AIR TRANSPORTATION OVERSIGHT SYSTEM

Federal Aviation Administration

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Memorandum

U.S. Department of Transportation
Office of the Secretary of Transportation
Office of Inspector General

Subject: ACTION: Report on the Air Transportation Oversight System
Federal Aviation Administration
Report No. AV-2002-088

Date: April 8, 2002

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Assistant Inspector General for Auditing

Reply to Attn. of: JA-10:x60500

To: Federal Aviation Administrator

This report presents the results of our audit of the Federal Aviation Administration's (FAA) Air Transportation Oversight System (ATOS). This report is in response to requests by the Senate Committee on Commerce, Science, and Transportation and the House Committee on Transportation and Infrastructure. We met with members of your senior management staff and considered their written comments in preparing this report.

The objectives of our audit were to assess FAA's progress in implementing ATOS and identify barriers to successfully implementing ATOS.[1] ATOS is FAA's new approach to air carrier safety oversight. The new system is an important change in the way FAA conducts air carrier safety inspections because it shifts FAA's oversight beyond the traditional inspection method of simply checking an air carrier's compliance with regulations to identifying and assessing risks to safety. FAA initiated ATOS at 10 of the Nation's largest passenger air carriers on October 1, 1998. While FAA has made progress, this report provides details on the work that still needs to be done to fully implement this new system.

Although the aviation industry and FAA agree that ATOS is conceptually sound, in actual field operations, the system is not reaching its full potential and significant challenges to full implementation still exist. First, FAA needs to finish developing and testing key elements of ATOS, its processes for analyzing ATOS inspection results and for ensuring corrective actions are implemented for weaknesses found in air carrier maintenance and operations systems. Second,

[1] See Exhibit A for a more detailed description of our audit objectives, scope, and methodology.

FAA needs to better prepare its inspectors to carry out ATOS by improving inspector training and locating qualified inspectors where they are needed most. Third, FAA needs to establish strong national oversight and accountability to ensure consistent ATOS field implementation.

FAA agreed with our recommendations to complete development of key aspects of the ATOS process; follow through on planned enhancements to procedures for collecting and analyzing important ATOS safety data; and provide improved training to all ATOS inspectors. In addition, FAA agreed to locate qualified inspectors where they are needed most; strengthen national ATOS program oversight and accountability; and finalize a comprehensive plan with goals and milestones for completing development and planned enhancements to the ATOS program.

However, FAA did not agree that inspectors need formal training on the recent integration of the ATOS inspection database with the agency's automated inspection analysis system, referred to as the Safety Performance Analysis System, or SPAS. Because the lack of adequate training for inspectors has been a long-standing problem cited in General Accounting Office (GAO) and OIG reports on FAA's oversight and is also one of the primary factors impeding FAA's implementation of ATOS, we continue to believe formal training is necessary. In addition, FAA expressed concerns with statements in our report regarding the status of ATOS implementation and the quality of training previously provided to ATOS inspectors. FAA's comments and our position on these issues are discussed in greater detail in Agency Comments and Office of Inspector General Comments on page 24, and FAA's full comments are provided in the Appendix.

Background

The safety of U.S. air passengers is the joint responsibility of the air carriers and FAA. The 139 commercial air carriers operating in the United States have developed unique and complex systems to provide safe and efficient operations. These systems are only part of the many aviation systems that FAA's 3,300 aviation safety inspectors must oversee to ensure safety standards are maintained. In addition to the 139 air carriers, FAA inspectors monitor approximately 5,200 repair stations, 637,000 active pilots, 273,000 mechanics, 7,600 commercial aircraft, 11,000 charter aircraft, 220,000 general aviation aircraft, and 700 training facilities located in 9 FAA regions.

In recent years, significant concerns have been expressed about the quality of FAA's aviation safety inspections and the training of its inspector workforce. In the aftermath of the 1996 ValuJet accident, FAA formed a task force to perform a 90-day review of its safety inspection process. The task force recommended that

FAA base its inspections on an assessment of safety risks, rather than simply verifying whether carriers complied with FAA requirements. To accomplish this recommendation, FAA hired a contractor to conduct a comprehensive analysis of FAA's air carrier oversight process. The results of this project became the framework for developing ATOS.

FAA initiated ATOS at 10 of the Nation's largest passenger air carriers on October 1, 1998.[2] Nearly 500 of FAA's 3,300 aviation safety inspectors are assigned to monitor the 10 ATOS air carriers. All other inspectors continue to conduct inspections of the remaining 129 air carriers using FAA's traditional inspection procedures.

As shown in Figure 1, there are several key differences between the traditional inspection system and ATOS. ATOS identifies safety risks based on analysis of data resulting from inspections of air carrier systems, such as flight operations. FAA's old inspection system relies on random inspection activities, such as repeatedly observing aircraft parked at departure gates, that focus on determining air carriers' compliance with FAA regulations. *ATOS corrects a long-standing flaw in FAA's traditional inspection system by limiting the likelihood of repetitive inspections of the same aircraft or function, even though no deficiencies had been found in prior inspections of the aircraft or function.*

Figure 1. Key Differences Between the Traditional and New Inspection Systems

Traditional Inspection System:

- Focuses on inspectors completing a prescribed number of inspection activities
- Relies on individual inspector expertise
- Strictly based on checking air carrier compliance with regulations

New Inspection System (ATOS):

- Inspectors develop surveillance plans for each air carrier, based on data analysis, and adjust the plan periodically based on inspection results
- Analysts review air carrier data to identify areas of safety risks
- Focus is on safety vulnerabilities rather than regulatory compliance

Although ATOS has not been extended beyond the 10 major air carriers, FAA has taken steps to introduce concepts used in ATOS into its traditional oversight process for the remaining 129 air carriers. In November 1999, FAA instructed its inspectors to begin adjusting planned inspections for new air carriers[3] based on an evaluation of areas of potential safety risks. Beginning in fiscal year 2001, while not a part of the ATOS system, inspectors are to perform safety risk evaluations of all other non-ATOS carriers using ATOS risk assessment principles. However, the inspections of the 129 carriers are still based on a determination of whether air

[2] The 10 ATOS air carriers are Alaska Airlines, America West Airlines, American Airlines, Continental Airlines, Delta Air Lines, Northwest Airlines, Southwest Airlines, Trans World Airlines, United Airlines, and US Airways.

[3] Air carriers are considered new entrants (or new air carriers) for their first 5 years of operation.

carriers are complying with regulations rather than whether air carriers' systems are operating effectively.[4]

Results in Brief

FAA oversees the largest, busiest, and one of the safest air transportation systems in the world. To maintain this level of safety, it is essential that FAA have a proactive safety oversight approach because FAA does not have sufficient resources to monitor all aspects of U.S. air carrier operations. More than 3 years ago, in October 1998, FAA moved to a proactive approach to aviation safety oversight of air carriers with the introduction of ATOS. The aviation industry and FAA agree that ATOS is a conceptually sound system because it is data-driven, targets inspector resources to the highest risk areas, and results in comprehensive systemic solutions to safety problems.

However, we found shortfalls in FAA's implementation of ATOS. First, FAA introduced the new inspection system without fully developing several key elements and without thoroughly testing the feasibility of ATOS as a stand-alone surveillance system. For example, although ATOS is principally based on analysis of data about the air carriers' operations, FAA is still working to fully implement the ATOS analysis element. FAA inspectors continue to need better tools to consistently collect and report inspection data so that FAA can fully use ATOS to determine where safety problems exist and where inspectors need to focus their inspections. *Sandia National Laboratories officials that helped FAA develop ATOS told us that FAA's compressed implementation schedule is one of the primary factors that hindered FAA's ability to successfully implement ATOS.*

Second, the training provided by FAA has not adequately prepared the inspector workforce for the shift from the traditional oversight approach to ATOS. While all ATOS inspectors had some initial ATOS training, 71 percent of the inspectors we interviewed considered the training inadequate. FAA has only recently begun providing inspectors with the kind of training needed to effectively accomplish ATOS inspections, such as training on evaluating air carriers' systems.

Third, FAA needs to improve the way it holds field managers accountable for consistently implementing ATOS. Although FAA created an ATOS program office, this office merely provided administrative support and guidance for field offices. The lack of strong national oversight of ATOS implementation caused confusion among the inspector workforce and managers as to who was really managing ATOS. As a result, ATOS has been inconsistently implemented across FAA field offices.

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[4] See Exhibit B for more detailed background information.

Within the last year, FAA has taken steps to address problems in ATOS and has made progress. FAA recently put a new management team in place that seems committed to improving ATOS and correcting past program problems and delays. FAA has also shifted managers from FAA field offices to Headquarters, which should improve the program by having people with field experience helping to make policy decisions that affect field offices.

When we began monitoring ATOS implementation in 2000, FAA had not hired data analysts for each of the ATOS field offices, developed system safety training for inspectors, integrated the ATOS database with SPAS, or corrected automation problems experienced by inspectors. To its credit, within the last year, FAA has worked to correct these deficiencies. However, significant challenges remain. For example, although FAA plans to finish developing the final two elements of the ATOS process by April 30, 2002, FAA had estimated it could take 5 years before planned system enhancements, such as improved inspection checklists for inspectors to collect air carrier data, are completed. Recently, FAA's new management team accelerated the timeframe for completing improved inspection checklists to the end of fiscal year 2003. However, at the same time, FAA has acknowledged that the final two ATOS elements it plans to complete by April 30, 2002, will only be issued as draft policies and procedures that will still have to be field tested before they are finalized. Nevertheless, FAA's recent efforts are commendable; the key now is follow-through.

To improve implementation of ATOS, FAA needs to focus on three key areas.

