RAindrops

Robert Allan Ltd. Information & News Issue 6

CCGS Vladykov

The first of three new near-shore fisheries research vessels

Meander

In the annals of Robert Allan Ltd., there is no vessel more significant

Full Astern!

CFD prediction of a barge convoy crash stop

ROBERT ALLAN LTD.
NAVAL ARCHITECTS AND MARINE ENGINEERS

Perspective

The Other Side of Shipbuilding

by Jody Bjerkeset, P.E.
Site Contract Engineer

There are only a few things that can be more exciting and invigorating than a vessel new build project. Starting from the Owner's initial identification of need, to the selection of the naval architect and the compilation of a final design package, a sense of excitement fills the air. Finally the tender gets put out to bid - this is when the fun really begins!

The birth of a shipbuilding project is a true testament to people's will and drive. When the moment of truth arrives, and it's time for the design to leap off the paper and materialize in steel and aluminum, outfitted with a multitude of machinery, components and pieces of equipment – that is when the true character of the people involved is exposed.

Of course the devil is in the details, and the core of a shipbuilding project is found in the contract provisions, specifications and plans. Granted, much of the production level detail is carried out by the builder, but the foundation for the whole process lies within the aforementioned primary documents. These form the agreement between an owner and builder, and are crucial in creating the proper environment in the shipyard. This will go a long way in defining a clear understanding of what is required and expected. While this foundation is necessary for success, it is by no means a guarantee of it!

There are many variables aside from the quality of the tender package that factor into the final outcome: The technical ability and business integrity of the builder are the two fundamental aspects that determine the outcome of a particular project. In the shipbuilding industry, one sees the whole spectrum; from "I wouldn't trust them to fix my bicycle", to absolutely top notch, and everything in between. The personalities of the various players and the resultant interactions can be a factor in how smoothly a projects runs. Is the yard project manager capable of engaging in a cooperative manner, or are they distant and unresponsive? Other factors include the complexity of the project, flexibility of the schedule, the technical ability of builder's engineering team, turnover of key personnel, lead times for equipment, the degree of owner on-site management and inspection, and sometimes just plain old luck, good or bad! Occasionally there are circumstances beyond everyone's control, in which case a well thought-out force majeure clause will help maintain calm among all parties.

> "The birth of a shipbuilding project is a true testament to people's will and drive."

As a result of all these and other variables, every project is a unique experience and thus yields new knowledge, better ways of doing things, and of course, pitfalls to avoid! One would think after so many projects that everything would be easy; that contract provisions, specification language and plan details would be perfected. Unfortunately it really isn't so – we are always learning something!

Another Point of View

by Rollie Webb
Senior Project Director

After spending 40 years in the world of ships and boats, all of which was spent at sea or employed in shipyards, working with Robert Allan Ltd since 2008 has provided a fascinating opportunity to see how the other side lives. Seagoing personnel and shipbuilders are fairly opinionated people who do not shy away from critical evaluation of the vessels they sail, build or repair. Candid and blunt would be two more gentle terms used to describe such people. A number of other, less "Politically Correct" terms also come to mind. While the chameleon effect has recently tempered my use of such terms they lie just below the surface… always ready for application when the opportunity arises.

The critical evaluation of a design by mariners and shipyard personnel is rarely defined in mathematical terms or specific operational requirements. Most common criticisms are defined in simpler terms: too big or too small; too difficult to build, fix or operate; too expensive or too cheap; too unreliable or too complex; too noisy…. etc. These opinions, when challenged, are generally found to be based on real life experiences ground into the DNA of the people involved.

Such strong opinions are not easily transformed into design reality and it requires an open-minded approach to truly develop a design that meets all the needs of class and other regulators as well as the operational personnel who will live with the vessel long after the designer has archived the drawings and moved on to the next project.

> "Robert Allan Ltd. is unique amongst the design firms one encounters on the waterfront."

