



United States
General Accounting Office
Washington, D.C. 20548

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Office of Special Investigations

B-277078

December 1, 1997

The Honorable Pete V. Domenici
United States Senate

Subject: TOPAZ II Space Nuclear Power Program - Management,
Funding, and Contracting Problems

Dear Senator Domenici:

As you requested, we have investigated questionable management practices and possible wrongdoing in the TOPAZ II space nuclear power program. This program, which was managed by the Strategic Defense Initiative Organization (SDIO) and its successor, the Ballistic Missile Defense Organization (BMDO), was primarily intended to acquire technology that would eventually allow U.S. industry to develop nuclear power as an energy source for long-term, space-based missions. As agreed with your office, we focused our review on the program's management, funding, and acquisition practices from 1990 through 1995.

BACKGROUND

In 1989, with the Cold War ending, the United States learned that the Soviet Union was willing to sell its thermionic space nuclear reactor technology, which came to be known as TOPAZ¹ II. SDIO, which was charged with developing a -- U.S. space-based missile defense program, believed that this acquisition would greatly decrease the time needed to design U.S. thermionics² systems. By 1990, SDIO and the Air Force had created a program to acquire and further develop the Russian technology for eventual transfer to U.S. industry. Specifically, the program was to focus on (1) testing and evaluating the Russian technology, (2) flight-testing a TOPAZ II reactor, and (3) developing the next-generation space power system based on the TOPAZ II technology.

¹TOPAZ is a transliteration of a Russian acronym for "thermionic experiment with conversion in the active zone."

²Thermionics is the generation of energy from charged particles emitted by an incandescent material.

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To acquire this technology, SDIO bought six Russian production-model TOPAZ II nuclear power systems between 1992 and 1994 from a Russian consortium (called INERTEK) through a U.S. contractor for \$34.5 million. However, in 1993, due to cost-cutting pressures and a change in defense spending priorities, the U.S. government reduced funding for the program. To justify continuing the reduced TOPAZ II program, SDIO officials added a new program goal. Instead of focusing solely on the existing program goal of technology transfer, the program was also intended to aid in defense conversion—aiding the Russians in converting portions of their defense industry to civilian operations. At the same time, SDIO renamed the program the TOPAZ International Program (TIP).

On October 1, 1995, the program was transferred to the Defense Nuclear Agency (DNA). By this time, the initial testing and evaluation project had concluded. The two TOPAZ II reactors acquired under a 1992 SDIO procurement contract for \$13 million had been resold for \$10,000 to the U.S. contractor that had brokered the sale and were returned to Russia. The four remaining reactors, purchased under a 1993 procurement contract for \$21.5 million, were reacquired by the same U.S. contractor for \$17,000 in 1997 and were also shipped back to Russia. However, in the end, only \$7.7 million of the \$21.5 million was actually paid on this contract. During the course of our investigation and a review by the DNA Inspector General, the remainder of the contract was cancelled. A termination settlement agreement was then negotiated, resulting in an increase of \$1.7 million—for a total of about \$9.4 million—in full settlement of the contract.

The Congress further reduced funding for the TOPAZ II program for fiscal years 1997-1999. The program was terminated on March 19, 1997; total program costs exceed \$100 million.

INVESTIGATIVE FINDINGS

The TOPAZ II program was unable to achieve either its original goal of technology transfer or the later goal of defense conversion. Achievement of the technology transfer goal was inhibited in large part by concerns over the Russians' unwillingness to allow full access to the TOPAZ II technology, while the defense conversion goal was impeded by the lack of a process for monitoring whether the funds expended were actually being used in the defense conversion effort. In addition to these problems, we identified an Antideficiency Act violation and a procedural violation of the Competition in Contracting Act (CICA).

Technology Transfer

In 1993, officials at the Department of Energy (DOE) and the U.S. Air Force Phillips Laboratory, who were working with SDIO on the TOPAZ II program, raised concerns to SDIO program officials that the Russians would not provide

them full access to the TOPAZ II technology. Specifically, the Russians had asserted that much of the important TOPAZ II data was either proprietary (requiring licensing) or trade secrets (unavailable). DOE and Phillips Laboratory officials were concerned that these assertions would seriously hinder U.S. industry's ability to take advantage of this technology. Although technology transfer was the initial goal of the program, SDIO program officials were unable to resolve these concerns.

Defense Conversion

In the meantime, by 1993 SDIO had restructured the program and added the program goal of defense conversion, claiming in August 1994 that funds from the TOPAZ II program were being used to successfully employ approximately 800 nuclear scientists and engineers at Russian institutes in nondefense work. However, neither SDIO nor its successor, BMDO, was able to support these claims. Further, neither organization developed a process by which to monitor whether the goal of defense conversion was being achieved.

After the program was transferred to DNA in October 1995, DNA asked the Russian institutes for a list of projects and expenditures for 1993 through 1995 that could be used to demonstrate that the moneys were being spent on defense conversion. The Russians estimated their total expenditures for defense conversion to be about \$586,000 of the \$7 million that had been paid for TOPAZ II technology during the time that defense conversion had been a goal of the program. In short, the Russians were able to provide no evidence that much of the money spent on the program was actually being used to achieve the goal of defense conversion.

Antideficiency Act Violation

SDIO violated the Antideficiency Act, 31 U.S.C. section 1341(a), in fiscal year 1993 when it did not obligate the total contract price for the purchase of the four TOPAZ II reactors. Specifically, SDIO obligated only about \$3.5 million and bound the U.S. government to a \$21.5-million contract—to be paid over 5 years from then current and future fiscal year funds—to purchase the four reactors and supporting documentation. Structuring the payments to include funds from future year appropriations violated the Antideficiency Act. This letter contains a recommendation aimed at determining the availability of about \$5.9 million in unobligated fiscal year 1993 funds that would allow BMDO to make appropriate adjustments to its accounts. If the funds are not available, BMDO must notify the Office of Management and Budget and the Congress that it violated the Antideficiency Act (31 U.S.C. section 1351).

