Is an all STOVL JSF Force the Right Choice for the Marine Corps?

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In the Marine Corps' quest for a short take-off vertical landing (STOVL) Joint Strike Fighter (JSF), the Marines have sacrificed needed capabilities and performance that past conflicts have proven a necessity and that future conflicts will confirm are essential. The Marine Corps has decided to acquire an all STOVL aviation force and thus has ignored the benefits to conventional take-off and carrier capable jet tactical air (TacAir) platforms. Limiting itself to a single jet aircraft diminishes the force as a whole by reducing flexibility and combat power. The Marine Corps has prided itself in doing more with less and being able to adapt to an ever changing battlefield, but an all STOVL JSF force will be a detriment to that effort. The United States Marine Corps (USMC) should purchase the carrier variant (CV) JSF, in addition to the STOVL JSF, because a mixed fleet will allow greater flexibility in employment, will continue TacAir integration with the U.S. Navy, and will bring more firepower to the fight.

Background

The Marine Corps has utilized the AV-8B and F/A-18 as its fixed-wing TacAir platforms, and both airframes have performed superbly and supported countless Marine, Joint, and Coalition forces. Each aircraft brings similar, as well as its own unique, capabilities to the fight for the Marine air ground task force (MAGTF); however, both platforms are nearing the end of

their service life and are in need of replacement. Going solely with the STOVL JSF, as the Marine Corps has chosen to do, could prove to be problematic in regard to the aging fleet.

Moreover, if the STOVL JSF encounters any further delays, the Marine Corps could be faced with relying on aircraft that have already exceeded their original service lives. As an official quoted in *Defense Daily* stated, "Any slides in [the Joint Strike Fighter] exacerbates [sic] any problems we have with aircraft shortages, mostly because the Marine Corps does not have any hot lines to produce new airframes."[1]

Another negative impact of acquiring a single fixed-wing TacAir platform is if the Marine Corps encountered any fleet wide aircraft issues once they transitioned to the STOVL JSF, they could potentially be without organic fixed-wing TacAir support. Consequently, the MAGTF will be left without its own inherent strike-fighter capability. This scenario is both avoidable and undesirable.

The jet TacAir aircraft capabilities that have proven to be the most valuable are mission radius, endurance or loiter time, the ability to carry an assortment of aviation ordnance and sensors, flexibility in employment, and the capability of upgrading with future technology and weapons. To some degree, all of the JSF variants, designated the F-35, have these capabilities and more. However, the Marine Corps is purchasing

only the STOVL variant, the F-35B, which has reduced capabilities in comparison with the CV JSF, the F-35C. Frank Wolfe highlights these performance shortfalls in *Defense Daily* by noting, “The Navy’s carrier version of the Joint Strike Fighter (JSF) is designed to have twice the internal payload and greater range than the Marine Corps short take-off and vertical landing (STOVL) variant of JSF.”[2]

The Marine Corps needs to maintain and maximize the ability to employ fixed-wing TacAir by three means: expeditionary strike groups (ESG), carrier air groups (CAG), and expeditionary airfields. The STOVL JSF will provide the Marine Corps with a fixed-wing strike-fighter capability within the ESG and the ability to phase these assets ashore in an austere environment. The CV JSF will maintain the tie with CAGs, while also being a more efficient and capable platform to deploy to expeditionary airfields. The Marine Corps should not limit itself to one platform that has reduced capabilities and currently lacks the ability to deploy with a CAG. With a mixed fleet of the F-35B and F-35C Marine aviation will be poised to more efficiently support the MAGTF and more equipped to adapt to the future.

TacAir Integration

A key element to Marine and Naval aviation is the TacAir Integration Policy which was “signed on 14 August 2002 by the Secretary of the Navy, the Commandant of the Marine Corps, and

the Chief of Naval Operations....”[3] This policy was designed to maximize the use of Navy and Marine Corps fixed-wing TacAir and to ensure combined assets were used efficiently, while reducing the cost of procuring and maintaining aircraft. The TacAir integration policy that is currently in use states that:

> Three Navy squadrons will participate in the Marine Corps’ Unit deployment Program (UDP) rotation, deploying to the Western Pacific with the Marines for approximately six months at a time. The agreement also calls for one Marine F/A-18 squadron to be assigned to each of the ten Navy air wings. This integration of TacAir assets will allow the Navy and Marine Corps to surge more aircraft than would otherwise be possible, and allow the exact mix of forces to flow where required, whether ashore or at sea.[4]

To date, no plans or policies have been created to integrate STOVL JSFs into CAGs. With an all STOVL JSF force the Marine Corps will be unable to honor this policy, and the Corps will lose the capability to deploy Marine fixed-wing TacAir on aircraft carriers. This loss will significantly limit Marine Aviation’s support of Marine ground forces as well as joint, and coalition forces throughout the world.

CV and STOVL JSF Capabilities

The CV and STOVL JSF are both fifth generation strike-fighter aircraft that possess the latest technology and performance; they represent a tremendous increase in fixed-wing TacAir capabilities for the USMC. The CV and STOVL versions’ capabilities mirror each other for the most part; however, they

differ in several key areas. The capabilities differences are as follows:

CV JSF

- Internal weapons carriage: The CV JSF can carry two 2,000 pound munitions and two advanced medium range air to air missiles (AMRAAM).
- External carriage: All stations have equal limitations other than station two and ten, which can carry 2,500 pounds.
- Mission radius: 641 nautical miles (nm)
- Internal fuel: 20,085 pounds
- Runway requirement: 8,000 feet land, air craft carrier-capable

STOVL JSF

- Internal weapons carriage: The STOVL JSF can carry two 1,000 pound munitions and two AMRAAMs.
- External carriage: All stations have equal limitations other than station two and ten, which can carry 1,500 pounds.
- Mission radius: 503 nm
- Internal fuel: 14,003 pounds
- Runway requirement (austere environment): take-off: 619 feet, landing: 1341 feet[5]

Each JSF version has its strong points and offers its own unique employment capabilities, but the CV JSF has more range,

endurance, and striking power, which are crucial to today's conflicts. The Marine Corps needs the CV JSF because a mixed CV-STOVL fleet will give us the diverse capabilities and employment options to support the MAGTF, as well as offset loss of combat power due to potential STOVL JSF production delays.