Robert Allan Ltd is unique amongst the design firms one encounters on the waterfront. Three generations of family ownership have bred a culture of talented and practical application of both the science and common sense aspects of ship design. The recent transition from family to employee ownership has only enhanced this culture. Today the workforce of Robert Allan Ltd is dominated by bright, open minded young people half my age whose most noticeable common characteristic is an abiding interest and commitment to designing good ships that truly just work well.

The Robert Allan Ltd. team brings a whole solution to the table. Capable designers, experienced managers, international exposure, ship and shipyard operational experience all congeal around employee involvement and ownership. As a truly independent designer, not subservient to a larger corporate entity, Robert Allan Ltd. provides not only competent design and independent evaluation of equipment options, but also experienced support throughout the cycle of vessel design and construction.

Full Astern! CFD Prediction of a Barge Convoy Crash Stop

by Bart Stockdill M.A.Sc., P.Eng.
Mechanical Engineer

Considering both cost and environmental impact, barge convoys are among the most, if not the most, efficient way of transporting bulk materials over long distances. A recent barge convoy designed for a South American client has the capacity to transport 50,000 tonnes of iron ore over a distance of 2,500 km using a fraction of the fuel that conventional land transportation would consume. The convoy consists of 16 – 61m long x 15m wide barges in a 4 x 4 arrangement. To operate safely in confined waterways, the convoy must be controlled by a powerful and manoeuvrable pushboat. One of the criteria that governs the design is the crash stop requirement, which in this case is 2.5 convoy lengths.

Using Computational Fluid Dynamics (CFD), the crash stop performance of the convoy can be predicted early in the design process. The simulation starts with the convoy moving at a steady speed before the azimuthing thrusters are vectored forwards and the propeller rpm increased to maximum. The reverse thrust of the propellers fights against the forward motion of the convoy, sending plumes of water forward under the pushboat hull, with the wash eventually spilling outboard in tumbling, turbulent eddies.

Figures 1 and 2 show a view of the pushboat stern looking aft early in the crash stop sequence. The model test photograph in figure 3 shows wake and propeller wash patterns that are very similar, particularly the large eddies on the port side of the pushboat.

Figure 4 shows a similar view from below the stern of the pushboat looking forward with the velocity vectors shown about half a meter below the water surface. The bias of the propeller wash to the port side (due to prop rotation), along with the recirculation of the wake into the thruster inlets is clearly visible. Areas of high viscous shear are visible in red where the propeller wash impinges on the forward part of the thruster tunnel. This wash impingement reduces the net thrust available for stopping and demonstrates one of the penalties of using thruster tunnels to reduce vessel draft. Considerable effort was placed on optimizing the tunnel geometry in order to balance performance with draft and deadweight issues.

As the convoy slows down, the momentum of water dragged along in the boundary layer of the barge hulls helps keep the convoy moving; this phenomenon is known as the added mass effect. CFD accurately captures this by modelling the boundary layer around the barge hulls and its unsteady response to deceleration. This is an advantage over traditional model testing where it is difficult to precisely capture the effect of added mass in real time since the viscous forces are too high at model scale.

Though less efficient, open propellers offer some advantages for river operations; primarily that they are less prone to fouling from debris. However, the exact performance difference between open propellers and nozzles in the dynamic conditions of a crash stop is difficult to predict using conventional calculation methods, so CFD simulations were carried out for both cases. CFD predicted a crash distance of 2.5 convoy lengths with nozzles and 3.2 lengths with open propellers. Model testing was then performed only for nozzled propellers, saving time and money in the design process.

