

## *USS Coronado* protects coastal waters, armed with twin MTU engines.



- Who:** *USS Coronado*, Independence Class Littoral Combat Ship
- What:** Two MTU 20V 8000 diesel engines
- Why:** High power-to-weight ratio, fuel economy and low lifecycle costs
- Where:** Mobile, Alabama, USA



The nature of U.S. marine defense is changing. Swift, maneuverable Littoral Combat Ships (LCS) such as the *USS Coronado* have been commissioned by the U.S. Navy to protect the U.S. coastline from the threat of terrorism. Powered by two MTU 20V 8000 diesel engines, the *USS Coronado* can achieve speeds up to 44 knots (50.6 miles per hour), in waters as shallow as 14 feet. Reliable, quiet and fuel-efficient, the engines are meeting tough standards set by the world's premier naval power.

As the world's geopolitical landscape evolves, the U.S. Navy must employ new strategies to stay one step ahead. According to a 2006 RAND National Defense Research Institute report prepared for the Navy, "...the nature of conflict is changing, and the United States no longer can consider itself to be an unassailable sanctuary." RAND further warned that defense budgets would come under increasing scrutiny, pressuring policymakers to ensure that military assets be fully utilized.

The U.S. Navy created the Littoral Combat Ship (LCS) program in 2002 to combat terrorism and other threats to the U.S. coastline. The program forms a new class of surface combat ships that can defeat littoral (near-shore) threats. These small, fast and agile ships are designed to

operate either independently in shallow waters or as part of larger, more conventional strike groups. Missions can include finding and destroying mines, hunting submarines and engaging in surface warfare. The program mandated that the new LCS is cost-effective, adaptable to multiple mission requirements and equipped with the most advanced, integrated digital equipment to minimize the cost of operations and future upgrades.

Rather than rely on a single source for the LCS program, the Navy contracted with two suppliers: General Dynamics (Falls Church, VA) and Lockheed Martin (Bethesda, MD). Both contractors were commissioned to submit vessel design plans to meet LCS Program specifications. The results were two very

Dr. Craig Hooper, vice president of sales, marketing and external affairs, Austal USA

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The 418-foot *USS Coronado* is powered by two MTU 20V 8000 diesel engines, featuring a high power-to-weight ratio and exceptional fuel economy.

different ships—Lockheed-Martin’s monohull Freedom Class LCS and General Dynamics/Austal’s trimaran Independence Class LCS.

Regardless of the design, the LCS has to meet strict requirements. According to the U.S. Navy, “...the LCS must be capable of operating at low speeds for littoral mission operations, transit at economical speeds and also excel in high-speed sprints.” MTU engines are at the heart of each propulsion system, capable of propelling the vessel at high speeds in littoral areas.

#### Fully up to speed

The keel for the *USS Independence*, Austal’s first LCS and major U.S. project, was laid in 2006. Since then, the Australia-based company has become one of the fastest-growing companies in Alabama and one of the state’s largest employers. In 2012, Austal USA completed its second Independence Class ship—the *USS Coronado*.

Built in Mobile, Alabama, the *Coronado* is 418 feet (127.1 m) long and 104 feet (31.4 m) wide. An angular, rakish bow is designed to minimize radar signatures. On deck, it’s permanently armed with an array of passive and active weapons, including a Raytheon SeaRAM Rolling Airframe Missile system, automated chaff and flare dispensers, a 220 rounds-per-minute MK 110 57 mm naval gun and four .50 caliber machine guns. *Coronado*’s enormous flight deck can carry two SH-60 Seahawk helicopters, one CH-53 Sea Stallion helicopter or several Unmanned Aerial Vehicles (UAV), incorporating a payload capacity larger than most destroyers.

#### MTU America Inc.

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At 11,800 square feet (1096.3 square meters), the mission bay is designed to carry multiple mission modules to support a wide variety of deployment objectives, along with up to four lanes of combat ground vehicles such as Strykers, armored Humvees and other hardware. It’s also equipped with an elevator so that equipment can be loaded and stored while the vehicle is at sea.

#### Unique trimaran design

The trimaran hull configuration produces low hydrodynamic drag, allowing for high speeds in water as shallow as 14 feet (4.3 m). “The aluminum trimaran hull is inherently stable and able to handle a much larger payload than a conventional monohull warship, and can operate in waters much shallower than a monohull vessel of similar size,” says Mike Rizzo, MTU program manager for governmental/naval business at Tognum America. The *Coronado* exhibits exceptional power-to-weight ratio, with main propulsion provided by a combination diesel and gas (CODAG) system, featuring two MTU 20V 8000 diesel engines, each driving a Wärtsilä waterjet and delivering 9.1 megawatts of power. When additional power and speed are needed, two General Electric gas turbines are activated, producing a sustainable 44 knots (50.6 miles per hour).

Dr. Craig Hooper, Austal USA vice president of sales, marketing and external affairs, says, “These ships are definitely not built to sit; they’re built to move—fast and frequently—and MTU makes that possible with engines that are powerful, reliable and robust.”

#### An essential force below deck

The MTU 20V 8000 engine may be the *USS Coronado*’s most powerful weapon. In addition to high power density and compact design, the engine boasts simple operation, straightforward maintenance and low lifecycle costs. Advanced engineering reduces noise levels, essential for stealth operations. Impressive fuel economy keeps operating costs low during long-range missions. Proven engine support, parts and service are available onsite, from two full-time Tognum America service technicians. And wherever the *Coronado* goes next, MTU’s worldwide service network is ready to provide support.

In addition to the two main propulsion engines, the ship includes four MTU 8V 396 generator sets—two each for vital and non-vital power, respectively—and another 8V 396-driven “hydraulic prime mover” to power the *Coronado*’s azimuth retractable bow thruster. The cross-functionality and redundancy of the engines and the systems they power contribute towards the self-sustainability required of the Independence Class LCS. “For example, the hydraulic prime mover engine alone can get the ship to safe port if absolutely necessary,” Rizzo explains.

#### Maintaining sea dominance

As the largest supplier of propulsion engines and systems to the U.S. Navy and U.S. Coast Guard, MTU has provided trusted and proven engines for decades. Since 1950, MTU has—along with its predecessor companies such as Detroit Diesel—delivered more than 30,000 engines and systems to almost every navy in the world. By supplying reliable power to the Independence Class Littoral Combat Ship project, MTU is poised to help the U.S. Navy meet new challenges for the 21st century.

MTU is a brand of Rolls-Royce Power Systems AG. MTU high-speed engines and propulsion systems provide power for marine, rail, power generation, oil and gas, agriculture, mining, construction and industrial, and defense applications. The portfolio is comprised of diesel engines with up to 10,000 kilowatts (kW) power output, gas engines up to 2,150 kW and gas turbines up to 35,320 kW. MTU also offers customized electronic monitoring and control systems for its engines and propulsion systems.



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