GAO

Testimony

For Release
on Delivery
Expected at
10 A.M. EST
Tuesday
April 12, 1988

FAA Appropriation Issues

Statement of
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Before the
Subcommittee on Transportation of the
House Committee on Appropriations

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GAO/T-RCED-88-35

Mr. Chairman and Members of the Subcommittee:

We appreciate the opportunity to comment on Federal Aviation Administration (FAA) appropriation issues. Over the past few years, our work has focused on how well FAA is ensuring aviation safety and the agency's efforts to modernize air traffic control (ATC) through the National Airspace System (NAS) Plan. The concerns we expressed to this subcommittee last year focused on FAA's schedule delays in developing major NAS systems. This year, many NAS Plan systems have entered a critical phase in which contractors are delivering equipment to FAA field sites. Accordingly, a major challenge facing FAA today is the integration and deployment of numerous NAS systems within budget and according to realistic schedules while also hiring adequate staff for its controller and maintenance work forces.

Our testimony today will focus on four issues: (1) the status of key NAS Plan projects; (2) how much ATC modernization could ultimately cost; (3) field implementation of delivered equipment; and (4) how many controllers and maintenance technicians will be needed. Overall, our work indicates that the cost of ATC modernization will be considerably more than FAA's current $15.8 billion estimate and that corrective actions are needed if further schedule delays are to be avoided.

STATUS OF MAJOR NAS PLAN PROJECTS

Introduced in December 1981, the NAS Plan is the nation's largest civilian technology project since the Apollo project. Air traffic control computers, radars, communications, and facilities

are being modernized. Major benefits projected include the ability to safely handle traffic growth, reduced maintenance requirements, and enhanced air traffic controller productivity.

Six years into the NAS Plan, many contractual commitments have been made for NAS systems; however, of the 12 major NAS Plan systems,[1] only one--the Host computer--is nearing completion. The status of FAA's 12 major systems is included as attachment I.

Development of systems has proven to be more difficult, time-consuming and costly than FAA expected. A comparison of operational readiness dates listed in the 1983 plan and the 1987 plan shows major system schedule delays ranging from 1 to 5 years (see attachment II). Consequently, anticipated benefits are being deferred.

The magnitude and complexity of integrating all ATC system components became apparent shortly after the NAS Plan was published in 1981. In 1984, FAA selected Martin Marietta Corporation as its systems engineering and integration contractor (SEIC) to assist it in implementing the plan. As part of this assistance, the SEIC identified hundreds of incomplete or incorrect interfaces between systems. These problems were caused by FAA's initial design. As a result of the SEIC's work, corrective actions have been initiated or planned in the form of engineering changes and new projects.

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[1]The Department of Transportation, which has final acquisition authority for the NAS Plan, has designated 12 of the plan's projects as major systems because they either exceed $150 million or are critical components of the plan.

NAS PLAN COST WILL

EXCEED PREVIOUS ESTIMATES

FAA's estimate of $15.8 billion for the basic NAS Plan projects authorized by the Congress does not reflect all changes and projects needed to meet original NAS Plan goals and objectives. These changes and projects could raise modernization costs to about $24 billion by the year 2000.

Cost Increases to Original NAS Projects. The SEIC has identified about $2 billion in engineering changes and funding increases to existing NAS Plan projects.

Although all engineering changes were identified by FAA engineering review boards as needed to integrate various systems and to correct inadequacies in the current NAS Plan design, none are included in FAA's $15.8 billion estimate of NAS Plan costs. Of the $1 billion in engineering changes, about $260 million have already been approved by FAA for inclusion in future funding requests. According to the SEIC, valid engineering change requirements totaling about $740 million still require FAA funding approval.

The current $15.8 billion NAS Plan cost estimate also does not include a $1 billion "risk allowance," the purpose of which is to compensate for understated procurement costs. The SEIC views such understatements as likely to occur.

