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FAA Appropriation Issues

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

GAO/T-RCED-87-20

Mr. Chairman and Members of the Subcommittee:

We appreciate this opportunity to comment on Federal Aviation Administration (FAA) appropriation issues. We have found that further modernization, automation, and consolidation of the national airspace system can, in some instances, achieve important gains. For instance, FAA has reduced its maintenance work load for navigational aids 21 percent by replacing tube-type equipment with solid state technology.

In our testimony before this Subcommittee last year, Dr. Palmer and I commented on FAA's appropriation requests for

-- procuring the technologies required for the National Airspace System (NAS) plan and

-- developing human resources, including adequate controller and inspector work forces.

Today, we would like to update FAA's progress in these two areas as they relate to FAA's fiscal year 1988 budget request. I will discuss four of the NAS plan's major systems that we have evaluated and Dr. Palmer will address FAA's current plans concerning the single most expensive system in the NAS plan--the Advanced Automation System (AAS).

STATUS OF THE NAS PLAN

The Department of Transportation (DOT), which has final acquisition authority for the NAS plan, has designated 11 of the plan's 150 projects as major systems because they either exceed

$150 million or are critical components of the plan.[1] The total cost for these 11 systems is about $8 billion, or roughly one-half the plan's current $16 billion price tag. Over the past 5 years all of these systems have experienced schedule delays ranging from 1 to 8 years.[2] (See att. I.) A general description and status of each of the 11 systems is included as attachment II.

The delays are having a variety of effects. For example, FAA expects to provide better air traffic control with fewer people because of NAS plan improvements, but the delays are making it difficult for FAA to provide the level of air traffic control needed in the meantime. Secondly, the NAS plan is supposed to save the airline industry considerable expense by reducing delays and permitting more efficient routing, but these benefits are now being pushed further and further into the future. A third effect is that the aviation trust fund, which was set at a level which would have paid for the NAS plan if it had proceeded on schedule, now has a huge unused balance. The existence of this balance has generated a variety of demands for spending programs.

Causes for these delays, as shown in the attached FAA analysis (see att. III), include FAA underestimating

-- the complexity of these highly-automated systems,

-- the time needed to develop system software, and

-- the interdependency among the systems.

1A twelfth major system--the terminal Doppler weather radar--has recently been added.

2<u>Aviation Acquisition: Improved Process Needs to be Followed</u> (GAO/RCED-87-8, March 26, 1987).

Some technologies thought to be fully developed and available "off-the-shelf" required further development and testing to meet existing air traffic control (ATC) operational requirements. For others, FAA had not defined the operational requirements well enough to permit developing adequate system specifications.

To expedite the benefits it estimated the NAS plan would provide, FAA used a fast-track acquisition strategy for many of the plan's major systems, involving overlapping development and production phases. (This practice is known as "concurrency.") This strategy did not, however, include adequately demonstrating many systems' performance before committing to production contracts.

We often have shown that this approach leads to increased technical, operational, and economic risks. For example, we testified on February 25, 1987, that the high degree of concurrency between development and production of the Air Force's B-1B bomber contributed substantially to that program's problems. We concluded that, for a technically challenging development program, one that advances the state of the art, testing and development should be reasonably complete before production begins.[3]

FAA has recently changed its acquisition process to correct some of the problems that have contributed to NAS plan delays. In addition to issuing its first standard operating procedures for acquiring major systems, the agency has established test and evaluation policies and procedures. FAA also is rethinking its

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[3] The B-1B Aircraft Program (GAO/T-NSIAD-87-4A, Feb. 25, 1987).

approach to acquiring or designing individual systems, in several cases at the direction of this Subcommittee.

These improvements are too late to benefit most of the 11 major NAS plan systems, but a few, including the critical AAS could still benefit. The same should be true for other systems, such as the terminal Doppler weather radar, that FAA decides are major systems subject to the new policies and procedures.

FAA IS ENTERING A CRITICAL PHASE OF THE NAS PLAN

The delays experienced to date have been system-specific. The NAS plan is, however, approaching a critical phase in which many contractors will begin delivering hardware and software to FAA field sites. The challenge for FAA will be not only to install the systems but to integrate more than 1,000 interfaces between the various radars, data processors, and data links that comprise the NAS plan. These challenges are such that, even with substantial management efforts, further delays and other acquisition problems may be unavoidable.

