Before the Committee on Transportation and Infrastructure
Subcommittee on Aviation
United States House of Representatives

Observations on FAA's Oversight of Aviation Safety

Statement of
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Mr. Chairman and Members of the Subcommittee:

We appreciate the opportunity to testify today on the Federal Aviation Administration's (FAA) oversight of the U.S. aviation system. Safety is FAA's highest priority and for more than 4 years, FAA and the U.S. aviation industry have experienced one of the safest periods in aviation history. However, the August 27, 2006, crash of Comair Flight 5191 serves as a stark reminder to all stakeholders that we must continue to do more to make a safe system even safer. This hearing is particularly timely in light of that accident.

While the Comair accident is at the forefront of everyone's attention, we need to remember that other fatal accidents occurred in the past year as well. In December 2005, a 58-year old Chalks Ocean Airways seaplane crashed off the coast of Florida when the right wing separated from the aircraft during flight. During the same month, a Southwest Airlines aircraft skidded off the runway at Chicago Midway and collided with an automobile off the airport grounds. Each of these accidents is the subject of an ongoing National Transportation Safety Board (NTSB) investigation.

Notwithstanding these tragic accidents, the United States has maintained one of the safest aviation systems in the world. This is a remarkable accomplishment given the many changes occurring within the industry. For example, network air carriers continue to work aggressively to move away from high-cost structures by reducing in-house staff, renegotiating labor agreements, and increasing the use of external repair facilities. To address these changes, FAA is working to implement and refine risk-based safety oversight systems.

At the same time, FAA must also remain attentive to other issues that could affect the safety of the aviation system; that is, runway incursions (potential collisions on the ground) and operational errors (potential collisions in the air). In recent years, FAA has made progress in reducing the overall number of runway incursions, but serious incidents (where a collision was barely avoided) continue to occur. For example, on March 21, 2006, at Chicago O'Hare, a controller mistakenly cleared two commercial aircraft (an Airbus 319 and an Embraer E145) for takeoff on intersecting runways. Before stopping, the two aircraft came within 100 feet of one another at the runway intersection.

Mr. Chairman, it is against this backdrop that we would like to address three areas that are important for strengthening FAA's oversight and enhancing aviation safety:

- Shifting FAA's oversight to risk-based systems,

- Addressing key safety issues for an industry and an Agency in transition, and

- Reducing the risk of accidents on the ground and in the air.

Shifting FAA's Oversight to Risk-Based Systems

During the past 8 years, FAA has taken steps to move its safety oversight for air carriers, aircraft repair stations, and aircraft parts manufacturers to risk-based systems. These systems are based on analysis of data, such as air carrier operations and maintenance data, to focus the oversight on areas posing the greatest safety risks and make more effective use of limited inspection resources. FAA's old inspection programs focused more on compliance with regulations and inspections in designated areas, regardless of the level of risk. For example, in FAA's old oversight process, inspectors could conduct hundreds of inspections of one air carrier, even if no significant problems were found.

Clearly, FAA is on the right path in developing risk-based oversight programs; however, FAA continues to face challenges in advancing these programs. Today, we will be providing perspectives on FAA's progress and the challenges FAA faces with respect to implementing risk-based systems.

FAA's risk-based oversight approach for air carriers needs to be more flexible and comprehensive. In 1998, FAA introduced the Air Transportation Oversight System (ATOS) for oversight of air carriers. We have always supported ATOS—the essential design of the system is sound. ATOS is intended to permit inspectors to proactively use data (e.g., air carrier maintenance problems and past FAA inspections) to assess air carrier systems, determine where inspections should be focused, and shift resources in response to changing conditions, such as financial distress.

FAA initially implemented this system at the 10 largest air carriers and did not expand the program beyond this group of carriers until 2003. Today, FAA uses ATOS for oversight of 37 air carriers. The remaining 85 air carriers are under a system that is designed to be a bridge between the old and new oversight systems until FAA can transition all air carriers to ATOS. This interim system combines FAA's old compliance-based system with some of the data and risk analysis

elements of ATOS. However, for the interim system, FAA does not have personnel to assist inspectors in analyzing safety data and identifying systemic weaknesses in air carrier programs. The safety inspectors are relied upon to analyze this data and identify risks.

While FAA has come a long way in implementing its risk-based oversight approach for air carriers, the systems need to be more comprehensive and flexible. In June 2005, we reported[1] that FAA inspectors had difficulties using the risk-based systems to respond to rapid changes air carriers were making to reduce costs, such as decreasing in-house staff and increasing the use of outside repair facilities. For example, FAA inspectors did not complete 26 percent of their planned inspections when air carriers were at the height of streamlining operations and reducing costs. More importantly, over half of the inspections that were not completed were in areas where inspectors had identified risks.

This occurred because FAA did not have a system to prioritize the planned inspections, so some of the areas that posed a safety risk were not inspected. For example, FAA inspectors for an air carrier that had filed for bankruptcy protection and laid off a number of its mechanics correctly identified a potential risk in the qualifications of remaining maintenance personnel. Despite this determination, inspectors did not finish the inspections that had been planned to assess these risks. Ten months later, they found out that mechanics at two of the air carriers' maintenance facilities had been making repairs on parts that they were not qualified to perform.

