

April 10, 2002

The Honorable Richard C. Shelby
Ranking Member
Committee on Appropriations
Subcommittee on Transportation
United States Senate
Washington, DC 20510

Dear Senator Shelby:

In response to your request, we reviewed the Federal Aviation Administration's (FAA) Advanced Technologies and Oceanic Procedures (ATOP) procurement strategy. You expressed concern about the procurement strategy and timeliness for delivering new oceanic systems and whether FAA is seeking competition for procurements in the air traffic control environment (terminal, en route, and tower). As part of our review of the ATOP procurement strategy, you requested that we talk with all parties that submitted proposals, including the Canadian air traffic control corporation (NAV Canada). We periodically met with members of your staff to discuss this matter.

FAA has initiated a number of past efforts to modernize its oceanic facilities, with little success. Since 1995, FAA has spent over \$233 million on oceanic automation efforts. Despite numerous advances in computer and communications technology, FAA's air traffic controllers primarily use a manual system to track oceanic air traffic and estimate aircraft locations. This labor-intensive process requires controllers to maintain larger than necessary separation between aircraft because of the lack of real-time information on aircraft locations.

In September 1999, Congress directed FAA to procure a new oceanic system. In accordance with its acquisition policy, FAA solicited vendor proposals and conducted a competition for a new oceanic system. The competition included three vendor systems and relied extensively on air traffic controller and maintenance technician evaluations. In June 2001, FAA completed the competition and awarded Lockheed Martin a \$217 million fixed price contract to deliver new oceanic systems in Anchorage, New York, and Oakland. The contract states that the first site, Oakland, is scheduled for operations by April 2003.

Initially, NAV Canada expressed interest in competing for the ATOP contract with its Gander Automated Air Traffic System (GAATS). However, in March 2000, NAV Canada elected not to compete, stating that it did not have the time or resources to simultaneously prepare for FAA's evaluation of vendor systems, held in April 2000, and complete the effort needed to have GAATS operational in the North Atlantic. Subsequently, NAV Canada deployed GAATS at Canada's Gander oceanic facility on February 23, 2002.

In a May 2001 letter, 1 month before the ATOP contract award, NAV Canada offered GAATS to FAA as a low-cost oceanic air traffic management system. FAA declined the offer, stating that the vendor selection process had been completed. In addition, NAV Canada's cost estimates did not provide an adequate basis for FAA to determine whether GAATS was competitive with the selected system. FAA noted that NAV Canada's cost estimates did not include all associated procurement costs (such as maintenance, training, and spare parts) and the cost proposal provided only summary cost figures that lacked sufficient details for an analysis.

During our visit to NAV Canada in October 2001, we observed that GAATS did meet most of the core capabilities required by FAA, but changes would be required that could have a cost and schedule impact on ATOP. For example, GAATS does not meet FAA's requirement for radar data processing, which processes data received from primary radars and displays the position of aircraft on the controller's screen. NAV Canada officials suggested that they could satisfy FAA's radar data processing requirement by integrating GAATS with FAA's radar data processing, but NAV Canada did not provide any cost, schedule, and technical data on how to satisfy FAA's requirement.

Other unknown factors with the NAV Canada system include the extent of modifications required for human factors and the amount of software development needed to interface GAATS with other FAA systems. Both of these factors have been problematic for the agency in other procurements.

ATOP Contract: Lockheed Martin Faces Challenges Completing Software Development and Meeting New Security Requirements. Lockheed Martin already faces significant challenges completing complex software development and meeting new security requirements that could delay the delivery schedule. The new oceanic system will require about 105,000 new software lines of code, which includes a 35 percent growth because the contractor underestimated the software coding needed to meet FAA requirements. Since the ATOP contract is a fixed price contract, the software code growth has no cost impact as long as FAA continues to keep the requirements stable and makes no changes to the scope of the contract.

A key concern is that about 45 percent (47,250 lines) of the software coding is subcontracted to a Canadian software engineering company (Adacel). This is significant because Adacel is responsible for the most complex software development tasks, and ATOP is the largest project Adacel has ever undertaken. Thus far, this software delivery schedule has been delayed up to 4 months. Lockheed Martin has authorized the subcontractor to add four staff members to the project and does not believe this delay will impact the oceanic system delivery schedule. FAA and Lockheed Martin must continue to closely monitor the software development effort to meet the April 2003 system delivery schedule.

