

Costliest Jet, Years in Making, Sees the Enemy: Budget Cuts

By CHRISTOPHER DREW



Vice Adm. David Venlet was named to lead the Joint Strike Fighter program in 2010 after problems had left it behind schedule and over budget.

LEXINGTON PARK, Md. — The Marine version of the F-35 Joint Strike Fighter, already more than a decade in the making, was facing a crucial question: Could the jet, which can soar well past the speed of sound, land at sea like a helicopter?

On an October day last year, with Lt. Col. Fred Schenk at the controls, the plane glided toward a ship off the Atlantic coast and then, its engine rotating straight down, descended gently to the deck at seven feet a second.

There were cheers from the ship's crew members, who "were all shaking my hands and smiling," Colonel Schenk recalled.

The smooth landing helped save that model and breathed new life into the huge F-35 program, the most expensive weapons system in military history. But while Pentagon officials now say that the program is making progress, it begins its 12th year in development years behind schedule, troubled with technological flaws and facing concerns about its relatively short flight range as possible threats grow from Asia.

With a record price tag — potentially in the hundreds of billions of dollars — the jet is likely to become a target for budget cutters. Reining in military spending is on the table as President Obama and Republican leaders in Congress look for ways to avert a fiscal crisis. But no matter what kind of deal is reached in the next few weeks, military analysts expect the Pentagon budget to decline in the next decade as the war in Afghanistan ends and the military is required to do its part to reduce the federal debt.



Behind the scenes, the Pentagon and the F-35's main contractor, Lockheed Martin, are engaged in a conflict of their own over the costs. The relationship "is the worst I've ever seen, and I've been in some bad ones," Maj. Gen. Christopher Bogdan of the Air Force, a top program official, said in September. "I guarantee you: we will not succeed on this if we do not get past that."

In a battle that is being fought on other military programs as well, the Pentagon has been pushing Lockheed to cut costs much faster while the company is fighting to hold onto a profit. "Lockheed has seemed to be focused on short-term business goals," Frank Kendall, the Pentagon's top weapons buyer, said this month. "And we'd like to see them focus more on execution of the program and successful delivery of the product."

The F-35 was conceived as the Pentagon's silver bullet in the sky — a state-of-the-art aircraft that could be adapted to three branches of the military, with advances that would easily overcome the defenses of most foes. The radar-evading jets would not only dodge sophisticated anti-aircraft missiles, but they would also give pilots a better picture of enemy threats while enabling allies, who want the planes, too, to fight more closely with American forces.

But the ambitious aircraft instead illustrates how the Pentagon can let huge and complex programs veer out of control and then have a hard time reining them in. The program nearly doubled in cost as Lockheed and the military's own bureaucracy failed to deliver on the most basic promise of a three-in-one jet that would save taxpayers money and be served up speedily.

Lockheed has delivered 41 planes so far for testing and initial training, and Pentagon leaders are slowing purchases of the F-35 to fix the latest technical problems and reduce the immediate costs. A helmet for pilots that projects targeting data onto its visor is too jittery to count on. The tail-hook on the Navy jet has had trouble catching the arresting cable, meaning that version cannot yet land on carriers. And writing and testing the millions of lines of software needed by the jets is so daunting that General Bogdan said, "It scares the heck out of me."

With all the delays — full production is not expected until 2019 — the military has spent billions to extend the lives of older fighters and buy more of them to fill the gap. At the same time, the cost to build each F-35 has risen to an average of \$137 million from \$69 million in 2001.

The jets would [cost taxpayers \\$396 billion](#), including research and development, if the Pentagon sticks to its plan to build 2,443 by the late 2030s. That would be nearly [four times as much as any other weapons system](#) and two-thirds of the \$589 billion the United States has [spent on the war in Afghanistan](#). The military is also desperately trying to figure out how to reduce the long-term costs of operating the planes, now projected at \$1.1 trillion.

“The plane is unaffordable,” said Winslow T. Wheeler, an analyst at the [Project on Government Oversight](#), a nonprofit group in Washington.

Todd Harrison, an analyst at the [Center for Strategic and Budgetary Assessments](#), a research group in Washington, said Pentagon officials had little choice but to push ahead, especially after already spending \$65 billion on the fighter. “It is simultaneously too big to fail and too big to succeed,” he said. “The bottom line here is that they’ve crammed too much into the program. They were asking one fighter to do three different jobs, and they basically ended up with three different fighters.”