- *First, FAA needs to complete development of key ATOS processes.* Key elements, such as analysis of ATOS inspection data and implementation of actions to correct identified weaknesses, are still under development as shown in Figure 2.[5] By June 2001, FAA had hired data analysts for all of the ATOS field offices. However, FAA must still complete other important steps to

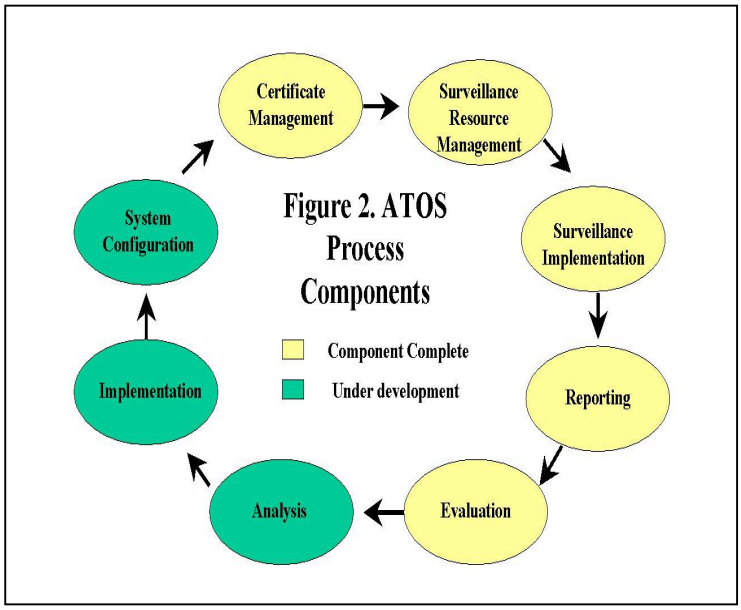

Figure 2. ATOS Process Components

[5] Figure 2 shows three ATOS elements under development. We focused our review on two of the three elements—analysis and implementation—because the system configuration element is *primarily* relevant to new air carriers.

finish the ATOS analysis element. For example, FAA has not determined what critical information will be required from inspectors to provide meaningful analysis of air carrier operations.

The inspection questions that were developed for data gathering checklists used by FAA inspectors were too broad to generate useful information. For example, one question on an ATOS inspection checklist is "Did all observed maintenance records comply with procedures for the Aircraft Airworthiness Requirements?" Given that there are literally thousands of maintenance records and airworthiness requirements, this question is not specific enough to allow useful analysis of inspectors' responses. FAA has acknowledged more work is needed to develop questions that help inspectors collect information about an air carrier's system that can be analyzed for trends and used to identify and correct systemic safety weaknesses.

In addition, critical inspection results have not been analyzed because the information has not been entered into the ATOS database. If inspection results did not pertain to pre-planned inspection categories, inspectors could not record their findings in these areas. For example, during an inspection of an air carrier's maintenance facility, inspectors at one ATOS field office observed two separate DC-10 aircraft where bolts that go through the bottom of the wing and into the fuel tank were loose, creating the potential for fuel leakage. However, the inspectors told us they could not enter the inspection results in the ATOS database, because the inspectors had not been tasked to inspect the aircraft. As a result, this critical information was not available for trend analysis to determine if a fleet-wide problem existed.

In addition, FAA has only recently (January 30, 2002) integrated the ATOS database with SPAS, a computer analysis tool designed to aid inspectors in determining areas to inspect based on safety risk. The need to analyze inspection data to decide when and where to direct its limited inspection resources has been a long-standing concern reported to FAA since at least 1987.[6] FAA responded to this concern by developing SPAS. Development of the initial SPAS system and deployment to field inspectors was a lengthy process that took 6 years.

SPAS has always been considered a critical system that FAA needed in order to analyze safety data from different databases, such as the Program Tracking and Reporting System that contains data collected under the traditional inspections. FAA designated SPAS to be the system to analyze ATOS inspection data as well. However, there has been a prolonged delay in resolving design inconsistencies that prevented SPAS from accessing ATOS

[6] GAO Report Number RCED-87-3, "Department of Transportation: Enhancing Policy and Program Effectiveness Through Improved Management," April 13, 1987.

data. As a result, for the past 3 years, inspectors have not been able to use SPAS to analyze ATOS inspection results for the 10 major air carriers.

Although the integration of the two systems was a significant accomplishment that should help with data analysis, FAA has not developed training for inspectors on how to use the new ATOS/SPAS integration. In addition, the ATOS/SPAS integration is in the initial stages with further development planned.

- *Second, given that ATOS is a major shift in FAA's oversight approach, FAA needs to improve the preparation of its inspector workforce for this change.* FAA has not adequately trained or located qualified inspectors where they are needed most. The poor transition from the traditional inspection system practiced by FAA for over 30 years, coupled with a cultural resistance to change, has adversely affected FAA's ability to implement ATOS. While all ATOS inspectors have had the initial ATOS training, the majority of the inspectors we interviewed considered the training inadequate.

  In addition, only a small percentage of inspectors we interviewed told us they had been given training in system safety[7] concepts, risk analysis, or auditing—knowledge and skills inspectors need to successfully accomplish ATOS inspections. FAA did introduce system safety concepts during the initial training; however, 84 percent of inspectors we interviewed told us they had not received system safety training. FAA has just recently begun to train inspectors in system safety (3 years after ATOS began), and will not complete training for all ATOS inspectors until September 2002.

  This lack of training for the inspector workforce has adversely affected the quality and usefulness of important data collected from ATOS inspectors. ATOS, when properly implemented, should allow FAA to use inspection data to target inspection resources to the highest risk areas, yet principal inspectors continue to *primarily* use their past experience to plan inspections and direct resources because they do not have quality data. Also, continuous analysis of ATOS data should permit inspectors to retarget, or change, their inspection plans when negative safety trends are identified. Although FAA inspectors have periodically retargeted inspections, 83 percent of the principal inspectors we interviewed said the ATOS data are not adequate to help with these retargeting efforts.

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[7] System safety refers to the structured means for identifying, analyzing, assessing, and controlling hazards and risks of the entire system as an integrated whole. A system is a set of components (e.g., pilot training, dispatching, and maintenance) that act together as a whole (e.g., an air carrier) to achieve a common goal (e.g., transporting passengers). Each component should include certain safeguards (e.g., documented procedures) that minimize hazards and risks to safety.

Principal inspectors cited the lack of training for inspectors as one reason they considered the data inadequate. ATOS inspection checklist questions are still unclear to inspectors, allowing for significant inconsistencies in the interpretation and responses to the questions. Over 50 percent of the inspectors we interviewed told us they do not understand ATOS inspection checklist questions they are required to use in evaluating air carriers' systems. If the meanings of the questions are unclear to inspectors, the inspectors would not be able to provide meaningful answers, i.e., collect accurate information when performing air carrier inspections.

In addition, FAA has not completely resolved problems with the location and qualifications of inspectors. Of the principal inspectors we interviewed, 68 percent told us that inspectors were not assigned to locations where they were most needed. Also, FAA did not always assign inspectors with the necessary experience and background to field offices responsible for oversight of ATOS carriers. For example, an inspector assigned to one field office responsible for monitoring a major air carrier had no experience with jet aircraft and therefore could only be used to conduct ground inspections. FAA management knew about the problems with location and qualifications of inspectors as early as February 1999. However, it was not until October 2000, over a year later, that FAA formed a workgroup to resolve these issues. Although the workgroup made recommendations to FAA management in January 2001, FAA is still working to complete implementation of the workgroup's recommendations.

- *Third, FAA needs to improve the way it holds field managers accountable for consistently implementing ATOS.* Although FAA created an ATOS program office, this office merely provides administrative support and guidance for field offices. The lack of a national authority on ATOS has caused confusion among the inspector workforce and managers as to who is really managing ATOS. Without strong national oversight, the field offices have essentially been left on their own to implement ATOS. As a result, ATOS has been put into practice inconsistently across FAA field offices. For example, one field office has taken a different approach to ATOS by conducting some ATOS inspections jointly with the air carrier's internal audit staff. While this joint approach has potential merit, FAA needs to resolve issues related to possible loss of inspector independence and the lack of written agency policy and procedures to sanction this approach.

FAA has been aware of problems with ATOS since 1999. However, the agency has been slow in taking corrective actions to address known problems. Reports issued in 1999 by the GAO[8] and FAA disclosed numerous problems with ATOS,

[8] As of February 2002, FAA had completed actions to implement all of GAO's recommendations.

such as lack of inspector training and quality data analysis. In its September 1999 report, FAA concluded that serious flaws existed with the new system and that ATOS was not meeting its primary intended outcome of targeting inspection resources to the greatest safety risks.

In May 2000, shortly before we began our audit, FAA initiated a special project to examine ATOS implementation. The project resulted in 42 recommendations for ATOS improvements. According to FAA, as of April 5, 2002, the agency had implemented corrective actions for 30 of the 42 recommendations. Our review disclosed that the majority of these 30 recommendations were automation changes, such as allowing inspectors to record more inspection data and providing better access to ATOS data. As part of the 30 completed recommendations, FAA implemented two key actions—the addition of seven people to assist the ATOS program office and the hiring of data analysts for each of the field offices. *However, in our opinion, FAA has not completed the most significant recommendations, such as developing audit training for inspectors, resolving issues about the location and qualifications of inspectors, and preparing a program plan (with milestones) for managing and directing ATOS implementation.* FAA planned to have all 42 recommendations completed by December 1, 2001, but target dates have slipped for the 12 open recommendations, in some cases as much as a year from the original target date.

FAA initially expected to expand ATOS to the remaining air carriers in fiscal year 2000. However, FAA has not expanded the program because of the problems experienced during the first 3 years. FAA still does not have an action plan with specific goals and milestones to complete ATOS at the 10 major air carriers and expand it to the remaining carriers. Although FAA continues to conduct traditional inspections at the non-ATOS air carriers, the agency has begun using risk analysis methods at these air carriers in a phased-in transition program called the Surveillance and Evaluation Program. FAA is currently developing a comprehensive program plan for completing ATOS implementation, but the plan is in the early stages. FAA initially established a March 2002 target date for completing the plan; however, FAA has recently revised this date to July 2002.

To move this important safety inspection program forward and meet the vision of ensuring the highest level of safety for the traveling public, FAA must take a number of steps, such as:

- meeting its deadline for completing the development of and thoroughly testing key elements of the ATOS process,
- following through on planned enhancements to the analysis element,
- training all inspectors in the concepts and skills needed to effectively carry out ATOS inspections,

- strengthening national oversight and accountability for ATOS development and implementation, and
- completing and implementing an action plan with milestones to finish ATOS development and implementation at the 10 largest air carriers and to expand ATOS to the remaining air carriers.