An additional concern is that new security requirements could delay the ATOP delivery schedule. A recent change to FAA acquisition policy mandates that new and existing contracts require foreign nationals working on National Airspace System programs to have lived in the United States for at least 3 consecutive years over a 5-year period. This change was made because a proper background check on contractor employees cannot be performed without at least 3 years of information on an individual.

Although this new security requirement went into acquisition policy on October 1, 2001, FAA has allowed foreign nationals to continue work on the ATOP program pending the decision on a waiver requested by ATOP officials. Allowing foreign nationals to continue work on the ATOP program is essentially a de facto waiver from the security requirement. This is significant to the ATOP program because Lockheed Martin subcontractors employ 40 team members who reside in Canada, New Zealand, and the United Kingdom. We are recommending that the Administrator take immediate steps to decide whether or not to provide the ATOP program a waiver from the security requirement that foreign nationals must have lived in the United States for at least 3 consecutive years over a 5-year period.

Competition in Other Air Traffic Control Contracts: FAA Is Noncompetitively Awarding Large Air Traffic Control Contracts Without Completing an Investment Analysis. In addition to a review of ATOP, we performed a limited review of FAA's procurement in the air traffic control environment (terminal, en route, and tower). We found that since 1996, FAA *noncompetitively* awarded six of nine large air traffic control contracts. These six contracts are valued at over \$1.25 billion, and are for replacement, sustainment, or enhancement of air traffic control systems at terminal and en route centers. Our review found that in five of the six noncompetitive contracts, FAA did not complete an investment analysis before making the single source award. An investment analysis is required by FAA acquisition policy to ensure that all potential competitive solutions and vendors are considered to satisfy a mission need. Without this analysis, FAA cannot determine the best value to the Government and to the taxpayers.

Most recently, FAA intended to award a single source contract for the En Route Automation Modernization contract without completing an investment analysis. However, as a result of a vendor protest, a General Services Administration judge concluded that FAA did not follow the intent of FAA acquisition policy to conduct the investment analysis and could not justify making a single source contract award. The En Route Automation Modernization program has been set back over 1 year while FAA completes an investment analysis and competitively awards the contract. In future contract awards, FAA needs to ensure that it evaluates other potential vendor solutions before deciding to use a single source contract award.

The following paragraphs provide additional details on the results of our review.

Results

FAA Initiated a Number of Past Efforts to Modernize Oceanic Facilities With Little Success But Has a New Strategy to Procure Oceanic Systems

The United States is responsible for providing air traffic control services for over 22 million square miles of the Atlantic and Pacific Oceans. Despite numerous advances in computer and communications technology, FAA's air traffic controllers primarily use a manual system to track oceanic air traffic and estimate aircraft locations. This labor-intensive process requires controllers to maintain larger than necessary separation between aircraft because of the lack of real-time information on aircraft locations.

FAA has initiated a number of efforts to modernize its oceanic facilities, with little success. Over the past 7 years, FAA spent over \$233 million on oceanic automation efforts, yet FAA still does not have a new oceanic system. In 1995, FAA awarded a multi-year contract for an Advanced Oceanic Automation System. However, in 1998, due to funding limitations and poor contractor performance, the contract scope was significantly reduced to deliver only the oceanic data link portion of the system.

In 1999, FAA developed a new strategy to obtain a lease for oceanic services. Under this strategy, FAA planned to contract with a service provider to install and maintain an integrated oceanic air traffic system. However, after much debate, in fiscal year 2000, Congress directed FAA to purchase an oceanic system rather than lease oceanic services.

In June 2001, FAA competitively awarded a fixed price contract to Lockheed Martin to acquire an oceanic system (ATOP). FAA selected Lockheed Martin following a complex selection process, including FAA air traffic controller and maintenance technician evaluations of three vendor systems, to address the lack of user involvement in the procurement process that has been problematic for FAA in other procurements.

FAA intends to install new oceanic air traffic systems at all three oceanic facilities, located in Anchorage, New York, and Oakland. The new systems will collect, manage, and display oceanic air traffic data, including electronic flight-strip data. This will replace the labor-intensive paper flight strips and plastic plot graphs that controllers currently use to track oceanic air traffic.

FAA also intends to integrate capabilities such as flight data processing, automatic dependent surveillance, controller-pilot data link, and conflict probe into the system. These capabilities are expected to provide controllers with more precise aircraft locations and allow them to direct aircraft to routes that are more favorable for weather and wind conditions, which would result in significant fuel savings for the airlines. The first system is scheduled to be operational at the Oakland oceanic facility in April 2003.

