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FAA Encountering Problems in Acquiring Major Automated Systems

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Before the Subcommittee on Transportation
and Related Agencies,
Committee on Appropriations,
House of Representatives

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Mr. Chairman and Members of the Subcommittee:

We are pleased to be here to discuss the Federal Aviation Administration's (FAA) efforts to modernize and upgrade its automated systems. During the past year our reviews of a major planned general-purpose procurement and two air traffic control modernization projects have uncovered consistent fundamental weaknesses in FAA's acquisition of major automated systems. These weaknesses could result in unjustified and costly procurements, further delays in delivering important components for the air traffic control modernization effort, and increased risk that existing air traffic control systems will be stressed beyond their capacities.

FAA's Computer Resources Nucleus (CORN) project is one example of an inadequately justified general-purpose procurement. With CORN, FAA intends to have a contractor provide and operate computer facilities for the agency's general-purpose data-processing functions such as payroll, personnel, and aviation safety information systems for the next 10 years. The total estimated cost for the 10 years is about $1.5 billion, a tenfold increase since the project was first proposed in 1986. FAA anticipates that the CORN contract will be awarded within the next few months.

While FAA's concept to contract out its general-purpose functions may be acceptable, the CORN procurement is not adequately justified and therefore, we are recommending in a draft report that it not be awarded.

FAA has identified a number of reasons to justify procuring CORN. One is insufficient computer capacity causing poor response times in the current system. However, project officials could not support this assertion, primarily because FAA does not perform needed capacity management and planning that would provide data on computer capacity and explain why users are apparently experiencing slow response times. Our own analysis of the limited data available does not show evidence of insufficient computer capacity causing poor response times. Other problems may be the source of the perceived poor response times, such as inefficient software or communications, which are not subject to change under CORN. This means that after investing hundreds of millions of dollars in procuring more computer capacity through CORN, FAA may still end up with poor response times.

A second reason for procuring CORN is FAA's claim that its general-purpose data-processing needs will increase by 30 percent each year for 10 years, ultimately requiring a system about 1300 percent larger than the current one. This is equivalent to saying that in 10 years a system will be needed that can produce about 15 million printed pages per day, 365 days per year. This projection is based

on sparse data with little identification of what dramatic changes will occur in FAA's missions to warrant this steep growth in later years.

Other major unresolved problems and uncertainties could increase the cost of CORN. In particular, FAA's method for validating bidders' proposed solutions is deficient because information that FAA provided to vendors to aid them in developing their proposals was incomplete. Further, the extremely small sample work load that FAA developed for validating proposals is unrepresentative of the agency's total work load. This flawed methodology will not provide adequate data for accurately evaluating vendors' proposals and their proposed charges for data-processing services. This deficiency could have cost ramifications throughout the life of the contract.

FAA's cost estimate of $74.5 million for converting current applications to CORN is unreliable. FAA estimates the cost to convert the 15 million lines of existing software at about $5 to $6 per line of code, while industry estimates are usually $15 to $20 per line of code or higher. Also, since generating the cost estimate, FAA has increased the amount of conversion work to be performed by the contractor and has doubled the amount of time needed to do this without correspondingly increasing the cost estimate. The estimate is based on unvalidated assumptions about

the availability of FAA staff to assist the contractor in the conversion.

In addition, CORN will not improve the quality of information. Under CORN, the contractor will be required only to move current applications and data bases to the new system. The contractor will not be required to enhance the applications, improve their performance, or eliminate existing deficiencies. Therefore, existing problems with FAA's applications and data bases would simply be transferred to CORN, at considerable expense.

In summary, while the CORN approach may have merit, FAA's justification and planning for this effort has been inadequate. Before it spends hundreds of millions of dollars to move to a new system that neither guarantees a remedy for existing deficiencies nor improves current information, FAA should first identify the causes of perceived problems with current system performance.

Mode Select, or Mode S, is another project where lack of adequate management oversight and action has resulted in the delayed delivery of important air traffic control system components. Mode S is an air traffic control surveillance and communication system that is being developed to provide more accurate aircraft location information by replacing some existing radars, and to allow controllers and pilots to exchange data, such as weather information. Fifteen years after initiating the Mode S concept,

FAA awarded a production contract in 1984 to a Westinghouse and UNISYS joint venture to buy 137 Mode S systems at an original estimated cost of $221 million. In 1988, before any of the 137 systems had been successfully produced, FAA decided to purchase 259 more Mode S systems, with contract award scheduled for late 1992. FAA estimates that the total cost of deploying all 396 systems will be $1.7 billion.

Over 5 years after FAA awarded the contract for the initial 137 systems, the agency has spent about $145 million of the $271-million contract ceiling price without receiving the first system. Delivery of the first fully capable Mode S system is now scheduled for April 1993, 5 years later than originally planned. This occurred because FAA used a high-risk acquisition strategy and did not remedy contract problems when they arose. In acquiring Mode S, FAA did not adequately develop or test the system before awarding the production contract, which contributed to later technical problems. Further, although officials knew of these problems as early as February 1987, FAA did not act to correct them until June 1989, when it warned the contractor that if contract deficiencies were not resolved, the contract might be terminated.

