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## Testimony

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# AVIATION SAFETY

## Targeting and Training of FAA's Safety Inspector Workforce

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Mr. Chairman and Members of the Subcommittee:

We appreciate the opportunity to testify on the Federal Aviation Administration's (FAA) safety inspection program. Although the accident rates for air travel in this country are among the lowest in the world and aviation is one of the safest means of transportation, recent fatal accidents have raised concerns about the safety of air travel. FAA's Office of Flight Standards Service develops the federal aviation regulations that airlines must follow and prepares guidance on how FAA safety inspectors should perform inspections. This office also inspects commercial and general aviation aircraft, aircraft repair stations, schools for pilot training and maintenance, and pilots. These inspections serve as part of an early warning system to identify potential safety-related problems. Our testimony today draws on our work since 1987 on FAA's targeting of inspection resources and its inspector training.<sup>1</sup> In addition, we interviewed about 50 inspectors for this and other work and have incorporated their comments on training where relevant to the issues discussed in this testimony. The comments made by these inspectors are not projectable to FAA's entire inspection training program, but their views and ongoing work by the Department of Transportation's Inspector General (DOT IG) indicate that long-standing problems with inspector training continue to exist.

In summary, we have found that

- FAA needs to target its inspection resources to the areas of greatest potential risk. Because of the magnitude of the inspectors' workload, targeting is essential because FAA may never have enough resources to inspect all pilots, aircraft, and facilities. Since 1991, FAA has been working to develop its Safety Performance Analysis System (SPAS) to target resources for aviation inspections. However, problems with the quality of the source data, such as data on the results of safety inspections, jeopardize the potential benefits of the \$32-million SPAS system. We recommended in February 1995 that FAA develop a comprehensive strategy to improve the quality of these data. FAA officials planned to develop such a strategy by the end of 1995, but the strategy drafted by an FAA contractor has yet to receive agency approval.
- Over the last decade, we, the DOT IG, and FAA have reported on problems related to the technical training for inspectors, including inspectors performing inspections for which they did not have appropriate or current credentials. Our work has shown persistent problems with FAA's training of

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<sup>1</sup>Related GAO Products are listed at the end of this testimony.

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inspectors. Specifically, inspectors have been unable to take courses that they believe are necessary to perform their inspection responsibilities. Additionally, FAA has limited aircraft-specific training and decreased the frequency of flight training for inspectors responsible for overseeing pilot proficiency. Decreases in FAA's overall budget have reduced the funding available for technical training by 42 percent from fiscal years 1993 through 1996. FAA estimates that it will have a shortfall of \$20 million for technical training that FAA had identified as essential in its fiscal year 1996 training needs assessment process.

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## FAA Efforts to Develop an Inspector Targeting System

As early as 1987, we identified the need for FAA to develop criteria for targeting safety inspections to airlines with characteristics that may indicate safety problems and noted that targeting was important because FAA may never have enough resources to inspect all aircraft, facilities, and pilots. FAA employs about 2,500 aviation safety inspectors to oversee about 7,300 scheduled commercial aircraft, more than 11,100 charter aircraft, about 184,400 active general aviation aircraft, about 4,900 repair stations, slightly more than 600 schools for training pilots, almost 200 maintenance schools, and over 665,000 active pilots.

Although FAA has taken steps to better target its inspection resources to areas with the greatest safety risks, these efforts are still not complete. SPAS, which FAA began developing in 1991, is intended to analyze data from up to 25 existing databases that contain such information as the results of airline inspections and the number and the nature of aircraft accidents. This system is then expected to produce indicators of an airline's safety performance, which FAA will use to identify safety-related risks and to establish priorities for FAA's inspections. FAA completed development and installation of the initial SPAS prototype in 1993. As of April 1996, FAA had installed SPAS in 59 locations but is experiencing some logistical problems in installing SPAS hardware and software. Full deployment of the \$32-million SPAS system to all remaining FAA locations nationwide is scheduled to be completed in 1998.

