cats and monohulls (utilizing hydrofoil technology) is appreciable. And if Maritime Dynamics Inc. keeps putting foils on non-hydrofoil craft, worldwide, at the rate they are going, this number probably will grow appreciably with time. So, hydrofoilers, take heart!

Bill Hockberger has done a masterful job of summarizing the continuing dialog on the future of hydrofoils and the IHS (see page 5). We are indeed grateful to his contribution to the Society. Perhaps there are additional issues we should be considering along with those outlined by Bill. Your comments and suggestions will be appreciated.

We are pleased to see the progress being made by Kvaerner Fjellstrand and how its Foil Cat design is catching on in Hong Kong. Sweden seems to be picking up the same baton with a Foil Cat manned model (see page 9). I assume that we will be reading about a full scale fast ferry Foil Cat from Marinteknik in the near future when they begin to appreciate what foils can do for them. In a different vein, Rodriquez, who has known for a long time what foils can do for a fast ferry, steadily improves their RHS 160 with another delivery of a FOILMASTER (see page 9). All of this supports my observation above that hydrofoils are not dead.

On the other hand we regret to see that Westfoil International 25 had to go on the block (see page 9). The propulsion system was indeed unique for a modern hydrofoil, but a valiant effort was made by a number of faithful hydrofoilers to make this a successful project. Are there some lessons learned here that should be shared with the hydrofoil community as a whole? The efforts of anyone wishing to pursue this task will be appreciated.

I had a recent call from Bob Johnston saying that he has completed an article about Gotthard Sachsenberg in which he describes the teaming arrangement with Von Schertel to take their hydrofoil system into production of practical and useful vehicles. We all know how well Bob documents such historical events. so you can look forward to reading his account in the next issue of the IHS Newsletter.

WELCOME NEW MEMBERS

Seth Hawkins - Seth retired from the Naval Surface Warfare Center, Carderock Division (formerly the David Taylor Model Basin) in 1994. During his stint there he managed the Small Waterplane Area Twin Hull (SWATH) ship program in its early years. He also managed the Advanced Concepts Office (during the time when John Meyer first advanced the notion of a hybrid ship called HYSWAS), managed the Hydrodynamics 6.2 (Exploratory Development) Program for Dr. Morgan, and started the Program Development Office while of the Technical Director's staff. He is now President of SPH Associates, a small consulting firm in Raleigh, North Carolina, where he presently lives.

Peter G. Noble - Peter has been in the ship design business for over 30 years, and much of that time has been working with high performance craft. He is currently Vice President of Engineering at the American Bureau of Shipping. In that position Peter is involved with rule development for high speed craft as well as conducting engineering reviews on a wide range of advanced craft submitted for classification approval.

G. E. Vanner - Mr. Vanner is with the Industrial Design Department at Coventry University in the U. K. He has designed and built some small hydrofoils which are included in his lecture programmes. He is currently doing some research in the area of hydrofoil dynamics.

Jan Zurakowski - Mr. Zurakowski resides in Ontario, Canada and is a retired test pilot. During the last 20 years he has been designing hydrofoil sailboats and high speed motor boats. He is currently investigating a high speed sailboat design with the aim of beating the world speed record of 46.5 knots currently held by Australia.

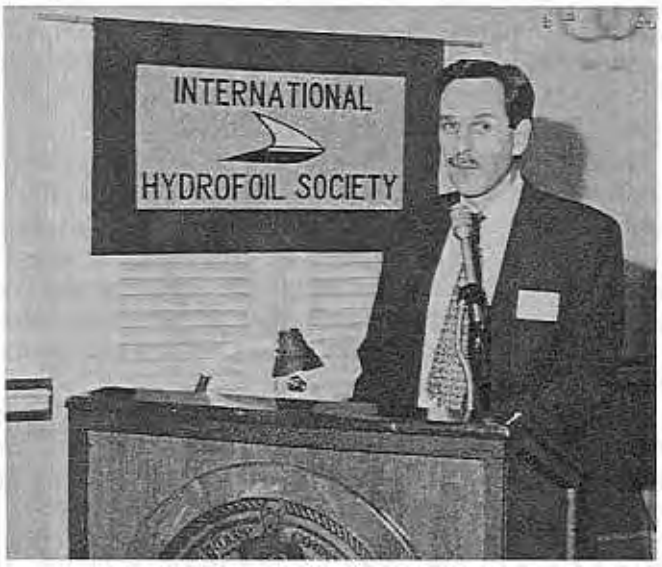
IHS AWARD FOR JOHN KING

As reported in the Winter 1995 Newsletter, John King, former Treasurer of the Society, and long time hydrofoiler and member of the IHS, died unexpectedly of an illness. The Society Board of Directors had elected to present him with an award to recognize his contributions to the hydrofoil community. Recently, the Board met, and presented to his wife, Sue and his son, John, a plaque and award citation.

Sue King and Son, John King Receiving the Award for Captain John W. King, USN (Ret.) from Society President, John R. Meyer (Photo, courtesy of Ken Spaulding.)

PICTURES FROM IHS 25TH ANNIVERSARY CONFERENCE - Courtesy of Ken Spaulding

Adm. Zumwalt Receives Plaque from John Meyer

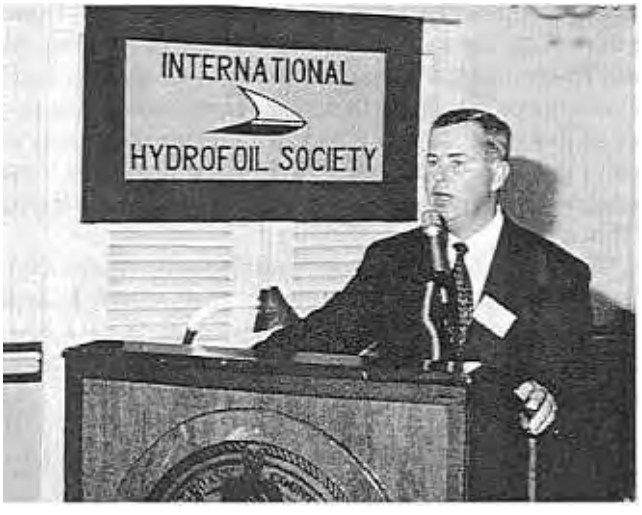


Mark Bebar Presides over Technical Sessions

John Monk Describes the Departure of PEGASUS

V.H. Van Bibber Describes Hydrofoil Utilization

Jean Buhler Reminisces about "ENTERPRISE"



Carroll Oates Discusses Marine Gas Turbines

R. JAMES JOHNSTON II MEMORIAL

R. James (Jim) Johnston of Washington, D.C. and St. Michaels, Maryland, died unexpectedly, on 18 January, 1996 in Washington. He suffered a heart attack. Jim was 52 years old. He was the son of Robert and the late Dixie Ann Johnston. He shared his father's interests in hydrofoils and was a member of IHS for a number of years.

Jim was born at the New York Naval Hospital on 25 March, 1943. He grew up as a Navy Junior residing in Boston, Long Island, Bethesda, and Miami. From his early years he displayed an interest in marine activities, particularly sailing. He learned to sail at an early age and this continued as one of his main hobbies. He and his brother won a trophy for finishing 5th in the 1965 nationals for the Jet 14 class.

Jim graduated from high school in Islip, N.Y. and attended Georgetown University in Washington, D.C. He served in the U.S. Marine Corps. While at Georgetown he showed an early interest in computers, joining Olivetti in a work study program. From there he held a variety of positions with corporations primarily in the D.C. area including Federal Systems Group, Storage Technology Corp., and General Electric. He was the program manager for the establishment of an early computerized Congressional Budget Program. For several years he headed his own computer leasing company.

During the early 1980s Jim worked as a consultant for his father's company, Advanced Marine Systems Associates, Inc. (AMSA). He was the on site representative of AMSA to evaluate, for Rodriquez Cantieri Navali, the use of the hydrofoil RHS 160 in the Virgin Islands. Along with the Rodriquez Company SNAV, it was determined that at least five RHS 160's were required to service the U.S. and British Virgin Islands as well as support the needs of the cruise industry and provide transportation to Puerto Rico. SNAV was unable to find backers for such an undertaking.

At the time of his death, Jim was Executive Vice President of Capital Capital, Falls Church, VA., responsible for the development of new business. His latest efforts were for the establishment of a combine to undertake the transporting of crude oil from the oil fields of Russia to out-of-country refineries. The design of a small tanker capable of navigating the rivers of Russia and the Mediterranean has been initiated. The prototype vessels are to be built in the U.S. and the following production in Russia. It is interesting to note that one of the yards under consideration for construction in Russia is currently building hydrofoils. Jim spent most of December 1995 in Russia working out the remaining details of this effort.

The Society extends their condolences to his father, one of our former presidents, his stepmother, Marcia Johnston, his wife Karen Johnston, his two sons Robert James Johnston III and Matthew William James Johnston, and his brother David Johnston.

VERNON H. SALISBURY, MARINE CORPS AVIATOR, BOEING TEST PILOT MEMORIAL

Vernon H. Salisbury, 74, a 40-year resident of Bellevue, Washington, died Thursday, March 28, 1996 in Puyallup, Washington. Born Jan. 9,1922, in Eagle Rock, Calif., to Tracy Vernon and Lillian Smith Salisbury. Mr. Salisbury attended a demonstration grade school for the University of California, Los Angeles. He attended classes at Los Angeles City College and developed an early interest in aviation after meeting Amelia Earhart, and took lessons at Burbank Airport.

Following the attack on Pearl Harbor in 1941, he signed up as a Naval aviator. After completing his U.S. Navy flight training, he was commissioned a second lieutenant in the Marine Corps and served in the South Pacific earning an Air Medal. At the end of the war he met and married Lurabelle Kline who was serving in the Marine Corps Women's Reserve. He remained an active member of the Marine Corps Reserve through most of his life, was recalled and flew in the Korean Conflict and retired in 1984 as a colonel.

After V-J day the couple moved to Seattle where he was employed by The Boeing Co. and he enrolled in mechanical engineering at the University of Washington. Upon completion of his bachelor of science degree he became a flight engineer in Boeing's Flight Test Division where he was involved in flight tests of the B-52 and witnessed one of the first test explosions of the hydrogen bomb at Eniwetok Island in the South Pacific. He also was involved in testing the 707 and in training customer flight crews. Among those were the crews for Air Force One which transports the President and other top federal officials.

In 1962 The Boeing Co. diversified into the marine world of hydrofoils. Mr. Salisbury and his crew became a familiar sight on southern Lake Washington as they tested a small 20-foot catamaran called "Little Squirt." In 1963 Boeing engineers put a jet engine on pontoons to test hydrofoil behavior at speeds of 80 knots. When Mr. Salisbury was testing this craft in Lake Washington, it rolled over in a spectacular crash that made the evening news. No one was hurt, and shortly thereafter he pushed the jet-powered boat to a speed of more than 84 mph, breaking a world hydrofoil speed record of 70 knots that had been set by Alexander Graham Bell in 1918. In the years following he tested a number of advance military and civilian ships based on the Advanced Marine System technology. Six of the military hydrofoils (PHM) were based in Key West, Fla., and played a major role in combating drug trafficking in the area until they were decommissioned in 1993.

Following his retirement from Boeing in 1984, he consulted with the Electronics Arts Co. to produce a best-selling computer game titled "PHM Pegasus" based on the capabilities of one of Boeing's military hydrofoils.

His survivors include his wife, Lurabelle of Bellevue; sons, David of Redwood Shores, Calif., and Jonathan of Buckley; daughter, Victoria Sykes of Mountlake Terrace; and grandchildren, Ryan Salisbury and Tamara, Laura and Ronald Sykes II.

[Sumi Arima, who was thoughtful in sending the above obituary, added: I first came to know Vern when he joined Al Kennedy (Boeing's Program Manager) on the FRESH-1 program as its test pilot in the early sixties. Vern was piloting the FRESH-1 when the forward foil ventilated

rendering the forward flap ineffective when operating in air. Thusly the FRESH-1 rose out of the water slowly where it was not noticed by the people onboard, whence the trailing rudder on the forward strut no longer had any directional control, and the craft rolled over. Pete Sias was in the right seat as the Navy's representative during the acceptance trials. I was in the escort ship with Al Kennedy and had to inform Supervisor of Shipbuilding, Seattle, CAPT Bob Harris (who also died recently) of the accident over the ship-to-shore radio. Over the years, Vern served as advisor on the HIGH POINT and PLAINVIEW on our support contract until he went to the PHM program. Before his retirement, Vern was under our contract to put together the PHM notebook.]

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WILLIAM HAUTH HAMILTON, P.E. MEMORIAL

Born April 4,1924 in New Brunswicik, New Jersey to John Wesley and Elizabeth Hauth Hamilton. Died February 4,1996 in Seattle, Washington. Resided in Burien since July 1949. Bill and Betty celebrated their 51st Wedding Anniversary in November 1995. Also survived by daughter, Cathy E. and Charles Gilligan, Dublin, Ohio; sons, William G. and Beverly, Federal Way, WA., Paul T. and Merry Lynne, Houston, Texas, and Robert A. and Carrie, Edmonds, WA. and much loved grandchildren. Bill served in the U.S. Naval Air Corps, WW II, in the South Pacific as a PBY pilot with the rank of Lt. Commander. He transferred to the active Sand Point Reserve VP 891 Squadron until March 1, 1969, and had been a happy civilian pilot since retiring from service.

Bill graduated from Rensselaer Polytechnic Institute in July 1949 with a degree in Aeronautical Engineering and, prior to entering the practice of engineering consulting in 1976 when he established Hamilton Engineering Inc., had 27 Years of engineering and management experience with first the Boeing Company and then Lawrence Manufacturing Company. In 1966 the Lawrence Company became the Lawrence Division of Ingersoll-Rand Company and Bill was named President and General Manager. On February 29, 1996, Bill (posthumously) and Hamilton Engineering were recognized at an award ceremony in Washington, D. C. by receiving a Design for Transportation National Award presented by the U.S. Department of Transportation and the National Endowment for the Arts for its design achievement of the West Seattle Low-Level Bridge.

[Sumi Arima provided the following information about Bill, which may strike a note with some fellow hydrofoilers: Bill Hamilton was in the original group at Boeing who worked on the design and construction of High Point at J. M. Martinac Shipyard in Tacoma, WA. Bill spent most of his time with the hullborne outdrive. He was also involved in the strut/foil design and the flap controls. Bill spent a lot of time at Lawrence Machine assembling and testing the outdrive. His time spent at the machine shop led to his employment with Lawrence Machine after delivery of High Point to the U.S. Navy. Bill Hamilton was the helmsman on High Point during the initial Contractor's trials and was at the helm when the first foilborne flight took place. It is not clear in the obituary, but Bill had leukemia.]

CONTINUING DIALOG ON THE FUTURE OF HYDROFOILS AND THE IHS

(By William Hockberger)

Since the panel discussion during our 25th Anniversary Conference last June, we have had a continuing dialog on the issues discussed then concerning the future prospects for hydrofoils and the resulting implications for the future of the IHS. In the previous 3 Newsletters we have printed the record of the panel discussion and a summary of comments and ideas as to what the future of IHS could or should be. We can expect this dialog to continue for a while longer, since thoughtful comments and good ideas are still coming in. What follows is a summary of where things stand at this point, to provide a basis for further discussion and suggestions. We strongly urge IHS members who have ideas on this topic, but have not yet spoken up, to let us know what you think about them.

THE PROSPECTS FOR HYDROFOILS:

The State of the Technology - Pure hydrofoils have been built and operated at displacements over 400 tons at speeds of over 50 knots (the Russian "Bobochka"). Present technology would permit pure hydrofoils with displacements up to perhaps 1500 tons, and considerably larger hybrids would be practical. Speeds of 60 knots are practical now, and 90 knot speeds ("Plainview" AGEH) have been considered achievable. Improved technology for materials and systems and equipment is available from other industries, particularly the aircraft industry, to support improved future hydrofoil designs.

Inhibitions to Hydrofoil Use - There are certain characteristics inherent in the hydrofoil that tend to discourage its use, plus shortcomings in our ways of comparing alternative craft for a given purpose. They include the following:

- Hydrofoils are relatively high in cost, have a relatively low payload fraction, tend to be mechanically and structurally complex, and have operational characteristics that make them relatively complicated to operate. But these disadvantages are less for craft with surface-piercing foils than for craft with fully-submerged foils.

- Most marine vehicles experience economies of scale, by which larger sizes yield increasing fractions for "business" purposes—i.e., the overhead for basic functions goes down, as a fraction of the total. But that is less true for hydrofoils, and they are not presently even believed to be practical in the large (multi-thousand ton) sizes for which significant economies would otherwise be expected for most ship types.

- The ability (as well as the will and the resources) to do good tradeoffs between and among high performance ships and conventional ships and craft is lacking, both on a pure technical and/or performance basis and on an economic/financial basis. A major shortcoming in the performance area, which spills over into the economic area, is the inability to factor seakeeping into the analysis, which penalizes the hydrofoil particularly.

- Connected with the preceding point, there is a tendency on the part of decision makers to look at one-for-one vehicle comparisons, instead of focusing on a total-system picture of what the company or agency is trying to ac-

complish. So the efficiencies provided by higher performance are not recognized, and system-wide savings that could result in a reduced total cost are not accounted for.

The Military Utility of Hydrofoils - It is generally recognized that hydrofoils can provide speeds far exceeding what conventional ships can, with equivalent or better seakeeping. However, hydrofoils cannot do that in sizes large enough to provide all of the capabilities the U.S. Navy tends to want in its ships, nor can they provide them for the extended periods of time that are desired. Some other countries' navies do see advantages for hydrofoils in some applications, however, and continue to operate them and in some cases plan for more. Japan is currently building a class. Partly as a result of the no-recognition of their full potential value, some believe that operational hydrofoils have not yet even been tested and evaluated as completely as they should have been to determine all that they can do militarily.

Even the U.S. Navy has missions for which it would be extremely useful to have a ship with a significant subset of those big-ship capabilities for a limited-duration mission but with high speed and excellent seakeeping. The U.S. focus on littoral warfare and on being able to tailor military responses to a very broad range of emergent circumstances around the world makes this more true now than ever before. But even those who see this tend to discount the hydrofoil's potential, because of its inability to transit long distances and to be self-sustaining for extended periods. It is generally not recognized that such a hydrofoil could be viable if it requires the company of a larger conventional ship (e.g., another combatant) able to provide the additional support needed for extended deployments.

Although the foregoing generally applies to other types of advanced marine vehicles, also, the hydrofoil is clearly superior in seakeeping. Unfortunately, while the value of seakeeping is known intuitively, it has not been characterized well enough to be dealt with adequately in analyses. So the true value of seakeeping is not reflected in studies done to determine which of several competing hull types should be selected for a particular mission. The extra costs of providing excellent seakeeping, which are significant, are there in a hydrofoil for all to see, but the extra performance and mission effectiveness gained thereby remain substantially hidden.

Commercial Utility - High speed has not generally seen to be economically viable for a cargo ship, even one carrying high value cargo. This belief is beginning to change, but the few applications recognized thus far are for long distance trade and amounts of cargo far exceeding what a hydrofoil could carry. The only clearly viable commercial uses for hydrofoils and other advanced marine vehicles now are for passenger ferries, in some cases also carrying vehicles. Passenger-carrying hydrofoil ferries are currently being built in Italy, Japan, China and Russia, and many built earlier continue in operation. (See article on page 7.) But most commercial operators are unwilling to pay the extra cost to obtain the extra ride comfort a pure hydrofoil (especially fully-submerged) can provide. They increasingly use fast catamarans with ride control systems (based on fins) or catamaran-hydrofoil hybrids.

Conclusion Regarding The Prospects For Hydrofoils - Hydrofoils will continue to be operated into the forseeable future, and there is a solid and growing commercial market for hydrofoil technology, though not for pure hydrofoil craft. It mainly takes the form of foils installed on catamarans for extra lift and thus speed, and foils installed on various ship types to generate forces for ride control and maneuvering. On the military side, there are missions for which hydrofoils could be advantageous, and there is reason to hope they will again be recognized and that hydrofoil designs will once again be called for. But in the meantime, there is very little military hydrofoil work anywhere — and none in the U.S. — and no way of forecasting when an upturn may occur.

IMPLICATIONS FOR THE IHS:

With a continuing commercial market for hydrofoils in various forms and at least a slight prospect for renewed military interest in hydrofoils in the indefinite future, reasons remain for having an IHS. In the absence of a solid commercial or naval program, an organization such as the IHS can:

- Keep together a group of people who know about and care about hydrofoils, preserving the knowledge of past hydrofoil developments and experience.
- Maintain a track on the evolving technologies that can support future hydrofoil design and disseminate the information 90 members remain current on new developments.
- Assemble information on hydrofoils and hydrofoil technology to inform and educate potential users and supporters, and write papers that capture new developments and fit them into the current context.
- Identify gaps in the technical and economic assessment of hydrofoil technology and foster new efforts to close them.
- Maintain a track on the state of the markets for high performance marine transportation and military systems and keep alert for areas in which hydrofoils could be cost-effective.

The fact that pure hydrofoils are declining in interest and application and that most current hydrofoil work involves hybrid craft and fins for ride control systems indicates to many that the organization should be broadened to reflect that greater range of interests. In fact, many of us have already implicitly accepted those other hydrofoil applications as legitimate elements for IHS membership and involvement. Others have advocated going much further and bringing in the full range of advanced marine vehicle types, which might involve combining with other organizations that already exist in support of particular vehicle types. This has been a matter of active consideration over the past year and has been reported on previously. Even float planes, seaplanes and wing-in-surface effect craft have been proposed for inclusion. Names that have been proposed for such an expanded organization include: "Marine Vehicles Society," "International Advanced Ma-

rine Platforms Society," and "International Hybrid Society."

Where the organization should be headquartered has been a topic of discussion. The bulk of present hydrofoil activity is in countries other than the United States, which has led some to think the organization itself should be located elsewhere. On the other hand, the U.S. is strongly involved in the ride control element of the industry now, and with the resurgence of the U.S. shipbuilding industry and the growing prospects for U.S. operation of fast ferries, there is reason to think the level of hydrofoil activity in the U.S. may increase. It is conceivable that the U.S. will again become a leader in the hydrofoil field and an appropriate locus for the organization's headquarters. Of course, if the organization is broadened to embrace the other types of advanced marine vehicles, it will be appropriate to consider where the activity is greatest for those other vehicle types as well.

Should the IHS continue to focus only on hydrofoils and hydrofoil hybrids, or should it try to broaden out to include other advanced marine vehicle types? Should the IHS continue to be run from the U.S., or should an effort be made to find a home for it in a place that is currently more friendly to hydrofoils and hydrofoil technology? Perhaps there are additional issues we should be considering along with these. Your comments and suggestions will be appreciated. Please send them to me, William Hockberger, at the IHS address.

KVAERNER ENERGY/GE FAST FERRIES ENTER SERVICE ON HONG KONG-MACAO RUN

(From Maritime Reporter, February 1996)

With the successful entry into service in the Far East of the first of Kvaerner Fjellstrand's Foilcat fast ferry design, high-speed gas turbine specialist Kvaerner Energy has seen a major breakthrough.

Penha and her sistership *Barca* were ordered from Norway's Kvaerner Fjellstrand by Hong Kong-based Far East Hydrofoil for the company's service between the British Crown Colony and the Portuguese protectorate, Macao. Both 114.8-ft. (35-m) long vessels have a capacity for 403 passengers, and are powered by twin GE LM 500 gas turbines driving waterjets. Each gas turbine has an output of 4,485 kW, providing a service speed of 45 knots.

Kvaerner Energy has been a General Electric licensee since 1957, initially supplying steam turbines for ship propulsion, and more recently gas turbine power packs for the offshore industry.

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FAST FERRY STATISTICS FROM THE 1995 FAST FERRY COMPUTER DATABASE

(By Barney Black)

The statistics below were compiled from the 1995 Fast Ferry computer database offered by Fast Ferry International and described in the Winter 1995 Newsletter. Fast Ferries, defined as vessels able to carry at least 50 passengers and capable of at least 25 knots fully loaded, are categorized in the database according to the following types:

Category	No. Listed
Catamaran	359
Foil Assisted Catamaran	16
Wave Piercing Catamaran	24
Hydrofoil Catamaran	5
Fully Submerged Hydrofoil	41
Surface Piercing Hydrofoil	298
SWATH	3
Monohull	175
Foil Assisted Monohull	2
Trimaran	1
Hovercraft	25
Surface Effect Ship	95
Total Listed	1044

In the combined categories of Fully Submerged Hydrofoils, Hydrofoil Catamarans, Surface Piercing Hydrofoils, there are 344 hydrofoils among the fast ferry listings, about one third of the 1044 total.

Fully-Submerged Hydrofoils - Of the 41 listed, 2 are in Belgium, 17 in Hong Kong, 17 in Japan, and 2 in Spain. The remaining 3 are not in regular ferry operations.