The NAS Program Director has asked the SEIC to develop proposals for cost reduction, or offsets, from existing NAS projects equal to the amount of these increases. Such reductions

are made possible by deferring activities or changing requirements. As of March 1988, $104 million had been identified as possible offsets from deleting projects, of which about $94 million has been approved. Therefore, if no additional offsets are found, basic NAS Plan costs could total $17.8 billion--not $15.8 billion.

Additional ATC Modernization Costs. FAA engineering review boards also identified new NAS projects and additional equipment needs that are classified as "other capital needs." These new projects and additional equipment needs did not appear in the original NAS Plan, so FAA has not included their costs in its $15.8 billion NAS Plan estimate. However, they are clearly part of the ATC modernization effort and, hence, have a direct link to NAS Plan goals and objectives. The SEIC estimates that these additional requirements will cost about $6.5 billion to implement. If FAA plans are not changed, NAS projects and additional equipment needs could cost about $24 billion by the year 2000.

Examples of such equipment requirements that have been approved by engineering review boards include additional airport surveillance radars, long-range radars, and advanced surveillance and communications equipment. Examples of new projects include $191 million for fuel storage tanks needed for emergency power generation and $2 billion to extend and continue NAS support activities, such as facility relocations, beyond 1992.

Impact of Increased Modernization Costs. The near term budget impact of these engineering changes and new projects could require funding requests that exceed current authorized levels.

Specifically, the Airways and Airport Capacity Act of 1987 provided for authorizations of about $2.2 billion for fiscal year 1990. According to the SEIC, implementing the additional approved engineering changes identified to date would exceed authorized facilities and equipment levels by $275 million in fiscal year 1990. Appropriations for facilities and equipment for fiscal years 1989 through 1992 would have to increase by about $2 billion over original estimates.

In our view, this suggests that now is an appropriate time for FAA to combine the "old NAS Plan" with "new" ATC modernization requirements, and to develop distinct project categories of required and funded, required and not funded, and deferrable. This analysis would permit the setting of priorities and the resulting funding schedule for the next 3 fiscal years and beyond. Currently, the cost distinction between NAS Plan and "other capital needs" clouds the issue of how much ATC modernization could cost and results in an incomplete picture of the magnitude of the modernization initiative.

REGIONAL IMPLEMENTATION PROBLEMS

COULD ADVERSELY AFFECT NAS PLAN SCHEDULE

Implementation of NAS Plan systems is underway. As more and more equipment is delivered to the field, the focus on meeting NAS Plan milestones is shifting from the project developers in headquarters to project implementors--FAA's nine regions. Regions have not been able to keep pace with system deliveries and needed facility design work has not been accomplished on time. The NAS

Plan schedule will be adversely affected if these problems are not resolved.

Site-specific Project Implementation Plans. Project implementation plans are generated by headquarters to provide guidance on the implementation of specific systems. However, because these plans are general in nature, they must be made substantially more detailed before they can be used by a specific facility. According to FAA field staff, the personnel and time needed to do this are often not adequately considered in headquarters schedules and resource estimates. For example, the Seattle air route traffic control center staff had to add substantial detail to the national Host computer project implementation plan provided by headquarters before completing its site-specific plan. According to a center official, the headquarters document provided no guidance as to how the system was to be implemented. The center was able to meet the commissioning deadline for the Host computer only because of a 6-month delay experienced by the contractor. This delay allowed the center staff enough time to develop and implement site preparation, installation, and testing procedures.

Regional Project Management Tools. Regions currently lack an integrated project and resource management tool. They use a national facilities and equipment reporting system supplemented by locally-developed automated programs to help schedule NAS implementation. However, these tools cannot calculate regional delivery dates, which are based on the installation work force

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available. A recent SEIC report indicated that, of 248 equipment deliveries scheduled by FAA headquarters between February 1988 and July 1988, 44 percent involved significant discrepancies between headquarters and regional schedules. While to the regions the delivery date is when they are ready to install the equipment, to FAA headquarters the date marks when the vendor will deliver equipment to the field. When the regions cannot install this equipment, it is stored either in the field or at the FAA Depot in Oklahoma City. For example, one region has been storing navigational-aid equipment for as long as 16 months because of insufficient staff.