In February 1995, we reported that although FAA had done a credible job in analyzing and defining the system's user requirements, SPAS could potentially misdirect FAA resources away from the higher-risk aviation activities if the quality of its source data is not improved.<sup>2</sup> SPAS program officials have acknowledged that the quality of information in the

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<sup>2</sup>Aviation Safety: Data Problems Threaten FAA Strides on Safety Analysis System (GAO/AIMD-95-27, Feb. 8, 1995).

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databases that are linked to SPAS poses a major risk to the system. To improve the quality of data to be used in SPAS analyses, we recommended that FAA develop and implement a comprehensive strategy to improve the quality of all data used in its source databases. FAA concurred with the need for this comprehensive strategy and planned to complete it by the end of 1995. As of April 1996, the strategy drafted by an FAA contractor had not been approved by agency management. Until FAA completes and implements its strategy, the extent and the impact of the problems with the quality of the system's data will remain unclear.

Although we have not determined the full extent of the problems, our recent audit work and recent work by the DOT IG have identified continuing problems with the quality of data entered into various source databases for SPAS. FAA's Program Tracking and Reporting Subsystem (PTRS), which contains the results of safety inspections, has had continuing problems with the accuracy and consistency of its data. Several FAA inspectors mentioned concerns about the reliability and consistency of data entered into PTRS. According to an inspector who serves on a work group to improve SPAS data inputs, reviews of inspectors' entries revealed some inaccurate entries and a lack of standardization in the comment section, where inspectors should report any rules, procedures, practices, or regulations that were not followed. He said inspectors continued to comment on things that were not violations while some actual violations went unreported. For example, during our ongoing work we recently found a PTRS entry indicating an inspection that never occurred on a type of aircraft that the carrier did not use. The DOT IG also concluded in a November 1995 report that FAA inspectors did not consistently and accurately report their inspection results in PTRS because reporting procedures were not interpreted and applied consistently by FAA inspectors, and management oversight did not identify reporting inconsistencies.<sup>3</sup> The DOT IG recommended that FAA clarify PTRS reporting procedures to ensure consistent and accurate reporting of inspections and to establish controls to ensure supervisors review PTRS reports for reporting inconsistencies and errors. Such problems can jeopardize the reliability of SPAS to target inspector resources to airlines and aircraft that warrant more intensive oversight than others.

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<sup>3</sup>Surveillance of Pilot Schools: Federal Aviation Administration, Office of Inspector General, U.S. Department of Transportation, R9-FA-002, (Nov. 8, 1995).

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## Adequacy of Inspector Training Continues to Be a Concern

Over the last decade, we, the DOT IG, and internal FAA groups have repeatedly identified problems and concerns related to the technical training FAA has provided to its inspectors. For example, both we and the IG have reported that FAA inspectors were inspecting types of aircraft that they had not been trained to inspect or for which their training was not current. In the wake of these findings, FAA has revised its program to train inspectors by (1) developing a process to assess training needs for its inspector workforce, (2) attempting to identify those inspections that require aircraft-specific training and limiting this training to the number of inspectors needed to perform these inspections, and (3) decreasing the requirements for recurrent flight training for some of its inspectors.

However, our interviews with 50 inspectors indicate that some inspectors continue to perform inspections for which they are not fully trained, and some inspectors do not believe they are receiving sufficient training. While we cannot determine the extent of these problems from our limited interviews, the training issues reflect persistent concerns on which we and others have reported for many years. For example, we reported in 1989 that airworthiness inspectors received about half of the training planned for them in fiscal year 1988.<sup>4</sup> Furthermore, we reported in 1989 and the DOT IG reported again in 1992 that inspectors who did not have appropriate training or current qualifications were conducting flight checks of pilots.<sup>5</sup> The Director of FAA's Office of Flight Standards Service acknowledged that the adequacy of inspector training remains a major concern of inspectors.

