Death of a Spy Satellite Program

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By May 2002, the government's effort to build a technologically audacious new generation of spy satellites was foundering.

The contractor building the satellites, Boeing, was still giving Washington reassuring progress reports. But the program was threatening to outstrip its $5 billion budget, and pivotal parts of the design seemed increasingly unworkable. Peter B. Teets, the new head of the nation's spy satellite agency, appointed a panel of experts to examine the secret project, telling them, according to one member, "Find out what's going on, find the terrible truth I suspect is out there."

The panel reported that the project, called Future Imagery Architecture, was far behind schedule and would most likely cost $2 billion to $3 billion more than planned, according to records from the satellite agency, the National Reconnaissance Office.

Even so, the experts recommended pressing on. Just months after the September 11 terrorist attacks, and with the new satellites promising improved, more frequent images of foreign threats like terrorist training camps, nuclear weapons plants and enemy military maneuvers, they advised Mr. Teets to seek an infusion of $700 million.

It took two more years, several more review panels and billions more dollars before the government finally killed the project—perhaps the most spectacular and expensive failure in the 50-year history of American spy satellite projects. The story behind that failure has remained largely hidden, like much of the workings of the nation's intelligence establishment.

But . . . the collapse of the project, at a loss of at least $4 billion, was all but inevitable—the result of a troubled partnership between a government seeking to maintain the supremacy of its intelligence technology, but on a constrained budget, and a contractor all too willing to make promises it ultimately could not keep.

"The train wreck was predetermined on Day 1," said A. Thomas Young, a former aerospace executive who led a panel that examined the project.

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The Future Imagery project is one of several satellite programs to break down in recent years, leaving the United States with outdated imaging technology. But perhaps more striking is that the multiple failures that led to the program's demise reveal weaknesses in the government's ability to manage complex contracts at a time when military and intelligence contracting is soaring.

. . . The satellite agency put the Future Imagery contract out for bid in 1998 despite an internal assessment that questioned whether its lofty technological goals were attainable given the tight budget and schedule.

Boeing had never built the kind of spy satellites the government was seeking. Yet when Boeing said it could live within the stringent spending caps imposed by Congress and the satellite agency, the government accepted the company's optimistic projections, a Panglossian compact that set the stage for many of the travails that followed. Despite its relative inexperience, Boeing was given responsibility for monitoring its own work, under a new government policy of shifting control of big military projects to contractors. At the same time, the satellite agency, hobbled by budget cuts and the loss of seasoned staff members, lacked the expertise to make sound engineering evaluations of its own.

The satellites were loaded with intelligence collection requirements, as numerous intelligence and military services competed to influence their design. Boeing's initial design for the optical system that was the heart of one of the two new satellite systems was so elaborate that optical engineers working on the project said it could not be built. Engineers constructing a radar-imaging unit at the core of the other satellite could not initially produce the unusually strong radar signal that was planned.

A torrent of defective parts, like gyroscopes and electric cables, repeatedly stalled work. Even an elementary rule of spacecraft construction—never use tin because it deforms in space and can short-circuit electronic components—was violated by parts suppliers.

By the time the project, known by its initials, F.I.A., was killed in September 2005—a year after the first satellite was originally to have been delivered—cost estimates ran as high as $18 billion.

"The F.I.A. contract was technically flawed and unexecutable the day it was signed," said Robert J. Hermann, who ran the National Reconnaissance Office from 1979 to 1981 and in 1996 led the panel that first recommended creation of a new satellite system. "Some top official should have thrown his badge on the table and screamed, 'We can't do this system at this price.' No one did."

Boeing's point man on the job was Ed Nowinski, an engineer who had become a top government spy satellite expert during 28 years at the Central Intelligence Agency. "It was a perfect storm," Mr. Nowinski said ruefully. But he acknowledged that Boeing frequently provided the government with positive reports on the troubled project.

"Look, we did report problems," Mr. Nowinski said, "but it was certainly in my best interests to be very optimistic about what we could do."

Boeing, which fired Mr. Nowinski as the project fell apart, declined to comment. A spokeswoman, Diana Ball, said Boeing could not discuss classified programs. . . .

