Silver Ships designed and constructed a 42-foot, multi-mission fire rescue and patrol vessel for East Baton Rouge (La.) Parish Sheriff's Office to support law enforcement operations on the Mississippi River.

The Patrol Boat of Tomorrow IS HERE

By Shawn Lobree, Federal Contracts Manager, Silver Ships Inc.

New technology for marine patrol vessels is constantly emerging and has the capability to reduce operator risk, save time and improve costs. Patrol boats are generally small naval vessels designed for coastal and harbor defense duties and operated by a nation's navy, coast guard, marine patrol, customs and other law enforcement agencies. They are consistently on the move and can often be put in harm's way and other challenging circumstances on the water.

Today's patrol boats can be advanced in their design, construction and outfitting. Their evolution over time has included improvements in manufacturing processes for precision cutting and welding; improvements in metal alloys used for construction; innovation in electronics, including radar, radio and navigation equipment; advancements in armor; new engine technology; and injury-reducing shock mitigation equipment, among many other developments.

Though designs and outfitting components continue to evolve, multiple new technologies are becoming available to patrol boat operators to even further enhance their mission readiness on the water. A few of these new and evolving technologies are highlighted in this article.

Autonomous Controls: A Game Changer

The use of autonomous controls for a variety of patrol missions has the potential to be a game-changer for operators. First, because patrol boat missions include maintaining a constant presence on the water, autonomous vessel technology offers relief for personnel manning requirements. This technology can allow operators to control a patrol vessel from shore or from a mother ship, or systems can be programmed for complete autonomy on the water.

Additionally, this technology can reduce risks the crew faces while aboard. Patrol missions can often put crewmembers in potentially dangerous situations; so using an unmanned vessel can reduce crew risks from maritime threats. This is particularly relevant with reconnaissance and surveillance missions without intercept or boarding requirement.

Finally, use of autonomous control technology can greatly extend mission endurance by eliminating fatigue problems associated with manned vessels. Being out on the water in potentially dangerous situations for long periods of time can be a strain for crews and operators, but use of autonomous controls can help ensure missions appropriate for this technology are completed efficiently with less risk to crewmembers.

Sea Machines Robotics is a forward-looking, autonomous technology company that specializes in advanced control technology for workboats and other commercial surface vessels. Sea Machines builds industrial-grade systems, including the SM-300 vessel intelligence system that provides "operator-in-the loop" autonomous command and control and direct remote-control operation via wireless belt pack. The SM-300 is easily installed aboard existing commercial vessels, or it can be included in new-build packages.

Incorporating autonomous vessel

Photo Credit: Silver Ships

technology aboard existing patrol boats can allow autonomous control and efficient mission performance while reducing overall risks to crew.

Diesel Outboards

A second new, potential patrol boat technology is the use of diesel outboards, which can quickly compound savings on fuel and add range and endurance on the water. In early testing, vessels have seen a 25% or more savings in fuel consumption using diesel outboards than comparable gasoline engines.

As demand for high-horsepower propulsion continues to grow alongside the need for reliable and cost-effective power sources, diesel outboards check all the boxes. Though the upfront cost of diesel outboards is higher than traditional gas engines, a quick return on investment is possible for operators that run their vessels constantly and over a large area of water and consume a lot of fuel.

Coinciding with fuel savings, the use of diesel outboards adds range and endurance on the water. For example, a vessel that might have previously traveled 300 miles before refueling using gasoline engines could potentially gain 100 miles or more of range.

Diesel outboards are new to the workboat and recreational boat industries and only a few companies have true diesel outboards in development. Cox Powertrain has developed a diesel outboard engine that combines the power and torque of a diesel engine with the mission-specific advantages of a traditional gasoline-powered outboard. Its CXO300 engine has been designed to meet the standards established by law enforcement, military, rescue agencies and other governmental entities and offers power, reliability, flexibility and significant fuel savings. Louisiana distributor Innovative Diesel Technology is a Cox partner that will be providing production 300 horsepower engines to both workboat and recreational customers by the end of 2019.

Solar Panels and Ultra Lightweight Batteries

A reliable power source is instrumental in supporting many patrol missions, which is why solar panels and ultra-lightweight batteries have great value to boat operators. Solar panels and ultra-lightweight batteries can serve as a main power source or provide auxiliary power for some or all patrol vessel needs, whether manned or unmanned, in-port or underway. They can act as a backup to shore power, and can increase mission endurance times while reducing fuel consumption by lessening engine loading and saving hull weight.

Companies, such as West Coast Solutions, specialize in expeditionary and scavenging power technologies, including the development of custom batteries and the integration of complex solar and hybrid systems. Its products such as the Ultra-Lightweight Expeditionary Power Supply (U-LEPS) and Ultra-Lightweight Expeditionary Battery (U-LEB) are robust and can be scalable to fit a variety of patrol and expeditionary mission needs.

Smart Bilge Systems

One might not consider the importance of patrol vessels keeping bilge water at bay while in operation. However, smart bilge sensor technology should be on operators' radar when outfitting their vessels.

Smart bilge sensors prevent pumping and discharge of petroleum products sometimes found with boat bilge water. The sensor allows bilge dewatering, but prevents spilled oil or fuel from being pumped overboard. Not only is this technology important and impactful from an environmental standpoint, but it also keeps a boat's wake clean and can help patrol boats become harder to locate – an oil or fuel slick left by a vessel can make it easier to locate by adversaries.

Technology, such as Blue Guard Innovation's BG-One smart bilge sensor and displays, turn the bilge pump off when oil or fuel is detected, which prevents water contamination, saves thousands of dollars in fines to boat operators and allows patrol vessels to operate without leaving a telltale oily wake.

Continued Focus on Innovative Patrol Technology

New technologies such as autonomous controls, diesel outboards, solar panels, ultra-lightweight batteries and smart bilge systems can add significant value to operators and will most certainly positively impact the boating industry in the future.

As military and law enforcement officials continue to grow and develop their fleets of workboats and patrol vessels, innovative technology for improving efficiency and reducing costs should be considered during the grant-writing, bidding and design processes. Boat builders such as Silver Ships maintain partnerships with organizations at the forefront of many leading technologies, including Sea Machines Robotics, Innovative Diesel Technology, West Coast Solutions and Blue Guard Innovations, and can offer guidance and support to customers looking to outfit a patrol vessel for mission-specific operating needs.

Silver Ships remains committed to designing and building the highest quality aluminum workboats for a variety of missions, including patrol, military and law enforcement. It has built vessels in operation across the globe, including Force Protection Medium Patrol vessels for the U.S. Navy and Riverine Patrol Boats for the Philippine Navy, among others.

This 40-foot Riverine patrol boat is one of six in service for the Philippine Navy.

Photo Credit: Silver Ships