Hydrofoil Catamarans - Of the 5 listed, 2 are in Hong Kong, 1 in Indonesia, 1 in Japan, and 1 (not currently operated as a ferry) in Norway.

Surface-Piercing Hydrofoils - Of the 298 listed, 1 is in Azerbaijan, 8 in Brazil, 8 in Bulgaria, 2 in Canada, 5 in Croatia, 12 in Cuba, 2 in Cyprus, 3 in Estonia, 3 in France, 1 in Georgia, 1 in Germany, 67 in Greece, 10 in Hungary, 2 in Iran (no current operator listed), 83 in Italy, 18 in Japan, 1 in the Netherlands, 1 in Poland, 13 in the Peoples Republic of China, 14 in Russia, 6 in Slovakia, 4 in South Korea, 6 in Spain, 2 in Tanzania, 4 in Thailand, 1 in Turkey, 2 in the United Kingdom, 9 in Ukraine, 5 in Uruguay, and 1 in the U.S. Virgin Islands. Also, three Fast Ferries are listed without current operator or country.

SWATHS - Of the 3 listed in use as Fast Ferries, 1 is in Japan, 1 in the United Kingdom, and 1 in the U.S.

The Fast Ferry database is available from Fast Ferry International, Milroy House, Sayers Lane, Tenterden, Kent TN30 6BW, United Kingdom. The cost per copy is 135.00 British pounds (European Union members add 23.63 pounds Value Added Tax). The cost can be charged to Access, Mastercard, Visa, or Eurocard if desired. Purchasers of the 1995 database, which is current through September 1995, will be entitled to purchase the 1996 update, when available, for the reduced price of 75.00 pounds.

Fast Ferry Inter-national's e-mail address is 100142.2135@compuserve.com.

IHS members who would like to have searches of the database done to select and sort records according to specific areas of interest may contact Barney C. Black by mail at: 4122 Taney Avenue, Alexandria, VA 22304-2441, or by e-mail at 102134.1446@compuserve.com. I will respond to reasonable requests and provide printed-out copies of search results at no cost to IHS members who are in good standing.

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FERRIES

(Karl Duff, who reports that he is busy in land development, GOP, Youth Ministry, Scouts, and other civic affairs while keeping track of Puget Sound demand for fast ferries, has provided the following article.)

"Private ferry bid is floated - Fast boats would link Seattle and Kitsap" By George Foster (Seattle Post-Intelligencer; March 11, 1996)

This is no slow boat to Suquamish.

S. Hilton Smith means business - high speed ferry business.

The Seattle entrepreneur and his newly acquired Horluck Transportation Co. of Port Orchard have announced their intentions to try to cut into the Washington State Ferries' passenger-only market next year between Kitsap County and Seattle with smaller boats and faster service.

The prospect of bow-to-bow competition over Puget Sound waters has elicited a "no comment" from the state ferry system.

State law prohibits private ferries from operating within 10 miles of the state system, so Smith applied last month for a waiver of that requirement. The law does allow such a waiver if the new service doesn't interfere with the existing service.

There are indications the state might oppose his application to the Washington Utilities and Transportation Commission.

Currently, the state ferry system is opposing applications from two private firms, Pacific Cruises Northwest and San Juan Island Shuttle Express Inc., to establish service between Bellingham and the San Juan Islands, according to UTC spokeswoman Marilyn Meehan. That service would encroach on the 10-mile limit of the Anacortes-San Juan Island-Sidney, B.C., run.

Smith, who bought the 72-year-old Horluck company from the founding family four months ago, proposes two routes — one between Seattle, Bremerton and Port Orchard and the other between Seattle and Suquamish on the north Kilsap Peninsula.

The name of the service - Cross Sound Flyer - is borrowed from the M.V. Flyer, which operated from 1891 to 1921 as one of the fastest vessels of the private Mosquito Fleet that served Puget Sound communities during the late 19th and early 20th century, Smith said.

Horluck Transportation operates the 79-year-old ferry Carlisle, which runs between Bremerton and Port Orchard.

"We'd like to take over the passenger only business (from the state)," Smith, 54, said in a telephone interview Friday. "We think we can provide a better quality service with more frequency and at a better price "

Smith would have five 73-foot ferries built at a Washington state shipyard over a three-year period. Each would carry 148 passengers, cruise at 33 mph and have enclosed as well as outdoor deck space. The size of the vessel, he says. "makes it much more economical to run."

Sailing times between Seattle and Suquamish would be less than 30 minutes; between Seattle and Bremerton, under 35 minutes, and between Seattle and Port Orchard, under 45 minutes.

That's faster than the state's present passenger-only vessel time between Bremerton and Seattle of 50 minutes. State ferries do not run between Seattle and Port Orchard.

Smith's proposed Seattle-Bremerton round-trip fare of $4.50 compares to $3.50 currently charged by the state's ferries between the two cities but Smith says his fares eventually would become more competitive.

The state has three passenger-only vessels divided between the Seattle-Vashon and Seattle-Bremerton runs: the 86-foot Tyee, and the Skagit and Kalama, both 112 feet long. All three have cruising speeds of 25 mph

Smith's plans pose an even greater conflict with the ferry system's long-range plans for two passenger-only ferries operating between Seattle and Bremerton, two between Southworth (near Port Orchard) and Seattle and two between Seattle and Kingston (north of Suquamish).

Cross-sound times would range from 30 to 35 minutes, according to Ray Deardorf, chief system planner.

Despite the apparent conflict, Smith says his relations with the state ferry system have been even-keeled.

There is mixed reaction among public officials who oversee the ferry system.

State Rep. Karen Schmidt, R - Bainbridge Island, who chairs the House Transportation Committee, opposes Smith's venture.

"We have been working a number of years to put this (state passenger-only project) together," she said.

Alice Tawresey, a member of the state Transportation Commission who is from Bainbridge Island, has mixed feelings about the state-private competition.

"My personal politics say I like private enterprise doing this," she said. But if Smith's ferries force the state's passenger-only Service out of Bremerton, commuters might be forced into paying higher fares, said.

"And what if he doesn't succeed", she asked.

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VICTORIA CLIPPER IV SCHEDULED FOR CONVERSION TO ALLIEDSIGNAL GAS TURBINES

(From Maritime Reporter, February 1996)

Detroit Diesel Snags $4 million contract to supply TF40 engines.

Clipper Navigation Inc. is installing gas turbines in its *Victoria Clipper IV*, which will reportedly make it the fastest passenger vessel in the western hemisphere with a top speed of 53 mph (45 knots).

The new AlliedSignal gas turbine engines, which will be installed by April 1996, will reduce the *Victoria Clipper IV's* travel time between Seattle, Washington and Victoria, B.C., from 2.5 hours to 1.75 hours.

Equally important are the emission and noise benefits that are expected to be gained.

Clipper Navigation Inc. signed a $4 million contract with Detroit Diesel Corp. to fit the *Victoria Clipper IV* with its TF40 engines. Detroit Diesel Corp. distributes TF40 gas turbines for yachts and commercial marine applications. The new gas turbines will double the *Victoria Clipper IV's* horsepower from 5,000 to 10,000 hp.

Darrell Bryan, vice president and general manager of Clipper Navigation said, "The new gas turbines in the *Victoria Clipper IV* will enable us to get passengers to Victoria more quickly, allowing a longer day to experience Victoria."

Clipper Navigation Inc. owns and operates four Victoria Clipper twin-hulled, high-speed luxury catamarans.

[Editor's Note: Detroit Diesel is the exclusive integrator of AlliedSignal's TF series turbines into marine system packages for military, commercial and yacht applications. Packages range in horsepower from 4,000 to 10,000 horsepower.]

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USTICA LINES ORDERS FOILMASTER HYDROFOIL

(From Fast Ferry International, January-February 1996)

It has been confirmed that Ustica Lines has ordered a Rodriquez Foilmaster hydrofoil for delivery in June. A development of the RHS 160F, the Foilmaster has a standard capacity of 220 passengers.

Ustica Lines's vessel will be the second completed at Rodriquez's Messina yard, the first entered service on Siremar's Sicilian route network in July 1994.

Established the same year, Ustica Lines has operated an RHS 160F, leased from Aliscafi SNAV, during the past two summers on two routes previously operated by SNAV itself.

Based in the Sicilian town of Trapani, the hydrofoil was operated to Favignana, Ustica and Naples on three days each week from the middle of June until the middle of September. On three other days, it was operated to Pantelleria and the Tunisian town of Kelibia.

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MARINTEKNIK

(Fast Ferry International, January-February 1996)

The 12th Fast Ferry International Conference and Exhibition was held in Copenhagen in February 1996. There were 24 papers presented along with the exhibition of various new fast ferry designs. The following was reported by FFI.

Marinteknik released first details at the Exhibition of a 55m vehicle catamaran that is to be delivered in December, 1996 to an operator in the Middle East.

The design has a single vehicle deck that can be configured with either six car lanes 2.25m high or with two car lanes port and starboard plus a central lane having a clearance of 4.75m. Capacities are 42 cars, 34 cars or 27 cars plus three coaches. All loading/unloading will be across the stern.

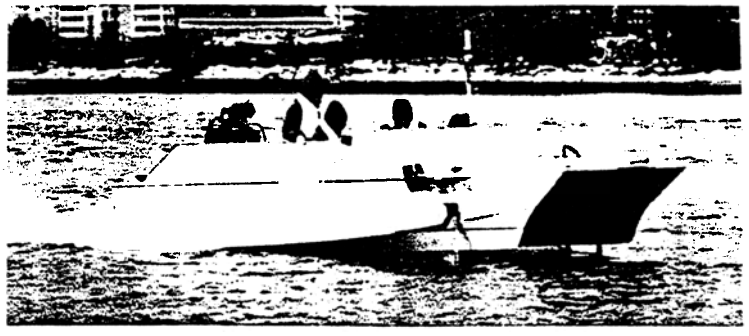
In an all car configuration, there will be three passenger saloons on two levels. In a car/coach configuration, the superstructure on the main passenger deck would be extended outboard and the tourist class saloon would be replaced by port and starboard saloons.

The standard design has three passenger saloons on two levels. On the main deck there will be a business class saloon forward for 146 passengers and a tourist class saloon for 242 passengers.

The saloon on the upper deck will be fitted out for 52 VIP passengers and have a kiosk/bar plus two toilets forward. The area between the wheel house and the saloon will be equipped with a crew mess and lounge.

Three months before the 55m catamaran is due to be delivered, the Marinteknik Shipbuilders yard in Singapore is scheduled to complete trials of a Superfast 45m catamaran ordered by Antilles Trans Express. Already being tested in Sweden. however, is a manned model of the foil equipped vessel.

According to Marinteknik, "A model has been constructed in order to carry out scaled sea trials and to verify the predicted performance of the 45m catamaran. Compared with a bare hull, the power/speed performance is improved by approximately 39%, which in reality allows for diesels as the main engines to reach a speed of over 50 knots with loads of up to 450 passengers.



Manned Model of Marinteknik Superfast Catamaran on Test in Sweden

"At the same time, sea keeping quality has been improved, more than 20 times compared with a bare hull, average for ISO 2631/3, which will provide an acceptable ride comfort for eight hours' service, 50 knot speed and 2m significant wave height. Sizes of catamarans available will range from 27m up to 55m and will be designed for various numbers of passengers and choices of engines."

FULLY SUBMERGED HYDROFOIL PROJECT PUT UP FOR SALE

(From Fast Ferry International, January - February 1996)

The developers of the Westfoil International 25 fully-submerged hydrofoil, Catalina Express and Westport Shipyard, have announced that the project is for sale.

The first vessel, which has a composite glass reinforced plastic (GRP) hull and is powered by four Detroit Diesel 12V-92TA diesels driving a pair of ducted air propellers, was launched in 1991.

Tracing the background of the program, Westfoil International says, "The hydrofoil is designed to carry 149 passengers at 42 knots cruising speed in upper sea state 4 to lower sea state 5 conditions.

"The design was carried out by some of the same Boeing engineers that developed the Jetfoil. However, the design objective was to radically lower acquisition and

operating costs. These objectives were met by adopting diesel propulsion and incorporating other widely available and proven off the shelf components.

"The foils and struts are designed to incorporate materials and construction techniques that would allow repairs to be accomplished at most of the world's full service ship repair facilities."

Referring to the decision to put the project on the market, the company reports. "It became clear that in order to exploit the full potential of the technology, the project needed an organization with an in house engineering capability and a building facility better positioned to complete the test program.

"The successful proof of concept trials of the first craft exposed certain limitations of the test site adjacent to the builder's shipyard. The restricted navigation channel in Gray's Harbor on the coast of Washington State will not allow the full range of tests required by the regulatory authorities."

Westfoil International can be reached at 180 W Dayton #101, Edmonds, Washington 98020. USA. Telephone: + 1 206 778 2275. Fax: + 1 206 775 9367.

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LETTERS TO THE EDITOR

29 January 1996

The International Hydrofoil Society — The Way Ahead

Firstly, as a life member recruited by CDR Mark Thornton, I would like to fill in a blank in the history of hydrofoils and, secondly, discuss the future of the Society.

In circa 1975 some unsteady lift hydrofoil tests of the AGEH-1 Plainview main foils were conducted in the David Taylor Model Basin, High Speed Towing Tank. During those tests, a deviation from the test plan occurred where the foil was entered into the water to simulate a hydrofoil broach. Broaching was an embarrassment which occurred when hydrofoil boats were operated beyond their design sea state. The understanding of the broach phenomena corrected the problem. As the foil approached the water surface, it needed a nose down command from the autopilot thus reducing the angle of attack. When the foil broached, the command rather than nose up needed to be nose down (low to neutral angle of attack) and gradually brought nose up (positive angle of attack) when the foil had fully submerged to a given depth in the water.

It seems that, sadly, the hydrofoil boat/ship will have a very limited future. However, the technology and lessons learned are applicable to other types of marine platforms. Marketing studies are unanimous in the requirement for fast platforms of all sizes. Irrespective of the conclusions of the ARPA WINGSHIP study, there are marketing studies that show limited potential of Wing-In-Ground Effect (WIG) vehicles of various designs. Aircraft/WIG hybrids, waterbased and/or amphibious with medium to high subsonic speeds were not and were not required to be addressed by the ARPA study. Yet, they clearly have potential.

Because of the North American and to a lesser extent European reliance on the car rather than public transportation provided by private operators, there is virtually no market in North America and relatively poor prospects in Europe. However, more environmental awareness and an increase in oil prices could make a difference to our attitudes.

As a Society, our scope should encompass float planes, [There is now a proposed C-130 {Hercules} float plane.] upgrades of the Shin MeWa PS-1 flying boat, various prototypes of Wing-In-Ground Effect platforms, proposed mammoth seaplanes and seaplane derivatives. Airport (runways, taxiways, terminals etc.) constraints will almost certainly limit the size of future landplanes making their economics questionable. This may suggest that very large aeroplanes should be waterbased. Furthermore, such a development will require an advanced marine vehicle infrastructure together with openings up the docklands and intercity railways.

Thus, as the International Advanced Marine Platforms Society, our professional, industrial and government membership and sponsorship opportunities would be greatly increased. This will assure the Society of a sound and significant future which was the intent of the founders.

Yours Sincerely,

Martyn Reeves, C.Eng., M.R. Ae.S.
5860 Ketch Road
Prince Frederick
Maryland 20678

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February 29, 1996

You know about the ups and downs in promoting the HYSWAS concept. Right now we are in a down swing in Germany. It is not the concept's fault. But the Bremer Vulkan is on the verge of filing for bankruptcy. As a first "brilliant" emergency measure, they close R&D and as of December 31 last year, EMIT officially ceased to exist. Dr Marzi will definitely leave the Vulkan group which is now daily in the newspapers ("salaries are safe until end of April"). So right now this puts an effective stop to our efforts. I am still young and I know from your experience that it takes stamina and patience before a quest sees success, but it will take some time before we have stable conditions again here in Germany. "Stable conditions" means also knowing who is in charge in the industry to approve further developments.

Fortunately, EMIT managed to finish the feasibility study and we now have a nice model of the 500t ferry design. You have the leaflet with artist vision, but I thought I might reduce my debt to you a little bit by supplying a foto of the model for your collection. (I always suspect that EMIT did not supply you with this.) In June I will be in St. Petersburg and South Africa like a HYSWAS evangelist. Who knows what will come out eventually of these effort?

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The NEWSLETTER

International Hydrofoil Society

P.O. Box 51, Cabin John MD 20818 USA

Editor: Barney C. Black | **SUMMER 1996** | Co-Editor: John R. Meyer

GOTTHARD SACHSENBERG

HYDROFOIL PIONEER

By Robert Johnson

"We are therefore... developing equipment which will lead to the destruction of our own cities and the loss of life of our children and their mothers."

INTRODUCTION

Since my retirement as editor of our IHS Newsletter, I have been filing and organizing my collection of Newsletters dating from the days when Commander Mark Thornton was the editor. I noted that we have covered contributions of most of the hydrofoil pioneers with the exception of Gotthard Sachsenberg. He teamed with Baron Hanns Freiherr von Schertel to take the von Schertel-Sachsenberg hydrofoil system into the production of practical and useful vehicles.

The material for this article comes from a visit to Sachsenberg's home in Lich, Germany, a few miles north of Frankfurt am Main. This visit in the fall of 1953 was arranged by Prof. Weinblum for Phil Eisenberg and me while we were on a tour of hydrofoil developments in Europe directed by the Secretary of the Navy. Also the paper "European Development of Hydrofoil Craft Technology" by Baron von Schertel, presented at the First IHS Conference in Nova Scotia, Canada in July 1982 provided background information.

Sachsenberg's home was an old family schloss which was the base for a farming operation. This castle was the only asset left of a

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IHS HOME PAGE

Visit the new IHS home page on the World Wide Web. The URL is : http://ourworld.compuserve.com /homepages/barneycblack
One or more volunteers is needed to help expand and maintain the web site. Please indicate your interest by sending an e-mail from the web site.

1996 DUES OVERDUE

A few valued IHS members are tardy with their $20 annual dues. If you have been remiss in keeping your dues up to date, please send your check to the above address.

IHS E-MAIL ADDRESS:

102134.1446@compuserve.com

INSIDE...

PRESIDENT'S COLUMN

This is the first issue of the IHS Newsletter with a "face lift." Thanks to Barney Black and his imagination and desire for new things, your Newsletter has an attractive and new look which, we hope, our readers will find pleasing. The IHS Board of Directors would like to hear from you on this issue, and look forward to your reactions and suggestions, as always.

During the last several years the IHS has held joint dinner meetings in the Washington, D.C. area in conjunction with our "sister" organizations, the United States Hovercraft Society and the Society of Naval Architects and Marine Engineers Ship Design Panel (SD-5) for Advanced Marine Vehicles. Ken Spaulding has dubbed this group the "TROIKA." The three organizations have many common interests and the members feel that that there is much to be gained by continued and expanded cooperation. Consequently, a "strategy" group has been formed consisting of the IHS and USHS presidents and the Chairman of SD-5. The purpose of this coalition is to plan ways to accelerate the application and use of High Performance Marine Vehicles (HPMVs) in the U. S. At a recent meeting of the strategy group, it was proposed that a "HPMV Workshop" be held in D.C.

It is anticipated that the audience for this Workshop will not be the usual technical community, or a case of "preaching to the choir", but will include key legislators and their staffs, state and national transportation planners, ferry operators, boat and ship builders, and representatives of such organizations as the Passenger Vehicle Association and American Waterways Operators.

There will be more information on the details of this Workshop in subsequent Newsletters or even special announcements as the time approaches. So please stay tuned. — John R. Meyer, President

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WELCOME NEW MEMBERS

Three new IHS members are from Maritime Dynamics Inc. of Lexington Park, MD USA, a strong supporter of the IHS. **Charlotte Sebra** works in sales and marketing; she received her B.A. from Virginia Commonwealth University. **Calvin Stringer** and **Brian Steele** work together on design of trim tabs, high speed T-foils, and hull structure of many of their customer's boats and ships. Calvin obtained his B.S. degree in mechanical engineering at University of Maryland at College Park. Brian's B.S. degree in mechanical engineering is from Virginia Institute of Technology.

Raymond Allen has over 35 years of experience in advanced marine systems design, analysis, construction, and testing. He has worked on a number of hydrofoil prototypes, including the AG(EH)-1, and PGH-1 and -2, and PCH-1. He developed several analysis and predictive tools for high performance ship hydrodynamic loads and structural design, some of which remain as primary references in the field. In his last position in the advanced marine vehicle area, he was Manager of the SWATH Technical Development Office at the then DTNSRDC. He transferred to the Naval Sea Systems Command in 1987, and became the Technical Director for ship radar cross section

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IHS OFFICERS 1996 — 1997

John Meyer	President
Mark Bebar	Vice President
George Jenkins	Treasurer
Ken Spaulding	Secretary

SACHSENBERG *(from Page 1)*

substantial family fortune after World War II. It was and had been the home of Gotthard's sister for many years. The family shipyard was in Dessau-Rosslau, located inland on the Elbe River. This became part of East Germany and all related property rights were lost to the family. The castle was about the size of a small city block, square in shape with a turret located on one corner of the four story building. In the top of the turret was Gotthard's office.

In this office Prof. Weinblum, Phil, and I met with Goddard and members of his old shipyard staff for a couple of days. As we climbed the wide staircase to his office we found ourselves surrounded by antiques, including many suits of armor. It was there that I learned how small the old knights were, as none of the suits were much over five feet tall.

As we went up the stairs, people would peak out from various doors with a high degree of curiosity regarding the visitors, particularly concentrating on the character in a U. S. Navy uniform. Later we learned that these curious individuals were chemists and pharmacists who were using the castle as laboratories for experiments in producing medicinal drugs. As former Nazis, they were unable to find post war employment. They had joined Sachsenberg to reproduce drugs of other countries that had proven beneficial. This was to be the start of a new Sachsenberg fortune, along with his continued involvement in hydrofoils with von Schertel. This renewed family fortune was never achieved during Gotthard's lifetime.

I still remember how cold the castle was during the October days of our visit. There was no central heat. Gotthard's office had a small wood-burning fireplace about which we all tried to get as close as possible. Gotthard was a bundle of energy, bustling about the office and rushing into an adjacent room to take frequent phone calls. We left wondering what all those phone calls were about. However we did enjoy two days of meeting members of the Sachsenberg Brothers Shipyard. We held frank, open, and interesting discussions with Gotthard and his staff about their experiences before, during, and after World War II in hydrofoils and other ventures.

Before von Schertel

Gotthard was interested in marine activities from his very youth. It was only natural that he would join the German Navy. He was in the Navy for a number of years culminating in his selection as a Destroyer Captain during World War I. For his service as a Commanding Officer during the war he was honored and decorated by the Navy. Gotthard's brother's marine interests went in the direction of building and servicing marine craft and ships. This led to the establishment of the Sachsenberg Shipyard in Dessau-Rosslau. When Gotthard left the Navy, he joined his brother in the management and operation of the shipyard which then became known as Sachsenberg Brothers Shipyard. The yard, located on the Elbe River, built and maintained river boats, small ships for the North Sea, and other small craft.

Gotthard was also interested in politics and ran for and was elected to the German Parliament. He served there for several years until Hitler and the Nazi party came into control. The Sachsenberg family were Jewish and although the Nazis wanted to use the family's assets in their build-up of their war machine, the family did not escape some harsh treatment.

In his parliamentary role Gotthard opposed the military build-up, particularly the emphasis placed on the Luftwaffe. To further aggravate the Nazis he published documents on the subject. He displayed and gave us a number of these articles, which were all were based on the same theme. His expressed contention was that war used to be a game conducted by and for gentlemen. He cited the knights of old who battled to control a space on the Rhine River so that tolls could be collected to support their estates. These knights were members of the estate owners' families and their hired combatants. He cited cases where the battles were engaged in the surrounding fields during the day and in the evening the participants retired to the nearby taverns and enjoyed their brew together and swapped war stories.

Now, modern war is a threat not only to the armies and navies engaged, but also to the women and children who happen to be in or near the field of engagement. "Today," Sachsenberg wrote, "we are building a substantial air force with equipment which is designed to bomb and destroy cities and facilities in foreign countries. As soon as we do this you can count on the foreign country's retaliation. We are therefore in the process of developing equipment which will lead to the destruction of our own cities and the loss of life of

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SACHSENBERG *(from Page 3)*

our children and their mothers." These articles were published during the 1930s and predicted what came to be for Germany.

As one can imagine, these articles irritated the Nazi regime. That fact, in addition to his religion, brought Gotthard to trial. He was not present for his trial for as a member of Parliament, the proceedings were held in secrecy. Gotthard, through his friends, was kept informed of what was going on and learned that his sentence was death. He was also told when they would come to arrest and execute him. When the Nazis came to get him, he dressed in all of his parliamentary regalia including the formal clothes and the wearing of the bright colored sash and navy sword. He was loaded in the back of a truck to be taken into the woods and shot.