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## Some Inspectors Still Do Not Receive Needed Technical Training

Recognizing that some of its employees had received expensive training they did not need to do their jobs while others did not receive essential training, in 1992 FAA developed a centralized process to determine, prioritize, and fund its technical training needs. This centralized process is intended to ensure that funds are first allocated for training that is essential to fulfilling FAA's mission. In accordance with this process, each FAA entity has developed a needs assessment manual tailored to the entity's activities and training needs. For example, the manual for the Flight Standards Service outlines five categories of training. The highest priority is operationally essential training, which is defined as training required to provide the skills needed to carry out FAA's mission. The other four categories, which are not considered operationally essential, involve

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<sup>4</sup>Aviation Training: FAA Aviation Safety Inspectors Are Not Receiving Needed Training (GAO/RCED-89-168, Sept. 2, 1989).

<sup>5</sup>Audit of Aviation Inspection Program: Federal Aviation Administration, Office of Inspector General, U.S. Department of Transportation, R6-FA-2-084, (May 29, 1992).

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training to enhance FAA's ability to respond to changes in workload, to use new technologies, to enhance individual skills, or to provide career development. To identify initial course sequences for new hires and time frames for their completion as well as some continuing development courses that are not aircraft-specific, FAA created profiles for the various types of inspectors.

Although each profile notes that additional specialized training may be required according to an inspector's assigned responsibilities and prior experience, the centralized process provides no guidance for analyzing individualized needs. According to several inspectors we interviewed who had completed initial training, they were not receiving the specific technical training needed for their assigned responsibilities. The inspectors said that the assessment process does not fully address their advanced training needs and that some inspectors were performing inspections for which they have not received training. For example, one maintenance inspector told us he was responsible for inspecting seven commuter airlines but had never attended maintenance training school for the types of aircraft he inspects. He said that he had requested needed training for 5 years with his supervisor's approval, but his requests were not ranked high enough in the prioritization process to receive funding. Instead, FAA sent the maintenance inspector to training on Boeing 727s and composite materials, which were not related to the aircraft he was responsible for. He said that he did not request these courses and assumed he was sent to fill available training slots. Another maintenance inspector said that although he was trained on modern, computerized Boeing 767s, he was assigned to carriers who fly 727s, 737s, and DC-9s with older mechanical systems.

While the Director of the Flight Standards Service said that inspectors could obtain some aircraft-specific training by attending classes given by the airlines they inspect, inspectors with whom we spoke said that supervisors have not allowed them to take courses offered by airlines or manufacturers because their participation could present a potential conflict of interest if the courses were taken for free. Some inspectors we interviewed said that when they could not obtain needed training through FAA they have audited an airline's classes while inspecting its training program. Although the inspectors might acquire some knowledge by auditing an airline's class, they stressed that learning to oversee the repair of complex mechanical and computerized systems and to detect possible safety-related problems requires concentration and hands-on learning, not merely auditing a class. The inspectors said that extensive familiarity with

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the aircraft and its repair and maintenance enhances their ability to perform thorough inspections and to detect safety-related problems.

While technical training is especially important when inspectors assume new responsibilities, other inspectors we interviewed said that they sometimes do not receive this training when needed. For example, although an operations inspector requested Airbus 320 training when a carrier he inspected began using that aircraft, he said that he did not receive the training until 2 years after that carrier went out of business. Similarly, several inspectors told us that despite their responsibility to approve global positioning system (GPS) receivers, a navigation system increasingly being used in aircraft, they have had no formal training on this equipment. Finally, a maintenance inspector, who was responsible for overseeing air carriers and repair stations that either operate or repair Boeing 737, 757, 767, and McDonnell Douglas MD-80 aircraft, said that the last course he received on maintenance and electronics was 5 years ago for the 737. Although the other three aircraft have replaced mechanical gauges with more sophisticated computer systems and digital displays, the inspector has not received training in these newer technologies. While acknowledging the desirability of updating training for new responsibilities, the Director of the Flight Standards Service said that prioritizing limited training resources may have defined essential training so narrowly that specialized training cannot always be funded.

