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FAA Work Force Issues

Statement of
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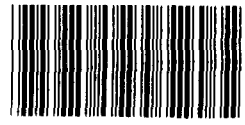
Subcommittee on Transportation of the
Senate Committee on Appropriations



Mr. Chairman and Members of the Subcommittee:

We appreciate this opportunity to comment on appropriation issues relating to Federal Aviation Administration's (FAA's) human resources, including adequate controller, inspector, and airway facilities maintenance work forces.

Our work over the past few years has shown that FAA needs more people in each of its major work forces. National Airspace System (NAS) plan delays have resulted in corresponding delays in air traffic controller and airway facilities maintenance productivity gains. And, FAA still needs more trained 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 inspector work force by 178 positions in fiscal year 1988. We are concerned, however, that FAA's fiscal year 1988 budget request does not reflect realistic maintenance staffing needs.

FAA's RESPONSE TO INCREASING AIR TRAFFIC

Deregulation of domestic airlines in 1978 affected FAA's responsibilities in two ways. First, air traffic grew to record levels and is expected to continue to grow. Increasingly competitive scheduling and hub and spoke operations have created peak air traffic periods placing extra demands on the air traffic control (ATC) system.

Even before deregulation, FAA knew that air traffic would continue to rise through the turn of the century, placing unprecedented demands on the ATC system. FAA also knew that

meeting these demands safely and efficiently would require improved and expanded services, additional facilities and equipment, improved work force productivity, and the orderly replacement of aging equipment. So in December 1981, FAA published a comprehensive NAS plan to modernize, automate, and consolidate the existing system.

In terms of dollars spent, the NAS plan is one of the largest single civil procurement programs ever, costing more than $16 billion by the year 2000. FAA believes the plan represents a practical way to achieve a significantly more efficient system while reducing the risks of mid-air and surface traffic collisions, landing- and weather-related accidents.

One NAS plan goal is to increase the productivity of various FAA work forces. Air traffic controller productivity is to be increased by an Advanced Automation System. Five years into the plan, however, the system has experienced schedule delays totaling 8 years resulting in corresponding delays in anticipated productivity gains. Meanwhile, FAA has not rebuilt the air traffic control workforce to its current staffing standards and goals.

The net result of FAA's actions to date is that FAA has fewer air traffic controllers now than it did in 1981 to handle more traffic within the same ATC system. FAA maintains that the system is presently operating safely and that there were more air traffic controllers than were needed before the 1981 strike.

We reported in March 1986[1] that during 1985 we had surveyed the controller work force including supervisors and managers, and found that they thought they were being stretched too thin. They believed the situation could impair their ability to maintain the proper margin of safety. Also our consultant, the Flight Safety Foundation, concluded that the ATC system was not as safe at the time of our survey as it was before the 1981 strike. We concluded that FAA could not quickly increase the number of air traffic controllers or provide new equipment to reduce their work load, leaving it only two choices: continue to stretch the controllers or limit air traffic. We recommended limiting traffic, but did not specify where or how. We did not have in mind a general limitation on the total quantity of air traffic, but rather limits on the quantities of air traffic in FAA's busiest control sectors at their busiest times. In other words, we believed that FAA should do more to tailor air traffic to the capabilities of its air traffic controllers.

In its response to our report and in hearings, FAA has stated that its existing traffic management system prevents controllers from having to control more traffic than they can safely handle and that the safety level of the ATC system is not being adversely affected. FAA also stated that, while controllers may perceive that they are overworked, the traffic management system includes a number of safeguards to preclude overload from happening.

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[1]Aviation Safety: Serious Problems Concerning the Air Traffic Control Work Force (GAO/RCED-86-121, March 6, 1986).

In addition to its central flow control program, FAA identified the following safeguards: (1) recent improvements to the traffic management system to predict overload and alert flow control, (2) local traffic management units (TMUs) at each of the 20 air route traffic control centers in the continental United States[2] and at designated airport towers responsible for monitoring traffic flow and ensuring that safe levels of air traffic are not exceeded, (3) first-line supervisors responsible for monitoring individual sectors and adjusting traffic flows, and (4) the controllers, themselves, who are responsible for making individual judgments on how much traffic they can safely handle.

