SAFETY OVERSIGHT OF AN AIR CARRIER INDUSTRY IN TRANSITION

Federal Aviation Administration

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Memorandum

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

Subject: <u>ACTION</u>: Report on the Audit of
Safety Oversight of an Air Carrier
Industry in Transition
Federal Aviation Administration
AV-2005-062

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Assistant Inspector General
 for Aviation and Special Program Audits

Reply to
Attn. of: JA-10

To: Federal Aviation Administrator

This report presents the results of our audit of the Federal Aviation Administration's (FAA) safety oversight of an air carrier industry in transition. During the past 4 years, network air carriers[1] experienced record financial losses and made unprecedented changes to their operations to regain profitability. While network air carriers have struggled, low-cost air carriers have continued to grow. To evaluate safety oversight during this time of transition, we conducted separate audits of FAA's oversight of financially distressed and low-cost air carriers. We have combined the results of these audits in this report.

We recognize that the United States has the safest aviation system in the world. Despite financial pressures, large U.S. air carriers have maintained an impressive safety record. There has not been a fatal crash of a large passenger air carrier in over 3 years. A number of factors may have contributed to this safety record. For example, air carriers are operating newer, more sophisticated aircraft and have established internal systems, such as Flight Operational Quality Assurance, to collect and analyze data to improve the safety of flight operations.

However, given the magnitude of changes occurring in the aviation industry and FAA's current budgetary and staffing challenges, FAA's oversight systems must be comprehensive, flexible, and data-driven to assure the public that safety will not be compromised and that limited inspector resources are used in an efficient

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[1] Network air carriers are defined as carriers using a "hub-and-spoke" system (e.g., United Airlines). Under this system, airlines bring passengers from a large number of "spoke" cities to one central location (the hub) and redistribute them onto connecting flights to their final destinations.

and effective manner. While FAA has made progress in moving toward a more risk-based approach to safety oversight, FAA inspectors were not able to effectively use the oversight systems to monitor the rapidly occurring changes. This is a significant concern in light of the fact that FAA is expected to lose about 300 aviation safety inspectors this year and in FY 2006 is only requesting budget authority to replace 97 inspectors. As a point of reference, there has been a lot of focus on hiring air traffic controllers—FAA has requested $25 million to hire 1,249 new controllers during 2006, which includes 595 new positions. While that is a critical issue for the Agency, it is also important to maintain a safety inspector workforce that is sufficient to achieve its mission of safety oversight. Until its risk-based approach to safety oversight is operating effectively and targeting already constrained resources to the areas of greatest risk, FAA needs to determine if it can make enough efficiency gains in its operations to sustain the cut in staffing beyond 2005.

The objective of this review was to determine whether FAA's risk-based oversight and data analyses systems are used effectively to monitor financially distressed and low-cost air carriers during periods of growth and change. We performed work at FAA and 10 air carriers. To evaluate FAA oversight of financially distressed air carriers, we selected five network air carriers—three that had declared bankruptcy or had been reported to be close to bankruptcy and two that had experienced significant monetary losses for a sustained period but were not yet reported to be close to bankruptcy. To evaluate FAA oversight of low-cost air carriers, we selected five air carriers that were identified in FAA's Flight Schedule Data System as low-fare air carriers, were regularly identified by the aviation industry as low-cost air carriers, and were experiencing growth. Exhibit A contains a list of the entities we visited or contacted. Exhibit B contains details on our objectives, scope, methodology, and prior audit coverage.

BACKGROUND

FAA employs approximately 3,400 aviation safety inspectors to oversee operations of commercial air carriers, aircraft repair facilities, general aviation operators, mechanics, pilots, and training facilities. To provide oversight of passenger air carriers, FAA uses two different inspection systems—the Air Transportation Oversight System (ATOS) for 15 air carriers[2] and the Surveillance and Evaluation Program (SEP) for the remaining 112 carriers. About 582 of FAA's inspectors use ATOS and 495 use SEP.

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[2] The 15 ATOS air carriers are Alaska Airlines, America West Airlines, American Airlines, American Eagle, Champion Air, Continental Airlines, Delta Air Lines, ExpressJet, FedEx, Northwest Airlines, SkyWest Airlines, Southwest Airlines, United Airlines, UPS, and US Airways.

In 1998, FAA implemented ATOS, a data-driven, risk-based approach to air carrier safety oversight. ATOS was designed to shift inspectors away from the inspection method they had used for over 30 years, which focused on whether air carriers were complying with regulations, to an approach that proactively assessed risks within air carriers' maintenance and operations systems. Under ATOS, FAA inspectors are to use data analysis to focus their inspections on areas that pose the greatest safety risks and to shift the focus of those inspections in response to changing conditions within air carriers' operations.

In 1999, FAA developed SEP to transition the remaining air carriers, including low-cost carriers, to ATOS. Like ATOS inspectors, SEP inspectors are to use data and risk analysis in targeting their inspections to areas within an air carrier's operation that pose a greater safety risk. However, FAA requires SEP inspectors to continue using its old National Program Guidelines, which require a pre-determined number of inspections, along with SEP-generated inspections. In addition, both ATOS and SEP inspectors are to use the Safety Performance Analysis System (SPAS), a computer-based system that analyzes inspection and air carrier data to aid inspectors in identifying safety problems.

In April 2002, we reported that although ATOS was conceptually sound, the system was not reaching its full potential, and significant challenges to full implementation still existed.[3] At that time, FAA had not finished developing and testing its processes for analyzing ATOS inspection results and ensuring corrective actions are implemented when inspectors find weaknesses in air carriers' maintenance and operations systems. In addition, the checklists used by inspectors to perform their inspections and gather data were too broad to provide useful information for analyses. Also, FAA had not developed a comprehensive program plan with target dates for further developing the system and transitioning all air carriers to ATOS. We also concluded that FAA needed to strengthen its national oversight of ATOS implementation to ensure consistency.

FAA has taken action to address our recommendations. In March 2003, FAA finished deploying the last two elements of the ATOS process—analyzing data and implementing corrective actions. In January 2004, FAA completed new inspector checklists. Also, FAA established an ATOS program plan for further developing ATOS but has not established target dates beyond fiscal year (FY) 2005 for transitioning the remaining air carriers to ATOS.

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[3] OIG Report Number AV-2002-088, "Air Transportation Oversight System," April 8, 2002. OIG reports can be found on our website: www.oig.dot.gov.

RESULTS IN BRIEF

FAA has made progress in moving to more risk-based, data-driven air carrier oversight systems that were designed to permit inspectors to respond to the types of changes occurring in the industry. In addition to ATOS, which was introduced 6 years ago and is now used for oversight of 15 large air carriers, FAA has developed an interim risk-based system, SEP, for oversight of the remaining 112 commercial air carriers.

FAA's risk-based oversight systems are conceptually sound. However, the magnitude of changes that air carriers are making and the rapid pace at which the changes are occurring have presented challenges for FAA at a time when its oversight systems are still evolving. After 6 years of working with ATOS and over 5 years with SEP, FAA still has a substantial amount of work ahead to refine and effectively implement its data-driven oversight systems. In reviewing FAA's oversight, we identified opportunities for FAA to enhance its ability to perform safety oversight of an air carrier industry in transition. Specifically:

✓ FAA needs to improve its processes for monitoring and conducting trend analyses of air carrier changes and planned inspections. Most network air carriers have been making similar changes and there have been marked similarities in low-cost carrier growth patterns; however, inspectors did not respond to industry changes in a timely and consistent manner. For example, all five network air carriers we reviewed had experienced record losses and were making similar changes to their operations and maintenance systems. However, inspectors only increased their surveillance at the three air carriers in or near bankruptcy.

Similarly, inspectors for low-cost carriers need to focus on the risks associated with the growth in air carrier operations. Inspectors for three of the five low-cost carriers we reviewed did not focus on these risks. For example, one air carrier increased its fleet size by 56 percent, nearly tripled the number of destinations it served, and increased flight operations by 59 percent between 2000 and 2003. As the air carrier grew, it reduced the number of mechanics it employed by 14 percent. However, FAA did not identify the increase in flights and reduction in mechanics as risks or evaluate the impact this growth and change had on the air carrier's maintenance and operations.

✓ Improvements were needed in key processes used by inspectors to identify risks in air carriers' systems, prioritize inspections, and shift inspections to areas of greater risks. Inspectors for the five network air carriers we reviewed did not complete 26 percent of their planned inspections during FY 2003 when carriers were making significant changes to streamline

operations and reduce costs. ATOS needs to have a process to prioritize inspections so that areas of greater risk are inspected first. As shown in the following table, more than half of the inspections not completed were in areas of air carriers' operations where inspectors had identified risks.

Inspectors Did Not Complete All Planned Inspections of Areas Where Risks Were Identified

FAA Office	Inspections		
	No. Planned	Total Number (%) Not Completed	Number (%) Not Completed That Were in Identified Risk Areas
United	617	259 (42%)	151 (58%)
Delta	582	234 (40%)	49 (21%)
American	614	168 (27%)	78 (46%)
Northwest	834	147 (18%)	108 (74%)
US Airways	894	130 (15%)	130 (100%)
Total	**3,541**	**938 (26%)**	**516 (55%)**

In addition, inspectors found it difficult to adjust their plans when new risks were identified and had to depart from ATOS-recommended surveillance to gather the data needed to effectively respond to industry changes. For example, when a network air carrier closed a major maintenance facility and shifted the work to four other facilities, inspectors did not reassess risks and change their inspection plan even though they had found significant problems at the facility where most of the work was shifted. FAA inspectors for three network and two low-cost air carriers we reviewed expressed reluctance to identify risks because it would result in more inspections than could be completed in a year.

✓ Improvements are needed in the interim SEP process to ensure that inspectors have the tools and guidance to effectively identify risks, conduct their inspections, and ensure risks are mitigated. SEP inspectors still use the old compliance-based system to conduct their inspections, and they do not have the benefit of dedicated data analysts. As a result, when inspectors identified maintenance discrepancies, they did not sufficiently focus on determining whether systemic problems existed in air carriers' maintenance programs and internal monitoring systems.

✓ FAA needs to ensure its inspection workforce is adequately staffed. FAA is expecting to lose about 300 aviation safety inspectors this year—233 of those positions are expected to come from its Flight Standards office and

67 from its Aircraft Certification office—another area that has been the subject of significant concern. While FAA has requested funding to hire 80 new flight standards inspectors and 17 aircraft certification inspectors during FY 2006, those numbers may not be sufficient to ensure that all high-risk or emerging issues receive adequate coverage.

As shown in this chart, the reduction in the Fight Standards office would represent a substantial change from the relatively stable number of inspectors the Agency has employed over the past 4 years, a period that included our field work for this review. As a point of reference, FAA has requested $25 million to hire 1,249 new air traffic controllers during FY 2006 (which includes 595 new positions) as it begins implementing its plans to hire 12,500 new controllers over the next decade.

Number of Aviation Safety Inspectors FY 2001 to FY 2005
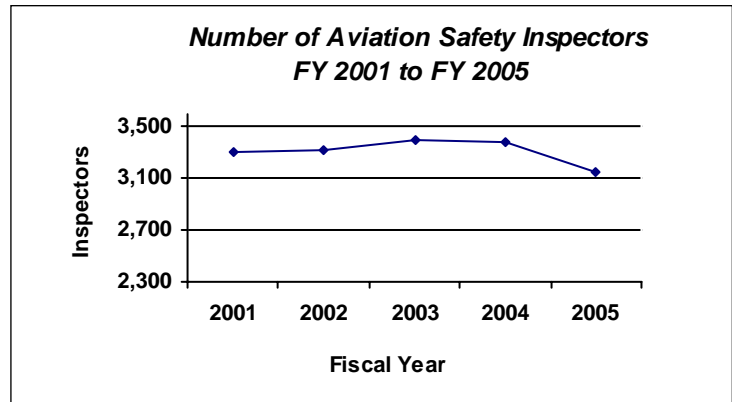
We recognize that FAA is facing an extraordinarily constrained budgetary environment, but adequate resources need to be committed to air carrier oversight to ensure the continuity of safe operations, particularly as the airline industry makes significant and ongoing transitions in their operations. Until its ATOS and SEP systems are operating effectively and targeting already constrained resources to the areas of greatest risk, FAA needs to determine if it can make enough efficiency gains to sustain the planned cut of 233 safety inspectors beyond 2005.

Although many of the changes underway in the industry, such as reduced gate turnaround times, have been a routine part of some air carriers' operations, they are new ways of doing business for others. With these changes have come new stresses in the system and, in some cases, potentially new risks that bear watching. While there has not been a fatal accident involving a large passenger air carrier in over 3 years, there have been incidents related to the changes occurring in the industry that may be precursors to potentially more serious incidents. For example, pilots and flight crews are flying more hours, and aircraft are being utilized for more hours a day. When a series of operational incidents occurred at one network air carrier, FAA inspectors determined that the prolonged psychological stress and fatigue that pilots had experienced as a result of major

pay cuts and flying extra hours to make up for the loss of pay were possible contributing factors.

Also, FAA noted that ground operations incidents were increasing while one air carrier was in bankruptcy. For example, in October 2003, a ground accident occurred between two Boeing 777 aircraft operated by this U. S. air carrier and a foreign air carrier. This highlighted the potential risk to passengers because at the time of collision, there were 449 passengers on board the two aircraft. Although no passengers were injured, both aircraft sustained substantial damage when the airplanes' right wing tips struck each other. In a more recent incident (May 2005), four crew members and a ground service agent were injured when a commercial aircraft operated by another U.S air carrier taxied to the arrival gate and struck the wing and rear tail sections of another aircraft, causing substantial damage to both aircraft.

FAA must have well-planned and well-executed oversight of air carriers' maintenance and operational systems to assure the public that industry changes, including financial distress and growth, do not compromise safety. The recommendations made in this report were designed to strengthen FAA's oversight and ensure the highest level of safety is maintained as FAA transitions all air carriers to ATOS.

