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## Sea Hawk Rides the Green Wave

### *MH-60S is the latest naval aviation platform to fly on bio-fuel blend*



Written by: [Jan Tegler](#) on January 7, 2011

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A U.S. Navy MH-60S Sea Hawk helicopter assigned to the Blackjacks of Air Test and Evaluation Squadron HX-21 tests a 50/50 Camelina seed-based biofuel blend at Naval Air Station Patuxent River, Md. The test demonstrates another step toward the certification of fuels from non-petroleum sources for use in all Navy and Marine Corps aircraft. U.S. Navy photo.

The U.S Navy's [alternative fuels](#) initiative, announced in late 2009 by Secretary of the Navy Ray Mabus, continues to pick up momentum toward the secretary's stated goal of having the service satisfy 50 percent of its energy needs via alternative sources by 2020.

On Nov. 18, an MH-60S Sea Hawk from Air Test and Evaluation Squadron Two One (HX-21) at NAS Patuxent River, Md., flew for the first time on a 50/50 blend of traditional petroleum-based JP-5 and a bio-fuel made from Camelina seed (HJ5).

"The first test flight was perfect," says Rick Kamin, the Navy Fuels team Lead at the NAS Patuxent River-based Navy Fuels Lab. "There were no anomalies identified, no issues for either the pilots or crew. The 50/50 blend showed no difference in performance than the petroleum-based JP-5 we've used throughout our history. We're going over reams of data and we'll know more when the experts get done going over all of the information."

The MH-60S, designed to perform VERTREP, CSAR, AMCM (airborne mine countermeasures missions) and anti-surface warfare missions, is the second Navy aircraft to fly on the HJ5 blend, following initial flight testing of the "[Green Hornet](#)," an F/A-18F Super Hornet from VX-23 at Pax River which went aloft using the same fuel in late April. The helicopter is also the latest Navy platform to operate with a bio-fuel blend in the wake of testing of the service's new RCB-X (Riverine Command Boat, Experimental) with an algae-based mixture in October.

The HJ5 undergoing test in the MH-60S is being developed as a "drop-in replacement" for JP-5, requiring no modifications to the aircraft's power plant, fuel system or to any fueling apparatus.

"We use the same refueling trucks that the fuel farm fuels aircraft with every day," Kamin adds. "The assumption of the entire program is that these fuel blends are interchangeable with petroleum. As a matter of fact, when the MH-60S was done testing after its first day, they did not drain the aircraft of any remaining fuel. They just filled it up with petroleum JP-5 and went on to their next test mission."

So far, the VX-21 Sea Hawk has completed two hours of ground test and six hours in the air using the Camelina/JP-5 blend. Supplied by Rozeman, Mont-based Sustainable Oils, LLC, the Camelina-based



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...sustainable, more... UOP, LLC, a Honeywell company, then delivered to NAS Patuxent River for blending with JP-5 at the Navy Fuels Lab.

Sustainable Oils was awarded a contract in September 2009 by the Defense Energy Support Center to supply the Camelina-based jet fuel to the USN. The contract was for 100,000 gallons of HRJ-8 beginning 2009 through 2010, and includes an option to purchase an additional 100,000 gallons between June 2010 and December 2012.

During the Nov. 18 sortie, the VX-21 flight crew put the MH-60S through a flight profile that would give the Navy Fuels team and Fuels Lab technical experts an initial impression of the bio-blend's effect on aircraft performance. According to Rick Kamin, all was normal.

"The crew tried to take the helicopter to the various parts of its flight envelope that the technical experts felt could be critical, or where the new fuel might have an impact. They were looking at the generic outer edges of the flight envelope just to see if there's anything in the fuel chemistry that could show up in flight performance. So far, so good."

Testing of the Camelina/JP-5-fueled Super Hornet has been more extensive, totaling 17.5 hours to date. The fighter's dynamic flight characteristics made it the logical first choice for testing the new fuel in an aircraft.

"We chose the Hornet to be the fleet lead aircraft for testing because it's our premier fighter and stresses the fuel further than any of our other aircraft due to its flight envelope," Kamin says. "It allowed us to get a good look across the board at how the fuel would perform. Based on the success of the Hornet, we're marching down the path of additional testing and additional platforms to develop the data necessary to approve the 50/50 blend for our aircraft."



The Sea Hawk helicopter assigned to HX-21 Blackjacks carrying out the testing of a 50/50 Camelina seed-based biofuel blend spools up at Naval Air Station Patuxent River, Md. Testing has so far shown no significant performance differences between the fuel and standard jet fuel. U.S. Navy photo.

For now, the Sea Hawk will be the only other aircraft using the HJ5 blend. Kamin reports that the Navy's intent is not to fly the fuel in every aircraft in its inventory. Only select aircraft types that the Fuel Lab's technical experts have identified for investigation will be employed to assess aspects of the fuel. The MH-60 will continue testing the 50/50 blend for most of 2011 in order to gain more information and experience with the fuel.

"We did the dedicated performance testing," Rick Kamin explains. "What we're hoping to start in the beginning of 2011 is a longer term evaluation where we'll have one MH-60 or an H-60 variant that we'll fuel with the 50/50 blend as part of its normal operations here at Pax River. So for any test missions that it's flying, it will be using this blend."

"That will give us a long term assessment of the impact of this fuel," he continues. "We're not expecting any real differences. We'll fuel Seahawk with the blend every time it's practical; looking at

durability and for any issues that arise beyond the short look we've had so far. We'll make a decision late in 2011 about how long we want the program of testing to go on."

In addition to providing "energy security" for the Navy and the nation's other armed services, the use of bio-fuels will provide tactical and strategic flexibility with potential environmental benefits as well.

"When you look at the family of plants and natural oils that are hydro-processed, ultimately the source doesn't change the end-product that much. While we're flight testing the Camelina blend, we've run a significant number of tests on Algae-based JP-5 and the end fuel components look pretty similar. That allows us to approve a whole class of product and sources instead of having to do a complete test program on each source, whether it is a plant, an algal or tallow source. The more sources we can tap, the better the availability of bio-fuel and the better the cost competitiveness."

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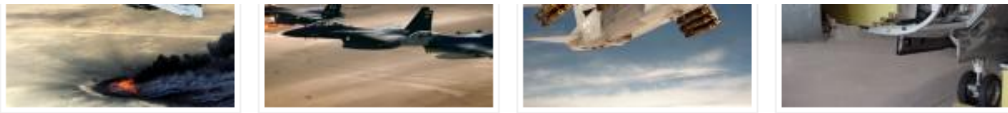
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