Events during the 2005 mechanics' strike at Northwest Airlines underscore the need for FAA to strengthen the flexibility and comprehensiveness of its oversight system. FAA inspectors abandoned ATOS in favor of a more simplified checklist, which they believed could be used to quickly gather the information needed to identify risks associated with the strike. The FAA office manager told us that the ATOS data collection tools (checklists) were not specific enough to capture the data the inspectors needed. In addition, he stated that parts of the ATOS process, such as evaluating data quality, would be too time consuming. This demonstrates that FAA inspectors do not see ATOS as flexible and comprehensive enough to adjust to air carrier changes.

In response to the recommendations in our June 2005 report, FAA has:

- revised its guidance to help inspectors more thoroughly address industry changes when assessing safety risks and continually monitor the effects of

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[1] OIG Report Number AV-2005-062, "FAA Safety Oversight of an Air Carrier Industry in Transition," June 3, 2005. OIG reports can be found on our website: www.oig.dot.gov.

those changes rather than reacting to a major event, such as an air carrier declaring bankruptcy; and

- completed a review of risk assessments and inspection plans prepared by field offices to ensure that inspectors are following ATOS procedures and prioritizing their inspections by risk level.

Also, FAA established a definitive schedule for transitioning the remaining air carriers to ATOS and now plans to complete the transition by the end of calendar year 2007. This is an important watch area for this Subcommittee because ATOS is a major cultural change for inspectors, who are not accustomed to relying on data analysis to find potential safety problems. We will continue to monitor FAA's progress in transitioning all air carriers to ATOS.

FAA needs to fully implement its risk-based oversight system for repair stations. Air carriers have historically performed most of their maintenance at their own in-house facilities, but are now contracting out a large percentage of this work to domestic and foreign repair stations. As shown in Figure 1, from 1996 to 2005, air carriers' use of external repair facilities grew from 37 percent of the carriers' maintenance costs to 62 percent.

Figure 1. Percentage Increase in Contract Maintenance Expense for Major Air Carriers From 1996 to 2005
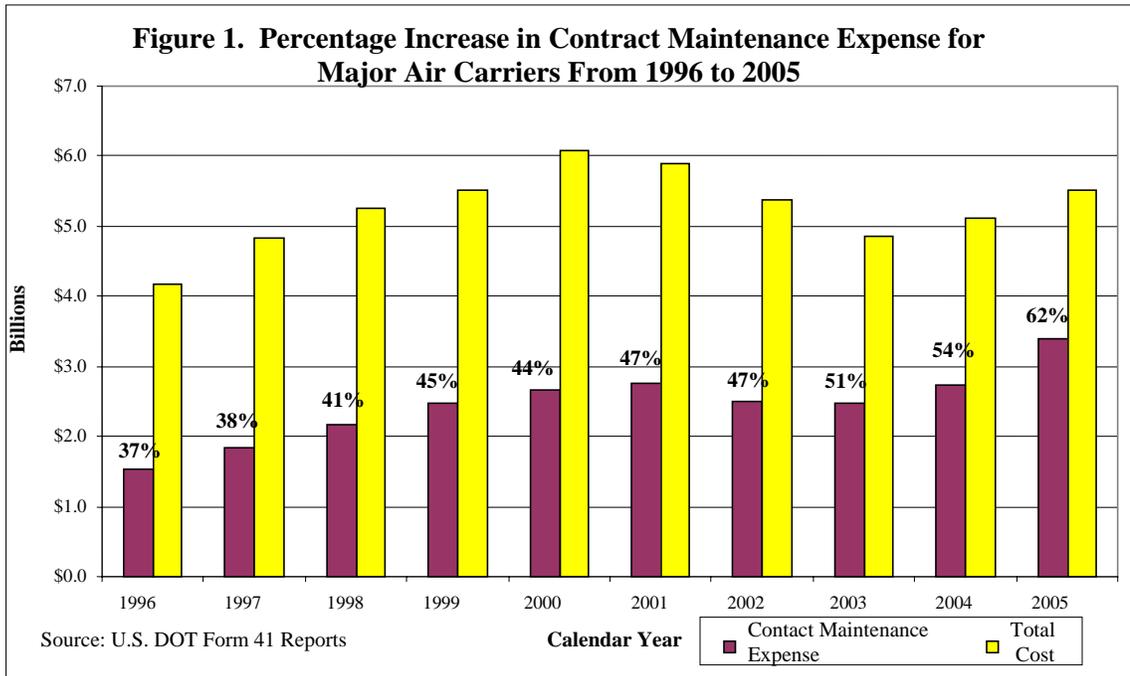
It is important to note that this issue is not a matter of repair station maintenance versus air carrier in-house maintenance; it is that maintenance, regardless of where it is performed, requires effective oversight.

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In July 2003, we reported[2] that FAA oversight had not shifted to where the maintenance was actually being performed. Instead, inspectors continued to focus inspections on in-house maintenance. For example, inspectors completed 400 inspections of in-house maintenance at one air carrier but only 7 inspections of repair stations. This occurred even though this carrier contracted out nearly half of its maintenance that year.

We also reported that 138 repair stations in Germany, France, and Ireland were not inspected by FAA at all. This was because the aviation authorities in these countries reviewed these facilities on FAA's behalf. But FAA did not have an adequate method to monitor the surveillance performed by other authorities. For example, most of the inspection files we reviewed that FAA received from the foreign authorities were either incomplete, written in a foreign language, or otherwise difficult to comprehend.