To improve its oversight systems, FAA needs to:

- ✓ Strengthen its oversight and monitoring of field offices to ensure that inspectors conduct their inspections in a timely and effective manner.

- ✓ Refine its risk assessment, inspection planning, and data analyses processes so they are more comprehensive and flexible.

- ✓ Ensure that inspectors using SEP have the tools and guidance to effectively identify risks, conduct their inspections, and ensure risks are mitigated.

- ✓ Determine if it can make enough efficiency gains in its operations to sustain the planned cut of 233 safety inspectors beyond 2005.

While FAA did not agree with all of our report conclusions, it generally agreed to implement our recommendations. However, we are requesting that FAA clarify its planned actions for some of the recommendations, such as modifying inspector checklists to include questions related to monitoring industry changes. When implemented, actions promised by FAA should make a safe aviation system even stronger.

The Changing Aviation Landscape

During the past 4 years, the airline industry has faced a series of major challenges including a weakened economy, the terrorist attacks of September 11, 2001, the Severe Acute Respiratory Syndrome epidemic, the war in Iraq, and soaring fuel prices. As a result, network air carriers suffered monetary losses of $37.2 billion. Two network air carriers are in bankruptcy and the rest of the network carriers continue to experience significant financial difficulties. With substantially lower cost structures, low-cost air carriers continued to grow during 2004 and are forecasted for more growth. However, the October 2004 bankruptcy filing by one of the low-cost air carriers shows that these air carriers have also begun to experience financial pressures.

In response to monetary losses and to compete with low-cost air carriers, network air carriers are making unprecedented changes to restructure their operations. For example, the five network air carriers we reviewed:

- ✓ Retired 664 aircraft from September 2001 through December 2004;

- ✓ Stored 166 aircraft as of December 31, 2004;

- ✓ Reduced their personnel by 9,920 pilots and 12,873 mechanics from 2001 through 2003;

- ✓ Closed 42 maintenance facilities from 2001 through 2003; and

- ✓ Established two low-cost airlines within their own corporate structures.

During the same time that network air carriers were reducing their operations, low-cost air carriers increased their market share of passengers from 17 percent to 22 percent and were able to expand their operations. For example, the five low-cost air carriers we reviewed:

- ✓ Hired 1,170 pilots and 384 mechanics from 2000 through 2003, and

- ✓ Added 228 new aircraft and retired 100 old aircraft between December 2000 and December 2004.

These changes have resulted in a significantly different air carrier industry, which requires a dynamic oversight process to ensure safety is maintained.

Stronger oversight and monitoring would improve the timeliness and consistency of FAA actions taken in response to industry changes

Given that air carriers are making similar operational changes, such as reducing staff and increasing their use of outsourced maintenance providers, FAA needs to strengthen its national analyses and support functions to ensure inspectors have sufficient data on the financial health and growth of air carriers and conduct inspections in a timely and consistent manner. The central groups established to provide national analyses support and to develop ATOS and SEP policies and procedures do not have a strong field office monitoring role and do not conduct continual data analyses to assist field offices. Instead, they provide data and support primarily upon request from field offices. As a result, actions taken by inspectors to increase their surveillance tended to be event-based (e.g., declaring bankruptcy). We found that:

- ✓ **Inspectors need current data to aid in predicting an air carrier's financial health.** FAA inspectors for only three of the network air carriers we reviewed requested financial data from the analyses group, and those inspectors did not make the requests in a timely manner. For example, inspectors for one air carrier did not request financial data until November 2003, well after the air carrier began making changes to respond to monetary losses. These changes included reducing personnel, closing maintenance facilities, and establishing a low-cost air carrier within its corporate structure. The carrier began reducing personnel between August and December 2001.

  To compound the problem, the financial data most readily accessible to inspectors through its Safety Performance Analysis System was not current and accurate. For example, one of the network air carriers in bankruptcy was not listed as bankrupt in the system for 6 of the 7 months it was in bankruptcy.

- ✓ **Inspectors should be provided with nationwide analyses on risks being identified and results of inspections conducted at other air carriers making similar changes.** Most network carriers have been making similar changes and there have been marked similarities in low-cost air carrier growth patterns, but FAA did not conduct any nationwide air carrier data and trend analyses. This information would have aided inspectors in conducting their inspections in a timely and consistent manner.

Because FAA did not provide strong oversight and analyses, inspectors did not respond to air carriers' financial distress, growth, and changes in a consistent and timely manner. For example:

✓ **FAA responded inconsistently to air carriers' financial distress and growth.** All five network air carriers we reviewed had experienced record losses and were making similar changes to their operations and maintenance systems. However, inspectors only increased their surveillance at the three air carriers in or near bankruptcy. Similarly, inspectors did not focus on risks associated with the growth of three of the five low-cost air carriers we reviewed. For example, one air carrier increased its fleet size by 56 percent, nearly tripled the number of destinations it served, and increased flight operations by 59 percent between 2000 and 2003. As the air carrier grew, it reduced the number of mechanics it employed by 14 percent. However, FAA did not identify the increase in flights and reduction in mechanics as risk or evaluate the impact this growth and change had on the air carrier's maintenance and operations.

✓ **FAA needs to place more emphasis on oversight of outsourced maintenance**. Of the 10 network and low-cost air carriers we reviewed, 6 increased the percentage of maintenance expense they outsourced during 2003. Although inspectors for all five network carriers increased the number of inspections planned for outsourced maintenance providers in FY 2004, the number of inspections planned ranged from 7 to 32. Inspectors planning only seven inspections were responsible for overseeing an air carrier that outsourced over 50 percent of its maintenance expense in 2003.

FAA has recognized the need to enhance surveillance in this area. However, key actions promised in response to our July 2003 report on air carriers' use of repair stations have not yet been implemented. For example, FAA is still working to develop a process for identifying trends in air carriers' use of repair stations and a process for determining which repair stations carriers are using to perform critical maintenance functions. In the interim, FAA began a national special emphasis program in 2004 to evaluate air carriers' oversight of outsourced maintenance. This is a step in the right direction, but FAA needs to monitor this program closely to ensure it is implemented consistently by inspectors.

✓ **FAA should focus risk assessments and inspections on changes in aircraft utilization**. Air carriers are taking a number of steps to increase the use and productivity of aircraft, personnel, and facilities. One method to increase aircraft utilization is to reduce the time aircraft remain at airport gates between flights, commonly referred to as the "gate turnaround time." FAA's guidance recommends that inspectors monitor this practice to ensure that carriers do not allow problems to occur, such as insufficient aircraft brake-cooling times or excessive or late maintenance deferrals.

However, FAA inspectors for the air carriers we reviewed did not consider short gate turnaround times to be a potential risk and did not adjust surveillance to monitor them. We found instances in which air carriers with short gate turnaround times did not adhere to required operating procedures. For example, at one air carrier, we found errors in four of the five weight and balance computations made by pilots. According to air carrier personnel, the errors were not discovered because the employee responsible for checking the computations did not have sufficient time.

✓ **FAA needs to track and analyze results of nighttime inspections**. Inspectors spent from a low of 1 percent to a high of 7 percent of their total work time conducting nighttime inspections.[4] FAA has not focused on nighttime inspections even though as much as 90 percent of maintenance is performed overnight. In our view, recent industry changes make the need to reassess the approach to nighttime surveillance more critical. FAA should conduct analyses to determine if there is an elevated risk factor associated with nighttime maintenance that needs to be included in future ATOS surveillance plans.

✓ **FAA should focus risk assessments and inspections on the potential risks associated with airport ramp operations**. Air carriers have reduced the number of ramp personnel and employees have taken on additional duties because of the reduction in the number of mechanics. For example, one air carrier changed the employee group responsible for receipt and dispatch of aircraft at 18 airports from mechanics to ground service agents. FAA inspectors at only one of the five network air carriers we reviewed were closely tracking changes in ramp operations as a potential risk area.

FAA needs to establish policies and procedures for its national analyses and support groups to strengthen their assistance to field offices and clarify existing guidance to ensure that risk assessments of air carrier changes are conducted in a timely and consistent manner. As part of this process, FAA should perform more national analyses to identify trends in air carrier changes and inspection findings.

FAA's risk assessment, inspection planning, and data analyses processes need to be more comprehensive and flexible

We found problems in key areas of FAA's inspection program—prioritizing inspections, adjusting planned inspections, assessing risks, and analyzing data.

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[4] These percentages are based on the total time available for the inspectors in our sample because we could not determine the amount of time each inspector actually spent on surveillance.

✓ **The ATOS system needs to have a process to prioritize inspections so that areas of greater risk are completed before lower-risk areas.** Inspectors for the five network air carriers we reviewed did not complete 26 percent of their planned inspections during FY 2003 when carriers were making significant changes to streamline operations and reduce costs. In many cases, FAA managers and principal inspectors cited insufficient staffing and budget as reasons for not completing all planned inspections. Without a system to prioritize planned inspections, more than half of the inspections not completed were in areas of the air carriers' operations where inspectors had identified risks.

For example, inspectors for one network air carrier that was financially distressed did not complete all planned inspections of repairmen qualifications in FY 2003, even though potential risks had been identified in this area because of turnover in personnel and a reduction in workforce. It was not until FAA conducted inspections during the next fiscal year that FAA found air carrier inspectors and mechanics at two major maintenance facilities had been repairing or inspecting repairs on parts that they were not qualified to repair. Once the problem was detected, FAA inspectors conducted focused, follow-up inspections in FY 2004. However, this had been occurring for at least 10 months before FAA inspectors detected the problem.

✓ **Inspectors found it difficult to adjust their inspection plans if new risks were identified during the year**. When a network air carrier closed a major maintenance facility and shifted the work to four other facilities, inspectors did not reassess risks and change their inspection plan even though they had found significant problems at the facility where most of the work was shifted. In fact, inspectors for only one of the five network air carriers we reviewed changed their annual inspection plans during FY 2003 even though major changes were occurring at all five air carriers. In FY 2004, inspectors increased their use of the system to change inspection plans. However, none of the inspectors followed ATOS procedures to reassess air carrier risks when revising their inspection plans.

ATOS also did not provide a process to override the minimum number if new risks were identified. As a result, FAA inspectors for three of the five network air carriers we reviewed expressed reluctance to identify risks because it would result in more inspections than could be completed in a year. Although the SEP system did have a process to override the required inspections when new risks were identified, we found inspectors for two low-cost air carriers did not follow this process and expressed reluctance to

identify risks in the fourth quarter because it would result in more inspections than could be completed in a year.

✓ **Although inspectors are increasingly using data in decision-making, they continue to rely more on their past knowledge and experience rather than data to identify risk areas**. Inspector experience and knowledge are important, but inspectors also need to evaluate inspection and air carrier data when making decisions on areas of risk. ATOS was designed to remove some of the subjectivity that could be associated with inspectors' use of their experience and knowledge in identifying risks within air carrier systems. For example, inspectors were provided specific checklists to use in inspecting air carrier systems and operations. However, inspectors did not consider ATOS inspection checklists adequate to gather data needed to respond to industry changes.

To compensate for these weaknesses, inspectors developed supplemental checklists. It is commendable that FAA took steps to develop a process to monitor potential risks associated with financial distress. However, some FAA officials agreed that substantial use of the alternative checklists hinders inspectors' ability to conduct ongoing analysis of risks in air carrier systems because the results from the inspections could not be effectively combined with data from planned ATOS inspections to identify emerging safety trends.

As a result, the data could not be used for comprehensive analysis of air carrier changes. FAA officials claimed that the supplemental checklists were just a part of ATOS that were developed to give the system the flexibility to respond to special issues like the ones addressed in our report. However, we found that inspectors relied heavily on the supplemental checklists rather than adjusting their inspection plans through ATOS.

In addition, inspectors did not consistently gather information to track air carrier changes. For example, even though all five network air carriers we reviewed reduced personnel, inspectors for only one carrier obtained the information necessary to assess the effect of staff reductions on air carrier operations (i.e., which departments the reductions occurred in).

FAA needs to improve data used for risk assessments by updating inspector guidance materials, including questions on inspector checklists to aid inspectors in evaluating air carriers undergoing change such as financial distress and growth. In addition, FAA should require inspectors to obtain detailed data from air carriers so the inspectors can effectively respond to changes such as personnel reductions.

Inspectors using FAA's interim SEP process did not have the tools and guidance needed to effectively identify risks, conduct their inspections, and ensure risks are mitigated

FAA provided inspectors with systems safety training on evaluating air carriers' systems. However, there are key differences in the manner in which FAA oversees ATOS versus non-ATOS air carriers.

✓ **SEP needs checklists like those used during ATOS inspections**. ATOS checklists have questions that guide inspectors to evaluate air carrier systems rather than using the old process of conducting random inspections of air carriers' compliance with regulations. FAA officials advised us that at the beginning of FY 2005, it began providing SEP inspectors with ATOS checklists. However, the lack of these inspection checklists hindered SEP inspectors' ability to effectively identify systemic risks at low-cost air carriers during a period of significant growth and change.

For example, at one low-cost air carrier that had increased operations by 35 percent from 2000 through 2003, we found 23 maintenance discrepancies that had not been recorded in aircraft logbooks for two of the three aircraft observed at the carrier. The carrier's subsequent inspection of the same two aircraft identified an additional 123 discrepancies. To their credit, FAA inspectors identified aircraft airworthiness as a risk area at this air carrier, but they did not focus their inspections on determining whether a systemic problem existed in the air carrier's internal maintenance systems that allowed these discrepancies to go undetected.

✓ **SEP inspectors should clearly document risks found in air carriers' maintenance and operations or provide detailed action plans to ensure risks are mitigated.** Our review of 71 risks documented by inspectors found that in 18 instances inspectors did not include descriptive information clearly defining risks, in 22 instances did not provide detailed information regarding their plans to ensure risks were mitigated, and in 35 instances did not document whether risks had been mitigated (i.e., whether air carriers had taken sufficient action to correct the condition that prompted inspectors to identify a potential risk).