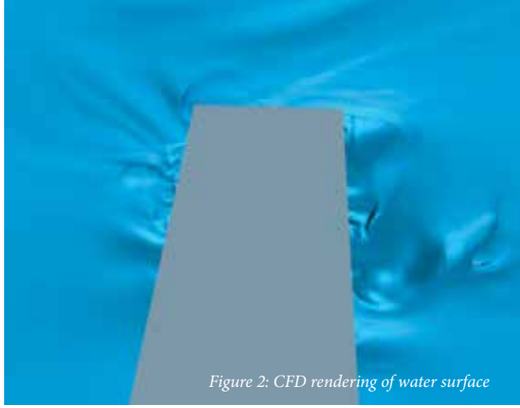


Figure 2: CFD rendering of water surface

Figure 3: Photo of model testing

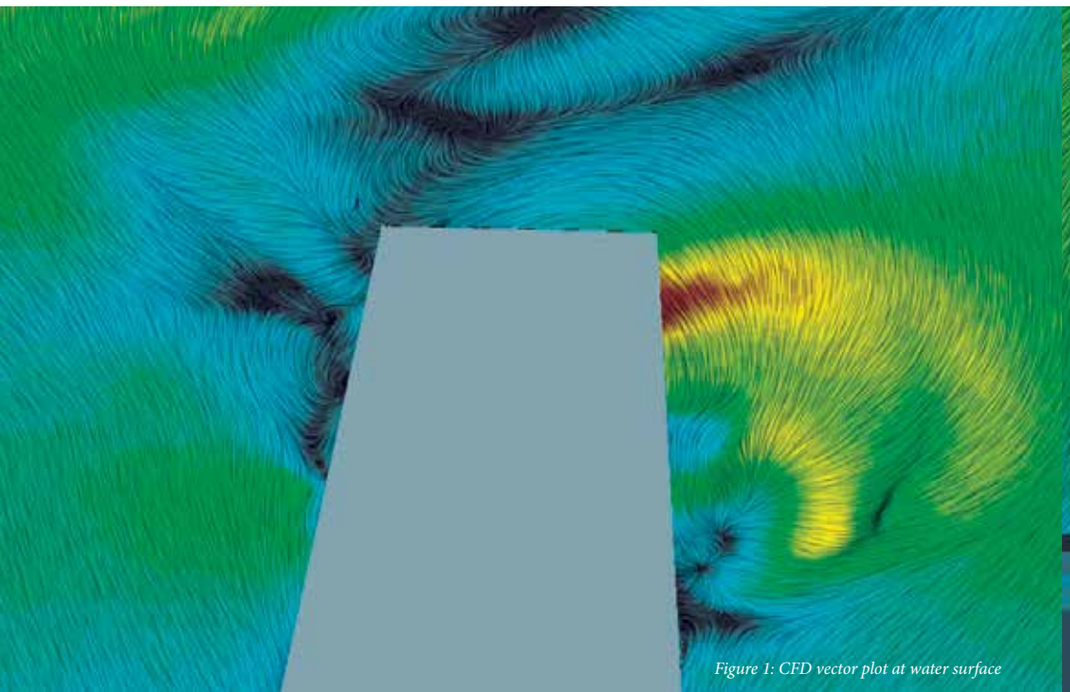


Figure 1: CFD vector plot at water surface

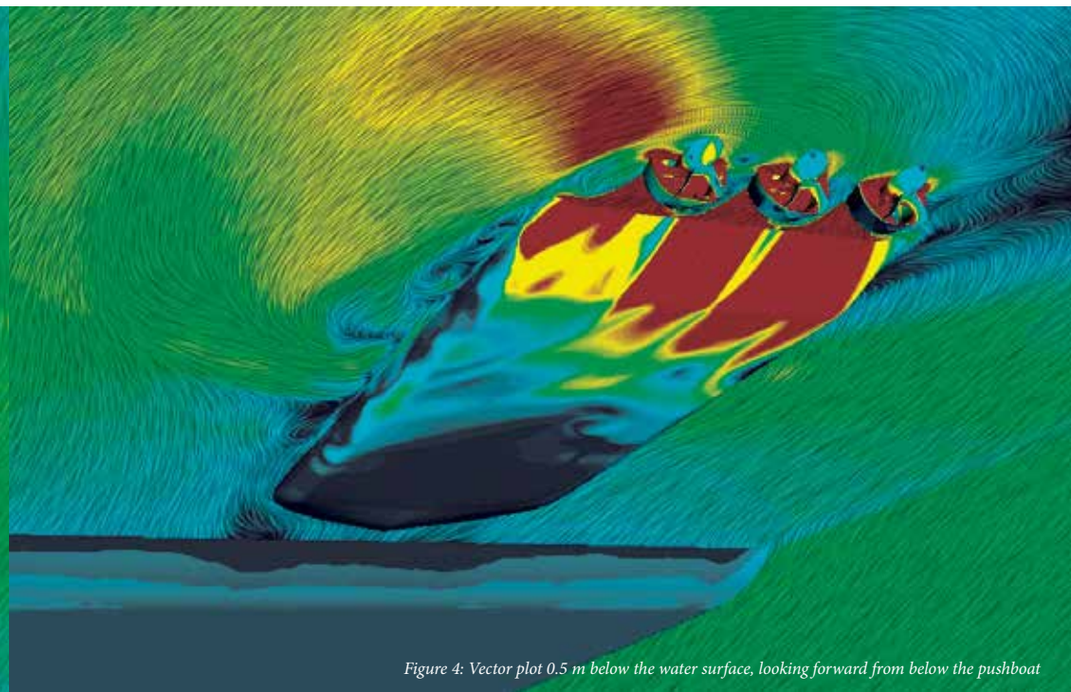


Figure 4: Vector plot 0.5 m below the water surface, looking forward from below the pushboat

Deliveries

Near-Shore Fisheries Research Vessel ***CCGS Vladykov***


AVT 36/70 *Class tug* ***Ibaizabal Diez***

The ***CCGS Vladykov*** (as seen on the cover and this page) is the first of three new 25 metre Near-Shore Fisheries Research Vessels to be delivered to the Canadian Coast Guard. Commissioned in August 2012, the vessel was constructed at Meridien Maritime Inc. in Matane, Quebec to a design developed by Robert Allan Ltd. of Vancouver, B.C. The ***CCGS Vladykov*** and its sister vessels will conduct scientific research in the Newfoundland and Labrador region. Secondary missions include search and rescue, environmental response and the support of marine programs for other government agencies.

The vessel is named after the internationally known ichthyologist, the late Professor Vadim Dimitrievitch Vladykov. Professor Vladykov contributed significantly to the study of fish biology in Canada.

