



BALLISTIC MISSILE DEFENSE

Sensor Failure in 1997 Test Sparks New Controversy

BOSTON—A government investigation has found that much of the data from a 1997 ballistic missile test flight that the U.S. Department of Defense labeled a solid success may be useless. Sources familiar with two studies by the General Accounting Office (GAO) say they highlight software and sensor problems on the 1997 flight over the Pacific. The wording of the reports is still the subject of fierce internal debate, but their upcoming release is sure to provide more ammunition for skeptics of the controversial ballistic missile defense program.

In the 24 June 1997 test, a vehicle carrying an infrared sensor was launched from Meck Island to determine whether it could discriminate among nine objects launched nearly simultaneously from the California coast. That capability is a first step on the path to identifying and shooting down enemy warheads while ignoring decoys. Shortly after, program manager Joseph Cosumano declared that “all aspects” of the \$100 million test “were highly successful.”

But that characterization has been hotly disputed for years. A former employee is suing contractor TRW Inc., claiming it falsified data and disregarded science and engineering standards, and a physicist at the Massachusetts Institute of Technology (MIT) argues that the tests’ flaws were covered up. The government is now spending \$8.3 billion a year on the program, with a boost expected in next week’s presidential 2003 budget proposal.

The debate prompted two legislative

requests—from Representative Howard Berman (D-CA) and Senator Charles Grassley (R-IA) and from Representative Ed Markey (D-MA)—for studies by GAO, Congress’s investigative arm. The reports uncovered a problem with the sensors that was never mentioned in unclassified materials, government officials say. GAO’s Robert Levin confirmed that the sensor’s performance lies at the heart of the reports, but he declined further comment. “There is a big fight over how to spin it,” says Michael Levi, an analyst at the Federation of American Scientists in Washington, D.C. Defense officials

last week admitted that the 1997 test was not as “robust” as first thought, adding that the vehicle and sensor in question are no longer part of the missile defense program.

A key component of the 1997 test was the focal plane array used to detect infrared wavelengths from the targets. The resulting data were key to determining whether an object was a warhead or a decoy. The sensor was calibrated to function best at 10 kelvin, but during the test the sensor temperature dropped only to an estimated 13 K. That discrepancy would have affected its accuracy. Realizing the problem in mid-flight, controllers tried to recalibrate the instrument by pointing it at Arcturus, a star with a known strong

signal, but they were not sure of the sensor’s exact temperature. As a result, “there was a tremendous amount of noise” in the resulting data, says one government engineer familiar with the test results. “It was guesswork to filter it out; there’s a lot of uncertainty in that data.”

Theodore Postol, an MIT physicist and

longtime missile defense critic who has studied the data, estimates that the signal-to-noise ratio was 25 to 40 times higher than expected. In a 14 January letter to MIT president Charles Vest, Postol says the high ratio “renders essentially all of the data in the experiment useless or open to question.”

The sensor had about 80 seconds to gather data on the objects. The Department of Defense initially claimed it had received 55 seconds of data, changing it to 18 seconds after an analysis by an independent panel. But even those 18 seconds of data are questionable, according to Postol and the government engineer. The engineer says that an informal but classified analysis in 2000 by researchers at MIT’s Lincoln Laboratory in Cambridge, Massachusetts, uncovered the problem. Lab spokesperson Roger Sudbury declined to discuss the matter.

Keith Englander, deputy for system engineering and integration at the Pentagon’s newly redesignated Missile Defense Agency, says that discriminating between decoys and warheads “is hard,” that the methods used in the test to analyze that discrimination “were fragile,” and that the sensors “did not have as robust a discrimination method” as the Raytheon vehicle that was eventually selected over the TRW and Boeing design. However, he declined to discuss technical details.

The performance of the sensor is the latest in a long line of complaints about the way the test was prepared, conducted, and analyzed. Nira Schwartz, an engineer formerly with TRW, says that the company used faulty algorithms in the design of the test and then covered up the sensor’s failure to identify the targets. A panel of academics, including several from Lincoln Lab, concluded in a 1998 study that some algorithm designs were “questionable” but that the overall experiment was “basically sound.” Schwartz was fired in 1996, and she is suing TRW and Boeing, the prime contractor, for violations of the False Claims Act. Lawyers for TRW and Boeing say the charges are spurious.

Meanwhile, at the prompting of Postol, Vest has initiated an inquiry into whether Lincoln Lab researchers provided sufficiently independent analysis of the test flight program in that 1998 study. However, Postol last month complained to the MIT trustees that Vest was dragging his heels. MIT provost Bob Brown declined to discuss details of the inquiry, which would precede a formal investigation.

—ANDREW LAWLER



Counterattack. U.S. defense officials say they have a new technical strategy for spotting enemy missiles.