A military officer accompanied him. Gotthard addressed this officer asking him if he wanted to be accused of shooting a member of Parliament. As they drove through the woods the officer became concerned over his planned action and told Gotthard to take off and hide when the truck stopped. Gotthard did take off, but returned to his office in the shipyard which was now engaged in the war effort. He was not bothered again.

Sachsenberg / von Schertel

In 1926, while a student at the Technical University of Berlin in Berlin-Charlottenburg, Hanns von Schertel became interested in the hydrofoil principle. He studied the works and experiments of the early hydrofoilers including Forlanini, Grocco, and Guidoni of Italy and the experiments and demonstrations of Alexandria Graham Bell and Casey Baldwin of North America. A year later, von Schertel started his own experimental work, fully obsessed with finding a solution for the problems of the flying boat.

Over the next eight years,von Schertel tested all foil configurations which he considered promising, both fully submerged and surface piercing. Seven experimental boats were built and tested. Fortunately his wealthy mother from the USA, who had married a German baron, could afford to support her son's efforts. He never did complete his studies at the Berlin Technical University. In von Schertel's own words, "It was a hard time during which failures kept following each other, and periods of disappointment and discouragement had to be overcome. But I never lost hope and believed that development work meant finding the right concept among a series of errors."

In 1935, von Schertel built his seventh test craft with V-shaped front and aft foils with trapezoid outer portions. This craft performed quite satisfactorily in various weather conditions on the Rhine River. With a 50 HP engine it could carry seven persons at nearly 30 knots. These demonstrations attracted the interest of the German Navy, Air Force, Ministry of Transportation and Finance and led to partnership with Gotthard Sachsenberg in the Sachsenberg Brothers Shipyard.

The Joint Venture

As soon as the partnership was formed, Sachsenberg and von Schertel placed their first efforts on obtaining a commercial order for a hydrofoil. Using von Schertel's seventh test craft, they conducted a round trip demonstration run from Mainz to Cologne on the Rhine River for the Köln-Düsseldorfer Shipline. This 370 kilometer trip convinced the Shipline of the feasibility of this new means of transportation for passenger service. As a result they placed the first order for a foilborne craft for commercial use. Before this craft could be completed and delivered the German WW II effort interfered, and the order was never fulfilled.

As work began on the commercial order, von Schertel and Sachsenberg initiated a development organization with the objective of building a larger test craft. Some of the best talents in Germany were brought into this group including Professor Weinblum, a renowned hydrodynamicist and naval architect, and Professor Schuster, an expert in high speed propellers and foils. The efforts of this group along with the enthusiastic leadership of Sachsenberg in the development of hydrofoil construction techniques created the VS-6.

The VS-6 was designed as a mine layer, propelled by a pair of Hispano Suiza engines of 1560 HP which could sustain a speed of 47 knots. A competition was held by the German Navy between this craft and a 17 ton craft designed by Professor O. Tiejens and built by Vertens Shipyard. While the Tiejens craft was faster, it had poor turning capabilities and unsatisfactory take-off characteristics. The VS-6 was declared the winner, and hydrofoil orders were placed with the Sachsenberg Shipyard.

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 (from Page 4)

Schertel-Sachsenberg Hydrofoil **VS-6**

Five different types of hydrofoils were ordered by the German Armed Forces during World War II in addition to the VS-6. In 1943 the 80 ton VS-8 was launched. The VS-8 was designed to provision Rommel's Army in Africa. It had the capability to carry a tank from Italy to Africa at a speed of 45 knots. Six surveillance craft were built, designated as TS-1 through TS-6. These hydrofoils displaced 6.3 tons and had a speed of 40 knots. A 60 knot hydrofoil was built and was designated the VS-10 with a displacement of 48 tons. The speed was never confirmed as the VS-10 was destroyed in a bombing raid. Two small, single seater torpedo boats were built. These were designed to approach the enemy as close as possible, then turn back sharply, launch a torpedo over the stern and make an escape at 60 knots. The last construction was a 5 ton hydrofoil catamaran with retractable foils.

Post War Activities

The Sachsenberg Shipyard fell into Russian hands after WW II's end along with a number of the yard's personnel, including several of the individuals involved in the development and construction of the hydrofoils. Sachsenberg, von Schertel, Prof. Weinblum, and a few others managed to escape into the Western zone. Most of the hydrofoils built at the yard were destroyed or damaged during the progress of the war. However one of the mine layers was captured and sent to England for evaluation. Unfortunately before there was enough interest in hydrofoils to fund an evaluation program, the boat had so deteriorated that it did not warrant reconstruction. The TS-6 became a Russian Navy test craft. In fact the personnel, hydrofoil building facilities, and technical data including drawings of the various craft all became Russian property.

An aside comment is made here regarding the Russian's acquisition of this technical data and related craft. Shortly after WWII ended, then Lt. Philip Eisenberg USNR, and other experts were members of a technical team that went into post war Germany for evaluation purposes. Phil identified the valuable hydrofoil material at the Sachsenberg Shipyard and urged the allies to take the material and craft before Germany was divided into the various zones. His urging fell on deaf ears, and very little was obtained by the allied nations.

The Russians, realizing the value of the captured material, established a design office in the Sachsenberg Shipyard at Dessau-Rosslau. Retained were engineers and scientists who had been involved in the yard's hydrofoil program along with engineers from the Junkers Aircraft Company forming a development and design group of about 100 people. This group designed and the yard built a 57 ton hydrofoil torpedo vessel. Powered by two Mercedes Diesel engines of 1000 HP each, the craft was designed for a top speed of 55 knots. The foil system was a submerged foil design using a stabilization system based on the surface effect theory. A number of the hydrofoil passenger boats, later built in

Continued on Page 6

Schertel-Sachsenberg Hydrofoil VS-8

SACHSENBERG *(from Page 5)*

Russia, continued to use this basic foil system. This office also prepared a basic design manual for the Russians, a copy of which was ultimately obtained by the U.S. Navy (see IHS Newsletter, Winter 1993).

Baron von Schertel was able to get to Switzerland. There he dreamed of and planned on establishing a design office leading to the construction and licensing of commercial hydrofoils. Gotthard Sachsenberg shared this idea, and the two of them worked to find a way to finance, staff and ultimately fulfill this dream. Financing was the major problem with Sachsenberg's wealth gone except for the family farm. Schertel had inherited a title from his German Father and wealth from his American Mother, but the money was tied up by U. S. authorities. Finally working together, Sachsenberg and von Schertel were able to convince Swiss bankers to lend them money to get started. With this Supramar was formed, but it was subject to the control of the Swiss bankers.

By the early 1950s Supramar was able to attract a number of the old Sachsenberg Shipyard staff, who had been released by the Russians, to join them, and a number of hydrofoil passenger designs were initiated. Von Schertel was the driving force behind these designs as Sachsenberg became less active due to his health and the Swiss bankers' role in Supramar. The PT-10, *Freccia d'Oro* was introduced on Lago Maggiore between Ascona, Switzerland and Arona, Italy in July 1953 as Supramar's first commercial design and venture.

Freccia d'Oro was the first operating passenger hydrofoil to go into service anywhere in the world. This was followed by designs and vehicles designated PT-20, PT-50, and PT-150. The first PT-20, licensed to and built by the Rodriquez Shipyard in Messina, Italy was placed in operation in 1956. The PT-50 followed in 1959 and the PT-150, built in Norway, went into service in 1968. Supramar ultimately entered into licensing agreements with hydrofoil builders in Italy, Japan, Norway, Holland and Hong Kong resulting in a number of Supramar designs operating in many countries. Unfortunately Gotthard Sachsenberg did not live to see the successes that grew out of his efforts.

Supramar Hydrofoil PT-10

WIGS IN IHS FUTURE?

[In a letter published in the Spring 1996 newsletter, IHS Life Member Martyn Reeves suggested that the scope of IHS could be broadened to include WIG platforms whose development owes much to Russian hydrofoilers. From Australia, Athol Yates sent us the program for the "Workshop on 21st Century Flying Ships" held November 7-8, 1995 at Sydney's University of New South Wales, also a copy of a magazine article by Paul Grad resulting from the workshop. Following are excerpts, reprinted by permission of the author, from "Ekranoplans" in the December 1995 issue of Civil Engineers Australia. *—editor]*

Called *ekranoplans*, from the Russian word *ekran*, meaning screen or ground, the craft exploit the Wing-in-Ground (WIG) effect, i.e. the increase of lift-to-drag ratio of a lifting system at relatively small distances from an underlying surface. They are part ship, part aircraft. The WIG effect works like the effect of the surface of the water on a hydrofoil, i.e. as an air cushion, increasing the lift-to-drag ratio. Within limits, at a certain distance from a surface, a lifting system will experience a restoring force when it moves slightly away from or towards the surface. The restoring force is provided whether by the system's weight or by the effect of the compressed air between the surface and the system. This tends

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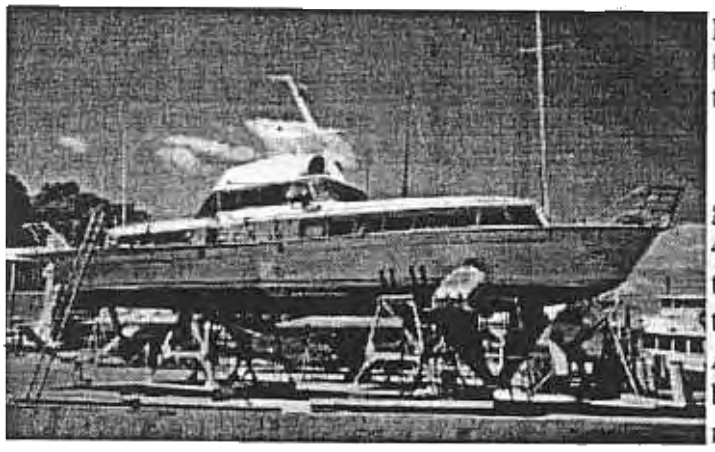
LETTERS TO THE EDITOR

I joined the IHS in 1994 and wrote about my desire to operate a commercial hydrofoil service in Australia. I am happy to say that this goal is now very close to fruition as a result of a trip I made to New Zealand in February last year. I was planning this trip to inspect a Supramar PT 4 for sale in Queenstown when friend and fellow IHS member Martin Grimm showed me a video of the Rodriquez-built PT 20 hydrofoil *Manu Wai*, delivered to Auckland in 1964.

Manu Wai underwent an extensive modernization and refit in 1989 and was used briefly as a luxury style corporate cruiser before being sold in 1993. Unfortunately she was run aground shortly afterwards, which caused extensive damage to the aft foil, hull and shafting and was laid up.



With newly formed partners in Sydney, we successfully tendered for the vessel and formed Sea Flight Cruises Pty. Ltd., which will operate the hydrofoil on regular excursion trips and charter work on Sydney Harbour and surrounding waterways.

Repairs are being carried out by Starkstrom Marine, one of the partners, in Sydney. This work is now 95% complete with the exception of the aft foil which has a 3° negative angle of attack between the support-

ing struts as a result of the grounding and is beyond our area of expertise. If any member of the Society has the expertise in repairing such damage, we would be very grateful if they could contact us to discuss in more detail, with the prospect of being brought to Sydney to carry out the repair.

Manu Wai's engine is an MTU 12V 493, for which, unfortunately, it is difficult to obtain spare parts in Australia. We would be grateful for any member's assistance in obtaining spare engines, engine parts and propellers.

Garry Fry, Operations Manager
SEA FLIGHT CRUISES PTY,
LTD A.C.N. 068 885 843
P.O. Box 150 (101-103 Queen St.)
Beaconsfield NSW 2015
Telephone: (02) 699 2377
Facsimile: (02) 698 3952

I left Westamarin West in January 1996 to become technical manager at Båtservice Holding A/S, a builder of high speed passenger catamarans (20-47 meters) in aluminum. The yard has developed catamaran hull forms with very low resistance and is now involved in projects aiming for further reduction of resistance and improved sea-keeping characteristics (passenger comfort) using fins and trim tabs. A 38 m. catamaran delivered in 1995 was very successfully equipped with a Maritime Dynamics, Inc. ride control system

Svein Berntsen
Båtservice Holding A/S
P.O. Box 113
N-4501 Mandal Norway
phone: 47-38-26-10-11
fax: 47-38 26 45 80

I came across your web site as I was browsing for hydrofoil designs. My name is Bernie Tsao, and I have been designing high performance sailboards for over ten years. I've worked with different composite materials and designs. One of my dreams is to develop a high speed hydrofoil sailboard which may some day break the world speed record for sailboarding, which is close to 50 knots. First, however, I would like to design and build a medium speed prototype and then modify it for high speed applications. I would be wasting my time "re-inventing the wheel" to start from scratch. Therefore, I am writing to you asking for your expertise and input in design or perhaps you can lead me to a resource where I can get some

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information regarding technical designs of the foils, such as size (max. surface area), positioning, angle, thickness, rake vs. no rake, V vs. flat, single or double?

I am trying to design a hydrofoil sailboard that will start to lift at 18 knots but topping at 30 knots without cavitation. The approximate total weight of craft, sail, and person will be 200 lbs. Water conditions r will be small to moderate chop. Questions:

1. What size or maximum surface area of foils are necessary? What wing span? 2. How many sets should there be? In what combinations? i.e. One large below the mid section of the craft held together by double struts and one tail foil below the aft section? or vise versa? Should the struts be raked forward or backwards? or a combination of both? What should the distance between the front foil from the rear foil? 3. How should the foils be designed? Flat or Vee. What should the thicknesses of the foils be?

I am open to any other comments or recommendations you can provide. Thank you so much for your time and consideration.
Bernie Tsao
Applied Aquatech Systems Int'l
75-5851 Kuakini Highway, #162
Kailua-Kona HI 96740-2148 USA

As an avid windsurfer, I have also thought of making a hydrofoil board, but here are some of the issues I came up with:

1. Stability and control. A hydrofoil must be stable in all of the normal airplane axes (roll, pitch, and yaw) as well as depth. This is very difficult to achieve without complicated computer autopilots or pilot involvement. The Decavitator used two axis pilot control which was impossible in anything more than 3-4" wave and would become even harder at speeds over 20 knots.

2. Ventilation. This is the same phenomena which windsurfers refer to as "spin out." All lifting surfaces must be kept away from the air, which is very difficult to in any kind of chop. We were forced to build our foils in a Tee configuration, which makes stability much harder, but experiments showed that a Vee foil would almost always ventilate.

3. Structure. Foils need to made out of solid carbon or steel, which is difficult to do at the required accuracy without spending lots of time and money. We had free access to a 3-axis CNC milling machine to make our molds.

I think the best answer to the problem would be two Vee foils (one in front and one in back) which would give automatic stability theoretically. I am not sure how they would handle in any kind of chop. The other problem is that the ventilation would add significant drag and our estimates seemed to show that a non-ventilating hydrofoil wouldn't be much better than a planing board at 35 knots. At higher speeds, the planing board is almost certainly better.
Marc Schafer

Have you had an opportunity to actually apply your theories of ventilation with Vee foils to a sailboard? I guess I needed some further clarification on your comment about "stability" with flat foils with a Tee configuration. Can the stability factor be compensated by the rider? If so, then wouldn't the flat foils make more sense, since most high wind situations result in choppy conditions?

Just a wild thought, if ventilation and stability are what we are dealing with, what about a reversed Vee or upside down Vee front foil combined with either a flat foil or a standard Vee foil in aft, much like some of the F-15 fighter jets? This way perhaps we can find the radical middle. In addition, when one refers to a Vee foil, what angle are we talking about? Can it be a slight Vee or even just a gentle roll?
Bernie Tsao

Around 1962, a friend had sent away for a foil kit for water skis. It amounted to affixing a pair of skis together about 1-1/2 ft apart. A triangular strut assembly was fixed in position on the bottom of the skis, directly under the skier's heels. The vertical legs of the triangle were about 2-1/2 ft long. They vee'd up and outward to a horizontal piece about 2 ft long (attached to skis). At the bottom of the triangle was a bar attached fore & aft, and on each end of the bar was a foil approximately 1 ft long.

A person could lift out of the water at 6 - 8 mph. Max skiing speed (for me anyhow) was 12 - 14 mph. Unstable above that.
Joe Schobert

The Letters To the Editor section of the IHS Newsletter is a means for hydrofoilers to request or provide information, exchange ideas, and inform the readership of newsworthy or interesting developments. All are invited to contribute.

AUSTAL VESSEL STABILIZING SYSTEM DEVELOPED FOR FAST APPLICATIONS

Maritime Reporter, May 1996

Western Australian shipbuilder Austal Ships is one of the world's most successful builders of high speed passenger catamarans and vehicle ferries in the 98.4 to 328 ft (30 to 100 m) size range. The company has become a dominant supplier to Asia, and — with several large car ferries already completed and on order — is fast becoming a leading choice with European operators.

Conscious of the need to improve safety and passenger comfort onboard high speed craft, in 1992 Austal began development of its Ocean Leveler stabilizing system — an automatic, electronically controlled and hydraulically operated motion dampening system.

Reducing Vertical Acceleration

According to Austal, the results of the system have been impressive, reducing vertical acceleration levels — known as the primary cause of seasickness — by at least 50 percent on vessels fitted with the system. Whereas the seasickness threshold is typically in 4.9 ft (1.5 m) seas for a vessel without a stabilizing system, Ocean Leveler reportedly moves this threshold out to 8.2 ft (2.5 m) and allows operation in conditions up to Beaufort Force 7. Since its development, Austal has installed the system in 10 vessels, including a fast monohull ferry, and on the second generation T-foil system designed specifically for their large car ferry designs. These vessels are in operation along the coastline of Guangzhou and Shanghai in the People's Republic of China, Indonesia, the Inland Sea of Japan, the French Polynesian islands around Tahiti, Scandinavia, and the Baltic Sea.

Adding Value Through Engineering

Designed specifically for Austal's high speed catamarans, the Ocean Leveler stabilizing system comprises two T-foil control surfaces fitted beneath the forward hulls. Where the draft is limited, two fins positioned forward on the inboard side of each hull can be used. In addition to the T-foil or fin control surface, two flaps aft, flush with the bottom of the hull just forward of the transom are also fitted. The system has also been successfully applied to a fast monohull ferry in a configuration which utilizes aft flaps only. Acceleration at the foil/fin and flap positions monitor movement at each corner of the vessel. A central microprocessor system, incorporating a sophisticated high speed monitoring and control algorithm, constantly monitors output from the motion sensors, then drives the foil and flap angles to counter movement and maximize passenger comfort. The foils and flaps are powered by independent hydraulic systems; the foil hydraulics are powered by separate electrical pumps in each hull, while the hydraulic power for the flaps comes from separate pumps mounted on the gearboxes in each hull. With the foils and flaps each able to operate independently, roll, pitch, and heave movements can be minimized. The system was designed to be fully computerized and requires no further input from the crew once activated. Automatic adjustment is made if going from a head sea to a beam sea. A VDU (Video Display Unit) screen on the bridge displays foil and flap positions, accelerations, and angles of vessel roll and pitch. A second screen page is dedicated to alarm displays. In the unlikely event of a system failure, the foils and flaps are driven to neutral positions and hydraulically locked.

A new feature of the system is "trim control," which allows a vessel's trim to be optimized to suit different loading conditions.

Tracing System Development

In mid-1992, Austal commenced an R&D project in collaboration with the Australian Maritime Engineering Co-operative Research Centre (AMECRC) at Curtin University in Western Australia. The project's aim was to develop a pitch, heave, and roll control system for high speed passenger catamarans.

The project commenced with the writing of a computer program to

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OCEAN LEVELER *(from Page 9)*

simulate vessel response in waves with various control systems implemented. It is this program that is used to determine the response of a vessel in a given set of conditions. Once the uncontrolled vessel response is established, it is then possible to implement various control algorithms.

The first complete stabilizing systems were fitted on two identical 40 m (131.2 ft) catamarans, and full scale trials were conducted in May 1993.

As the vessels were identical, it was possible to omit the fins on one vessel and make a direct assessment of motion improvement attributed to the stabilizing system. Though both vessels were ultimately delivered with the stabilizing system for the course of the trials, one vessel's fins were removed and the flaps locked into a flush position with the underside of the hull. The second vessel had a fully functioning Ocean Leveler stabilizing system.

Assessing Practicality, Cost-Effectiveness

In 9.8 ft (3 m) seas, the vessels were run side by side in a number of different headings and a direct comparison was made. The vessel fitted with the system reportedly achieved speeds higher than 30 knots at 1750 rpm, with accelerations reduced by approximately 50 percent. In the absence of Ocean Leveler, 1950 rpm was needed to maintain the same speed. As uncovered by Austal, apart from improved levels of passenger comfort, these results represented a fuel savings of around 160 liters per hour in trial conditions, for the same trial speed.

SPANISH RHS 160F REFITTED WITH NEW PROPELLERS

Fast Ferry Int'l, April 1996

One of the Rodriquez RHS 160F hydrofoils operated by Compania Trasmediterranea, *Barracuda,* has been retrofitted with a pair of Sistemar CLT three bladed propellers having a 1.0 m diameter and nominal speed of 986 rpm.

Based in Madrid, Sistemar has fitted propellers on almost 200 vessels since the company was established in 1978. Referring to the hydrofoil installation, it says, "The owner wanted to improve performance by reducing main engine overloading during take off and the length of the acceleration period. Trials and service experience since the CLT propellers were fitted have proved that the higher thrust supplied by these has met both requirements."

Trasmediterranea has confirmed its intention to order CLT propellers for the remaining three RHS 160F hydrofoils in its fleet.

This is not the first fast ferry application for CLT propellers. In 1993 Sistemar installed units on two Fjellstrand 38.8 m catamarans operating in Spain. According to the company, satisfactory results have been observed with CLT propellers driven by main engines providing a 1400 kW continuous power rating at 1940 rpm with a gear reduction of 1:2.5 giving a speed of 32 knots.

"The owner noticed that the ship's speed increased, vibration levels have been reduced and blade root erosion problems, observed by underwater inspections, of the former conventional propellers have been avoided."

Later the same year, a set of CLT propellers was fitted on one of the five Fjellstrand 38.8m catamarans delivered to Turkey with non-standard 12 cylinder diesel engines.

WIGS *(from Page 6)*

not only to have a stabilizing effect, but also provides an increase in lift, compared with conventional aircraft flying far from the ground.

The "flying ships" have been developed in Russia since the 1960s for military purposes and tested over the Caspian Sea. The U.S. became aware of the tests only in the 1980s. They dubbed the craft the "Caspian Sea Monsters," probably referring to the largest of them, the prototype KM with takeoff weight of 550t, length of about 90m, and cruising speed above 500 km/h.

[Professor Kirill] Rozhdestvensky said since the 1960s Russia has been the leader in creating large ekranoplans, thanks to the pioneering efforts of Dr. Rostislav Alexeyev and his Hydrofoil Design and Construction Bureau in collaboration with several other institutions. Rozhdestvensky said between the 1960s and 1980s a number of ekranoplans were built with takeoff weight ranging from 120t to 550t and a cruise speed between 400 km/hr and 500km/hr.

Potential commercial uses of ultra large ekranoplans that have been

Continued on Page 12

AVENGER RIB

Maritime Reporter, June 1996

USA Catamarans offers its gas turbine-powered *Avenger* 78.7 ft (24 m) all aluminum, unsinkable RIB. Propulsion is through KaMeWa 45 waterjets. With a passenger capacity of 100 and a service speed of 50 knots in an operational environment that encompasses sea state 4, USA Catamarans now has a single hull that reportedly outperforms its own foil-assisted catamarans. The high deadrise hull reportedly has half the drag of the standard deep-Vee. During sea trials of an *Avenger* 39.3 ft (12 m), super critical operation was reportedly achieved at speeds of more than 40 knots. According to preliminary calculations from scale model performance, a 101.7 ft (31 m) *Avenger* crew boat powered by two Solar Centaur gas turbines with KaMeWa waterjets will carry 50 tons at 50 knots, in 8 to 10 ft (2.4 to 3 m) seas.

FPC FOIL ASSISTED CATAMARAN

Fast Ferry Int'l, March 1996

[The following reprinted article is heavily condensed. Refer to the original for the design details and the full text of Mr. Bandula's comments. —Editor.]

The design of a 22.5 m foil assisted catamaran intended for operation in the Adriatic, the FPC 23, was described by Darko Bandula of the Brodarski Institute. Tracing the background of fast ferries in the region, he said, "The Republic of Croatia, with its 960 nautical mile long coastline and islands, has a well developed tourist infrastructure and a significant potential for the operation of fast ferries. Today, when only a few fast ferries are operating in the Croatian part of the Adriatic, it is worth remembering that the first Kometa hydrofoil started operating in Croatia in 1969.