The ***CCGS Vladykov*** hull form incorporates features of the very successful Robert Allan Ltd. ***RAstar*** Escort Tugs - a unique class of ASD tugs designed with a sponsoned hull form. This form has been proven in both model and full-scale testing to provide significantly enhanced seakeeping performance. The motions and accelerations are less than half those of a comparable sized wall sided "standard" hull. These features, combined with excellent manoeuvrability, allow the vessel to maintain station and continue conducting scientific operations in much higher sea states than previously possible with this relatively small size and type of vessel.

On trials, ***CCGS Vladykov*** met or exceeded all performance expectations, achieving a free running speed of over 10.5 knots.

Ibaizabal Diez (above) and ***Ibaizabal Once***: The Spanish tug company, Remolcadores Izbaizabal has taken delivery of two new ***AVT 36/70*** Escort tugs from the drawing board of Robert Allan Ltd. The tugs were constructed by Astilleros Armon in Navia, Spain.

GPC Barú (below) was delivered to her owner Sociedad Portuaria Regional De Cartagena (SPRC), Colombia. GPC Baru is the third of the ***RAmparts 3200-CL*** class design built by Cheoy Lee Shipyards Ltd. The vessel is specialized for ship-assist service and coastal towing, and uniquely designed to operate in restricted water depths. The vessel is also equipped and classed with fire-fighting 1 capability.