Until FAA is in a position to move all air carriers to ATOS, the Agency should improve the SEP process. FAA plans to complete incorporation of ATOS inspection checklists into SEP by the end of FY 2005. FAA must ensure that it meets this milestone. In addition, in July 2004, FAA implemented new risk tracking procedures to ensure inspectors are documenting whether risks have been mitigated. FAA needs to ensure

inspectors are following these new procedures and are clearly describing risks and action plans in accordance with SEP guidance.

✓ **FAA also needs to establish a more definitive plan for transitioning the remaining air carriers to ATOS.** Only one additional air carrier is scheduled to be added to ATOS during the remainder of FY 2005—Trans States. FAA's ATOS Phase II Project Plan, dated October 1, 2002, stated that FAA's goal was to complete transition of all air carriers to ATOS by the end of FY 2003. Even though only 15 of the 127 carriers are currently under ATOS, FAA's current ATOS transition plan, dated March 1, 2004, does not establish milestone dates for transitioning additional air carriers to ATOS beyond FY 2005.

The plan merely states that conditions may change considerably, (e.g., availability of resources—people and dollars) during the time period for transitioning all remaining air carriers to ATOS. In January 2005, FAA reported to Congress that the transition will proceed as rapidly as ATOS development and resources permit. FAA needs to establish a more definitive goal for the number of air carriers that will be added to ATOS each year, taking into account its staffing and budgetary resources.

SUMMARY OF RECOMMENDATIONS

Given the magnitude of changes occurring within the aviation industry, FAA must ensure its oversight systems are working effectively to identify potential risks and change the focus of inspections to areas that pose the greatest risks. We have made recommendations to aid FAA in ensuring that the highest level of safety is maintained during this period of transition in the aviation industry. *A detailed list of these recommendations can be found on page 23.* Generally, we are recommending that FAA:

✓ Establish policies and procedures to ensure the national analyses and support groups provide stronger assistance and analytical support to field offices.

✓ Conduct an increased number of nighttime inspections to gather sufficient data to perform analysis and determine if there is an elevated risk factor associated with nighttime maintenance that needs to be included in future ATOS surveillance plans.

✓ Improve data used for risk assessment by updating inspector guidance materials, including questions on inspector checklists to aid inspectors in

evaluating air carriers undergoing change, such as financial distress and growth, requiring inspectors to obtain data from air carriers so they can effectively respond to changes such as personnel reductions, and developing a better method of providing financial information either through SPAS or from other sources.

✓ Establish a more definitive goal for the number of air carriers that will be added to ATOS each year considering the Agency's staffing and budgetary resources.

✓ Determine if it can make enough efficiency gains in its operations to sustain the planned cut of 233 safety inspectors beyond 2005.

SUMMARY OF AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

On April 11, 2005, FAA provided comments to our draft report. While FAA went to great lengths to express general disagreement with some of the conclusions in our report; the Agency generally agreed with our recommendations. Specifically, FAA agreed or partially agreed to take action to implement all of our recommendations. When implemented, many of the actions promised by FAA should make a safe aviation system even stronger and will help ensure limited inspector resources are used efficiently and effectively. FAA's full response can be found in the Appendix on page 36. After FAA provided its response, we added a recommendation pertaining to inspector staffing. Key actions FAA plans to take to our draft report recommendations are to:

✓ Develop procedures to strengthen national assistance to field offices and to improve field office managers' oversight of risk assessment and inspection planning when air carriers make significant changes.

✓ Develop procedures to ensure inspectors are continually monitoring the effect of industry changes, such as financial distress.

✓ Require inspectors to identify the types of maintenance accomplished during off-hours and to collect enough inspection data during off-hour periods to assess risks.

✓ Monitor implementation of recent changes to the ATOS risk assessment process to ensure that ATOS inspections are prioritized so that high-risk areas are inspected before lower-risk areas, inspectors are able to effectively change inspection plans when new risks are identified, and the

frequency and number of planned inspections is commensurate with the potential risks identified.

✓ Meet the FY 2005 milestone for incorporating the ATOS inspection checklists into SEP.

✓ Require inspectors to follow SEP procedures to document risks and action plans, track risks until corrective action has been taken to mitigate the risks, and override required inspections when new risks are identified.

Actions planned by FAA, in some cases, did not meet the intent of our recommendations. Therefore, we are also requesting that FAA reconsider its position or provide additional data for these recommendations. Areas covered by these recommendations include: modifying inspector checklists to include questions related to monitoring industry changes, providing better financial information to inspectors, monitoring implementation of recent changes to the ATOS risk assessment process, requiring inspectors to follow SEP procedures, and developing more definitive goals for transitioning the remaining air carriers to ATOS. We are also requesting that FAA provide a response to the additional recommendation on inspector staffing. Details on the action required by the Agency can be found on page 29.

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During the past 4 years, network air carriers have faced record financial losses and made unprecedented changes to their operations to regain profitability. While network air carriers have struggled, low-cost air carriers have continued to grow. These changes have resulted in a significantly different air carrier industry, which requires a dynamic oversight process to ensure safety is maintained. The Federal Aviation Administration (FAA) has made progress in moving to a more risk-based, data-driven air carrier oversight system designed to respond to the types of changes occurring in the industry. In addition to its Air Transportation Oversight System (ATOS), which was introduced 6 years ago and is now used for oversight of 15 large air carriers, FAA has developed an interim risk-based system, the Surveillance and Evaluation Program (SEP), for oversight of the remaining 112 commercial air carriers.

However, after 6 years of operational experience with ATOS and phased-in implementation of SEP, FAA still has a substantial amount of work ahead to improve its oversight systems, especially given the magnitude of changes air carriers are making and the pace at which the changes are occurring. Most network carriers were making similar changes and there were marked similarities in low-cost air carrier growth patterns, but FAA did not provide strong nationwide monitoring and trend analyses to ensure that inspectors responded to these changes in a timely and consistent manner. In addition, the key processes used by inspectors to identify risks in air carriers' systems, prioritize their inspections, and shift their inspections to areas of greater risks were not working effectively. As a result, inspectors' ability to effectively respond to industry changes was diminished.

Network and Low-Cost Air Carriers Have Substantially Changed Their Operations

Network air carriers have made unprecedented changes to restructure their operations in response to record-breaking monetary losses. They now outsource an average of 53 percent of their maintenance expense, as compared to 37 percent in 1996. In addition, the five network air carriers we reviewed:

- ✓ Retired 664 aircraft from September 2001 through December 31, 2004;

- ✓ Stored 166 aircraft as of December 31, 2004;

- ✓ Reduced their personnel by 9,920 pilots and 12,873 mechanics from 2001 through 2003;

✓ Closed 42 maintenance facilities from 2001 through 2003; and

✓ Established two low-cost airlines within their own corporate structures.

In August 2004, we reported that network air carriers have made some progress in reducing labor and other costs, but these gains have been partially offset by rapidly rising fuel costs.[5] All network air carriers posted net losses for 2004.

However, most low-cost air carriers have experienced significant growth and have expanded their operations. Southwest Airlines, the largest low-cost air carrier, had more domestic passengers during 2004 than any other U.S. air carrier. The five low-cost air carriers we reviewed hired 1,170 pilots and 384 mechanics from 2000 through 2003. In addition, from December 2000 through December 2004, they added 228 new aircraft and retired 100 old aircraft, for a net increase of 128 aircraft. As shown in Table 1, the five low-cost air carriers we reviewed also increased their average monthly scheduled departures, passenger enplanements, and available seat miles by over 100 percent since 2000.

Table 1. Summary of Growth Indicators for Five Low-Cost Air Carriers, Average Monthly Operations, 2000 Compared to 2004

Growth Indicator	2000 Monthly Operations	2004 Monthly Operations	Increase
Departures	18,398	38,156	107%
Passengers	1,834,724	3,810,807	108%
Available Seat Miles*	2,399,848,000	5,549,873,000	131%

*Available seat miles is the number of miles flown between destinations multiplied by the number of seats on the aircraft.
Sources: Air Carrier Financial Reports (Department of Transportation Form 41) submitted to the DOT Bureau of Transportation Statistics and the FAA Flight Schedule Data System.

Not all low-cost air carriers are individually growing at the rates shown above, and one low-cost carrier recently declared bankruptcy. However, the overall growth of low-cost air carriers is a trend that is projected to continue.

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[5] OIG Report Number CC-2004-085, "Airline Industry Metrics: Trends on Demand and Capacity, Aviation System Performance, Airline Finances and Service to Small Airports," August 10, 2004.

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FAA Is Facing Further Challenges as a Result of an Expected Reduction in the Number of Inspectors in FY 2005

It is important that FAA have well-planned and well-executed oversight of air carriers' maintenance and operational systems to assure the public that industry changes, including financial distress and growth, do not compromise safety. Within this context, a significant concern is that FAA is expected to lose about 300 aviation safety inspectors this year—233 of those positions are expected to come from its Flight Standards office. As shown in Figure 1, that reduction would represent a substantial change from the relatively stable number of inspectors the Agency has employed over the past 4 years, a period that included our field work for this review.

Figure 1. Number of Aviation Safety Inspectors FY 1995 to FY 2005
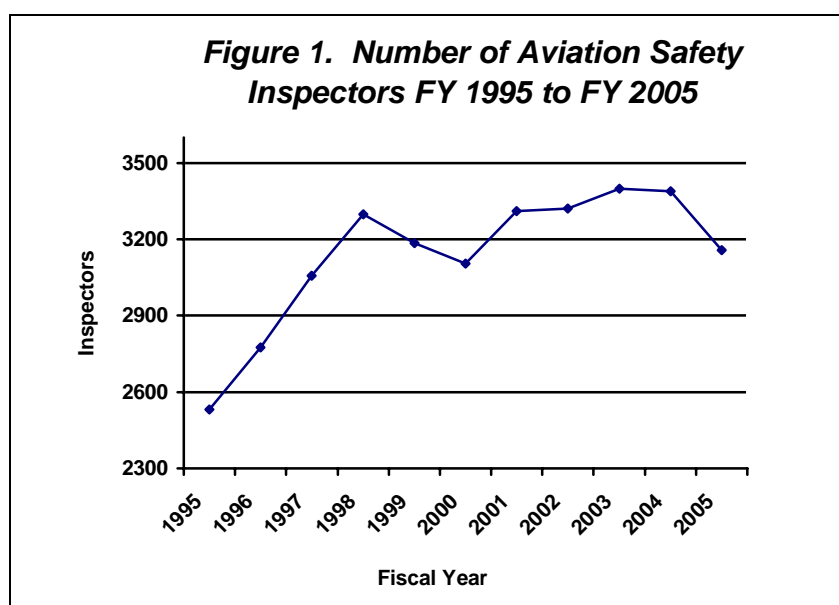
While FAA has requested funding to hire 80 new Flight Standards inspectors during FY 2006, those numbers may not be sufficient to ensure that all high risk and emerging issues receive adequate coverage. As a point of reference, FAA has requested $25 million to hire 1,249 new air traffic controllers during FY 2006 (which includes 595 new positions) as it begins implementing its plans to hire 12,500 new controllers over the next decade. We recognize that FAA is facing an extraordinarily constrained budgetary environment, but adequate resources need to be committed to air carrier oversight to ensure the continuity of safe operations, particularly as the airline industry makes significant and ongoing transitions in their operations.

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Until its ATOS and SEP systems are operating effectively and targeting already constrained resources to the areas of greatest risk, FAA needs to determine if it can make enough efficiency gains to sustain a cut of 233 safety inspectors beyond 2005.

Stronger Oversight and Monitoring Would Improve the Timeliness and Consistency of FAA Actions Taken in Response to Changes in the Industry

FAA needs to strengthen its oversight and monitoring to ensure inspectors have sufficient data on the financial health and growth of air carriers and conduct inspections in a timely and consistent manner when air carriers make changes. The central groups established to provide national analyses support and develop ATOS and SEP policies and procedures do not have a strong monitoring role. Instead of conducting continual data analyses and field office monitoring to ensure timely and consistent actions, these groups provide data and support primarily upon request from field offices.

FAA inspectors for only three of the five network air carriers we reviewed requested financial data from this analyses group, and inspectors did not make these requests in a timely manner. For example, inspectors for one air carrier did not request these data until November 2003, well after the air carrier began making changes because of substantial monetary losses, such as reducing personnel, closing maintenance facilities, and establishing a low-cost air carrier within its corporate structure.

To compound the problem, the financial data most readily accessible to inspectors through the Safety Performance Analysis System (SPAS) was not current and accurate. For example, SPAS did not accurately reflect the bankruptcy status of two network air carriers and one low-cost air carrier. One of the network air carriers was not listed as bankrupt in the system for 6 of the 7 months it was in bankruptcy. SPAS showed the low-cost carrier as bankrupt 9 months before it actually filed for bankruptcy protection. Therefore, inspectors could not use SPAS to help predict air carriers' financial health. As a result, actions taken by inspectors to increase their surveillance tended to be event-based (e.g., declarations of bankruptcy). FAA needs to develop a better method of providing financial information either through SPAS or from other sources.

FAA has an ATOS operations research analyst in each of the ATOS offices. Although these analysts have improved FAA inspectors' abilities to identify areas of risk, we found inconsistencies in the analysis of data by the analysts and the use of those data by FAA inspectors. For example, inspectors at one office routinely asked their data analyst to provide them information. Inspectors in this office

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were even using the analyst to review reliability data submitted by the air carrier to justify maintenance interval extensions. However, inspectors for another air carrier told us they have not found their analyst useful.