While weapons cost overruns have long been a problem, the F-35 is also running into the changing budget realities, and a new focus on rivalry with China, that will probably require shifting money to a broader mix of planes.

Yet, for years, the problems with the F-35 raised few red flags, as money flowed freely after the 2001 terror attacks and enthusiasm for a three-in-one jet blinded officials in the Clinton and Bush administrations and in Congress to its overly ambitious design. Now, unless the Pentagon can substantially reduce the price of each plane, analysts say, it may be lucky to buy 1,200 to 1,800.

Robert J. Stevens, the chief executive of Lockheed Martin, said company officials were “working as aggressively as we can” to fix the problems and cut costs. Vice Adm. David Venlet, who now runs the program at the Pentagon, said he was confident that “good old-fashioned engineering is going to lick” the flaws. But he declined to predict how many planes would be bought.

“It’s a very fair conversation that ought to be had for the country,” he said.

‘Acquisition Malpractice’

Right from the start, Pentagon officials were warned of the dangers of beginning to produce an aircraft before it was tested. And right from the start, Pentagon officials did not listen.

The roots of the problems go back to the mid-1990s, when military officials pitched the F-35 as simple and affordable, like a Chevrolet of the skies, with the three versions sharing 70 to 80 percent of their parts. The planes would also be versatile, capable of fighting other planes but focused mainly on attacking ground targets.

Pentagon officials thought advances in computer modeling would simulate so precisely the way the F-35 would fly that only minor problems would be discovered in the flight tests.

And given a ban on exporting the F-22, the top stealth fighter, moving quickly on the F-35 would lock up foreign buyers and keep Europe from creating its own stealth planes.

"There was this big desire to kill the competition," said Richard L. Aboulafia, an analyst at the Teal Group in Fairfax, Va.

Lockheed beat out Boeing for the F-35 contract in October 2001.

Pentagon testing experts and Congressional auditors warned as the program got under way that it would be wiser to "fly before you buy." They cautioned that some of the new technologies were not ready and that years of flight tests would find flaws that the simulations had not anticipated.

Lockheed and the joint Air Force and Navy office that runs the program countered that the sooner they started building a sizable number of planes, the sooner they could realize economies of scale that would lower the price of each plane, even if some needed updating.

But almost immediately, the project proved to be incredibly complicated. Lockheed's initial designs were late and had to be redone, delaying the manufacture of parts for the test models. While most military programs start building before all the testing is done, the Pentagon took that to an extreme, starting production of the F-35s in 2007, before flight tests had even begun.

Mr. Kendall, who became the Pentagon's top weapons buyer in May, has said that diving into production so soon amounted to "acquisition malpractice."

Mr. Harrison, the analyst at the budget center, said the willingness to "roll the dice" reflected the peculiar incentives at the Pentagon, where rushing into production creates jobs and locks in political support, even if it allows programs to drift into trouble. Lockheed and its suppliers on the F-35 employ 35,000 workers, with some in nearly every Congressional district.

"The military services want to get the planes as quickly as possible," Mr. Harrison said. "The defense industry wants to start producing as quickly as possible. But it's not in the best interest of taxpayers, and it ends up catching up with you."

Asked who protects the taxpayer, he said, "That's what the Pentagon's civilian leadership is supposed to bring."

But with the Iraq and Afghanistan wars raging, Robert M. Gates, who was then the defense secretary, did not deal with the problems with the F-35 until late 2009 and early 2010, when he fired the general in charge and brought in Admiral Venlet, a former fighter pilot who had overseen testing of Navy aircraft. According to the admiral, Mr. Gates said, "Dave, the program has made small adjustments over the years and persistently disappointed people."

Then, sweeping his finger in a wide arc, Mr. Gates added, "If you evaluate that we need a big adjustment, tell me, and I'll make it, so we don't disappoint anymore."

Contractor in the Hot Seat

Admiral Venlet's first move was to bring in technical experts from the services who had been shut out of the program. He said his predecessors had given Lockheed too much leeway earlier, when government oversight was considered "a hindrance more than a help."

Another method that he chose to assert control is decidedly low-tech: printouts of charts, hung from whiteboards on all four walls of a "war room" in the F-35 offices near the Pentagon.

"It looks maybe a little dinosaurlike," he acknowledged, standing near cutout plane shapes tracking the flow of parts into [Lockheed's mile-long plant](#) in Fort Worth. "But you know what? It works."