The Acting Manager of FAA's Flight Standards National Field Office, which oversees inspector training, told us that to improve training programs for inspectors FAA is also providing training through such alternative methods as computer-based instruction, interactive classes televised via satellite, and computer-based training materials obtained from manufacturers. However, the effectiveness of these initiatives depends on how FAA follows through in promoting and using them. For example, while FAA has developed a computer-based course to provide an overview of GPS, the course is not currently listed in the training catalogue for the FAA Academy. We found that several inspectors who had requested GPS training were unaware of this course. According to the Manager of the Regulatory Standards and Compliance Division of the FAA Academy, their lack of awareness may be because the course is sponsored by a different entity of FAA, the Airway Facilities Service. If this GPS course meets inspectors' needs, they could be informed of its availability through a special notice and by cross-listing it in FAA's training catalogue. The extent to which inspectors will use distance learning equipment (e.g., computer-based instruction) and course materials depends in great part on their awareness



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of existing courses and whether the equipment and software are readily available.

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### FAA Has Limited the Number of Inspectors Who Receive Aircraft-Specific Training

Because of resource constraints, FAA has reduced the number of inspections for which aircraft-specific training is considered essential and has limited such training to inspectors who perform those inspections. For example, FAA requires inspectors to have pilot credentials (type ratings by aircraft) when they inspect commercial aircraft pilots during flight. FAA has a formula to determine how many inspectors each district office needs to perform inspections requiring aircraft-specific skills. A district office must perform a minimum number of aircraft-specific inspections each year to justify training for that type of aircraft. Offices that perform fewer than the minimum number of inspections that require specialized skills may borrow a “resource inspector” from FAA headquarters or a regional office. According to the Director of the Flight Standards Service, FAA cannot afford to maintain current pilot credentials for all inspectors so they can conduct pilot inspections.

However, inspectors interviewed mentioned problems with using resource inspectors, although we have not determined how pervasive these problems are. Some of the inspectors said that they had difficulties obtaining resource inspectors when needed. Additionally, they said that sometimes resource inspectors are not familiar with the operations and manuals of the airline they are asked to inspect and may therefore miss important safety violations of that airline’s policies or procedures. For example, while one inspector, who had primary responsibility for a carrier that was adding a new type of aircraft, had to terminate the inspection because the airline’s crew was not operating in accordance with the carrier’s operations manual, the resource inspector who accompanied him had not detected this problem because he was unfamiliar with that carrier’s specific procedures. In responding to these concerns, the Director of the Flight Standards Service acknowledged that the resource inspector may need to be paired with an inspector familiar with the airline’s manuals.

According to the Director of the Flight Standards Service and the Acting Manager of the Evaluations and Analysis Branch, identifying inspections that require aircraft-specific training and limiting training to those who perform such inspections has reduced the number of inspectors who need expensive aircraft-specific flight training. They said this policy also helps to ensure that inspections requiring a type rating are only conducted by

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inspectors who hold appropriate, current credentials. As we recommended in 1989, reevaluating the responsibilities of inspectors, identifying the number needed to perform flight checks, and providing them with flight training makes sense in an era of limited resources for technical training.

The DOT IG's ongoing work has found differences of opinion and confusion within FAA about which inspections require aircraft-specific training and type ratings. For example, while the Flight Standards Service training needs assessment manual lists 48 inspection activities for which operations inspectors need aircraft-specific training,<sup>6</sup> during the DOT IG's ongoing audit the Acting Manager of the Evaluations and Analysis Branch listed only 15 inspection activities requiring current type ratings. Until FAA identifies the specific inspection activities that require aircraft-specific training or type ratings, it will remain unclear whether some inspections are being performed by inspectors without appropriate credentials. The DOT IG's ongoing study is evaluating this issue in more detail.