"The Croatian government has decided to introduce a new law for public line coastal maritime traffic on a concessional basis. This law and the fact that peace is coming back to Croatia and Bosnia Herzegovina, that the Croatian Gross National Product in 1995 started to rise, and that the forecasts for the 1996 tourist season are optimistic will probably result in new circumstances in which a new generation of fast commercial craft can compete successfully with the current 10 to13 knot traditional passenger ferries on the regular short local coastal routes as well as with the Kometa and Kolkhida hydrofoils on the seasonal tourist routes."

Turning to the FPC 23, Darko Bandula explained, "To establish design objectives, market and feasibility studies for fast passenger transportation in the Adriatic were undertaken. Although there are two types of operation in which fast passenger craft could be profitably introduced in Croatia, regular annual coastal routes and seasonal tourist routes, the proposed design should be attractive for both with initial cost as low as possible. The craft should be waterjet propelled, simple and reliable with as little maintenance as possible, built in Croatia if possible, and in compliance with IMO Code of Safety for High Speed Craft.

"After the design objectives were determined, a study of potential hull configurations was undertaken. three potential conceptual designs were developed. After carrying out resistance model tests in calm water of all three, it was found that the resistance of the foil assisted catamaran was most favorable."

GE LM500 GAS TURBINE POWERS KVAERNER FOILCATS

Maritime Reporter, May 1996

The first commercial installation of General Electric Marine & Industrial Engines' (M&I) smallest aeroderivative gas turbine - LM500 - was on two Foil Cat hydrofoil fast ferries. The ferries, built by Kvaerner Fjellstrand for Hong Kong's Far East Hydrofoil, Ltd., each have two LM500 propulsion system packages, providing a total power output of 9400 kW per vessel. The propulsion system packages were built and supplied by Kvaerner Energy. Commercial operation of these 400-passenger vessels, which provide service between Hong Kong and Macao, began late last year. M&I develops, designs and manufactures aeroderivative gas turbines for a variety of commercial and military marine propulsion and industrial applications.

Aeroderivative gas turbine-powered ferries include the Aquastrada class ferries (*Guizzo* and *Scatto*) and High Speed Sea Service ferries (Stena *Explorer*). Kvaerner Energy and GE are currently working on Seajet 250 passenger/car fast ferries, which will contain LM1600 gas tur-

Continued on Page 12

LM500 *(from Page 11)*

bines. These vessels were designed by Danyard in cooperation with NQEA Australia, and are expected to be supplied to Danish operator Mols-Linien this spring.

Advantages

According to GE and other turbine manufacturers, aeroderivative gas turbines offer several advantages over more traditional propulsion systems. Benefits of turbine use include lower acquisition and installation costs, lower vibration and noise levels, and the lack of visible smoke and soot. Turbine emissions are reported to contain considerably lower concentrations of noxious substances, as compared with diesel engine emissions. GE also offers a Dry Low Emissions (DLE) combustion system for its LM6000, LM2500, and LM1600 industrial models, and has plans to make the system available for marine propulsion applications in the near future.

Other benefits of turbine propulsion include: lower maintenance costs and higher reliability, allowing for a smaller engineering crew and lower manning; propulsion speeds in excess of 40 knots; and minimum en-

WILLIWAW SEARCH

A hydrofoiler in Denmark would like to contact David A. Keiper of Williwaw fame (a hydrofoil sailboat with which he made ocean crossings in the mid- and late 1970s). Anyone knowing his current whereabouts, please contact IHS.

SEA FALCON LINES IN GREECE

Fast Ferry Int'l, April 1996

The latest fast ferry operator in Greece is Sea Falcon Lines. The company has introduced a pair of Meteor hydrofoils, *Falcon I* and *II*, on a local route linking Piraeus with Aegina. Just one of the vessels is required to maintain the basic frequency of five return crossings a day to Suvala, a town on the Island's northern coast.

Two services a day in each direction are extended to Agia Marina on the northeastern coast. Scheduled journey times are 25 minutes for Piraeus-Suvala and 45 minutes, including the call at Suvala, for Piraeus-Agia Marina. Coincidentally, the hydrofoil operates from the same berth in Piraeus as another Meteor, *Nattem XII*, that was leased from Nattem Passenger Lines by the Municipality of Piraeus and operated on another local route from early 1994 until the vessel was arrested last year.

FBM MARINE SWATHs

Maritime Reporter, June 1996

FBM Marine of Cowes, Isle of Wight, UK, has been awarded a contract to build two, 75.4 ft (23 m) passenger transfer craft for the UK Ministry of Defense (MOD). The vessels are scheduled to be delivered in July and September of 1997, and are the first vessels of a small waterplane area twin hull (SWATH) design ordered by the agency.

The 75-passenger vessels will be used in support of Flag Officer Sea Training (FOST) at Plymouth to transfer staff quickly and comfortably from warships and auxiliaries within the breakwater and in open sea condition. The vessels will be fitted with twin marine diesel engines of approximately 450 kW each, driving conventional propellers to service speeds in excess of 11 knots in sea state 3.

WIGS *(from Page 10)*

proposed include transportation of payloads of large sizes and weights including large quantities of perishable goods, large scale search and rescue operations, large scale high-speed luxury transportation, and rapid response to market fluctuations. Russian scientists, engineers and technicians involved in the development of ekranoplans are now engaged in an intensive effort to market the craft worldwide and establish joint programs for their further development. Based on studies of transport economics and on data on both Russia's and other countries' ekranoplans, Rozhdestvensky said, these craft can be considered at least not worse economically, in their own speed range, than modern jet airliners, the Japanese Shinkansen, and Techno-Superliner A and container ships.

Copies of Proceedings from the *Workshop on 21st Century Flying Ships* are available from the Institute of Marine Engineers (Sydney Branch), 58 Melba Drive, East Ryde, NSW 2113 Australia, Attn: Laurie Prandolini for A$100 plus A$15 for sea mail or A$24 for air mail. Telephone: +61-2-878-1914 or Fax: +61-2-878-4669.

HYDROFOIL BENEFITS FROM TIP LOADED PROPELLER RETROFIT

Marine Propulsion, April 1966

Recent orders for Sistemar's CLT propellers for a 30m hydrofoil and a cape-size bulk carrier demonstrate the range of vessels that can benefit from these high-efficiency designs. The orders have come from ship owners who have already evaluated the Spanish designer's CLT propellers after these were retrofitted to existing tonnage of different types.

By the end of February this year, successful results had been achieved with a pair of 1 m diameter three-bladed CLT propellers fitted to a Trasmediterranea hydrofoil, *Barracuda,* which has a 34 knot service speed. Each propeller is driven at a nominal 986 rev/in by a 2100 bhp main engine.

The Spanish owner runs four hydrofoils in its fleet and wanted to improve performance by reducing main engine overloading during take-off and the length of the acceleration period. Trials and service experience on *Barracuda* since the CLT propellers were fitted have proved that the higher thrust supplied has met both requirements.

Trasmediterranea has confirmed its intention to order CLT propellers for the remaining hydrofoils in its fleet. The company already had experience of the benefits of retrofitting CLT propellers when blades of this type were used to replace conventional CP blades on a series of three 4540 dwt ROROs in 1993 and 1994, *Ciudad de Alicante, Ciudad de Cadiz,* and *Ciudad de Burgos.*

Trials were carried out last July just before and just after fitting the CLT propeller, to compare the ship's performance. Results showed fuel savings of around 9%, significantly lower propeller excitation levels, and noticeably improved maneuvering characteristics, including a smaller turning circle. Subsequent service experience has produced a higher fuel saving figure of around 12%.

There are several reasons why owners should be wary of apparently similar designs to its CLT propeller, according to Sistemar, which claims 20 years experience in designing, testing, and full scale evaluation of tip loaded propellers.

Sistemar says that not only is the CLT design extremely complex, but extrapolating model test results up to full scale can only be achieved using the method developed by Sistemar, to which only the Netherlands Ship Model Basin, MARIN, has access. Traditional theories for propeller design and extrapolation of model test results are not valid for tip-loaded propellers.

Design tolerances for tip loaded designs are more critical than for conventional propellers. If the slope of the radial pitch distribution is too big, flow separation is induced. If this slope is too small, the tip section of the propeller blades may cause negative thrust and consequent loss of efficiency.

Another critical aspect when designing this type of propeller is that there is a risk of ending up with a very heavy or very light propeller if the appropriate design procedures are not followed, as conventional propeller theory is of no use when predicting all elements of a tip loaded propeller's pitch.

As well as design aspects, technical challenges in manufacturing tip-loaded designs also need to be met, which Sistemar has achieved during a long relationship with licensees Navalips and Fundiciones Adrio.

Sistemar guarantees that a CLT propeller will improve a ship's performance in accordance with its calculations, and the company can provide calculated improvements for specific ships free of charge. Because Sistemar does not need to carry out tests when designing a CLT propeller for a retrofit, the cost is significantly lower than for a competitor which needs to conduct model tests, and delivery time is also very short.

Over 200 CLT propellers have been delivered, ranging from fishing vessel versions to an 80 tonne unit for a 300,000 dwt tanker. Repeat orders from owners for new buildings and retrofits show that the results promised for CLT propellers are being achieved. Sixteen companies have CLT propellers installed on three or more vessels in their fleets.

WWW TIP

Visit an interesting and professionally designed World Wide Web home page to see and read about the HD-4 Hydrofoil and its inventor, Alexander Graham Bell. Good photos; good text.

The WWW URL is as follows: http://www.chatsubo.com/fitzgerald/bell/inven-

MEMBER NEWS

Mike Terry retired from Boeing defense and space in 1995 and opened a consulting firm in Seattle WA USA. He has been supporting Joe Sladky at Kinetics with proposal preparation and coordination the first annual Seattle area model hovercraft high school competition.

Eugene P. Weinert, P.E. is teaching thermo-fluid science subjects at Drexel University in Philadelphia PA USA. He also provides consulting services in marine and mechanical engineering and in gas turbine systems.

S. Tanaka returned to Japan in late July 1996 after three and a half years in the US as Kawasaki Heavy Industries (USA) VP Marine Sales. Mr. **Masami Kawai** has assumed Mr. Tanaka's former responsibilities in the US. Mr. Tanaka's new business address is as follows: Europe & Americas Department, Overseas Market Office; Corporate Marketing & Business Development Group; Kawasaki Heavy Industries, Ltd.; World Trade Center Building; 2-4-1 Hamamatsu-cho; Minato-ku, Tokyo 105 Japan.

Harry T. Larson writes that he has happily flown his 24 ft submerged foil hydrofoil various times over the last three years on Quartermaster Harbor, Vashon Island near Seattle WA USA. He bought the craft in 1989, and its first flight was in 1992. During the week of June 5, 1996 Harry flew the hydrofoil to the Advanced Marine Vehicles Conference held at the Silverdale Inn on Dyes Inlet. He treated dozens of the participants to a ride around the harbor. The round trip to the conference via Shilshole (Seattle) was about 100 nautical miles with 4 hours of flight time. Harry points out that an aspect of hydrofoiling not always recognized in published articles is that hydrofoils are fun to fly. "Unlike the typical planing power boat, submerged foil hydrofoils roll into their turns, are highly maneuverable, have excellent pilot visibility, and — once up — pilots don't come off the foils unless or until they must."

NEW MEMBERS *(from Page 2)*

(RCS) signature reduction programs, and in 1989, Program Manager. He retired from Government service in 1994, and is presently employed as the Director, Combat Systems, for Symmetron, Inc., Fairfax, VA USA.

Dott. Ing. **Francesco Surace** obtained a degree in Aeronautical Engineering, after which he worked for an Italian aircraft builder, CAD/CAE Division of AERITALIA, for about six years. Subsequently, he joined the Rodriquez C.N. organization in Messina, Italy. There he served as Chief of foil, active stabilization and machinery design. He was also responsible for the Company's EPD system. Dr. Surace is currently serving as a consultant in stress analysis and structural design.

Doug Bombard is Chairman of Catalina Channel Express, Inc., of San Pedro, California, which operates fast ferries on the 22 mile route between Los Angeles and Catalina Island. Although his company currently operates monohulls and catamarans, he has expressed an interest in hydrofoils and particularly a Hydrofoil Small Waterplane Area Ship (HYSWAS) for commercial passenger use in the United States.

CALL FOR PAPERS

The 13th Fast Ferry International Conference will be held February 25-27, 1997 at the Singapore International Convention & Exhibition Center. A general call for papers has been issued. the organizers solicit a variety of topical papers addressing current concerns and interests or covering operating experience, safety, and new designs and developments. The deadline for submitting proposals (title and abstract) is September 18, 1996. Authors selected will be informed by September 30, and completed papers will be required by December 1. Also note that proceedings from the 12th Fast Ferry conference are available in a bound volume plus four loose papers at a price including postage of £105 (Europe) or £125 (Overseas). To submit an abstract or to order last year's proceedings, contact Giles Clark, Fast Ferry International; Milroy House; Sayers Lane; Tenterden, Kent, TN30 6BW; United Kingdom. Phone: +44 1580 766960. Fax: +44 1580 766961. Internet: 100142.2135@compuserve.com.

YOU MAY BE AN ENGINEER ...
❶ If your spouse sends you an e-mail instead of calling you to dinner ❷ If you stare at a juice container because it says CONCENTRATE ❸ If the only jokes you receive are through e-mail ❹ If you have used coat hangers and duct tape for something other than hanging coats and taping ducts ❺ If your wrist watch has more computing power than a Pentium 166Mhz ❻ If your idea of good interpersonal communication is getting the decimal point in the right place ❼ If the best part of Christmas is putting together the kids' toys. MORE NEXT ISSUE...

The NEWSLETTER

International Hydrofoil Society

P.O. Box 51, Cabin John MD 20818 USA

Editor: Barney C. Black | AUTUMN 1996 | Co-Editor: John R. Meyer

THE FUTURE OF HIGH SPEED SURFACE SHIP DEVELOPMENT:

A U. S. CONGRESSIONAL PERSPECTIVE

Presented September 26, 1996 to a Joint Meeting of the International Hydrofoil Society, the US Hovercraft Society, and the SNAME SD 5 Panel at Fort Myer Officer's Club in Arlington VA

By William J. Andahazy

"...unless a new strategy for the future is developed, some sectors of the industry may cease to exist..."

I want to thank Jack Offutt and John Meyer and the members of the Society for the invitation to speak tonight. What we will discuss I believe is tantamount to a wake up call not only for this community, but also for the United States. This is because the nation may not possess critical elements of high speed sea surface technology as it moves into the next century in competition with the other countries of the world for new markets and new transportation developments.

As most of you know I am fresh off the "Hill" as a senior professional staff member of the House National Security Committee (HNSC) responsible for Research Development, Test, and Evaluation

Continued on Page 4

IHS HOME PAGE

Visit the new IHS home page on the World Wide Web. The URL is : http://ourworld.compuserve.com /homepages/barneycblack One or more volunteers is needed to help expand and maintain the web site. Please indicate your interest by sending an e-mail from the web site.

1996 DUES OVERDUE

A few valued IHS members still have not paid their $20 annual dues. If you have been remiss in keeping your dues up to date, please send your check now to the address above.

IHS E-MAIL ADDRESS:

102134.1446@compuserve.com

INSIDE...

PRESIDENT'S COLUMN

This is the second IHS Newsletter (NL) with a "face lift". We thought that Barney Black did a pretty good job of making the NL more attractive and pleasing, and in general we have had a favorable response from most members that we have talked to. However, Sumi Arima has some constructive comments which have been considered in this edition. We hope that we have been responsive. The IHS Board of Directors would still like to hear from you on this issue, and looks forward to your reactions and suggestions, as always.

In my Summer NL column I mentioned an initiative being undertaken by the IHS and our "sister" organizations, the United States Hovercraft Society and the Society of Naval Architects and Marine Engineers Ship Design Panel (SD-5) for Advanced Marine Vehicles. The "strategy" group formed last summer and consisting of the IHS and USHS presidents and the Chairman of SD-5 has been expanded to include several members of each organization. The IHS members added are Mark Bebar and Jerry Gore.

The group has met several times, and has laid out a tentative schedule for a one-day Workshop to be held on "Capitol Hill", Washington, D.C. sometime next Spring.

The objectives of the "Advanced Marine Vehicle (AMV) Workshop are to: 1. Provide information to decision makers about the state-of-the-art; 2. Foster interest from ship owners and investors in fast ferry transportation; and 3. Create a national strategy for the development of AMV transportation systems as part of the Intermodal Surface Transportation Efficiency Act (ISTEA). The latter is up for reauthorization in FY 1998. The target audience for the Workshop has been identified, the Workshop structure outlined, tentative speakers have been suggested, and budget estimates/arrangements for the meeting facility are underway.

It is anticipated that the audience for this Workshop will include key legislators and staffs, state and national transportation planners, ferry operators, boat and ship builders, and representatives of such organizations as the Transportation Research Board, Passenger Vessel Association and American Waterways Operators.

In connection with this initiative, the September meeting of the TROIKA, for which the IHS was responsible, featured Bill Andahazy as a guest speaker. See the feature article starting on page 1. Another article on this same subject, namely, "Needed: National Ferry Policy", reprinted herein, shows that we are on the right track, and the Society can make a sizable contribution.

There will be more information on the details of this Workshop in subsequent NLs or even special announcements as the time approaches. So please stay tuned

John R. Meyer, President

WELCOME NEW MEMBERS

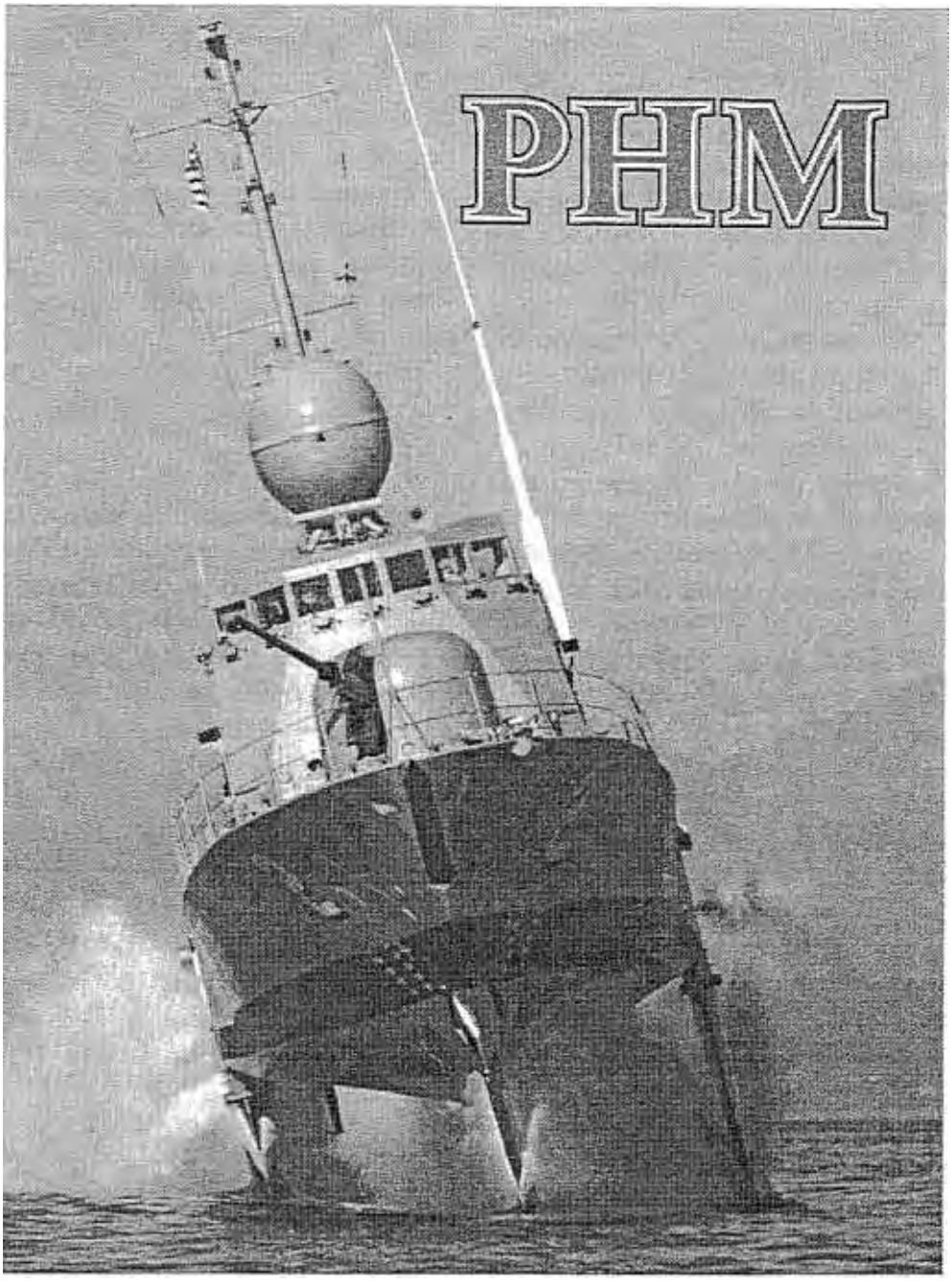
Dr. Gerrie Thiart is a member of the faculty at the University of Stellenbosch, in Stellenbosch, South Africa. He obtained degrees in Naval Architecture at the University of California (LA). Currently he is a senior lecturer in Fluid Dynamics at Stellenbosch. One of his colleagues is Professor Karl-Gunter Hoppe who has developed/patented the HYSUCAT (Hydrofoil Supported Catamaran) concept. Dr. Thiart became interested in hydrofoils through him, and has subsequently done some theoretical work on the subject.

R. Karthik is a student at the University in New Delhi, India. Mr. Karthik is studying Naval Architecture and Shipbuilding. He is currently in his final year there and has undertaken a project to design a hydrofoil. Although now in India, Mr. Karthik has a contact address in Davis CA.

PHMs DOWN AND OUT; DRUG TRAFFIC UP

By George Jenkins

The *Washington Post*, in a September 3, 1996 article, calls the Caribbean the key to U.S. drug trade and points out that the area is reemerging as the major transit zone for cocaine and heroin. According to the *Post*, "In the 1970s and early 1980s much of the cocaine and marijuana bound for the United States was shipped through the Caribbean. In the mid-1980s, however, the flow began shifting toward Mexico as law enforcement agencies targeted the Caribbean for interdiction efforts... But... drug traffickers recently began to reactivate their old Caribbean smuggling routes..." The article goes on to describe the resultant massive growth in violent crime, economic instability, and governmental corruption among many of the small island nations of the region.



Ex-Hercules In Prouder Days

Why this shift back to the Caribbean? The *Post* quotes law enforcement officials as placing at least partial blame on the reduced level of resources devoted to Caribbean drug interdiction, starting in 1993. The article shows a disturbing reduction in funding for this effort, starting in 1993, with 1995 levels at only about 56% those of 1992. A very small portion of that reduction — about $18M of a total of $444M "saved" — came from the decommissioning of the U.S. Navy's PHM hydrofoil combatants. These 6 ships, formerly homeported in Key West Florida on the northern rim of the Caribbean, were used widely (but not exclusively) in drug interdiction. They had a splendid track record in this mission area; 3% of the Navy accounted annually for more than 30% of Navy drug seizures! The PHMs began operating in the Caribbean in 1983, when drug trafficking in the region was at its peak.

Intensified interdiction efforts, which included increased use of these ships, gradually throttled off these "trade" routes and forced the drug czars to rely more heavily on the less direct, more expensive, Mexico

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PHMs DOWN AND OUT

(Continued From Page 3)

routes. By the time the PHMs were decommissioned in 1993, the Caribbean traffic had been reduced to a trickle of its former volume. Now the pendulum has swung back, it appears.

The Navy has in being the 16-ship Western Hemisphere Task Group to handle contingencies in the Western Atlantic (e.g., Haiti) as well as Caribbean drug interdiction. This group, homeported in Mayport FL comprises Guided Missile Frigates, older Destroyers, and older amphibious ships. Will this group be as effective as the PHMs? That is difficult to predict, though its efforts have apparently not been noteworthy thus far. PHMs had the advantages of speed and location in the Caribbean Basin over other platforms in drug interdiction . The combination gave them the ability to sortie rapidly to intercept other craft in the area, even in stern chase scenarios; alternatively, they could often reach the site of air-dropped contraband before the "go fast boats" of the drug traffickers.

Could the PHMs be reactivated to cope with the problems cited in the *Post* article? Unfortunately, no. Ex-USS HERCULES (PHM 2) has been sold without her foils to Mr. B. J. Meinhof of Missouri for private use. *[The next NL will include an article about Mr. Meinhof's plans for ex-Hercules - Ed.]* The other 5 PHMs have been sold to Charleston Shipbuilders Inc., of Charleston, SC for scrapping. Ironically, these ships were being towed to Charleston about the time the *Post* article was being written.