Counterargument

The Marine Corps has chosen to pursue an all STOVL aviation force and feels the STOVL capability will best support the MAGTF. An official quoted in *Defense Daily* states the following:

> We are all STOVL. Right now there is no reason for us to envision anything else. We will have all the capability we expect [the F-35B] to have for us to stake a step back, which is why the question of the EA-18G, he said. Why would we introduce [an aircraft] tied to a long runway when we are looking to become more expeditionary over time? That really becomes a ludicrous point to consider, the official said. When you look at everything else [we are] doing from VTUAS (Vertical Take-off Unmanned Aerial Systems), [we] are almost to the point now with the V-22 and the helicopter fleet, if we get an all STOVL fixed-wing fleet, and VTUAS, we are not tied to any runways.[6]

This statement is misguided for two reasons. First, it links STOVL capability to being expeditionary, when, in actuality, STOVL does not define being expeditionary. As written in *MCDP 3*, "the defining characteristic of expeditionary operations is the projection of force into a foreign setting."[7] The second misconception is the thought that the Marine Corps

will someday operate independently from runways. In reference to expeditionary operations, *MCDP 3* states "key to the entry phase is the presence or creation of some entry point—an available airfield or port...."[8] Of importance is the fact that often the first objective of an operation is the seizure of an airfield, and even if the Marine Corps had an all STOVL JSF force, requirements for airfields and runways will still be abundant. A large portion of USMC troop movement and logistical support is accomplished by airlift, not to mention that joint, coalition, and private sector support will all require conventional runways. Therefore, if the Marine Corps is going to have airfields to which it can deploy fixed-wing TacAir having a more capable CV JSF that can utilize the runway with a conventional take-off, rather than having a less capable STOVL JSF that uses a portion of the full runway would be prudent.

Currently, the Marine Corps is pushing for the Air Force and the Navy to purchase the STOVL JSF to help reduce its cost as program delays and design issues drive up the price; the Marines argument is that a STOVL JSF will foster the Air Force and Navy's expeditionary capability.[9] Again, the Marine Corps have erroneously linked being expeditionary to a STOVL capability. The Marine Corps' agenda is self-serving and gains nothing in terms of savings for the Department of Defense (DOD). A joint purchase of the STOVL JSF, which has international

partners, would, in fact, reduce its cost; however, this would in turn drive up the cost of the CV JSF, which has no international partners, therefore removing any benefit, to the DOD, of a reduction in cost of the STOVL version.[10]

Another positive element of the JSF is that it will have common parts, engines, and common training for maintenance personnel, and pilots, thereby reducing expense and improving readiness.[11] The most recent numbers out of the JSF Program Management Office state that the JSF variants have 70-90% common/cousin parts, a common core propulsion system, and a 100% common avionics system.[12] These commonalities will be beneficial across the services but will be the least beneficial to the Marines in the current purchasing arrangement. The STOVL version is the least like the other variants, and due to its STOVL engine and different flight characteristics, common maintenance personnel and pilot training will be very difficult, if not impossible, to integrate with the other services. These factors minimize the commonality and reduced cost benefit for the Marine Corps.

Conclusion

The Marine Corps is on the verge of replacing its F/A-18 and AV-8Bs with only the STOVL JSF, at which time the Marines will be limited to a single fixed-wing TacAir platform. The Corps will then be unable to uphold the TacAir Integration

Policy thereby reducing its flexibility of employment and integration with the U.S. Navy. With only one fixed-wing TacAir aircraft, any production delays or fleet aircraft issues could translate into a tremendous loss of combat power for the Marine Corps. In addition, the CV JSF's increased capabilities will maximize the USMC's use of land-based fixed-wing TacAir. A mixed fleet of CV and STOVL JSF will provide the MAGTF with the needed firepower, performance, and basing/employment options to allow the Marine Corps to continue to operate anywhere in the world.

1894 words

Notes

[1] "Aircraft reliability, Missions, and Schedule Significant Issues for Marine Corps." *Defense Daily* 231, no. 10 (Jul 18, 2006): 1.

[2] "Navy Not Ruling out STOVL JSF for Carriers by Frank Wolfe." *Defense Daily* 201, no. 33 (Feb 22, 1999): 1.

[3] Mackley, Paul. "TacAir Integration: Where the Rubber Meets the Road." *Naval Aviation News* 87, no. 4 (May/Jun, 2005): 16.

[4] Mackley, 16.

[5] Johnson, Richard, "JSF Capabilities," 11 December 2007, personal email (12 December 2007)

[6] *Defense Daily* 231, no. 10 (Jul 18 2006): 1.

[7] *MCDP 3 Expeditionary Operations* (Washington D.C., 1998), 31-32/39-40.

[8] *MCDP 3 Expeditionary Operations*, 31-32/39-40.

[9] Fulghum, David A. "Buy More, Pay Less: Marines Push USAF, Navy to Buy Stovl JSF." *Aviation Week & Space Technology* 166, no. 13 (Apr 02, 2007): 32.

[10] Fulghum, 32.

[11] Herman, Theodore. "Why Single-Engine STOVL?" *United States Naval Institute. Proceedings* 126, no. 4 (Apr, 2000): 72.

[12] Johnson, personal email (12 December 2007)

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