

AEROSPACE & DEFENSE

Air Force F-35 Lightning IIs Still Can't Fly Within 25 Miles Of ... Lightning

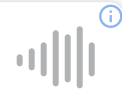
Eric Tegler Contributor 



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U.S. Air Force Capt. Kristin "BEO" Wolfe, F-35 Lightning II Demonstration Team commander and pilot, ... [\[+\]](#) U.S. AIR FORCE PHOTO BY CAPT. KIP SUMNER

Thanks to a compromised ability to render their fuel tanks inert, F-35A Lightning IIs can't fly within 25 miles of a thunderstorm or other atmospheric electrical activity. Over two years after issuing the flight

restriction, the F-35 Joint Program Office was expected to lift it. It hasn't.

As one might imagine, the prohibition on flight in proximity to thunderstorms has implications for F-35 training, particularly in places like Eglin Air Force Base located in the Florida panhandle where thunderstorms pop up regularly.

Eglin is home to the Air Force's [58th Fighter Squadron](#) which trains fledgling F-35A pilots, about 60 of them per year. A storm within 25 nautical miles of the base would presumably shut down takeoffs and landings - and training. The same would hold for lightning in proximity to nearby training ranges.

How much of an issue is the restriction on the Air Force F-35 community? "The F-35 Joint Program Office does not comment on any impact to flight operations due to operational security concerns," JPO spokesman, Chief Petty Officer Matthew Olay (USN) said today in an emailed response.

The Program Office's policy of not commenting would be no impediment to U.S. adversaries' ability to figure out how much of a dent the lightning problem puts in F-35 training. They could simply review the weather data for U.S. and foreign F-35 bases and get a gauge.

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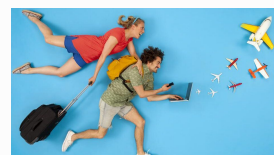
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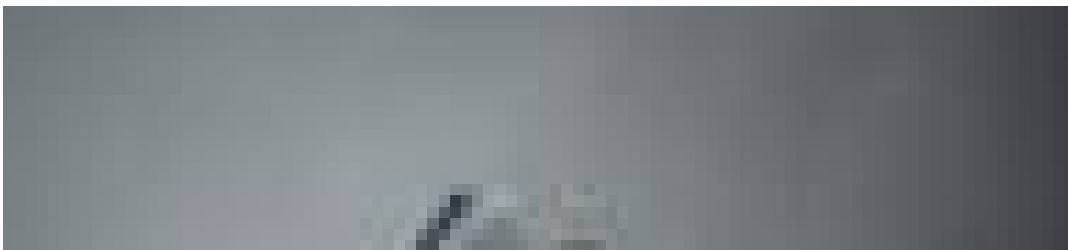


In addition, a clever adversary could - in a low tension, low threat situation - schedule tactical activities to coincide with bad weather in an area where F-35As might otherwise be expected to fly with their electronic intelligence gathering systems scooping in data. This is but one example of the possible repercussions the flight restriction imposes on the F-35A.

Curiously, the restriction does not extend to the Marine Corps' F-35Bs or the Navy's F-35Cs, a point which the JPO clarified in an email this afternoon. Though the Program Office gave no explanation as to why that is, the Navy/Marine aircraft apparently suffer same the problem as the F-35A to a lesser degree.

The issue lies within the F-35's OBIGGS (Onboard Inert Gas Generation) system which pumps nitrogen-enriched air into its fuel tanks to inert them, preventing the aircraft from exploding if it is struck by lightning. Apparently, the tubing and fittings inside the F-35's fuel tank (which deliver the nitrogen mix) cease to function effectively over time due to the vibrations and possibly swings in temperature and pressure during flight.

In 2020, maintainers at Hill Air Force Base's Ogden Logistics Complex in Utah found damage to an OBIGGS system during depot maintenance of an F-35A. Subsequent inspection found that 14 of 24 F-35As examined contained damaged tubing. That led to a pause in F-35 deliveries for two weeks while a determination was made as to whether the problem lied in faulty production. This was found not to be the case and deliveries resumed but the JPO issued the flight restriction.





A U.S. Air Force F-35 Lightning II performs a "Dedication Pass" maneuver at the 2020 Stuart Air ... [+] U.S. AIR FORCE PHOTO BY CAPT. KIP SUMNER

Meanwhile, DoD and Lockheed came to an agreement on a fix for the OBIGGS system. Darren Sekiguchi, Lockheed's then vice president of F-35 production, told *Defense News* that the fix involved "strengthening a number of brackets associated with these tubes for OBIGGS." The modification, which Lockheed and the Air Force began making in 2021, would allow the tubes inside the fuel tank to be fixed in place more securely and prevent vibrational movement.

In February of this year, *Air Force Times* reported that upgrades to OBIGGS would allow F-35As to fly near lightning without restriction by mid-summer. No such lifting of the restriction came however. And the JPO declined to explain why - despite the fixes - the prohibition on flying near lightning remains in place.

The Office's reticence to explain is curious, even more so because Chief Olay explained to me that, "F-35B and C variants have some of the same OBIGGS issues as the F-35A, but have been able to alleviate operational impacts."

It's worth recalling that in July 2021 the Marine Corps [revealed](#) that a pair of its F-35Bs were grounded in Japan with millions of dollars in damage after being hit by lightning during sorties earlier that month.

How the Navy and Marines are alleviating operational impacts (which implies these exist) Olay did not say. It's also unclear how - if at all - OBIGGS differs in design and function in the B and C models of the F-35.

A clue may lie in a blog from [Parker Aerospace](#) (a business unit within Cleveland-based Parker-Hannifin PH +2.2%) which designed and built the OBIGGS system for the F-35. In discussing the development of the system, the blog relates that each F-35 variant "had different performance requirements which drove different fuel and inerting system architectures. Parker was able to utilize common hardware between all three aircraft variants even though the system architectures were unique."

The fact that USAF F-35As can't operate near lightning may arise from its specific OBIGGS architecture. However, it may also suggest another issue is present which may or may not relate to OBIGGS. Proximity-to-lightning restrictions for the F-35As flown by U.S. allies from Europe to Israel to Australia haven't been made public but logic would suggest their aircraft face the same issue, potentially hampering training on an international scale.

According to [Breaking Defense](#), the JPO has offered no specific plan or timeline for returning F-35As to full all-weather status. The Office merely stated that, "Lightning restrictions will be lifted when all safety concerns are resolved or acceptably mitigated."

The JPO has said that all F-35As (presumably U.S. aircraft) will receive OBIGGS hardware upgrades by 2025. A software modification, which notifies a pilot when the OBIGGS system is degraded, began rolling out in August 2022. Given the schedule for hardware upgrades, it appears that for another couple years at least, USAF Lightnings will have to scurry if there's lightning around.

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