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Expensive F-15EX Does Not Deliver: Congress Should Nix Its Purchase

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KEY TAKEAWAYS

The fourth-generation F-15EX will cost significantly more to acquire and operate over the course of its viable life than the fifth-generation F-35.

The F-15EX's fourth-generation capabilities will be inadequate for a peer-level fight the day it is fully fielded—and for the entirety of its anticipated 60-year life span.

Congress should redirect funding currently tied to the F-15EX to increase procurement of fifth-generation fighters that can win in peer-level threat environments.

Earlier this year, the Air Force signed a deal to develop, test, and eventually buy up to 140 fourth-generation Boeing F-15EX fighters. Defense Department and Air Force arguments to acquire the F-15EX have run the gamut from it being cheaper to acquire and operate than the F-35, to the need to sustain Boeing's place within the fighter production industrial base. While there is a sliver of truth attached to many of those claims, no fact-based argument to acquire the F-15EX stands up to even a modest level of scrutiny. The legacy of the misguided decision to acquire this weapons system will be with the Air Force for decades—and it is important to understand why moving forward with this acquisition is a bad fiscal investment that will hurt the United States' ability to fight a war with a peer competitor for the foreseeable future.

Acquisition Cost

Perhaps the biggest argument for acquiring the F-15EX surrounds that weapons system's initial procurement cost and the cost to operate when compared to the F-35 over those jets' working lives. In fiscal year 2022, the Air Force will pay $77.9 million for fully equipped and ready-for-combat F-35As.[1] While the Air Force and Boeing have both claimed the F-15EX will cost $80 million per copy, the Air Force's budget presents a strikingly different story. According to the Secretary of the Air Force Financial Management Directorate's cost estimate for the F-15EX, each jet will cost $87.7 million.[2] While that figure is already $9.8 million more than the cost of an F-35A, it represents a baseline (only) jet that requires the addition of two critical sub-systems to be capable of employing in combat: an electronic countermeasures (ECM) system known as the Eagle Passive Active Warning Survivability system and a targeting pod, which cost $12.2 million[3] and $900,000,[4] respectively. Accounting for that required equipment means that every combat-ready F-15EX will cost $102 million—$24.1 million more than a combat-ready F-35A.

Operational Cost

Fighter procurement costs are certainly a big fiscal consideration, but operating costs that accumulate over the life of a fighter usually dwarf the initial purchase price. The operating costs associated with F-15EX have been argued to be well below those for the F-35—but that argument is, at best, flawed.

Day-to-day operational costs are generally determined by tallying the costs for fuel, oil, spare parts, and the maintenance personnel it takes to launch, maintain, and repair a fighter over time, and then dividing that dollar figure by the number of hours flown over that same period of time.

The resulting figure is known as the cost per flying hour (CPFH). The F-15EX's CPFH was recently estimated to be $27,000[5] by the Defense Department's Office of Cost Assessment and Program Evaluation (CAPE)—the same office that pushed the Air Force to acquire the F-15EX. Bizarrely, that price *does not* include the operations and support costs for the ECM equipment and targeting pods—components the F-15EX requires for combat. That same office estimated the F-35A's CPFH had dropped from $32,554 per hour in 2014 to $30,137 in 2018—a figure that includes all combat requirements that was calculated when the F-35 was still flying a relatively low number of hours.[6] As the Air Force refines its maintenance

practices, reduces over-manning,[7] and increases the number of hours each jet flies in a given month, the CPFH will continue to drop.

In real terms, the total CPFH for the F-35A and F-15EX are a wash now, but the F-15EX costs are based on its older sibling, the F-15E, which has been flying for the past 35 years. Those costs will not budge over the years ahead, but the F-35A's CPFH is still falling. While that will likely mean the F-35 will cost less to operate than the F-15EX, it is not the end of the government's CPFH argument.