This phase is complicated further by the number of groups involved. While FAA headquarters retains decision making authority, it will depend on

-- the Martin Marietta Corporation to share responsibility and accountability for NAS plan effectiveness and provide system engineering and integration contractor (SEIC) services;

-- a technical support services contractor (TSSC) to provide hands-on hardware installation, testing, and, to a lessor extent, site preparation for possibly over 20,000 separate facilities and pieces of equipment; and

-- its nine autonomous regional offices to provide direction to the technical support services contractor and to contract competitively for individual construction efforts.

SEIC role, contribution, and costs

In January 1984, FAA and Martin Marietta entered into a 10-year, $684 million contract for systems engineering and integration services. The contract is divided into three phases--a 5-year phase ending in January 1989, followed by two optional phases of 3 and 2 years. Over the past 3 years

-- the cost of this contract has increased over $200 million;

-- Martin Marietta's responsibilities have been expanded to include technical direction for six NAS plan systems; and

-- Martin Marietta has received over 80 percent of the available performance award fee bonuses despite delays, cost overruns, and other acquisition problems relating to the NAS plan's major systems and the corresponding delays in anticipated work force productivity gains and aviation user benefits--all of which are used in determining the award fee bonuses.

In light of these events, this Subcommittee directed FAA to report on alternatives to the existing contractual agreement and raised questions about the independence of Martin Marietta's judgment and FAA's award fee process. At your request, we will review FAA's report to identify the major, contract-related performance issues that the Congress should consider in deciding whether to fund the contract's first option phase in fiscal year 1989.

TSSC role, contribution, and cost

FAA anticipates awarding a technical support services contract in June of 1988. FAA estimates that the contract will cost between $350 million and $400 million over 9 years. According to FAA, this cost is within the scope of the current NAS plan estimate.

The need for such support appears well-founded. A 1984 FAA study suggests that FAA will need 5,000 more staff-years than it presently has available to install the NAS plan systems. Both FAA and Martin Marietta have since confirmed that FAA needs more people to supplement FAA's facilities and equipment work force.

The review of TSSC that we are doing for this Subcommittee has identified two issues we believe need to be addressed before a technical support services contract is awarded. First, Martin Marietta has identified a 1,850 staff-year shortfall for site-adapted design work that it believes is outside the SEIC scope and FAA must resolve in some other way. Conversely, FAA's Office of Chief Counsel believes that this same site-adapted design work is clearly within the scope of the SEIC contract and is Martin Marietta's responsibility. If the latter is true, FAA must closely monitor TSSC contract development and implementation to ensure that it does not include any site-adapted design work.

Second, FAA must still decide what kind of contract to use for the TSSC. For example, much of the work to be accomplished under the technical support services contract cannot be precisely defined to obtain real price competition in the contract award process. This is because the contractor will be used to supplement FAA's work force and the work to be performed is dependent on the delivery schedules of others, such as the individual system contractors. Therefore, a "level of effort" contractual arrangement whereby potential contractors bid on work skills and projected levels of staff years identified by FAA, rather than on an indefinite description of work to be performed, may be appropriate. Under this type of arrangement, FAA would commit TSSC resources only after identifying the work to be performed.

TERMINAL DOPPLER WEATHER RADAR

Our work on 4 of the NAS plan's 11 major systems has identified issues that should be addressed before fiscal year 1988 funds are appropriated. First, despite recent changes to FAA's acquisition process, the current implementation schedule for the terminal Doppler weather radar does not allow adequate time to resolve the many technical issues that are still outstanding. If the radar is to be FAA's "optimal" ground-based low-level wind shear detection system, it should, according to FAA, be able to

(1) accurately measure the wind shear headwind-tailwind component,

(2) scan all airport runways and flight paths,

(3) forecast the development of microbursts (extremely violent, rapidly developing, vertical wind shears) by detecting wind shear precursors,

(4) have at least a 90 percent probability of detecting all microbursts,

(5) have a 10 percent or less false alarm rate, and

(6) be fully automated so that radar signals are automatically translated into information that is useful to controllers and pilots.

