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—Isabella Conti, President and CEO, Marine Advanced Research

HP customer case study: Pioneering marine start-up turns to HP Workstation to transform unique maritime design from idea to reality

Industry: Marine vessel development

HP recommends Windows Vista® Business

Objective:
Enable in-house 3D design of a revolutionary new marine vessel at a reasonable cost

Approach:
Marine Advanced Research has paired an HP xw4400 Workstation with Autodesk Inventor Professional

IT improvements:
• Stable, reliable performance
• Support for dual monitors
• HP Performance Tuning Framework helps maintain peak Workstation performance

Business benefits:
• Faster modeling and animation allows investigation of multiple design alternatives in a short period of time
• Ability to revise sophisticated assemblies quickly for presentation to potential customers
• Dual monitors enable designers to zero in on a particular assembly, while also retaining an overall view of the vessel
• Stability in the OS and primary software applications prevents interruptions in the design process

Imagine a boat that doesn't "fight" a heavy sea, but instead, adapts to provide a smoother, more efficient ride.

That's exactly what the visionaries at Marine Advanced Research have created. And to translate that vision into a prototype, and eventually into commercial products, the company turned to an HP xw4400 Workstation.

"The HP Workstation enabled us to explore more design alternatives, and do so faster, with greater stability than our previous hardware," explains Isabella Conti, President and CEO of Marine Advanced Research. "In the future, it will enable us to quickly customize the design for individual customers, making the technology more affordable and accessible."

Photo courtesy of Michael Morrone and HP

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From idea to reality

The roots of Marine Advanced Research date back some 30 years, when Conti and her design engineer husband, Dr. Ugo Conti, were sailing around the world in their 50-foot ketch. Each time the boat was faced with heavy seas, Ugo Conti said, "There's got to be a better way." A few years later, he adapted a 28-foot inflatable with the goal of enabling smoother, more stable sailing. He sailed it alone from San Francisco to Hawaii. When Isabella joined him in the islands, she was amazed. "I think I actually felt safer on the 28-footer than I had on our ketch. It sailed incredibly well."

"HP's technical staff turned me onto Performance Tuning Framework to make sure we're getting the most out of the graphics card, and the performance of Autodesk Inventor. It helps us make sure the Workstation is operating at its peak."
Mark Gundersen, Chief Engineer, Marine Advanced Research

Now, more than two decades later, the couple has founded Marine Advanced Research to refine their design technology into an entirely new kind of sea-going vessel: the Wave Adaptive Modular Vessel, or WAM-V® (www.wam-v.com). The WAM-V is an ultralight flexible catamaran that's modularly designed to fit the requirements of a specific user, mission or project.

The company's Prototype WAM-V vessel is named Proteus, after an early sea-god capable of changing shape and assuming many forms. Unlike conventional boats that force water to conform to the hull, Proteus adjusts to the surface of the water. Its innovative superstructure is flexibly connected to specially designed pontoons to support the vessel and dramatically minimize stresses to structure, payload and crew. "Proteus does not pierce the waves; it dances with them," says Ugo Conti.

To make his invention a reality, Conti initially worked on the design with Antrim Associates naval architects. When the Contis decided to launch Marine Advanced Research, they brought Phase II of the design process in-house. It soon became obvious they needed a more powerful computer.

"The old hardware just didn't meet the system requirements we needed in order to properly run our software of choice, Autodesk Inventor Professional," explains Mark Gundersen, Chief Engineer for Marine Advanced Research, who collaborated with Ugo Conti on the Phase II design. "The design is complex; our old system just couldn't handle it. If you wanted to switch views, for example, it would take a long time for the screen to re-draw. We just couldn't be productive."

HP becomes partner to power innovative design

So the company turned to HP to establish a partnership. It chose the HP xw4400 Workstation running genuine Windows® Vista® Business, with a downgrade to Windows XP Professional custom-installed,*+ and outfitted it with 4 GB of RAM, dual 160-gigabyte hard drives, 2.67 GHz Intel® Core™2 Duo processor,[1] and an NVIDIA Quadro FX 3500 video card.