FAA headquarters is aware of the need for a project management system in the regions. The SEIC is now developing such a system--the Regional Project Management System (RPMS)--the purpose of which is to provide a firmer foundation for determining installation resource requirements and installation schedules. However, according to responsible SEIC staff, there is no requirement for reconciling equipment delivery date differences between regions and headquarters. Resolution of this matter is needed before the RPMS can be implemented.

Unresolved Facility Design Work Responsibilities. The SEIC has a major responsibility in developing architect and engineering plans for FAA's ATC facilities. However, the scope and timing of its contributions are in dispute.

Facility design work must begin about 2 years before scheduled equipment deliveries so that facilities can be ready when

the equipment arrives. The SEIC's facility design subcontractor has not met milestones for site-specific design work at FAA's air route traffic control centers. A revised schedule to accomplish the work was unacceptable to FAA's structures program manager, and a default letter was drafted in February 1988 to notify the SEIC of non-delivery of scheduled work. Further, there is a dispute between FAA and the SEIC about the SEIC's responsibilities for doing site-specific design work at hundreds of other FAA facilities, such as airport towers and radar sites. FAA assigned the SEIC responsibility for site design at these facilities in 1987. However, SEIC officials believe that this work was beyond the scope of their responsibility. This design work will either have to be performed by the SEIC, another contractor, or FAA staff. In our opinion, resolution of this uncertainty is essential if further schedule delays are to be avoided.

Acquisition of Implementation Support. Several FAA regions attribute their delays in installing delivered equipment to insufficient installation personnel. Insufficient personnel was identified in an FAA survey conducted in January 1987. According to the survey, about 600 equipment deliveries to the field could not be installed without additional staff. Equipment deliveries did not let up in 1987; according to the Office of the Associate Administrator for Development and Logistics, project deliveries continued at the rate of more than 100 per month throughout 1987.

FAA plans to address regional staffing problems in implementing NAS systems with a technical support services contract

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(TSSC) to be awarded this summer. However, we found that the TSSC request for proposals makes provision for about 2,000 fewer staff years than FAA's resource estimating system indicates would be necessary. We believe it would be prudent for FAA to account for this staffing disparity before the TSSC is awarded. This is important because, in practical terms, either sufficient resources are applied to meet the current headquarters schedule or the schedule must be extended to account for work force constraints.

WORK FORCE ISSUES

In addition to NAS Plan cost and scheduling problems, FAA cannot say with confidence how many people it needs to operate the current ATC system or a modernized NAS. Since last year FAA has made progress in increasing its controller and maintenance staffing to a level of 13,300 controllers--including 9,030 full performance level (FPL) controllers--and 8,496 field maintenance employees, as of March 31, 1988.

Our work on FAA's rebuilding of the controller work force shows that while FAA has been increasing staffing since the 1981 strike, FAA has underestimated its controller requirements. In addition, FAA prematurely reduced its maintenance staffing anticipating productivity savings from new systems which are only beginning to reach the field.

Staffing Models. A key reason why FAA cannot confidently project its staffing requirements is that its internal staffing models are not reliable. FAA's controller staffing standards underestimate needs because, among other things, they do not

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provide sufficient staff to cover peak traffic periods and have not been validated. The agency is currently reexamining its standard for airport terminal staffing.

Although better designed than the controller staffing standards, FAA's maintenance staffing standard has not been used as the basis for FAA's budget requests. We reported in September 1987[2] that FAA prematurely reduced its maintenance staffing in anticipation of productivity benefits which did not occur because of delays in NAS Plan projects. For example, from 1984 until this year's budget request, FAA had requested reduced field maintenance staffing because modernized systems were expected to reduce work load. The fiscal year 1989 budget is a step in the right direction because it reflects the first time that FAA has requested increases for all of its major work forces.

