

# Flying across the open sea

By Elisabeth Wagner

“When everything is getting more complicated by the minute, it helps to simplify things for a change.” And that’s exactly what MTU’s affiliate Vericor Power Systems did: it developed a control unit for marine gas turbines to hurl luxury-class yachts of many tons across the water at high speed. The new electronic black box facilitates work for captain, crew and engineers alike. The Vericor team once more impressed its mark of excellence on the marine propulsion market.



When Vericor’s marine sales manager Tony Wilcoxson visited Diesel Center, a distributor of marine propulsion equipment and control systems in La Spezia, Italy, in March 2006, Diesel Center’s president Michele Maggi told him that he would love to offer a TF50 gas turbine package as a boost system for mega-yachts. But it wasn’t enough that

the 5,600-horsepower TF50 package could take a 120-foot yacht to speeds of over 50 knots, the package needed to be attractive to ship builders who were competing in an ever cost-conscious environment. “Just because these buyers spend 20 million euros on a yacht doesn’t mean they don’t shop for the best value,” explained Maggi.

Upon his return to Vericor headquarters in Atlanta, Georgia, Wilcoxson huddled with the company’s marine propulsion specialists, and they quickly decided that a complete integration of the control functions of the whole propulsion system would reduce cost, installation, and space requirements as well as improve maintainability.

Normally, a gas turbine has a dedicated unit to control all engine functions in a factory-sealed box with limited modification and serviceability in the field. Similarly, there are discrete control units for the reduction gearbox, exhaust cooling, water jet as well as other systems, all supplied by different manufacturers. All these discrete controls connect to an operating console in the engine room (called local operating panel or "LOP") supplied by yet another vendor that duplicates many of the controls available to the ship's captain. These boxes and panels claim valuable space in the engine room, and the related complexity of various software and system interfaces results in a real headache for yacht builders and marine outfitters like Diesel Center.

A Vericor project team was assembled and tasked to find a way to make this concept a reality—and do it fast as Diesel Center had two projects on their list that could be given the go-ahead if the system was ready in time. The engineers quickly concluded that programmable logic control technology could be used to integrate all of the various propulsion system control functions into a single unit. Off-the-shelf equipment was available that would allow the team to not only integrate all the functions, but also to make quick programming changes during its development.

For the integrated control system to be a success, it was critical that Vericor, as the



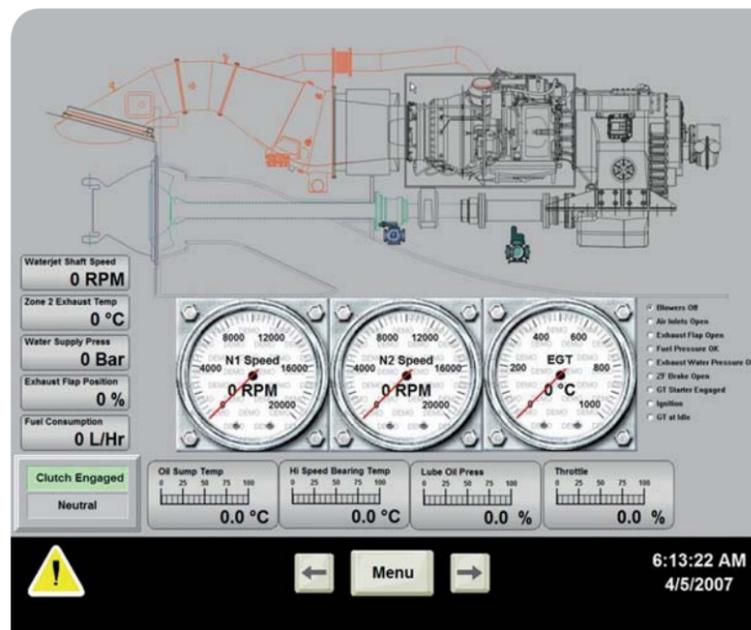
The important data at a single glance, deeper information with just a few touches of the screen.

engine builder, was the overall technical leader. Diesel Center had been working with reduction gear builder ZF Specialty Marine Products on a new, lightweight gearbox, and Vericor identified T3 Automation, a yacht controls specialist, as a resource for graphics and hardware expertise. All agreed to the basic requirements and the new product was designated the integrated turbine control

panel (ITCP). Lorenzo Previsani of Diesel Center, a veteran of many high-speed yacht projects, said: "By designing one system that does everything we eliminate a lot of redundancy and get rid of all these separate boxes from different vendors that have to understand each other."

In October 2006, Diesel Center ratcheted up the pressure by presenting Vericor with an order for two TF50s with ITCPs requiring a June 2007 delivery—meaning Vericor had to develop, test and deliver a completely new control system in less than eight months.

Development then proceeded at urgent speed. "By using standard, off-the-shelf hardware components and taking advantage of T3 Automation's programming support, we were able to dramatically shorten the development cycle," explained Vericor's controls engineer Joe McMurry. The ITCP had to be ergonomically and aesthetically pleasing while giving the technicians on board all essential information about the status of the various systems at a glance, and at an economical cost. Another important criterion was that the displays and graphics be consistent with a multi-million dollar mega yacht. "While the product we deliver must be cost effective, the yacht owner still wants to see high technology and a lot of innovation," said Wilcoxson.



According to the motto "less is more", Vericor's new panel integrates formerly separate control units into a single one.



The sleek, elegant Pershing 115 is the first high-performance yacht to have the new ITCP panel installed in its machinery room.

The first test came in February 2007 when a prototype ITCP was connected to a TF50 for actual engine start and operations validation. The TF50 functioned perfectly, never realizing it had a new rider in the saddle. The ITCP was then shipped to La Spezia to begin the crucial activity of programming and validating all of the other system functions. Once all programming was complete, the ITCP prototype with the engine, gearbox, bridge control and local control panel were

systematically checked out in a simulation exercise in a quickly established test facility at Diesel Center.

The final gate was, of course, success at sea and the first project was a new 140-ton Pershing 115. In parallel to the software development, the two ITCPs were released for assembly and delivered to the yacht builder in May. When the panel was received, the team worked long hours in the tight con-

ditions of the engine room to install the TF50, ZF reduction gear, ITCP and the rest of the propulsion system. Connections were made, checked and rechecked, and finally only the last test remained.

With the 35-meter Pershing 115 cruising along under diesel power at 33 knots, the captain pressed the "Start" button; seconds later the turbine was up and running. He then advanced the throttle to engage the clutch; ten seconds later the gas turbine was ready for serious business. "Hold on" was the call to everyone on board and the captain gave the boat 100 percent throttle. Like a jet on afterburner, the big yacht leapt forward reaching 53 knots in a matter of a few seconds. The ITCP was a success!

Yachting magazines claimed the Pershing 115 propulsion system was a new standard for speed and luxury. Commentaries like these are music to the ears of Vericor president and chief executive officer Tom Bray: "The team demonstrated how a small, focused company like Vericor provides innovative solutions quickly and efficiently."



Vericor's gas turbine provides aircraft power to marine clients. The compact TF50 develops 5,600 hp. The new ITCP makes this engine even more attractive to the owners of high-performance mega yachts.

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