In response to the recommendations in our July 2003 report, FAA has developed a risk-based oversight approach for FAA-certificated repair stations. This system was developed to assist inspectors in targeting resources for both repair station oversight and oversight of air carriers' maintenance outsourcing programs. However, the new risk-based oversight system is not yet fully operational. Inspectors can use a manual version of the new system to assess potential safety risks at repair stations, but this system does not permit inspectors to share information across offices. This capability is important because multiple air carriers may use an individual repair station that would be inspected by different inspectors assigned to those carriers. According to FAA's current timetable, FAA inspectors will begin using the more effective automated system on October 1, 2006.

FAA is making progress in improving its oversight of domestic and foreign repair stations. FAA has recognized the need to shift its resources to those areas where the actual maintenance is performed (i.e., from primarily focusing on air carriers to placing more emphasis on repair stations). Additionally, FAA officials have worked closely with the aviation authorities of other countries to improve the surveillance they perform on FAA's behalf.

Once the automated feature of FAA's new risk-based oversight system is fully operational, we believe FAA will have a comprehensive, standardized approach to repair station oversight. Further, the information generated from this oversight will be available for review by all FAA inspectors to assist them in targeting their inspections more effectively.

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

FAA's risk-based approach to oversight of aircraft manufacturers needs to be more flexible to adjust to the prominent role suppliers now play in aviation manufacturing. Over the past 10 years, the aircraft manufacturing environment has changed dramatically. Traditionally, manufacturers produced most, if not all, of their major products and parts in their U.S. facilities. Now, most major products and parts are produced for the manufacturer by other suppliers, many of which are located in foreign countries. One major U.S. manufacturer uses major parts and components from close to 1,200 domestic and foreign suppliers to manufacture its aircraft. Some of these suppliers are located in Israel, Turkey, and Russia. This represents a challenge to FAA's ability to effectively perform oversight, particularly in foreign countries.

FAA's risk-based approach to oversight of manufacturers is intended to assist inspectors in determining where to focus their inspection efforts. However, this system was not designed to address the increasingly prominent role that aircraft parts and components suppliers now play in aviation manufacturing. For example, in determining how to target inspector resources, FAA's oversight system does not consider the number of suppliers that manufacturers use or the fact that suppliers have now taken on more responsibility in the design and production of aircraft parts. FAA recognizes that more work will have to be done to make this system more effective at keeping pace with the changing environment. We will be issuing a report on FAA's risk-based oversight system for suppliers later this year.

Addressing Key Safety Issues for an Industry and Agency in Transition

As FAA continues efforts to implement risk-based oversight systems, it must ensure it is prepared to respond to the challenges of an evolving aviation environment—with both its oversight systems and its inspection resources.

FAA needs to improve its oversight of air carriers' use of non-certificated repair facilities that perform critical and scheduled maintenance work. In December 2005, we identified[3] a trend in air carriers' use of external maintenance facilities that FAA was unaware of—the use of repair facilities that have not been certificated by FAA to perform critical and scheduled aircraft maintenance. We reported that these facilities are not covered under FAA's routine oversight program because FAA believes this responsibility rests with the air carriers. We also reported that non-certificated facilities do not have the same regulatory requirements as repair stations that obtained certification from FAA, but performed the same type of work as certificated repair stations.

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[3] OIG Report Number AV-2006-031, "Review of Air Carriers' Use of Non-Certificated Repair Facilities," December 15, 2005.

FAA does not know how many non-certificated maintenance facilities air carriers currently use because it does not maintain a list of the facilities. However, during our audit, we identified over 1,400 non-certificated repair facilities performing maintenance for 19 air carriers we sampled. More than 100 of these facilities were located in foreign countries.

Air carriers have used non-certificated facilities for years, but it was widely believed that these facilities principally performed minor aircraft work, such as checking engine oil levels or changing tires. However, we identified non-certificated facilities that performed the same type of work as certificated repair stations, including scheduled and critical aircraft maintenance. For example, we found some non-certificated facilities that performed critical repairs, such as engine replacements and adjustments to flight control systems. FAA permits air carriers to use these facilities as long as the work is approved by an FAA-certificated mechanic.

While a certificated mechanic may approve repair work at non-certificated repair facilities, many other safeguards and quality controls that are in place at certificated repair stations are not required at non-certificated facilities. For example, non-certificated repair facilities are not required to employ designated supervisors and inspectors to monitor maintenance work as it is being performed. Other differences in FAA requirements between these two types of maintenance operations are illustrated in Table 1.

Table 1. Differences in Requirements for FAA-Certificated Repair Stations and Non-Certificated Facilities

FAA Requirement	Certificated Repair Station	Non-Certificated Repair Facility
Annual FAA Inspections	Required	Not Required
Quality Control System	Required	Not Required
Reporting Failures, Malfunctions, and Defects	Required	Not Required
Designated Supervisors and Inspectors	Required	Not Required
Training Program	Required	Not required

We also reported that neither FAA nor the six air carriers we visited provided adequate oversight of the work performed at non-certificated repair facilities. The air carriers we reviewed relied primarily on telephone contact to monitor maintenance performed at these facilities rather than conducting on-site reviews of the actual maintenance work. In contrast, as an added level of quality control, air carriers often assign on-site representatives to monitor the work performed at certificated repair stations; this is not the case at non-certificated facilities.

FAA regulations require air carriers to have mechanic training programs and oversight programs for work performed by external maintenance facilities. However, we found significant shortcomings in air carrier training and oversight programs we reviewed. As shown in Table 2, at these air carriers, mechanic training ranged from a 1-hour video to 11 hours of combined video and classroom training; one carrier only required mechanics to review a workbook.