A recent trend in fighter economics is to frame the total cost of ownership of a weapons system over its programmed lifetime. That estimate combines the sticker price of the jet with the total operational costs for the estimated life of that fighter, dividing it by the estimated total number of hours a weapons system will fly over its lifetime. The F-35 is rated for 8,000 hours[8]—4,000 hours more than the F-15C when it was fielded.[9] The F-15EX is rated for an impressive 20,000 flight hours,[10] a pre-production estimate that has never been matched by any other modern-day fighter. That means the F-15EX's denominator in the cost of ownership equation will ensure it remains well below that of the F-35. But it is important to understand what that means in practical terms.

For a variety of reasons, the average life span of a jet fighter, even after service life-extension programs, is less than 10,000 hours. The most heavily flown F-16s are just beginning to cross[11] that threshold, and the average age of the F-16 fleet is 30 years,[12] which means a fighter with a life span of 20,000-hours could be flying for more than 60 years.

Viable Operational Capability

The F-15EX airframe was designed 45 years ago, and while many of the onboard electronic boxes carry capabilities that are much more modern, most were considered new technology in the early 2000s. Fourth-generation fighters like the F-15EX have a non-stealth metal skin covering that serves as a "homing beacon" for modern surface-to-air missile (SAM) systems. Combat operations over areas formerly considered "low threat," like Syria, now include the highly capable Russian S-300 SAM system—and the Russians have already fielded the S-400.

By the time all 140-plus F-15EXs are on the ramp in 2030, those high-end SAMs will be everywhere, which will severely constrain its operations. In a shooting war against a peer competitor, the F-15EX will not be able to penetrate an enemy's integrated air defense system, and to survive *at even the fringes* of a peer adversary's air defenses, the F-15EX will require the

presence of numerous other fighter and ECM jets, like the F-16CJ and the FA-18G to protect it.

In mock air-to-air combat training, stealth fighters slay fourth-generation fighters like the F-15EX at a kill ratio that often exceeds 16-to-1.[13] F-16 pilots flying with the most sophisticated electronic targeting capabilities of any current fourth-generation platform equate a single F-35's air-to-surface capabilities as equal to three F-16CJs.[14] While proponents of the F-15EX acquisition may view those real-world assessments as wild exaggerations, if the F-35 is only equal to two of those $102 million Boeing fighters, paying $204 million for a capability a single $77.9 million jet can deliver does not equate to good fiscal logic.

The Argument for Additional Fighter Capacity

The five operational squadrons scheduled to receive the F-15EX currently fly F-15C Eagles. In its heyday, the Eagle was the world's best air-to-air fighter that could deploy globally, fly out in front of strike platforms, and decimate an enemy fighter force so that follow-on air-to-surface jets could accomplish their tasks. Unfortunately, as already discussed, the capabilities of modern surface-to-air threats mean that non-stealth fighters can no longer sweep out in front of other aircraft. Because of the rapid proliferation of S-300 and S-400 SAMs and their equivalents, the limitations they place on fourth-generation fighters will render them to sidelines. That means every squadron that converts to the F-15EX will equate to one less squadron the U.S. can use to fight a peer competitor for what remains of the jet's 20,000-hour, 60-year life span.

Unit Conversion Time

The Air Force has highlighted the need to bring additional capacity up to operational standards as quickly as possible and has stated that it will take significantly less time to convert F-15C units to the F-15EX than it will to the F-35.[15] An experienced fighter pilot will require few sorties in either jet to master its handling qualities, so the conversion argument is really with the time it takes to learn to employ either jet. Experienced pilots transitioning to new fighters are expected to pick up those roles quickly and, therefore, a handful of sorties—unless they have never flown that mission set before. While the model numbers of the F-15C and F-15EX are only separated by letters, the F-15EX is a dual-role fighter, which means it conducts air-to-air *and* air-to-ground missions. The majority of F-15C model pilots in the Air

National Guard have never dropped a bomb in their lives, and learning the air-to-surface mission will take just as much time in the F-15EX as it will in the F-35A. The same is true for maintenance professionals who repair the jets, load the munitions, launch the aircraft, and arm and de-arm weapons many have never handled in their careers. If there is an advantage for the F-15EX with conversion time, it is minimal.