Agency Comments and Office of Inspector General Response

FAA agreed to take action to fully implement six of our recommendations and partially agreed to implement one recommendation. Specifically, FAA has agreed to complete the development of key elements of the ATOS process by April 30, 2002, and follow through on planned system enhancements to the analysis element, such as improved inspection checklists. FAA agreed to improve 25 percent of the ATOS inspection checklists by the end of fiscal year 2002 and the remaining 75 percent during fiscal year 2003. In addition, FAA agreed to better prepare the inspector workforce by training all inspectors in system safety concepts by September 2002 and locating qualified inspectors where they are needed most. Further, FAA agreed to strengthen national program oversight and accountability and complete a comprehensive plan with goals and milestones for program monitoring.

Although FAA agreed to complete the development of the analysis and implementation elements by April 30, 2002, field-testing of these elements will follow this date. FAA did not provide an estimated target date for completing field-testing, so we are requesting FAA provide us a target date for completion of field-testing.

While FAA agreed to complete the system safety training course by September 2002 and continue to develop other ATOS training programs, FAA did not agree that training on the recent ATOS/SPAS integration was necessary because an awareness video has been prepared for inspectors. However, training inspectors on nontraditional methods has been a long-standing problem and has been one of the main factors that limited FAA's ability to successfully implement ATOS. Therefore, we continue to believe that formal training on the ATOS/SPAS integration may be necessary. In our view, an awareness video is not sufficient training.

Overall, FAA disagreed with our statements that ATOS is not fully implemented at the 10 ATOS air carriers, that only minimal training has been provided, and that ATOS was implemented prematurely. FAA stated that ATOS was a functional system when it was introduced in 1998 because written procedures were published

for all of the ATOS elements, and training on the new system was conducted in 1998 for nearly 500 inspectors. However, we found that although written procedures were published, the system was far from functional. For example, we found that without analysts onboard at each of the ATOS field offices, very little ATOS data analysis was being performed. In addition, while we agree that FAA conducted training in 1998, 71 percent of the inspectors we interviewed considered the training inadequate. Finally, in our opinion, the rushed implementation resulted in a poor transition from the traditional oversight system and caused many of the problems experienced during the first 3 years. *In addition, Sandia National Laboratories officials told us that FAA's compressed implementation schedule is one of the primary factors that hindered FAA's ability to successfully implement ATOS.* Sandia National Laboratories helped FAA develop the ATOS system.

Finding and Recommendations

ATOS IS NOT REACHING ITS FULL POTENTIAL, AND MUCH WORK REMAINS TO TAKE FULL ADVANTAGE OF THIS KEY INSPECTION SYSTEM

Although ATOS has been the oversight system for the 10 major air carriers for 3 years, significant challenges remain to implement the new system. FAA initiated ATOS aggressively without fully developing or thoroughly testing the new system. At this time, key processes need further development, such as analysis of inspection data. Completing the development of the analysis element is critical to ATOS because the system was primarily designed as a data-driven approach to safety oversight. FAA also needs to improve the preparation of the inspector workforce to carry out ATOS oversight—FAA has provided inspectors only minimal training and has not physically located qualified inspectors where they are needed most. Equally important, FAA needs to improve the way it holds field managers accountable for consistently implementing ATOS.

As a result, FAA inspectors have not widely accepted ATOS as a reliable oversight system to identify indicators of potential safety problems. In addition, inspection data quality problems exist because of inspectors' confusion on how to conduct ATOS inspections, and FAA principal inspectors[9] continue to *primarily* use their past experience rather than ATOS-derived data to plan inspections and target resources because of the lack of quality data and analyses.

FAA Introduced the New Inspection System With Several Key Elements Not Fully Developed and Without Thoroughly Testing the Feasibility of ATOS as a Stand-Alone Surveillance System

Key elements of ATOS—analysis of ATOS inspection data at each field office and implementation of corrective actions for identified weaknesses—are still under development. Although FAA has actions underway to complete these elements by April 30, 2002, the agency has delayed the completion and validation of these ATOS elements for nearly 3 years. Until FAA finalizes the analysis element of ATOS, inspectors cannot use ATOS data to *effectively* determine changes air carriers need to make to correct deficiencies. Additionally, until FAA finalizes the element of ATOS for implementing corrective actions, inspectors

[9] For each air carrier, FAA assigns three lead inspectors, called principal inspectors (one for each of the three major areas of specialization—operations, maintenance, and avionics). Within FAA, principal inspectors have the primary responsibility for ensuring their assigned air carrier complies with the Federal Aviation Regulations.

cannot *effectively and consistently* follow up on identified problems, track corrective measures taken, or target resources to the greatest safety risks.

When we initially interviewed inspectors between September and December 2000, inspectors expressed frustration with their limited ability to record and retrieve the results of their inspections using the ATOS system. The system would not permit input of data outside the specific questions on the inspection checklists. For example, there was no inspection checklist related to aircraft engine performance, so inspectors could not record specific findings in this area. Also, inspectors could not perform keyword searches to obtain information on trends related to a particular area, such as all deficiencies that had been identified related to a carrier's de-icing procedures. FAA has recently established procedures allowing principal inspectors to review all inspector findings indicating problems in the carriers' systems. However, this is an interim measure until FAA can complete development of the analysis and implementation elements of ATOS. Therefore, FAA needs to focus its efforts on completing the development of all ATOS elements.

FAA Needs to Finish Developing the ATOS Analysis Element

Although data analysis is a key element of ATOS, FAA did not have data analysts in each field office until June 2001. This action was a good first step, but additional steps must be taken to complete the data analysis element. First, FAA must still identify and develop the data requirements for ATOS inspections to facilitate meaningful analyses of the inspection results. Second, FAA must provide inspectors training on the recently integrated ATOS/SPAS system and continue to develop the system. Finally, FAA must enhance the usefulness of ATOS inspection data by increasing the amount of operational data obtained from air carriers.

FAA has not identified or developed the data requirements for ATOS to facilitate meaningful analyses. Questions on the inspection checklists used to gather critical inspection data require "yes" and "no" responses to complex questions. For example, inspectors must answer "yes" or "no" to the broad question "Did all observed maintenance records comply with procedures for the Aircraft Airworthiness Requirements?" To provide sufficient details for FAA to understand the extent of any problem that might exist in the carrier's maintenance records, more information would be needed.

Inspectors were always required to record comments to explain "no" responses and can now record comments for "yes" answers as well; however, there are no requirements specifying minimum information inspectors must record to explain the "yes" or "no" answer. As a result, answers inspectors have recorded vary widely and must be analyzed comment by comment. To illustrate, for the

maintenance question above, inspectors might record different answers depending on which records and how many records were reviewed (i.e., 1 record versus 20). FAA has acknowledged that more work is needed to develop questions that can help inspectors collect information about an air carrier's system that can be analyzed for trends and used to identify and correct systemic safety weaknesses.

A majority of the analysts told us that they are conducting limited analysis of ATOS data by merely comparing the number of yes/no responses and calculating the corresponding percentages. However, analysts expressed concern with the quality of the ATOS data and the limited amount of analysis that can be accomplished. FAA needs to identify the data required for the ATOS database that will permit reliable trend analysis and determine whether the current yes/no format gives sufficient information for drawing informative conclusions on safety problems.

In addition, FAA has only recently (January 30, 2002) integrated the ATOS database with SPAS, a computer analysis tool designed to aid inspectors in determining areas to inspect based on risk. SPAS analyzes safety data from several different databases, such as the Program Tracking and Reporting System that contains data collected under the traditional inspections. FAA designated SPAS to be the system to analyze ATOS inspection data as well. Since at least 1998, FAA was aware of the importance of integrating the ATOS database and SPAS to provide better safety data and improve aviation safety. However, FAA efforts in this area were delayed.

In an October 1998 report by FAA's contractor, Sandia National Laboratories, FAA was warned that significant changes would be required in the data and performance measures used by SPAS to integrate the system with the ATOS database. The contractor cautioned FAA that these changes would be necessary to ensure that SPAS continued to provide relevant information for decision-making. It was not until November 2000 that FAA formed a group to work toward integrating the two systems. Although the integration of the two systems in January 2002 was a significant accomplishment that should help with data analysis, FAA has not developed training for inspectors on how to use the new system. In addition, this is an initial version of ATOS/SPAS integration that will need further development to realize its full potential.

Further, although FAA intended ATOS inspection data to be the primary information analyzed for targeting inspections, analysts in the field stated that other data are needed in ATOS for sufficiently identifying trends in air carrier operations and maintenance. ATOS data analysts have the ability to analyze ATOS data in conjunction with other FAA databases, as well as databases maintained by the National Transportation Safety Board, aircraft manufacturers, and the air carriers. However, the amount of data obtained from air carriers has

been limited. The Associate Administrator for Regulation and Certification has been quoted as saying that FAA collects only 2 percent of the safety data that air carriers have available. FAA needs to enhance the usefulness of ATOS data by continually seeking ways to increase the amount of data collected from other sources, such as operational data obtained from air carriers.

FAA Needs to More Fully Develop the ATOS Component for Implementing and Tracking Corrective Actions

The final element of the ATOS system is to implement and track corrective actions. The results of this element may require changes to an air carrier's operating systems that are then factored into the development of future inspection plans. While FAA has a group actively working to complete and test this final element, it has not yet been completed. In the interim, ATOS automation improvements in fiscal year 2001 now allow principal inspectors to track "no" responses and follow up on corrective actions. However, until the final element of ATOS is fully developed, FAA field offices cannot realize the full benefits of ATOS because they cannot *effectively and consistently* factor the results of corrective actions into future inspection planning efforts.

While awaiting completion of this final element, FAA has provided general guidance to FAA field offices on implementing corrective actions for identified problems. However, it is not specific enough to ensure consistent practices in implementing and tracking corrective actions. For example, the current guidance simply states that the FAA field office should prepare an action plan to implement and track corrective actions.

Further, the guidance refers to the formation of a System Analysis Team (SAT) as an example of one method inspectors can use to ensure air carriers make the necessary changes to correct deficiencies that are identified during inspections. The SAT is a collaborative approach where the air carrier, other non-FAA entities, and FAA work together to determine root causes and solutions for identified problems. According to the guidance, the principal inspector is responsible for determining when problems are so significant that a SAT is needed.

