

The big fighter program has been revamped for success. That's good, because the US is running out of alternatives.

F-35 at Endgame

By Marc V. Schanz, Senior Editor

The next year shapes up as a critical period for the F-35 Lightning II. The fighter forces of the Air Force, Navy, Marine Corps, and some allied services hinge on its success. After a rash of problems, the US has imposed serious reforms, and the months just ahead will tell whether the get-well program is working.

For their part, USAF officials, Lockheed Martin, and the Pentagon's top leadership all believe a recent F-35 program restructuring will smooth the way for the fighter to replace hundreds of F-16, F/A-18, A-10, and AV-8 fighters with a more advanced, stealthy successor.

In February, after much deliberation at the Pentagon, Defense Secretary Robert M. Gates unveiled the revisions. Then,

taking into account various Pentagon reviews, the DOD 2011 budget sought an extra \$2.8 billion for the program, but for 122 fewer production aircraft through 2015. More aircraft would be bought later, and the additional money would be used to increase testing and development.

The new F-35 plan adds 13 months to development. It should reduce the oft-criticized concurrency in development and operational testing of the aircraft.

"They won't have any overlap," Stephen O'Bryan, vice president of F-35 business development for Lockheed Martin, said in June.

Through May, the Joint Strike Fighter was ahead of schedule for flight tests in 2010, said O'Bryan. The flight-test program had 93 test flights complete



Lockheed Martin photo by Tom Harvey

Lockheed Martin photo by Tom Reynolds

Secretary of Defense Robert Gates (center, in the group of three at right) tours Lockheed Martin's F-35 production facility at Fort Worth, Tex., in August 2009.

(versus the 90 planned through May), and a total of 394 planned by the end of the year.

Pentagon officials in June certified to Congress the F-35 is critical to national security, and that there are no viable options to the next generation stealth fighter.

Backers point to a series of recent events as evidence the program has returned to level flight. These include



The first two Air Force-variant F-35 Lightning II aircraft on a test flight.

first flight of the Navy's F-35C variant, the arrival of two Air Force F-35As at Edwards AFB, Calif., and an expansion of flight-testing activities at Edwards and NAS Patuxent River, Md.

Lockheed also points to specific accomplishments in the flight-test program this year.

On May 17, two F-35A test aircraft flew from Lockheed's Fort Worth, Tex.,

facility to Edwards—which was the first multiship, long-range flight in the fighter's development. The arrival of AF-1 and AF-2 marked the expansion of flight-test operations at Edwards, which is building up to a fleet of at least eight test aircraft.

While at Edwards, the AF-1 and AF-2 Air Force test vehicles will complete both ground and flight testing. Their

propulsion systems, aerial refueling capabilities, logistics, weapons integration, and flight envelopes will all be put through their paces.

On March 17, a short takeoff/vertical landing (STOVL) F-35B successfully completed a hover test flight at NAS Patuxent River. The first successful vertical landing for the Marine Corps variant came the next day.



The Air Force remains committed to the fighter. The difficulties the F-35 is experiencing at this stage of its development are not unusual for such an effort, Air Force Chief of Staff Gen. Norton A. Schwartz and Secretary Michael B. Donley said in the service's Fiscal 2011 posture statement. "The F-35 is our largest and most important program, and we are dedicated to successfully delivering these aircraft," they added.

Lt. Gen. Mark D. Shackelford, the Air Force's military acquisition deputy, told lawmakers in April the service has

Left: Wilbert Pearson Jr., chief of F-35 test and verification at Lockheed Martin, greets test pilot Lt. Col. Hank Griffiths at Edwards AFB, Calif., as Maj. Gen. David Eichhorn (l) and Col. William Thornton look on. Below: BF-1, the Marine Corps variant, makes its first vertical landing March 18.

The Navy's carrier variant, the F-35C, performed its first test flight on June 6 in Fort Worth, completing a 57-minute hop.

Fixed Pricing

As of May, the F-35 program had completed more than 200 test flights with activities at Fort Worth, Edwards, and NAS Patuxent River—where both the Navy and Marine Corps variants are undergoing tests.

According to O'Bryan, the partners and services are feeling more assured about the F-35's future. A year from now, he anticipates all of the US systems development aircraft will be delivered to the test sites.

The low rate initial production Lot One aircraft will be delivered by June 2011; Air Force pilots will be training at Eglin AFB, Fla.; and the F-35B short takeoff and landing testing will be under way at Eglin as well.