Table 2. Air Carrier Training Provided for Mechanics*

Carrier	Training Provided
A	Less than an *1 hour* of video training
B	*1.5 hours* of classroom training
C	*11 hours* of combined classroom and video training
D	*3.5 hours* of combined classroom and video training
E	Maintenance procedures provided in a *workbook* that had to be signed and faxed back to the air carrier
F	*3 to 4 hours* of combined classroom and video training
G	*4 hours* of classroom training
H	*3.5 hours* of classroom training

    *   Training information obtained either from air carriers' or non-certificated facilities' records.

Despite the differences in quality controls and oversight that exists between certificated and non-certificated maintenance entities, there are no limitations on the scope of work that non-certificated repair facilities can perform. For example, we looked at critical repairs performed under special authorizations at one air carrier and found that, over a 3-year period, 14 of the 19 (74 percent) repairs were performed at non-certificated repair facilities. Examples of the work performed include landing gear checks, lightning strike inspections, and door slide replacements. In contrast, repair stations that are certificated by FAA are limited

to completing only the specific maintenance tasks that FAA has determined the facility is capable of performing.

FAA agreed that it needs to gather more information on the type of work non-certificated facilities perform and place more emphasis on the training and oversight air carriers provide. However, even though our report was issued in December 2005, FAA has not yet provided an action plan to address these issues. Mr. Chairman, this is another area that bears watching and one that requires prompt action by FAA.

FAA and the industry must remain vigilant in their efforts to address aging aircraft issues. After the 1988 Aloha Airlines accident, FAA and the aviation industry developed the Aging Airplane Program. This program was intended to ensure that older aircraft remained structurally sound. The Aloha accident also prompted the Aging Aircraft Safety Act of 1991.[4] The Act required FAA to perform aircraft inspections and records reviews of each aircraft used in air transportation. To implement this Act, FAA issued the 2005 Aging Airplane Safety Rule.[5] This rule formalized requirements for FAA to perform records reviews and aircraft inspections. It also required certain operators to perform supplemental inspections of their aircraft to identify potential cracks and corrosion. Figure 2 provides additional details on the progression of the Aging Airplane Program.

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[4] Aging Aircraft Safety Act of 1991, Pub. L. No. 102-143 (1991).
[5] Aging Airplane Safety Rule, 70 F.R. 5518 (February 2, 2005).

Figure 2. Timeline of the Aging Airplane Program
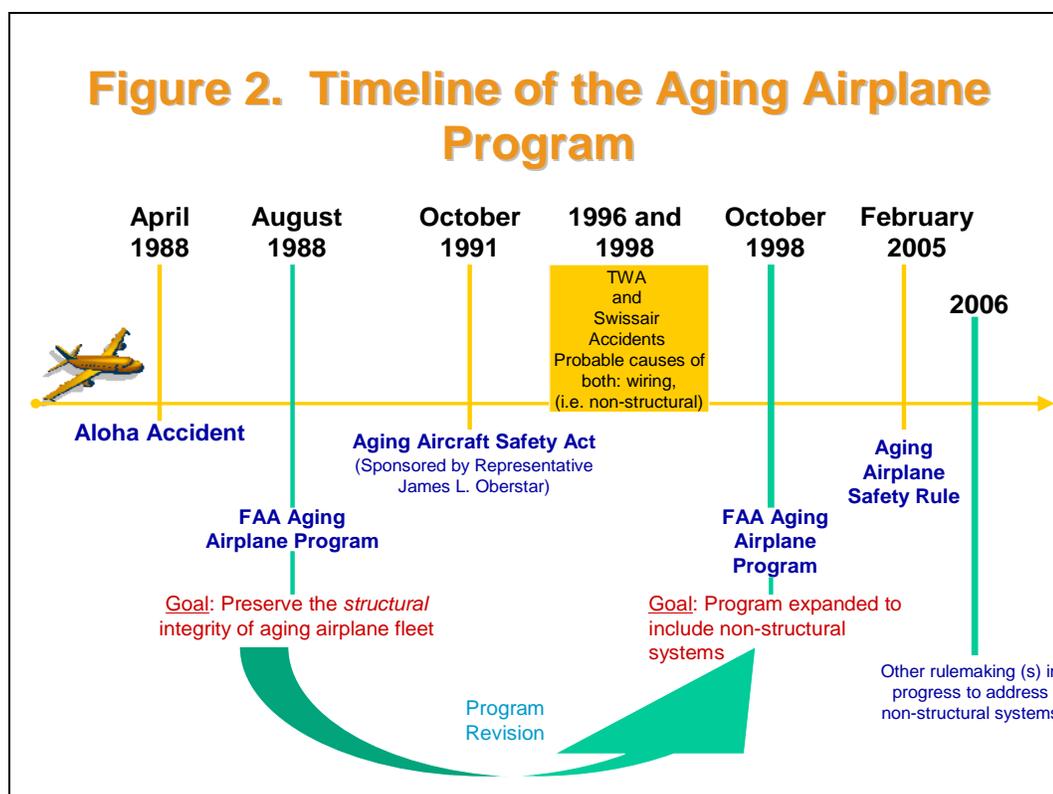
FAA and the aviation industry have made significant advances in addressing problems with aging aircraft. FAA has initiatives underway that will foster even more improvements in aging aircraft requirements for large transport and cargo operators. For example, FAA recently issued a rulemaking[6] for public comment on Widespread Fatigue Damage, which will address potential damage that occurs on aircraft structures over periods of time. FAA has also initiated a task force to address general aviation aging aircraft issues. However, vulnerabilities remain in aging aircraft inspections for certain passenger air carrier and cargo aircraft fleets.

