

Foreign Affairs, Defence and Trade Committee
Department of the Senate
PO Box 6100
Parliament House
Canberra ACT 2600

15 Feb 2016

RE: The planned acquisition of the F-35 Lightning II (Joint Strike Fighter).

Gentlemen,

I am writing to your committee as an interested observer. My name is Scott Perdue and I am a retired USAF F-4 and F-15E fighter pilot. I am still a professional pilot and pursued a career in Defense Department Consulting after retirement, primarily with the RAND Corporation. Among other efforts, I was co-author, with Dr John Stillion, of the August 2008 study "Air Combat Past, Present and Future."

While the F-35 was not the primary subject of that study, its performance capabilities were included in our analysis. I am not writing to offer a detailed pro-and-con analysis for your consideration, I expect that your committee has data representing both sides of the F-35 acquisition argument. My purpose is to entreat you to seriously consider the facts and weigh them with your overall goals and requirements to secure your nation against present and future threats. I take an historical look at the aircraft and its potential, I suggest that this perspective should play a significant role in your deliberations.

At the risk of belaboring the obvious. Any manufacturer is going to emphasize the strong points of their designs and strive to diminish or conceal the weak points. It is human nature. It is the job of the Air Force representatives as well as the Defense agency to exercise oversight over the proposal and potential program. In a perfect world the final decision will be made at the Parliamentary level. This is a decision that has the potential to affect the very survival of your country and should not be taken lightly. The emerging threats are more significant and lethal than the weapons of the First, and even, the Second Gulf War. The extreme agility of frontline fighter aircraft on both sides, not to mention the capability of the latest Russian Surface to Air Threats represent a clear and present threat today. How the Russians and Chinese were able to evolve the Flanker variants into an incredibly capable aircraft is instructive.

This leads me to the historical perspective I mentioned previously. In the early days of World War Two, the United States and Australia fielded inferior fighter aircraft. This situation pertained throughout 1942, where in particular the US Navy lost two, and the Japanese Navy lost five (four at Midway) Aircraft Carriers in force on force engagements. The Wildcat logged a good record, despite the fact that it was inferior in performance to the Japanese, in fact the only area of performance the Wildcat was superior in was dive speed. The actual Japanese losses at Midway were the result of perfect timing afforded by other means than US Navy air superiority and are not the subject in discussion. For the sake of this letter I want to concentrate on two developments made to the F4F in the days prior to Midway to illustrate my point.

The F-4F-3 was replaced by the F4F-4 in the few weeks before the US Navy sortied for the Midway battle. The most significant upgrades to the -4 variant were folding wings and 6 machine guns instead of 4. The folding wings were significant in as much as that modification allowed more fighters to be aboard the Aircraft Carrier. The 6-gun installation, nominally added to the weight of fire available to the pilot, but at considerable cost in persistence. The 4-gun installation allowed 34 seconds of shooting, the 6 gun installation reduced that to 18 seconds, a significant reduction when the average shot was 2-5 seconds. A fighter without weapons is nearly useless in the combat arena, one could make an argument that this lack of persistence played a significant role in US carrier losses in 1942. The most significant impact of these changes made to the F4F-4 were the addition of approximately 800 lb of additional weight. The Wildcat already demonstrated a poor climb rate, poor acceleration and the added weight reduced all of these factors, while at the same time increasing fuel burn. The lesson to be learned is that the F4F was designed by Grumman to US Navy specifications based on the current performance parameters of the aircraft they already had in inventory. There was no effort to specify performance parameters based on potential threats. When confronted with threat aircraft the only response available was to incorporate changes that actually made the performance of the aircraft worse not better. In short there was virtually no margin of growth in the basic airframe.

In my view what makes a fighter successful, in the context of service life, is the basic performance characteristics combined with the airframes ability to be upgraded over time in response to new threats and mission requirements. Of course cost plays a large role programmatically. Cost becomes paramount when considering how many of each aircraft can be purchased, maintained and flown throughout its operational life. Cheaper is better because it directly translates into more aircraft and lower operating cost. In the fighter business you will have losses, in peace as well as war, making any loss in a small community a potentially debilitating situation. Margin of growth is a key design factor, often only stumbled into by accident. Missions and threats will change with time. If you procure an airplane that has marginal growth capability and inferior performance characteristics from the very beginning you are setting yourself up. The worse case would be to lose the war and the best case to spend exorbitant amounts of money to wrest some relevance out of the airframe going forward.

The F-35 is optimized for Strike Missions. This does not actually mean that will enhance its survivability against modern SAM threats. It does however mean that the aircraft is inferior to virtually every other aircraft it will meet on the battlefield. Having to keep threats at arms length is not a reliable defense tactic in the long run. Avionics and 'Systems of Systems' will not be able to close the gap in performance. The impact of short range and small numbers of weapons drive acquisition of more airframes and closer basing, which may or may not be possible solutions. Tanker support will not close these gaps effectively, for a multitude of reasons. Consider closely the margin of growth capability in the airplane to face future threats.

The Russians, in the design of the Flanker, accidentally stumbled into an airframe that is robust enough to evolve to meet the threat represented by the F-22. A short comparison of its contemporary Mig-29 can highlight the growth margin argument that I am advancing. The Flanker is indeed a worthy adversary to the F-22 and the fact that these variants have been made in such large numbers is troublesome for future world stability. I suggest your committee look closely at the actual threat fielded today and evaluate the F-35's capability to meet and defeat that threat and evolved threats into the future.

Yours Truly,

Scott Perdue