MQ-25 UAV Makes History with First Unmanned Aerial Refueling

The MQ-25 T1 test asset refuels the Navy F/A-18 during a flight June 4 at MidAmerica Airport in Illinois. This test marked the first aerial refueling operation between a manned aircraft and unmanned tanker. *BOEING*

ARLINGTON, Va. — An unmanned aerial vehicle (UAV) made aviation history on June 4 with a successful air-to-air refueling of another aircraft. Boeing's MQ-25 Demonstrator, T1, refueled a U.S. Navy F/A-18F Super Hornet strike fighter, a major step in the MQ-25A Stingray's journey to become the Navy's carrier-based aerial refueler.

Boeing's T1 and the F/A-18F, flown by a crew from Air Test and Evaluation Squadron 23, joined up and the MQ-25 passed a total of 325 gallons of fuel to the Super Hornet in two separate refueling events.

The MQ-25 carried a Cobham-built refueling store with a drogue refueling hose, the same type currently used in the fleet by Super Hornets. The Navy plans to use the MQ-25 in the refueling role to free more Super Hornets for combat operations, for which it was designed.

During a June 7 media roundtable, Boeing's MQ-25 program manager, Dave Bujold, described the sequence of events for the historic flight (a video summary is here). The F/A-18 flew in formation to observe the dynamic characteristics — particularly the stability — of the MQ-25. With the safety evaluation completed, the F/A-18 closed and T1's ground controller streamed the drogue. For about 30 seconds, the F/A-18 crew conducted a wake survey and noted the wake to be very stable and benign. While the chase plane filmed,

telemetry was collected, and the F/A-18 made a “dry” connect without the transfer of fuel.

The F/A-18 backed away and then reconnected for a transfer from 300 pounds of fuel in the refueling pod. (T1 is not plumbed for transfer of fuel from the airframe, which will be a capability of the production MQ-25.) The two aircraft made another dry connect at 15,000 feet and then joined for another successful transfer of 25 pounds fuel. The fuel transfer rate was 220 gallons per minute during the 4.5-hour flight.

Bujold noted that the F/A-18 crew commented on the quietness of the rendezvous, which with two F/A-18s is very noisy.

“The test flight will provide important early data on airwake interactions, as well as guidance and control, Reed said in a Navy release. “The team will analyze that data to determine if any adjustments are needed and make software updates early, with no impact to the program’s test schedule.”

“The milestone comes after 25 T1 flights, testing both aircraft and ARS aerodynamics across the flight envelope, as well as extensive simulations of aerial refueling using MQ-25 digital models,” Boeing said in a release. “MQ-25 T1 will continue flight testing prior to being shipped to Norfolk, Virginia, for deck handling trials aboard a U.S. Navy carrier later this year.”

Capt. Chad Reed, the Navy’s MQ-25 program manager, said those deck handling tests for T1 are slated for December, depending on availability of a carrier. Without a tailhook, T1 cannot conduct landings on a carrier.”

The seven test MQ-25s being built by Boeing will be used for multiple tests by the Navy in beginning with ground testing in the fall of 2022, including field catapult launches and arrested landings prior to flights from an aircraft carrier. Reed said testing is likely to include refueling an E-2

Hawkeye battle management aircraft in the future, including manned/unmanned teaming.

“This is our mission, an unmanned aircraft that frees our strike fighters from the tanker role, and provides the Carrier Air Wing with greater range, flexibility and capability,” Reed said. “Seeing the MQ-25 fulfilling its primary tasking today, fueling an F/A-18, is a significant and exciting moment for the Navy and shows concrete progress toward realizing MQ-25’s capabilities for the fleet.”

“This history-making event is a credit to our joint Boeing and Navy team that is all-in on delivering MQ-25’s critical aerial refueling capability to the fleet as soon as possible,” said Leanne Caret, president and CEO of Boeing Defense, Space & Security, in the Boeing release. “Their work is the driving force behind the safe and secure integration of unmanned systems in the immediate future of defense operations.”

“This flight lays the foundation for integration into the carrier environment, allowing for greater capability toward manned-unmanned teaming concepts,” said Rear Adm. Brian Corey, program executive officer for Unmanned Aviation and Strike Weapons. “MQ-25 will greatly increase the range and endurance of the future carrier air wing – equipping our aircraft carriers with additional assets well into the future.”

The Navy has switched plans to a Lockheed Martin-built ground control station for the MQ-25, not just for cyber protection but to have the architecture for the Joint All-Domain Command and Control concept.

The Navy will rely on multiple communications links to control and execute missions for the MQ-25, Reed said. The list includes the Lockheed Martin Mobile User Objective Satellite for over-the-horizon control.

Currently under production by Boeing are the first test MQ-25A and the first static test airframe. Initial operational

capability for the MQ-25A is slated for 2025.