According to FAA, SATs have been successful in correcting the root causes of problems identified during some inspections; however, these corrections have not always been achieved using ATOS data analysis, and not all field offices have attempted to use them. For example, one field office used a SAT to implement a system-wide corrective action for a problem with aircraft cargo doors. Working in partnership with the air carrier, FAA developed a procedure to ensure the cargo doors were securely closed prior to takeoff. However, this problem was discovered through air carrier incident reports, not ATOS inspections. Although the problem was not identified through ATOS inspections, the FAA field office

was able to successfully use ATOS inspection checklists to determine the root causes of the incident. Identifying and correcting the root cause of problems is one of the primary goals of ATOS.

FAA Needs to Better Prepare the Inspector Workforce to Carry Out ATOS

ATOS is a major shift in FAA's oversight approach. However, FAA has not adequately prepared the inspector workforce for this change. FAA has provided inspectors only minimal training on the new inspection system and has not located qualified inspectors where they are needed most. The poor transition from the traditional inspection system practiced by FAA for over 30 years, coupled with a cultural resistance to change, has adversely affected FAA's ability to implement ATOS.

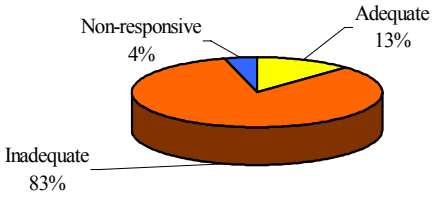
Inspectors Have Received Minimal Training Necessary to Successfully Accomplish ATOS Inspections and Consistently Collect ATOS Data

FAA provided a basic ATOS training class in 1998 (when ATOS was first initiated) and a training seminar on ATOS in 2000. However, the training has not been effective in preparing the inspector workforce to carry out ATOS inspections. In addition, only a small percentage of inspectors we interviewed told us they had been given training in system safety concepts, risk analysis, or auditing—knowledge and skills inspectors need to successfully accomplish ATOS inspections. This lack of training has affected the inspectors' ability to consistently collect quality ATOS data.

While all of the ATOS inspectors have had the initial ATOS training, about 71 percent of the inspectors we interviewed considered it to be inadequate. For example, inspectors responded that inspection checklists and automation were not finished at the time of the initial classes in 1998. As a result, the classes were nothing more than familiarization, with no practical hands-on training. FAA did introduce system safety concepts during the initial training; however, 84 percent of inspectors we interviewed told us they had not received system safety training. FAA has been developing a training course on system safety since October 2000. The agency finally began providing the training to inspectors in October 2001. However, according to the agency's training schedule, all ATOS inspectors will not be trained on system safety until September 2002.

This lack of training for the inspector workforce has adversely affected the quality of important data collected from ATOS inspections. As shown in Figure 3, although FAA inspectors have periodically retargeted inspections, 83 percent of the principal inspectors we interviewed consider ATOS data inadequate for these retargeting efforts. The primary goal of ATOS is to use data to target inspection resources to the highest risk areas, yet according to principal inspectors we interviewed, inspectors continue to *primarily* use their past experience rather than ATOS-generated data to plan inspections and target resources because of the lack of quality data to guide these important decisions.

Figure 3. Principal Inspectors Consider ATOS Data Inadequate to Retarget Inspection Resources



Principal inspectors cited the lack of training on ATOS inspection checklists as one reason they considered the data inadequate. ATOS inspection checklist questions are still unclear to inspectors, allowing for significant inconsistencies in the interpretation and responses to inspection checklist questions. Over 50 percent of the inspectors we interviewed told us they do not understand ATOS inspection checklist questions. For example, one question that inspectors struggled with related to determining individual accountability at the air carrier. The inspection checklist question was, "Does the individual understand the interfaces attribute associated with the Aircraft Airworthiness Requirements process?"[10] Without adequate training in ATOS and system safety principles, the inspector was left confused as to what needed to be done to answer this question.

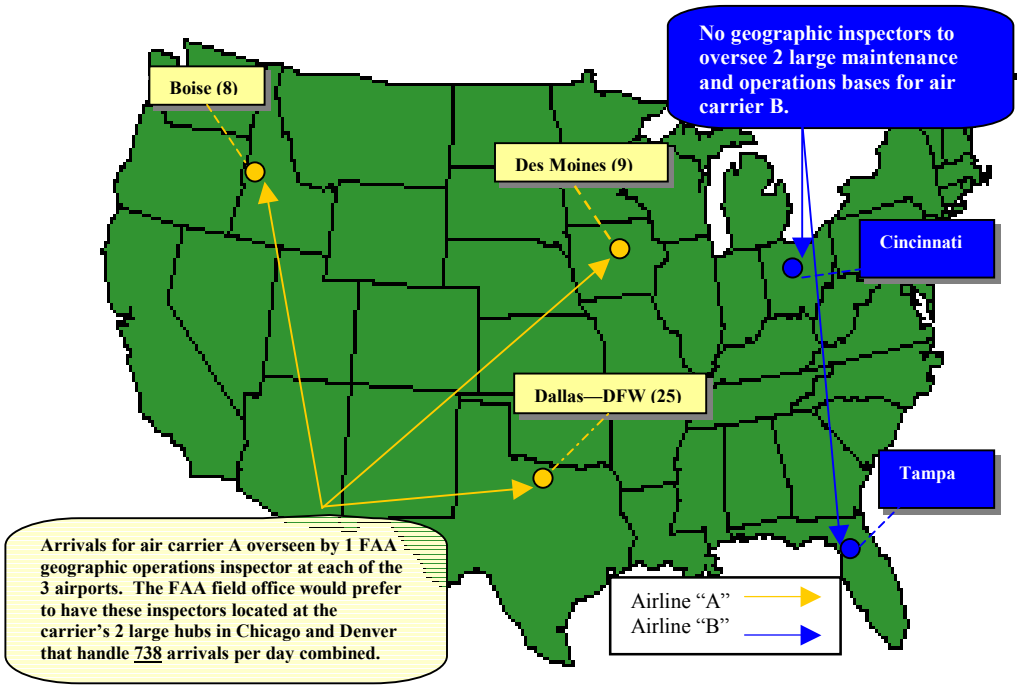
The Location and Qualifications of Inspectors Remains a Barrier

For each air carrier, FAA assigns inspectors, called geographic inspectors, to inspect air carrier operations that are outside the physical boundaries of the FAA office with primary air carrier oversight. Although FAA reported in June 1999 that 39 percent of the 186 geographic inspectors were located in the wrong locations (20 percent) or did not have the necessary background and experience (19 percent), we found this problem still exists today. *Of the principal inspectors we interviewed, 68 percent told us that inspectors were not assigned to locations where they were most needed*. For example, one oversight office is responsible for overseeing two large air carrier operations and maintenance bases in the eastern United States but has no field inspectors located near these bases. In addition,

[10] FAA made slight modifications to this question after our field visit; however, these changes did not significantly affect the content of this question.

FAA has inspectors for one air carrier in locations with low air traffic, such as Boise, Idaho, with only 8 flights per day, rather than where they are more needed at 2 large hubs that have 738 flights per day combined. Figure 4 illustrates these two situations.

Figure 4. Example of Inefficient Inspector Locations for Two Airlines



We also found problems with geographic inspector qualifications. For example, a geographic inspector assigned to one of the FAA field offices responsible for oversight of an ATOS carrier had no experience with jet aircraft, and according to the principal inspector, this negatively affected the inspector's ability to conduct surveillance on a carrier that only had this type aircraft. Therefore, the inspector could only be used for ground inspections. With only nine operations inspectors assigned to cover the whole Nation for this air carrier, even just one inspector without proper qualifications can significantly hinder inspections.

The geographic inspectors were assigned to specific air carriers prior to, and independently of, ATOS. As a result, ATOS field offices were assigned geographic inspectors who were not geographically located where they were most needed and/or did not possess the experience required. Because of an initial agreement with the inspectors' union on the geographic assignments, inspectors were allowed to keep their positions at their original locations until they vacated the position. Considering the high turnover rate among geographic inspectors—

over 50 percent between October 1998 and June 1999—FAA had the opportunity to significantly improve these assignments. However, our audit disclosed there were still problems in this area.

FAA's System Process Audit group[11] reported problems with the geographic inspector workforce to FAA management as early as February 1999, and both the GAO and FAA's System Process Audit group reiterated and expanded on these problems in subsequent reviews in June 1999. However, it was not until October 2000, over a year later, that FAA formed a workgroup to resolve these issues. In January 2001, the workgroup presented its recommendations to FAA management, but the recommendations have not yet been implemented. FAA should evaluate inspector geographic assignments, and make it a priority to shift inspectors to locations where they are most needed and ensure that their qualifications match the needs of the air carrier oversight offices to which they are assigned.

In addition, geographic inspectors may not be available to conduct ATOS inspections due to competing demands from their office supervisor. Because geographic inspectors report to a separate supervisor, the principal inspectors have no authority to direct the geographic inspectors' workload. Although the former Director of Flight Standards mandated that ATOS be given top surveillance priority, we found that some geographic supervisors continue to make non-ATOS work their geographic inspectors' priority.

FAA Needs to Establish Strong National Oversight and Accountability to Ensure Consistent Field implementation of ATOS

FAA has not provided strong national oversight to ensure the standard application of ATOS and to hold field managers accountable for consistently implementing ATOS. Although FAA created an ATOS program office and appointed an ATOS program manager in March 1999—shortly after ATOS was first initiated—it did not give the program manager the line authority to direct ongoing ATOS efforts. Instead, the ATOS program office merely provides support for the field offices, such as issuing guidance. Because of the lack of strong national oversight, the principal inspectors at the 10 field offices bear the responsibility for making ATOS work.

The lack of a national authority on ATOS has caused confusion among the inspector workforce and managers as to who is really managing ATOS. Without strong national oversight, FAA's field offices have been essentially left on their

[11] The System Process Audit group is a team of FAA inspectors established to conduct audits of ATOS. The group reports directly to the Director of Flight Standards.

own to implement ATOS. As a result, ATOS has not been put into practice consistently across the FAA field offices. For example, one oversight office has taken a different approach to ATOS by inspecting the air carrier's operations jointly with the carrier's internal audit staff.