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## FAA Has Reduced Flight Training Requirements for Operations Inspectors

We and the DOT IG have previously reported that FAA inspectors making pilot flight checks either did not have the credentials (type ratings) or were not current in their aircraft qualifications in accordance with FAA requirements. Being current is important because some inspectors may actually have to fly an aircraft in an emergency situation. In May 1993, FAA decreased the frequency of inspector training and more narrowly defined those inspector activities requiring type ratings. Under FAA's previous policy, inspectors overseeing air carrier operations received actual flight training (aircraft or simulator flying time) every 6 months to maintain their qualifications to conduct flight checks on pilots. FAA now requires recurrent flight training every 12 months and limits this requirement to those inspectors who might actually have to assume the controls (flight crewmember, safety pilot, or airman certification) in aircraft requiring type ratings. Because inspectors who ride in the jump seat would not be in a position to assume control of an aircraft, they no longer need to remain current in their type ratings, whereas inspectors of smaller general aviation aircraft who might actually have to assume the controls, are required to receive flight training. However, this annual requirement for general aviation inspectors has been changed to every 24 months.

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<sup>6</sup>Operations inspectors generally monitor the operational aspects of an airline, including pilot certification and performance, flight crew training, and in-flight record keeping.

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Inspectors we interviewed opposed the change requiring less frequent flight training. An operations inspector for general aviation aircraft believed training every 2 years was inadequate for inspectors who have to be at the controls every time they conduct a check ride. Another inspector, who is type rated in an advanced transport category aircraft, said he has not received any aircraft flying time and only half the simulator time he needs.

According to the Acting Manager of the Evaluations and Analysis Branch, the decision to reduce the requirements for flight training was driven by budget constraints, and FAA has not studied the potential or actual impact of this reduction. Consequently, it is unknown whether the change in inspector flight training frequency is affecting aviation safety. The Director of the Flight Standards Service said that FAA has been placed in a position of having to meet the safety concerns of the aviation industry and the public at a time when air traffic is projected to continue increasing while resources are decreasing.

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### Funding for Technical Training Has Decreased Significantly

Between fiscal years 1993 and 1996, decreases in FAA's overall budget have significantly reduced the funding available for technical training. FAA's overall training budget has decreased 42 percent from \$147 million to \$85 million. FAA has taken a number of steps over the years to make its technical training program more efficient. For example, the prescreening of air traffic controller trainees has improved the percentage of students who successfully complete this training and decreased the number of FAA and contract classes needed. Additionally, in response to our recommendation, FAA has limited expensive flight training to inspectors who require current flight experience. FAA has also realized savings from the increased use of distance learning (e.g., computer-based instruction) and flight simulation in place of more expensive aircraft training time.

FAA's reduced funding for technical training has occurred at a time when it has received congressional direction to hire over 230 additional safety inspectors in fiscal year 1996. To achieve this staffing increase, FAA will have to hire about 400 inspectors to overcome attrition. New staff must be provided initial training at the FAA Academy to prepare them to assume their new duties effectively. The cost of this training, combined with overall training budget reductions, constrains FAA's ability to provide its existing inspectors with the training essential to effectively carry out FAA's safety mission.

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For fiscal year 1996, FAA's training needs assessment process identified a need for \$94 million to fund operationally essential technical training. However, due to overall budget reductions, FAA was allocated only \$74 million for this purpose. For example, the budget for Regulation and Certification is \$5.2 million short of the amount identified for operationally essential training. Specific effects of this shortfall include: delaying the training of fourth quarter inspector new hires until fiscal year 1997; cancellation of 164 flight training, airworthiness, and other classes planned to serve over 1,700 safety inspectors; and delay of recurrent and initial training for test pilots who certify the airworthiness of new aircraft. Based on the fiscal year 1997 request, the gap between FAA's request and the amount needed to fund operationally essential technical training will be even greater in fiscal year 1997, in part because of training postponed in fiscal year 1996. Regulation and Certification, for example, is projecting an \$8.1-million shortfall in operationally essential training.