FAA has not determined whether these criteria can be met. Yet, FAA's implementation schedule calls for awarding a production contract in fiscal year 1988. We do not see how this can provide time to demonstrate that the system meets FAA's operational requirements before committing to production.

MICROWAVE LANDING SYSTEM

The microwave landing system (MLS) is the second most expensive NAS plan system--costing $1.5 billion--mainly because FAA plans to replace every existing instrument landing system (ILS) it is presently using. This, in turn, will require every aircraft owner who wants to use a precision landing capability to ultimately buy new on-board MLS avionics equipment, including those who presently use ILS.

Our continuing evaluation of this system raises policy issues concerning FAA's current procurement and implementation plan. We have briefed appropriate DOT officials on our findings relating to the system's need and justification, cost and benefits, and implementation strategy. We have also communicated in writing to FAA our observations concerning the validity of the assumptions and calculations made in the original 1976 cost-benefit study and the limited 1983 update for consideration in conducting their new cost-benefit study.

Our report on this highly complex and controversial system is being drafted. But, because you must make judgments on MLS before we can finish, we will present our preliminary findings today.

MLS was originally justified in 1969 as a replacement for ILS, but during the intervening 18 years, FAA has largely fixed the problems it had been having with the ILS. For example, solutions have been found and are being implemented to the ILS' reliability, siting, and radio channel congestion problems. Improvements to both on-board avionics and ILS ground-based equipment now permit more landings under lower ceiling and visibility conditions than before. There are some airports and runways, however, that

(1) qualify for a precision landing capability but cannot use an ILS,

(2) where operations such as helicopter activity may economically justify MLS rather than ILS, or

(3) where MLS is needed to meet the 1978 international commitments.

We have found little support within the aviation community for FAA's current MLS implementation strategy. For example, on March 18, 1987, Boeing informed the FAA Administrator that recent detailed negotiations with its customers resulted in every airline rejecting the MLS option being offered by Boeing. As a result, Boeing stated it would not begin delivery of MLS-equipped 747s in 1988 as originally planned. This means that Boeing aircraft being delivered for at least the next 4 to 5 years will not be equipped for MLS.

There has been some recent movement toward accepting MLS as a long-term complement to rather than a replacement for ILS, and FAA now assumes that ILSs and MLSs will be collocated until at least 1998. FAA is also in the process of rethinking its MLS implementation plan and is developing a new policy for acquiring more ILSs that will foster their use where they are needed and can be supported. Further, the Department of Defense (DOD) now plans to equip its transport aircraft with both ILS and MLS avionics and to equip its tactical aircraft with dual avionics that will be compatible with both ILS and MLS ground units. This will ensure civilian/military compatibility.

In the meantime, FAA's "official" plan still is to acquire 1,250 MLSs under an all-or-nothing ILS replacement strategy. Toward this end, FAA is requesting $48.7 million in fiscal year 1988 to begin a 500-unit, $572 million second MLS procurement. While we think MLS should be used when it provides important advantages, we see no basis for appropriating funds for a second buy until FAA's implementation strategy is revised to recognize MLS as a long-term complement to ILS and a decision is made on where to locate the 178 units already acquired and how many more MLS units are justified.

AUTOMATED FLIGHT SERVICE STATIONS

While FAA's MLS implementation strategy may have been overtaken by events, our work shows that FAA's flight service station consolidation program deserves this Subcommittee's continued support. We have recently completed our work on various aspects of this program for the Chairman of the Joint Economic Committee and the Chairman of the House Subcommittee on Aviation. What we found is that FAA has solved most of the start-up problems it had when it began consolidating flight service stations. For example, pilot complaints about lost flight plans within FAA's new, partially automated Model 1 system have been corrected. Delayed access to weather briefers, the other main complaint by pilots, is due primarily to staffing constraints at the automated stations rather than to Model 1 system deficiencies.

The staffing problem has arisen because consolidation of flight service specialists at the automated stations has been delayed by the lack of Permanent Change of Station funds. If FAA is to achieve the benefits of increased productivity that economies of scale make possible, flight service station consolidation must proceed.