This joint approach, called the Joint Safety Review Team (JSRT), is only being used by one FAA office. Currently, the JSRT concept is applicable to safety attribute inspections conducted for flight operations, onboard service, and customer service divisions. The JSRT members participate throughout the review process on an equal and interchangeable basis that includes entrance and exit briefings, daily issue updates to the air carrier, and report preparation. Notes and observations are shared openly between FAA and the air carrier.

The final report is written as a joint product of both FAA and air carrier participants. However, the report remains the property of the air carrier and is shared with FAA representatives on the air carrier's property, as requested. The air carrier is responsible for developing an appropriate quality review follow-up action plan, and FAA has access to the information contained in the follow-up tracking system. Additionally, the ATOS quality review action update is provided to FAA at a monthly self-disclosure meeting. FAA uses the joint inspection to facilitate completing its own ATOS inspections and separately enters data in the ATOS database.

While this joint approach has potential merit, FAA has not evaluated whether it is appropriate nor has it established written policy and procedures that sanction this approach. The operations inspectors that use this concept have concluded the joint approach has worked well and allows FAA to obtain a better understanding and working knowledge of the air carrier's operations. Inspectors claim that FAA retains its independence by completing the FAA ATOS database autonomously. However, maintenance inspectors for this same air carrier told us FAA is losing its independence while participating on the joint team and that the air carrier has too much control over the outcome of the joint inspection. We agree that this joint approach raises questions about FAA's independence. Therefore, FAA should expedite the ATOS Special Project recommendation to conduct an evaluation of the appropriateness of this approach.

As a result of not having strong national program oversight, FAA operated for 3 years with the original policy and procedures issued when the program began in 1998. ATOS policy and procedures guidance was not updated until recently, in October 2001, despite numerous changes in the program. Field inspectors obtained explanations of changes to the program during the last 3 years principally through a newsletter issued by the ATOS program office. Frustrated by perceived lack of policy guidance and lack of support from Headquarters and the ATOS program office, principal maintenance inspectors at the field offices discussed

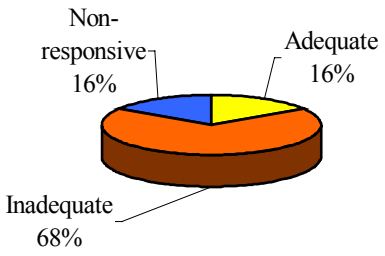
ATOS issues during meetings of an informal, unofficial council. This council continues to meet about every 6 months to discuss ATOS policy issues and share experiences. Unless FAA takes prompt action to strengthen national oversight, it runs the risk of inconsistent policy and procedures being developed by field inspectors.

FAA Inspectors Lack Confidence in ATOS and Have Not Widely Accepted the New System

Because of the problems encountered with ATOS implementation, the FAA inspector workforce has not widely accepted ATOS and in many cases has reverted to the traditional inspections that are not based on system safety principles, such as observations and inspections of aircraft parked at airport gates. We found FAA inspectors are: (1) confused over how to conduct ATOS inspections, (2) unclear on the concepts of system safety and risk analysis, (3) frustrated by a perceived lack of management direction and support, and (4) concerned that ATOS does not give sufficient inspection coverage of air carrier operations.

We found a strong concern among ATOS inspectors regarding the adequacy of inspection coverage. As shown in Figure 5, 17 (68 percent) of the 25 principal inspectors we interviewed were concerned that ATOS does not provide enough inspection coverage. For example, inspectors told us they found it necessary to maintain supplemental records of observed safety problems separate from ATOS because they did not trust the ability of the ATOS process to capture all safety problems observed during ATOS inspections. Many inspectors perceive ATOS to be solely a paperwork exercise that does not allow them the flexibility to physically inspect air carrier facilities and aircraft. These inspectors said that most of their time is now spent reviewing manuals and records at air carriers. Inspectors expressed concern that their diminished presence at the air carriers' facilities and airports compromises safety. Some inspectors, as well as managers, recommended a hybrid approach that would augment ATOS with parts of the old traditional system.

Figure 5. Principal Inspectors Said ATOS Does Not Provide Enough Inspection Coverage



FAA responded to this concern by creating a Dynamic Observation Report, which allows inspectors to capture unplanned inspections similar to the traditional inspections using the ATOS format, which should help with obtaining more data

for the ATOS database. However, until inspectors are fully trained on ATOS and understand that it is based on building safety into air carrier systems to reduce the need to inspect every aircraft as done under the traditional inspection system, their lack of confidence in the system is likely to continue.

FAA Has Been Aware of ATOS Problems Since Early 1999 but Has Been Slow in Taking Corrective Actions

Since early 1999, FAA has been aware of problems with ATOS. However, the agency has been slow in taking corrective actions to address known problems. Inspectors told us they have been sharing their problems with FAA senior management since at least March 1999. Additionally, the GAO and FAA's System Process Audit group issued reports in 1999 disclosing problems with ATOS. Problems included unclear inspection checklists for inspectors, lack of training, data integrity problems, automation concerns, and inspectors not located where most needed. In a September 1999 report, FAA's System Process Audit group concluded that serious flaws existed with the new system and that ATOS was not meeting its intended outcomes, such as targeting resources to the greatest safety risks.

Finally, FAA initiated another review in May 2000, to examine ATOS issues and make recommendations on how to improve and accelerate the development and implementation efforts. In December 2000, FAA released the ATOS Special Project report, which contained 42 recommendations to strengthen ATOS. The final report contained short-term (90 days), medium-term (180 days), and long-term (360 days) recommendations in the areas of staffing, system flexibility, data utility, inspector qualifications and training, and management oversight.

According to FAA, the agency had implemented corrective actions for 30 of the 42 recommendations as of April 5, 2002. Many of these 30 recommendations were related to automation changes, such as allowing inspectors to record more inspection data and providing better access to ATOS data. Also included in the 30 completed recommendations were 2 key actions regarding resources—the addition of 7 people to assist the ATOS program office and the hiring of data analysts for each of the field offices. *However, in our opinion, FAA has not implemented the most significant recommendations, such as developing audit training for inspectors, resolving problems with the location and qualifications of inspectors, and developing a comprehensive program plan with milestones.* FAA planned to have all 42 recommendations completed by December 1, 2001, but target dates have slipped for the 12 open recommendations, in some cases as much as a year from the original target date. Exhibits D and E show the ATOS Special Project recommendations that remain open and those that are completed, respectively.

In addition, FAA formed the Continuous ATOS Development Core Group in April 2000 to provide recommendations for finishing the ATOS process and for continuously improving ATOS. Unlike the Special Project, the core group is addressing longer term issues, such as (1) integrating the ATOS database with other FAA data systems, (2) developing a staffing model for FAA field offices, and (3) determining additional training needs for inspectors. In addition, the core group is developing new inspection checklists to move beyond simple "yes" or "no" responses for broad questions. *According to the core group's team leader, it will take up to 5 years to complete its mission tasks.* FAA management officials have recently accelerated the timeframe for completing the new inspection checklists to fiscal year 2003.

FAA still has not developed an action plan with goals and milestones to fully implement ATOS at the 10 major air carriers and for expanding to the remaining air carriers. Although FAA continues to conduct traditional inspections at the non-ATOS air carriers, the agency has begun using risk analysis methods at these air carriers in a phased-in transition program called the Surveillance and Evaluation Program. FAA is currently developing a comprehensive program plan for completing ATOS implementation. However, it is in the early stages. FAA initially established a March 2002 target date for completing the plan; however, FAA management officials recently revised this date to July 2002.

FAA Has Made Improvements to ATOS During the Last Year but Significant Challenges Remain

Within the last year, FAA has taken steps to address problems in ATOS and has made progress. FAA recently put a new management team in place that seems committed to improving ATOS and correcting past program problems and delays. FAA has also shifted managers from FAA field offices to Headquarters, which should improve the program by having people with field experience helping to make policy decisions that affect field offices.

When we began monitoring ATOS implementation in 2000, FAA had not hired data analysts for each of the ATOS field offices, developed system safety training for inspectors, integrated the ATOS database with SPAS, or corrected automation problems experienced by inspectors. To its credit, within the last year, FAA has worked to correct these deficiencies. However, significant challenges remain. To continue to move the program forward, FAA must follow through with efforts to improve data analysis and tracking corrective actions. In addition, FAA must ensure inspectors are well trained in the concepts and skills needed to effectively carry out ATOS inspections. Further, FAA must strengthen national oversight, and complete and implement an action plan to finish development and implementation of ATOS.

RECOMMENDATIONS

We recommend that the Federal Aviation Administrator:

1. Meet the April 2002 scheduled date for completing and field testing the ATOS analysis and implementation elements.

2. Follow through with (a) planned enhancements of inspection checklists by identifying information needed to ensure that sufficient data are available in the ATOS database for performing thorough analyses and making informed safety decisions, and (b) efforts to increase the amount of operational data obtained from air carriers to enhance ATOS data analyses. Establish a firm target date for completion of changes to inspection checklists.

3. Develop training for inspectors on the new ATOS/SPAS integrated system, prepare a training schedule within 30 days of this report, and continue to devote resources to further develop the initial version of this integration.

4. Follow through on the agency's commitment to complete its system safety training plan as scheduled by September 2002 and continue to develop training programs that support inspectors' ability to perform ATOS inspections.

5. Evaluate inspectors' geographic assignments, and make it a priority to shift inspectors to locations where they are most needed and ensure their qualifications match the needs of the air carrier oversight offices to which they are assigned.

6. Strengthen national oversight and accountability to ensure consistent field implementation of ATOS.

7. Expedite completion of the comprehensive program plan for ATOS. This plan should include specific short- and long-term goals, milestone dates, task assignments, and critical pathways, and incorporate the recommendations in the ATOS Special Report issued in December 2000. The agency should continually monitor this plan to (a) ensure that critical paths, goals, and accomplishments are being met and (b) identify delays that could affect implementation.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

On March 21, 2002, FAA provided comments to our February 28, 2002 draft report. FAA concurred with six recommendations and partially concurred with one recommendation as follows.

- FAA agreed to complete the *draft* policy and procedures and *prototype* software for the ATOS analysis and implementation elements by April 30, 2002. However, system and field-testing will not be completed until some time after April 30, 2002. While this action is responsive to our recommendation, FAA will need to provide a target date for when system and field-testing is expected to be completed.