FAA's Center for Management Development in Palm Coast, Florida, which provides management training in areas such as leadership development, labor-management relations, and facilitator skills, has experienced a 9-percent funding decrease since fiscal year 1993. At a time when FAA's overall staffing has decreased from 56,000 in fiscal year 1993 to around 47,600 in fiscal year 1996, these decreases have not been reflected in the center's costs or level of activity.

An FAA contractor study completed in April 1995 showed that co-locating the center with the FAA Academy in Oklahoma City would result in cost savings of a half million dollars or more per year. Specifically, the study estimated that FAA could save between \$3.4 million and \$6.3 million over the next 10 years by transferring the center functions to the FAA Academy. The study also identified such intangibles as adverse employment impacts in the Palm Coast area that could be considered in making a relocation decision. FAA management currently supports retention of the center. In reviewing this study, we have identified potential additional savings that could increase the savings from relocating this facility to as much as \$1 million annually. For example, the study estimated that easier commuting access to Oklahoma City would save \$2.5 million in staff time over the 10-year period, an amount that was not included in the study's overall savings estimate. The study also did not consider reducing or eliminating center staff who duplicate functions already available at the FAA Academy, such as course registration and evaluation. In an era of constrained budgets where funding shortfalls for essential technical training have become a reality, FAA must find ways to make the best use of

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all available training resources. Moving the center's functions to the FAA Academy should be seriously considered—particularly since FAA's 10-year lease on the center facility expires in August 1997.

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Mr. Chairman, this concludes our statement. We would be pleased to respond to questions at this time.

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# Related GAO Products

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Aviation Safety: Data Problems Threaten FAA Strides on Safety Analysis System (GAO/AIMD-95-27, Feb. 8, 1995).

FAA Technical Training (GAO/RCED-94-296R, Sept. 26, 1994).

Aircraft Certification: New FAA Approach Needed to Meet Challenges of Advanced Technology (GAO/RCED-93-155, Sept. 16, 1993).

FAA Budget: Important Challenges Affecting Aviation Safety, Capacity, and Efficiency (GAO/T-RCED-93-33, Apr. 26, 1993).

Aviation Safety: Progress on FAA Safety Indicators Program Slow and Challenges Remain (GAO/IMTEC-92-57, Aug. 31, 1992).

Aviation Safety: Commuter Airline Safety Would Be Enhanced With Better FAA Oversight (GAO/T-RCED-92-40, Mar. 17, 1992).

Aviation Safety: FAA Needs to More Aggressively Manage Its Inspection Program (GAO/T-RCED-92-25, Feb. 6, 1992).

Aviation Safety: Problems Persist in FAA's Inspection Program (GAO/RCED-92-14, Nov. 20, 1991).

Serious Shortcomings in FAA's Training Program Must Be Remedied (GAO/T-RCED-90-91, June 21, 1990, and GAO/T-RCED-90-88, June 6, 1990).

Staffing, Training, and Funding Issues for FAA's Major Work Forces (GAO/T-RCED-90-42, Mar. 14, 1990).

Aviation Safety: FAA's Safety Inspection Management System Lacks Adequate Oversight (GAO/RCED-90-36, Nov. 13, 1989).

Aviation Training: FAA Aviation Safety Inspectors Are Not Receiving Needed Training (GAO/RCED-89-168, Sept. 14, 1989).

FAA Staffing: Recruitment, Hiring, and Initial Training of Safety-Related Personnel (GAO/RCED-88-189, Sept. 2, 1988).

Aviation Safety: Measuring How Safely Individual Airlines Operate (GAO/RCED-88-61, Mar. 18, 1988).

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**Related GAO Products**

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Aviation Safety: Needed Improvements in FAA's Airline Inspection Program Are Underway (GAO/RCED-87-62, May 19, 1987).

FAA Work Force Issues (GAO/T-RCED-87-25, May 7, 1987).

Department of Transportation: Enhancing Policy and Program Effectiveness Through Improved Management (GAO/RCED-87-3, Apr. 13, 1987).



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