

GAO

Report to the Chairman, Subcommittee
on Investigations and Oversight,
Committee on Public Works and
Transportation, House of
Representatives

April 1991

FAA STAFFING

New Pay Act Offers Options to Bolster Maintenance Work Force



143640

**Resources, Community, and
Economic Development Division**

B-242887

April 2, 1991

The Honorable Robert A. Borski
Chairman, Subcommittee on
Investigations and Oversight
Committee on Public Works
and Transportation
House of Representatives

Dear Mr. Chairman:

In 1987 GAO reported that the Federal Aviation Administration (FAA) was experiencing a shortage of technicians for maintaining the air traffic control (ATC) system.¹ GAO also found that expected retirements, coupled with the lengthy period required to train new technicians, could further limit the agency's ability to maintain the ATC system unless corrective actions were taken.

This report responds to the former Chairman's request that we follow up our 1987 report by (1) determining whether shortages in the maintenance technician work force have adversely affected ATC operations and (2) assessing FAA's plans to increase its maintenance capability.

Results in Brief

Since our 1987 report, FAA has hired new staff to replace retired technicians. However, because the 3 to 5 years required to train new technicians and an increasing work load reduced the agency's maintenance capability, FAA also took other measures to preserve a reliable ATC system. For example, it relied more on contractors to maintain new equipment, increased overtime usage, and reduced maintenance coverage at some ATC facilities. Consequently, although some operational problems have occurred, overall system reliability and safety have not greatly deteriorated. In fact, since 1987, aircraft delays caused by ATC system outages were, on average, only about 2 percent of total aircraft delays.

To further enhance its maintenance capability, FAA is proposing to spend about \$118 million between fiscal years 1992 and 1996 to supplement its in-house maintenance technician work force with contractor personnel to maintain existing equipment as modernized ATC systems are installed.

¹FAA Staffing: Challenges in Managing Shortages in the Maintenance Work Force (GAO/RCED-87-137, Sept. 25, 1987).

However, FAA expects its maintenance work load to decline from 1991 through 1995, roughly the same period in which it is seeking to supplement its technician work force. Also, since FAA developed its proposal, the Congress authorized other financial incentives under the Federal Employees Pay Comparability Act of 1990 that may help FAA bolster technician staffing.

Background

The nation's air traffic control system is a network of sophisticated communications, radar, navigational, and computer equipment. This equipment, located at over 26,000 facilities nationwide, ranges from a single automated navigational aid at a remote location to busy control towers in major airports.

To ensure the safety of air passengers—about 485 million in 1989—much of this equipment operates 24 hours a day, 7 days a week, and must be properly maintained. FAA employs specialized technicians to service and maintain this equipment; for certain systems, this work force is supplemented by contracted maintenance services.

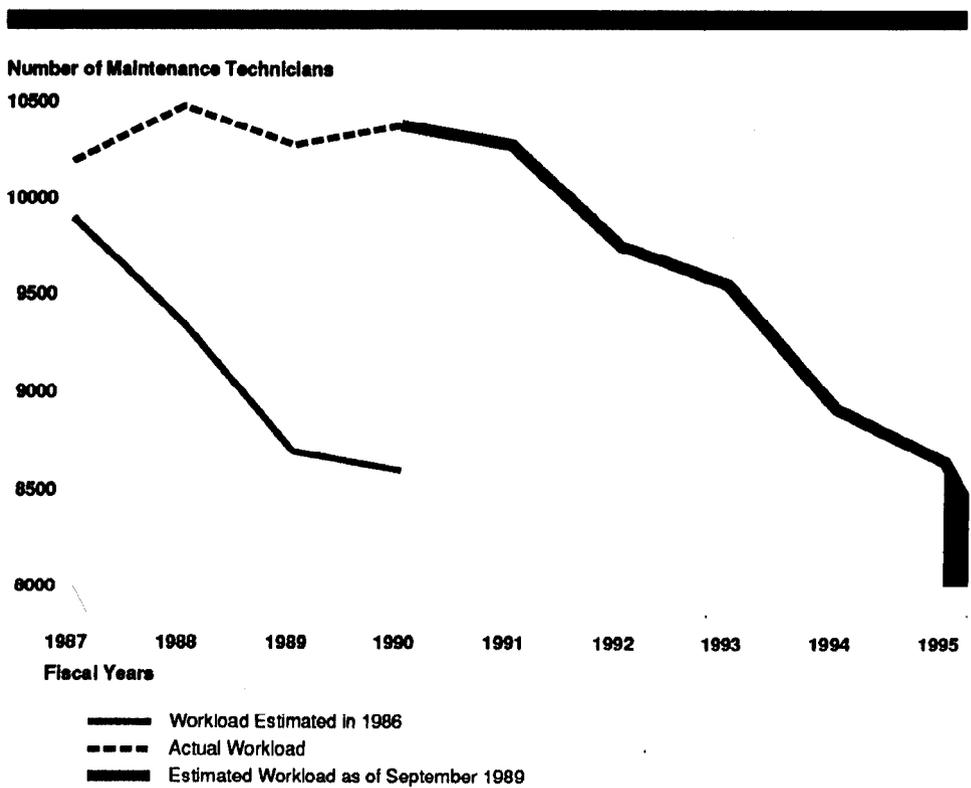
Technician responsibilities include performing corrective and preventive maintenance and providing system knowledge and coordination for the installation of new equipment. At some locations, technicians provide continuous maintenance “watch” coverage to immediately restore failed equipment to service. To perform these duties, technicians must undergo extensive training accompanied by on-the-job experience.