FUTURE DEVELOPMENT

(Continued From Page 1)

(RDT&E) issues in a wide range of programs and industrial topics of concern to the military. Since I'm now a full fledged bona fide "private citizen," my plan is to work with industry in the promotion of technology and programs. I intend for this talk to be a "tell it like I see it" session with questions and discussion to follow.

I appreciate being asked to give an outsider's observations tonight on high speed ship development. I've worked similar issues in other industries and have had the responsibility for the strengthening of a number of industries that were so-called "endangered." However, I feel somewhat of a novice in this field since this is a technology in which I'll be the first to admit, I personally have paid little attention to at the Congressional level. Yet, at the same time, I feel a bit relieved because I know that in the Congress, no one else has either!

I will add also, that I feel very welcome to be here tonight since I've had an affiliation with many of you in my earlier career at David Taylor Research Center (or NSRDC or NSWC or what ever it is now) as well as when I was at The Defense Advanced Research Projects Agency (DARPA or ARPA, or what ever it is now) and in the Congress at the Armed Services Committee. I look forward to continuing our relationship in my private practice in the future which, I hope, will be a little less bureaucratic.

In my former job with the Committee, I had a chance to see how the Department as well as other Agencies support (or do not support) technologies and industries it views as important to the nation's security, be it national defense security or national economic security.

I have not been very close to this community of high speed ship developers. But unless I've missed something, this industry appears to be one of the many defense supported industries that is at a critical point in its existence. That is to say, unless a new strategy for the future is developed, some sectors of the industry may cease to exist. But you are not alone. This scenario existed with commercial shipbuilding, some facets of electronics, specialty metals, high definition displays, submarine technology, etc.

I believe we can take a lesson from these programs and other similar initiatives to apply to the high

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(Continued From Page 4)

speed surface ship technology and industry to see what might be done and more importantly, how to get it done, if we intend to strengthen this sector of the industrial base.

A few decades ago hydrofoil and air cushion vehicle development held a stronger position at the budget table as the U. S. Navy was forming the framework of its future fleet. There was a predictable and supported development program, and a small fleet of patrol craft and landing vehicles was constructed. But, when the war in Southeast Asia concluded and the Department's attention, and funding, began to focus on strategic systems such as Star Wars, MX, rail mobile and midgetman missiles, the B-2 bomber, as well as on suites of tactical modernization systems for the Services, to out muscle the Soviet "Evil Empire," support for contingency technologies and lower priority programs waned.

Today, now that the Cold War is over, we are experiencing even more draconian funding reductions and priority shifts as the public demands that military downsize. And in doing so, the Services are focusing the smaller available resources on what they consider essential modernization programs to support today's forces. And yes, you guessed it, the losers will be technology programs and lower priority items.

The net result is that not only you, who are concerned about the future of high speed surface ship technology, but technology of every industry is, and will continue to be, challenged to define and justify the reasons why there should be continued public investment.

Simply stated, each industry should constantly be redefining its own destiny and justifying its own continued existence. It is a living, continuing, functioning process in a world of rapid technology change.

Most of us, particularly in government, have been accustomed to a funding stream for technology development that originates at the Office of Naval Research (ONR), the Naval Sea Systems Command (NAVSEA), or the Department of Defense (DoD) with reasonable objectives. We work the program, we make progress, we repeat the process, year after year. There always seemed to be support for our programs. The new reality is that with the current and projected budget pressures, continued development of technologies that are not in the main stream of the Navy's (or DoD's) policy, or even in some cases, new knowledge for knowledge's sake may not find support. The danger for the Nation and the military is that there may not be the technologies around that we expect to make a difference in future surface fleets.

Another option of course is to break out of the military market and pursue developments on the commercial side. Better yet would be some dual-use program that drew its support from both funding sources. More on that later. But the key questions are: Are there markets for what we develop and build? And if so, how do we engage public officials and private industry to create a program?

If IHS hopes to make a difference, hopes to continue the legacy of its technology development and its industry, there are four considerations I would like for you to take aboard as a starting agenda. They are: market assessments, defining a vision for the future, developing funding strategies to minimize public investment, organizing a campaign to get there.

Market Assessment

Let's face it. Without a market assessment to determine the potential customer or user of a technology, it will be difficult to support the program. There are many technology sectors that are receiving declining resources. I'm working with the oceanographic community that has been receiving a smaller portion of the National Science Foundation (NSF) budget, declining annually for the past dozen years. Yet the ocean holds the potential for energy independence, food and fresh water for the ever expanding population of the planet, biochemical materials for everything from adhesives to pharmaceuticals. My focus on this is to generate a greater importance of research to stimulate new industry.

In the case of national defense, the de-emphasis of Anti-Submarine Warfare has also caused a decline in the studies related to deep water oceanography, which is forcing a realignment of the research strategy.

Alternatively, electronics and advanced materials enjoy a significant amount of research support. And why not? Electronics is nearly a trillion dollars per year industry for the nation. It pervades everything we do, and it is the cornerstone technology for military modernization. Certainly, electronics far and away exceeds in-

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vestment in platform technologies in the military R&D budget.

There are clearly some exceptions such as submarines, which continue to capture the attention of the Members of Congress. Congressman Hunter (CA), the Chairman of the Defense Procurement Subcommittee, has made advanced submarine technology and an accompanying prototype program an HNSC priority. Right or wrong, you have to admit he has everyone's attention. He justifies his initiative on the importance of undersea superiority and the belief that the Russians have technologies that we are too conservative to try.

The degree to which there is that kind of horsepower to support high speed surface vehicles is not evident. So you have to do your own homework if you want any attention or expect any funding consideration for future development. I recommend you review the latest DoD and Service documentation on future needs, threats and trends. (Sea Dragon, From the Sea, The Joint Warfighting Science and Technology Plan, The Defense Technology Area plan, etc.) If you need a starting point, sit down with George Singley from the DDR&E. He's about as reasonable a person that there is in the Pentagon. And, he thinks like a warfighter.

So the degree that high speed surface ship development makes sense militarily (or commercially for that matter) must be examined creatively with the widest vision. My wife always says that "you have to kiss a

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HYSWAS DEMONSTRATOR, QUEST UPDATE

By John Meyer

The original press release describing the U.S. Navy's Hydrofoil Small Waterplane Area Ship (HYSWAS) concept demonstrator vehicle *QUEST* was published in the Summer 1995 Newsletter (p. 10). Subsequently updates were reported in the Autumn and Winter IHS Newsletters (pp. 9 and 5). Following only a limited number of trials due to funding shortages, *QUEST* was laid up for the winter until additional funds could be allocated to perform certain modifications. However, very encouraging trials results were obtained proving that this relatively small 27 ft, 12 ton vehicle could operate in rough water waves of 5 to 7 feet confirming predictions of remarkably low motions.

On July 1, 1996, a contract was awarded to Maritime Applied Physics Corp. for incorporation of several modifications to *QUEST*. These include: decrease engine air intake temperature, replace foil hydraulic actuators, rudder size modifications, auto-pilot (heading hold) implementation, radar installation, and improved data acquisition system. All modifications were completed and ready for system checkout at Laurel Maryland during October 1996. The vehicle was trucked to the U.S. Navy Amphibious Base at Little Creek, Virginia for rough water trials on October 28, and launched on November 4.

QUEST flew that same day (November 4) for the first time since November 1995. The upgraded systems worked flawlessly. The biggest news was that the rudder modifications were very successful in that foilborne maneuverability has been improved considerably. Operating in the vicinity of the Chesapeake Bay Bridge-Tunnel near Norfolk, Virginia, trials included hard turns and high speed runs in relatively calm water to expand the baseline database. During the remainder of November, rough water trials are planned well out into the Atlantic Ocean. The rougher the water the better to collect much needed motions and structural loads data on this relatively new hullform.

QUEST Foilborne During 1995 Trials

lot of frogs before you find the prince." The point is, market assessments assess every aspect of the technology application for potential user benefit. That other countries are building commercial high speed surface ships may give us cause for concern, but that argument alone will not suffice, especially if those ships, once in service, may be subsidized by the governments of those countries.

The degree to which there may be renewed desire for high speed surface ships is not totally evident. However the key is maintaining an organized connectivity to the military scientific leadership, and awareness of the application of the technology or segments of the technology as potential solutions of problems/needs cited by future defense plans.

Likewise, on the commercial side, market assessments must be conducted to determine the potential for a business opportunity and industrial investment. The key is that the assessments should be "Landmark" assessments that involve the technical community, academia, mid and high-level administrators of industry, government, and the military. Perhaps the Transportation Research Board of the National Research Council might be an appropriate assignment for a commercial assessment.

Be aware of the negative impacts (i.e. who gets hurt) if you propose replacing existing industries such as trucking. This will have a negative impact not only on the Teamsters, but also on road construction industries, loaders, fuelers, food service, repair infrastructure, etc. Also recognize union interests and potential lost revenue at the federal, state, and local levels. Understand that new infrastructure will be created, but old habits go down hard.

Defining a Vision

Prior to this talk I reviewed some well thought out details of your proposal for both studies and a development/demonstration program for high speed surface vehicle transportation under auspices of the Intermodal Surface Transportation Efficiency Act, commonly referred as ISTEA.

That proposal, which is excellent, sets in motion the second principle I recommend, that of establishing a vision and goals that address the market opportunities identified by the studies. The Bill language that I reviewed put into place an Advisory Committee which is a good start not only to match the technical program to the market opportunity, but also to be valuable in lining up your most critical asset — Champions!

I believe that without Champions there is little chance you will see any full scale demonstration program which is detailed in the proposed legislative language. Certainly not at the dollar values you envision. I believe the market assessments you make will be essential in substantiating any follow on technical program. Which is indeed robust, yet in retrospect, I don't see any less ambitious plan that is worth pursuing other than a prototype program. Therefore an accurate supportable funding plan and legislative strategy to get the funding will be extremely important.

Let me say a word about funding strategies. The current mood, at least for the Defense Committees, is toward cost sharing where technologies have dual use application. This is not just a theme for DARPA; it is the way they do most of their business.

The Services, on the other hand, have been slow to implement new acquisition strategies for technology development. Our Committee (The HNSC) initiated legislation in the FY 1996 Defense Authorization Act to force the Services to cost share 5% of their technology base budgets at not less than 50/50 ratios.

Minimizing Public Investment

In the draft document I read regarding ISTEA there is a 90/10 government-to-industry cost sharing proposal. I'm not totally familiar with the original ISTEA legislation, so what you are proposing may be a little heavy on the government's contribution side. It may be that you expect overwhelming evidence that the proposed initiative will show economic and social benefit that will justify the public investment. But if it's that good, it could also be argued that more private investment is justified.

I also suspect that any attempt to attach funding from the Transportation Trust Fund will be met with some resistance from the trucking or road works people, since the fund was raised through gas taxes.

Developing the Campaign

The last tenet is strategies. OK, we've got the market assessment. We know what we want to do. We believe we have found the right funding mechanism and dollars are defensi-

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ble. Now all we need is a roadmap to get it sold.

If you have done your homework, you ought to be able to identify champions or decision makers in key places who believe in what you are saying and are going to go to bat for you. You as an organization need to tell your story of facts to the cognizant agencies and offices that will eventually be responsible for execution of your program. Things always go smoother if they are onboard before going the Congressional route.

With the Federal Agencies you are either in the Planning Objective Memorandum (POM) for that year or you have to get to Congress to alter the Bill being considered. Again you will have to seek out or create Champions of Members and staff. Your task is to show National and local (Congressional District) benefit in terms of projected jobs and new industry. A few pointers here: Get started early in the congressional calendar, but don't rush the strategic plan.

The ISTEA is up for reauthorization in FY 1998, so the timing for your initiative is excellent. This is the ideal time to attempt to change legislation to include water surface transportation. Actually, if successful, this would make it a true intermodal program. With the reauthorization there will be a number of hearings for sure. Those hearings often get set early, so if your message is strong you may want to try to be a part of the process by offering to send witnesses.

In summary, (1) Get the hard facts on the table in your marketing or "worth" assessment. Investigate all public and private sectors. (2) Define what you want to do or develop. Get into enough detail to whet the appetite and to convince people you know what you are talking about and that there is an audit trail of solid information to back it up. (3) Find the most creative funding arrangement that shares risk and puts minimum stress on the public budget. (4) Find champions and sell the deal!

NEEDED:

NATIONAL FERRY POLICY

Marine Log, October 1996

[In an article "Demands for Ferries Speeds Ahead" in the October issue of Marine Log, *a sidebar, reproduced below, argues for a U.S. National Ferry Policy. -Ed.]*

As ferry ridership in the U.S. continues to grow, the Passenger Vessel Association (PVA), Arlington, Va., has asked Congress, in reauthorizing the Intermodal Surface Transportation Efficiency Act (ISTEA), to adopt a policy statement affirming the important role of ferries in the nation's transportation system.

Testifying before the House Subcommittee on Surface Transportation, I. Bernard Jacobson, general manager of the North Ferry Co., Shelter Island Heights, N.Y. and chairman of PVA's Ferry Council, declared that "ferries are a critical component of public transportation in many American communities." He pointed out that both "publicly-owned and private ferries provide vital intermodal service by carrying passengers, automobiles and buses in locations where heavy infrastructure alternatives are insufficient or impractical.

Because of ferries' flexibility and environmental and economic attractiveness, Jacobson urged Congress to:

- Direct transportation planners to incorporate public and private ferry service into regional transportation plans where such service is viable.
- Have Metropolitan Planning Organizations encourage private ferry applicants to work with public sponsors to access ISTEA funding and support.
- Encourage private control of publicly funded vessels and terminals through long-term leases or other mechanisms.
- Encourage public entities to utilize the resources of private ferry operators by entering joint ventures with private operators or by contracting out routes and services that might otherwise be served by publicly-owned ferries.
- Permit a flexible application process for ferry applicants for ISTEA funding that recognizes ferry service can be implemented quickly and the application process should be commensurately responsive.

STUDENTS NEEDED

IHS Membership for full time students is only US$2.50 per year. If you know people interested and eligible, please encourage them to join now!

LETTERS TO THE EDITOR

Too Bold

Just received the IHS Summer NL today. I found it very difficult to read. The format is fine, but the bold lines and the close similarity of the Headings, Titles, and Subtitles made it difficult to determine whether I was to continue reading or I was starting a new article. Reading Bob Johnston's article on Sachsenberg, I got to the subtitle "Before von Schertel" and thought it was a new item. I went back and read the IHS home page, etc. before coming back, when I realized it was a continuation of Bob's article. I suggest you limit use of bold print, especially on subtitles. The change from all caps to caps and lower case was not realized at the time.

The other problem I had was with the letters to the editor. I was doing okay until after Bernie Tsao's letter when Marc Schafer, Bernie Tsao, and Joe Schobert comments led me to confusion. These thoughts need a comment or two from the editor to lead us through the maze. In fact, how did these comments occur?

You left us hanging on page 12. The paragraph under LM500 advantages leaves us with an ellipsis.

The content is good. I also noted it was easier to read with all the acronyms defined. That part is an improvement. Thanks.

Sumi Arima

[Reader feedback, especially specific comments like those in Mr. Arima's letter, helps us make the NL better. The partial sentence on page 12 of the Summer NL should have read: "Other benefits of turbine propulsion include: lower maintenance costs and higher reliability, allowing for a smaller engineering crew and lower manning; propulsion speeds in excess of 40 knots; and minimum engine room space, facilitating larger passenger and vehicle capacities."

Now that IHS is reachable by Internet, we will include interesting e-mail exchanges here. -Ed.]

Two Points

I am writing to provide timely additional information concerning two articles in the Summer 1996 NL:

Since Garry Fry sent his letter detailing his proposed PT-20 operation on Sydney Harbor, I am pleased to say that Sea Flight Cruises Pty Ltd. has had *Manu Wai* successfully running on foilborne trials. A retired Rodriquez engineer assisted with repair of the damaged foils. I plan to visit Garry in the coming days to see how *Manu Wai* is progressing.

Following the interest shown in the Workshop on 21st Century Flying Ships on November 7-8, 1995, I refer to letter from Athol Yates (page 6, IHS Summer 1996 NL) a further workshop on Ecranoplans and Very Fast Craft is being held December 5-6, 1996. Unfortunately this workshop will be held before there is an opportunity to announce it through the IHS newsletter. In any event, they would have to be keen to fly all this distance for a two day workshop!

Martin Grimm

Bond... James Bond

Hello— Believe it or not, I'm writing the next James Bond 007 novel. My name is Raymond Benson, and I've been commissioned by the Ian Fleming Estate to pen the next book, which will be published next spring. I need some quick info on hydrofoils... The situation is this — I need a hydrofoil that can travel from Hong Kong to Perth, Australia in 3 days. That's about 3,728 miles. Is it possible? How often would it have to refuel? How many miles can a good hydrofoil travel before refueling? Can you recommend a brand name or model of a hydrofoil, jetfoil, or other seacraft that can do this?

[Although IHS responded promptly to this e-mailed request suggesting how the trip could be accomplished, it was not to be, as the follow-up e-mail from Mr. Benson (reprinted below) shows. -Ed.]

Thanks for all the great info, which I can probably use another time! I had solved the problem with use of a cargo seaplane doing a rendezvous with the ship in Singapore. Cheers,

Raymond Benson

Proposal to Mate

Having retired as of three years ago, I find, much to my regret, that I no longer find it practicable to retain memberships of most Associations and Clubs. I particularly regret that I have found it difficult to time in any

Continued on Next Page

further visit to the USA to fit into any annual meetings of the IHS. Particularly, to allow me to meet such very dear old friends as Bob Johnston. To be honest, my onetime "welfare" country has (inevitably) had to "eat" the consequences. And so have pensioners as rest of population. This has lead to our drastically having to reduce all non-revenue expenses. This is the reason for mine also having to include the IHS. With a bit of luck - and in spite of my age - I might yet revive it at some later date.

May I come forward with a suggestion: Whilst I have in no way lost interest in continued hydrofoil development, I have rather become a CAT fan. I am sure Bob could elaborate on this in my behalf. So, all in all, seeing that CATS have a very much enhanced future, I do, nevertheless, foresee a certain future that will continue improving upon the "mating" of hydrofoils and CATS. At least as regards smaller hulls. I leave the medium and large hull future non-commented. Reason for that being that I cannot exclude a joint Russo-US-(and European) future for large Ekranoplanes. In turn, jet engine developments becoming the main contribution to such (future) possibilities.

It is my consequent hope that the IHS join hands with all and any Societies dealing with such "PLATFORM" [interests] mainly concerned with over-water transportation.

Alexander Reichel

History Tests

I am a student at Old Dominion University, Norfolk VA, and I'm currently working on a project to design a flying boat that uses a hydrofoil to eliminate the "step" on the hull. This would allow faster takeoff and higher cruise speeds due to decreased drag. I have seen mention of the Navy doing tests in the 70's of small flying boats using hydrofoils. My question is, does anyone in your group know of these test and if so how can I get ahold of the information? Please send your answer to *ashbyk@juno.com.*

David A. Kitzmann

Lost Kitter

Would anyone please send me the address (postal/e-mail/fax) of Sam Bradfield whom I believe markets hydrofoil kits for catamarans? I wish to obtain a set for my 14 ft SeaSpray catamaran. Many thanks in advance for your help, e-mail me at *rnap@islandnet.com.*

Roger Napier

[If anyone without Internet access wants to answer either of these e-mailed requests, just mail hard copy to IHS, attention NL Editor, and we will forward the information. -Ed.]

High Point Admired

Hi. I found your web page tonight and just had to bother you. First off, I would like to know if I can get the student membership rate, I am 16 and homeschooled. Second, I would like to have a sample copy of the newsletter.

I have been interested in hydrofoils since I discovered the USS High Point (PCH-1) in my own backyard. She is currently on the Columbia River, apparently owned by Diversified Marine. At first, I thought she was a torpedo retriever, since the only pictures I have of that type of craft were at an angle that made it look similar to the High Point. But then, I was flipping through a book of US naval vessels, and I found a picture of the High Point in some obscure section of the book that I almost missed. I was very suprised, and immediately set off to find more information. So far I have only found a few books and a web page. I have been considering calling Diversified Marine to see if I can get a close-up look at the High Point, but I get extremely nervous under such circumstances and have not done so yet. Maybe someday I will be able to overcome that nervousness, but that does not appear to be something that will happen anytime soon. I guess I should send this message before it gets too big... Thanks for your help

John Rollins

[Bill Ellsworth was kind enough to autograph a copy of his book Twenty Foilborne Years, the US Navy Hydrofoil High Point PCH-1 and send it to John Rollins. That should tell him all he wants to know and more. Note that student membership in IHS is a genuine bargain at only US$2.50 annually. -Ed.]

See Article, Page 16

The Letters To the Editor section allows hydrofoilers to ask for or provide information, to exchange ideas, and to inform the readership of interesting developments. All are invited to contribute.

HYDROFOIL NEWS DIGEST

OPERATORS FORM FAST FERRY LOBBY GROUP

Fast Ferry Int'l, October 1996

The second meeting of the recently formed International High Speed Craft Operators Association (IHSCOA) took place in London on September 13, 1996. The Association is still in its formative stages but is setting out to provide a platform/lobby for the combined interests of fast ferry operators.

The chairman, Tony White of Condor Marine Services, explained the need for a discrete fast ferry owners lobby group. "At the present time there are numerous organizations offering agendas for meetings to discuss specific issues relative to the High Speed Craft and ISM codes, but which do not address the ever increasing wide range of operational and practical difficulties associated with high speed craft.

"There are a variety of legislative bodies representing administrations who, together with numerous third parties, are creating the regulations which control the high speed craft industry.

"There is a wealth of knowledge and experience for these vessels within the UK and Europe. However, it is concentrated in isolated operations and has hitherto acted independently in solving problems or confronting administrations.

"We felt that high speed craft operators should cooperate to the benefit of all concerned by sharing technical awareness and development, general expertise, crewing and safety training together with developing coordinated responses to specific issues with administrations and legislation."

The response to the suggestion has been overwhelming. Ten owners from around the world sent representatives to the London meeting. Together with the apologies for absence, the list began to read like a who's who of the fast ferry market. In addition to the operator members of the group, there were several invited observers, including suppliers and regulators.

The aim of inviting suppliers and regulators is, says Tony White, to open a route for open and frank discussion about points of mutual concern over the future of specific areas of the high speed market. IHSCOA already has plans for future meetings, and suppliers have been invited and have committed themselves to becoming involved in the ongoing dialogue.

In general terms, the London meeting invited comments on a wide range of topical concerns for the industry, including spare parts pooling, crewing and staffing problems, long term training, and noise and environmental pollution.

The subject of crisis management was also considered in some detail. Condor Marine Services (CMS) produced a uniquely qualified speaker, Alice White, the company's cabin services and crew safety training manager, who had recent direct experience of crisis management with the crash of TWA Flight 800. She came to CMS with a background as a senior flight service manager at TWA. On retirement and subsequent relocation to Europe, she became part of the airline's global crisis management team in a stand-by volunteer capacity. Following the recent crash of TWA 800, she was drafted to New York as a key member of the trauma response unit.

She detailed the problems of dealing with such a catastrophic casualty and the need for a highly efficient, trained and practiced response to it. The parallels between an air casualty and a fast ferry casualty may not be immediately obvious, she said, but, given that the passenger numbers involved in TWA 800 were 267 and large high speed craft now carry in excess of 500, the fast ferry industry can and should be actively seeking to learn from the airline industry.

IHS COASTERS AVAILABLE

The same ceramic medallions featured on IHS award plaques are available as coasters in sets of four. The price per set is $12.00 plus $2.95 for mailing within the US. Overseas shipment is available by special arrangement. These 3-1/2 in. diameter coasters feature the IHS logo and the words "International Hydrofoil Society." They are the obvious solution for preventing water stains on your coffee table. Send your order directly to IHS at the address on the first page of the newsletter.

FAST FERRY FEASIBILITY IN CANADA

Fast Ferry Int'l, Sept 1996

Fleet Technology Ltd, a company based in Kanata, Ontario, has completed "a techno-economic study of the application of fast passenger/vehicle ferries to Canadian ferry routes." The project, carried out in conjunction with Band, Lavis & Associates of Maryland and The Mariport Group of Cambridge, Ontario, was sponsored by the Canadian Department of Transport. The study, FTL says, "was to determine whether introducing fast ferries on Canadian routes could contribute to changes that would reduce Government subsidies.

"Using the British Columbia Ferry Corp.'s project for large catamarans on the Nanaimo-Horseshoe Bay route as a 'calibration' for economic analysis and technical feasibility, the study identified candidate routes, examined feasibility of introducing fast ferries, and examined economics of selected routes.

"Rather than expend resources on technical design of vessels to fit the routes at this stage, the study used a database of existing and imminent fast passenger/vehicle ferries as a basis for technical feasibility, recognizing that existing vessels could be less than optimal for a given route.

"The resulting economic model allows examination of mixed conventional and fast ferries, seasonal operations, charter vs. purchase, terminal facilities, etc. Parameters that can be varied — as well as economic factors such as crew rates, fuel costs, etc. — include route speed profiles, downtime for poor weather, etc."