- FAA agreed to follow through with planned enhancements of inspection checklists beginning in May 2002. FAA plans to improve 25 percent of ATOS inspection checklists to provide better data quality and analysis capabilities by the end of fiscal year 2002 and the remaining 75 percent during fiscal year 2003. In addition, FAA will provide *draft* procedures for obtaining and analyzing operational data from sources other than the ATOS database by the end of April 30, 2002. FAA will then field-test these procedures.

- FAA partially agreed with Recommendation 3 to continue to devote resources to further develop the initial version of the ATOS/SPAS integration. However, FAA did not agree to develop training for inspectors on the new ATOS/SPAS integrated system and prepare a training schedule within 30 days of the report.

  FAA stated that the SPAS program office produced an awareness video that includes SPAS presentations of ATOS data and that no further training is necessary because ATOS data in SPAS may be manipulated the same as other data within SPAS. However, we found that the lack of adequate training for inspectors was one of the primary factors affecting the implementation of ATOS. Before making a final decision on what type training is needed, FAA may want to survey inspectors in each ATOS field office to determine if the awareness video provided enough training for them to feel comfortable using the system or whether additional training is necessary. We are requesting FAA to reconsider its position on this recommendation.

- FAA agreed to follow through on the agency's commitment to complete its system safety training plan as scheduled by September 2002 and continue to develop training programs that support inspectors' ability to perform ATOS inspections.

- FAA agreed to shift inspectors to locations where they are most needed when positions become vacant and ensure that all ATOS inspectors are qualified.

- FAA agreed to strengthen national oversight and accountability to ensure consistent field implementation of ATOS. FAA stated that the recent selections of field managers to key Headquarters Flight Standards positions should increase the involvement of field division managers in the enhancement and implementation of ATOS.

- FAA agreed to complete a comprehensive program plan for ATOS by July 2002, including goals, milestones, task assignments, and critical pathways.

Also, in its response, FAA disagreed with statements in the report that ATOS is not fully implemented at the 10 ATOS air carriers and that only minimal training has been provided to ATOS inspectors. FAA stated that ATOS was a functional system when it was introduced in 1998 because written procedures were published for all eight of the elements that comprise ATOS. However, we found that although written procedures were published, the system was far from fully functional. For example, although there were written procedures for analysis, we found that without analysts onboard at each of the ATOS field offices and the ability to analyze ATOS data using SPAS, very little analysis was being performed at the time of our review. FAA is still in the process of developing the final ATOS elements.

FAA also stated that it conducted a major training effort in 1998 for nearly 500 inspectors. While we agree that FAA conducted this training, as stated in our report, 71 percent of the inspectors we interviewed considered the training inadequate. To date, FAA has not provided inspectors with recurrent ATOS training and has just recently begun more in-depth system safety training, after a prolonged delay in course development.

Finally, FAA did not agree that ATOS was implemented prematurely. However, in our opinion, the rushed implementation resulted in a poor transition from the traditional oversight system and caused many of the problems experienced during the first 3 years. *Sandia National Laboratories officials told us that FAA's compressed implementation schedule is one of the primary factors that hindered FAA's ability to successfully implement ATOS*. According to Sandia, ATOS was implemented less than 1 year after the Administrator announced it. In that time, policies, processes, and procedures were developed primarily for the air carrier surveillance element of ATOS with other parts of the ATOS process not yet developed. In particular, the analysis element did not exist, according to Sandia officials. To meet the schedule, initial training for ATOS was developed before the subject matter was adequately defined.

ACTION REQUIRED

FAA's planned corrective actions for all recommendations except 1 and 3, when properly implemented, will satisfy the intent of our recommendations. Therefore, we consider these five recommendations resolved, subject to the audit follow-up requirements of Department of Transportation Order 8000.1C.

Although FAA concurred with Recommendation 1 to complete the analysis and implementation elements of ATOS by April 30, 2002, FAA needs to provide a

planned date for completing system and field-testing of the new elements before we consider this recommendation resolved. In addition, FAA partially concurred with Recommendation 3. While FAA agreed to continue to devote resources to further development of the ATOS/SPAS integration, the agency did not agree to provide training on the newly integrated system. Because the lack of adequate training for inspectors has been a long-standing problem cited in GAO and OIG reports on FAA's oversight and is also one of the primary factors impeding FAA's implementation of ATOS, we continue to believe formal training may be necessary. FAA should reconsider its response to this recommendation. In accordance with the requirements of Department of Transportation Order 8000.1C, we would appreciate receiving your comments on this memorandum within 30 calendar days.

We appreciate the cooperation provided by your staff during the audit. If you have questions or need further information, please contact me at (202) 366-1992, or David A. Dobbs at (202) 366-0500.

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Exhibit A. Objectives, Scope, and Methodology

After the January 2000 crash of Alaska Airlines Flight 261, the Senate Committee on Commerce, Science, and Transportation asked the Office of Inspector General to review FAA's oversight of airline safety. Following this request, the House Committee on Transportation and Infrastructure asked us to review FAA's current approach for providing oversight of airline operations and maintenance and the agency's efforts to target its inspector workforce to the most pressing concerns. To address these requests, we reviewed FAA's implementation of ATOS. Specifically, our objectives were to assess FAA's progress in implementing ATOS and to identify barriers to successfully implementing ATOS.

We performed our audit at FAA Headquarters and field offices within the FAA Flight Standards Service. We performed work at 9 of the 10 ATOS field offices.[1] In addition to analyses of ATOS records, we interviewed 82 (31 percent) of the 261 inspectors onboard, 25 (93 percent) of the 27 lead inspectors onboard, and all 9 of the managers onboard at these field offices. We also obtained perspectives on ATOS implementation from air carriers, Sandia National Laboratories, and industry associations, such as the Air Transport Association. Exhibit C contains a list of entities visited or contacted during the audit.

We performed our audit from July 2000 to November 2001. Our audit covered FAA oversight of air carriers during the period from October 1998 to November 2001. We conducted the audit in accordance with Government Auditing Standards prescribed by the Comptroller General of the United States, and included such test of procedures, records, and other data as warranted.

PRIOR AUDIT COVERAGE

GAO issued an audit report entitled "FAA's New Inspection System Offers Promise, but Problems Need to Be Addressed" on June 28, 1999 (Report Number RCED-99-183). GAO concluded that ATOS offered promise for significantly strengthening FAA's inspection process, but FAA's ability to conduct effective inspections remained limited by a lack of clear guidance. Additionally, GAO concluded high staff turnover rates and continued difficulties with the adequacy of inspectors' technical training and experience would hamper FAA's efforts in improving the process if not immediately addressed. FAA agreed with GAO's recommendation not to expand ATOS beyond the 10 major air carriers until problems that emerged during the program's initial implementation are resolved.

[1] We did not perform work at the FAA field office for Alaska Airlines because of ongoing criminal investigations resulting from the January 2000 crash.

Exhibit B. Background on ATOS

The safety of U.S. air passengers is a joint responsibility of the air carriers and FAA. The air carriers are responsible for operating their aircraft safely. FAA is responsible for examining an air carrier's operations before issuing an operating certificate and conducting periodic inspections to ensure the air carrier complies with safety regulations. Within FAA, the Office of Flight Standards Service has about 3,300 aviation safety inspectors with a wide range of oversight responsibilities as shown in the Figure.

Figure. Scope of FAA Oversight

Approximately 3,300 FAA safety inspectors provide oversight to:

- 139 commercial air carriers
- 5,200 repair stations
- 637,000 active pilots
- 273,000 aircraft mechanics
- 7,600 commercial aircraft
- 11,000 charter aircraft
- 220,000 general aviation aircraft
- 700 aviation training facilities

As shown in Table 1, events occurring in 1996 led to the development of ATOS—a process that significantly changes FAA's approach to air carrier oversight.

Table 1. Events Leading to the Development of ATOS

Date	Event
May 11, 1996	ValuJet Flight 592 crashed in the Florida Everglades, killing all 110 people onboard.
May 12-June 17, 1996	FAA conducted a special emphasis review of ValuJet and found system-wide deficiencies in operations, engineering, maintenance, aircraft airworthiness, and quality assurance of contractors.
June 18, 1996	FAA formed a task force to conduct a 90-day review related to FAA's oversight of air carriers.
September 16, 1996	FAA issued the 90-Day Safety Review report. In response to this report, FAA formed a joint team to review the surveillance process for air carriers. The team had members from FAA and Sandia National Laboratories, a recognized leader in applying system safety principles to high-consequence operations, such as nuclear reactors.
July 1997	The joint team issued a report titled "Surveillance Improvement Process," which became the framework for ATOS development.

FAA initiated ATOS at the Nation's 10 largest passenger air carriers on October 1, 1998.[1] ATOS replaced FAA's traditional inspection system, called the National Program Guidelines (NPG), for the 10 largest air carriers. Traditionally,

[1] The 10 ATOS air carriers are Alaska Airlines, America West Airlines, American Airlines, Continental Airlines, Delta Air Lines, Northwest Airlines, Southwest Airlines, Trans World Airlines, United Airlines, and US Airways.

FAA's oversight of air carrier safety was based on the air carriers' compliance with the Federal Aviation Regulations. Under the traditional inspection system, still in use at the remaining 129 air carriers, FAA Headquarters develops an annual work plan that requires individual inspectors to complete a minimum number of activity-based inspections. For example, a common type inspection would be to physically observe an aircraft while it is parked at the departure gate. The inspection activities required by the NPG applied uniformly to all air carriers without consideration to individual air carrier strengths and weaknesses. This system, for the most part, had remained unchanged since the early 1970's when the air transportation industry was highly regulated.

ATOS shifts FAA's surveillance beyond simply checking an air carrier's compliance with regulations to proactively evaluating an air carrier's entire operation. Unlike the traditional process, ATOS is structured to analyze interactions within and between air carrier systems to identify and assess threats to safety before they result in incidents or accidents. There are several differences between the traditional inspection system and ATOS, as shown in Table 2.