FAA believes that these safeguards, if properly implemented, should accomplish the "tailoring" of air traffic that we believe is needed. However, we recently looked into how well these safeguards were working in the Chicago area to respond to inquiries from the Subcommittee on Government Activities and Transportation, House Committee on Government Operations. We reported at the Subcommitee's February 27, 1987, hearing, that none of the safeguards were fully implemented and were not reliable means for assuring that controllers are not faced with more traffic than they can safely handle.

First, the existing flow control program is designed to control aircraft departures and en route flows based primarily on weather conditions and capacity at arrival airports rather than

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[2]Air route traffic control centers, referred to as "en route centers" control flights between airports.

controller work load at the centers. Moreover, the en route sector loading program, intended to predict overloads in specific en route sectors and alert flow control, will not be fully operational for several more years because of limited computer capacity.

In addition to flow control, FAA says it looks to its traffic management coordinators, supervisors, and controllers to make judgments on how much traffic can be safely handled. But, the en route Chicago center traffic management unit was staffed with only four full-time coordinators, instead of the 21 called for by FAA staffing standards and the Chicago tower did not have a traffic management unit at all. In our 1985 survey, supervisors at the Chicago center told us they typically spent 60 percent of their time working traffic, and over 60 percent of them said that this hindered their ability to coordinate airspace and perform other procedural or operational matters. Half of them also said that they did not believe that they had sufficient say in determining the volume and complexity of traffic the controllers they supervised were expected to handle.

We also found that the hourly traffic capacity acceptance rates FAA had determined for O'Hare Airport did not directly consider controller staffing levels or the performance limits or capabilities of the controllers who are actually on duty.

So FAA's "safeguards" to preclude ATC system overload around Chicago boiled down mainly to depending on controllers to make individual judgments about how much traffic they could safely handle on the basis of their own professional knowledge,

experience, and skill. While we agree that professional judgment is invaluable, we also agree with the National Transportation Safety Board's (NTSB's) May 1983 conclusion that

> "the external management of controller work load through effective traffic volume metering and restrictions to ATC service should continue until the effective means to measure and monitor controller proficiency and performance are in place and have been validated."

Toward this end, NTSB, in its recent study on O'Hare recommended FAA establish traffic capacity acceptance rates that

> ". . . ensure that air traffic controller staffing levels and performance limitations are accounted for appropriately and that the air traffic controller team capabilities are not exceeded during peak traffic periods."

At your request, we gathered FAA data similar to the data we gathered at Chicago for other FAA centers and major terminals, which had experienced increased air traffic activity, to determine whether similar conditions existed elsewhere in the system. As is generally perceived, we found traffic substantially higher than pre-strike levels and experienced staffing levels lower than FAA goals. We also found FAA authorized traffic management unit staffing substantially below the levels called for by FAA's staffing standard in all 16 en route centers we checked, and actual

full-time staffing below the FAA-authorized levels in 11. We found full-time staffing levels below FAA-authorized levels for TMU's in 10 of the 12 towers, when applicable. And finally, we found that first line supervisors control traffic at least half of their total time in two centers and one tower.

From these data, we would conclude that the situation we found in Chicago is not unique and that there are other centers and towers in the air traffic control system where traffic tailoring based on controller work loads in peak periods may be needed to maintain safety.

FAA, with congressional encouragement, is working to increase its controller work force to 15,225 by the end of fiscal year 1988. This includes an increase of 225 in fiscal year 1988, and we believe the increase is needed. We cannot at this time, however, say how many air traffic controllers is enough.

FAA's RESPONSE TO THE NEED FOR GREATER AIRLINE SURVEILLANCE

Deregulation's second major effect on FAA came about because of the flood of new airlines and accompanying competitive fares that occurred in commercial aviation after deregulation, creating an environment which pressured airlines to contain expenditures for aircraft maintenance, flight crew salaries, and other controllable expenses--a situation that required greater FAA surveillance over airline operations and maintenance.

