



# Range of Advanced Technologies for FFG(X) Ready for U.S. Navy

**A**s the U.S. Navy focuses on building a new and more lethal frigate, much of the platform's operating and warfighting capabilities will be sought as advanced off-the-shelf technology, giving the service an array of proven technology to quickly pull from.

The next-generation guided-missile frigate (FFG(X)) platform will require essential technologies from power and propulsion systems; communication systems; undersea warfare systems, and advanced energy storage. Companies that are long-time providers of naval technology, like Leonardo DRS, will be among the suppliers that the Navy will look to for capabilities that are proven and ready to be plugged into the FFG(X).

## ENERGY STORAGE FOR INCREASED NAVAL POWER DEMANDS

As the Navy continues to increase its need for more power throughout the fleet, robust but space-saving energy storage capabilities are required. Companies like Leonardo DRS have developed energy storage technology around Navy requirements, including for the FFG(X). The company's Energy Magazine is a power and energy storage system designed to master many of the challenges associated with the increasing demand for available shipboard electrical power. The types of technology being incorporated into a range of ship systems today is not only driving the need for more power, higher power quality, and efficient use of power, but also requires intermittent power for high-bursts of energy required by pulse power weapons and sensor systems.

The key to managing all this power is the Energy Magazine which

employs state-of-the-art lithium iron phosphate batteries for energy storage and advanced controls for energy management. The system is capable of supplying energy to either the ship's electrical distribution system or directly to the pulse weapon/ sensor accommodating spiked power demands that the ship's generators cannot provide. During times of lower demand the Energy Magazine is "recharged" from the ship's electrical system. The technology also provides ship back-up power in the event the generator(s) go offline.

The modular design of the system allows for flexible configurations to fit different applications and available footprint. Each of the building blocks are sized to fit through common ship hatches for simple installation.

Leonardo DRS has demonstrated Energy Magazine technology and multi-application hardware for the pulsed power and stable back up power required to help sustain multiple mission systems.

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Leonardo DRS Energy Magazines will be able to power shipboard pulse weapons.



it's potential as a more lethal and survivable platform than LCS. But companies like Leonardo DRS, a leading HED development company, offer systems that are well-suited for a ship intended for anti-submarine warfare missions which involve long periods of cruising at relatively slow speeds. Because the HED can be decoupled from the gearbox and main propulsion engines, there is no gearbox noise and vibration, allowing the vessel to run silently. This is increasingly important both for stealth and to perform its mission of detection of submarines as potential adversaries improve on how quiet their submarines are able to operate

Hybrid electric drive systems also provide lower operational and maintenance costs than traditional diesel and gas turbine propulsion plants. Hybrid motor operations produce less wear-and-tear on the main propulsion system, save fuel, and can have long-term operational costs savings.

## POWER AND PROPULSION

The FFG(X) will be a more capable ship than its predecessors, requiring a modern and efficient power generation and propulsion system. To meet today's warfighting requirements, it is now standard practice throughout the world's Navies to utilize a flexible hybrid power and propulsion arrangement.

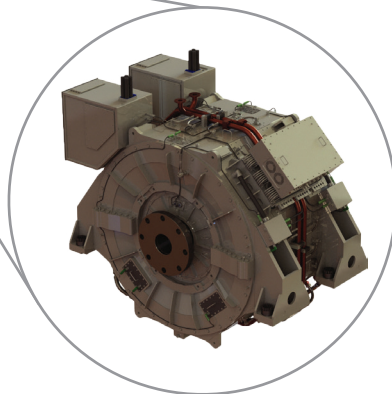
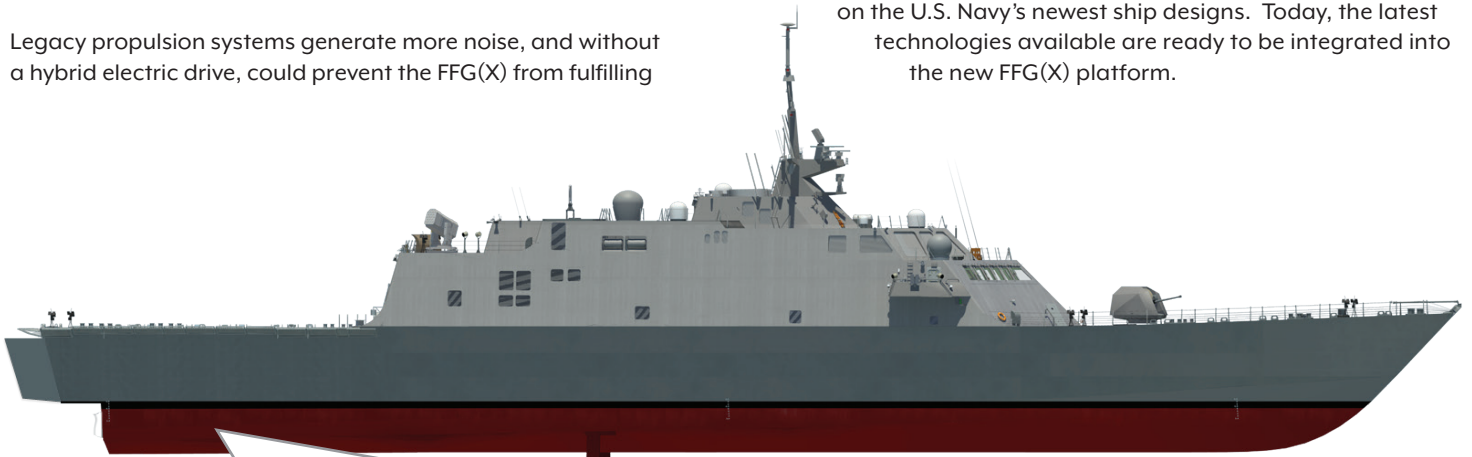
Mature hybrid electric drive (HED) systems bring multiple advantages to combat ships and are easily integrated into the propulsion system. The U.S. Navy FFG(X) can benefit from this technology on multiple fronts.