Table 2. Differences Between the Traditional and New Inspection Systems

Traditional Inspection System	New Inspection System (ATOS)
➢ Prescribed number of inspections for similar air carriers	➢ Flexible and comprehensive surveillance plans tailored to each air carrier based on data analysis
➢ Reliance on individual inspector expertise	➢ Reliance on trend data to identify high risk areas
➢ Strictly based on compliance with regulations	➢ Goes beyond regulatory compliance to evaluating air carriers' systems for specific safety attributes
➢ Field inspectors located throughout the country support several air carriers without air carrier-specific training	➢ Field inspectors located throughout the country are assigned to a specific air carrier and receive air carrier-specific training
➢ Inspection results are recorded in the Program Tracking and Reporting System database	➢ Inspection results are recorded in a new ATOS database that allows retargeting inspections

Under ATOS, FAA field offices develop a comprehensive surveillance plan for their assigned air carrier using a risk analysis tool called the Air Carrier Assessment Tool (ACAT).[2] In an ACAT, information about the air carrier is taken from a variety of sources to formulate an assessment value. Using this value, inspectors can then increase or decrease the number of inspections they need to make based on concerns they have identified. A comprehensive

[2] When our audit began, FAA used a second risk assessment tool, called the System Safety Assessment Tool, or SSAT, to focus the inspection team's attention on the systems that an airline has in place. However, during our audit, FAA discontinued the use of the SSAT because the agency concluded it did not add value to the process.

surveillance plan tailored to the airline is automatically generated based on the information the inspection team enters into the ACAT.

To implement the surveillance plan, inspectors carry out two kinds of inspections at their assigned air carriers—*safety attribute inspections (SAI) and element performance inspections (EPI)*. The SAIs are completed by a team of inspectors and are used to assess the seven air carrier systems defined in ATOS.[3] EPIs are used to verify whether the air carrier follows its own procedures identified by the SAIs. Unlike the SAIs, the EPIs are completed by individual inspectors. To complete SAIs and EPIs, inspectors use checklists, called job aids, which prescribe specific tasks the inspector must complete and specific questions the inspector must answer.

[3] The seven basic air carrier systems defined in ATOS are aircraft configuration control; manuals; flight operations; personnel training and qualifications; route structures; airman/crew member flight, rest, and duty time; and technical administration.

Exhibit C. Entities Visited or Contacted

FAA

Headquarters:

Flight Standards Service	Washington, DC
Financial Management Staff	Washington, DC
Certification and Surveillance Division	Dulles Airport, VA
ATOS Certificate Management Office	Dulles Airport, VA
Continuous ATOS Development Core Group	Dulles Airport, VA
Flight Standards Safety Analysis Information Center	Dulles Airport, VA
Flight Standards Training Division	Herndon, VA

Flight Standards Division Regional Offices:

Southwest Region	Fort Worth, TX
Western-Pacific Region	Los Angeles, CA

Flight Standards Service Field Offices:

American Airlines Certificate Management Office	Dallas, TX
America West Airlines Certificate Management Office	Phoenix, AZ
Continental Airlines Certificate Management Office	Houston, TX
Delta Air Lines Certificate Management Office	College Park, GA
Northwest Airlines Certificate Management Office	Bloomington, MN
Southwest Airlines Certificate Management Office	Dallas, TX
Trans World Airlines Certificate Management Office	St. Louis, MO
United Airlines Certificate Management Offices	San Francisco, CA, and Denver, CO
US Airways Certificate Management Office	Pittsburgh, PA
St. Louis Flight Standards District Office	St. Louis, MO
Kansas City Flight Standards District Office	Kansas City, MO
Chicago Flight Standards District Office	Chicago, IL
Atlanta Flight Standards District Office	Atlanta, GA
Arizona Flight Standards District Office	Phoenix, AZ
Dallas/Fort Worth Flight Standards District Office	Dallas, TX

AIR CARRIERS

American Airlines	Dallas, TX
America West Airlines	Phoenix, AZ
Continental Airlines	Houston, TX
Delta Air Lines	Atlanta, GA
Northwest Airlines	St. Paul, MN
Southwest Airlines	Dallas, TX
Trans World Airlines	Bridgeton, MO
United Airlines	Chicago, IL, and San Francisco, CA
US Airways	Pittsburgh, PA

INDUSTRY REPRESENTATIVES

Sandia National Laboratories	Albuquerque, NM
Air Transport Association	Washington, DC
Professional Airways Systems Specialists	Washington, DC
Flight Safety Foundation	Alexandria, VA
John A. Volpe National Transportation Systems Center	Cambridge, MA

Exhibit D. Open Special Project Recommendations As of April 5, 2002

Recommendations on Field Issues and Concerns	*Original Target Date*	*Revised Target Date*
F-19. Develop and implement a process for national and regional independent audits, to be conducted on a periodic basis or upon request.	**6/1/01**	**6/02** *slipped 13 months*
F-21, (part b).[**] Expedite development of inspector training courses for auditing.	**6/1/01**	**6/02** *slipped 13 months*
Recommendations on Miscellaneous Issues	***Original Target Date***	***Revised Target Date***
M-1. Provide sufficient additional quota in the ATOS training course for all air carrier inspectors assigned to FAA Headquarters.	**3/1/01**	**Revised date not yet established**
M-2. Provide ATOS automation access to all Headquarters air carrier inspectors and their managers immediately upon completion of the ATOS training course.	**3/1/01**	**Revised date not yet established, dependent upon recommendation M-1**
M-3. Coordinate with Headquarters to develop a process that fully integrates the development and publication of new and revised rules and programs with ATOS inspection job aids.	**6/1/01**	**6/02** *slipped 13 months*
M-6. Develop and implement a process that provides industry input on the development and revision of ATOS policies/procedures, risk assessment tools, and SAI/EPI job aids.	**3/1/01**	**Revised date not yet established**
M-9. Charter a joint management-union work group to conduct an in-depth review of the FAA and United Airlines Joint Safety Review Team agreement and process, and make recommendations on the potential application of that approach on a voluntary basis with other ATOS carriers.	**6/1/01**	**Revised date not yet established**

[**] Part a (developing an inspector training course for system safety) is complete.

Recommendations on Miscellaneous Issues	*Original Target Date*	*Revised Target Date*
M-11. The Flight Standards Business Process Improvement Steering Committee should consider the emerging agency Portfolio Management Model and Lifecycle Management System Concepts in pursuing a more effective Service organizational structure through the established portfolio work groups.	**3/1/01**	**The ATOS program office is no longer tracking this recommendation***
M-12. Develop and maintain a comprehensive program plan and graphical chart that will depict the planned evolution of ATOS through its versions and phases into full operational capability.	**3/1/01**	**7/02** *slipped 17 months*
Recommendations on Process Issues	***Original Target Date***	***Revised Target Date***
P1. Charter a joint management-union ATOS Geographic Program Work Group to study and make recommendations addressing current issues with the geographic inspection component of ATOS, and to assist with the implementation of approved recommendations	**6/1/01**	**Revised date not yet established. Work Group completed its work on schedule. Implementation delayed due to recommended personnel actions.**
P-2, (part b).** Expand and update Data Evaluation Program Managers' job task analysis within 60 days after policy and procedures guidance completed.	**12/1/01**	**5/02** *slipped 6 months*
P-6. Initiate activities to incorporate recording and tracking of Module 8-Implementation actions (e.g., action plans, System Analysis Team activities, etc.) in ATOS automation, to provide more effective, traceable, and accountable processes.	**12/1/01**	**4/02** *slipped 5 months*

* FAA determined that this recommendation was outside the scope of ATOS.

** Part a (incorporating data quality and guidelines into the Policy and Procedures guidance) is complete.

Exhibit E. Completed Special Project Recommendations

Recommendations on Field Issues and Concerns	*Purpose or Objective*
F-1. Develop procedures and automation to enable inspectors to record single-activity inspection data in "unplanned Element Performance Inspection (EPI)" master records that are open continuously.	Provides method to capture unplanned surveillance observations.
F-2. Develop procedures and automation to enable principal inspectors to assign unplanned EPI activities outside the Comprehensive Surveillance Plan and retargeting processes.	Provides method to assign unplanned observations for immediate concerns.
F-3. Develop policy and procedures to enable ATOS inspectors to report unplanned inspections when the inspector feels the EPI reporting mechanism is insufficient for a particular inspection.	Eliminates confusion with unrelated question on job aids. Easy way for inspectors to capture data.
F-4. Develop procedures and automation to enable ATOS inspectors to report System Attribute Inspection (SAI)/EPI observations related to the system element being inspected but not covered by the questions.	Provides method to capture observations not covered by existing job aid questions.
F-5. Revise procedures and automation to add the capability for inspectors to enter qualifying information as comments to "Yes" answers on SAIs and EPIs.	Provides method to capture additional information about observations.
F-6. Develop policy to allow non-ATOS inspectors to conduct additional types of unplanned inspections, recorded in the Program Tracking and Reporting System.	Allows non-ATOS inspectors to do some surveillance on ATOS carriers.
F-7. Develop keyword mapping and associated queries of Program Tracking and Reporting System (PTRS) inspection comments to ATOS system elements to facilitate analysis.	Allows analyst to better utilize PTRS data in preparation of analysis reports.
F-8. Map regulatory requirements to all SAI and EPI questions having a regulatory basis.	Enables better decisions regarding inspector action and allows more effective analysis of the regulatory compliance of air carriers.
F-9. Revise policy, procedures and automation to eliminate the System Safety Analysis Tool.	Provides increased value to the process because of time consumed to complete it.
F-10. Revise procedures and automation to add SAI/EPI capability for inspectors to report information on what was inspected in making the "Yes" or "No" determinations in activity reports.	Allows inspectors to report information on what was inspected to help establish confidence level in data.