While the 1978 act removed government control over fare costs and schedules, FAA remained responsible for assuring that airlines comply with federal safety regulations. Until 1984, however, FAA took few steps to address the impact deregulation had on its safety inspection work load or staffing requirements. For example, between 1978 and 1983, when the number of airlines and aircraft grew substantially, FAA's inspector work force was reduced from about 1,600 to about 1,500 or 7 percent.

In May 1986 we testified that FAA could not say with assurance that airlines were complying with federal safety regulations. FAA studies--as well as those conducted by the Office of Inspector General and by us--showed that FAA's airline inspection and follow-up activities were often insufficient to identify major safety problems or to ensure that problems were corrected once they were detected. For example, FAA's 1985 Safety Activity Functional Evaluation--Project SAFE--found that FAA surveillance of airlines was often ineffective and that broad changes in FAA's inspection program were needed to improve aviation safety. Moreover, several NTSB investigations criticized FAA's inspection program and concluded that ineffective FAA inspections contributed to aircraft accidents.

FAA also concluded that it needed to improve its surveillance of airlines and, building on initiatives launched by the Secretary of Transportation, has begun to take action on a broad front. FAA had increased the size of its inspector work force to 1,919 as of the end of fiscal year 1986. FAA has established minimum

inspection standards to identify what inspections need to be performed and how frequently, and affirmed that inspections--not certification of potential new airlines--are the inspectors' number one priority. FAA has also begun to address needed improvements in its internal controls and management information systems.

FAA expected to increase its number of inspector positions in by the end of 1987 to 1,975 and has requested an additional 178 inspector positions in fiscal year 1988. Even with these additions, though, it will be years before all the needed improvements in inspector hiring, training, and guidance are implemented; important regulatory revisions are completed; nationwide minimum standards, for the type and frequency of airline inspections, are revised to include characteristics that indicate possible safety deficiencies at a given airline; and adequate internal controls and management information systems are in place.

While FAA's requested increase in inspector positions is apparently warranted, FAA cannot at present know how many inspectors are needed or where they should be assigned. FAA does not now have agencywide inspection standards that permit an accurate analysis of staffing needs; current inspection guidelines specify only minimum inspection requirements applicable to all airlines. As a result, FAA's current staffing estimates are based on judgments that are not supported by guidance to inspectors on how many inspections should be performed. Our report, which discusses these issues will be out within the next several weeks.

We will recommend improvements in FAA's staffing standards to address this problem.

FAA RESPONSE TO AN AGING AIRWAY FACILITIES MAINTENANCE WORK FORCE

Competing budgetary priorities and FAA's commitment to reduce airway facilities maintenance staffing as part of the productivity gains to be derived from the NAS plan have caused a shortfall in the funding available for FAA maintenance staffing. Until recently, FAA has not filled maintenance vacancies because of hiring freezes and personnel restrictions and during fiscal year 1987, FAA plans to maintain staffing at a level 16 percent below the field's work load as projected by FAA's maintenance staffing standard.

Last year, the Congress restored the number of Full Time Equivalent (FTE) maintenance employees FAA proposed to cut. We believe that FAA's fiscal year 1988 budget request once again does not realistically reflect maintenance staffing needs.

FAA should hire in advance of attrition for the maintenance work force to allow time for training. By 1990 about 2,500 of FAA's 8,300 engineers and technicians will be eligible to retire. By 1995 almost 60 percent of the maintenance work force will be retirement eligible. Because training takes from 2 to 5 years, FAA needs to begin hiring people now to establish a pipeline for when these technicans leave.

So far, FAA has been hiring only to fill vacancies when they occur. This approach replaces qualified, experienced technicans

who can carry full work loads with inexperienced technicans who will need extensive training, and results in inefficiencies and skill shortages, reduces total routine maintenance, increases equipment outages, and demoralizes the work force. In addition, flight delays caused by FAA equipment failures increased 22 percent more than total delays increased between fiscal years 1985 and 1986.