FAA Faces Challenges in Deploying the New Oceanic System on Schedule

FAA faces challenges in completing complex software development and complying with a new security requirement for foreign nationals working on National Airspace System programs. The bulk of work to meet these challenges still lies ahead, which is a significant risk to deploying the new oceanic system on time.

Software Development. The Lockheed Martin system is considered a non-developmental acquisition, with an estimated 758,000 lines of complex computer code. Approximately 82 percent of the code (623,000 lines) had been developed before the ATOP competition, and another 4 percent (30,000 lines) was developed during the competition. The remaining 14 percent of code (105,000 lines) will be developed and tested under the terms of the contract.

A key concern is that about 47,250 lines of the software code will be developed by Adacel, a software engineering subcontractor located in Montreal, Canada. This is significant because Adacel is responsible for the most complex software development tasks, and ATOP is the largest project Adacel has ever undertaken. This is also Adacel's first project with Lockheed Martin. Adacel's work includes

the majority of the new software development to support the flight data processor and the conflict probe, which are used to track the movement of aircraft and ensure that all aircraft meet FAA's aircraft separation standards.

When the contract was awarded in June 2001, Lockheed Martin expected to develop 78,000 lines of code; however, the estimated software coding has increased by 35 percent (27,000 lines), primarily because Lockheed Martin and Adacel underestimated the software development effort needed to meet FAA requirements. Lockheed Martin has identified up to a 4-month delay in the software delivery schedule, but does not believe this delay will impact the oceanic system delivery schedule. Lockheed Martin has authorized Adacel to add four staff members to the project and is developing plans to keep the ATOP delivery schedule on track.

In our opinion, Lockheed Martin faces significant challenges in meeting the April 2003 operations date for the Oakland facility, given the early delays in the software development and that much of the software coding remains to be completed. We note that the FY 2001 Senate appropriation report suggests that FAA consider any unsolicited proposal that promises a cost-effective alternative system if the ATOP program incurs schedule delays. In order to avoid schedule delays that would affect the delivery date, FAA and Lockheed Martin must continue to carefully monitor the software development and keep the contract requirements stable. The key now lies in effective execution by Lockheed Martin.

Security. New security requirements pose an additional risk to the ATOP program and could delay the system delivery schedule. As of October 1, 2001, FAA acquisition policy mandates that new and existing contracts require foreign nationals working on National Airspace System programs to have lived in the United States for at least 3 consecutive years over a 5-year period. This change was made because a proper background check on contractor employees cannot be performed without at least 3 years of information on an individual.

ATOP officials requested a waiver from FAA's Office of Civil Aviation Security Policy and Planning; however, the waiver process for this new security requirement is not yet in place. Foreign nationals are continuing work on the ATOP program pending the decision on a waiver. This is significant to the ATOP program because Lockheed Martin subcontractors employ 40 team members who reside in Canada, New Zealand, and the United Kingdom. These employees do not meet FAA's new security requirement. We are recommending that the Administrator take immediate steps to decide whether or not to provide the ATOP program a waiver from the security requirement that foreign nationals must have lived in the United States for at least 3 consecutive years over a 5-year period.

FAA Is Noncompetitively Awarding Large Contracts Without Completing an Investment Analysis

In addition to a review of ATOP, we performed a limited review of FAA's procurements in the air traffic control environment (terminal, en route, and tower). We found that since 1996, FAA *noncompetitively* awarded six of nine large air traffic control contracts.¹ These six contract awards are valued at over \$1.25 billion, and are for replacement, sustainment, or enhancement of air traffic control systems at terminal and en route centers but exclude communication, navigation, surveillance, and weather systems. Our review found that in five of these six noncompetitive contracts, FAA did not complete the important investment analysis before making the single source contract award. The investment analysis is an important step in FAA's Acquisition Management System (AMS)² process because it identifies and analyzes potential competitive solutions and vendors to satisfy a mission need. Without this analysis, FAA cannot determine the best value to the Government and to the taxpayers.

Recently, FAA planned single source contract awards for two major en route programs, the En Route Communications Gateway and the En Route Automation Modernization programs, without conducting market surveys and investment analyses recommended by the AMS. For investments of this size, in order to ensure that FAA is achieving the best value to the Government, FAA should conduct a thorough market survey and investment analysis as a precondition to awarding a single source contract. Following this process could well save time and money in the long run and is more consistent with the business approach of a performance-based organization.