FTL concludes, "While several West Coast routes have promise, most routes in Canada do not have the volume, and have a high proportion of commercial and freight traffic — factors not usually beneficial to fast ferry operation — as well as the likelihood of ice covered waters.

"However, some seasonal applications of restructured routes using a mix of conventional and fast ferries may prove to be comparatively more economic than current systems."

Freccia del Sole

WAVEMASTER BREAKS THROUGH IN JAPAN

Workboat Int'l, Sept 1996

Wavemaster International, the Western Australian based high speed aluminum shipbuilder has become the first non-Japanese builder to sign a contract wtih the Maritime Credit Corporation (MCC) through which most Japanese ferry operators get government aid.

The contract worth Aus$3.9M is for a ferry for Ezaki Kisen based in Kyushu. It is a 24.5 meter catamaran seating 96 and travelling at 28.5 knots.

Wavemaster has another new client in Malaysian operator Johor Riau Ferry Sdn Bhd which has ordered three 37.5 meter 240 passenger high speed monohulls in a deal worth about Aus$18M.

40 YEARS AGO

Fast Ferry Int'l, Jul-Aug 1996

The world's first fast ferry service was introduced on the Straits of Messina 40 years ago when Aliscafi-Societa Navigazione Alta Velocita, the newly formed operating division of Rodriquez, introduced *Freccia del Sole*, a 72-seat PT.20 hydrofoil built by Rodriquez under license from Supramar, on the route between Messina and Reggio di Calabria. By the time it was withdrawn 29 years later, the vessel had traveled over a million miles. "When we were last in Messina, *Freccia del Sole* was still lying in the Rodriquez Yard. Somebody should preserve it. And yes, the route is still being operated by Aliscafi SNAV, using a variety of hydrofoils - including PT.20s."

CORSAIRE 11000 HAS SOPHISTICATED RIDE CONTROL SYSTEM

Fast Ferry Int'l July-Aug 1996

NGV Asco, the first of two Corsaire 11000 monohulls built at the St. Malo yard of Leroux & Lotz for Société Nationale Corse Méditerranée, or SNCM Ferryterranée to give the state-owned French operator its marketing title, entered service in the Mediterranean on April 20, 1996. By now the vessel should have been joined by *NGV Aliso*, the second Corsaire 11000.

R. Dussert Vidalet, the operator's technical manager confirmed that the main design requirements for its fast ferry were speed of 36-37 knots; capacity of 500-560 passengers and 150 cars; ability to carry campers, caravans and four buses; installation of both bow and stern doors; great comfort for the passengers; and the best possible safety level. Turning to hull design, he said that one of the most important criteria has been passenger comfort. SNCM used O'Hanlon and McCauley data to define maximum vertical accelerations and maximum motion sickness incidence figures of 2% in Sea State 4, 5% in Sea State 4.5 and 10% in Sea State 5 during a three hour journey in head seas at 35 knots.

A monohull design, he said, gave the lowest accelerations on the Nice-Calvi route of any design capable of carrying 150 cars. The normal Mediterranean wavelength of around 70 meters was too close to the length of a catamaran having that capacity.

The resulting Corsaire 11000 design is described by Leroux & Lotz as a deep V semi-planing monohull, with spray rails and flaps, of mixed construction with mainly longitudinal elements. The hull is divided by six transverse bulkheads and a single longitudinal bulkhead, between the two main engine rooms, into nine compartments.

SNCM's desire for passenger comfort is reflected in the ride control system. This vessel has virtually everything short of air cushion venting. It is equipped with a pivoting T-foil forward, a pair of fin stabilizers aft, and a pair of active trim tabs to dampen pitch, roll, heave, and yaw.

Maritime Dynamics supplied the controls and the T-foil, Vosper Thornycroft's Hydraulic Power Division produced the fins and hydraulic power packs, and Leroux & Lotz itself manufactured the trim tabs.

Vosper Thornycroft reports, "the RCS is among the most sophisticated in the world. It will also interface with the autopilot and KaMeWa waterjet system and use the fin stabilizers to reduce yaw and roll. This will help to correct the course stability problems that waterjet monohulls often experience because of the lack of underwater appendages and roll/yaw coupling."

Statistically, the area of operation of the Corsaire 11000s has an 80% probability of conditions being equal to or less than 1.50m significant wave heights and 5.0 second period (Sea State 4), a 90% probability of being equal to or less than 2,25m significant wave heights and a 6.5 second period (Sea State 4.5), and a 95% probability of being equal to or less than 3.25m significant wave heights and a 7.5 second period (Sea State 5).

VOSPER THORNEYCROFT BUYS MARITIME DYNAMICS

Fast Ferry Int'l July-Aug 1996

Of several recent fast ferry developments at Vosper Thornycroft, probably the most significant has been the acquisition by the company of Maritime Dynamics, Inc. The United States company was formed in 1972 to undertake marine technology research for advanced hull forms and marine motion control, mainly for U.S. military markets. More recently, the technology has been developed for the fast ferry market. Over 70 ride control systems have now been supplied by the company, which employs 35 people.

MDI is to become part of Vosper Thornycroft's marine Products division within the company's Enterprise Group. This, VT says, "consists of developing businesses defined as those which do not depend on the company winning ship orders." The Group now accounts for some 25% of the total turnover of parent company Vosper Thornycroft Holdings.

Explaining the background to the take over, the United Kingdom company says, "VT and MDI have worked together closely for several years in providing ride control systems for fast passenger ferries. On these projects, VT provides hydraulic equipment and fin stabilizers while MDI supplies sophisticated electronic ride controllers, T-foil stabilizers and active stern flaps.

"The VT/MDI partnership has supplied systems to ferries through-

Continued on Next Page

VT BUYS MDI

(Continued From Page 13)

out the world, including Europe, North and South America, and the Far East. MDI has also been particularly successful in working with Australian fast ferry builders and as a supplier to Scandinavian shipyards. Under VT ownership, MDI will remain autonomous but will benefit from VT's considerable financial and commercial strength.

"MDI and VT have entered a security agreement with the US government to enable MDI to continue classified US and overseas military work under its existing US security clearance.

"VT has declared its intention to invest further in MDI's ride control technology and to expand its worldwide presence to provide full support to the growing market for ride control. MDI will be VT's second notable marine product acquisition in the US. In 1991 the company acquired Van Dusen and Meyer, whose Naiad line of roll stabilizers is the world leader for yachts and leisure vessels.

Commenting on its newest company, managing director Martin Jay said, "VT and MDI know each other well and the acquisition cements a relationship which has grown successfully over the past few years. While the move brings the two companies together, they will still have the freedom to develop their individual activities and product lines. Acquiring MDI is another step in VT's move to broaden the base of the company by developing businesses which are independent of the timing of naval shipbuilding orders."

1997 CALENDAR

Fast Ferry Int'l, October 1996

February 6-7 — **Safety of High Speed Craft Conference**

London, England

Contact: The Royal Institution of Naval Architects
10 Upper Belgrave Street
London SWIX 8BQ, UK
Tel: + 44 171 235 4622
Fax : + 44 171 245 6959

February 25-27 — **13th Fast Ferry Int'l Conference/Exhibition**

Singapore Exhibition Centre

Contact: Fast Ferry International
Milroy House, Sayers Lane
Tenterden, Kent TN30 6BW, UK
Tel: + 44 1580 766960
Fax: + 14 1580 766961
e-mail: info@fastferry.co.uk

March 18-21 — IV Symposium on Hi Speed Marine Vehicles

Naples, Italy

Contact: Dipartimento di Ingegneria Navale
P. le Tecchio 80
80125 Napoli, Italy
Tel: + 39 81 768 2594
Fax: + 39 81 768 2103
e-mail: DIN@ds.unina.it

(Continued on Next Page)

NIGHT VISION SYSTEM LAUNCHED IN UNITED STATES

Fast Ferry Int'l, Sept 1996

Aerojet Business Development has launched an ANVC (Aerojet Night Vision Camera) infrared thermal imaging system for maritime applications. The equipment is being distributed for purchase or lease by National Offshore Supply Company, who describes the ANVC as "a new product to the market offering close to military performance at competitive commercial prices".

The system operates in the 3.5 micron infrared band which, Aerojet says, "is especially effective in the high humidity conditions often experienced by maritime users." Detection ranges are: swimmers at over 6,400 meters, 5.0 meter yachts at 15.5 km, freighters at over 27.5 km and low land masses at over 36.5 km. *[Amazing range... can this be achievable in real world conditions? - Ed.]*

According to Aerojet, "The camera is fully contained in an environmental enclosure qualified to the most severe marine environments which employs a hardened IR window and standard wiper. The sensor can be mounted on optional pan/tilt pointing pedestals or, if required, stabilized platforms that can compensate for pitch and roll.

"A standard analogue controller allows operation of most camera features. A Windows compatible software controller is also provided to control camera features, dual field of view adjustments, focus, black/white inversion, electronic zoom, and automatic/manual gain and contrast control."

1997 CALENDAR (CONTINUED)

Fast Ferry Int'l, October 1996

April 13-16 China Fast Ferry & Commercial Craft Show
Shanghai, People's Republic of China
Contact: Proshow
16a Chelsea Wharf; Lots Road
London SWlO OQJ, UK
Tel: +44 171 376 7777
Fax: +44 171 352 0818

May 13-15 Cruise+Ferry 97 Exhibition & Conference
Olympia 2, London, UK
Contact: Cruise + Ferry Secretariat
2 Station Road
Rickmansworth
Hertfordshire WD3 lQP, UK
Tel: +44 1923 776363
Fax : +44 1923 777206

Jul 21-23 Fast '97 Conference & Exhibition
Sydney, Australia
Contact: Baird Publications
PO Box 460
South Yarra 3141
Australia
Tel: +61 39826 8741
Fax: +61 39827 0704

IHS 25th Anniversary Celebration/Conference Proceedings

To order a copy of the *Proceedings* containing a complete collection of papers presented, send US$18.50 for shipment within the US or $25 for international shipment to George Jenkins, Treasurer; 713 S. Overlook Drive; Alexandria VA 22305 USA.

75 FOOT, 30 PASSENGER HYDROFOIL OFFERED

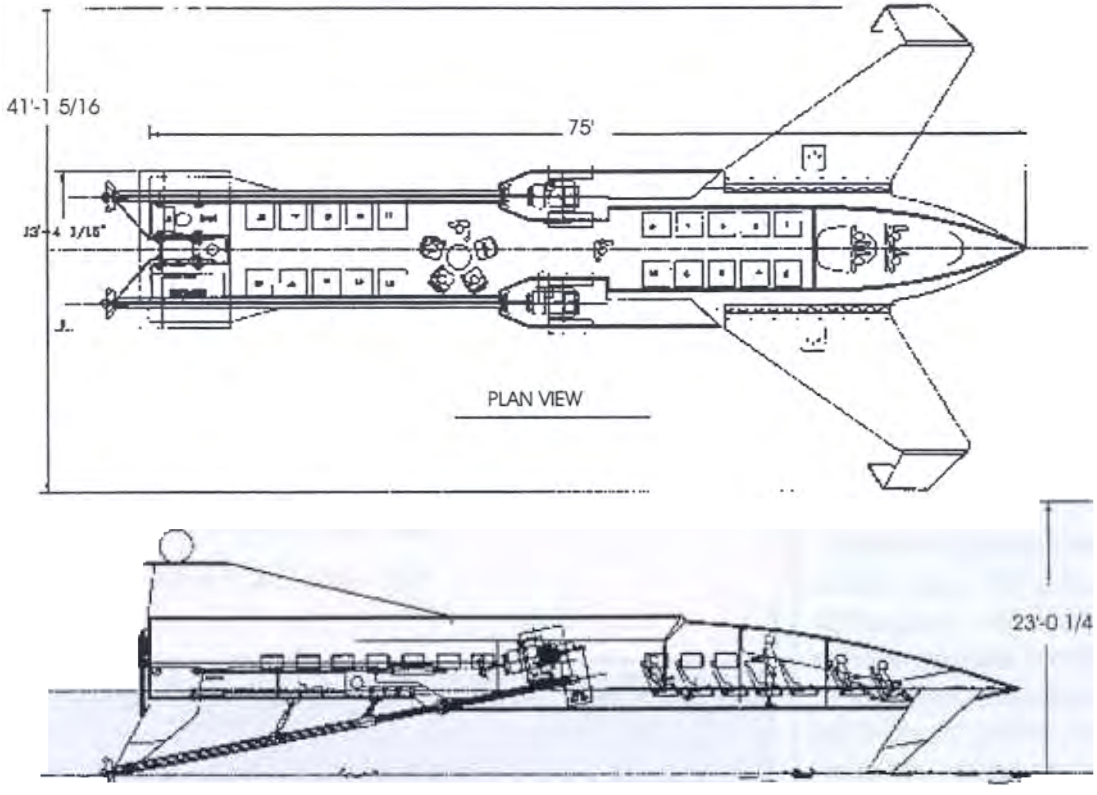
Hydrofoils Inc. (HI) of Lake Worth FL, known for its radio controlled (R/C)racing model hydrofoils and its human-carrying 16.5 foot two-seater hydrofoil is scaling its products up in size. HI is now marketing a 20/35 passenger hydrofoil that can be reconfigured quickly for different freight/passenger mixes at various capacities *(see below)*. HI president Ken Cook says, "We are the only company worldwide that offers a ferry boat in a speed range similar to and compatible with rail or auto.

"Features, electronics, and decor of this 75 foot length, 41 foot beam hydrofoil boat can be fully customized to the intended application, similar to a Fokker, Saab, or Gulfstream commuter airplane of like size, which of course affects the final cost considerably. For example, new twin T55 gas turbine engines with gearboxes from Textron Lycoming / Cincinnati Gear will cost us about $1.3M U.S. each. A finished running boat with this power is estimated at $6.8M U.S. Or, to reduce cost, remanufactured turbines are obtainable for less than half the cost of new, and similar savings can be achieved with the hull. One of these vessels can be operational in approximately 18 months after receipt of order. These figures don't include dock manufacturing costs (estimated at $1M U.S. each for an ADA compatible dock) or operating costs.

"Good docking features coupled with our rapid transit vessel can greatly enhance turnaround time on service and investment. We can move more passengers in reasonable lot sizes at greatly improved costs since unlike the 12- 35 mph normal ferry speeds, we operate at standard rail and traffic speeds."

Above: This 60 inch length, 30 in. beam, 16 lb. 5 oz. R/C hydrofoil racer offered by Hydrofoils, Inc. is not for your bathtub. It uses a .90 cubic in., 6 HP, nitromethane two-cycle engine and has been clocked at greater than 80 knots true speed.

For more information on passenger carrying hydrofoils or on R/C models, contact Ken Cook at Hydrofoils, Inc.; Box 6006; Lake Worth FL 33466 USA; Phone 407-964-6399. Or visit HI's world wide web site for photos/ info on R/C hydrofoil models: http://www.gate.net/~caseyc/hydrofoil.html.



The NEWSLETTER

International Hydrofoil Society

P.O. Box 51, Cabin John MD 20818 USA

Editor: Barney C. Black | **WINTER 1996-97** | Co-Editor: John R. Meyer

From the Archives...

GERMAN NAVY PROVES HYDROFOIL BOATS UNFIT FOR PEACE OR WAR

By Robert J. Johnston

"For military purposes a boat designed on this [hydrofoil] principle is therefore unsuitable. It even appears questionable whether the pursuit of the principle after the war has any point at all... The problem will be running against the swell, and it will never be overcome."

Among my papers is a report on the trials conducted by the German Navy on various hydrofoil boats during World War II. This report is an English translation summary of the German Navy's conclusions from trials conducted during 1940 to 1944 on various designs. The report was written by operational officers of the German E-Boats who studied the development and participated in the trials of this new type of high speed motorboat.

I am not completely certain just who gave me this report, but I believe it came out of my 1953 visit to Sachsenberg and von Schertel as discussed in the Summer 1996 IHS Newsletter. I recall their discussions at that time regarding these trials and the attitude of the German Navy toward the use of hydrofoils. The E-Boat commanders loved their high speed craft and could not visualize these beautiful planing boats being replaced by hydrofoils. The hydrofoil concept was primarily accepted by the naval engineers and the designers who supported the continued development of the hydrofoil. Similar attitudes were evident in the German Navy as late as the 1970s.

See German Navy Trials on Page 3

IHS HOME PAGE

Visit the IHS home page on the World Wide Web. The URL "address" is: http://ourworld.compuserve.com/homepages/barneycblack One or more volunteers is needed to help expand and maintain the home page. Please indicate your interest by e-mail, which you can send from the web site.

1997 DUES ARE DUE

It's a brand new year, and IHS dues are due once again... still only US$20.00 for regular membership or US$2.50 for full time students. Please send your check now to the address above.

IHS E-MAIL ADDRESS:

foiler@erols.com

INSIDE...

PRESIDENT'S COLUMN

As you can see from this and the last several Newsletters, the IHS is "reaching out and touching" a lot of people. Many of them are not IHS members, but are getting the Hydrofoil Message - thanks to NL and World Wide Web Home Page Editor Barney Black. In this way we are functioning more in accordance with the charter and purpose (in part) of the Society, namely: "Promote educational activities relative to hydrofoil subjects."

However, as some of us know who are "answering the mail" the best we can on an all-volunteer basis, it takes time and effort. We are therefore looking for members who can help other members, or potential members, in answering questions and providing advice/references. We are making a sincere effort to encourage IHS Home Page participants to join the Society and also let us know how **our** help has helped **them**. We therefore issue a plea to our more mature hydrofoilers to let Barney Black know your E-Mail address. He will put you on his distribution list and seek your assistance as soon as the cry for information and advice comes in. Of course it's often not too late to respond to such requests that you see published in the NL.

Recently, I sent Barney Black over 25 files containing a variety of items and articles that may be of interest to the IHS Home Page (IHP) readers. When this material is added to our web site, it will expand the IHP by orders of magnitude.

The next step in the process of making the IHP more interesting and complete will be to introduce a "Hydrofoil Photo Album". We have a host of hydrofoil photographs which must be scanned and placed in a server for access. This is the area we could use some help, since it will stretch Barney's present internet capacity. This is particularly so if many of the pictures are in color, which expect them to be.

Progress on the Advanced Marine Vehicle Workshop continues with meetings of the working group being held almost every two weeks. Bill Hockberger and I attended a meeting in January of the Transportation Research Board committee on ferries chaired by Martha Reardon. At that time Bill gave a presentation to the members present (about 25) outlining our objectives and plans. It was well received, and Bill attended several of the TRB meetings the following day that dealt with reauthorization of ISTEA (Intermodal Transportation Efficiency Act) scheduled for later this year. (See my column in the Autumn 1996 NL.)

During the next several weeks a group from the Workshop planning committee will be going to visit several legislative staff members to brief them on our plans and obtain reactions and suggestions for the Workshop now planned for April.

I am also pleased to report that a lot more information on the status of Ex-Hercules, PHM-2 has been obtained. See pages 10 and 16 herein for the latest. Any help that that some of the members familiar with the PHM can lend to BJ Meinhardt and Eliot James will be much welcomed, I'm sure.

We have decided to institute a formal reminder, in the form of an INVOICE from our Treasurer, to all members to pay their annual dues. We hope that you will do so soon - at the same time you send in your Ballot for the new Board Members. Thanks to all in advance.

WELCOME NEW MEMBERS

D. Hardy, who lives in the Canadian river city of Winnipeg, shares his father's interest in boating and works as a hydraulic design technologist for Buffalo Industries Ltd. He wrote IHS of his plans to build a 30 ft. catamaran style cruiser, saying, "The idea of hydrofoils is intriguing, though I'm not sure if it's do-able. That's why I'm here, I hope that the IHS can suggest reference material so that I can learn and share your interest in hydrofoils." To contact D. Hardy with encouragement, commiseration, or information, send email to him: dhardy@MTS.net.

LOST NEWSLETTERS

Due to insufficient glue on our address labels or very rough handling by the U.S. Postal system, or both, five of the Autumn 1996 IHS Newsletters were returned to our Post Box. The address labels had disappeared!!! Therefore we know that there are five of our U.S. members that did not receive their Newsletter for Autumn 1996. The mailing was made during the first part of December 1996. **Please let us know if you are one of the five, and we will try again.**

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.

IHS OFFICERS 1996 — 1997

John Meyer	President
Mark Bebar	Vice President
George Jenkins	Treasurer
Ken Spaulding	Secretary

GERMAN NAVY TRIALS

(Continued From Page 1)

The report does reveal the following-sea problem of the early von Schertel hydrofoil designs. This was solved much later when Rodriquez installed flaps on surface-piercing foils controlled by an automatic system. Also, this problem was one of the reasons that the U.S. Navy adopted fully-submerged foils on all of their hydrofoil designs.

Anyway, what follows is the English translation (not made by me, and in fact I don't know who made the translation) slightly edited for clarity:

The following information was extracted from various papers dated 1940 to 1944 which covered development and trials of this new type of high speed motorboat. To record as much as possible of the German experience, the available information has been translated and included in this report.

Papers dated June 1940 contain lists of the following experimental E-boats fitted with hydrofoils:

- TS 1-6 (six units formerly named TW 1-6) - based on the Sachsenberg/von Schertel system and being built at the Sachsenberg Yard. One of the TW boats was built to the following general specifications: Weight - 5 tons, Speed - 40 knots, Endurance - 36 hours at 25 knots, Drive - 250 hp, and Use - Norwegian fjords.

- VS 6 (formerly named VT 1) - built on Sachsenberg/von Schertel system at Sachsenberg Bros., Dessau - Rosslau.

- VS 7 (formerly VT 2) - built on Dr. O. Tietjen's system at the Brandenburger Dredge & Shipbuilding Yard, K. Siebert, Berlin-Spandau. Trials were held at Schleswig.

Schertel/von Sachsenberg Hydrofoil VS 8

Further records, dating up to November 1944, show the following types:

- VS 8-developed by Engineer Wankel at Sachsenberg Bros., Dessau -Rosslau.

  » This type was first designed in 1940 as an invasion tank-landing craft for the Army. The boat had an open-well stern that would accommodate floating pontoons. It was estimated that this craft would achieve 45 knots on hydrofoils with its two 2500 hp. engines. Load was to be 20 tons.

  » In 1941 the project was taken over by the German Navy for development of a fast mine-layer, torpedo-boat, and air-sea rescue boat. Only two MB 501 (2000 hp each) engines could be provided for trials. To make the most of this inadequate horsepower, the propellers were given less pitch, resulting in a top speed of 37 knots (instead of 45), and a maximum engine performance of 1250 hp and 1150 RPM.

- VS 10- No information.

- VS 14- No information.

After the trials of VS 8 in August and the VS 6 in October 1944 it was decided to suspend work on VS 6, 7, 10, and 14 immediately, and that "every drop of fuel expended on further trials would be regarded as wasted." If continued, it would have required 1-1/2 to 2 years to prepare as a combat weapon. It was, however, generally agreed that trials should resume after the war.

Trial of the VS 8 on 8 Jan 1944

"After putting out, the boat was brought onto its hydrofoils between the beach-heads, i.e. in calmer water, and then proceeded out into the bay of Danzig, into the open sea north-east of Hela. With the wind NE, strength 5-6, swell 4, sometimes more, the boat proceeded on hydrofoils against the sea and was stable, and there was no spray, whereas an ordinary E-boat would have been buffeted about and shipped water. That created a very good impression and is a great recommendation for the

Continued on Page 6

FAST FERRY OPERATORS DIRECTORY 1996

[Following are excerpts of interest to hydrofoilers. The complete directory is available from FFI, Milrose House, Sayers Lane; Tenterden, Kent TN36BW, United Kingdom. Subscriptions to FFI magazine are US$110.00 per year -Ed.]

In the 1996 Fast Ferry Operators Directory, the thirteenth in the annual series, we list details of 233 companies and 756 vessels. Included in the following pages are those companies that were operating fast ferries at the end of August 1996, or had operated seasonal services earlier in the year, or were awaiting delivery of vessels.

This year we have deleted 33 companies, including several in both Greece and Asia, as we could get no confirmation that they are still operating. Some of these, and others, undoubtedly are.

Four companies that have definitely closed down or stopped operating fast ferries are Brighton Ferries and the Isle of Man Steam Packet Company in the United Kingdom, Grenaa-Hundested in Denmark, and Islands Cruise Line Pacific in Guam. The Isle of Man Steam Packet Company, which had been leasing an Incat Tasmania 74m wavepiercer, is expected to introduce a new vehicle ferry next year though.