For fiscal year 1988, FAA is requesting $25.5 million to reconfigure Model 1 software to increase the system's operating capacity and complete consolidation. This Subcommittee has sought assurance from DOT that the present total estimated cost of FAA's proposed Model 1 reconfiguration will not grow and that this option is the most cost-effective and timely alternative available.

Our work to date indicates that, for some fairly complicated reasons, FAA's proposed approach may not be the most cost-effective and may delay consolidating the remaining stations. For example, a study done by the MITRE Corporation for FAA found that simply extending the existing Model 1 system to 24 more automated flight service stations using equipment FAA has already purchased would allow consolidation of all the remaining stations at about half the cost and 30 months sooner than FAA's preferred option. We are drafting a report on this subject to be issued to this Subcommittee shortly.

AUTOMATED WEATHER OBSERVING SYSTEMS

We have also found some evidence suggesting FAA may be changing its approach to providing weather observations for areas previously served by flight service stations that have been closed. FAA plans to provide weather observations contracting out for weather observers. Once the plan is implemented, FAA's consolidated flight service stations will meet the legislative requirement in the Airport and Airway Improvement Act of 1982 (Title V of Public Law 97-284) to provide as good or better weather information than the old flight service stations provided.

FAA's fiscal year 1988 budget request, however, includes $2.7 million to begin installing automated weather observing systems (AWOS) at locations where flight service stations had been providing weather observations before they were closed. FAA's justification is that AWOS is cheaper than providing weather observations through contracted weather observers.

In a July 1985 report to you, we stated that FAA's operational testing showed that its AWOS did not meet all of FAA's operational requirements for the nine weather elements considered essential to providing airport and area aviation weather forecasts and to maintaining aviation safety.[4] Conversely, surface weather observations made by observers using equipment to measure or estimate the nine weather elements meet or exceed FAA's operational requirements.

On the other hand, FAA's program manager for the flight service station modernization program informed us that an AWOS has been developed and will be tested soon which FAA anticipates will meet all its weather forecasting operational requirements. If successful, the improved AWOS will meet the 1982 Act's requirement and contract observers will not be needed. Therefore, we believe this Subcommittee should consider making money appropriated for AWOS installation contingent on AWOS meeting FAA's operational requirements and the intent of the 1982 Act.

HUMAN RESOURCES

Turning from technologies to people, little has changed in FAA's work force management picture since we testified last year. NAS plan systems' delays have resulted in corresponding delays in air traffic controller and airways facilities technician productivity gains, and these work forces continue to be stretched thin. FAA still needs more commercial aviation safety inspectors to effectively respond to the changes deregulation has brought to the airline industry. We therefore support FAA's request to increase the controller work force by 225 positions and the

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[4] Installation of Automated Weather Observing Systems by FAA at Commercial Airports Is Not Justified (GAO/RCED-85-78, July 29, 1985).

inspector work force by 178 inspectors in fiscal year 1988, but we are concerned that FAA's fiscal year 1988 budget request does not reflect realistic maintenance staffing needs.

Maintenance technician work force

Competing budgetary priorities and FAA's commitment to reduce maintenance staffing as part of the productivity gains to be derived from the NAS plan have caused a shortfall of FAA maintenance engineers and technicians. Until recently, hiring freezes and personnel restrictions have kept FAA from filling maintenance vacancies, and during fiscal year 1987, FAA plans to maintain staffing at 16 percent below the field's work load as projected by FAA's maintenance staffing standards.

By 1990, about 2,500 engineers and technicians or about 25 percent of the work force will be eligible to retire. Because training takes from 2 to 5 years, FAA must be able to hire new engineers and technicians now to be prepared for the expected attrition in the maintenance work force.

So far, FAA's general strategy has been to hire new employees only when the old ones leave. This approach replaces qualified, experienced technicians who can carry full work loads with inexperienced technicians who will need extensive training. FAA's approach has resulted in inefficiencies and skill shortages, and is negatively affecting the accomplishment of routine maintenance, increasing the amount of equipment outages, and demoralizing this work force.

Last year, this Subcommittee restored the number of full time maintenance technicians FAA had proposed to cut. For fiscal year 1988, FAA again proposes to cut this work force by 84 positions, from 10,397 to 10,313. We believe that not only is this reduction not warranted, FAA must begin now to increase the size of its technician work force. Our report on this subject will be issued this summer.

