

ENSURING SAFETY ON A HYBRID DUAL-FUEL VESSEL

Fault ride through assurance
from the generators to the lightbulbs

SUMMARY

OneStep Power was selected to test the power system of Harvey Gulf's dual-fuel vessel, *Harvey Energy*, that was recently converted to hybrid battery power by Wärtsilä. *Harvey Energy* was the first United States flagged OSV with a hybrid battery and converter system, and the first North American vessel to be powered primarily by liquefied natural gas, or LNG. It started operations in March 2015.



Images: © Harvey Gulf International Marine, LLC

CHALLENGES

Harvey Gulf's goal is to have the most environmentally friendly fleet of platform supply ships in the Americas. "Harvey Gulf International Marine became the first U.S. vessel operator to contract for construction of vessels capable of operating exclusively on natural gas." The vessels are also "ENVIRO+, Green Passport" certified by the ABS.

Harvey Energy is a 5,312 dwt vessel powered by Wärtsilä's LNGPac system including three Wärtsilä 6L34DF dual-fuel gensets providing 7,530 kW, or 10,100 hp. Wärtsilä's fully integrated hybrid module combines engines, energy storage, and electronics into one package.

Before the hybrid battery installation, Harvey Gulf needed to test to prove voltage dip ride-through to run in Closed Bus operation safely.

ROBUST

RELIABLE

REPEATABLE



SOLUTION

OneStep Power was contracted to develop an on-site test plan and delivered a voltage dip ride through program using their proprietary GVRT and ZeroDip testing methods to prove zero volts ride through, transient over-voltage, and transient under-voltage. The test program was designed to confirm the capability of the vessel to survive faults on the integrated power system.

OneStep Power's ZeroDip technology was used to confirm zero volt ride through of the system. OneStep Power's GVRT was used to induce voltage transients. Combined, these two test methods provide indication of the integrated system's response to a short circuit. In short, these tests provided fault ride through assurance of the entire vessel from the generators to the lightbulbs.

RESULTS

OneStep Power used their proprietary Generator Voltage Response Tester (GVRT) to ensure safety of the power system. With this test complete and closed bus operation achieved, the vessel expects to save 10-20% on fuel costs. According to ABS, the vessel is expected to now be equipped to sail on battery power alone in and out of dock. *Harvey Energy* is the first "hybrid dual-fuel" platform supply vessel (PSV) in operation, with four more planned to receive hybrid battery technology.

OneStep Power provides testing solutions for Closed Bus operation on dynamically positioned DP2 and DP3 vessels. We lead the way on safety, fuel savings, and emissions reduction through the verification of high-reliability power systems.

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ROBUST RELIABLE REPEATABLE