In 1981 FAA developed the National Airspace System (NAS) Plan to modernize air traffic control equipment. The Plan includes projects to replace computers, increase automation, consolidate facilities, and upgrade navigational equipment. According to FAA's estimates, ATC modernization will cost about \$27 billion and will be completed around 2004. In the meantime FAA must continue to maintain existing ATC equipment while training technicians to install, test, and commission new equipment.

FAA Has Used Overtime and Contract Maintenance to Accommodate Technician Shortages

FAA's practice of hiring technicians after maintenance personnel retire has reduced the number of technicians qualified to perform all maintenance functions from about 8,000 in 1988 to about 7,400 in 1990, thereby also reducing FAA's in-house maintenance capability. The agency believed increased automation and improved equipment reliability would steadily reduce the maintenance work load as the increased benefits of modernization were realized. However, because FAA has experienced delays in deploying new equipment, the work load did not decline (see figure 1). FAA now expects the maintenance work load to decline from 1991 through 1995.

Figure 1: Work Load Measured by Maintenance Technicians Needed



To compensate for the decline in qualified technicians, FAA increased its reliance on overtime and contractors to maintain ATC equipment. Overtime usage increased FAA-wide from about 185,000 hours in fiscal year 1988 to nearly 221,000 hours in fiscal year 1990. As FAA has added new NAS equipment, it has also relied more on contractors to maintain these systems. For example, since its deployment in 1987, contractors have

maintained the Host computer system, which is installed at the agency's 20 enroute air traffic control centers. Contractors now maintain 21 ATC systems, as opposed to 6 in 1987.

In addition, FAA expects that about 229,000 hours of overtime will be used to maintain ATC equipment in fiscal year 1991. Although overtime may vary among offices, FAA's planned overtime averages about 1 hour per week for each experienced technician. Moreover, maintenance officials told us that FAA technicians are a highly motivated and dedicated work force that has generally been willing to work overtime. In some cases, increased overtime usage may improve maintenance operation efficiency. For example, several facilities we visited often used overtime to call in off-duty technicians as needed to restore failed equipment to service rather than incurring the added cost of staffing a maintenance watch full-time. According to maintenance officials, calling in off-duty technicians has generally had minimal effect on ATC operations because normally only the watches with fewest problems, such as midnight or other nonpeak periods, were not staffed.

FAA's use of more overtime and contract maintenance has generally ensured the reliability and safety of the ATC system. Since 1987, the portion of total aircraft delays caused by system failures nationwide has averaged about 2 percent, and ATC systems FAA-wide have been available for service over 99 percent of the time. This reflects positively on FAA's total maintenance capability. Also, the redundancy built into ATC systems has contributed to this good track record even though some older equipment to be replaced requires more maintenance than current systems. In addition, we visited three large FAA regions and found they generally met preventive maintenance goals, accomplishing at least 95 percent of required maintenance on schedule.

Some FAA field offices reduced coverage by eliminating selected scheduled watches or staffing them with less than the recommended number of experienced technicians. However, maintenance supervisors at these locations identified only two instances during the first 6 months of fiscal year 1990 in which reduced maintenance coverage caused aircraft delays; they also stated that aircraft safety was not compromised in either case. In the first case, 7 aircraft were delayed for about an hour at Dulles International Airport when a qualified, off-duty technician had to be called in to restore a failed radar component; in the second case, 40 aircraft were delayed at the Chicago O'Hare International Airport due to equipment failure.