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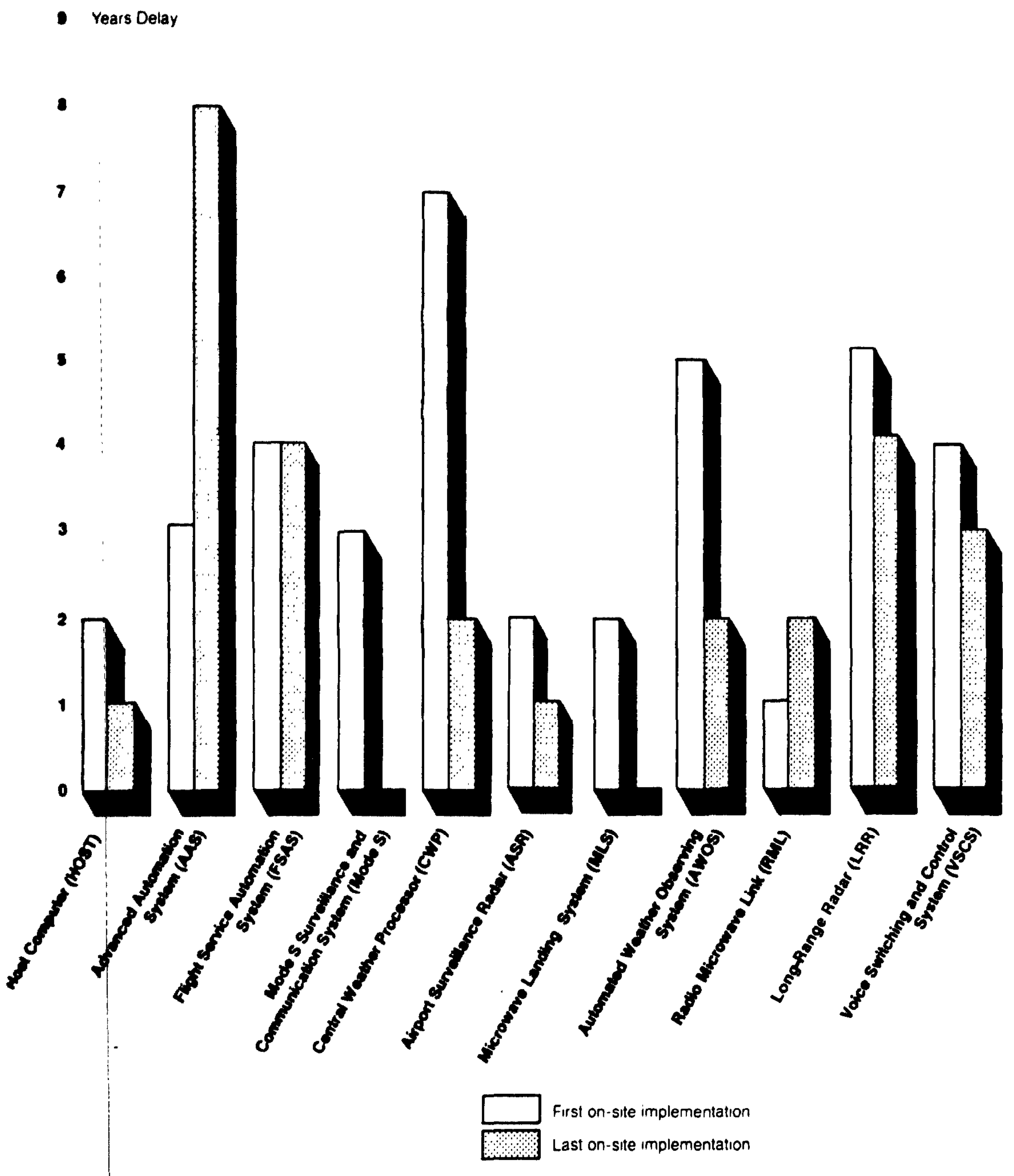
This concludes my testimony, Mr. Chairman. I will be happy to answer any questions that you or other Subcommittee Members may have at this time.