The ***Al Fenci*** and ***Al Durrah***, two new ***RAmparts 3200*** tugs have been successfully delivered to Abu Dhabi Ports Company by Grandweld Shipyards. The vessels are specially designed to assist in marine and harbour operations at Khalifa Port, including escorting & towing, mooring/unmooring, and fire-fighting operations.

Doña Clary is the first of the new ***RAmparts 3700*** Class design built for Serviport S.A. of Colombia. The vessel is designed with enhanced manoeuvring and sea-keeping capabilities and is fully equipped for ship-assist, long distance towing, fire-fighting, anchor-handling, cargo handling and other offshore support duties.

PMS 1386 and ***PMS 1387:*** Two ***RAstar 3200*** Class Tugs were completed by PM Coast Maritime(s) Pte. Ltd. With Fi-Fi 1, oil recovery and escort capabilities and notations, this particular vessel is able to fulfill a wide variety of duties in adverse conditions.


Aft Science Conrtol Station

RAmparts 3200-CL *Class tug* ***GPC Barú***

RAmparts 2800 Class tug ***Tarua 120***

Tarua 120 (above) is the latest of the ***RAmparts 2800*** Class Tugs to be built to this widely accepted design, and is the first tug to be built to a Robert Allan Ltd. design in Thailand. Working in close cooperation with shipyard personnel, the standard ***Ramparts 2800*** design was customized to meet the Port Authority of Thailand's requirements for propulsion equipment, accommodations, tank capacities and outfit.

Originally conceived as a training vessel, the ***BRAtt*** has developed into a class of small but tough workboats. While the original ***BRAtt*** is of all-welded aluminum construction, a recently built pair are constructed with a steel hull and aluminum house. These two new ***BRAtt 880-SU*** workboats (one shown below) are ice-strengthened utility vessels.

Ulupinar XV: The Ulupinar Series of compact ASD tugs has proven to be a very successful part of Sanmar's portfolio, with 14 vessels in service; the first one delivered in 2007. After five years, the Sanmar board decided that some updates were needed and Robert Allan Ltd. was contracted to provide an updated design that would keep this compact tug at the forefront of the modern tug world. Minor cosmetic changes brought the look to a more modern standard, and improved outfit materials and method have increased crew comfort and livability, but the real changes were "under the hood". Upgrades to the drive and propulsion system will ensure that this model has a long future ahead of it! The first vessel, ***Ulupinar XV*** has been completed and has entered service with the Sanmar fleet.

The Saudi Ports Authority, owner of the ***Rasalkir 1***, ***Rasalkir 2*** and ***Rasalkir 3***, has taken delivery of all three tugs. The ***RAmparts 3200-W*** class are powerful ship-handling/terminal support tugs designed to act as harbour, escort, pollution control and fire-fighting tugs, and will assist in mooring, unmooring and all maintenance requirements in the ports of the Kingdom of Saudi Arabia, in both the Red Sea and Arabian Gulf waters.

The ***Z-Tech™ 6500***, ***ICDAS-19*** has been successfully delivered to ICDAS Port Operations, by sister company, ICDAS Shipyards. This vessel was conceived, constructed and will be operated entirely in house under the parent company; ICDAS Celik Enerji Tersane ve Ulasim A.S, in Turkey.

BRAtt 880-SU *Class tug*

Original Watercolour by Bart Stockdill M.A.Sc., P.Eng.

Meander… 80 years a Lady!

by Robert G. Allan, P.Eng.
Executive Chairman of the Board

In the annals of Robert Allan Ltd., there is no vessel more significant than ***Meander***.