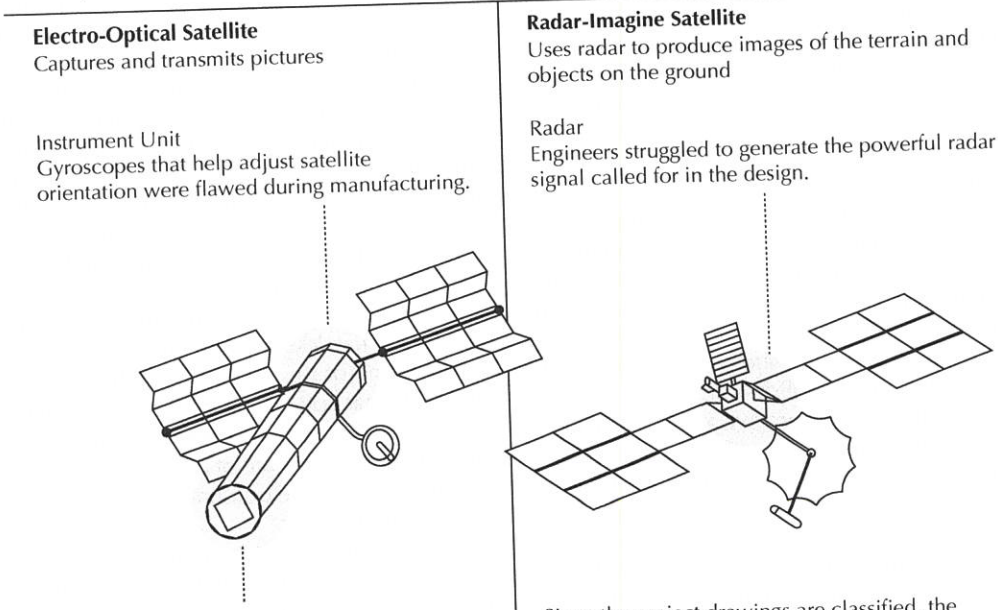
Asked about the recent problems with F.I.A. and other satellite programs, Senator Christopher S. Bond, Republican of Missouri and vice chairman of the Intelligence Committee, said, "It's fair to say we have lost double-digit billions on satellite programs that weren't effectively managed by the government."

This year, a stealth satellite program was killed by Mike McConnell, the director of national intelligence. Also, a new generation of infrared satellites for detecting missile launches has barely survived cost overruns and technical setbacks.

Taken together, these episodes represent a stark reversal for a satellite program born in the most perilous years of the cold war, when American technology

Figure 12.2 An Ambitious Satellite Project

The Future Imagery Architecture project was going to replace older spy satellites, but both of the main pieces of the project ran into trouble.



Source: Charles Vick, GlobalSecurity.org

answered the call of national defense by taking spying into space.

Today, space technology has lost its luster for young engineers, who are drawn increasingly to companies like Google and Apple. Defense experts say the entire acquisition system for space-based imagery technologies is in danger of breaking down. And the nation, at least for now, has been left without advanced new systems to replace a dwindling number of reconnaissance satellites first designed in the 1970s and updated in the 1990s.

Even though reconnaissance satellites are less useful in spying on terrorist groups than on more traditional threats like foreign military forces, they remain integral to intelligence and military operations, including monitoring nuclear and missile installations in Iran and North Korea. They are also critical to Pentagon mapmaking and the targeting of precision-guided weapons like cruise missiles.

"There is not a gap in the coverage we are providing, but our constellation is fragile," said Alden V. Munson Jr., deputy director of national intelligence for acquisition.

Since the F.I.A. debacle, the National Reconnaissance Office has banned Boeing from bidding on new spy satellite contracts. But all the news was not bad for Boeing. The company received a $430 million kill fee for the optical satellite system. And, despite the ban, the radar-imaging satellite remained in Boeing's hands.

Response to Soviet Threat

The first generation of photo reconnaissance satellites was developed in the waning months of the Eisenhower administration, in a frantic effort to measure the Soviet threat.

The satellite system, code-named Corona, was the product of an inspired partnership of government, science and industry. The Central Intelligence Agency set broad goals and then let the Lockheed Corporation, with help from the Air Force, figure out how to build the satellites, get them into orbit and return the film canisters to earth without burning up as they plunged through the atmosphere.

In the mid-1970s, the same partnership developed systems that electronically captured and transmitted pictures moments after they were recorded. These electro-optical satellites were among the first devices to use the technology now common in digital cameras.

They were followed in the 1980s by radar-imaging satellites, which can see though clouds and operate in darkness, bouncing radar signals off the earth to plot terrain and paint images of objects on the ground.

By the 1990s, though, the threats to national security—and the world of satellite intelligence—were undergoing convulsive change.

Familiar targets like Soviet air bases and missile factories were being supplanted by the more varied and elusive threats of the post-cold-war world. At the same time, the armed services, eager for increased tactical intelligence after the 1991 Persian Gulf war, were demanding satellites that could stream battlefield data instantly to commanders around the globe.

In 1996, a commission created by the director of central intelligence recommended building a fleet of light, small, relatively inexpensive satellites that, according to a declassified version of the panel's report, could together be at least as effective as the Lockheed behemoths then in orbit. (They cost about $1 billion apiece, weighed 30,000 pounds and were the size of a bus.)

Having more satellites in orbit, the theory went, would increase "revisit time," the number of times a day satellites pass above target sites. That would help combat increasing efforts to camouflage such sites.

Lighter satellites would require cheaper and less powerful rockets than the Titan IV's then in use, which could cost $450 million per launching. The panel also envisioned saving money and time by taking advantage of technologies and parts developed by commercial satellite companies.

But as the concept took shape, several powerful forces were bearing down, turning the satellite procurement system to quicksand, military experts said.

One was the new policy, cousin to the Clinton administration's effort to downsize government, of transferring control of big military projects to contractors, on the theory that they could best manage engineering work and control costs.

Another factor was a decline of American expertise in systems engineering, the science and art of managing complex engineering projects to weigh risks, gauge feasibility, test components and ensure that the pieces come together smoothly.

Finally, troubled by the free-spending habits of the satellite agency, Congress demanded rigid spending guidelines for the satellite project.

The first concerns about the project's formula—high-concept technology on a fast schedule with a tightly managed budget—came from the satellite agency itself.