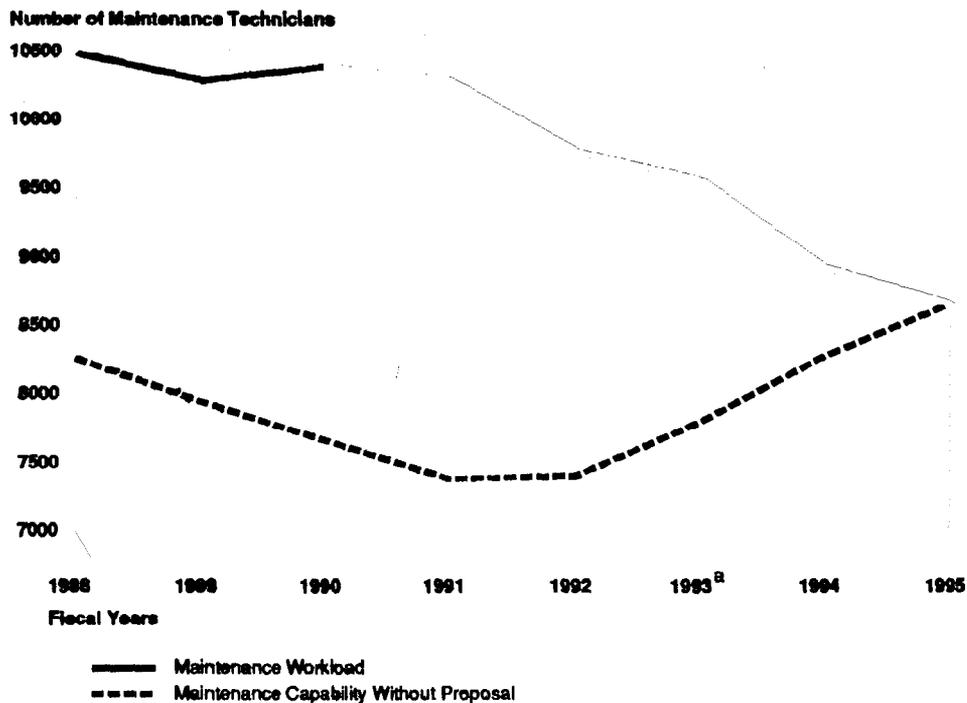
FAA Developed an Interim Plan to Supplement the Technician Work Force

FAA expects that about one-third of its maintenance technicians will be eligible to retire through 1995 and believes the current work force cannot continue to efficiently maintain existing ATC equipment while undergoing additional training required to install, test, and commission new systems. FAA also believes that current measures, such as increased overtime usage and contract maintenance for new systems, will not be sufficient to sustain its maintenance capability through fiscal year 1995.

To alleviate potential technician shortages, in September 1989 FAA developed a 4-year, \$130 million proposal to supplement its maintenance work force with up to 533 contractor technicians who would maintain existing equipment while new ATC equipment is installed. The proposal called for an initial expenditure of \$10 million in fiscal year 1991, but FAA reduced its proposal to \$118 million, with \$20 million to be spent in fiscal year 1992. Ultimately, FAA asked for only \$4 million of this amount, which is sufficient to contract for 53 of the 266 technicians who the proposal stated are needed in 1992.

However, the gap between FAA's maintenance capability and work load will begin closing prior to the agency's acquisition of additional contractor staff. As shown in figure 2, work load estimates contained in the proposal indicate that the gap between FAA's maintenance work load and capability will be the greatest in 1991, 2 years before FAA expects to fully implement the proposal. Further, FAA expects that the gap will continue to close through 1995 as recently hired, in-house technicians become fully qualified and productivity gains are realized from the installation of new ATC equipment.

Figure 2: Narrowing Gap Between Maintenance Work Load and Capability



Note: FAA's capability estimates assume that new technicians will achieve full proficiency in 4 years.

^aIndicates year that FAA plans to fully implement proposal.

FAA plans to continue replacing retiring technicians and expects to have a sufficient number of fully trained technicians to accomplish the anticipated maintenance work load in 1996. However, should ATC system reliability become threatened due, for example, to delays in deploying improved equipment, recent legislation provides several options that FAA may use to bolster its technician work force. On November 5, 1990, the President signed into law The Federal Employees Pay Comparability Act of 1990 (P.L. 101-509), which, under certain circumstances,² allows (1) agencies to pay retention allowances of up to 25 percent of employees' base pay and (2) rehired retirees to receive both a full salary and retirement benefits.

²For example, for rehired retirees to receive full salary and retirement benefits under the act, a federal agency must demonstrate on a case-by-case basis that there is exceptional difficulty in obtaining qualified staff.