ATTACHMENT I

Figure 1.1: Number of Years of Estimated Delays in Major NAS Plan Projects



Source: Comparison of December 1981 NAS plan and May 1986 NAS Program Master Schedule Baseline.

Major NAS Plan Projects

The following is a general description and status of each of the 11 major NAS plan projects. The information is, for the most part, taken from the current NAS plan project resumes and from project descriptions contained in the SEIC's August 1984 evaluation of the NAS plan.

Advanced Automation System (AAS)

Because the current en-route and terminal automation systems were approaching the end of their useful lives and could not accommodate FAA's planned consolidation of terminal and en-route operations into a single system at the planned Area Control Facilities, FAA decided that a totally new automation system design was required.

According to FAA, AAS will provide the primary upgrade to air traffic control automation capability in the NAS plan. It will provide the foundation for the Automated En-Route Air Traffic Control system and is the key system through which the benefits for the Next Generation Weather Radar, the Mode S surveillance and communication system, and the Central Weather Processor will be realized. AAS will contribute to the NAS plan's operational, cost, and expandability goals. Operationally, the system will improve air traffic control efficiency and safety and provide for increased NAS capacity. AAS is also expected to contribute to decreasing NAS maintenance costs by providing highly reliable hardware and software and reducing the maintenance staff needed. The system will provide the computer capacity needed to support facility consolidation—a major cost benefit in the NAS plan. Finally, AAS is structured to be expandable to meet future growth requirements. This expandability is targeted both to software and hardware.

Status

DOT approved the project for full-scale development and initial production in April 1983, and two design contracts were awarded in August 1984. DOT authorized a 6-month extension to the contracts in October 1985 at an additional cost of $128.3 million. FAA is currently discussing restructuring the AAS project to address congressional concerns over the risks in proceeding to full production without adequate testing. Total funding required for the program is estimated to be about $3.2 billion.

Automated Weather Observing System (AWOS)

AWOS is designed to automatically collect weather observation data and distribute the data to pilots, FAA weather observers, and National Weather Service aviation weather forecasters. According to FAA, AWOS will increase efficiency at commercial airports by reducing the amount of time now required to make weather observations and by reducing or eliminating the higher maintenance costs of obsolete weather-observing equipment currently in use. Consequently, FAA plans to install 304 AWOSS at commercial airports and 441 AWOSS at general aviation airports (those serving private aircraft only) where no weather observations are currently provided. FAA expects that such systems, by providing weather data where none are now available, will reduce the number of private aircraft accidents, thereby enhancing flight safety.

Status

The project's schedule has been delayed as a result of the unreliable technical performance of sensors and a change in the procurement strategy. DOT has not yet approved this program for any key decision point. The AWOS program is estimated to cost about $203 million.

Central Weather Processor (CWP)

CWP is planned to provide needed improvements in the quality of weather information available throughout the NAS by automating many of the weather-data processing and disseminating functions, including the distribution of near real-time weather information to controllers. A total of 26 production systems are planned and are to be implemented by the end of 1993.

Status

DOT approved this program to proceed with full-scale development and initial production in January 1985. Prototype delivery to the FAA Technical Center for test and evaluation is scheduled for March 1989. The estimated cost of this program is about $155 million.

Flight Service Automation System (FSAS)

To meet an increased demand for services, FAA plans to automate flight service stations, enabling pilots to brief themselves either through a computer terminal or by use of a "touch-tone" telephone.

FSAS will be implemented in three segments, called models 1, 2, and 2 enhancements. With model 1, FAA's objective is to quickly establish a limited-capability automated system at its 37 busiest stations. Model 2 will automate all the manual operations now carried out by specialists and will have the capacity to handle the workload of 318 stations. Model 2 enhancements will incorporate additions and improvements to model 2, enabling pilot self-briefings. In this way, the present and projected long-term demand for preflight services can be met without a proportional increase in staff or operating costs.

ATTACHMENT II

Status

DOT approved the program to proceed with full production in August 1981. The first Model 1 system was commissioned in February 1986. The estimated cost of the program is about $480 million.