Contracting Impropriety

Phillips Laboratory officials were not in compliance with the statutory requirements of CICA in 10 U.S.C. section 2304(f)(1) in awarding a facilities contract in support of the TOPAZ II program. This contracting impropriety occurred when Phillips Laboratory awarded a sole-source contract to the New Mexico Engineering Research Institute (NMERI) for test facilities and technical support services, without justifying the need for the award (10 U.S.C. section 2304(f)(1)(A)) and without obtaining the appropriate approval for such an award (10 U.S.C. section 2304(f)(1)(B)). We have provided this information to the Defense Criminal Investigative Service and the Air Force Inspector General.

RECOMMENDATION TO THE SECRETARY OF DEFENSE

We recommend that the Secretary of Defense ensure that BMDO audits its fiscal year 1993 funds to determine if unobligated funds are available to cover the \$5.9 million difference between \$9.4 million (the contract's total price) and \$3.5 million (the amount obligated and expended from fiscal year 1993 funds). If funds in that amount are not available, the Secretary should ensure that BMDO notifies the Office of Management and Budget and the Congress that it violated the Antideficiency Act.

AGENCY COMMENTS AND OUR EVALUATION

The Department of Defense (DOD) provided comments on a draft of this report expressing its disagreement with our report's findings concerning the achievement of TOPAZ II's goals, the Antideficiency Act violation, and the contracting impropriety.

Concerning our discussion of the program's goals, DOD contended that proprietary data/trade secret limitations did not impede technology transfer. This conflicts dramatically with documented statements from DOE and Air Force officials in the TOPAZ II program and test and evaluation project officials. One DOE manager called the proprietary data issue "a show-stopper" with regard to full competition for U.S. industry. The test and evaluation project manager stated that, by 1995, INERTEK's proprietary data/trade secret assertions were "killing the program."

In addition, DOD contended that (1) defense conversion was not a main purpose of the second technology acquisition (for four reactors) and (2) an August 1994 citation of 800 Russians working in defense conversion did not relate to this acquisition. However, this also conflicts with documentary evidence. Such documents include the 1993 Secretary of Defense approval of the second acquisition and a 1995 memorandum from the Assistant to the Secretary of Defense to the Director, DNA. Both documents identified defense conversion

and technology transfer as primary program objectives. Further, the August 1994 document entitled "TOPAZ International Program Overview" noted that "[w]ithin Russia, [TIP] funds are being used to employ approximately 800 nuclear scientists and engineers" and that a "significant portion of the TIP funds in Russia are financing the conversion of these institutes to commercial production enterprises." (Emphasis provided.) Furthermore, payments under the second procurement contract had been made to the contractor/INERTEK by August 1994. BMDO's claims in the document thus appear to include moneys paid under both contracts.

DOD also presented an exhaustive analysis to support its contention that the contract requirements establish that the agency did not violate the Antideficiency Act. None of the reasons presented altered our interpretation of the contract. The contract essentially constituted a nonseverable, or complete, undertaking: the delivery of the reactors, peripheral equipment, and documentation represents the primary performance requirement; and delivery of minimal engineering services to ensure successful testing represents ancillary performance requirements. Thus, BMDO could not fund the contract incrementally. As a result, we have retained our recommendation that the Secretary of Defense take action to resolve this issue.

Finally, DOD did not agree that the sole-source award of the facilities and support services contract by Phillips Laboratory was improper but was unable to comment further because of an ongoing criminal investigation by the Defense Criminal Investigative Service. As indicated above, we have provided the information we developed on this issue to the Defense Criminal Investigative Service and the Air Force Office of Special Investigations for their consideration.

OBJECTIVES, SCOPE, AND METHODOLOGY

Allegations of mismanagement and contracting improprieties in the TOPAZ II program arose in the summer of 1995, following a counterintelligence investigation by the Air Force Office of Special Investigations and the Federal Bureau of Investigation. We conducted a preliminary investigation of these issues in August 1995, focusing on the facilities and support contract. We subsequently briefed your office—and those of the Senate Committees on Appropriations and Budget and the House Committee on National Security—on the results. You requested that we continue our investigation. We then focused our efforts on SDIO's and BMDO's acquisition, contracting, and funding practices on the TOPAZ II program from 1990 through 1995.

During the course of this review, we interviewed current and former program and contract officials, as well as contractor and subcontractor personnel. We also reviewed program, contract, and funding documents at BMDO, DNA, Phillips Laboratory, NMERI, and International Science Products, Inc.

As agreed with your office, we coordinated and shared information concerning our investigation with the Air Force Office of Special Investigations and the Defense Criminal Investigative Service. Several issues regarding the TOPAZ II program are currently under review or investigation by these entities. We have also coordinated with DOD, Defense Special Weapons Agency (formerly DNA), and Air Force Inspectors General.

As arranged with your office, unless you announce its contents earlier, we plan no further distribution of this letter until 30 days after the date of this letter. At that time, we will send copies of this letter to interested congressional committees, the Secretaries of the Departments of Defense and Energy, the Secretary of the Air Force, the Director of BMDO, and the Director of the Defense Special Weapons Agency. If you have questions concerning these issues, please contact me, or Deputy Director Donald J. Wheeler of my staff, at (202) 512-6722.

Sincerely yours,



Eljay B. Bowron
Assistant Comptroller General
for Special Investigations

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