Air Defense Fighter Requirements

The F-15EX capabilities are below the threshold required for a peer fight, but they are well beyond the requirements for homeland defense. The jet's advertised combat radius and 22 air-to-air missile capacity are dazzling, but fighters employ in pairs, which means two F-15EXs could carry an absurd 44 missiles to defend a single swath of U.S. territory. The air defense mission has never required that many missiles or a 750-plus nautical mile combat radius[16] to defend the continental United States, which means the F-15EX is overkill for that role—$24.1 million of overkill. The range and eight-missile capacity of a flight of two F-16s is more than adequate to defend against bomber or cruise missile threats, and those jets would be much cheaper. So would brand new, fifth-generation F-35As.

Weapons Capacity

While the air-to-air and air-to-surface weapons capacity of the F-15EX is impressive, it is irrelevant in a high-end fight because the jet is not likely to survive long enough to fire or drop them. The F-35's stealth configuration allows it to engage air-to-air targets with four missiles before enemy fighters or SAM systems can engage it. In a non-stealth configuration, the carriage capacity of the F-35 is almost as "dazzling" (and tactically irrelevant) as the F-15EX. Its 16-missile[17] capacity is twice the number any U.S. fighter has ever carried into combat—and more than double the number any pilot has attempted to fire in combat.

The Fighter Industrial Base

The U.S. has just two companies that produce fighters, but acquiring or forgoing the acquisition of the F-15EX will likely have no impact on the U.S. defense industrial base. In 2018, Boeing's F/A-18 Super Hornet production line already had a seven-year backlog and, with the potential for sales to India or Finland, production of that aircraft could extend even beyond

2025.[18] Qatar should receive the first of 36 F-15Qs in 2020 from the same production line on which the F-15EX will be produced, and that nation has an option for another 36 jets over the years ahead.[19]

The Air Force just signed a multi-year contract for Boeing's T-7, the Air Force's new advanced trainer, a variant of which is now being considered as a light air defense fighter to provide a capable and genuinely economical way to defend the homeland. And, unlike the FA-18 or F-15EX, the T- 7's price tag, method of construction, and open architecture design make it something the Air Force should want more of.[20] That jet, alone, will keep Boeing's fighter-capable production lines open through at least 2033[21]—three years beyond the Air Force's current plan for the F-15EX.

The New Construction Argument

Historically, the Air Force has used major fighter-acquisition programs as a premise to fund bed-down location updates for everything from squadron operations and maintenance facilities to resurfacing runways. While those updates are long overdue for many operational locations, the F-35A itself does not require any new construction. Unlike previous stealth aircraft, the F-35A does not require special hangars or facilities. The radar-absorbing material on the F-117A, B-2, and F-22A was incredibly hard to maintain—and could actually be damaged by the sun if those jets were parked on an open ramp. The F-35A's exterior surfaces are covered by a fourth generation of stealth material and maintaining it requires no special facilities: It can park in open sunlight, so new hangars are not required.

And, the "Sensitive Compartmented Information Facilities" required for classified systems are already at the proposed bed-down locations. The locations that will receive the F-15EX really do need updating, but the service is not tying their expense to the F-15EX like they are for the F-35 bed down. Those costs will be rolled in quietly, just like the F-15EX's ECM and targeting pod, to mask their linkage to this jet.

Recommendations

Congress should:

- Thoroughly evaluate the employment limitations and real costs associated with acquiring the F-15EX, and then terminate the authorization for the Air Force to acquire the F-15EX.

- Redirect the funding currently tied to the F-15EX to increase the procurement of fifth-generation fighters that can employ in the highest end, peer-level threat environments.

- Direct the Air Force to realign planning for active-duty F-35 unit bed down to ensure Air National Guard units currently flying the F-15C transition to the F-16C by 2030.

Summary

The choice for Congress seems relatively clear. It can fund the acquisition of 140 F-15EXs and field fighters that deliver markedly less capability, will cost more to operate, will reduce our deployable combat capability, are overqualified for the homeland air defense mission, and whose acquisition will not affect the fighter industrial base. Or they can acquire 183 F-35As for the same price—and get much more capability at lower cost of ownership for a much longer period of viability.

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