FAA Responded Inconsistently to Air Carriers' Financial Distress and Growth

FAA inspectors significantly increased their surveillance of the three network air carriers in or near bankruptcy. However, they waited until those air carriers were in or near bankruptcy to increase and focus their surveillance on areas that could be affected by financial distress. For example, inspectors for the three air carriers increased the number of inspections of mechanics' training and experience because of the significant shifting of personnel to different facilities and aircraft as a result of layoffs and facility closures.

In addition, inspectors for the three air carriers in or near bankruptcy had to depart from ATOS-recommended surveillance to effectively monitor financially distressed air carriers. Special checklists had to be developed to conduct inspections of issues related to financial distress that were not specifically covered by existing ATOS elements. Inspectors stated that they relied upon these unplanned inspections because the regular ATOS checklists were not comprehensive enough and the ATOS system was not flexible or easy to use.

However, as shown in Figure 2,[6] FAA did not take similar action to increase its surveillance for the other two network air carriers. FAA inspectors did not consider those two carriers to be financially distressed even though they had experienced record losses of $4.2 billion from 2001 through 2003 and were restructuring their operations to remain competitive.

Figure 2. Number of Inspections Outside of Planned ATOS Surveillance*
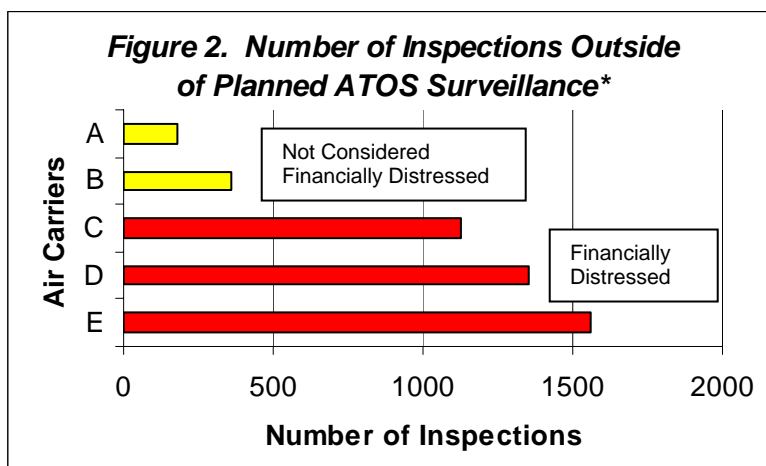
* The period covered for bankrupt air carriers is the three quarters after bankruptcy was declared (8/02 and 12/02), and for the other carriers it was the first three quarters of FY 2003.

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[6] Figure 2 data are compiled from Constructed Dynamic Observation Reports (ConDOR), Dynamic Observation Reports (DOR), and inspections of aircraft at the gate, referred to as ramp checks, recorded in the Program Tracking and Reporting SubSystem. Inspectors primarily used these unplanned inspections to increase their surveillance in response to financial distress instead of relying on regularly planned ATOS inspections.

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Similarly, FAA responded inconsistently to low-cost air carrier growth. The five low-cost air carriers we reviewed had increased operations by 76 percent, almost doubled the number of passengers they carried, and increased their fleet size by 50 percent from 2000 through 2003. FAA inspectors for three of the five low-cost air carriers we reviewed did not obtain growth plans or effectively monitor potential risks in these areas. Although air carrier growth is not inherently unsafe if carefully managed by air carriers, FAA inspectors should closely monitor it. While there is no specific regulatory requirement for an air carrier to submit a growth plan, FAA's guidance for inspectors to monitor air carrier growth and change recommends that inspectors obtain growth plans to determine whether air carriers have maintenance personnel, contracts, facilities, equipment, and training in place before any air carrier changes have taken place.

For example, in 2002, one air carrier we reviewed increased its aircraft fleet size 28 percent, from 29 to 37 aircraft, but FAA did not evaluate the impact this change had on the air carrier's operations and maintenance. Even though FAA's guidance instructs inspectors to consider increases in fleet size of 10 to 15 percent per year as high, inspectors for this air carrier did not focus their inspections on this growth because they considered the aircraft additions to be steady growth. Also, in the next year, the carrier reduced the size of its maintenance staff by 44 mechanics (14 percent), even though it continued to add new and more complex aircraft to its fleet. Although the reduction in mechanics may have been appropriate given that new aircraft might not require as much maintenance as older aircraft, inspectors did not evaluate whether the air carrier retained a sufficient number of trained mechanics to properly maintain its fleet.

We found several problems at this air carrier's maintenance facility, such as mechanics signing off on maintenance testing and tagging procedures that had not been performed and not following prescribed instructions while performing maintenance. In addition, we found numerous aircraft fasteners and bolts that were not traceable to their original manufacturing batch and items that had an expired shelf life but were still available for use. While these deficiencies were not safety of flight issues, they were indicators that both the air carrier and FAA need to be more vigilant in their oversight processes.

In addition to its ATOS and SEP policies and procedures, FAA has supplemental guidance for monitoring air carrier financial distress, growth, and change. However, the guidance added further confusion because it did not clarify when inspectors should adjust their surveillance. The guidance on financial distress provided items (e.g., increases in repeat maintenance discrepancies) inspectors should monitor as indicators of financial distress. The guidance was not clear as to when inspectors should begin monitoring these indicators and did not instruct them to adjust surveillance until air carriers declared bankruptcy.

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Similarly, the guidance for monitoring air carrier growth listed the expansion of an air carrier's route structure as a growth indicator but did not specify how many new routes would represent a rate of growth that should be evaluated. As a result, inspectors primarily focused on growth in fleet sizes and did not adequately consider risks associated with substantial increases in the five low-cost carriers' flight operations and destinations.

FAA Needs To Place More Emphasis on Oversight of Outsourced Maintenance

We reported in July 2003[7] that by the end of 2002, nine ATOS air carriers were outsourcing 47 percent of their aircraft maintenance expense. We recommended that FAA change its approach to oversight of repair stations. FAA agreed to implement our recommendations; however, proposed changes are still underway. Since that time, we found that maintenance outsourcing has increased to 53 percent as of September 2004 for these same air carriers. We also did a similar analysis that included the five low-cost air carriers we reviewed. As shown in Table 2, 9 of the 14 air carriers had increased their percentage of outsourced maintenance expense as of September 2004 as compared to 2002, four either stayed the same or slightly decreased their percentage of outsourced maintenance expense, and results were inconclusive for one because Department of Transportation (DOT) Form 41 data were not available for 2002.[8]

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[7] OIG Report Number AV-2003-047, "Review of Air Carriers' Use of Aircraft Repair Stations," July 8, 2003.

[8] Spirit Airlines reported to the Bureau of Transportation Statistics that 34 percent of its maintenance cost was outsourced in the fourth quarter of 2003. We determined from a senior official at Spirit Airlines that 34 percent was representative of the amount of maintenance outsourced by this air carrier for 2003 and prior years. However, we could not verify this with data from the carrier's DOT Form 41 submission.

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Table 2. Percent of Outsourcing for 14 Air Carriers in 2002, 2003, and the First Three Quarters of 2004*

Air Carrier	Percent of Maintenance Expense Outsourced			
	2002	**2003**	**2004****	**Change (2002 to 2004)**
Jet Blue	39%	51%	63%	24%
United	33%	41%	54%	21%
ATA	22%	20%	43%	21%
Air Tran	31%	46%	46%	15%
Frontier	20%	27%	33%	13%
US Airways	50%	58%	60%	10%
Northwest	44%	56%	51%	7%
American	38%	38%	42%	4%
Alaska	79%	75%	80%	1%
Continental	65%	65%	65%	0%
Southwest	65%	65%	64%	(1%)
Delta	38%	37%	35%	(3%)
America West	77%	75%	72%	(5%)
Spirit	Not available	34%***	30%	Unknown

*   To determine outsourced maintenance percentages, we compared the amount of direct maintenance expense air carriers incurred for outside repairs to the amount the carriers incurred for total direct maintenance expense as shown on Form 41 financial data that air carriers submit to the Department's Bureau of Transportation Statistics. This is the best source currently available for data on air carrier outsourcing.

**   First three quarters only

*** Percent for Spirit Airlines based on FY 2003 fourth quarter data only.

Source: DOT Form 41 data

Although inspectors for all five network air carriers we reviewed increased the number of inspections planned for outsourced maintenance providers in FY 2004, the number of planned inspections varied widely. For example, FAA inspectors for one air carrier planned 32 inspections of carriers' management and oversight of outsourced maintenance programs, while inspectors for another carrier planned only 7. The inspectors planning only seven are responsible for overseeing an air carrier that outsourced over 50 percent of its maintenance expense in 2003 and plans to outsource more work in the future. However, inspectors for this air carrier conducted 98 percent of their inspections of the air carrier's in-house maintenance.

Also, FAA has found problems with this carrier's oversight of outsourced maintenance providers. For example, in March 2004, a pilot for this air carrier declared an in-flight emergency on an aircraft for which an outsourced

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maintenance provider had just completed a maintenance check. FAA determined that the outsourced maintenance provider had improperly tightened a moisture drain cap, causing erroneous readings on flight critical instruments, such as the airspeed indicating system. Although the pilot was able to return to the departure airport without further problems, a failure in these systems could cause aircraft accidents during take off and landing. An FAA inspector investigating the incident concluded that it appeared there was a lack of air carrier oversight of the outsourced maintenance provider.

We also found a wide range in the number of FAA inspections planned in FY 2004 of outsourced maintenance providers for the low-cost air carriers. For example, FAA inspectors for one air carrier planned to conduct only nine inspections of outsourced maintenance providers even though this air carrier outsourced over 40 percent of its maintenance expense in 2003. In comparison, inspectors for another air carrier planned 25 contract maintenance inspections for an air carrier that outsourced less than 30 percent of its maintenance expense. While we acknowledge that there could be different factors that influence the number of inspections, the lack of correlation between inspections and outsourced maintenance providers raises questions as to whether FAA's inspection planning adequately considered the carriers' actual maintenance practices.

The FAA inspectors planning only nine inspections had never visited a new contract facility that performs heavy maintenance for this air carrier. During our visit to this air carrier, one aircraft that had recently returned from this maintenance facility had a baseball-sized asphalt rock embedded in one of its wheels and cleaning fluid covering the landing gear that, according to the FAA inspector, could have masked a leak.

FAA has recognized the need to enhance surveillance in this area. However, actions in response to key recommendations in our July 2003 report on air carriers' use of repair stations, such as determining trends in air carriers' use of repair stations and developing a process to find out which repair stations the carriers are using to perform maintenance, have not yet been implemented by FAA. In the interim, FAA began a national special emphasis program in 2004 to evaluate air carriers' oversight of outsourced maintenance. This is a step in the right direction, but FAA needs to monitor this program closely to ensure it is implemented consistently by inspectors.

FAA Should Focus Risk Assessments and Inspections on Changes in Aircraft Utilization

To lower their unit costs, air carriers are taking a number of steps to increase the utilization and productivity of aircraft, personnel, and facilities. For example, by

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operating with shorter gate turnaround times and operating more hours per day, low-cost air carriers have achieved aircraft utilization rates that are about 16 percent higher than those of network air carriers. Both Delta and United have established low-cost operations, called Song and Ted respectively, within their corporate structure that use several of these techniques to improve efficiency and offer lower ticket prices. Even though Song and Ted's operations differ from the network air carriers' operations, FAA does not provide separate risk analyses and oversight for these low-cost operations. FAA officials stated that they did not have concerns with Song and Ted operations because any negative trends would appear in overall statistics for Delta and United.

FAA's guidance recommends that inspectors monitor operating practices such as short gate turnaround times because some air carriers may not adhere to safe operating procedures, such as insufficient aircraft brake-cooling times or excessive or late maintenance deferrals. FAA inspectors for the five low-cost air carriers we reviewed and the two network air carriers that had started low-cost operations did not consider short gate turnaround times as a potential risk and did not adjust surveillance to monitor this operating procedure. Although improving airport gate turnaround times is a good business practice, we found instances in which air carriers operating with short gate turnaround times did not adhere to required operating procedures.

For example, we reviewed the weight and balance computations at one low-cost air carrier and found errors in four of the five computations made by pilots. According to air carrier personnel, the errors were not discovered because the responsible employee did not have time to check the computations. Although the errors we found were not significant enough to affect the safe operation of the aircraft, calculation of weight and balance is a critical safety procedure that if calculated incorrectly can lead to accidents.

In addition, during observations of three aircraft at another low-cost air carrier, we identified 16 maintenance discrepancies that were not recorded on the aircraft's maintenance logbooks. On one aircraft, the wires for the emergency escape lighting were exposed in three rows of the aircraft. The FAA inspector required the air carrier to complete the repair before the aircraft's next flight. Although we could not determine why the air carrier had not recorded these maintenance discrepancies, the lack of logbook entries could be an indicator that the carrier may be waiting until the last flight of the day to record discrepancies. FAA's guidance points out that late maintenance deferrals are a problem that may stem from an air carriers' attempt to reduce gate turnaround times.

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FAA Needs to Track and Analyze Results of Nighttime Inspections

The network air carriers we reviewed reduced their mechanic workforce by nearly 13,000 and closed 42 maintenance facilities. Also, to keep costs low, network and low-cost air carriers use their aircraft for more hours during the day, limiting the amount of time maintenance can be accomplished. However, even though a significant amount of maintenance is performed overnight—as much as 90 percent at some locations—we found that inspectors spent an average of only 3 percent of their time conducting inspections at night. As shown in Table 3, the amount of nighttime surveillance ranged from a low of 1 percent to a high of 7 percent for the 10 air carriers we reviewed.