Host Computer

The current en-route and terminal computers in use in the NAS are of 1960's vintage and are approaching obsolescence. The total hardware/ software replacement of these systems with a common system will not be completed until the early 1990's. To provide the computer capacity for the demand projected for the late 1980's, the en-route computers must be replaced prior to full AAS implementation. This replacement will take the form of computers called Host, which will use existing software with minimum modification.

The purpose of the air traffic control Host computer is to provide needed computer capacity for the present en-route system as early as is practical. The modernization consists of implementation of the Host computers, which is the first step of the advanced automation program, and will provide the required capacity until the AAS has been fully implemented.

Status

DOT approved this program to proceed with full-scale development and initial production in March 1983 and full production in June 1985. The first Host computer went to the FAA Technical Center in August 1985. FAA expects to have the computer systems operational at all 20 Air Route Traffic Control Centers by the end of 1987. The estimated cost of this program is about $406 million.

Long-Range Radar (LRR)

The NAS plan requires the networking and upgrading of en-route radar and terminal radar into a cost-effective system providing primary radar coverage of both en-route and terminal airspace. The present LRR system has surpassed its design life expectancy.

This program is for the procurement and installation of 48 3-dimensional radars (range, azimuth, height) to be located at 39 existing joint-use, long-range radar facilities; 8 existing military-only sites; and the FAA Academy. The FAA and U.S. Air Force determined that, owing to the age of the present equipment and anticipated poor logistics supportability, replacement of joint-use, long-range radars and height-finder radars is required. They also determined that a combined

3-dimensional radar would be the most cost-effective method for providing a suitable replacement.

Status

Although this project was scheduled for key decision point 4 approval in July 1986, it had not yet been submitted for DOT's consideration as of September 1986. (FAA had not submitted this project for prior key decision point approval). The estimated cost of the program is about $485 million.

Microwave Landing System (MLS)

The MLS program was initiated in 1971. In 1979, the Service Test and Evaluation Program was initiated to gain initial operational experience with MLS and to develop operational procedures and criteria. A transition plan was published in 1981 which defined the strategy for MLS implementation.

The project's objective is to develop and implement a new common civil/military approach and landing system that will meet the full range of user operational requirements well into the future and be selected for international standardization as the replacement for the current Instrument Landing System.

Status

DOT approved this program to proceed with full production in April 1983. A contract for the first purchase of 208 MLS systems was awarded in January 1984. Contractor delays, attributed to software and personnel problems, are expected to slow production by about 1-1/2 years. The estimated cost for the MLS program is about $1.5 billion.

Mode S

Mode S is a cooperative surveillance and communication system to support air traffic control and provide other data link services. It employs ground-based sensors and airborne transponders. Ground-to-air and air-to-ground data link communications are integral with the surveillance interrogations and replies. In Mode S, each aircraft is assigned a unique address code. Using this unique code, interrogations can be directed to a particular aircraft and replies can be unambiguously identified. Interference is minimized because a sensor limits its Mode S interrogations to specific targets, and proper timing of interrogations permits replies from closely spaced aircraft to be received without mutual interference.

The objective of the Mode S program is to provide the improved surveillance and communications capabilities required to meet the need of automated air traffic control in the 1980's. Specific goals are

- overcoming surveillance limitations of the present air traffic control radar beacon system,
- providing an integral two-way data link,
- evolutionary transition from the present system,
- reasonable cost to the airborne user, and
- high availability and reliability.

A total procurement of 197 Mode S systems is planned. The first procurement of 137 systems will provide surveillance and data link coverage from the ground up at most major terminals and above 12,500 feet in the en-route airspace. The second procurement, for 60 systems, will complete the system by lowering the en-route coverage to 6,000 feet or to the minimum instrument flight rules altitude if higher.

Status

DOT approved the program to proceed with full production in March 1983. FAA plans to award two sequential contracts—a contract for a total of 137 systems was awarded in October 1984 and a follow-on contract for 60 systems is planned for March 1990. The initial installation of Mode S is scheduled for mid-1988. The program is estimated to cost about $526 million.