Both staffing standards also understate requirements because they do not provide for an adequate "pipeline" of trainees to (1) replace those who leave and (2) meet future work loads. FAA's controller and maintenance personnel require several years of training before they are able to carry full work loads. Many of these employees are currently eligible to retire, and to provide for smooth NAS operations, FAA needs to have enough individuals in training now so that fully trained personnel will be available to replace those who retire.

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[2]FAA Staffing: Challenges in Managing Shortages in the Maintenance Work Force (GAO/RCED-87-137.)

<u>Recruitment Needs</u>. Once FAA has identified its staffing requirements, it needs to be able to bring employees on board as quickly as possible. Recognizing that its current hiring process is time-consuming and inefficient, FAA is streamlining this process by doing its own testing of controller candidates and performing some pre-employment checks formerly done by the Office of Personnel Management. FAA's transition to a modernized NAS also has major implications for the types of people FAA recruits and the way FAA's major work forces are trained. At the request of the House Subcommittee on Investigations and Oversight, we are examining FAA's programs for recruiting, hiring, and training its controller, inspector, and maintenance work forces.

Our initial work shows that although FAA's hiring is behind planned levels, FAA expects to meet its congressionally mandated staffing targets for fiscal year 1988 inspector and maintenance staffing. However, FAA will not meet the fiscal year target of 10,450 FPL controllers. FAA cannot increase its FPL staffing overnight because it currently takes about 4 years from the time someone applies to be an air traffic controller to reach FPL status. For each applicant who successfully completes FAA's training program, FAA has experienced one loss through failure or withdrawal. The eventual failure or withdrawal of over 50 percent of controller applicants costs the government millions of dollars.

Recently, FAA has faced a tight labor market and is having difficulty finding adequate numbers of highly qualified controller applicants. We believe that this is a serious problem because FAA

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needs highly qualified candidates. Research has shown that individuals with the best chance of completing FAA's training program are those who score 90 and above on required aptitude tests.

There are limited ways that FAA could increase its staffing levels by (1) reducing the time it takes to hire and train an FPL or (2) improving its pass rates. One way to save time is to reduce the time it takes to hire a qualified candidate and, as previously mentioned, FAA has a new program underway to streamline this process. FAA's goal is to reduce the current 11.5 month pre-employment processing time to 2 months for applicants who score 90 or above. Another way to save time is to hire experienced controllers who will require less training. For instance, FAA plans to hire several hundred military controllers. Also the Congress is currently considering legislation to rehire some fired FAA controllers. To increase the number of candidates who complete training, FAA must improve the quality of the applicants sent to the FAA Academy. We are examining ways that FAA could improve its recruitment efforts to ensure that an adequate pool of high-scoring applicants is available for hiring.

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To summarize, we found that modernizing the ATC system will cost more and take longer than the original NAS Plan indicated. Modifications and additional projects identified by FAA's SEIC as necessary to meet established performance requirements could raise

the total cost of NAS modernization to about $24 billion by the year 2000. Furthermore, FAA may not have the necessary controller and maintenance work force--in terms of numbers, skills and abilities--needed for transition to the future ATC system.

Our findings suggest to us the need for a redefined NAS Plan that clearly reflects all projects and costs; and an agency-wide schedule which recognizes constraints on installation, such as work force shortages. We believe a redefined NAS Plan will enhance the basis for making future implementation decisions and permit the setting of priorities that may be needed in light of the significant increase in projected funding needs.