Table 3. Percent of Inspectors' Time Spent Performing Inspections of Air Carriers' Nighttime Maintenance— Second Quarter, FY 2003

FAA Office	Nighttime Inspection Hours*	Total Inspection Hours*	Percent at Night
AirTran	29	3,294	1%
American	29	2,171	1%
ATA	40	1,802	2%
Delta	94	3,924	2%
Frontier	210	3,027	7%
Jet Blue	8	1,735	0.5%
Northwest	46	2,975	2%
Spirit	25	1,313	2%
United	127	3,415	4%
US Airways	108	3,035	4%
Total	**716**	**26,691**	**3%**

* FAA nighttime and total inspection hours for the five network air carriers are based on inspection data for a random sample of 37 maintenance inspectors. For the five low-cost air carriers, the hours represent all maintenance inspectors assigned to these carriers.

FAA disagreed with our conclusions because our calculations are based on the total available time rather than the amount of time inspectors spent conducting surveillance. However, FAA has no method to accurately determine the actual number of hours spent on surveillance. Regardless of the methodology used to report the amount of surveillance conducted at night, we found that it varied significantly from office to office, and FAA did not track and analyze the results from nighttime inspections to determine if there was an elevated risk factor at night. Therefore, FAA does not have the data necessary to determine whether there is a greater risk at night that would warrant increased scrutiny.

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In our view, the risk is potentially greater now given the significant changes that are occurring in the industry, coupled with the amount of maintenance that is conducted overnight. We are not suggesting that FAA should revert to the old "kick the tires" approach. However, to ensure the system is working effectively, ATOS requires inspectors to test whether the air carrier system controls are working (e.g., mechanics are following established procedures). In our opinion, a more effective way of testing to see if the system's controls are working would be to focus FAA maintenance inspections on times when maintenance is actually being performed, rather than reviewing the aircraft's paperwork the next morning, to determine if there is an elevated risk factor that needs to be included in future ATOS plans.

Air carrier personnel told us that FAA inspectors rarely conduct their surveillance at night. Senior maintenance officials at one of these air carriers expressed concern that FAA inspectors were not even available for meetings after 1:30 p.m. and conducted very little surveillance after this time. At another air carrier, a senior maintenance official stated that FAA inspectors do not visit the maintenance facility until 5:00 a.m. or 6:00 a.m., after all nighttime maintenance has been completed. During our visit at this facility from 10:00 p.m. to 2:00 a.m., a mechanic approached us and expressed concern that a contractor who was waxing the aircraft was not covering the aircraft's static port. The static port allows flight critical instruments to provide readings for airspeed and altitude. By not covering the static port, wax could enter it and cause inaccurate instrument readings. When we informed FAA inspectors about this problem, they told us that this could present a serious problem.

This incident illustrates the importance of FAA conducting its inspections at night when maintenance is being performed to ensure that the air carrier has adequate procedures, controls, and supervision in place to prevent such problems. FAA needs to conduct an increased number of nighttime inspections to gather sufficient data for analysis to determine if there is an elevated risk factor that needs to be included in future ATOS surveillance plans.

FAA Should Focus Risk Assessments and Inspections on the Potential Risks Associated with Airport Ramp Operations

Even though air carriers have changed their operations in the airport ramp area,[9] FAA inspectors at only one of the five network air carriers we reviewed were closely tracking this as a potential risk area. Air carriers have reduced the number of ramp personnel and employees have taken on additional duties because of the

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9 The ramp area is the site of activities that are involved in turning the aircraft around, such as marshalling, loading or unloading passengers and cargo, refueling, aircraft towing, and pushback/powerback.

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reduction in the number of mechanics. For example, one air carrier changed the employee group responsible for receipt and dispatch of aircraft at 18 airports from mechanics to ground service agents. In addition, air carriers are striving to turn aircraft around faster at the gate, thus increasing the potential for accidents and incidents.

In past years, ground accidents and incidents have caused injuries to ground personnel, passengers and crewmembers, and have resulted in substantial damages to aircraft and costs to the airlines. FAA estimated the current cost to the airlines is at least $2 billion a year. A fatal incident that occurred in September 2003 when a vehicle used to tow aircraft struck a Northwest Airlines aircraft in Norfolk, Virginia, during passenger boarding highlights the potential risk to ground personnel. Although the aircraft received only minor damage, the tug operator was killed. The National Transportation Safety Board (NTSB) cited the probable cause for this accident as the use of improper equipment. However, the air carrier also determined that its procedures should be changed to make this a two-person operation rather than the one-person operation it had been.

Another ground incident that occurred in October 2003 highlights the potential risk to passengers and costs to the airlines. A United Airlines Boeing 777 aircraft collided on the ground with an All Nippon Airlines aircraft. At the time of the collision, the United Airlines aircraft was pushing back from the gate and the All Nippon Airlines aircraft was taxiing to the gate. There were 449 passengers on board the two aircraft when the collision occurred. Although no passengers were injured, both aircraft sustained substantial damage when the right wing tips of the two airplanes collided. According to FAA inspectors, the damage to the United Airlines aircraft was over $1 million.

According to statistics compiled by FAA's Office of Accident Investigation, an average of three accidents and incidents per month occurred in 2002. Information obtained from air carriers shows that the number of incidents is even higher than what is reported in the NTSB and FAA accident and incident data bases. NTSB and FAA databases only consider incidents occurring during the time when passengers are enplaned for flight, whereas carriers and insurers collect data on all losses such as those to aircraft that are parked, those that are damaged on the ground by inclement weather, and those that are being moved by mechanics or tugs during maintenance. One of the air carriers in our review had 1,401 incidents that resulted in aircraft damages of $280 million during 2002. As a result, FAA inspectors closely monitored this area as a risk during 2003. Air carriers continued to have problems in this area in 2003. For example, an air carrier we reviewed had 62 ramp incidents from January to July 2003, an average of about 8 to 9 incidents per month. FAA needs to ensure inspectors are obtaining data on aircraft ground damages and focusing analyses on FAA inspection results. If

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necessary, inspectors should adjust their surveillance to focus on this safety concern.

In summary, FAA needs to take a number of actions to ensure inspections of air carrier changes are conducted in a timely and consistent manner. FAA needs to establish policies and procedures to ensure the national analyses and support groups provide stronger assistance to field offices. In addition, FAA should require field office managers to ensure inspectors assess risks and adjust their surveillance plans, if necessary, when air carriers make significant changes to their operations and maintenance programs, such as closing maintenance facilities, reducing personnel, outsourcing maintenance, and reducing gate turnaround times. Further, FAA needs to clarify and expand inspector guidance to: (1) ensure inspectors do not wait until bankruptcy to begin monitoring data related to financial distress and adjusting their surveillance; (2) emphasize the importance of obtaining and continually monitoring detailed data for carriers experiencing financial distress, growth, and other changes; and (3) provide specific indicators of problems in air carriers' resources and performance that would require close monitoring.

FAA's Risk Assessment, Inspection Planning, and Data Analyses Processes Need To Be More Comprehensive and Flexible To Effectively Respond to Industry Changes

The changes network air carriers are making and the operational practices of low-cost air carriers make sound business sense and are not inherently unsafe. However, the changes have created new potential risks that warrant close scrutiny by FAA. FAA has made progress in improving ATOS, but the tools and processes need further refinement. For example, ATOS did not have a process that prioritized inspections so that areas of greater risk received higher priority.[10] As a result, more than half of the inspections not completed in FY 2003 when air carriers were making significant changes to streamline operations and reduce costs were in areas that were identified as being at risk. In addition, inspectors for the three air carriers in or near bankruptcy had to significantly depart from ATOS-recommended surveillance to effectively monitor financially distressed air carriers.

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[10] Although ATOS had a priority system used to determine which inspections were to be conducted to determine if the air carrier had adequate system controls (Safety Attribute Inspections), it did not have a similar priority system for critical inspections conducted to determine whether the controls were working effectively (Element Performance Inspections).

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The ATOS System Needs a Process to Prioritize Inspections so That Areas of Greater Risk Are Completed Before Lower-Risk Areas

In FY 2003 when air carriers were making significant changes to streamline operations and reduce costs, inspectors for five network air carriers we reviewed did not complete 26 percent of their planned inspections. Of the inspections not completed, 55 percent were in areas of the air carrier's operation that were identified as being at risk (see Table 4).

Table 4. Inspectors Did Not Complete All Planned Inspections of Areas Where Risks Were Identified in FY 2003*

FAA Office	No. Planned	Total Number (%) Not Completed	Number (%) of Inspections Not Completed That Were in Identified Risk Areas
United	617	259 (42%)	151 (58%)
Delta	582	234 (40%)	49 (21%)
American	614	168 (27%)	78 (46%)
Northwest	834	147 (18%)	108 (74%)
US Airways	894	130 (15%)	130 (100%)
Total	**3,541**	**938 (26%)**	**516 (55%)**

* Table 4 represents planned inspections and does not include unplanned surveillance conducted by inspectors and reported through Dynamic Observation Reports (DOR) and Constructed Dynamic Observation Reports (ConDOR).

For one air carrier, inspectors did not complete a significant portion of their plan in FY 2003 and FY 2004 even though the air carrier was designated by FAA as financially distressed. This air carrier experienced an increase in serious incidents during 2003. For example, a crew landed an aircraft on the wrong runway, and another crew on a transcontinental flight experienced a fuel leak that it failed to recognize until an engine flamed out. FAA inspectors responded to these incidents by developing a risk management action plan in accordance with the ATOS process guidelines and documented that the prolonged psychological stress and fatigue that pilots had experienced as a result of major pay cuts and flying extra hours to make up for the loss of pay were possible contributing factors. Even though operations inspectors responded to this increase in incidents, they only completed 29 percent of their ATOS inspections for this air carrier in FY 2004.

At another network air carrier, FAA inspectors identified potential risks in the area of repairmen qualifications because of turnover in personnel and a reduction in workforce but did not complete all planned inspections in FY 2003. It was not until FAA conducted inspections during the next fiscal year that FAA found that

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air carrier inspectors and mechanics at two major maintenance facilities were reviewing and approving repairs to parts and instruments that they were not qualified to repair. In two instances, employees had been returning parts to service without the proper certification for 10 months since February 2003. FAA inspectors had visited these maintenance facilities 12 times[11] during FY 2003 to conduct inspections of repairmen qualifications but did not detect this problem. To FAA's credit, in response to their findings in FY 2004, inspectors conducted investigations, ensured the air carrier took corrective actions, and planned to conduct follow-up inspections. However, nearly a year passed in which unauthorized air carrier personnel performed repairs and returned aircraft instruments and components to service before FAA inspectors found the discrepancies.

The three primary reasons FAA managers and principal inspectors gave for not completing all planned inspections were sufficient staffing was not available; the continuing budget resolution prevented inspectors from traveling in the first and second quarters of FY 2003; and the complexity of one air carrier changed, thus reducing the number of inspections needed. Other reasons included some inspections were never assigned, were started but not finished, and were inappropriately written off as "not applicable" to the air carrier. Although FAA has established a procedure within ATOS for FAA inspectors to obtain additional resources to conduct inspections, FAA inspectors for the five network air carriers we reviewed did not follow these procedures. In addition, although inspectors for one air carrier stated the continuing budget resolution prevented them from traveling to conduct inspections, FAA Headquarters management advised field offices during the first quarter of 2003 to restrict administrative but not operational travel.

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[11] Under ATOS, FAA inspectors normally conduct more than one activity to complete an inspection. Inspectors for this air carrier visited the facility 12 times to complete the 5 inspections performed during FY 2003.

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FAA inspectors did not take aggressive steps to ensure key inspections were completed. For example, as shown in Figure 3, inspectors for one air carrier did not complete all planned inspections in critical areas, such as air carrier required inspection items (i.e., significant main-tenance tasks that must be observed by air carrier inspection personnel), while accomplishing inspections in lower-priority areas, such as Management Information System reports, in which inspectors review whether air carriers are following proper procedures when reporting maintenance information. When inspectors determined that they could not complete all planned inspections, they did not adjust their surveillance plans to ensure inspections of higher-risk areas were completed. FAA inspectors identified this as a risk again in FY 2004 because they only completed half of the planned inspections of the air carriers' required inspection program during FY 2003.

Figure 3. Examples of Higher-Priority Inspections Not Completed and Lower-Priority Inspections Completed By Inspectors for One Air Carrier

Higher-Priority Inspections Not Completed	Lower-Priority Inspections Completed
Maintenance program	Management Information
Deferred maintenance	System reports
Required inspection items	Display of certificate
Parts/material control	Aircraft listing
Continuing Analysis and	
Surveillance System	
Outsource organizations	

Inspectors Were Reluctant To Identify Risks Because of the Requirement To Conduct a Minimum Number of Inspections

The ATOS tool used to assess the air carrier and plan inspections requires that inspectors conduct a minimum number of inspections regardless of risks identified. However, inspectors advised us that the automated tool generates more inspections than they can accomplish in a year. Inspectors told us, and we observed at annual inspection planning meetings, that inspectors were reluctant to identify known risks within air carrier operations because they knew identification of such risks would generate requirements to complete more inspections.

We also found SEP inspectors were reluctant to identify risks because of a requirement to complete a minimum number of inspections. In addition to completing inspections planned using the SEP risk analyses process, inspectors also must complete required inspections assigned by FAA Headquarters. Although the SEP system did have a process to override the required inspections when new risks were identified, we found inspectors for two low-cost air carriers did not follow this process and were reluctant to identify risks during the fourth quarter because to do so would generate additional inspections that they might not be able to complete before the end of the fiscal year.

Findings

*Inspectors Were Not Routinely Using the Process in ATOS To Change
Their Inspections During the Year in Response to Changing Risks*

We found that inspectors for only one of the five air carriers in our review
changed their annual inspection plans through ATOS during FY 2003 in spite of
the fact that major changes were occurring at all five network air carriers. For
example, when a network air carrier closed a major maintenance facility, reduced
the number of mechanics by 41 percent, and moved this work to four other
facilities, inspectors did not reassess risks and change their inspection plan even
though inspectors initially found significant problems at the facility where most of
the work was shifted. Inspectors found serviceable and unserviceable parts from
the main landing gear mixed together and numerous parts with no tags to indicate
whether they were serviceable or unserviceable. In this situation, mechanics could
have used defective parts to make repairs.