Military officials said the testing had picked up substantially at the Patuxent River Naval Air Station here and other bases, where the planes have already flown near their top speeds of Mach 1.6. Still, the overlap between testing and production remains a serious problem, and the extra cost of refitting planes built while the flight tests are under way could reach \$2.4 billion to \$3.8 billion, Admiral Venlet said.

Lockheed has already lost profits, earning only \$28 million of a possible \$87.5 million in award fees for meeting development goals in 2010 and 2011. In tense negotiations over the latest batch, the Pentagon has been demanding that the company shoulder some of the costs of fixing the problems found in the tests.

"It should not take 10, 11, 12 months to negotiate a contract with someone we've been doing business with for 11 years," General Bogdan said.

The general started as Admiral Venlet's deputy in August, and he will succeed him next week. His criticism startled Lockheed officials, because in his last job, overseeing the award of a \$35 billion contract for aerial refueling tankers, Boeing gave the Air Force such a good price that analysts think Boeing is subsidizing the early work.

Lockheed argues that the government's estimates of what the F-35s should cost now are too low and that the program was far riskier than the military said it would be. Only 20 to 30 percent of the structural parts ended up in common,

though the models will share engines and software. Lockheed officials also noted that commercial plane makers had run into delays with their most innovative planes, Boeing's [787 Dreamliner](#) and Airbus's A350.

Mr. Stevens, the Lockheed chief executive, said military programs bog down in many layers of auditing, a process he described as "sclerosis in the system." In [World War II](#), he said, "We managed to either invent or refine jet propulsion, nuclear weapons, radar, radio communication, electronics in three years and eight months." In that time today, he said, the Pentagon cannot even finish the initial design of a system.

Lockheed is fixing the most glaring problems. A support wall in the fuselage of the Marine version — the only one that can land like a helicopter — was strengthened after it cracked in a test in 2010. The tail-hook on the Navy model was just seven feet behind the landing gear, much closer than on other Navy planes. After the wheels flattened the arresting cable, the cable did not bounce up quickly enough for the hook to grab it. Lockheed is reshaping the hook to try to scoop up the cable.

But the "gorilla in the room," General Bogdan said, is testing and securing the 24 million lines of software code for the plane and its support systems, a mountain of instructions that goes far beyond what has been tried in any plane.

Under the latest plan, Lockheed will be held to about 30 planes in each of the next two years. But the Pentagon will still have bought 365 planes before the flight tests end in 2017.

Two years ago, General Bogdan said, the F-35 program was like an aircraft carrier that "was going to run aground." But if the military and Lockheed can "hold each other accountable," he said, "we've got a shot at getting this done."

Rough Skies Ahead

With the budget problems at home, Pentagon and Lockheed officials are looking to allies to help pay for the F-35. They have stepped up phone calls and visits, trying to reassure the eight countries that have invested in the program, as well as persuading two others, Israel and Japan, to sign up.

Lockheed needs more foreign orders to realize volume savings and get closer to the Pentagon's targets of \$79 million to \$106 million a plane, depending on the model. But to get those orders, said Mr. Aboulafia, the Teal Group analyst, Lockheed must be more aggressive in cutting its prices, especially since the allies have their own economic difficulties.

This year, Italy cut its planned order 30 percent. Britain and Australia have delayed decisions on how many F-35s to buy. Lawmakers in Canada and the Netherlands are questioning the costs.

And while Congress continues to support the F-35, the leaders of the Senate Armed Services Committee are concerned that production is now set to ramp up later in this decade just as two other major projects — the refueling tankers and a \$55 billion stealth bomber program — will seek financing.

On top of that, the F-35 could be too sophisticated for minor conflicts, and its relatively short flight range could be a problem as the Pentagon changes its view of possible threats. Mark Gunzinger, a retired Air Force colonel who is now an analyst at the Center for Strategic and Budgetary Assessments, said the Pentagon would need to shift money to longer-range planes as China and other countries expanded the reach of missiles capable of destroying American ships and bases.

The Navy is developing a stealthy unmanned fighter that could fly from carriers and go two or three times as far as the F-35. The Air Force is studying concepts for the bomber, which could fly much farther and carry more firepower than the F-35.

Representative Norm Dicks of Washington, the top Democrat on the House defense appropriations subcommittee, said support for the F-35 could also dwindle if lawmakers faced tougher choices between military and domestic programs. "Anything where there are still issues hanging out is going to be vulnerable to some extent," he said.