Since June 1989, FAA and the contractor have been unable to agree on an approach to overcome the contract problems. Recently, additional delays occurred and the contracting officer stopped paying the contractor until progress is made. These continuing

problems make it uncertain whether FAA's approach--to negotiate additional contract changes--is the most effective way to deal with this situation. Therefore, we believe the Secretary of Transportation should conduct an independent evaluation of the economic, operational, and technical risks involved in completing the Mode S contract that considers all alternatives available to the government--including terminating the contract in whole or in part.

Even though Mode S still does not work, FAA has decided to spend over a billion dollars to buy 259 more of the systems. This decision is unjustified. In making this decision, FAA did not properly analyze requirements, did not adequately consider alternatives, and did not evaluate benefits and costs. We therefore are recommending in a draft report that the Secretary of Transportation direct the FAA Administrator to cancel plans for buying the additional 259 Mode S systems and to perform a thorough analysis of requirements, alternatives, benefits, and costs.

The Advanced Automation System, or AAS, is yet another project where FAA is encountering delays in the delivery of critical components for the air traffic control modernization effort. These delays have the potential for affecting FAA's ability to handle safely the predicted increases in air traffic into the next century.

AAS is scheduled to replace aging air traffic control computer systems with new hardware, software, and controller workstations. Improvements are expected to result primarily from (1) the use of modern equipment and (2) the development of new software functions intended to automate some controller functions and allow more aircraft to fly user-preferred, fuel-efficient routes. FAA awarded competitive contracts to design AAS to International Business Machines (IBM) Corporation and Hughes Aircraft Company in 1984. During this design competition phase, new requirements were added, contract costs doubled, and the schedule was delayed a year. In 1988, FAA awarded a contract to IBM to complete the design and production of AAS. The cost of AAS is estimated at over $5 billion, making it the most expensive program in the National Airspace System Plan.

Less than a year after the contractor began work on the contract, FAA and IBM jointly identified a 13-month delay in the scheduled delivery of the first major segment of three project increments, called the Initial Sector Suite System. The primary causes of this delay were an overly ambitious software development schedule and FAA's and the contractor's inability to resolve key requirements issues. Although FAA's required schedule appeared unrealistic, IBM agreed to it. In addition, FAA did not adequately define some requirements, and IBM did not thoroughly analyze other requirements. At present, some requirements issues are still unresolved, which will likely lead to even further delays.

As a consequence of the delay in the first segment, the potential exists that later phases of AAS to upgrade terminal automation systems will also be delayed. This increases the likelihood that FAA will be forced to operate its current aging systems through the 1990s and further delay benefits. As we reported last year, many of these current systems have experienced capacity shortfalls.[1] Indeed, almost 70 percent of the large, busy terminal radar approach control facilities, known as TRACONs, reported to us that they had experienced aircraft information disappearing from controllers' screens, flickering displays, or delayed computer responses to controllers' attempts to update or request data. These overload problems threaten the ability of controllers to maintain safe separation of aircraft.

To address this dilemma, last year we recommended that the Secretary of Transportation direct FAA to institute a computer capacity and performance management program to monitor work loads and system utilization in all facilities, and investigate alternatives for meeting the larger TRACONs' air traffic control requirements for at least the next 10 years. Since our report, FAA has initiated some steps to remedy immediate capacity deficiencies.

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[1]Air Traffic Control: Computer Capacity Shortfalls May Impair Flight Safety (GAO/IMTEC-89-63, July 6, 1989).

However, regarding the need to explore alternatives, the Department of Transportation believed that FAA had already developed an appropriate interim solution in 1987 to meet TRACON requirements for the next 10 years. This interim solution is not encouraging. It calls for increasing the capacity of the present systems in larger TRACONs by pursuing sole-source contracts to expand current system configurations to their maximum design limits. This expansion will require FAA to buy 1960s-vintage computers similar to existing processors. These antiquated processors have less processing capability than a desktop computer that can be purchased in a local store.

Given the potential further delay in AAS and the clear inadequacies of the existing computer systems in large TRACONs, FAA is assuming the risk that its systems will not be able to handle the increasing air traffic of the 1990s. To prevent this potential threat to air traffic safety and reduce the possible need to take drastic actions in the future, such as limiting the number of aircraft, we reiterate our recommendation that FAA immediately identify other alternatives for meeting the larger TRACONs' air traffic control requirements through the 1990s.

In summary, Mr. Chairman, FAA's acquisition management suffers from fundamental weaknesses that have resulted in expensive, inadequately justified procurements, continued delays in the development and delivery of important elements of air traffic

control modernization, and increased risk that some existing air traffic control systems will be stressed beyond their capacities. Implementation of the National Airspace System Plan is a formidable task. To develop and acquire so many large, complex systems would challenge the abilities of any organization.

To do the best job possible, FAA must elevate the importance of acquisition management within the agency. It must improve its acquisition management and ensure that acquisition has the visibility and involvement of top management within the organization. We understand that FAA has recently instituted a reorganization to give acquisition increased emphasis. This is a positive beginning. However, reorganization must be accompanied by adequate program management policies and practices. Until FAA gets its acquisition house in order and breaks the trend of unjustified, costly, and delayed procurements, the American public cannot be assured that its money is being well spent and that its air safety is ensured.

Mr. Chairman, this concludes my prepared remarks. I will be pleased to answer any questions you or other members of the Subcommittee may have at this time.