According to FAA guidance, relocating or closing a facility can significantly
affect an air carrier's safety and the potential for failure in their systems. In
addition, when there are significant workforce reductions or layoffs, mechanics
need to be retrained or cross-trained to perform new functions.

FAA inspectors for this air carrier told us they did not identify the facility closure
as a risk and did not adjust their surveillance because the air carrier closed the
facility after inspectors had developed their annual inspection plan. Although
ATOS has a process, referred to as "retargeting," that permits inspectors to change
their inspection plan during the year, inspectors for this air carrier told us they did
not use it because the retargeting process is not flexible or easy to use.

In FY 2004, inspectors increased their use of the system to change inspection
plans. However, even though inspectors for all five network air carriers changed
their inspection plans at least once during FY 2004, none of them followed ATOS
procedures to reassess air carrier risks when revising their inspection plans.
According to FAA, changes to ATOS released in October 2004 increased the
flexibility of the system and made it easier for principal inspectors to initiate
changes or retarget the surveillance plan. FAA needs to closely monitor the
implementation of these changes to ensure inspectors are able to effectively
change inspection plans when new risks are identified.

*Inspectors Need to Effectively Use the Automated Tool to Assess Risks
and Adjust Their Inspections to Changes Air Carriers Were Making*

The automated process designed to assist inspectors in focusing their inspections
on areas of higher risk did not produce a surveillance plan commensurate with
potential risks identified. The tool can actually recommend reducing or keeping
the baseline number of inspections planned even when risks are identified. As a

Findings

result, for all five network air carriers we reviewed, inspectors either did not change the number of inspections or planned a lower number of inspections in 48 percent of the areas where risks were identified during FY 2003 and FY 2004.

For example, at a network air carrier that was experiencing substantial monetary losses, FAA maintenance inspectors identified potential risks in 11 areas (e.g., aircraft airworthiness) because of air carrier changes such as a reduction in workforce, shifting of maintenance to new locations, and turnover in personnel. However, the ATOS automated process recommended either reducing or keeping the baseline number of inspections for all 11 areas where maintenance inspectors identified risks. Although inspectors can add inspections, they planned to conduct fewer than or the same number of baseline inspections for 10 of the 11 areas. As a result, for this air carrier there was no difference in the number of inspections planned for areas where risks were identified and areas where no risks were identified.

FAA officials stated that the system was designed with the assumption that an inherent level of risk existed in air carriers' operating environment, so if risks identified by inspectors did not go above this inherent level, the recommended frequency or number of inspections was either reduced or not changed. However, the formulas in ATOS were not sophisticated enough to weigh the importance of risk indicators. For example, when recommending the frequency of inspections, the system treated potential risks identified as a result of increased accidents and incidents the same as risks identified because of turnover in personnel.

Another problem with the automated tool is that for a highly critical inspection area, such as aircraft airworthiness, the risk assessment tool recommends that FAA inspectors perform only one more than the baseline number of inspections for any risk level that is determined to be between 16 and 100 percent. ATOS guidance does not specify what risk level is high enough to increase the number of inspections. For example, FAA inspectors for one air carrier in bankruptcy assigned a 58 percent risk level to aircraft airworthiness because of potential risks, such as changes in air carrier management, turnover in personnel, reduction of workforce, and accidents and incidents and only a 16 percent risk level to the air carrier's program for borrowing aircraft parts from other carriers. The risk assessment tool recommended inspectors perform the same number of inspections (nine) for each of these areas despite the wide variance in risk levels assigned.

Inspectors can manually change the number of inspections planned. However, decisions for increasing the number of inspections planned were not based on data and risks identified. For example, in FY 2004, inspectors for one air carrier that outsourced over 50 percent of its maintenance expense assigned a risk level of 23 percent to outsourcing because of changes, such as turnover in personnel, enforcement actions, and air carrier self-disclosures, and 6 percent to the minimum

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equipment list.[12]   Yet, inspectors planned only 7 inspections of outsourcing but planned 63 inspections of the minimum equipment list.

In October 2004, FAA released a change to the automated process used in ATOS to assess risks and plan inspections. The system will no longer recommend reducing the frequency of inspections for areas where risks have been identified. In addition, according to FAA, revised policies and procedures provide stronger guidance with regard to prioritizing inspections based on risk. However, no controls have been put in place to ensure the frequency of inspections planned is commensurate with potential risks identified. As illustrated in the example in the previous paragraph, when inspectors manually determined the amount of surveillance, the number of inspections planned did not consistently correlate with risk levels identified. In addition, each of the risk indicators continues to receive equal weighting. FAA does have plans to further improve this tool; however, the Agency has not established target dates for completion. Because risk assessment is the core of the ATOS program, FAA needs to emphasize improving the risk assessment process and establish target dates for further improvements.

Decisions on Risks Are Still Subjective in Many Cases and Often Based on Inspector Knowledge Because of the Lack of Comprehensive, Quality Air Carrier and Inspection Data

FAA inspectors are increasingly using data in decision-making, but they continue to rely more on their past knowledge and experience rather than data to identify risk areas. Inspector experience and knowledge are important, but inspectors also need to evaluate inspection and air carrier data when making decisions on areas of risk. Inspectors for the three air carriers near or close to bankruptcy significantly departed from ATOS-recommended surveillance in order to effectively monitor financially distressed air carriers. Inspectors did not consider ATOS inspection checklists adequate to gather data to respond to industry changes, and the system did not provide the flexibility needed to change planned inspections to effectively respond to air carriers' financial distress. Inspectors developed checklists to address specific issues related to financial distress that were not covered by ATOS. Inspectors stated they relied upon these inspections because the ATOS checklists were not comprehensive enough and the ATOS system was not flexible or easy to use.

While it is commendable that FAA took steps to develop a process to monitor potential risks associated with financial distress, some FAA officials agreed that substantial use of the alternative checklists hinders inspectors' ability to conduct ongoing analysis of risks in air carrier systems because the results from

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[12] The minimum equipment list contains the aircraft instruments and equipment that can be inoperative under specified conditions, allowing the aircraft to be operated until these items can be fixed.

Findings

inspections completed using the alternative checklists cannot be effectively merged with data gathered from planned ATOS inspections to identify emerging safety trends. Consequently, all identified risks may not be considered when planning future surveillance. Analyzing data is especially important in an environment where air carriers are making major changes in their operations.

FAA analysts acknowledged that data obtained from ATOS inspection checklists are difficult to analyze because the checklist questions need to be further improved and inspection findings are reported using unstructured text. This makes them more difficult to use to identify emerging safety trends. FAA officials told us that the new checklists revised in January 2004 were only an interim step and that the questions will be revised for ATOS version 2.0, which is not scheduled to be finished until after FY 2006. The continuing lack of useful safety inspection data hindered analysts' and inspectors' ability to effectively identify areas of risk. According to FAA, the structure and formats that are used in ATOS data are still evolving and more work is still needed to make the data more efficient and effective in analysis efforts.

In addition, inspectors did not gather sufficient air carrier data in all cases to understand and address risks associated with changes air carriers were making. For example, inspectors for each of the five network air carriers identified personnel reductions as a potential risk; however, inspectors for only one carrier obtained the information necessary to assess the effect of staff reductions on air carrier operations (i.e., which departments the reductions occurred in). Therefore, FAA inspectors were not fully aware of personnel changes when deciding risks and locations to target. In fact, at one office where the air carrier had reduced staffing by almost 14,000 employees, the FAA inspectors responsible for oversight of this carrier did not know the correct number of staff reductions, nor in which departments and locations the reductions had occurred.

To ensure its systems are adequately developed to respond to the rapid pace at which air carriers are making changes, FAA needs to monitor the implementation of recent changes to the ATOS risk assessment tools and processes. This will ensure that the frequency of planned inspections is commensurate with potential risks identified, inspectors are able to effectively change inspection plans when new risks are identified, and ATOS inspections are prioritized so that high-risk areas are inspected before lower-risk areas. In addition, FAA needs to improve data used for risk assessment by updating inspector guidance materials, including questions on inspector checklists, to aid inspectors in evaluating air carriers undergoing change (such as financial distress and growth), and by requiring inspectors to obtain data from air carriers so they can effectively respond to changes such as personnel reductions.

Findings

Inspectors Using the Interim SEP Process Need the Tools and Guidance To Effectively Identify Risks, Conduct Inspections, and Ensure Risks Are Mitigated

FAA provided inspectors with systems safety training on evaluating air carriers' systems. However, there are key differences in how FAA oversees ATOS versus non-ATOS air carriers. Inspector procedures and checklists used for conducting surveillance and the processes for identifying risk and analyzing data differ between SEP and ATOS. As a result, FAA does not conduct consistent oversight for all air carriers. FAA plans to add only three air carriers to ATOS during FY 2005. FAA's plan does not establish definitive milestones beyond FY 2005 for transitioning the remaining air carriers to ATOS.

Key Differences Exist in the Oversight of ATOS and Non-ATOS Air Carriers

When planning their surveillance, SEP inspectors have a process to document potential risks they have identified within air carrier systems, the severity of those risks, and the actions needed to ensure air carriers properly manage or mitigate the risks. However, FAA did not begin providing checklists for inspectors to use in conducting their inspections of air carrier systems like the ones used during ATOS inspections until FY 2005. The lack of checklists hindered inspectors' ability to evaluate whether systemic problems existed during a period of significant growth and change.

For example, at one air carrier, we identified 23 maintenance-related discrepancies that had not been recorded in aircraft logbooks for two of the three aircraft observed at this air carrier. These discrepancies included a misaligned alternate static port (which allows flight critical instruments to provide readings for airspeed and altitude), which could have resulted in incorrect readings; electrical wires that were disconnected and dangling, posing a fire hazard; and a circuit breaker in the cockpit that was broken off, which could have prevented the flight crew from using it in an emergency.

The air carrier's subsequent inspection of the same two aircraft identified an additional 123 discrepancies. Although FAA inspectors identified "airworthiness" as a risk area, they did not focus their inspections on determining whether a systemic problem existed in the air carrier's overall maintenance program, its inspection program, or its Continuous Analysis and Surveillance System that allowed these discrepancies to go undetected. ATOS inspection checklists would provide questions to guide inspectors in identifying weaknesses in these key internal systems.

Findings

In addition, SEP inspectors for all five low-cost air carriers we reviewed did not clearly define risks found in the air carriers' maintenance and operations or provide detailed action plans to ensure risks were mitigated as required by SEP guidance. Our review of 71 risk worksheets found that 18 (25 percent) of them did not include descriptive information clearly defining the risk and that 22 (31 percent) did not provide detailed information regarding the inspectors' action plans to ensure risks are mitigated. FAA's guidance also requires inspectors to document whether risks are mitigated (i.e., whether air carriers had taken sufficient action to correct the condition that prompted inspectors to identify a potential risk). However, our review found that inspectors did not document whether risks had been mitigated for 49 percent of the risks identified

Until FAA is in a position to move all air carriers to ATOS, FAA needs to improve the SEP process. FAA plans to complete incorporation of ATOS inspection checklists into SEP by the end of FY 2005. FAA must ensure that it meets this milestone. In addition, in July 2004, FAA implemented new risk tracking procedures to ensure inspectors are following these new procedures and are clearly describing risks and action plans in accordance with SEP guidance.

FAA Needs to Establish Definitive Milestones for Transitioning Remaining Air Carriers to ATOS

The SEP process is currently being used for the oversight of 112 air carriers, including low-cost, regional, and cargo air carriers. One additional air carrier is slated to be added to ATOS in FY 2005—Trans States. FAA has developed a plan to transition the remaining air carriers to ATOS but the plan does not establish milestone dates beyond FY 2005. The plan merely states that air carriers are selected for transition based on certain criteria, one of which is the availability of FAA oversight resources. FAA needs to establish a more definitive goal for the number of air carriers that will be added to ATOS each year, taking into account its staffing and budgetary resources.

RECOMMENDATIONS

To maintain the highest level of safety during this period of transition in the aviation industry, we recommend the Federal Aviation Administrator:

1. Establish polices and procedures to ensure national analyses and support groups provide stronger national assistance to field offices so that risk assessments and inspections of air carrier changes are conducted in a timely and consistent manner.

2. Require field office managers to ensure inspectors assess risks and adjust their surveillance plans, if necessary, when air carriers make significant changes to their operations and maintenance programs, such as closing maintenance facilities, reducing personnel, outsourcing maintenance, and reducing gate turnaround times.

3. Clarify and expand inspector guidance to: (a) ensure inspectors do not wait until bankruptcy to begin monitoring data related to financial distress and adjust surveillance; (b) ensure inspector checklists are modified to include questions that incorporate evaluation of air carrier changes, such as financial distress and growth; (c) emphasize the importance of obtaining and continually monitoring detailed data for carriers experiencing growth, financial distress, personnel reductions, and other changes so that inspectors can effectively respond to the changes; and (d) require inspectors to closely monitor growth indicators such as increases in operations or additions of new destinations, as the changes occur.

4. Develop a better method of providing financial information to inspectors either through SPAS or from other sources.

5. Conduct an increased number of nighttime inspections to gather sufficient data to conduct analysis and determine if there is an elevated risk factor associated with nighttime maintenance that needs to be included in future ATOS surveillance plans.

6. Monitor the implementation of recent changes to the ATOS risk assessment tool and processes to ensure that: (a) the frequency and number of planned inspections is commensurate with potential risks identified, (b) inspectors are able to effectively change inspection plans when new risks are identified, and (c) ATOS inspections are prioritized so that high-risk areas are inspected before lower-risk areas and target dates are established for completing additional improvements to the risk assessment tool and processes.