FAA Awarded a \$125 Million Noncompetitive Contract to Develop the En Route Communications Gateway Program Without Completing an Investment Analysis. The En Route Communications Gateway program is intended to replace the hardware and software that delivers flight plan and radar data to FAA's air traffic control system. On May 15, 2001, FAA waived the requirement to perform an investment analysis and awarded the contract noncompetitively on June 1, 2001. In the waiver decision, FAA stated that a market survey, completed almost

¹ Our sample included contracts exceeding \$50 million each. The six noncompetitive contracts are for the Maintenance Display Monitors Standard Terminal Automation Replacement System, Automated Radar Terminal System Sustainment, the Host Oceanic Computer System Replacement, the User Request Evaluation Tool, En Route Software Development and Support III, and the En Route Communications Gateway. The three competitive contracts are for the Standard Terminal Automation Replacement System, Controller-Pilot Data Link Communications, and ATOP.

² The Acquisition Management System establishes policy and guidance for all aspects of the acquisition lifecycle and is intended to integrate the elements of lifecycle acquisition management into an efficient and effective system that increases the quality, reduces the time, and decreases the cost of delivering needed services.

2 years earlier, in July 1999, indicated there were no other options associated with the acquisition. (A market survey is intended to identify potential vendors who can provide solutions to the mission need.)

Our review of the 1999 market survey found that six vendors were interested in competing for the contract. However, without fully evaluating these vendors' proposals in an investment analysis, FAA awarded a single source contract citing a lack of clearly defined requirements and the time constraints caused by the approaching end-of-service life of the existing system. In our opinion, FAA had ample time in the 2 years between the market survey and the contract award to complete an investment analysis and fully evaluate whether the En Route Communications Gateway contract could be competed.

FAA Attempted to Award a Single Source Contract for the En Route Automation Modernization Program Without Conducting an Adequate Investment Analysis. The En Route Automation Modernization program is needed to replace the current air traffic control computer system, called the Host computer, before its estimated end-of-service life in 2008. FAA anticipates that it will take approximately 7 years for a contractor to develop the new system, and, in February 2001, FAA announced its intention to award a single source contract to develop the new system.

In March 2001, Raytheon filed a protest that objected to FAA's intention to award a single source contract for this program. In June 2001, a General Services Administration judge upheld the protest and, in his decision, concluded that FAA did not follow the intent of AMS to conduct the market survey and investment analysis. FAA is now completing the AMS-recommended market survey and investment analysis to determine which offerors provide the best value to the Government.

FAA issued the final screening information request on March 15, 2002, more than a year after announcing its initial intention to award a single source contract. By not completing market and investment analyses in early 2001 to identify all potential vendors, FAA has lost over 1 year in awarding the En Route Automation Modernization contract. This delay is significant given the current Host computers' end-of-service life in 2008 and FAA's estimate that it will take 7 years to develop a new system.

Key Actions Need To Be Taken

At this juncture, the following actions need attention.

- First, with regard to the ATOP contract, Lockheed Martin must complete the software development effort on time in order to meet the ATOP delivery schedule. Thus far, FAA has taken reasonable steps to keep the program on schedule; therefore, we are not making any recommendations at this time. We will continue to closely monitor FAA and Lockheed Martin's efforts to manage software development and keep contract requirements stable.
- Second, to address FAA security requirements for foreign nationals working on National Airspace System programs, we are recommending that the Administrator take immediate steps to decide whether or not to provide the ATOP program a waiver from the security requirement that foreign nationals must have lived in the United States for at least 3 consecutive years over a 5-year period. We take no position on whether a waiver should be granted for this contract, but FAA needs to move out now on making this decision.
- Finally, FAA clearly needs to make a better effort to follow the intent of its own acquisition policy and conduct market surveys and investment analyses as a precondition to awarding single source contracts. We are deferring any recommendations at this time, pending FAA's future efforts to complete market surveys and investment analyses before awarding single source contracts. We will continue to monitor FAA's efforts to complete all analyses recommended by AMS in future high dollar contract awards.

We are forwarding a copy of this letter to the Federal Aviation Administrator. I would be glad to discuss these issues at your convenience. Please feel free to call me on (202) 366-1959 or my Deputy, Todd J. Zinser, on (202) 366-6767.

Sincerely,



Kenneth M. Mead
Inspector General

cc: Federal Aviation Administrator