"The difference was like night and day," Gundersen continues. "In the past, when we tried to run a 3D animation, everything bogged down. It took forever. With the HP Workstation, I can run an animation

almost in real time."

Animations are important to Marine Advanced Research in two ways. First, Gundersen notes, animations quickly tell the designer whether there are interferences or other design flaws. If so, he can quickly adapt the assembly and re-test it. Many design flaws can be eliminated long before the design is prototyped.

But animations play another important role for the Contis' company. "Understanding WAM-V technology requires a certain amount of imagination," says Isabella Conti. "So we have found that it's very helpful to show animations to potential customers to help them understand all the vessel can do."

Gundersen adds that the company also uses Autodesk AliasStudio software to quickly do conceptual renderings. AliasStudio provides sketching, modeling, and visualization tools that help the design team quickly realize ideas in a single environment. The company uses an HP Business Inkjet 2800 and HP Photosmart printers to create hard copy presentations.

HP software fine tunes performance
The HP xw4400 Workstation is not only far faster than

the company's previous hardware, but it's fine-tuned for the software and design tasks at hand, thanks to HP Performance Tuning Framework software. Performance Tuning Framework allows a custom configuration that best matches the Workstation to users' requirements. "HP's technical staff turned me onto PTF to make sure we're getting the most out of the graphics card, and the performance of Inventor," says Gundersen. "It helps us make sure the Workstation is operating at its peak."

He uses the Workstation's dual monitor capability, driving an HP LP2465 24-inch diagonal Widescreen LCD Monitor and L1955 19-inch diagonal LCD Flat Panel Monitor. "On a boat that's 100 -feet long by 50 feet wide, it's nice to zero in on a particular assembly or feature, but also to have a view of the overall vessel. Having dual monitors lets me see both, so I can be more efficient as I'm moving around the boat."

Such features speed the design process, which can sometimes seem endlessly iterative. "It's much quicker to go in and make a change, run an animation and see the results in 3D, so we can view it from different angles," Gundersen explains.

Conti says the Workstation enables Marine Advanced Research to prepare a presentation or mock up of a new design with faster turnaround that simply wouldn't be possible otherwise. "Obviously, having a powerful Workstation saves engineering time and that translates directly into financial savings," she adds.

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The company has been working with its HP Workstation for around two years. Typically, design engineering is a field where technology changes quickly, demanding frequent refresh of hardware. But

HP recommends Windows Vista® Business

Customer solution at a glance

Primary applications
3D design and modeling

Primary hardware
• HP xw4400 Workstation

• HP LP2465 24-inch diagonal Widescreen LCD Monitor

• HP L1955 19-inch diagonal LCD Flat Panel Monitor

Primary software
• Windows® Vista® Business with a downgrade to Windows XP Professional custom-installed*+

• Autodesk Inventor Professional

• Autodesk AliasStudio

• HP Performance Tuning Framework

Gundersen says he expects the xw4400 Workstation to continue serving his needs for the foreseeable future, despite upgrades to newer versions of Inventor and other software. "It's been essentially trouble-free, and it runs the software reliably without any crashes," he adds.

At present, Proteus is being evaluated by the U.S. Navy for potential applications.

Marine Advanced Research is continuing to work on the next generation design, anticipating a variety of potential uses from sea exploration to rescue missions.

The Proteus is 100 feet long and 50 feet wide, and carries a 4,000-pound payload. Yet its draft is only 8 inches in front and 16 inches aft, at half load. As a result, Proteus travels in very shallow water and can be beached without damage, delivering cargo or personnel. Isabella Conti notes that the design can be scaled anywhere from 8 feet to 150 feet in length with payload capacity up to 20,000 pounds.

For the next few years, each WAM-V vessel that Marine Advanced Research produces will be a unique, one-of-a-kind design based on the needs of a particular customer. That underscores the importance of having in-house design capabilities for adapting the base design quickly and productively.

"Our design capabilities are critical to our success," notes Isabella Conti. "Having the computer and software available to make changes in 3D and drive custom manufacturing is a key part of our plan for future success. We're fortunate to have HP and Autodesk as technology partners, which together give us both high-end capability and a stable platform we can depend on for years to come."

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