7. Meet the FY 2005 milestone for incorporating the ATOS inspection checklists into SEP.

8. Improve the SEP process by requiring inspectors to (a) follow SEP risk tracking procedures implemented in July 2004, (b) document risks and action plans in accordance with SEP guidance, and (c) follow SEP procedures to override required inspections when new risks are identified.

9. Establish a more definitive goal for the number of air carriers that will be added to ATOS each year, considering the Agency's current staffing and budgetary resources.

Recommendations

10. Determine if it can make enough efficiency gains in its operations to sustain the planned cut of 233 safety inspectors beyond 2005.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

On April 11, 2005, FAA provided comments to our draft report. While FAA went to great lengths to express general disagreement with some of the conclusions in our report; the Agency generally agreed with our recommendations. Specifically, FAA agreed to take action to implement five of our draft report recommendations and partially agreed to implement four recommendations. When implemented, many of the actions promised by FAA should make a safe aviation system even stronger. FAA's full response can be found in the Appendix on page 36. After FAA provided its response to our draft report, we added a recommendation on inspector staffing. FAA's response to the draft report recommendations is summarized below.

Recommendations 1 and 2: FAA agreed to develop procedures to strengthen national assistance to field offices and to require field office managers to ensure inspectors assess risks and adjust their surveillance plans when air carriers make significant changes. FAA's proposed actions, when implemented, will improve the consistency and timeliness of FAA oversight.

Recommendation 3: FAA agreed to develop job aids and revise guidance to ensure inspectors are continually monitoring the effect of industry changes, such as financial distress. However, they did not agree to modify existing inspector checklists. We do not understand FAA's rationale because the inspector checklist is the primary tool used to guide inspectors in performing their oversight. In our view, providing specific questions on the checklists related to financial distress and growth would provide FAA data on potential risks associated with industry changes on a continuous basis. It is unclear how the proposed job aids will ensure inspectors are continually checking for risks associated with industry changes. Therefore, we are requesting that FAA provide a more detailed explanation on how the proposed job aids will provide inspectors the ability to continually monitor the effect of air carrier changes and how the job aids would be used in relation to inspector checklists.

Recommendation 4: FAA's planned action to ensure that principal inspectors conduct regular meetings with air carrier personnel to determine the financial status of air carriers could provide inspectors with useful information. However, we disagree that this process will remedy problems identified in our report. At the time of our review, inspectors had been instructed to assess changes in air carriers'

financial condition, but we determined that they did not consistently obtain this data and when it was obtained, it was not done in a timely manner. The intent of our recommendation was to bridge this gap in timeliness and consistency by having FAA obtain the data from independent sources and provide those data to inspectors. To ensure these data are readily available to all inspectors so they can assess potential risks and plan inspections, we encourage FAA to develop a method to incorporate the air carrier data into SPAS or develop an alternative method of ensuring the data are readily available. Accordingly, we are requesting that FAA reconsider its response.

Recommendation 5: FAA partially agreed with our recommendation to conduct an increased number of nighttime inspections to gather sufficient data to determine if there is an elevated risk factor associated with nighttime maintenance. FAA stated that data from several field offices indicate adequate off-hour surveillance; however, our review showed that inspectors for the 10 air carriers we reviewed only spent an average of 3 percent of their total work time conducting inspections at night. FAA agreed to require inspectors to identify the types of maintenance accomplished during off-hours and to collect enough inspection data during off-hour periods to assess risks. These actions are responsive to our recommendation.

Recommendation 6: Although FAA agreed to monitor implementation of recent changes to the ATOS risk assessment tool, the proposed action to conduct field surveys does not meet the intent of our recommendation. In our view, conducting surveys of field office managers will not ensure inspectors are consistently following the new procedures, prioritizing their inspections by risk, and planning the frequency of inspections commensurate with risk levels identified. Ensuring inspectors comply with these requirements is important because recent changes to ATOS rely more heavily on inspectors to determine the number of planned inspections.

In addition to its planned field surveys, we encourage FAA to conduct reviews of completed risk assessments and comprehensive surveillance plans. These reviews could be accomplished by the national analyses and support groups or through an internal System Process Audit to assess the effectiveness of the new policies and procedures and whether field offices are consistently following ATOS procedures.

We are requesting that FAA reconsider its response and develop a process that will meet the intent of our recommendation, including an estimated target date for completion. In addition, we are requesting that FAA provide its planned action, including an estimated target date, for establishing future milestones for improving the risk assessment tool.

Recommendations 7 and 8: FAA's proposed action to meet the FY 2005 milestone for incorporating the ATOS inspection checklists fully

addresses our recommendation. However, FAA did not describe how and when the Agency would remind management of its requirement to ensure inspectors follow existing SEP procedures for tracking risks, documenting risks and action plans, and overriding required inspections when new risks are identified. Therefore, we are requesting that FAA provide additional information on the method and estimated target date for improving the SEP process.

Recommendation 9: FAA partially agreed with our recommendation to establish a more definitive goal for the number of air carriers that will be added to ATOS each year. FAA stated that it would continue setting specific fiscal year goals. However, this action does not change the way FAA is currently planning the transition of air carriers to ATOS. As stated in our report, FAA still has not developed a target date for adding *all* air carriers to ATOS. At the current rate of adding three air carriers to ATOS each year, *it could take FAA 37 years to complete this transition*. The intent of our recommendation was for FAA to develop more definitive goals that project *beyond* each fiscal year. A multi-year plan would provide FAA with a framework to demonstrate its commitment to converting all air carriers to ATOS, FAA's more comprehensive risk-based oversight system. To do this, FAA must clearly indicate in its transition plan how long it will take to transition all air carriers to ATOS, taking into account current staffing and budgetary resources.

Therefore, we are requesting that FAA reconsider its response and develop a more definitive plan that will show its best estimate of when all commercial air carriers will be converted to ATOS.

In addition to its response on our report recommendations, FAA also made general comments about its view of our report conclusions. FAA stated it disagreed with the report's inference that changes occurring in the industry are unknown and unaccounted for by FAA employees who oversee air carriers and that these industry changes represent risks requiring increased inspections. FAA also stated that the changes discussed in the report are not new and "insidious."

Our report does not state that FAA employees did not know about changes in the industry. Rather, we reported that:

- ✓ inspectors did not respond consistently and in a timely manner to similar air carrier changes that were occurring nationwide,

- ✓ key processes used by inspectors to identify risks in air carrier systems were not working effectively, and

- ✓ inspectors were not continually monitoring key data, such as personnel reductions.

Agency Comments and Office of Inspector General Response

In addition, while general changes were known, in some cases inspectors did not obtain key details to determine the potential impact of the changes. As a result, inspectors' ability to effectively respond to industry changes was diminished.

Our report also does not assert that changes such as financial distress and outsourced maintenance were new and "insidious." In fact, we reported that the changes air carriers are making are not inherently unsafe, and despite financial pressures, large U.S. air carriers have maintained an impressive safety record. We recognize that the United States has the safest aviation system in the world. We believe that implementation of the recommendations in this report will make the system even stronger.

Key points in our report were that:

- ✓ The magnitude of air carrier changes and the pace at which they are occurring require FAA to have a comprehensive, flexible, and data-driven oversight system to ensure the public that safety will not be compromised.

- ✓ FAA has made progress in moving to a more risk-based, data-driven air carrier oversight system designed to permit inspectors to respond to the types of changes occurring in the industry. However, the systems were not working effectively and did not permit inspectors to consistently identify areas of greatest potential risks.

Our conclusions are supported by two internal reports issued by the ATOS program office and the Flight Standards Safety Analysis Information Center on February 2 and March 10, 2004, respectively. In these reports, FAA states that inspections are not always data-driven, approximately half the ATOS field offices continue to rely heavily on principal inspector knowledge, and there is a wide variation in how inspectors interpret ATOS risk indicators.

FAA stated that it disagreed with our conclusion that increased risk should drive increased inspections. However, FAA's guidance and risk assessment processes in effect during our audit directly refute FAA's statement. Specifically, the guidance:

- ✓ directed inspectors to increase the frequency or number of inspections when an increased level of risk was identified.

- ✓ stated that based on sound data analyses, there may be valid reasons why inspectors might want to increase the number of inspections even more than the frequency recommended by the automated system.

We support FAA's move toward a data-driven, risk-based system. However, FAA still needs to ensure inspectors focus their inspections on areas of greater risk and

conduct an adequate number of inspections to obtain sufficient data. Gathering enough data to use in making decisions on whether air carriers' systems are working effectively is important. It is also important for FAA's quality assurance philosophy to be well defined in Agency policies and procedures, and for inspectors in the field to consistently support and follow this approach.

ACTION REQUIRED

FAA's planned corrective actions resolve four of the nine recommendations in our draft report and will be subject to our audit follow-up process. However, we are requesting FAA reconsider its position or provide additional data for five of the nine recommendations and provide a response on its plan to address our recommendation on inspector staffing. We request that FAA:

- ✓ Provide a more detailed explanation for Recommendation 3 on how the proposed job aids will provide inspectors the ability to continually monitor the effect of air carrier changes and how the job aids would be used in relation to inspector checklists.

- ✓ Reconsider its response for Recommendation 4 and develop a process to provide inspectors with consistent financial data through SPAS, or an alternative process to ensure that the data are readily available to inspectors when assessing risks and planning their inspections.

- ✓ Reconsider its response for Recommendation 6 and develop a process to ensure that the frequency and number of planned inspections are commensurate with potential risks identified; inspectors are able to effectively change inspection plans when needed; and high-risk areas receive inspection priority. FAA should also provide estimated target dates for implementing these procedures and identify actions planned to establish milestone dates for future improvements to the ATOS risk assessment tool.

- ✓ Provide information for Recommendation 8 on the method and estimated target date for reminding management of the requirement to follow SEP procedures.

- ✓ Reconsider its position on Recommendation 9 and develop definitive goals that not only project the number of air carriers that will be transitioned to ATOS each fiscal year but also shows an estimate of when all air carriers will be transitioned to ATOS.

These five recommendations will remain unresolved until we receive your written response.

In accordance with Department of Transportation Order 8000.1C, we request that FAA provide additional information on actions you intend to take to fully address the five recommendations along with estimated target dates. We would appreciate receiving your response within 30 calendar days. We appreciate the cooperation of FAA representatives during this audit. If you have any questions concerning this report, please contact me at (202) 366-0500 or Lou Dixon, Program Director, at (404) 562-3770.

Action Required

EXHIBIT A. ENTITIES VISITED OR CONTACTED

Office of the Secretary of Transportation

Air Carrier Fitness Division	Washington, DC

FAA

Headquarters:

Flight Standards Service	Washington, DC
Certification and Surveillance Division	Dulles Airport, VA

Certificate Management Offices for:

AirTran Airways	Orlando, FL
American Airlines	Fort Worth, TX
Delta Air Lines	College Park, GA
Northwest Airlines	Bloomington, MN
United Airlines	Daly City, CA Denver, CO
US Airways	Coraopolis, PA

Flight Standards District Offices in:

Denver, CO

Belleville, MI

Indianapolis, IN

Garden City, NY

Atlanta, GA

Schiller Park, IL

Fort Lauderdale, FL

Air Carriers

AirTran Airways	Orlando, FL
American Airlines	Fort Worth, TX
ATA Airlines	Indianapolis, IN
Delta Air Lines	Atlanta, GA
Frontier Airlines	Denver, CO
JetBlue Airways	New York, NY
Northwest Airlines	Minneapolis, MN
Spirit Airlines	Detroit, MI
United Airlines	San Francisco, CA
US Airways	Pittsburgh, PA

Industry and FAA Inspector Workforce Representatives

Air Transport Association	Washington, DC
Professional Airways Systems Specialists	Washington, DC

Exhibit A. Entities Visited or Contacted

EXHIBIT B. OBJECTIVES, SCOPE, METHODOLOGY, AND PRIOR AUDIT COVERAGE

This report provides the results of two audits—FAA's oversight of financially distressed air carriers and FAA's oversight of low-cost air carriers. Because both audits had similar results regarding FAA's oversight, we determined that a single audit report was the most effective way to address our findings. The following objectives, scope, and methodology were used in conducting the audits.

Objectives

The combined objectives of these reviews were to determine whether: (1) action taken by FAA to monitor financially distressed air carriers is effective, (2) ATOS and SPAS are used effectively to monitor financially distressed air carriers by providing the data and tools inspectors need to conduct their work, (3) FAA is effectively implementing procedures to heighten surveillance of low-cost air carriers during periods of growth or change, and (4) FAA's risk-based surveillance system is used effectively to target identified risk areas and to aid FAA in the allocation of inspector resources for oversight of low-cost air carriers.

Scope

The audit of FAA's oversight of financially distressed air carriers was conducted between April 2003 and May 2005. The audit of FAA's oversight of low-cost air carriers was conducted between August 2003 and May 2005. The audits were conducted in accordance with Government Auditing Standards prescribed by the Comptroller General of the United States and included such tests as we considered necessary to provide reasonable assurance of detecting abuse or illegal acts.

To evaluate FAA oversight of financially distressed air carriers, we visited FAA offices and five network air carriers. We selected three network air carriers that had declared bankruptcy or had been reported to be close to bankruptcy. We also selected two network air carriers that had experienced significant and sustained monetary losses but were not yet reported to be close to bankruptcy. To evaluate FAA oversight of low-cost air carriers, we selected five air carriers that were identified in FAA's Flight Schedule Data System as low-fare air carriers, were regularly identified by the aviation industry as low-cost air carriers, and were experiencing growth. Exhibit A contains a list of the entities we contacted or visited during our review.