Thirty-one companies have been added to the Directory this year: Comab, DSB Rederi Europa-Linien, Ezaki Kisen, Famille Dufour, Flying Adler Line, Gotlandslinjen, Grand Seaway Ferries, Hong Kong Entertainment (Overseas) Investments, Insel und Halligreed- erei, the Indonesian Ministry of Transport, Jindo Transportation, Johor Riau Ferry Services, Kelana Megah, Larvik Line, Mashantucket Pequot Tribal Council, Navitalia, Negros Navigation, Niekamp Seetouristik, North by South Ferries, P&O European Ferries, Quick Cat Cruises, Red Sea Flying Cat, Reef Jet Cruises, Sea Falcon Lines, SinoJapan East Sea Shipping, SweFerry, Transportes Maritimos Acorianos, Vina Express, Water Jet Shipping, WeiBe Flotte, and Yue Qing High Speed Passenger Ship Company.

The majority of the new operators listed have introduced or ordered vessels during the past 12 months but some have been included for the first time, or reinstated, because we have only received confirmation during the past year that they have fast ferries in service.

As in previous years, for this Directory a fast ferry is considered to be a vessel able to carry a minimum of 50 passengers and having a full load speed capability of at least 25 knots.

The operators are listed alphabetically with fleet details in date acquisition order. Where there are two dates, the first is the year of construction and the second is the year in which the vessel was introduced by the current operator.

Adriatica di Navigazione
Casella Postale 705
30100 Venezia, Italy

A Rodriquez PT.50 hydrofoil was introduced by Adriatica di Navigazione in 1964 alongside its ships on a network of routes between the island of Tremiti and points on the southeast Italian mainland. An RHS 160 hydrofoil joined the PT.50 in 1975 and four years later the company took delivery of an RHS 160F.

During 1992 Adriatica introduced two Rodriquez 47m foil assisted monohulls and sold its PT.50. One of the monohulls entered service on a new route in the northern Adriatic linking the Italian port of Trieste and several towns in Slovenia and northern Croatia.

Aerobarcos do Brasil
Praca Iaia Garcia No 3
Ribeira - RJ, Brazil

Aerobarcos do Brasil (Transtur) operates a fleet of hydrofoils on two local routes from Rio de Janeiro. Services were introduced with four Seaflight P46s in the late 1960s.

The first vessels in its current fleet to enter service, a pair of PT.20s, were delivered by Rodriquez in 1970. Six more PT.20s were then acquired from other operators during the next 8 years.

Aliscafi SNAV
Via Caracciolo 10
80122 Napoli, Italy

Aliscafi SNAV, or Aliscafi Societa Navigazion Alta Velocita to give its full title, was part of the Rodriquez group until it was sold in 1995 to Mediterranean Shipping, the company that also owns Navigazione Libera del Golfo.

The company introduced the world's first coastal hydrofoil route in 1956 when a Rodriquez PT.20 entered service in southwestern Italy between Messina and Reggio di Calabria.

Local services are now operated in Sicily and the Bay of Naples with longer routes being scheduled every summer from Sicily to Naples.

Continued on Next Page

Ceres Hydrofoil Joint Service
8b Efplias Street
Piraeus, Greece

Ceres introduced its first Kometa hydrofoil in 1975 and now has a fleet of 24, the most recent acquired from operators in eastern Europe, running in the Argosaronic and Sporades regions of Greece.

Three Kolkhida hydrofoils entered service with the company in 1985-86, on the Sporades network, and a Kvaerner Fjellstrand Flying Cat 40m catamaran in 1991 on its Zea-Hydra-Poros-Spetsae route. A fourth Kolkhida was delivered in 1993.

A new service from Zea was introduced in 1991, to the Cyclades islands of Kea and Kithnos, but activity in the past few years has been concentrated on the continuing expansion of routes in northeastern Greece.

Far East Hydrofoil
Shun Tak Centre
200 Connaught Road
Central
Hong Kong

Far East Hydrofoil introduced its first hydrofoil in 1963 on a route between Hong Kong and the Portuguese territory of Macau. A total of 13 surface piercing hydrofoils were operated during the next 18 years, the last being withdrawn in 1982 as the company standardized on the Boeing Marine Systems Jetfoil hydrofoil. FEH has continued to increase its Jetfoil fleet as vessels have become available from other operators.

During the past two years the company has introduced a pair of PS 30 fully submerged hydrofoils built by China State Shipbuilding and a pair of Kvaerner Fjellstrand FoilCat 35m hydrofoil catamarans.

Sea Falcon Lines
Greece

Earlier this year, Sea Falcon Lines introduced a pair of Meteor hydrofoils on a route between the port of Piraeus and two towns on the island of Aegina.

Semo Co
5 ga 16-5 Jung-ang Dong
Jung-gu Busan, South Korea

During 1989 Semo Co's ferry division took over the routes of three operators in South Korea and their combined fleet of two PT.20 hydrofoils, a single RHS 70 hydrofoil built under license by Hyundai, two Korea Tacoma Marine Industries 26m surface effect ships, and one KTMI 28m SES.

The following year it introduced a Cirrus 120P SES built by Eikefjord Marine and in 1992 it acquired a KTMI 18m SES from another Korean operator. The company operates both fast ferries and conventional ferries on the south coast of Korea.

The hydrofoils are in service on its Pusan-Yeosu route: one of the 26m surface effect ships, its 18m SES and Cirrus 120P are operated between Pusan and Jangsungpo: the other 26m SES is operated between Yeosu and Geomun island: and its 28m SES is operated between Chungmu and Yokji island.

At the end of 1992 Semo introduced a 36m SES. Built at the company's own shipyard, this entered service on the west coast of Korea on a route between Inchon and the islands of Sochong, Taechong and Paengnyong.

Two years later a pair of 40m surface effect ships built at the yard entered service on new routes from Cheju Island to Mokpo and Chungmu.

Another replaced one of the PT.20s on the Pusan-Yeosu route. During the past year, Semo has introduced a 40m catamaran and two 28m monohulls built at its Kyung Nam yard.

Ustica Lines
Via F. Galiani 20
80122 Napoli, Italy

During the summers of 1994 and 1995 Ustica Lines operated a Rodriquez RHS 160F hydrofoil, leased from Aliscafi SNAV, on routes linking Naples and Kelibia, Tunisia. with Sicily.

Last year the company purchased a Rodriquez RHS 140 hydrofoil from another Italian operator and introduced it on seasonal services off the southwest coast of Sicily.

This year Ustica Lines has taken delivery of a Rodriquez Foilmaster hydrofoil to replace the leased vessel previously operated on its original routes. The company has also acquired two RHS 160 hydrofoils from other companies in the Mediterranean and introduced a new year round route off the northwest coast of Sicily.

IHS COASTERS AVAILABLE

The same ceramic medallions featured on IHS award plaques are available as coasters in sets of four. The price per set is $12.00 plus $2.95 for mailing within the US. Overseas shipment is available by special arrangement. These 3-1/2 in. diameter coasters feature the IHS logo and the words "International Hydrofoil Society." They are the obvious solution for preventing water stains on your coffee table. Send your order directly to IHS at the address on the first page of the newsletter.

GERMAN NAVY TRIALS

(Continued From Page 3)

sea-going characteristics of the boat. When the boat was turned slowly in a slight sea, 10-12 degrees abaft the beam, it dropped from hydrofoils. The attempt to bring it onto hydrofoils again, when heading the boat in all directions, failed in a calm sea as well as with a swell. The boat, therefore, only rose on to its hydrofoils once during the whole trial. The reason was said to be the insufficient performance of the engines. The trials therefore were brought to a close, and the results yielded nil.

Subsequent Trials of the VS 8

Wind Force 5-6, Sea Force 3-4. When running against the sea or during sharp turns, the VS 8 always dropped down from its foils. However, it was proved that a hydrofoil boat of this size could maintain a 35 knot speed in sea force 5, and could probably increase this performance to 40 knots under similar conditions if proper engines and propellers were provided. The craft was remarkably stable even in sea force 3 from ahead. However, even with two 2500 hp. engines it was considered doubtful that the craft would stay on hydrofoils with the rudder turned hard in either direction; a five-degree turn seems to be the maximum rudder for staying on hydrofoils.

To test the speed when hydrofoils were damaged, it was found that 20 to 21 knots was absolute maximum on both motors because of the braking action of the submerged foils. Technically, this is not due to drag but mainly to the lack of a variable-pitch propeller suitable for running both on and off hydrofoils.

At the end of trials, it was decided to abandon VS 8 in favor of VS 6, which had an improved hydrofoil. The craft itself was subsequently stranded at Stolpmunde after engine failure. It was planned to cut off the hydrofoils and lay up the hull at Maureb, Swinemunde.

Trials of the VS 6

VS 6 was tested in Bay of Travemunde on 24 and 25 October 1944. "Wind 1 - 2, swell 1!" The boat rose on to its hydrofoils, in all directions, in 6 -10 seconds calculated from a medium speed. That means that the hydrofoil's principle with this [gentle] swell is solved, and that the engine installations and the performance attained from them, was not only sufficient but very high (2 engines totaling 1300 hp!)."

A second trial showed that the boat became foilborne in 14 seconds from a start with engine cut and helm turned 10 degrees. When the helm was turned hard over, and remained thus, the boat rose onto foils with difficulty.

On the 25th October, the following results were recorded with wind 2 - 3 from the NE and swell 2: "On courses against the sea, and with the sea running abeam, the boat rose on hydrofoils and was buffeted badly by the heavier seas. The performance of the engines was completely sufficient, and the boat rose onto foils in approximately 15 seconds, calculated from a low speed.

"When course was set *with* the sea, *in not one instance* was it possible to bring the boat back onto the hydrofoils. As soon as the forward part of the boat came just in front of the crest of a wave, and the stern in the trough, the boat rose for a brief period on to its hydrofoils, and when the stern was lifted by the next wave it dropped completely from the hydrofoils again, and even caused the boat to pitch down to a certain extent. In these cases the revolutions had to be decreased immediately to prevent the bow from submerging completely because of the braking effect of the hydrofoils."

"It is established that the boat, which has a displacement of approximately 13 to 17 tons maximum with 2 engines totaling 1300 hp, sets out the most favorable conditions for the proof of the hydrofoil principle. According to a report of the Representative of the Sachsenberg Yards, all the latest developments of the hydrofoil principle are included in this boat. The trials ought, therefore, to be pursued fully."

"It has now been established that the hydrofoil E-boat can only be used in favorable weather (swell 1). For military purposes a boat designed on this principle is therefore unsuitable. It even appears questionable whether the pursuit of the principle *after the war* has any point *at all.*

"The Navy Department and Ships Construction Commission, from which Departments a representative was sent to take part in these trials, do not concur.

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GERMAN NAVY TRIALS
(Continued From Page 6)

"The *problem* will be running *against the swell*, and it will never be overcome. A seaplane, for instance, cannot land or take off against the swell. The incline of a hydrofoil boat to the sea depends on the wave crests and troughs. As soon as the stern is lifted by the wave the boat always drops from its foils and threatens to dip. This failing will never be offset by increasing engine power. The hydrofoils will always tend to go into a dip no matter how many alterations aligning the foils are tried to control the movement of the forward part of the ship, when the stern is lifted by the swell."

[Contrast these mid-1940 statements on military unsuitability of hydrofoils with achievements of the US Navy's developmental hydrofoils (High Point, Plainview, Flagstaff, Tucumcari) and later its PHM Squadron. Despite their technical success, the PHMs were a political failure... always struggling for existence and ultimately felled in their prime by the budgeteers' ax. -Ed.]

Advantages Compared to Normal E-Boats

(a) Slightly greater speed (E-boats with MB 518 engines reach 44.3 knots, while new V-shaped hull will give a 46.5 to 47 knots speed. However, the maximum sustained speed of E-boats is well below 40 knots, while the equivalent speed figures on future hydrofoil E-boats will attain 45 to 50 knots).

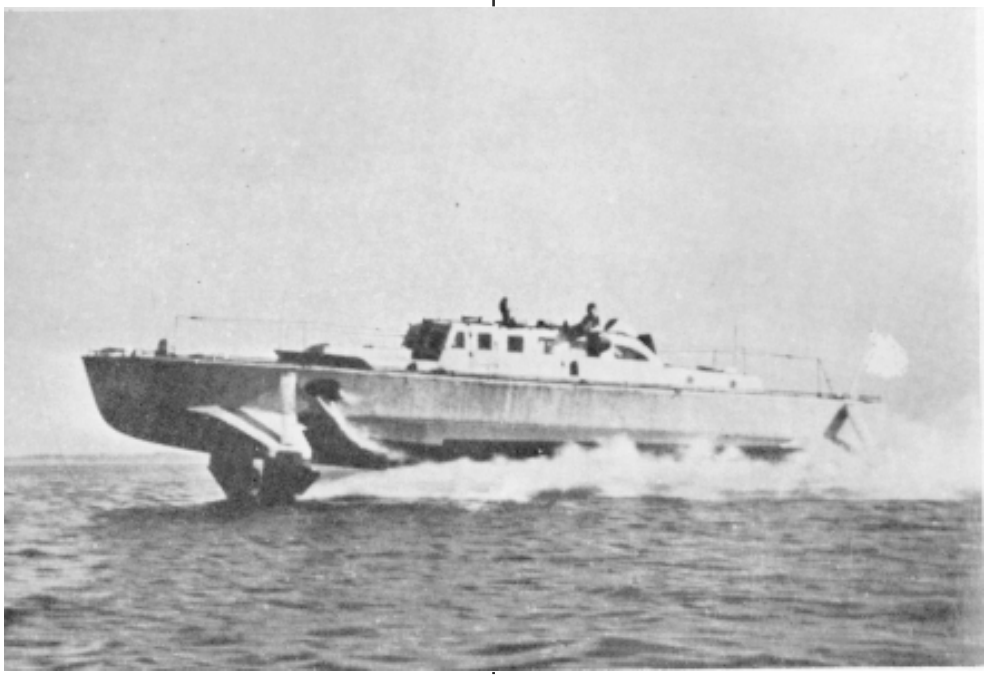
(b) Dryer, more stable cruising.

(c) Higher speed in rough weather (although E-boats proceed at high speed to ride over swells).

(d) Little bow and stern wake.

(e) Lessened danger from mines (not affected by magnetic mines, less vulnerable to the acoustic mine, not affected by the pressure mine AD 204, less danger from the snag-line mine).

(f) Greater mine-carrying (20) capacity.



von Schertel/Sachsenberg Hydrofoil VS 6

Disadvantages Compared to Normal E-Boats

(a) Foils sensitive to hits and floating objects.

(b) Larger target for detection and gunfire. Hits on the hull would probably sink the craft, since most of the craft is submerged when hullborne.

(c) Louder exhaust noises (E-boat exhausts are under water).

(d) Greater draft, making docking in E-boat pens and shallow harbors impossible (exceeds 4 meters).

(e) Large turning circle and less maneuverability; "steering way" on foils after torpedo attack almost impossible

(f) All engines will fail if extremely long, vulnerable cooling-water lead (engines to stern) is damaged.

(g) Very low hullborne speed on one engine at 10 - 12 knots (even on two engines hullborne, the hydrofoil drag limits speed to 20 knots absolute max).

(h) Unfavorable torpedo initial launch dive (greater height than normal).

(i) Slower acceleration from low speed on turns, when engaging enemy.

(j) Proceeding in formation difficult when changing course (every boat acts differently on hydrofoils).

(k) The boat must always proceed on hydrofoils when passing through mined areas (normal E-boats can travel through moored mines on 1.9 m. draft).

(l) Small reserve displacement, since underwater distribution is too small (can be corrected by new designs).

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LETTERS TO THE EDITOR

Oklahoma

I am working on an experimental hydrofoil and need someone who can build a working R/C model of my design. Is there anyone in the Tulsa County area or in Oklahoma belonging to your society who can help me? I need to prove my design by experimenting with a working R/C hydrofoil model. Please help.

Matthew Delaney
matthew.delaney@wcom.com

[IHS does not have any members in Oklahoma, unless you decide to join, in which case we will have one! - Ed.]

India

Since I am doing my final year project in the design of a passenger hydrofoil, I would like to have some information regarding the following aspects of design: (1)The propulsion design for a 200 passenger craft with fully submerged foil configuration; (2) IMO regulations for hydrofoil craft; (3) engine type and propeller to be used; (4) structural design for the hull, foils, and struts. The hull type is NPL Round Bilge High Speed. If the classification rules to be followed are also mentioned it would be helpful.

R. Karthik
dstsec@alpha.nic.in

Cat Foil Kits

Re: Roger Napier's letter in the Autumn IHS newsletter: The last address I have for Dr. W. Samuel Bradfield is Dept. of Mechanical Engineering, University of South Florida; Tampa FL 33620; work: (813) 974-2581, home: (516) 473-1506. This is ~ 10 years old.

Chris McKesson
Chris_McKesson@WestPost.ccmail.comp
userve.com

Whither PHMs?

I know the the PHMs (patrol hydrofoil missile) were decommissioned after chasing drug smugglers in Key West for awhile. Where are they now? I worked on them for years at Boeing Marine Systems. It would be great to find out what's up with them.

Steve Jensen
sjensen1@gte.net

[The Autumn N/L updated IHS members on the fate of the PHMs. We sent Steve a free copy. IHS urges all current and former Boeing employees who worked on hydrofoils to join IHS and share their expertise and experience with their fellow hydrofoilers around the world. - Ed.]

High School Hydrofoiler

I am a student at Ladue Horton Watkins High School in Missouri. My science project is on how to reduce cavitation on the surface of hydrofoils to improve performance. I was thinking of using adaptive materials such as string that can be manipulated to contract and extend. If I could produce a composite material with these strings bonded to it, I could pull certain parts of the hydrofoil to change its shape. Like adaptive propeller that change their pitch to set an efficient set up, I would like to know if it is possible. Also, I need technical data about the forces acting on the hydrofoil, pressures, and the flexibility of the material currently used. Also, why don't they turn the pitch of the hydrofoils and add a flap to create faster changes?

Manuel Choi
wook40@aol.com

[This inquiry arrived by internet and generated several informative exchanges by email, some of which are reproduced below. -Ed.]

I worked on the MIT human powered hydrofoil project (WWW site URL: http://lancet.mit.edu/decavitator). I will try to answer some of your questions about cavitation. Hydrofoils produce lift by creating a low pressure on the top of the wing and a higher pressure on the bottom. When the low on top is lower than the vapor pressure of water the water boils producing cavitation. Airfoils typically have very low pressure over the front part with the pressure slowly increasing as you move towards the back. One way to delay onset of cavitation is to even out the pressure distribution so that it is moderately low over a long section. This is similar to the problem faced by commercial jets flying close to the speed of sound, and I recommend looking at a discussion of airfoil characteristics in *Introduction to Flight* by John D. Anderson.

Unfortunately, it is difficult to play many games with the shape of hydrofoils due to structural considerations. Water is 840 times denser than air, and the forces are correspondingly higher. The foil thickness is set by structural constraints, and this affects the minimum pressure on the upper surface. Foils are made of solid steel and are thick enough that cavitation is unavoidable at high speeds. Flaps or other control surfaces would be very difficult to build due to the high loads.

Marc Schafer
spaceboy@narf.engr.sgi.com

[Besides solid steel, foils can and have been made in solid aluminum, or hobbed-out steel (as in PHM foils), or spars and ribs with an outer skin. -Ed.]

The best ways to reduce cavitation are: produce the airfoil section accurately and do not overload the foil. Unless you expect the craft CG to move

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LETTERS TO THE EDITOR
(Continued From Previous Page)

longitudinally as it flies, with concurrent fore/aft foil load changes, I'm not sure what 'reconfiguring' the foil would add. Can anyone comment on using compliant coatings to attain highly accurate foil section profiles? This is probably a better focus for the project.

Mark Bebar
bebar_mark@hq.navsea.navy.mil

Foils with control flaps can be successful with some advantages: better off-design performance and sometimes a better cavitation performance. But the discontinuities can eliminate the cavitation benefits and increase resistance. Incident control is simpler than flap control. In theory, some of the disadvantages of flap control could be overcome using an adaptive surface such as you describe. Essentially, the surface could cover the fixed and flap portion of the foil. I don't know if anyone has investigated this, though it has been talked about for some time.

We are working on a related technology: encapsulation. The foil is built up as a structural, non-fair foundation. Then, this is surrounded by a molded surface which is fair, tough, and much less expensive. We are looking at tough, relatively hard urethanes which would not be suitable as an adaptive surface. If a suitable surface could be found, this process could be good for constructing it. In the past, when we've considered adaptive surfaces, we've been faced with large loads under fatigue. However, new materials may be available now which would make this approach more practical. As materials, computer, and machinery technology advances, hydrofoils become more competitive.

James H. King
jking@code70.dt.navy.mil

Do you know where I can find a computer simulation for hydrofoils? I need to input models and the computer calculates speed, drag, lift, etc.

Manuel Choi

One possibility is the ASSET Hydrofoil (ex HANDE) foil system drag module, but it's never been released to the public. Another is Fluid Dynamic Drag by Hoerner.

Mark Bebar

The best thing would be the ASSET hydro model, but that is probably too complex. Reprogramming it could be more time consuming than the analysis. What do you plan to simulate? What geometries are you planning to investigate? If the range of geometries is small enough, you might be able to use a scaled-down version of the ASSET hydro module or something from Hoerner.

James H. King

My model's dimensions are not yet set. The objective is to separate cavitation from the foil surface. I think I could do this if I could "take" the incoming water at the front of the hydrofoil and, through a series of small tunnels, disperse the incoming water with a slower velocity to produce a thin layer that will not produce cavitation. Since the lower pressure of the high velocity water that goes all the way through the upper part is not canceled in any way, I think, this should not reduce lift. Please comment.

Manuel Choi

The only generic computer program I am aware of that would allow variables like the one you describe is called ASSET (Advanced Surface Ship Evaluation Tool). There are modules for all types of marine vehicles, including hydrofoils. ASSET was a Boeing computer program funded by the U. S. Navy David Taylor Research Center.

Leo Ahearn
leo.ahearn@kauai.ds.boeing.com

[The ASSET program is not currently operative due to changeover from the VAX to a PC-based computer system at David Taylor. At the moment there is no funding to convert the program. Meanwhile, following is more from Manuel Choi -Ed.]

Thanks for your responses and support. I contacted my closest university, Saint Louis University (as you told me). They have a water tunnel and hydrodynamic simulators. The best part is that they want me to work with them!

My idea is that if I can produce a thin layer of slower speed water (high pressure)on the surface of the hydrofoil after the point where cavitating bubbles form, it would be possible to separate the bubbles and their micro jets from the surface of the hydrofoil. To achieve this, I am thinking of drilling holes (from the front) of the hydrofoil and carry the higher pressure water from the front to the point right after the lowest pressure. The holes would be spaced every some fixed distance and "mini-tunnels" would carry the "protective water" to the top of the hydrofoil, producing a protective sheet where cavitating bubbles will not produce and separates the bubbles to collapse from the surface of the hydrofoil. I got this idea from the super- cavitating propeller - it turns fast enough that the bubbles are left behind in the current and they do not "stick around" to collapse in the blades. Since I have not had any luck finding bibliography, I do not know how dramatically the changes in pressure are and how realistic this project is. Also, I can not find software where I can test this. Thanks a lot. If you have any comments on the project description, you know where to mail it.

Manuel Choi

University Hydrofoiler

I am a student at Old Dominion University, Norfolk VA, and I'm currently working on a project to design a flying boat that uses a hydrofoil to eliminate the "step" on the hull. This would allow faster takeoff and higher cruise

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LETTERS TO THE EDITOR
(Continued From Previous Page)

speeds due to decreased drag. I have seen mention of the Navy doing tests in the 1970s of small flying boats using hydrofoils. My question is, does anyone in your group know of these tests and if so how can I get the information?

David A. Kitzmann
ashbyk@juno.com

Sailing Foilers

My son and I are interested in designing a sailboat that will allow conversion to hydrofoil under sail power. If you could direct us to web sites or other information, we would appreciate it.

Jeff Willis
jwillis@IntNet.net

Foiling For Bass

I'm adding foils to a 15' Alumicraft flat-bottom bass boat with a 40 hp outboard motor. Are any of your members interested in building small recreational hydrofoil craft? I am sure that you have heard, "I didn't know that there were others who were interested.....".

Allan E. Hobson
ahobson@crrel.usace.army.mil

PHM 2 Owners Report

I am Eliot James, BJ's partner on the PHM-2. I was eager to hear about IHS and read your newsletter.

We have tried to buy other ships in the past, most notably one of the three Sea Bird class vessels (ex-Coast Guard), also stationed out of Key West and used for drug intervention as the PHMs were. The trip to Key West, however, proved to be only a short, but expensive "vacation."

When the PHMs came for sale, we felt the odds of purchasing such a ship were quite small. Following the surplus business creed, "You can't buy cheap unless you bid cheap," we entered a bid with high hopes, but little confidence.

For unknown reasons, the government rejected more than one bid in excess of $100,000. Confusion in the posting of the sale (PHM-6 was said to have her foils, when in fact it was PHM-5) could have been part of the problem. Another company, who was first noted as a successful bidder via the unofficial abstract, tells me they lost the bid on three of these ships because they were a few minutes late with their bid entry.