My grandfather, with an impeccable sense of timing, decided to commence in private practise in 1930. As this must have been after the stock market crash of October 1929, I can only surmise this must have been an act of desperation to make a living independently in the very toughest of economies. In the absence of any other paying jobs in his field, it was also likely his only possibility to earn a living. In our family lore, there are stories of earnings in the period between 1930 and 1933 in the region of $100-$200 per year. In 1933 however Robert Allan was approached by Mr. George Kidd, a local prominent businessman (obviously less affected by the depression!) to design a luxury yacht, to be named ***Meander***. This was a major commission at the time, and lifted my grandfather out of both an economic and an emotional depression, and consequently paved the way for a further 80 years of our company success. (Regrettably I do not know how much he was paid for this design!). Kidd was a fellow Scot, which undoubtedly had some influence in the selection of my Grandfather to do this work. He reportedly wanted a ship that would carry him anywhere up and down the Pacific Coast and ultimately to his ancestral home in Glasgow, Scotland. Kidd was President of the Vancouver Power Co., and the chairman of the Vancouver Board of Trade in 1934-35. The vessel was built in 1934 at W.R. Menchions shipyard in Coal Harbour (located just east of where the Bayshore Inn now stands). As noted on the Midship Section drawing, this boat was stoutly built from the finest materials available;

- Yellow cedar hull planking
- Bent 2" x 3" white oak frames at 9" centres
- Teak deck planking
- Yellow cedar ceiling (inner planking)

Like many large yachts of the period, ***Meander*** was seconded by the Royal Canadian Navy for coastal patrol duty, serving as ***HMCS Meander*** in the "Fisherman's Reserve" during WWII. (Incidentally my Father's cousin's husband spent his war years patrolling the BC west coast aboard ***Fifer***, another of my Grandfathers "grand yachts" (which was undoubtedly one of the luckier postings of the war!). The current Owner's brief web history refers to ***Meander***'s wartime designation as ***FY11***, but according to Navy documents that designation was for a vessel named ***HMCS Talapus***. (more research required!) The most detailed summary of Meander's post-war life appears in "Antiques Afloat…from the Golden Age of Boating in BC" by Peter Vassilopoulis [1980]. That publication indicates the following history of ownership:

1945: Sold to Pacific International Airways – function unknown.

1948: Bought by Sydney & Walter Wilson and used as a charter yacht under "Meander Charters Ltd.".

1950-51 to 1963: ***Meander*** worked as the United Church Missionary Vessel ***Melvin Swartout II*** working up and down the West Coast of Vancouver Island, based initially out

of Port Hardy and in 1953 moved to Bamfield.: http://memorybc.ca/melvin-swartout-ii-fonds.

1963-1972: Sold to Frederick Alexander Menzies of West Vancouver, who operates her as a charter yacht. Bequeathed to Robert Menzies.

1972: Sold to Art and Norma Clements.

In 1977 she acted (presumably briefly?) as ***Greenpeace IX*** which blockaded a vessel carrying representatives from 15 oil companies promoting an oil tanker port in northern British Columbia, and reportedly blockaded nuclear submarines from going into Hood Canal.

The boat was purchased in 1975 by the current Owner, Mr. Dennis Feroce, who still lives aboard her with his wife Jan. For many of the intervening years Meander has been operated as a charter yacht. That purchase was a fortuitous thing for Meander, as Dennis has maintained Meander in an absolutely pristine condition, and most importantly maintained her in a manner faithful to her original design. Jan has lent a talented decorator's touch to showing the boat off beautifully with refined paintwork and beautiful upholstery and fine artistic touches.

The original design drawings for the ***Meander*** reside in our archives which are classic design drawings, in India ink on linen, and the inboard profile in particular is a mass of information detailing the construction, machinery and outfitting of the boat.