Specifically, FAA's records review and visual inspections of aircraft will not identify hidden cracks or corrosion. These types of problems will only be identified through more detailed supplemental inspections, which are not required for all aircraft under the current rules. For example, 2 months before the December 2005 Chalks Ocean Airways accident, FAA completed an aging aircraft records review and visual aircraft inspection at Chalks, but no structural issues were identified. However, the NTSB preliminary report[7] on this accident indicates that fatigue cracking was evident in both wings. This incident shows that the structural integrity of aircraft cannot be assured if they are only covered under

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6 Aging Aircraft Program: Widespread Fatigue Damage, 71 Fed. Reg. 19928 (proposed April 18, 2006) (to be codified at 14 C.F.R. pts. 25, 121, and 129).
7 NTSB Preliminary Report Number DCA06MA010.

FAA's Aircraft Inspection and Records Review process and not subject to supplemental inspections.

Additionally, there are some categories of aircraft that are not covered by any aging aircraft program, as shown in Table 3. According to FAA and industry, this is due to the cost associated with developing programs for these operators.

Table 3. Aging Aircraft Requirements by Type of Operation

Type of Operation	Operator Inspections (Supplemental Inspections)	FAA Inspectors (Inspection & Records Review)
Multi-Engine/Scheduled Operators With 30+ seats (including Part 121 cargo)	Required	Required
Multi-Engine/Scheduled Operators Below 30 seats	Not Required	Required
Multi-Engine/On-Demand Operators (including Part 135 cargo)	Not Required	Not Required
Single-Engine Operators	Not Required	Not Required
Alaska Operators (flights within the State)	Not Required	Not Required

As part of its investigation of the Chalks accident, NTSB identified similar vulnerabilities. In July 2006, NTSB recommended that FAA require records review, aging airplane inspections, and supplemental inspections for all scheduled operations and cargo operations under Parts 121 and 135.

The Aloha Airlines and Chalks Ocean Airways accidents highlighted the importance of ensuring the structural integrity of older aircraft. FAA, Congress, and the aviation industry have made significant strides in this area, but as aircraft continue to be operated beyond their original design goals, this will be an area that bears watching.

Very light jets will present challenges to FAA's inspector and air traffic controller workforce. One of the new challenges FAA is likely to encounter within the next year is operations of a new class of aircraft called very light jets or VLJs. These small, "affordable" aircraft can operate on runways that are less than 3,000 feet long and can carry up to eight passengers.

As shown in Table 4, one VLJ has already received FAA certification and at least eight others should receive FAA certification within the next 2 years. These jets range in price from less than $1 million to $3.7 million and can fly at the same altitudes as large commercial aircraft.

Table 4. Operational Characteristics of Very Light Jets

VLJ	Full Certification	*Range (Nautical Miles)	**Ceiling	Seats (including pilots)	Price (in millions)
#1	2006	1,100	41,000 feet	6 - 8	$2.3
#2	September 8, 2006	1,250	45,000 feet	6	2.3
#3	2008	1,350	25,000 feet	5	< 1
#4	2006	1,280	41,000 feet	6	1.5
#5	2007	1,600	41,000 feet	5, 6, or 7	< $1
#6	2007	1,300	41,000 feet	8 - 10	3.0
#7	TBD	1,500	41,000 feet	4	TBD
#8	TBD	1,100	41,000 feet	6 - 8	TBD
#9	2007	1,250	45,000 feet	2	2.3
#10	2008	1,160	41,000 feet	6 - 8	2.8
#11	2007-08	1,750	45,000 feet	8 - 10	3.7
#12	TBD	1,300	41,000 feet	4 - 6	1.2

*The distance an aircraft can fly without re-fueling. VLJ operations will generally be on shorter routes of under 600 miles and mainly at altitudes below those of longer-range commercial operations.

**The highest altitude an aircraft can operate. According to FAA, typical operations for VLJs will be between 15,000 and 28,000 feet; they are capable of flying between 38,000 and 45,000 feet. Jetliners typically fly between 30,000 and 40,000 feet.

VLJ manufacturers expect these aircraft to find a niche among a variety of corporate and private owners and on-demand air taxi operators. FAA predicts that approximately 5,000 VLJs will be vying for airspace by 2017—these aircraft will fly in the same airspace as passenger aircraft operated by commercial airlines.

VLJs could also lead to an influx of a new class of pilots, possibly resulting in human factors issues. The pilots of these aircraft are expected to come from general aviation, corporate aviation, air taxi operations, and private ownership. The potential mix of pilot experience levels will demand a new standard in flight training. In addition, VLJs could have an impact on the workload of FAA inspectors and air traffic controllers—a challenge FAA must prepare to address.

FAA has to ensure its readiness for Unmanned Aerial Vehicles. Another emerging challenge facing FAA is the increasing use of unmanned aerial vehicles

(UAV). UAVs are pilotless aircraft operated by remote control. They can have wingspans greater than a 737 aircraft. The number of UAVs has risen dramatically in the last several years. For example, as of June 2006, FAA had issued 55 certificates to operate UAVs this year alone; last year the Agency issued 50 certificates.

