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## Part 1: A Dynamic Duo for Decades



### ***A two-part conversation with Bruce Hays and Larry Leibman (Orca3D) and Don MacPherson and Jill Aaron (HydroComp)***

Some things in life just go together: milk and cookies, Mickey and Minnie, an ocean view and a good book. Let's not forget the powerful combination of HydroComp, Inc. and Orca3D LLC – two companies sharing a history together that spans decades. With a well-developed business and technical partnership, they have co-exhibited at industry trade shows and made their software tools work as a team, particularly HydroComp NavCad, the Orca3D naval architectural suite, and more recently Orca3D Marine CFD. We spoke with Bruce Hays and Larry Leibman, naval architects and co-founders of Orca3D, as well as Don MacPherson and Jill Aaron, principals of HydroComp, about this long-standing partnership and their plans for the future.

Bruce and Larry first met HydroComp's Technical Director, Don, back when they were students at Webb Institute. After graduating, Bruce and Larry went to work with George Hazen, the brilliant engineer that was developing the FastYacht/FastShip design software. Bruce noticed that a lot of their customers were using Rhino with their software. "They would do the initial hull design and some of the basic hydrostatic and stability analysis in FastYacht and FastShip, and then they would transfer it into Rhino," he shares.

Since Rhino encourages third-party plugins, Bruce, Larry, and George developed one – RhinoMarine – to bring the naval architecture aspects of FastYacht and FastShip into Rhino. HydroComp's commercial relationship with Orca3D started here some 20 years ago with the development of a Drag Prediction Library for RhinoMarine, which evolved into the current Orca3D naval architectural suite. "Orca3D was written from the very beginning as a Rhino plugin and our first release was in October 2008 - that was Version 1," Bruce declares. "We just recently released Version 3."

HydroComp continued development of the library under the Orca3D banner for a period of time. It became clear, however, that there were opportunities to enhance the design workflow for the two companies' common customers. Don notes, "Naval architecture is a complex juggling of many different tasks and objectives. First and foremost, it is a system problem, so data exchange and smooth interface between tools is very beneficial to an efficient workflow." This prompted cooperation to introduce a NavCad Connector utility so that users of Orca3D could have a streamlined workflow from the design tasks in Orca3D to the hydrodynamic and propulsion system simulation in NavCad.

This theme of cooperation among naval architectural tool developers was a big part of the evolution of both companies. As Bruce reflects, "We worked together with HydroComp and a few other small software companies doing detailed stability analysis, structural analysis, cost estimating, and we formed a group called IMSA, the International Marine Software Associates." The purpose of IMSA was not just technical cooperation, but also marketing cooperation. For example, the group "developed an interfacing and data exchange standard so that our software could work together. We also had a lot of marketing cooperation – including

shared participation at trade shows for several years – as we were all small businesses and it made it much more cost-effective.”



*Figure 1: The logo for the International Marine Software Associates (IMSA).*

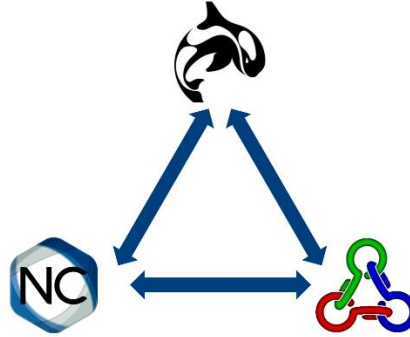
HydroComp’s Managing Director, Jill, was the marketing and promotional lead for IMSA, but she comments that “the magic glue to IMSA was that these smaller businesses were represented by one European agent: Nick Danese, of NDAR (formerly Design Systems Europe). Nick was instrumental in helping to develop both the FastShip hull form software and NavCad by providing feedback on user requirements and operational suggestions.” As a naval architect, Nick understood the benefit of offering clients a comprehensive suite of “best-of-breed” naval architectural tools. Jill reflects that “there really would not be a relationship with Bruce and Larry without Nick as the glue. We showcased this as IMSA at many trade events and conferences during these early years alongside Nick, and we continue to do so today.”