A surplus buyer soon realizes the strict and just manner that the DRMS conducts these sales. While we received little information on the PHM-2 from the government, it wasn't for lack of trying on their part. Special thanks should go to Tommy Tise and everyone at the NISMF (Naval Inactive Ship Maintenance Facility) for helping us gather information and for taking good care of the ship. You see no rusted hulks there.

Our plans are to repower this ship using surplus MTUs that were originally spare rebuilt engines from the facility that maintained these ships while in active service. We are currently working on the control system so that in the spring she will be ready for the ferry to Missouri.

We are not sure as of yet the best way to get home. The ICW via the north has been ruled out because of the vessel's 29 ft height above the waterline, so that means a trip south, across the gulf and up the Mississippi River to the Missouri River where we are still reviewing dockage sites; a trip of nearly 2,500 miles.

After getting the ship to Missouri and acquiring further funding, we plan to refit the ship for service as close to the original configuration as possible. Nothing would suit us better to see her again on foils, if we could find work to justify this expensive mode of propulsion. Until then, we need to obtain max. speed with max. efficiency in the hullborne mode.

Water jets are not efficient at low speeds, but we hope that being approx. 100 tons lighter will gain us enough speed to bring the jets closer to efficiency. Depending on who we talk to, jet people or prop people, this may or may not be possible. We would appreciate input from your readers. Currently we have the original jets, engines, and 2.51 to 1 gear boxes that provided a top speed of 15 knots at 240 tons. This speed, I am told by jet manufacturers, is too slow to be efficient. We need to know what gearing would increase jet thrust to run at optimum performance/efficiency.

We are also considering firing the main jet while in the hullborne mode (with an engine we have yet to procure) and would like input on the validity of such an experiment.

We are seeking information to help us determine a career for our ship. Unfortunately we are not very knowledgeable in maritime business. One possibility is a live-aboard dive charter vessel, but we are very open to ideas, hopefully something that will allow us to take full advantage as a very fast ship. If we do use the boat for diving, it won't be on the river.

I doubt engines will do much for the way the ship sits in the water, and the fuel tanks are located too close to mid ship to do us much good either. Definitely we have some work ahead of us and need of help from a shipbuilding engineer.

Eliot James
RR 2 Box 192
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(816) 777-3300
(816) 777-3302 Fax
esjames@vax1.rain.gen.mo.us

Continued on Next Page

LETTERS TO THE EDITOR
(Continued From Previous Page)

[Mr. Carroll Oates of Detroit Diesel responds below to Mr. James. -Ed.]

I must admit that I am at a loss to propose an ideal propulsion system [for EX-PHM-2] as Mr. James is still unsure of what to do with the vessel. I agree that he needs to find a suitable mission as a fast craft because this type of ship is costly to operate in either foil or hull mode. Lessening the weight via an engine refit is possibly a move in the right direction as long as the effects of weight distribution are understood (the newer model Detroit or MTU engines we offer are weight sensitive). Of course our marine turbine offers the greatest power-to-weight advantage (our smallest unit is 4,000 HP and weighs 8,000 lbs. total).

The real problem is matching the engines, gears, and jets to gain efficiency. This cannot be done without taking into account the vessel itself and what mode (hull or foil) to optimize. But is simple to solve once you understand the hull or foil attributes. It will boil down to how many RPM does the waterjet have to turn to drive the vessel at the desired speed. Once you know this you can calculate the required horsepower given the ambient environment and the necessary reduction gearing. We do this all the time when involved in the installation of our marine turbine systems for ferries or high speed craft, but it is a team problem.

By team I refer to all the players. When Detroit Diesel repowered the *Clipper IV* last year we faced a similar scenario. The craft was powered by two MTU 16 V 396 diesels delivering 2,700 hp each. It was doing an honest 28 to 30 knots with this power. The craft was a 40m Fjellstrand catamaran, so we asked Fjellstrand to consult with KaMeWa (who had the water jets on this vessel) and determine the RPM it would take to drive the craft at 42 knots (assuming certain ideal conditions). This number was calculated at 991 RPM. Our turbine team then consulted with KaMeWa and our own gear people and determined that we should produce some 4,400 hp per turbine to give this water jet speed taking into account the proper reduction ratios (our TF Series turbines have an output of 15,400 RPM), the new weight of the vessel (we had lightened the load), and ambient conditions.

Although we were successful and the *Clipper IV* has been operating at her 40 or so knots since last April, we all agreed that speed is easier to achieve when you can optimize the craft to the propulsion system from the start. Building a new vessel is much easier than refitting an existing vessel because you can optimize all systems for greatest efficiency/performance.

The EX-PHM-2 faces this same problem only worse, since it has two modes of movement. It will be difficult to optimize both... perhaps a CODOG? We offer several in which you can select the correct size diesels for slow speed running and the turbine(s) for high speed.

Carroll R. Oates
Detroit Diesel Corp

Yamaha

Did Yamaha ever put the OU-32 into production? I have a video clip of it.

Carl Allison
allison1@llnl.gov
Plank Owner, USS Pegasus PHM-1

13th FFI Conference & Exhibition
February 25-27, 1997 in Singapore

I invite you to attend what promises to be Fast Ferry's largest and most dynamic event to date. For information on this and other FFI products, visit our web site: http://www.fastferry.co.uk.

Denise Clifford
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Tel: +44 1580 766960
Fax: +44 1580 766961

The Letters To the Editor section allows hydrofoilers to ask for or provide information, to exchange ideas, and to inform the readership of interesting developments. All are invited to participate.

IHS E-MAIL ADDRESS:

102134.1446@compuserve.com

GTEs FILL NEED FOR SPEED

From Marine Technology Int'l
Sep 1996

Installation of marine gas turbine engines (GTEs) is an increasingly popular means of reaching new speeds. AlliedSignal and Caterpillar subsidiary Solar Turbines are two suppliers of these superfast engines.

In April, Clipper Navigation, Inc. (whose 5-vessel fleet serves the Seattle-Victoria, BC region) installed AlliedSignal TF40 GTEs on *Victoria Clipper IV.* This was part of a US$4M contract with Detroit Diesel, which distributes TF40s for yachts and commercial marine applications. The new GTEs double *Clipper IV*'s horsepower from 5,000 to 10,000 hp, reduce round-trip passage time from 2.5 to 1.75 hours, and bring the vessel's speed to 45 knots.

Solar Turbine also works to increase vessel speeds. The Mashantucker Pequot Tribal Council has ordered two 5.2 MW (7,000 hp) Taurus 60M marine GTEs to power the first in a line of high-speed 330- passenger TriCat ferries to be built in the tribe's new Pequot River Shipworks in New London CT.

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Denise Clifford
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From Marine Technology Int'l
Sep 1996

Installation of marine gas turbine engines (GTEs) is an increasingly popular means of reaching new speeds. AlliedSignal and Caterpillar subsidiary Solar Turbines are two suppliers of these superfast engines.

In April, Clipper Navigation, Inc. (whose 5-vessel fleet serves the Seattle-Victoria, BC region) installed AlliedSignal TF40 GTEs on *Victoria Clipper IV.* This was part of a US$4M contract with Detroit Diesel, which distributes TF40s for yachts and commercial marine applications. The new GTEs double *Clipper IV*'s horsepower from 5,000 to 10,000 hp, reduce round-trip passage time from 2.5 to 1.75 hours, and bring the vessel's speed to 45 knots.

Solar Turbine also works to increase vessel speeds. The Mashantucker Pequot Tribal Council has ordered two 5.2 MW (7,000 hp) Taurus 60M marine GTEs to power the first in a line of high-speed 330- passenger TriCat ferries to be built in the tribe's new Pequot River Shipworks in New London CT.

SICHUAN PROVINCE
(Continued From PreviousPage)

of funding. Another company, Slight Shallow Shipping, established by Chongqing Post Office, introduced a pair of Meteors in 1994. These operators are unable to maintain reliable schedules, however, due to the problems with the main engines and a lack of reserve vessels. Services are frequently canceled.

Problems

Another problem with operating the Meteor on the Upper Yangtze that has yet to be solved is the frequent blocking of the cooling water system inlets by debris in the water.

Yet another is the high wear rate of the water lubricated strut bearing caused by silt in the water. In an attempt to overcome this, oil lubrication was substituted but the hydrofoil would not then take off. As the component is not too expensive, it will be replaced after the flood season each year until a better lubrication method can be found.

The interior of the hydrofoil has also caused problems. The space between the three passenger saloons contains combustible materials, but there are no fireproof walls between them. A consequence of this was that a Meteor on a positioning trip ran aground in fog, resulting in a fire which spread to the midships area. The vessel was subsequently destroyed by the flames and sunk.

One problem common to hydrofoils and surface effect ships has been inadequate air conditioning. Sets installed in the vessels have not proved suitable for the very humid environment of the Upper Yangtze, and they are frequently out of order, or often shut off by the crew to save fuel. To compensate for this, the side access doors of the Meteors and bow door openings on some of the ACC surface effect ships are kept open while the vessels are underway.

FAST CRAFT MARKET BIG BUSINESS DOWN UNDER

Excerpted From Maritime Reporter/Engineering News Oct 1996

In response to the growing demand for faster craft, Australia has become a front-runner in the high speed market. With companies such as Austal Ships, Incat, and WaveMaster leading the pack, Australian shipbuilders are providing the craft to fill the booming need for speed. Furthering its lead even more, Australia has pioneered its way into the Japanese market, supplying fast ferries to the country traditionally known for building its own ships.

Austal has announced a four vessel contract estimated at $56 million with Turkish operator Istanbul Deniz Otobusleri (IDO). The contract includes two 40m (131.2 ft) passenger catamarans and two 60m (197 ft.) Auto Express passenger/vehicle designs. Both car ferries will be fitted with Austal's Ocean Leveler, an automatic, electronically controlled, hydraulically operated, motion dampening system.

Since its development in 1992, the Ocean Leveler has reportedly been installed in 10 vessels, including a fast monohull ferry and the second generation T-foil system designed specifically for its large car ferry designs. These vessels are in operation along the coast line of Guangzhous and Shanghai in the People's Republic of China, Indonesia, the Inland Sea of Japan, the French Polynesian islands around Tahiti, Scandinavia, and the Baltic Sea.

Presently, Incat is working on a 92m (301.8-ft.) high speed catamaran, a further development of the company's 74, 78, and 81m (242.7, 255.9, and 265.7 ft.) vehicle/passenger ferries. The vessel will be built to comply with Det Norske Veritas' high speed, light craft rules and IMO's high speed craft code, and is designed to operate at 45 knots light ship and 32 knots fully loaded. The vessel's main deck will be fitted to carry a total of 152 containers double stow, with a total dwt of 980 tons. Powered by four conventional, medium speed diesels each developing 7,080 kW. Each of the vessel's engines drive a transom-mounted waterjet through a reduction gearbox with internal clutch. An optional application involves two marine-type gas turbines driving transom-mounted water jets through a reduction gearbox with internal clutch. A ride control system is fitted to the vessel, providing trim and motion dampening with structural hydraulic services for the fitting of forward active ride control foils as an option.

MARAD ENTERS AGREEMENT TO FUND HIGH-SPEED CRAFT DEVELOPMENT

Marine Log, Sep 1996

The Maritime Administration has entered into a cooperative agreement to develop high-speed craft. It is with a team headed by Swiftships, Inc., Morgan City, LA. for design and construction of competitive high-speed vessels for world markets. New products to be developed under this project include a family of crew/supply vessels, called Swift Express, ranging from 100 ft to 160 ft in length. Swiftships also intends to design a new shipyard, Shipyard 21, to build this new range of vessels. Other team members include Diamond Services Corp., Amelia, LA; Detroit Diesel Corp., Harvey, LA; Stewart Supply, Inc., Morgan City, LA, and Hamiltonjet, Inc., New Zealand. Total value of the agreement is $1.3 million. The project is scheduled to be completed within 18 months.

BACK TO THE FUTURE...

IN TWO RECENT* ARTICLES, FAST FERRY INTERNATIONAL LOOKS BACK 30 YEARS

Fast Ferry Int'l Dec 1996*

News stories in the December 1966 / January 1967 issue of *Hovering Craft & Hydrofoil* were almost non existent as the magazine concentrated on features and the coming year. In that issue there was a 'look back/forward' editorial.

The beginning of 1967 was an eye-opener as far as headlines went. Donald Campbell died attempting to set a new world water speed record, his body was never found after his boat *Bluebird* flipped at almost 300 mph.

"Perhaps it is inevitable that this journal should glance back, whilst eagerly looking forward to the future. 1966 was the year of the hovercraft; the first Hovershow, a gallant and rewarding effort, showed these craft to the world in an appropriate setting.

"The signposts for 1967 are already up. It is to be International Tourist Year; many a tourist will be planning to experience the novel thrill of seaspeed. Two SR.N6s will carry commuters and visitors to and from the Montreal World Fair; Grumman's Dolphin will be showing its paces in the Canaries; Westermoen are building the largest hydrofoil vessel in the world; Rodriquez clients are pioneering new hydrofoil routes; the Soviet Union's Kometas are reaching out into the Mediterranean and other seas.

"It is clear that a speed up in the development and exploitation lies ahead in the three facets of this journal - three now that aerotrains and hovertrains join the earlier modes of fast transport incorporated in the journal's title."

There was a touchingly old fashioned view of the role that bankers and investors should play in the development of the industry, "... it is necessary to encourage those whose life is finance. Although some who were first 'in' have had their fingers burnt, financiers must accept risks inherent in new systems - and not only financiers, but industrialists and equipment makers as well. The merchant venturer spirit needs to match the courage of the technical adventurers."

Plaudits were due elsewhere, "This journal's congratulations go to the newly formed inter-party, inter-house, Hydrofoil Committee." The column then named the list of worthies involved in the committee, "It is the interest of leaders that helps spread the news. May they succeed in hastening British hydrofoils afloat. Our rough seas will be a good test ground for a promising export.

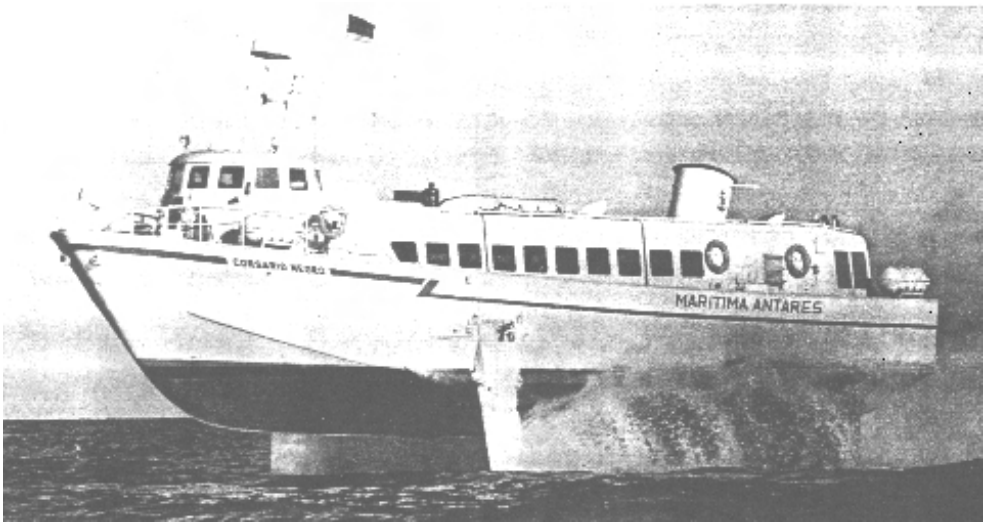
Fast Ferry Int'l Nov 1996*

It was not only Moore-McCormack who had a belief in the future of the hydrofoil in the USA. According to the magazine, "Two 100-passenger ocean-going hydrofoils have been sold to the American Satra Corporation by the Soviet Sudoimport organisation. The craft, which are of the Kometa type, will be delivered in 1967. The American company has also ordered ten six-seater Volga-type hydrofoils. In 1965 Sudoimport exported one Kometa to West Germany and three to Bulgaria. It is now negotiating the sale of Kometas to Yugoslavia and Greece."

Things were moving in the Far East too. "On November 17th, the

Continued on Next Page

Towards the end of 1966 the trials programme of the Grumman Dolphin fully submerged hydrofoil *Corsario Negro* got underway off Kiel, West Germany. Designed by the US company and built by Blohm and Voss, the 23m vessel was ordered by Spanish operator Maritima Antares for service in the Canary Islands.



BACK TO THE FUTURE...
(Continued From Previous Page)

two PT 32 hydrofoil craft, the *Bontoc* and the *Baler,* ordered by the Philippine Navy through Tokyo Trading Co Ltd and built at the Hitachi Zosen Kanagawa Shipyard, were delivered to their owners. The two craft will be based at Manila, and by utilising their 70 km/hr speed will patrol the neighbouring waters with a mission to prevent smuggling."

Not surprisingly in a developing industry, there was also an element of bigger and faster, a trend which has not vanished today. "The Svenska Sjofarts Tidning" (a Swedish marine industry magazine) recently published specifications of the PT.150 DC passenger hydrofoil ordered from Westermoen Hydrofoil A/S, Mandal, Norway, for service between Gothenburg and Danish ports.

"Claimed to be the largest in the world, the craft has been ordered by a company formed by four Gothenburg firms: Göteborg Frederikshavn Linie (CAPT Ulf Trapp, who will act as manager); Eriksberg Mek Verkstad A/B; the Rederi A/B Bifrost; and the Nya Angfartygs A/B Heimdal.

"With an overall length of 37.45m, a maximum beam of 7.5m and a maximum draught of 5.5m, she will have a displacement of 150 tons and will carry 150 passengers and eight cars or alternatively 250 passengers. Her range will be 300 miles and two Mercedes-Maybach

IHS 25th Anniversary Celebration/Conference Proceedings

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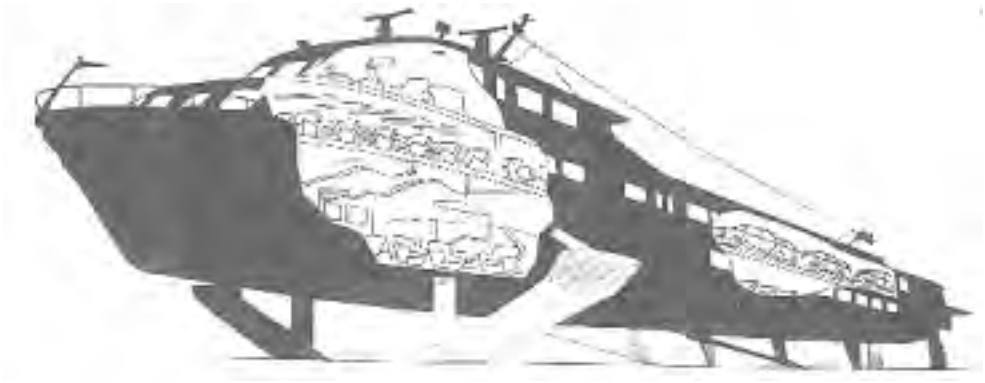
30 YEARS AGO



Although originally conceived to carry both passengers and their vehicles as shown above, the as-built PT.150 Hydrofoil carried only passengers, no cars.

AND NOW BACK TO THE PRESENT...

EU FUNDS FAST CARGO VESSEL RESEARCH

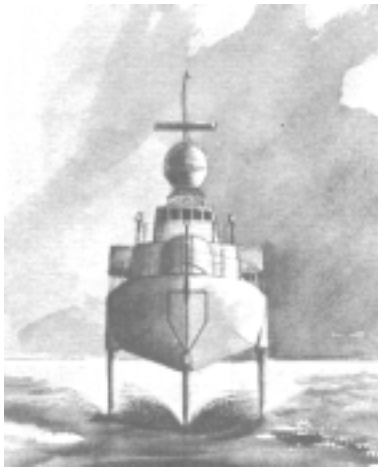
Fast Ferry Int'l, Nov 1996

A contract for research into using high speed RO-RO ferries to move freight along coastal routes of Europe has been awarded to a consortium led by Napier University Transport Research Institute in Edinburgh. The project, known as EMMA (European Marine Motorway) and aiming to examine if fast cargo vessels can compete commercially with road transport, forms part of the European Union's Specific Transport Programme under the Fourth R&D Framework Programme managed by DGVII-Waterborne Transport.

Napier University reports, "The project reflects the growing popularity of high speed ferry services and widespread recognition that over reliance on road transport is leading to excessive traffic congestion, accidents and pollution.

"It is increasingly acknowledged that without significant changes in transportation patterns and investment in alternative traffic systems, rising transport costs are likely to impair the competitiveness of European industries. The EMMA project will examine one of the possible methods of addressing these issues - the use of high speed RO-RO ferries. The study will examine the feasibility of attracting freight traffic from roads onto a number of selected sea routes. It will identify the key factors for the success of such a service, paying particular attention to the needs of potential users, and will investigate the impediments which will have to be overcome to create a cost effective alternative to road transport."

The project will be carried out by a consortium of five partner organizations from different countries in the EU: NEA, a Dutch transport research and training organization; Stena Line; Technicatome, a French engineering group; the University of Barcelona; and Napier University. The project, which began in September. is scheduled to be completed by the end of 1998.



FORMER USS HERCULES (PHM-2) SAVED (MOSTLY) FROM THE SCRAP PILE

By John R. Meyer

All of the former crews of USS HERCULES (PHM-2) must have been praying real loud and clear because two guardian angels from Missouri came to the rescue to save this prize beauty of a hydrofoil from the jaws of certain death.

As mentioned in an article by George Jenkins in the Autumn 96 Newsletter, Bill J. (BJ) Meinhardt and Eliot James of New Cambria MO bid $37,777 for PHM-2 when all the PHMs went on the block several months ago. Later information was obtained to show that Eliot S. James is a partner with BJ in this venture. Although Missouri may seem like a strange location for a 235 ton, 40+ knot hydrofoil, BJ and Eliot plan, at first, to operate their new baby at low speeds on the Missouri River. When I asked BJ why he bought a PHM, he remarked: "they are such beautiful ships!"

EX-HERCULES is now at a Norfolk VA pier near the US Naval Inactive Ship Facility. It is being prepared for a Spring 1997 transit hullborne to a pier somewhere on the Missouri River. BJ said by phone that all but one PHM had foils removed for the sale. The sale notice wrongly listed PHM-6 as the one with foils. But the successful PHM-6 bidder found the craft to be without foils. PHM-5 was the one craft with foils, but the bidding was over, and by that time all PHM foils had gone to the scrapper. The PHM-6 bidder got a refund, so that ship also was scrapped.

BJ and his partner will be installing MTU Diesels for hullborne operations as the originals were removed from all PHMs along with a myriad of other equipment. Their plans are to repower their ship using surplus MTUs they have acquired from the facility that maintained these ships while in active service. They are currently working on the control system so that in the Spring she will be ready for the ferry to Missouri, but at this writing, are not sure the best way to get home. The Inter Coastal Waterway via the north has been ruled out because of the 29 foot height above the waterline of the PHM-2 so that means a trip south, across the Gulf and up the Mississippi River to somewhere on the Missouri River, a trip of nearly 2,500 miles.

When back in Missouri and after further funding is acquired, the owners plan to refit the ship for service as much to the original configuration as possible. The vessel is in good condition, but since so much equipment has been removed from aft spaces, she is riding down by the bow somewhat. Undoubtedly the new diesels and a full fuel load should help to compensate and bring the bow up a bit.

Plans are to use HERCULES as a live-aboard dive boat, but BJ and Eliot are open to suggestions. So, from Spring 1997 on, there will be many an eye following HERCULES as she makes her way up and down the Missouri River and elsewhere. BJ Meinhardt and Eliot S. James join the ranks of proud owners of former U.S. Navy hydrofoils along with John Altoonian, owner of FLAGSTAFF, and Ronald Fraser, owner of HIGH POINT. We salute all of them!

GERMAN NAVY TRIALS

(Continued From Page 7)

(m) Constant repair lay-up, due to damage of foils, armor, and propellers.

(n) Heavy cavitation of propellers (unavoidable) since they operate just below water surfaces.

(o) Difficulty in coming alongside, due to the projection of hydrofoils 1-1/2 to 2 m on either side of the hull.

(p) When proceeding against the sea *not* on hydrofoils, the boat may be swamped due to the braking effect of the hydrofoils.

(q) Silent running impossible even hullborne, due to hydrofoil noise.

Conclusion

The main role finally proposed for the hydrofoil E-boat was that of a fast offensive mine-layer invulnerable to all German types of sea mines. The main concern was with the DM (pressure box) mine, but it was found in trials that the pressure effect of the hydrofoils was insufficient to make the DM react, even if adjusted to maximum pressure sensitivity. At high speeds the mine is unaffected because of the short time factor (note - the normal E-boat will detonate D-mines at speeds under 10 knots with a draft of less than 2.0 meters).

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