In addition, the Department of Homeland Security is using this technology to protect the Nation's borders. Any aircraft operated by Government agencies in the National Airspace System (NAS), including a UAV, is considered a public aircraft operation, and the certification and oversight of that aircraft is the responsibility of the applicable Federal agency. These public operations are, however, required to be in compliance with certain FAA regulations, especially those that ensure that the operation of these aircraft does not compromise the safety of the NAS.

In April of this year, a U.S. Customs and Border Protection Predator B drone, which is as large as some commuter aircraft, crashed in Arizona, reportedly within several hundred feet of homes. According to preliminary incident reports, because the ground operator used the wrong procedures, he accidentally shut off the drone's engine. This accident raises questions about the safety of other unmanned aircraft in the NAS and people on the ground.

In January 2006, FAA stepped up its efforts to address safety issues associated with UAVs by creating a new organization within FAA's Aircraft Certification Service. This office has been tasked with developing policy and rulemakings to ensure that operation of UAVs does not compromise the safety of the NAS. However, as the use of these vehicles continues to grow, FAA will face challenges in developing and implementing rules to govern the safe operation of UAVs.

An evolving aviation system requires that FAA maintain a sufficient number of safety inspectors and ensure inspectors are positioned in the right locations. Much attention has been paid to controller staffing—FAA plans to hire over 11,000 controllers in the next 10 years. While replacing retiring controllers is a critical issue for FAA, it is also important to maintain a safety inspector workforce sufficient to achieve the Agency's mission of safety oversight.

FAA's FY 2007 budget request calls for an increase of 116 safety inspectors. However, it is unlikely that staffing gains over the next few years will be enough to offset the number of safety inspectors eligible to retire during the same time period. For example, this year, 28 percent of the current inspector workforce (1,008 of 3,628) will be eligible to retire. By 2010, however, half of the safety inspector workforce (1,820 of 3,628) will be eligible to retire. Just as FAA has recognized the need to address an expected surge in controller attrition, it must also ensure it closely monitors retirements and takes steps to hire and train the next

generation of safety inspectors. In our opinion, FAA needs to carefully evaluate its inspector staffing levels to ensure it can sustain sufficient oversight in light of the potential attrition within that workforce.

However, FAA does not currently have a staffing model that would provide an effective means of determining inspector staffing needs. In 1996, FAA recognized the need to have a model to more effectively respond to workload changes, such as air carrier growth and cutbacks. FAA developed a model in 2000 at a cost of $1.5 million. However, it was never implemented because by the time the model was completed, FAA had transitioned to ATOS—a change in its oversight process—which made the model obsolete. Without a staffing model, FAA cannot be assured that it has the right number of inspectors, assigned to the right locations, to effectively respond to changes in the air carrier industry.

During our review of FAA oversight of financially distressed and low-cost air carriers, we found inconsistencies in the way inspectors were allocated among field offices. For example, two FAA offices had the same number of inspectors assigned to oversee each of their assigned air carriers, but one air carrier had twice as many aircraft and 127 percent more flights than the other.
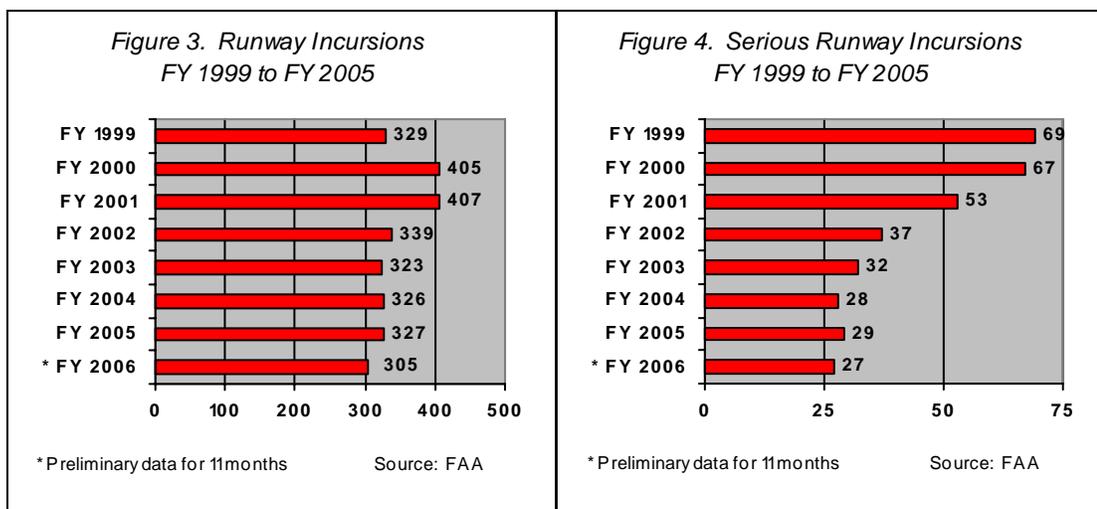
We also found that inspectors were not assigned to the locations where they were needed most. For example, FAA currently has one operations inspector assigned to Des Moines, Iowa, where his assigned air carrier averages only 6 flights per day, but does not have an operations inspector assigned to Chicago, Illinois, where the same air carrier averages 298 flights each day. The fact that inspectors are often not assigned to locations where they are needed most is largely the result of an April 2003 memorandum of understanding (MOU) between FAA and the union representing its inspectors. The MOU allows inspectors for ATOS air carriers to remain in their assigned locations if they choose to do so, even when air carriers substantially reduce operations or close maintenance facilities at those sites.