As for the Air Force's wish to get closer to a 110 aircraft annual buy to replace older fighters, O'Bryan expressed guarded optimism, and said the third low rate production lot of 17 F-35As came in 20 percent lower than previous cost estimates.

O'Bryan said Lockheed Martin anticipates signing the fourth LRIP contract with DOD, encompassing some 32 aircraft, for at least 20 percent less than estimated.

With a transition to fixed pricing, the hope is that by coming in under budget, the Air Force will get greater flexibility with its procurement accounts—and can potentially get greater numbers of F-35s into the force sooner.





An F-35 undergoes an engine test run.

put its bet down on the F-35. “We are putting the proper pressure in terms of bringing that program along in as successful a manner as we can ... to get the production ramp rate up to something that will flow those aircraft into the inventory as quickly as we’re able to,” he said.

The F-22 Raptor force was capped at 187 airframes, and legacy fighters will receive some upgrades until the F-35 fleet is fully operational, but the long-term tactical-air solution is nothing short of a fifth generation fighter force.

Between 2010 and 2013, 60 operational aircraft are slated for delivery to Eglin, home of the fighter’s training schoolhouse for all services.

Officially, the Marine Corps anticipates initial operational capability with the F-35B in 2012 (although they do not intend to deploy the jet aircraft until 2014), and the Air Force is working toward a 2015 operational date.

In spite of the restructuring, Gates has assured Congress the IOC dates stand pat. In a February hearing at the House Appropriations Committee’s defense panel, Rear Adm. David L. Philman acknowledged that the Navy is anticipating a slip of its IOC declaration to 2015 and maybe later, but the Marines

are firm in holding onto their 2012 date pending the successful completion of F-35B testing.

A Level of Transparency

The Air Force leadership, however, has adjusted expectations slightly.

On Feb. 24, Schwartz told Congress the Air Force would likely not have its first combat-ready F-35A unit available until the end of calendar 2015—a full two years later than the 2013 target date prior to the program restructuring.

Air Combat Command chief Gen. William M. Fraser III said in February at AFA’s Air Warfare Symposium that ACC was actively re-examining the target date to field USAF’s initial combat-ready unit of F-35As, in light of restructuring and extension of development by 13 months. “It has got to be about combat capability—and that is crews trained, spares, supportability, all of that together,” Fraser said.

Pentagon acquisition chief Ashton B. Carter, meanwhile, estimated that the Navy and Air Force would actually have their aircraft operational in 2016.

Much is riding on the restructured program, said Donley during a Capitol Hill speech in May to the Senate Aerospace Caucus.

The service’s topline budget is not keeping pace with the new missions the Air Force is being asked to take on, he noted, and 63 percent of the service’s spending over the future years defense program is tied up in operations. That leaves just 37 percent for investment—of which a quarter goes to the combat air forces.

While large portions of modernization funding will go toward “joint enablers” such as airlifters, tankers, unmanned aircraft, and intelligence-surveillance-reconnaissance platforms, the F-35 alone consumes 60 percent of CAF investment funding over this time.

For his part, Schwartz is convinced the program will survive.

“We’ve had program management issues, we’ve had cost-control issues, we’ve had some manufacturing issues, but what I’m seeing is, at the technical level, pretty promising,” Schwartz told *Defense News* in May.

If the cost curve comes down, he added, “I’m nowhere near to thinking of abandoning this effort.”

The F-35 suffered through a steady diet of schedule problems and cost growth over the past year. Critics have seized on missteps to caricature the JSF as the poster child for Pentagon acquisition woes, but much of the cost growth stretches back years.

The F-35 had already reached 38 percent cost growth by 2006, Rebecca Grant, head of the Mitchell Institute for Airpower Studies, noted in April 2010. “Is it something we wanted to happen? Certainly not. But the good part of this is that it signals a relatively strong level of transparency about what has caused the cost growth,” she said.

What specifically pushed the F-35 over the Nunn-McCurdy threshold was the DOD decision in late 2009 to better fund the program, Grant said.

“The prudent decision has been made to put money in, take jets out, and achieve a program that has less risk,” she added.

That said, the past year has certainly not been easy for the F-35 program. Since June 2009, it experienced a Nunn-McCurdy cost-growth breach, its military program director was fired, and its contractor management at Lockheed Martin was reshuffled.

Things looked much better last August, when Pentagon leadership trumpeted the program. Gates traveled to Lockheed’s Fort Worth JSF production line to personally inspect progress.



The Navy's F-35 variant is put through structural integrity testing during a drop test at Lockheed's test facility.