Recommendations on Field Issues and Concerns	*Purpose or Objective*
F-11. Revise procedures and automation to enable Data Evaluation Program Managers (DEPM) to evaluate activity reports before the master record is saved final.	Relieves workload demands flowing to DEPM and provides more timely data.
F-12. Revise procedures and automation to enable principal inspectors and supervisors to run queries on all SAI and EPI inspector activity reports saved as "Draft" or "Final" and revise automation functionality to allow users to easily save inspection reports in a single step.	Allows easy and timely access to ATOS data and simplifies process for inspectors to save surveillance activity reports.
F-13. Revise SAI job aids and procedures.	Identifies questions on job aids as regulatory or system-safety based.
F-14. Retract guidance issued to effect that principal inspectors should not increase number of EPI inspections in the Comprehensive Surveillance Plan to level above that driven by Air Carrier Assessment Tool results and consider use of some form of fleet factor for certain fleet-related system elements.	Provides flexibility in determining number of inspections to complete.
F-15. Develop guidance to align the next inspection planning cycle to fiscal year 2002.	Gets ATOS annual cycle aligned with fiscal year.
F-16. Revise policy and automation to enable a proxy capability for the Cabin Safety Inspector signoff of the Air Carrier Assessment Tool.	Does not delay retargeting due to Cabin Safety Inspector unavailability.
F-17. Eliminate the recording of best practices in ATOS and further develop concept and criteria for Best Practices.	Eliminate best practice reporting until inspectors receive training on how to identify best practices.
F-18. Develop criteria and revise (as necessary) the Criticality Baseline of all system elements.	Establishes criteria to define low, medium, and high criticality baseline parameters based on appropriate data.
F-20. Add a policy requiring annual recurrent air carrier-specific training for geographic inspectors.	Provides guidance for air carrier-specific training.
F-22. Meet with ATOS offices to identify, validate, and propose solutions to any root causes identified surrounding variations in consistency and accomplishment rates of SAIs between offices.	Standardizes methods of accomplishing SAIs and increases the rate of accomplishment.
F-23. Revise policy, procedures and automation to include managers as part of the certificate management team and to require their approval of the Comprehensive Surveillance Plan.	Helps managers to become more engaged in overseeing assigned air carriers and in improving ATOS.
F-24. Allocate six additional inspectors detailed to the ATOS program office.	Provides additional resources to the ATOS program office.

Exhibit E. Completed Special Project Recommendations

Recommendations on Miscellaneous Issues	*Purpose or Objective*
M-4. Distribute the "ATOS EPI and SAI Results Report" and the "ATOS 2000 Inspection/Activity Summary Report" to field managers on a monthly basis via e-mail and incorporate these as standard reports in ATOS automation.	Ensures managers become familiar with ATOS reports and begin to apply them in ongoing interaction with inspection teams.
M-5. Initiate action to effect the assignment of responsibility for the handling and release of ATOS data under the Freedom of Information Act (FOIA) and publish FOIA handling and release policy in the ATOS policy/procedures document.	Resolves confusion about what is releasable and who can release information.
M-7. Provide industry the opportunity to assist in the development of ATOS-related training.	Takes advantage of industry expertise in designing more effective ATOS training.
M-8. Work with industry to develop and implement a process review mechanism enabling carriers to question FAA at the national level about the standard application of ATOS policy/procedures.	Clarify the air carriers' understanding of ATOS and facilitate communication between carriers and FAA.
M-10. Complete all corrective actions responsive to FAA's September 30, 1999 "Audit of ATOS Data and Implementation."	Improves data quality.
Recommendations on Process Issues	***Purpose or Objective***
P-3. Recruit and hire nine operations research analysts.	Provides field analysts necessary to optimize ATOS process.
P-4. Finalize the analyst training profile and on-the-job training checklist that is in draft form.	Helps get field analysts productive as soon as possible.
P-5. Commence regular meetings of the new analysts to begin developing standard analysis reporting mechanisms and more detailed procedures.	Assists new analysts in providing information to principal inspectors for application of appropriate intervention strategies.

Exhibit F. Major Contributors to This Report

The following Office of Inspector General staff contributed to this report.

Name	Title
Lou E. Dixon	Program Director
Alan D. Robson	Program Director
Robin P. Koch	Project Manager
Thomas D. Jefferson	Senior Auditor
Ron Jones	Senior Auditor
Curt Boettcher	Analyst
Kevin George	Analyst
Shirley Murphy	Writer/Editor

Appendix. Management Comments

U.S. Department of Transportation
Federal Aviation Administration

Memorandum

Subject: **INFORMATION:** Draft Report on the Air Transportation Oversight System, Federal Aviation Administration

Date:

From: Assistant Administrator for Financial Services and Chief Financial Officer

Reply to Attn. of:

To: Deputy Assistant Inspector General for Aviation

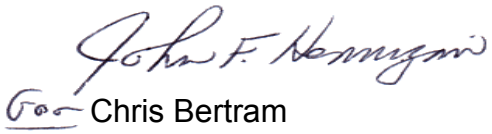
Thank you for providing us with the draft report of your audit of the Federal Aviation Administration's (FAA) Air Transportation Oversight System (ATOS). We value your assessment of our progress in implementing ATOS and your identification of barriers to successful implementation. Your acknowledgment of steps taken to improve ATOS, commendation of our recent progress, and recommendations to move this important safety program forward, including full coverage of all Federal Aviation Regulation Part 121 air carriers, is encouraging. We are pleased that you agree that ATOS is a proactive approach that corrects long-standing flaws in the traditional inspection system, and agree that the key is follow-through.

However, we disagree with some statements and inferences in the draft report. ATOS was introduced knowing that some of the key elements, such as analysis and implementation, would be further developed. Continuous improvement is a vital part of ATOS system design, and we do not view this as a shortcoming. ATOS was a functional system when it was introduced in 1998. At that time, procedures were published for all eight of the process modules that comprise ATOS. For the same reason, we disagree with the statement that ATOS is not fully implemented at the ten airlines under the system, and that minimal training was provided to ATOS inspectors. In 1998, nearly 500 inspectors were trained on ATOS procedures, job aids, software, and on system safety and risk management concepts. We also trained ATOS inspectors on the specialized procedures used by the airline to which they were assigned. These were major training efforts. The initial ATOS training has been improved and is now supplemented with a new system safety course and planned recurrent training. Finally, we disagree with the inference that ATOS was implemented prematurely. ATOS was developed with the assistance of Sandia National Laboratory consultants who are experts on system safety. Due to the thoroughness of ATOS job aids and the systematic nature of its inspection protocols, we were justifiably confident in its superiority over the traditional oversight system. ATOS

provides more coverage than traditional inspections. It assures that safety is built into airline operating systems and focuses surveillance resources on areas of higher risk.

Attached is the agency's response to all recommendations contained in the report. We agree with the intent of each of the recommendations. For the most part, these recommendations are complementary to our existing plans for enhancing and expanding ATOS.

If you have questions or need further information, please contact Anthony Williams, Budget Policy Division, ABU-100. He can be reached at (202) 267-9000.



for Chris Bertram

Attachment

Federal Aviation Administration's Response to the Office of Inspector General Draft Report on the Air Transportation Oversight System

OIG Recommendation 1: That the FAA Administrator meet the April 2002 scheduled date for completing and field testing the ATOS analysis and implementation elements.

FAA Response: Concur. Draft policy and procedures and prototype software for ATOS process modules 7 (analysis) and 8 (implementation) are planned for completion by April 30. Alpha, beta, and field-testing will follow in accordance with the management plan.

OIG Recommendation 2: That the FAA Administrator follow through with (a) planned enhancements of inspection checklists by identifying information needed to ensure that sufficient data are available in the ATOS database for performing thorough analyses and making informed safety decisions, and (b) efforts to increase the amount of operational data obtained from air carriers to enhance ATOS data analyses. Establish a firm target date for completion of changes to inspection checklists.

FAA Response: Concur. (a) Development of a comprehensive compendium of job task items (function objectives) for each ATOS element will begin in May 2002. These job task items will permit identification of data requirements for present and future ATOS applications. Also, the draft procedures for ATOS module 7 make ATOS surveillance data more robust by improving data sampling and distribution techniques. (b) Procedures for obtaining and analyzing operational data from sources other than the ATOS database are included in the draft procedures for ATOS process module 7 and will be field-tested at the end of April 2002. We will improve 25 percent of ATOS data collection job aids to provide better data quality and analysis capabilities by the end of FY 2002. The remaining job aids will be revised during FY 2003.

OIG Recommendation 3: That the FAA Administrator develop training for inspectors on the new ATOS/SPAS integrated system and prepare a training schedule within 30 days of this report and continue to devote resources to further develop the initial version of this integration.

FAA Response: Partially concur. At this time, ATOS data in SPAS may be manipulated the same as other data within SPAS. The SPAS program office produced an awareness video that includes SPAS presentations of ATOS data. No further training is required for inspectors previously trained to use SPAS. Field operations research analysts will receive specialized training during quarterly seminars. We are continuing to develop new SPAS analysis capabilities for ATOS data.

OIG Recommendation 4: That the FAA Administrator follow through on the agency's commitment to complete its system safety training plan as scheduled by September 2002 and continue to develop training programs that support inspectors' ability to perform ATOS inspections.

FAA Response: Concur. FAA is fully committed to meeting the September 2002 goal of having all Part 21 air carrier ATOS principal assigned inspectors fully trained in system safety training. This training began in September 2001. Fifty-five percent of ATOS inspectors will have completed system safety training by the end of March.

OIG Recommendation 5: That the FAA Administrator evaluate inspectors' geographic assignments and make it a priority to shift inspectors to locations where they are most needed and ensure their qualifications match the needs of the air carrier oversight offices to which they are assigned.

FAA Response: Concur. Whenever a geographic inspector position becomes vacant, we will move the position to the location of greatest need as determined by the principal inspector. These vacant positions will be filled via competition or reassignment in accordance with agency processes. All ATOS inspectors will be qualified in accordance with FAA Order 8400.10, Appendix 6.

OIG Recommendation 6: That the FAA Administrator strengthen national oversight and accountability to ensure consistent field implementation of ATOS.

FAA Response: Concur. We recently selected experienced field managers to be the Director of the Flight Standards Service and the Manager of the Certification and Surveillance Division. These individuals increased the involvement of field division managers in the enhancement and implementation of ATOS. Field and headquarters managers are accountable to adhere to management plans and to implement ATOS effectively.

OIG Recommendation 7: That the FAA Administrator expedite completion of the comprehensive program plan for ATOS. This plan should include specific short- and long-term goals, milestone dates, task assignments, and critical pathways, and incorporate the recommendations in the ATOS Special Report issued in December 2000. The agency should continually monitor this plan to (a) ensure that critical paths, goals, and accomplishments are being met and (b) identify delays that could affect implementation.

FAA Response: Concur. By July 2002 we will revise our existing ATOS management plans to include explicit short- and long-term goals for implementing and enhancing ATOS. The plans will include milestones, task assignments, and critical pathways. They will also incorporate actions to be taken as a result of the December 2000 ATOS Special Report.