Radio Microwave Link (RML)

The existing interfacility communications system is a hybrid of landlines, radio links, and satellite media, and a combination of FAA owned and leased services. The primary FAA-owned medium is radio microwave. RML systems are virtually the only alternative FAA has to a totally leased interfacility communication transmission system. Virtually all existing FAA facilities have interfacility communications requirements. FAA-owned RML systems will play an expanding and changing role from that of primary broadband radar remoting to one of communications trunking. The majority of the FAA-owned systems are over 24 years old and are maintenance-intensive and difficult to supply support. With modern equipment, the FAA transmission systems will offer a viable option to total agency dependence on commercial communications.

As part of the FAA transmission system, the existing RML facilities will serve as a national area transmission medium for voice and data communications. Existing RML equipment, used primarily for radar remoting, will be replaced with Radio Communications Link equipment that can be used for general purpose interfacility communications. New facilities will be added to tie existing facilities together, forming a complete national radio communications network. FAA plans to replace 750 existing RML facilities and establish an additional 250 new facilities.

Status

DOT approved the program to proceed with full production in March 1984. A contract was awarded in May 1985 to procure 312 units of radio and linking equipment. The estimated cost of this program is about $264 million.

Terminal Radar Program

The airport surveillance radar (ASR) models 4/5/6s were originally procured in 1958. The first system was commissioned in 1960 and the last in the 1964-65 timeframe. Thus, the average age of the hardware and design is currently over 20 years old.

Replacement of all 96 ASR-4/5/6 systems, together with associated air traffic control beacon interrogator equipment, is planned. Present plans call for the direct replacement of 40 ASR-4/5/6 radars with new ASR-9s and the remainder with leapfrog donor ASR-7/8 radars. The 56 donor ASR-7/8 sites will receive ASR-9 radars.

Status

DOT approved the program to proceed with full production in May 1982 and a contract was awarded in September 1983. Delivery of ASR-9 systems is expected to begin in mid-1987. The estimated cost of this program is around $606 million.

Voice Switching and Control System (VSCS)

VSCS provides the man-machine interface and the switching control system for voice communications. The VSCS provides an integrated system for the operation and management of voice communications resources for air traffic control. VSCS is the prime system that supports the availability requirements of operational communications services. It provides the means for reconfiguration of voice communication resources and is a critical item for achieving increased controller productivity along with reduction of leased services costs.

Status

Approval was given by DOT to proceed with the full-scale development and initial production in February 1985, and a prototype request for proposal was issued in the same month. The estimated cost for this program is about $429 million.

 ATTACHMENT III

Status of Major NAS Plan Projects

MSA Project	Amount of Slippage in Initial Implementation Comparison 1983 NAS Plan with Draft 1987 Plan	Reason for Slip
HOST	6 Months	Contractor delays in software coding and documentation.
AAS	2 Years	Additional requirements added (color/AERA) and provision for pre-production testing.
VSCS	1 Year	Additional requirements (number of operational positions, redundancy) and testing to reduce risk.
FSAS	2 Years	Software development problems.
AWOS	2 Years	Contractor difficulty complying with Critical Design Review require-ments and failure to perform required quality assurance procedures.
CWP	3 Years	Addition of prototype phase, redefinition of statement of work with contractor (NASA/JPL), less than optimum contractor staffing.
Long Range Radar (ARSR-4/FARR)	4 Years	Delay in consummating FAA/USAF agreement on number of systems requi-red and funding.
MODE-S	4 Years	Prototype added, clari-fication of speci-fications, revised test plan, contractor late meeting critical design review.

Source: March 5, 1987. Statement by FAA's Acting Députy Associate Administrator for NAS Programs before the Subcommittee on Aviation, House Committee on Public Works and Transportation.

Status of Major NAS Plan Projects (Cont.)

MSA Project	Amount of Slippage in Initial Implementation Comparison 1983 NAS Plan with Draft 1987 Plan	Reason for Slip
ASR-9	3 Years	Delay in completion of critical design review, problems in system integration testing, FAA rejection of inadequate test procedures, contractor problem obtaining critical parts.
MLS	2 Years	Delay in contractor software coding; changes of deployment location/runway; delay in receipt of valid frequency assignments.
RML	1 Year	Implementation started in 1986.
TDWR (New project in 1986 plan)	1 Year	Revision of draft project specification; evaluation of impact of various siting options