In 2003, Congress directed FAA to contract with the National Academy of Sciences to conduct a study of the assumptions and methods the Agency uses to estimate staffing standards for its inspectors. The purpose of the study was to ensure that FAA has adequate resources to conduct proper oversight of the aviation industry. The National Academy of Sciences has completed their work, and FAA plans to publish the results of their study today. We have not had an opportunity to review this study. However, Mr. Chairman, in our opinion, it is important for the Subcommittee to follow up with FAA to ensure that a model is implemented to effectively allocate inspector resources in response to changes in the industry.

Reducing the Risk of Accidents on the Ground and in the Air

Two primary indicators of system safety are runway incursions (potential collisions on the ground) and operational errors (potential collisions in the air). Reducing these incidents are key performance goals for FAA that require heightened attention at all levels of the Agency.

Progress has been made in reducing runway incursions but serious incidents continue to occur at major airports. From 1998 to 2001, runway incursions were increasing at alarming levels. To its credit, FAA took decisive action—it established regional runway safety offices, conducted numerous safety evaluations at problem airports, initiated aggressive educational programs for pilots, and implemented technologies at major airports that alert controllers of potential runway accidents. As shown in the figures below, the total number of runway incursions decreased from a high of 407 in FY 2001 to 327 in FY 2005, and the most serious incidents have decreased from a high of 69 in FY 1999 to 29 in FY 2005.

Figure 3. Runway Incursions FY 1999 to FY 2005	Figure 4. Serious Runway Incursions FY 1999 to FY 2005
FY 1999 — 329	FY 1999 — 69
FY 2000 — 405	FY 2000 — 67
FY 2001 — 407	FY 2001 — 53
FY 2002 — 339	FY 2002 — 37
FY 2003 — 323	FY 2003 — 32
FY 2004 — 326	FY 2004 — 28
FY 2005 — 327	FY 2005 — 29
* FY 2006 — 305	* FY 2006 — 27
* Preliminary data for 11 months Source: FAA	* Preliminary data for 11 months Source: FAA

However, the number of runway incursions since 2003 has reached a plateau and very serious runway incursions (those in which a collision was barely avoided) continue to occur. Recent incidents at several large airports highlight the potential safety risks associated with runway incursions.

- On July 17, 2006, at Chicago O'Hare, a pilot of a commercial regional jet made a wrong turn and mistakenly entered a runway as a Boeing 737 was landing. The Boeing 737 flew directly over the top of the regional jet, narrowly missing it by less than 100 feet.

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- On March 21, 2006, at Chicago O'Hare, a controller mistakenly cleared two commercial aircraft (an Airbus 319 and an Embraer E145) for takeoff on intersecting runways. Another controller spotted the error and ordered both aircraft to abort their takeoff rolls. Before stopping, however, the two aircraft came within 100 feet of one another at the runway intersection.

- On June 9, 2005, at Boston Logan, a controller mistakenly cleared two commercial aircraft (an Airbus 330 and a Boeing 737) to depart on intersecting runways. As the Airbus lifted off the ground, the Boeing 737 pilot saw the potential hazard and kept the aircraft on the ground to avoid a collision. The two aircraft came within 171 feet of one another.

Three airports in particular—Chicago O'Hare, Boston Logan, and Philadelphia—have experienced a recent increase in runway incursions. During the period FY 2005 through August 2006, Boston Logan had 22 incidents (1 severe), Chicago O'Hare had 15 incidents (5 severe), and Philadelphia had 15 incidents (1 severe involving a collision). Those were the highest number of runway incursions among the Nation's large commercial airports. We are currently conducting a review of FAA's actions to address the increase in incidents at those three locations.

Over the past several years, FAA has invested in multiple technologies to reduce runway incursions. FAA initially deployed a system known as the Airport Movement Area Safety System (AMASS) at 34 large airports to alert controllers of potential runway collisions. However, AMASS produced false alerts during heavy rain storms, which rendered the system inoperable at times when it was most needed.

Because of the problems with AMASS, FAA is installing a new system called the Airport Surface Detection Equipment—Model X (ASDE-X). ASDE-X is already operational at 8 airports, and FAA plans to deploy this system to a total of 35 airports (including 25 airports that are currently using AMASS).

Although ASDE-X performs better in adverse weather conditions, it also has problems with false alerts similar to AMASS. In addition, ASDE-X has experienced significant schedule slippages, and the final deployment date has been pushed from 2007 to 2011.

More importantly, while AMASS and ASDE-X provide alerts of potential runway incursions to air traffic controllers, neither system provides alerts to pilots, which has been a longstanding NTSB recommendation. Providing warnings directly to flight crews is a potentially significant tool to prevent runway incursions since over 50 percent of runway incursions are caused by pilot error. We are

completing a review of FAA's ASDE-X program and intend to issue a report early next year.

To address the collision risk of operational errors, FAA needs an accurate baseline of the number of errors actually occurring. While FAA has had success in reducing the total number of runway incursions Agency-wide, it has not had the same success with operational errors—where aircraft come too close together in the air. In addition, shortcomings in FAA's reporting system for operational errors have indicated that the true number of these incidents is not yet known.

In FY 2005, there were 1,489 operational errors (up from 1,149 in FY 2004), which is the highest number of errors reported in the past 6 years. Seventy-three of those errors were classified as serious incidents (those rated as "high" severity—those where a mid-air collision is barely avoided), compared to 40 serious incidents reported in FY 2004.

During the first 11 months of FY 2006, the number of operational errors has decreased—there were 1,242 operational errors compared to 1,358 during the same period in FY 2005. However, the number of operational errors during the 11-month period still exceeds the *total* number of errors experienced during all of FY 2004.