"The importance of this program can hardly be overstated," Gates said after his visit, noting that it is at the heart of the Air Force, Navy, and Marine Corps fighter plans—with a total buy of around 2,443 fighters though the 2030s.

After the endorsement, the F-35 limped into 2010 with a faltering flight-test program and multiple reports indicating cost growth troubles. Earlier this year, DOD confirmed to Congress unit costs on the fighter were up to \$92.4 million. This was a cradle-to-grave cost, including development, construction, and a lifetime of upgrades, but it was still up from 2001 estimates of \$50 million a copy. The cost growth triggered the Nunn-McCurdy breach.

Pentagon leadership continues to dole out tough love for the program. The cost of the program is now projected to go as high as \$382 billion.

The largest reason for cost growth remains significantly higher-than-expected contract labor and overhead expenses, DOD and Lockheed officials said. Military construction, as well as the Navy's cut of 409 aircraft from its plan several years ago, and a stretched development cycle also served to raise costs. The OSD recertification in June called the F-35 "fundamentally sound," but recommended a new risk review and management process. The Pentagon stated Lockheed processes were not compliant with DOD standards for value management—and challenged the company to improve with the recertified JSF effort.

A major criticism in several recent reviews (such as the much-reported Joint Estimate Team review) looked

at risk in relation to proven flight testing to demonstrate combat capability. Last year was less than stellar for the F-35's flight testing, and this forced analysts to assume the worst going forward. The program only flew about 10 percent of its planned test flights in 2009, due to delays in aircraft delivery, according to O'Bryan.

No More Wishful Thinking

In his revamped plan, Gates said progress toward key goals was lacking. This led him to withhold \$614 million in performance fees from Lockheed Martin in February, arguing that taxpayers "should not have to bear the entire burden of getting the JSF program on track." The revamp was not a surprise. Air Force and DOD leadership indicated a program scrub was coming, and acted as if the program was in breach of Nunn-McCurdy even before it became official.

Gates said senior OSD officials had burrowed into program details beginning in late 2009—and didn't like what turned up.

"It was clear that there were more problems than we were aware of when I visited Fort Worth," Gates said in February.

On March 2, Donley told reporters in Washington that the restructuring reflected the "mitigating and corrective action" to be taken if a breach was confirmed, adding such a breach was "likely."

Nine days later, Carter confirmed to the Senate Armed Services Committee the F-35 had busted the Nunn-McCurdy thresholds and needed recertification. Accompanying Carter, Christine H. Fox, DOD's chief for cost assessments, told the panel that costs for

the program had grown more than 50 percent since 2001.

Lockheed officials emphasized the program's steep cost growth in development was in large part due to materials scarcity, fixing weight and software problems, and parts shortages.

"We've been pretty candid about what happened ... at the strategic level," said O'Bryan. The problems uncovered by several reviews of the program were related to test aircraft delivery delays that averaged six months, he added. "We underestimated the amount of change we'd have to make as they rolled down the assembly line," O'Bryan said. In addition to management improvement, he said development of the F-35's software is 84 percent complete as of the end of May, but—like flight testing—the company is behind on the delivery of the software.

As part of his F-35 scrub, Gates eviscerated the program's management, announcing a change in the leadership of the program office. Gates in February fired the director, Marine Corps Maj. Gen. David R. Heinz, and raised the JSF program manager to a three-star general officer slot. The program is now led by Vice Adm. David J. Venlet, who was brought over to lead the F-35 program from his previous assignment as commander of Naval Air Systems Command.

In March, Lockheed Martin CEO Robert J. Stevens publicly defended his corporate program director, Daniel J. Crowley. Crowley kept his job, and Stevens said he had "absolute confidence" in his role. In early May, Crowley was promoted to chief operating officer of Lockheed Martin's aeronautics unit, where he would oversee the F-35, F-22, F-16, C-130, and C-5M programs, effective June 7. Succeeding Crowley was Larry A. Lawson, who had led the company's F-22 effort since December 2004.

The program tumult has resulted in some tension between DOD and Air Force leadership, on one hand, and the F-35 contractor, Lockheed Martin, on the other. The tension was especially high after Gates sacked Heinz.

"This is no longer a time for wishful thinking," said Schwartz in February, when asked at AFA's Air Warfare Symposium what his message was to industry.

"Tell me what you can do. I expect you to deliver what you promise," Schwartz said, adding, "If they don't, what occurred recently with the F-35 program is only the start." ■