

How Often Does The F-35 Need To Refuel?

Aviation Week

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A recent, lengthy journey by U.S. Marine Corps F-35Bs traveling from Arizona to Japan has sparked a quiet debate within the Pentagon about how often the stealthy fighter needs to refuel during ocean crossings.

It took seven days for 10 U.S. Marine Corps F-35Bs to fly from Yuma to their new home at Iwakuni, Japan, a flight that on a commercial airliner normally takes less than 24 hr. Many factors contribute to the time it takes a military fighter to get from point A to point B: weather, terrain and pilot fatigue, to name just a few. But on this particular voyage, the U.S. Air Force's conservative refueling model required the Marine Corps aircraft to refuel with accompanying tankers a grand total of 250 times, a number the Marine Corps' top aviator says is far too high for an efficient ocean-crossing.

"The airplane has got longer legs than an F-18 with drop tanks, so why are we going with the tanker so often? We don't need to do that," said Lt. Gen. Jon Davis, Marine Corps commandant for aviation. "We are tanking a lot more than we should, maybe double [what we should.] We could be a lot more efficient than that."

While Davis says the tanking model for refueling the Joint Strike Fighter is "off in an overly conservative manner," it is ultimately up to the Air Force to set the rules—and the air arm is not budging.

An often overlooked piece of the air logistics puzzle is tanker refueling, a critical enabler for operations around the world. Fighters are thirsty aircraft, and the F-35 is no exception, said Air Force spokesman Col. Chris Karns. During the Jan. 18-25 crossing to Iwakuni, nine tankers flew with the 10 F-35Bs, transferring a total of 766,000 lb. of fuel over 250 aerial refuelings, or 25 per F-35, according to Karns.

The Marine Corps does have tankers—the legacy KC-130s—but only Air Force tankers support fighter ocean crossings.

It comes as no surprise to Air Force Brig. Gen. Scott Pleus that the Marine Corps jets needed to refuel so many times during the crossing to Iwakuni. The Air Force sets up ocean crossings assuming the worst-case scenario, so that if any aircraft is not able to get fuel at any given time during the journey—whether due to weather or a technical malfunction—the entire group has enough gas to land safely, Pleus explained. For instance, the F-35Bs flew with their refueling probes out during the entire voyage, which significantly increases drag on the aircraft, to simulate a scenario in which the operator is not able to retract the probe.

“So when we plan these things we take the worst winds, we take the worst configuration of the airplane, and we say: at the worst time, what would happen?” said Pleus, a former F-16 pilot who now heads the Air Force’s F-35 integration office. “It is very conservative, and the reason why we’re so conservative is because it’s a life or death decision.”

Traditionally the Air Force refuels “almost continuously” when crossing a large body of water, as often as every 30 or 40 min., Pleus said. An F-35B, which carries 5,000 lb. less fuel than the Air Force F-35A, likely needs to hit the tanker even more often than that, he noted.

Pleus pushed back on Davis’ criticism, stressing that extending time between refuelings during an ocean crossing would mean more risk to pilots.

During a combat scenario, however, the Air Force would have a different calculus. Typically on a 6-hr. mission, a pilot would tank just two or three times, according to one Air Force official. It is important to top up before the mission because tankers are too vulnerable to fly alongside fighters during combat.

Fighters are often in the spotlight, but the tanker piece is equally important to national defense—without it, the F-35’s global reach is impossible, Karns emphasized

“The F-35 and projected future fighter and bomber requirements only reinforce the need for the next generation of tanker capability to ensure rapid global response across nine combatant commands in an environment where seconds and minutes matter,” Karns said. “As the fighter force increases, it is apparent that global tanker demand and potential future threats will drive an increase for the next generation of tankers.”