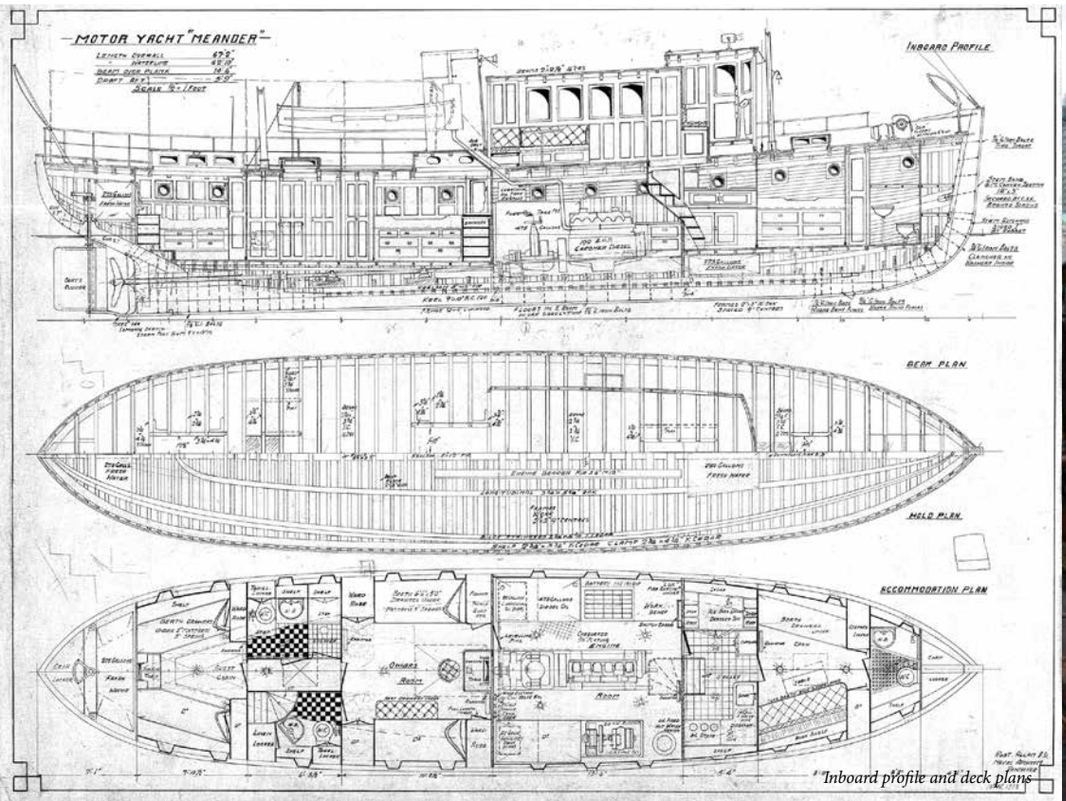
It is a testimony to the skills of the designer and the shipwrights of the day that this venerable vessel was built to just 4 detailed drawings!

Some Robert Allan Ltd. staff have had the pleasure of a recent visit aboard ***Meander*** through the connection which our naval architect Vesna Klipa has made with Dennis and Jan. There are myriad photos detailing the yacht on the Owner's website: www.mvmeander.com.

I had the distinct pleasure of a private showing of the yacht about two weeks ago, and spent several hours swapping waterfront stories with Dennis and Jan. It is abundantly clear that this is a boat much loved, and that shows in every aspect of its hull and outfit, which according to all recent surveys is in excellent condition. The hull has never been re-planked, nor had any major re-construction. Dennis takes great care to maintain thorough circulation of air through all parts of the hull. Regrettably, Dennis and Jan have decided that it is time for a lifestyle change and they have reluctantly put ***Meander*** up for sale. (Still time to make an offer!!)

It is gratifying to know that the roots of this company were laid on the ways with this beautiful classic BC yacht, and that this wonderful example of the skills of previous generations still abides in our local waters.

Footnote: in the basement of the Vancouver Maritime Museum resides a model of ***Meander***, in a rather poor state of repair. My memory is that my Father built this model and sold it to Mr. Kidd in 1934, thus paying for his university tuition for a year; Dad would have been 18 years old at the time!.. (another project for further research!)



Inboard profile and deck plans

Meander *at her moorage near Granville Island, BC*

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On the cover: Near Shore Fisheries Research Vessel ***CCGS Vladikov***.

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