



HYBRIDS POWER UP

Technological advances increase interest in hybrid propulsion

By John R. Snyder, Publisher & Editor in Chief

A step change is underway in hybrid marine power and propulsion system applications. Rapid advances in battery technologies—and significant reductions in cost—have caught the attention of vessel operators.

Just a few short years ago, for example, it would have been unthinkable to consider hybrid propulsion for a 17,500 dwt IMO Class II chemical tanker. Earlier this year, however, it became a reality when Norway's **Rederiet Stenersen AS** choose **Corvus Energy's** Orca Energy ESS solution to integrate with **WE Tech Solutions'** Direct Drive Permanent Magnet Shaft Generator solution.

Halvard Hauso, Senior Vice President Business Development, Corvus Energy, says the application proves the "viability for energy storage for the hybridization of longer-haul vessels. As the cost of lithium ion batteries continues to improve we will see more and more applications beyond the traditional ferry and tug base."

While hybrid propulsion applications have begun to branch out into more and more ship types in Europe, the U.S. has just begun to scratch the surface of applications for tugs, water taxis, ferries and research vessels. Building on the early efforts of pioneers **Bob Bekoff**, **Foss Maritime** and **Hornblower**, other operators are realizing the advantages of hybrid propulsion.

Just last month, the **Kitsap Transit Board** in Kitsap County, Washington, gave the go ahead to proceed to contract for a new hybrid-powered catamaran ferry from **All American Marine**, Bellingham, WA.

So why go hybrid? "Our board selected a hybrid vessel to reduce emissions and sound because the vessel will operate exclusively in Sinclair Inlet, which is surrounded by residents and businesses," says Kitsap Transit spokesperson Sanjay Bhatt.

"Hybrid vessel technology, specifically the batteries, has advanced significantly over the past 5 years," says Kitsap Transit Marine Service Director Casey Harrington. "The application on our hybrid vessel is optimized for the vessel's service parameters: time equally distributed between medium-speed transit and passenger handling at the

terminal. The hybrid design will deliver a measureable reduction of both fuel cost and emissions of greenhouse gasses and particulate pollutants, key initiatives at Kitsap Transit."

Designed by Seattle-based naval architecture and marine engineering consultancy **Glosten**, the 70 ft x 26 ft, 150-passenger-only ferry will be fitted with two **Cummins** QSL9 diesel generators, one in each hull, with an expected service speed of 16 knots. Two **BAE Systems** HybriDrive propulsion systems will drive fixed-pitch propellers.

Glosten Project Manager and Design Lead William Moon, PE, says that besides reduced emissions and fuel consumption, Kitsap Transit will also benefit from lower maintenance costs because the engine running hours are minimized. "The engines can be shutoff when the boat is at the dock," he says. "And from a passenger standpoint, this boat will be super quiet."

The new hybrid electric passenger ferry is the first in Puget Sound. All American Marine (AAM) was the low bidder to construct the hybrid ferry for \$4.77 million.

Other shipyards competing for the contract were **Derecktor Shipyards**, Mamaroneck, NY, **Safe Boats International**,

Bremerton, and **Vigor**, Seattle, WA.

It is expected to be delivered in 2018 and carry over 350,000 passengers annually.

"Early on, I think there was some 'hybrid hype,'" says AAM's Joe Hudspeth, "but now it has developed into a true viable solution."

AAM has been the beneficiary of increased interest in hybrid vessels, says Hudspeth. Earlier this year, it won a contract to build a 600-passenger aluminum monohull passenger vessel **Enhyrda** for San Francisco's **Red and White Fleet**.

AAM partnered with BAE Systems to design and integrate the complete battery electric hybrid system. That includes supplying a HybriDrive Propulsion System with a generator, control system, and AC electric traction motor. The generator will mount to a variable speed Cummins QSL9 diesel engine developing 410 hp at 2,100 rev/min.

Another benefit of hybrid propulsion is "push button" start and the availability of full acceleration.

The motor generator offers diesel-electric operation of the AC traction motor, which is coupled directly to the propulsion shaft. With this configuration, torque is immediately available for the propeller and the speed can be precisely controlled without



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