The increase in operational errors is significant, but it is important to recognize that the number of errors reported in prior years may not be an accurate benchmark. This is because, at the majority of FAA facilities, FAA relies on an inaccurate system of self-reporting operational errors.

In September 2004, we reported[8] that only 20 of FAA's 524 air traffic control facilities had an automated system that identifies when operational errors occur. At its towers and terminal radar approach control (TRACON) facilities, FAA depends on an unreliable system of self-reporting operational errors.

Recent investigations by our office and FAA at two locations found multiple instances of unreported operational errors. Specifically, at the Dallas/Fort Worth TRACON, we investigated claims by a whistleblower that operational errors were being intentionally underreported. We substantiated that operational errors were systematically ignored and traced the cause to local management policy that did not comply with national guidelines. Prior to our investigation, the facility reported just two operational errors during the 6-month period from January 1 to

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[8] OIG Report Number AV-2004-085, "Audit of Controls Over the Reporting of Operational Errors," September 20, 2004.

June 24, 2004. During our investigation, we identified five unreported operational errors that occurred during May and June alone.

After instituting appropriate use of playback tools[9] in June 2004, the facility reported 36 operational errors during the next 6 months. Facility managers also took actions to improve operations by training all personnel on proper procedures for reporting and investigating operational errors, redesigning facility-specific air traffic procedures, and conducting refresher training to improve controller performance.

At the New York TRACON, FAA initiated an internal investigation in response to a rash of allegations that operational errors were increasing. That review identified 147 unreported operational errors during a 2-month period. The number of reported operational errors for the New York TRACON increased from 24 in FY 2004 to 233 in FY 2005. Again, it is important to note that prior to FY 2005, the number of operational errors was most likely understated. Managers at the facility responded by re-training all personnel and redesigning certain facility-specific air traffic procedures.

This past year, FAA has taken steps to improve operational error reporting. For example, FAA implemented procedures that require towers and TRACONs to conduct random audits of radar data to identify potential unreported operational errors. FAA Headquarters is also conducting random audits at selected facilities and is evaluating its severity rating system in an effort to capture more accurately the collision risk that operational errors pose. More importantly, FAA is developing an automated system to identify when operational errors occur at TRACON facilities. FAA plans to start fielding this system in FY 2008 with an estimated completion date in FY 2009.

Clearly, those actions are steps in the right direction, but FAA needs to follow through on those efforts—the number of unreported errors identified just at the New York TRACON underscores the need for top management attention to this issue.

Mr. Chairman, we see two key issues that FAA needs to address to reduce the collision risk of operational errors.

First, FAA needs to identify an accurate baseline of the number of operational errors that are actually occurring. That is, FAA must ensure that operational errors are accurately reported and ascertain the causes of these incidents, especially the

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9 Playback tools are software programs and other electronic instruments for recreating air traffic incidents by replaying recorded radar and voice data.

most serious ones. FAA's action to implement an automatic reporting tool at TRACONs should go a long way in establishing that baseline.

Second, FAA must address the issue of controller attrition and staffing at each facility. The controllers have repeatedly stated that staffing is a primary cause of operational errors. While FAA can disagree, the issue will remain unresolved until FAA has reliable and accurate staffing standards for each of its air traffic facilities (over 300 FAA-operated nationwide). This is particularly important in light of the fact that FAA estimates over 70 percent of its controllers hired after the 1981 strike will be eligible to retire in the next 10 years.

To address the surge in retirements, FAA plans to hire and train over 11,000 new controllers through FY 2015. In December 2004, FAA developed a comprehensive workforce plan that lays out the magnitude of the issue and establishes broad measures for meeting the challenge. However, as we reported in May 2005,[10] the plan lacks essential details concerning two key areas.

- FAA's plan does not identify how much it will cost. The cost of hiring and training 11,000 new controllers will be substantial, particularly since it currently takes new controllers 2 to 5 years to become fully certified. During that time, FAA incurs the cost of the trainees' salary and benefits, as well as the cost of the salary and benefits of the certified controllers who instruct them one-on-one.

- In addition, the plan does not address hiring and staffing needs by location. Without this information, FAA cannot have confidence in the projected number of controllers it says it needs to operate the system safely. That level of detail is critical because there are over 300 FAA-operated air traffic control facilities—many with significant differences in the levels of air traffic they manage and the complexity of operations they handle. Without accurate facility-level planning, FAA runs the risk of placing too many or too few controllers at key locations.

It is important to note that FAA's most recent report, dated June 2006, did not address these two key areas. We are currently reviewing FAA's progress in implementing key staffing and training elements of the plan and will be issuing a report later this year. In addition, at the request of the Ranking Members of the Full Committee and this Subcommittee, we are reviewing FAA's policies regarding the number of controllers required to be on duty during certain shifts at tower and TRACON facilities. Our auditors are visiting the first site this week.

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[10] OIG Report Number AV-2005-060, "Report on Controller Staffing: Observations on FAA's 10-Year Strategy for the Air Traffic Controller Workforce," May 26, 2005.

That concludes my statement,[11] Mr. Chairman. I would be pleased to address any questions you or other Members of the Subcommittee might have.

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[11] This testimony was conducted in accordance with <u>Generally Accepted Governmental Auditing Standards</u> prescribed by the Comptroller General of the United States. The work supporting this testimony was based on prior and ongoing audits conducted by the Office of Inspector General.