*Figure 2: Larry Leibman, Bruce Hays, and Don MacPherson at IBEX 2014.*

This is an organic partnership, where the HydroComp and Orca3D tools represent a larger and more comprehensive solution for their mutual users. For example, when an Orca3D customer would make a request outside of their wheelhouse, Bruce would happily refer the client to HydroComp. “I could turn and say, ‘Well, this is Don MacPherson, he knows everything there is to know about resistance and propellers, so you need to talk to him,’” he shares. HydroComp is a user of the Orca3D suite, while Larry and Bruce are experienced users of NavCad. “We both use each other’s software, and we see several opportunities to leverage capabilities from one tool to the other,” declares Larry.

In 2017, Orca3D partnered with Simerics, Inc., who specializes in CFD, to expand the scope of a team-based comprehensive suite of tools. “One of the things that we were trying to do is take advantage of some of the tools they had built into Simerics to make it more accessible to the average engineer and naval architect,” Larry states. “In the context of Orca3D, we’ve wrapped this system with Simerics CFD and Rhino together into a thing called ‘Orca3D Marine CFD’.”



*Figure 3: HydroComp NavCad (bottom left), Orca3D (top center), and Simerics (bottom right) are all interconnected.*

According to Don, this offers a unique holistic opportunity for naval architects and designers to evaluate hydrodynamic problems. “I have several maxims that I rely on, but two are particularly relevant here – one, everything is a system problem first, and two, the tool needs to match the problem.” Having a comprehensive suite of capabilities like those of Orca3D and HydroComp that communicate and work as a toolchain gives users ways to most effectively tackle design problems. For example, NavCad provides a workbench for full Vessel-Propulsor-Drive system analysis, with a library of prediction models for hulls and propulsors. NavCad enables users to “predict the resistance in literally seconds,” chimes in Bruce. Don explains further, “the Vessel piece of the system, particularly a vessel resistance for example, can now include results from Orca3D Marine CFD in addition to those from the native 1D parametric methods and 2D ADVN vessel resistance method of the NavCad component library. It can provide 3D results for the Vessel component that can be brought back into NavCad for full system analysis,” explains Don.

And the cooperation doesn’t end here. Additional development is underway to use NavCad prediction data to enhance the force model – and the simulation fidelity – for Orca3D Marine CFD planing hull predictions. More to come on that subject! It’s no surprise the Orca3D and HydroComp collaboration that started so long ago is continuing to advance the software and services that naval architects and designers from around the globe rely on for their projects, clients, and reputation.

Harnessing the power of the expertise, resources, and commitment of both teams is aiding the development of innovative solutions meeting the needs of our customers – with a strong history and foundation, there is no stopping this dynamic duo. We invite you to join both Orca3D and HydroComp at the Orca3D Marine CFD Workshop at the IBEX Pre-Conference on September 30 in Tampa, Florida! Register [here](#).

The Orca3D team will also be exhibiting during IBEX (October 1-3) at Booth 2-345. Email to make an appointment or stop by. Just like the IMSA days, HydroComp staff will be alongside them. We look forward to seeing you and demonstrating all that you can accomplish with the powerful combination of Orca3D and NavCad.

Keep an eye out for “Part 2: What Lies Ahead...”

### **About HydroComp**

Since 1984, HydroComp has been a leader in providing hydrodynamic software and services for resistance and propulsion prediction, propeller sizing and design, and forensic performance analysis. Through its unique array of software packages and services, HydroComp now serves over 1400 naval architectural design firms, shipyards, yacht owners, ship operators, propeller designers, universities and militaries around the globe.

### **About Orca3D**

Since 2008, Orca3D has been the marine plug-in of choice for more than 3,000 Rhino users around the world, adding features to Rhino for hull design, intact and damage stability, speed/power prediction, weight and cost tracking, and computational fluid dynamics. Our customers design and build recreational power and sailboats, luxury yachts, and commercial and naval vessels of all sizes, and Orca3D is taught in over 70 universities worldwide.

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