

What's wrong with America's Fighter Program?

Part I: The F 22

Sometime in the course of 1986, the U.S. Air Force issued an RFP (request for proposal) for a new advanced tactical fighter (ATF). This was brought on by the threat of the Soviet Mig 29 (Fulcrum) and Su-27 (Flanker) fighter aircraft that was more superior in terms of air combat and flight avionics, than the aging F-15 Eagle and F-16 Fighting Falcon. The ATF was to be the successor to the F-15, a long range air superiority fighter with the performance to kill any other tactical aircraft and the operating radius to threaten targets deep inside the USSR while flying from bases in Western Europe. This was to be achieved by the use of a highly integrated airframe using composite technologies, upgrade avionics systems and thrust vector propulsion designs, including stealth technology, the latter to delay an opponent's initial firing opportunity for as long as possible, and thus capitalise on the large Radar Cross section (RCS) of the Fulcrum and Flanker.

Eventually two companies responded to the RFP, being a partnership between Boeing/General Dynamics and McDonnell Douglas/Northrop with the YF-22 and YF-23.

Each company ended up with two prototypes, of which one had to feature the new thrust vectoring technology coupled to a Pratt & Whitney F119 turbofan. The thrust vectoring allowed the fighter plane to perform a very tight turning radius. As development progressed, the ever increasing weight of the new fighter planes led to the downgrading of the infra red search and tracking system (which was eventually eliminated!) as well as the cancellation of side looking radar.

The YF-22 was eventually announced as the winner on the 23rd of April 1991, although the YF-23 was in fact faster with greater stealth capabilities. An initial order commitment of 650 planes was made by the US Air Force at an estimated cost of US\$ 86 Billion. Eventually this number was reduced to 442 planes at a cost of US\$ 71 Billion.

The development of the F22 was plagued by delays, budget cuts and operational design issues. These included : manufacturing problems with titanium castings,

delaminating of longerons, structural weaknesses in aft fuselage, anomalies in brakes, inertial reference system and environmental control system, nagging fuel leaks, problems with engine low pressure turbine blades, high pressure turbine blades, and engine combustors, and problems with excessive engine vibration. The Air Force reported that as of mid-1997 there were 97 issues limiting aircraft operations and 68 issues limiting ground maintenance.

Assembly of the first operational F-22 Raptor fighter began in March 2001 and achieved Initial Operational Capability (IOC) on 15 December 2005.

The F-22 is projected to cost six times as much as the aircraft it replaced (the F-15). The unit cost of the F-22's is currently US\$412 million a pop – making it the most expensive fighter plane ever built. Considering that, since coming on line in 2005, not a single F-22 Raptor has ever been involved in any form of air combat, not in Iraq, Libya or Afghanistan; it seems like a lot of money to pay for an aircraft not being utilized!

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Let's summarize some of the issues that have not been given enough press:

During 2010–2012 periodic

operational hazards surfaced regarding F-22 operations. In February 2010 the entire fleet was grounded due to rusting ejection seat rods and again in May 2011 following the November 2010 crash near Elmendorf Air Force Base, Alaska. The F-22 had been restricted to flying below 25 000ft while the Honeywell oxygen generating system was inspected. In June 2011, the investigation broadened across the life support systems, and aircraft deliveries were stopped.

In July 2011 the investigation suspected a scenario in which the pilots were poisoned by carbon monoxide from the engines while warming up the aircraft inside the hangars. Tests on pilots have found other chemicals have been inhaled from the on-board oxygen generating system (OBOGS), including oil fumes and propane. In September 2011, the F-22 returned to flight with added pilot safety equipment and careful monitoring of crew and aircraft. On 21 October 2011, Langley's F-22s were grounded after a suspected oxygen system problem; Joint Base Elmendorf-Richardson grounded their aircraft as well. All aircraft were cleared to fly again on 25 October 2011.

A USAF report released on 13 January 2012 stated that toxins entering the aircraft cockpit caused the hypoxia-like symptoms in pilots and aircraft maintenance personnel between April and September 2011. Up to April 2012 seven serious accidents occurred with two pilots killed. Since the redeployment in September 2011, 11 incidents of pilots

reporting hypoxia-like symptoms have been recorded. Air Force pilots have reported being pressured to continue flying the aircraft in spite of fearing for their safety because of the still-unresolved problems with the oxygen system.

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During the same week, ABC News ran a piece that indicated that the aircraft is so dangerous that some pilots are refusing to fly it. At issue. As ABC noted in the program, the oxygen delivering system problem in the plane could cause "hypoxia-like symptoms" which can result in "a lack of oxygen to the brain ... characterized by dizziness, confusion, poor judgment and... loss of consciousness." One terrible incident caused the death of Capt. Jeff Haney. The accident was blamed on pilot error, while Haney's family is demanding an investigation to determine whether it was caused by the faulty oxygen-delivery system.

In summary, Sen. John McCain a long-time critic of the plane, has suggested that its main use "may be at air shows, where it can do stunts at low altitudes -- low enough that the oxygen problem is not an issue."

In our next edition we will look at the next generation F-35 fighter. Yet another problem child in the US Air Force arsenal. •