Methodology

To determine the effectiveness of action taken by FAA to monitor financially distressed air carriers, we obtained and reviewed the processes, procedures, and guidance FAA inspectors use to perform oversight of air carriers during periods of financial distress. We discussed this guidance: *"Monitoring Part 121 Operators Before, During, and After Labor Dispute, Strike, or Bankruptcy"* (FAA Order 8300.10, Chapter 125), with FAA Flight Standards management in Washington, DC. In addition, we identified the significant changes made by the selected network air carriers over the last 2 years and determined what actions that FAA and air carriers have taken to ensure those changes have not adversely affected safety. To accomplish this work, we interviewed FAA managers, inspectors, and analysts; analyzed FAA inspection records; interviewed air carrier quality assurance, operations, and maintenance personnel; reviewed air carrier reports; and accompanied FAA inspectors during aircraft inspections.

To evaluate FAA's actions taken to monitor low-cost air carriers during periods of growth or change, we obtained and reviewed the processes, procedures, and guidance FAA inspectors use to perform oversight of air carriers during periods of growth or change. We determined whether FAA inspectors were using the guidance *"Monitoring Operators During Periods of Growth or Major Change"* (HBAT 98-36 and HBAW 98-21) during their surveillance. Also, to determine the effectiveness of FAA's oversight of growth and changes occurring at low-cost air carriers, we accompanied FAA inspectors during inspections of airport ramp operations and maintenance facilities at nine locations. We participated in the inspection of aircraft and verified that identified discrepancies were recorded in the aircraft's maintenance log book. At maintenance facilities, we observed shop conditions, reviewed training records, and sampled procedures such as control of calibrated tools and parts inventory. In addition, we interviewed FAA inspectors, analyzed FAA inspection records, reviewed air carrier reports, and analyzed inspector travel records.

To evaluate FAA's process and tools used to identify risks at air carriers, we reviewed the ATOS Air Carrier Assessment Tools (ACAT) prepared for the five network air carriers and the SEP Surveillance and Evaluation Assessment Tools prepared for the five low-cost air carriers for FYs 2003 and 2004. For ATOS, we determined what data inspectors used to identify risks on the ACAT and how they changed the number and focus of inspections to target high-risk areas. We also attended FAA's FY 2004 annual inspection planning meetings for the five network air carriers we reviewed to determine how risks are identified and inspections are planned. For SEP, we reviewed risk work sheets for FY 2003 to determine if inspectors followed FAA guidance for identifying and defining risks, preparing action plans to resolve risks, and documenting inspection results in FAA's Program Tracking and Reporting Subsystem inspection records.

Exhibit B. Objectives, Scope, Methodology, and Prior Audit Coverage

To determine if air carriers' outsourced maintenance practices changed from 2002 to 2004, we obtained DOT Form 41 financial data that air carriers submitted to the Department's Bureau of Transportation Statistics during calendar years 2002, 2003, and the first two quarters of 2004 for nine ATOS air carriers and five low-cost air carriers. We compared the amount of direct maintenance expense air carriers incurred for outside airframe and engine repairs to the amount the carriers incurred for total direct flight equipment maintenance performed internally by the carriers.

To identify growth trends of low-cost air carriers, we analyzed data from Form 41 reports; the Airclaims database, Safety Performance Analysis System, and Flight Schedule Data System; quarterly and annual air carrier financial reports filed with the Securities and Exchange Commission; and air carrier officials. We measured the growth of low-cost air carriers by analyzing the increases in air carrier flight operations, passenger enplanements, available seat miles, fleet size, and personnel from calendar year 2000 through the first 8 months of 2004.

We determined that FAA and DOT data were sufficiently reliable for measuring the operational changes in the aviation industry. We assessed the reliability of FAA and DOT databases by interviewing Agency officials to identify the data integrity controls in place to ensure accuracy of data and comparing selected data to information obtained from air carriers and Securities and Exchange Commission financial reports.

To determine what percentage of FAA inspectors' time is spent conducting surveillance at night, we randomly sampled 37 FAA maintenance inspectors' time records for the five network air carriers we visited and reviewed time records for 26 FAA maintenance inspectors providing oversight of the five low-cost air carriers we reviewed. We defined nighttime hours as time worked between 6:00 p.m. and 6:00 a.m. To estimate the percentage of air carrier maintenance that is conducted at night, we interviewed air carrier personnel.

Prior Audit Coverage

Report AV-2002-088, "Air Transportation Oversight System," April 8, 2002

We concluded that ATOS is conceptually sound because it is data-driven, targets inspector resources to the highest-risk areas, and results in comprehensive solutions to safety problems. However, we found shortfalls in FAA's implementation of ATOS. First, FAA needed to finish developing key elements of ATOS—specifically, its processes for analyzing ATOS inspection results and for ensuring corrective actions are implemented. A key part of this was to revise the checklists inspectors use to conduct their inspections. Second, FAA needed to

Exhibit B. Objectives, Scope, Methodology, and Prior Audit Coverage

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

In response to our report recommendations, in March 2003 FAA finished deploying the last two elements of the ATOS process (i.e., data analysis and implementation of corrective actions) and in January 2004 completed new inspector checklists. FAA also trained inspectors in system safety concepts and developed a new program for remotely sited inspectors. Further, FAA put a new management team in place in 2002 that was committed to improving ATOS and correcting past program problems and delays.

Report AV-2003-047, "Review of Air Carriers' Use of Aircraft Repair Stations," July 8, 2003

We found that airlines are increasingly outsourcing maintenance to repair stations. Despite the increase, FAA concentrates its oversight of airline maintenance on work performed at air carriers' in-house facilities. Discrepancies in U.S. and foreign repair-station operations went undetected at 86 percent of the stations we visited. The discrepancies included using improper parts and equipment and having uncorrected repetitive deficiencies. Because of the poor documentation received and the lack of focus by foreign authorities on FAA requirements, FAA was unable to determine if FAA-certified foreign repair stations meet FAA standards.

We made nine recommendations to improve FAA's oversight, including that FAA must determine trends in air carriers' use of repair stations; find out which repair stations the carriers use to perform maintenance; perform more frequent, detailed reviews of those facilities air carriers use the most; and take steps to ensure foreign authorities are following FAA standards in conducting inspections. FAA concurred with our recommendations.

Exhibit B. Objectives, Scope, Methodology, and Prior Audit Coverage

APPENDIX. AGENCY COMMENTS

**U.S. Department
of Transportation**

**Federal Aviation
Administration**

Memorandum

INFORMATION: Draft Report on the Audit of Safety Oversight of an Air Carrier Industry in Transition

Date: April 11, 2005

Assistant Administrator for Financial Services
  and Chief Financial Officer

Reply to
Attn. of:

Assistant Inspector General for Aviation Audits

Thank you for providing us with the draft report of your audit of "Safety Oversight of an Air Carrier Industry in Transition." We appreciate your acknowledgement of the actions we have taken to improve the Air Transportation Oversight System (ATOS) and the Surveillance and Evaluation Program (SEP), including implementation of the data analysis and risk management elements of ATOS and deployment of new checklists for ATOS inspectors. These new checklists are currently being incorporated into the SEP program. Your report also acknowledges a recent change we made to ATOS software that improves the automated development of a risk-based inspection plan, makes retargeting inspections easier, and allows clear identification of priorities based on the relative criticality of work elements. All of these improvements address specific findings and recommendations in the report.

We respectfully disagree with the report's inference that changes occurring in the industry are unknown and unaccounted for by FAA employees who oversee part 121 air carriers and that these industry changes represent risks requiring increased inspections.

The industry changes discussed in the report—financial stress, outsourced maintenance, operational changes driven by new marketing strategies, growth, night-time maintenance, perceived increases in ramp incidents—are not new and not insidious. Our certificate managers have been monitoring these types of changes since 1996.. In fact, the Air Transportation Oversight System recognizes that the industry business model is constantly changing in response to economic and other pressures and was built as an oversight system that analyzes risks. The potential risks associated with these changes are addressed in annual surveillance plans and, for that reason, frequently do not require

Appendix. Agency Comments

retargeting inspections. FAA senior executives are regularly briefed by the certificate managers of many of the airlines discussed in the report on exactly the conditions that the report's authors imply are not properly monitored by FAA. We believe that the effectiveness of FAA oversight and of the industry's ability to deal with changing conditions is reinforced by the fact that since 1996 when we began monitoring these changes, the accident rate has declined so significantly that the past three years have been the safest in air carrier history.

We also disagree with your conclusion that the portions of the report that suggest increased risk should drive increased inspections. This theme is contrary to your strong endorsement the OIG's acknowledgement of the conceptual soundness of a risk-based approach to oversight. and implies that FAA should perform a quality control function. We intentionally moved away from a quality control inspection process. We realize the futility of trying to police millions of annual flight operations and maintenance activities. We aligned our oversight system with a quality assurance methodology when we implemented ATOS and SEP., the subject programs of the audit. The tools developed for ATOS and SEP focus on program assessment and risk management. In other words, we are concerned with determining how well the airline is managing its processes and whether or not those processes are performing as designed. Our inspection tools are designed to collect data for these purposes. The only reason to increase inspections is to collect additional data when they are needed.

The quality assurance approach of ATOS and SEP is the best way to leverage our limited resources. ATOS and SEP processes engage air carriers in the management of their safety issues. This is greater leverage than the enforcement deterrence provided through quality control. Nevertheless, enforcement deterrence remains a byproduct of the data collection we do for ATOS and SEP.

Attached is the agency's response to all recommendations contained in the report.   For the most part, these recommendations are complementary to our existing plans and on-going activities to enhance and expand ATOS and SEP.

OIG Recommendation 1: Establish polices and procedures to ensure national analyses and support groups provide stronger national assistance to field offices so that risk assessments and inspections of air carrier changes are conducted in a timely and consistent manner.

FAA Response: Concur. We will develop policies and procedures to be published in FAA Order 8400.10, Appendix 6, and in Surveillance Evaluation Program (SEP) documentation by March 31, 2006.

OIG Recommendation 2: Require field office managers to ensure inspectors: (a) assess risks and adjust their surveillance plans, if necessary, when air carriers make significant changes to their operations and maintenance programs,

Appendix. Agency Comments

such as closing maintenance facilities, reducing personnel, outsourcing maintenance, and reducing gate turnaround times.

FAA Response: Concur.   We will revise FAA Order 8400.10, Appendix 6, and SEP documentation accordingly by March 31, 2006.

OIG Recommendation 3: Clarify and expand inspector guidance to: (a) ensure inspectors do not wait until bankruptcy to begin monitoring data related to financial distress and adjust their surveillance; (b) ensure inspector checklists are modified to include questions that incorporate evaluation of air carrier changes, such as financial distress and growth; (c) emphasize the importance of obtaining and continually monitoring detailed data for carriers experiencing growth, financial distress, personnel reductions, and other changes so that inspectors can effectively respond to the changes; and (d) require inspectors to closely monitor growth indicators such as increases in operations or additions of new destinations, as the changes occur.

FAA Response: Partially concur. We do not agree that modification of existing checklists is appropriate. We will develop job aids and revise FAA Orders 8400.10, Appendix 6, and 8300.10, Chapter 125, and SEP documentation to meet the intent of this recommendation by March 31, 2006.

OIG Recommendation 4: Develop a better method of providing financial information to inspectors either through SPAS or from other sources.

FAA Response: Partially concur. Principle inspectors meet regularly with air carrier management to review financial status, as well as business plans to deal with associated program changes. Based on these meetings, principle inspectors assess risks and make appropriate adjustments to surveillance plans. We believe monitoring financial status through meetings with the air carrier is better than monitoring commercially available financial data, such as credit ratings, investment advisories, and bankruptcy filings, which have proven to be only weakly correlated with airline safety. We will revise FAA Orders 8400.10, Appendix 6, and 8300.10, Chapter 125, by March 31, 2006, to ensure principle inspectors conduct these regular meetings.

OIG Recommendation 5: Conduct an increased number of nighttime inspections to gather sufficient data to conduct analysis and determine if there is an elevated risk factor associated with nighttime maintenance that needs to be included in future ATOS surveillance plans.

FAA Response: Partially concur. Notwithstanding that data from several certificate management offices indicate adequate off-hour surveillance, we agree to revise inspector guidance material by March 31, 2006, to require identification of the types of maintenance accomplished during off-hours and to collect enough inspection data during off-hour periods to assess risks.

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OIG Recommendation 6: Monitor the implementation of recent changes to the ATOS risk assessment tool and processes to ensure that: (a) the frequency and number of planned inspections is commensurate with potential risks identified, (b) inspectors are able to effectively change inspection plans when new risks are identified, and (c) ATOS inspections are prioritized so that high-risk areas are inspected before lower-risk areas and establish target dates for completing additional improvements to the risk assessment tool and processes.

FAA Response: Concur. The Flight Standards Certification and Surveillance Division in accordance with its ISO 9000 requirements will conduct follow-up surveys with ATOS certificate management teams to determine the effectiveness of recent changes to ATOS automation.

OIG Recommendation 7: Meet the FY 2005 milestone for incorporating the ATOS inspection checklists into SEP.

FAA Response: Concur. Consistent with the plan we developed in Fiscal Year (FY) 2004, we agree to complete the implementation of SEP Module 4 in FY 2005.
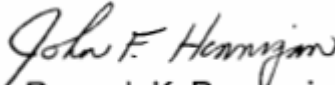
OIG Recommendation 8: Improve the SEP process by requiring inspectors to (a) follow SEP risk tracking procedures implemented in July 2004, (b) document risks and action plans in accordance with SEP guidance, and (c) follow SEP procedures to override required inspections when new risks are identified.

FAA Response: Concur. We will remind management of its requirement to ensure that existing SEP procedures are followed.

OIG Recommendation 9: Establish a more definitive goal for the number of air carriers that will be added to ATOS each year considering the Agency's current staffing and budgetary resources.

FAA Response: Partially concur. We agree to continue setting specific fiscal year goals based on available staff and budget in conjunction with FAA's performance planning process.

If you have questions or need further information, please contact Anna Briataico, Budget Policy Division, ABU-100. She can be reached at (202) 267-7131.

John F. Hennigan
For   Ramesh K. Punwani

Appendix. Agency Comments