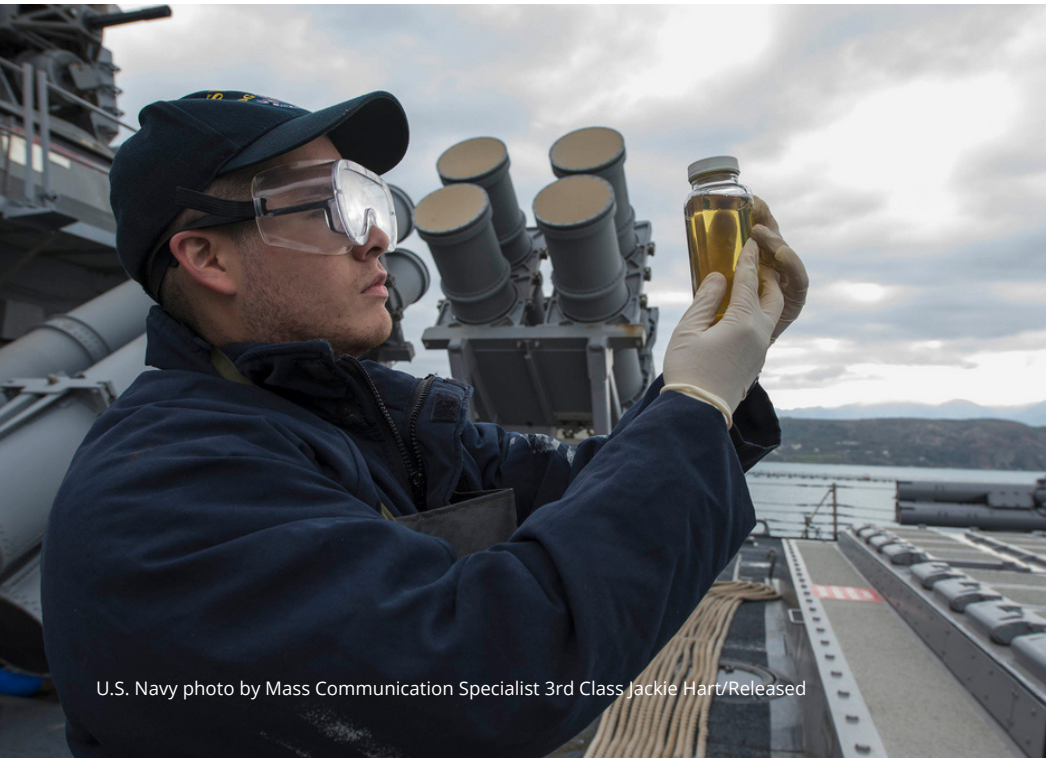
FAIRBANKS MORSE
DEFENSE

CASE:
ALTERNATIVE FUEL TESTING



U.S. Navy photo by Mass Communication Specialist 3rd Class Jackie Hart/Released

- Green Fleet
- Alternative Fuel Testing

Testing alternative fuels for use by the United States Navy for its initiative to "green" the fleet

A long-time supplier to the Navy, Fairbanks Morse has marshalled its unique combination of resources to be the only engine manufacturer conducting alternative fuel testing on its own engines in support of the United States Navy's Energy Goals Initiative.

Working with Life Cycle Engineering, Inc., the company under contract for part of the Navy's alternative fuel testing program, Fairbanks Morse has developed test protocols and tested the viability of several alternative fuels for use in two of its engines.

"Fairbanks Morse has been able to complete one-third of the full-scale diesel engine testing for this program because of its unique combination of engine design experience, testing prowess and facilities large enough to handle testing of the FM PA6B – one of the largest engines in the U.S. Navy's fleet," said Tom Risley, director, energy programs for Life Cycle Engineering.

The testing objective is to qualify alternative fuels that will meet all of the Navy's current fuel specifications for chemical properties and performance requirements – making them suitable as "drop-in fuels" which could be used in the fleet without making costly changes to the engines and the vast infrastructure that stores and transports fuel supplies.

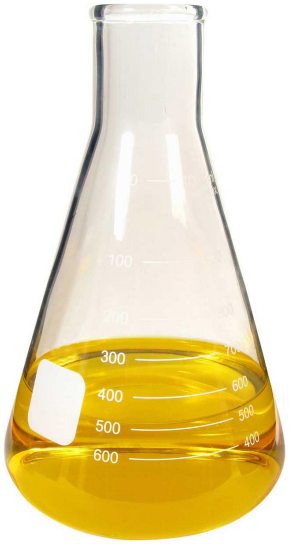
The U.S. Navy is a large consumer of petroleum fuels. Identifying viable alternatives supports greater energy security. Alternative fuels reduce vulnerability to supply interruptions created by dependence on foreign oil, and reduce consumption of finite petroleum resources while increasing use of renewable fuels.

Two of the fuels commonly used by the Navy are F-76 (diesel) and JP-5 (jet fuel). Fairbanks Morse has completed testing on three separate alternative F-76 biofuel blends on the FM 38D 8-1/8 engine and one alternative JP-5 biofuel blend on the FM PA6B engine. In fact, the first alternative fuel tested on the Fairbanks Morse engines are now included in the respective fuel specifications for F-76 and JP-5. These fuels are classified as hydroprocessed esters and fatty acids (HEFA) fuels that can come from algae, plants and other renewable sources. The other two biofuels tested on the FM 38D 8-1/8 were derived from plant sugars and wood. The FM PA6B engine is currently being tested on a blended fuel derived from alcohol, known as Alcohol to-Jet (ATJ).

The test protocol for one alternative fuel on one engine requires three to six months to complete. The test begins with disassembling, inspecting, measuring, and photographing the engine's fuel system to establish a baseline. The engine is then put through a series of tests using a currently qualified petroleum product. These include cold starts, transient response, emergency starts, fuel consumption and emissions performance. Next the engine is put through the same series of tests operating on the alternative fuel, along with a series of 12 cycle tests consisting of 96 hours of endurance tests, after which the engine's fuel system is again disassembled, inspected and measured for wear and photographed to determine any physical changes to the components. A report on the findings is then prepared for Life Cycle Engineering.

"This is ideal as we know our engines better than anyone else," said Linda Rodriguez, Fairbanks Morse project manager. "It is also a great opportunity to gain in-depth knowledge about how our engines perform with alternative fuels, which will only become increasingly relevant."

For more information, please visit www.fairbanksmorsedefense.com or email us at FM.marketing@fmdefense.com



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