FAA officials told us they had not compared the costs and benefits of the act with the agency's proposal to contract out for additional technicians because FAA will not know how extensively it will be allowed to exercise these options until the Office of Personnel Management develops governmentwide regulations to implement the act. The officials also told us they expect the regulations to be issued by May 1991. At that time, FAA plans to compare the costs and benefits of the act's provisions to its proposal. Until FAA makes such a comparison, it will not know whether one of these alternatives or a combination of them is most cost-effective.

Conclusions

The measures FAA has taken since our 1987 report to preserve a reliable ATC system have generally been successful. Although some operational problems have occurred, overall system performance has been reliable, causing only about 2 percent of total aircraft delays.

To further enhance its ability to maintain ATC equipment, FAA is proposing to supplement its in-house maintenance technician work force with contractor personnel. However, the gap between FAA's maintenance capability and work load is beginning to close, and new legislation authorizes financial incentives to bolster technician staffing. An evaluation of additional personnel requirements in light of new developments would provide FAA with a basis for determining the proper combination of contractor and federal employees if additional staff is needed.

Recommendation

Should additional maintenance technician support be needed, we recommend that the Secretary of Transportation direct the Administrator, FAA, to use the most effective and cost-beneficial mix of contractor support and options authorized by the Federal Employees Pay Comparability Act of 1990.

We discussed the facts presented in this report with cognizant FAA officials, who agreed with our findings. However, as requested by your office, we did not obtain official agency comments. Details on our objectives, scope, and methodology are contained in appendix I.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 15 days from the date of this letter. At that time, we will send copies to the Secretary of Transportation and the Administrator, FAA, and make copies available to others upon request.

We performed our work in accordance with generally accepted government auditing standards under the direction of Kenneth M. Mead, Director for Transportation Issues, who can be reached on (202) 275-1000. Other major contributors to this report are listed in appendix II.

Sincerely yours,



J. Dexter Peach
Assistant Comptroller General

Objectives, Scope, and Methodology

On January 9, 1990, the Chairman, Subcommittee on Investigations and Oversight, House Committee on Public Works and Transportation, requested GAO to examine FAA's long-range plans for training technicians to maintain ATC systems. This report follows up our 1987 report that discussed FAA's ability to maintain this equipment and, as subsequently agreed with Subcommittee staff, (1) determines whether shortages in the maintenance technician work force have adversely affected ATC operations and (2) assesses FAA's plans to increase its maintenance capability.

This report draws from work we performed at FAA headquarters and three of the agency's nine regional offices. We selected the Eastern, Great Lakes, and Southwest regions because they were included in our 1987 report and thus provided a frame of reference for assessing any changes in the ATC system at these locations since our report. As shown in table I.1., we visited six general NAS sector offices, three air route traffic control centers, and two sector field offices.¹

Table I.1: Locations Visited

Region	Sector	Sector field office
Eastern	Washington ARTCC Metro GNAS Capital GNAS	Dulles
Great Lakes	Chicago ARTCC Chicago GNAS Illinois GNAS	O'Hare
Southwest	Fort Worth ARTCC Dallas-Fort Worth GNAS Oklahoma City GNAS	

To determine whether shortages of qualified maintenance technicians have adversely affected ATC operations, we reviewed information on aircraft delays attributable to equipment outages and discussed authorized and actual staffing levels with field office personnel. We also analyzed FAA's demographic studies of projected retirements and supplemented this information with interviews of resource managers and budget officials at FAA headquarters and maintenance managers in field offices. In addition, we reviewed FAA data on overtime usage and contracts for maintenance services.

¹The sector office is responsible for monitoring, controlling, maintaining, and certifying facilities. Sectors are headquartered at 20 air route traffic control centers (ARTCC) and 80 general NAS (GNAS) sectors throughout the country. Sectors are subdivided into one or more sector field offices.

To determine the status of ATC operations, we reviewed FAA maintenance operation reports showing system outages, system reliability, equipment-caused air traffic delays, and preventive maintenance performed. We also reviewed FAA policies for restoring equipment to service and determining watch coverage. We supplemented this information with interviews of FAA maintenance and air traffic control managers.

To assess FAA's plans to supplement the maintenance work force with additional contractor technicians, we analyzed the proposal and discussed it with FAA maintenance managers at headquarters and in the field. We also reviewed the Federal Employees Pay Comparability Act of 1990 to identify alternatives to FAA's proposal. In addition, we reviewed current and proposed FAA directives concerning the roles of FAA and contractor personnel in certifying that equipment provides required service.

Our field work was conducted between November 1989 and September 1990, in accordance with generally accepted government auditing standards.

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