This concludes my prepared statement. I will be pleased to respond to any questions you may have.
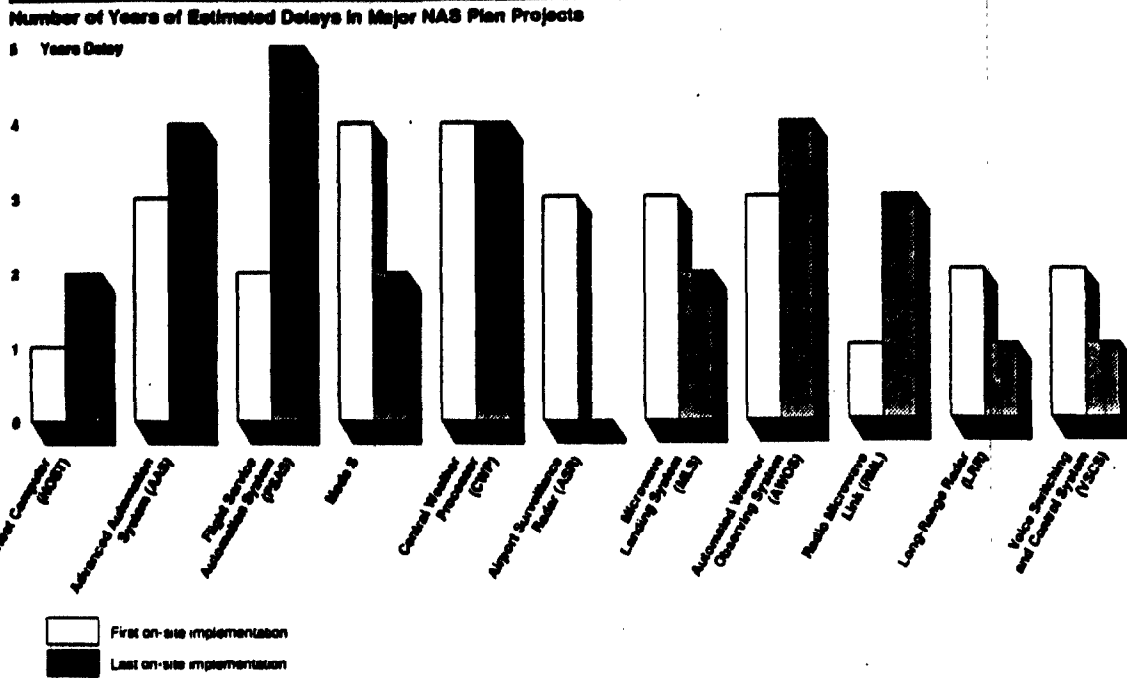
SYSTEM NAME	CURRENT PHASE (As of April 1, 1988)	VENDOR (S)	ESTIMATED TOTAL PROGRAM COST	FY 89 F&E BUDGET REQUEST	YEAR OF FIRST IMPLEMENTATION/ LAST IMPLEMENTATION
Voice Switching and Control System (VSCS)	Design competition	AT&T and Harris	$556M	$59M	1991/1993
Flight Service Automation System (FSAS)	Production	E-Systems	$511M	$21M	1986/1994
MODE S	Production	WEC/UNISYS (Joint Venture)	$489M	$13M	1990/1995
Microwave Landing System (MLS)	Production (1st buy) Second & third buy pending	Hazeltine	$1.6B	$20M	1988/2001
Long Range Radar (LRR)	RFP	To be determined	$349M	$58M	1987/1996
Airport Surveillance Radar (ASR)	Production	Westinghouse	$562M	0	1988/1992
Terminal Doppler Weather Radar (TDWR)	RFP	To be determined	$322M	$120M	1993/1996
Central Weather Processor (CWP)					
MWP	Preparing RFP	To be determined	$205M	$5M	1994/1995
RWP	Full scale development	Jet Propulsion Laboratory	$250M	$5M	1994/1995
Radio Microwave Link (RML)	Production	AT&T	$285M	$41M	1986/1992
Automated Weather Observing System (AWOS)					
NWS	RFP	To be determined	$143M	$2M	1989/1994
ADAS	RFP	To be determined	$8M	$5M	1989/1993
HOST	Production/Systems being commissioned	IBM	$417M	0	1987/1989
Advanced Automation System (AAS)	Design competition	IBM and Hughes	$5B	$212M	
ISSS					1993/1995
TAA					1995/1998
ACCC					1996/1998
TCCC					1995/2000

Source: FAA Program Managers

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Number of Years of Estimated Delays in Major NAS Plan Projects

NOTE 1: Delays computed by comparing April 1983 and April 1987 Program Master Baselines

NOTE 2: Terminal Doppler Weather Radar (TDWR) is not shown because the project was introduced in the April 1987 NAS Plan