Legacy propulsion systems generate more noise, and without a hybrid electric drive, could prevent the FFG(X) from fulfilling

### *Power Distribution*

Leonardo DRS has been a longtime provider of naval power distribution technology for the U.S. Navy as well as power conversion, motor controls, drives, and automation / control equipment for a wide range of naval ships from carriers to frigates. These technologies are virtually standard in the industry.

The company legacy with the U.S. Navy goes back decades, in fact Leonardo DRS naval power system products have been deployed on every U.S. Navy combatant delivered since 1945, including on the U.S. Navy's newest ship designs. Today, the latest technologies available are ready to be integrated into the new FFG(X) platform.



**The Powerful Leonardo DRS Shaft-Mounted Hybrid Electric Drive Technology Provides Tactical Power to the Warfighter.**





The Leonardo DRS/ Advanced Acoustic Concepts team has developed strong anti-submarine warfare detection, localization, classification and targeting capabilities.

### SMALL COMBATANT UNDERSEA WARFARE

A major role for FFG(X) ships will be to hunt and defend against advanced quiet submarines. In addition to hybrid electric drive systems allowing ships to run silently; proven undersea and anti-submarine warfare mission packages that can be rapidly adapted to new threat environments via more flexible and frequent software updates, will be critical to the U.S. Navy's maintaining an advantage over near-peer competitors.

Companies with vast experience in this realm include Leonardo DRS and Advanced Acoustic Concepts. Working with other experienced partners, they have developed and produced systems that the U.S. Navy counts on for undersea warfare superiority.

The Leonardo DRS/ Advanced Acoustic Concepts team has proven experience by developing the hardware/computer & software for

mission package computing environments, common software support functions, Multi-Vehicle Communication Systems, Mission Package Portable Control Stations, and data mission payload. The complex hardware and software systems have been critical on both platforms of the LCS fleet.

These technologies provide surface ships with strong anti-submarine warfare detection, localization, classification and targeting capability.

From fleet modernization to new platform development, the need for a total ship common compute environment is critical and the Leonardo DRS/ Advanced Acoustic Concepts team has proven experience with leading technology to keep U.S. Navy sailors mission-successful.





The onboard Integrated Voice Communication System integrates tactical, administrative, voice and data communications all on one system.

## TACTICAL NETWORKS AND COMMUNICATIONS

Controlling and managing every aspect of shipboard communications onboard ships is an essential requirement for today's modern combat missions. These complex communication systems give users the ability to easily and securely communicate throughout the ship, as well as outside the ship to other U.S. and allied naval vessels to improve tactical situational awareness.

One of the most successful systems in use today is the SHINCOM 3100, better known by U.S. Navy sailors as the Integrated Voice Communication System (IVCS) and the Secure Voice system (SVS). SHINCOM 3100 integrates tactical, administrative, voice and data communications all on one system. The SHINCOM 3100 from Leonardo DRS is an all-digital secure voice system that interfaces, controls and manages internal and external communications. The system architecture ensures continuity of communications in very adverse conditions with multiple levels of built-in redundancy and backup power.

More portable communication systems are also available to the U.S. Navy such as the Shipboard Carry-On/Off Satellite Communication System (SCOSS). The Leonardo DRS SCOSS provides a secure network connection from stem-to-stern on large and small naval vessels. It provides continuous service on wideband satellite networks that compensates for blocked shipboard network issues. The system can also be moved off-ship for use on ground vehicles to provide continuous high bandwidth communication in the most demanding environments.

**To see the full range of products available for the FFG(X), visit [www.leonardodrs.com/navy-league](http://www.leonardodrs.com/navy-league)**