Because of the current and projected staffing shortages and the time required to train technicians, we believe FAA needs to begin a hiring effort aimed at bringing its field work force closer to the currently congressionally authorized level of about 9,300.

MEASURING THE LEVEL OF AVIATION SAFETY

FAA's human resource problems are often cited as affecting the level of aviation safety. This perception is bolstered by surveys over the last 2 years, including the Air Line Pilots Association's June 1986 survey of its members and our 1985 survey of the controller work force. Both of which suggested that the level of aviation safety had declined.

FAA, on the other hand, points to an aviation accident rate that has fallen over the last 2 decades as an indication that the level of aviation safety has increased. The aviation accident rate, however, may not be the best indicator of the margin of safety in our national airspace. This is because many different things usually have to go wrong before an accident occurs. Investigators have observed that unsafe operating practices do not inevitably lead to accidents and, unfortunately, accidents can

occur in even the best managed airspace. In either case, accidents occur so rarely that they cannot be used alone to analyze aviation safety.

For these reasons, more specific measures--precursors of safety risk--are needed to identify and direct attention to unsafe or high-risk conditions. FAA uses two precursors, near mid-air collisions and operational errors, as additional indicators of national airspace safety. Near mid-air collisions are classified by FAA according to the degree of hazard to air safety. According to FAA, a near-mid air collision could potentially occur when two airborne aircraft inadvertently come within 500 feet of each other. Operational errors occur when there is less than the applicable minimum separation distance between two or more aircraft or between an aircraft and terrain or obstacles and obstructions. In its July 1986 response to our March 1986 report on the controller work force, the Department of Transportation said that a major indicator of how safely the system is being operated is the number of operational errors that occur over a given period of time.

Recent fluctuations in these two safety indicators have resulted in calls for changes to the ATC system. We must caution here that, while near mid-air collisions and operational errors may be good indicators of national airspace safety, we have not evaluated how accurate FAA's data may be or whether the data are consistently collected from year to year. For example, in 1985, FAA implemented a monitoring system intended to enhance the reliability of the near mid-air collision pilot reporting process.

According to the FAA, the new system contributed to a rise in 1985 pilot report totals compared to prior years.

FAA has not yet identified precursors of risk to indicate how safely airlines are operating and maintaining their aircraft. We have suggested the frequency and severity of airline noncompliance with safety regulations and standards over time as one possibility. Changes in the total number of safety deficiencies and the frequency of those considered to directly or adversely affect safety could be used to indicate whether an airline's level of safety has changed from year to year and where additional FAA inspections may be needed. But, FAA would have to improve its inspection guidance and management information system before adequate and comparable data could be available to use as risk precursors.

THE BOTTOM LINE

We believe our recommendations for maintaining air traffic control system safety and enhancing the effectiveness of FAA's airline inspections are still appropriate. We also believe FAA should take steps to improve its air traffic control equipment maintenance including hiring and training additional technicians. This subject will be discussed in more detail in a report we expect to issue this summer. We believe increases are needed in each of these work forces.

While air travel remains safer than many things we do in our society, we believe the evidence we have gathered over the past few years that the margin of safety FAA maintains through its air

traffic control system and airline inspection program is not what it could be. Some steps FAA has taken to maintain safety have not been fully implemented. FAA could increase the safety margin by acting on our recommendations and there are other steps FAA could take to increase it even more, but neither GAO nor FAA can tell the Congress or the public when the margin is sufficient. One thing FAA could do to help the Congress understand how safe air travel is, would be to identify a reasonable set of safety indicators, what we call precursors of risk, and then measure them accurately and consistently from period to period. FAA has used three such measures, (accidents, operational errors and near mid-air collisions) but all are presently open to questions about their accuracy, consistency, and usefulness.

Until such yardsticks can be agreed upon, we all will be feeling our way along, judging what should be done based on sometimes differing perceptions of safety and the public interest.

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