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Key Issues Facing the Federal Aviation Administration's Controller Workforce

Statement of
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Mr. Chairman and Members of the Subcommittee:

We appreciate the opportunity to testify today on key issues facing the Federal Aviation Administration's (FAA) controller workforce. With FAA's plans to hire and train nearly 17,000 controllers to offset retirements over the next decade, ensuring there are enough certified controllers at FAA's more than 300 air traffic control facilities will remain a significant watch item for this Subcommittee

This "surge" in controller retirements stemmed from the air traffic controller strike in 1981. When 10,438 striking controllers did not return to work, then-President Reagan fired them. Between 1982 and 1983, FAA hired over 8,700 new controllers; it subsequently hired an average of 2,655 controllers per year until 1991. By the end of 1992, the controller strike recovery period had ended and controller hiring stabilized to the level of "one retirement—one hire." However, the hiring wave between 1982 and 1991 created a large pool of controllers who have reached or will reach retirement eligibility at roughly the same time.

As a result, a surge in controller retirements has begun. Since 2005, 3,300 controllers have left the workforce;[1] while 1,876 were retirees, only 37 of those controllers retired because they had reached the mandatory retirement age of 56. Further, the total rate of attrition was 23 percent higher than FAA had projected, and FAA accelerated its hiring efforts to keep pace. Since 2005, FAA has hired 3,450 new controllers—25 percent more than projected (see figure 1).

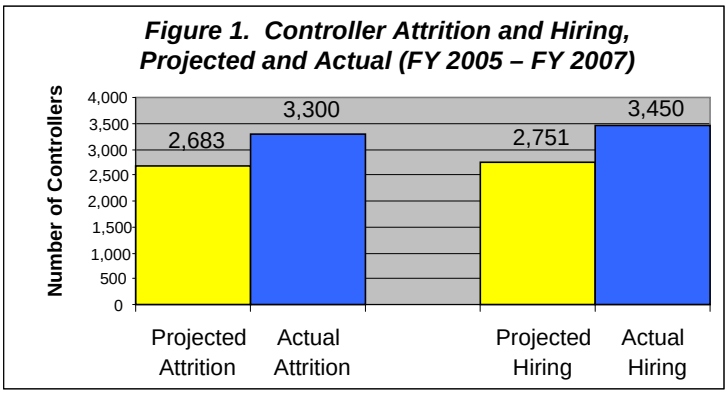

Figure 1. Controller Attrition and Hiring, Projected and Actual (FY 2005 – FY 2007)

FAA is now facing a fundamental transformation in the composition of its controller workforce, as the overall percentage of controllers in training has grown substantially over the past 4 years. From April 2004 to April 2008, the overall size of the controller workforce remained relatively constant. During that period, however, the number of controllers in training increased by 1,407, or nearly 64 percent, while the number of fully certified professional controllers (CPC) decreased by 1,364, or 11 percent (see table below).

FAA expects the percentage of controllers in training to continue to increase to as much as 30 percent of the workforce over the next 4 years.

[1] Attrition includes retirements, resignations, and promotions to supervisory or non-controller positions, training failures, and deaths.

Table. Controller Workforce Composition			
Date	**CPCs**	**Controllers in Training***	**Total**
April 2004	12,328	2,209	14,537
April 2008	10,964	3,616	14,580
Difference	(-1,364)	+1,407	+43

*Includes newly hired or developmental controllers and transferred CPCs in training at new locations.
Source: FAA

New controllers now represent 25 percent of the workforce (up from 15 percent in 2004).[2] However, that percentage can vary extensively by location—from as little as zero percent (e.g., Pittsburgh air traffic control tower) to as much as 67 percent (e.g., Rochester air traffic control tower).

Addressing controller attrition will be a major challenge for FAA for at least the next 10 years. Our testimony today is based on our audits and investigations of FAA controller workforce issues over the past decade. We have identified three key areas where FAA should focus its efforts to successfully hire and train 17,000 new controllers through 2017: (1) improving facility training, (2) addressing controller human factors, and (3) ensuring accuracy and consistency in reporting and addressing operational errors.

Improving Controller Facility Training

A major challenge in addressing the surge in controller attrition will be training new controllers to the CPC level at their assigned locations. Facility training can take up to 3 years and is the most expensive part of new controller training. Training new controllers to the CPC level is important for two reasons: (1) only CPCs are qualified to control traffic at all positions of their assigned area, and (2) only CPCs certified for at least 6 months (at their assigned location) can become on-the-job training (OJT) instructors for other new controllers. Having enough OJT instructors at all locations is a vital part of FAA's long-term hiring plans.

It is important to note that new controllers who have completed portions of training and certified on a position are partially qualified and can independently staff that position. However, controllers are not qualified CPCs until they have certified on all positions within their assigned area. In addition, using partially qualified controllers extensively to staff positions can increase the time required for them to become CPCs because they are not training on other new positions.

[2] We used 2004 as a benchmark for comparison purposes because (1) 2004 was the last year we audited this program, which created a natural benchmark for all our comparisons, and (2) 2004 was the year FAA first published its Controller Workforce Plan.

Last week, we issued our report on FAA's controller facility training program[3]—our second review of this program since 2004. FAA is taking actions at the national level to get this important program on track. For example, FAA is increasing the use of contractor training support—from 53 facilities in 2004 to 190 facilities in 2007—and training simulators at towers. We found, however, that many of FAA's efforts are still in the early stages. Our report identified problems that we also reported in 2004—that the facility training program continues to be extremely decentralized and the efficiency and quality of the training varies from one location to another. We identified the following actions needed to improve this important program:

Establishing realistic standards for the level of developmental controllers that facilities can accommodate. Given the various size and complexities of FAA's more than 300 facilities, FAA needs to identify (by facility) how many developmental controllers facilities can realistically accommodate. We recommended that FAA's new standards consider several factors, such as the availability of OJT instructors, classroom space, and simulators as well as training requirements and the number of recently placed new personnel already in training. FAA agreed to convene a working group to identify a percentage range target for developmental controllers based on facility type. FAA expects the workgroup to hold its first meeting this month.

Clarifying responsibility for oversight and direction of the facility training program at the national level. Facility training is primarily the responsibility of the Air Traffic Organization's (ATO) Vice President for Terminal Services and Vice President for En Route and Oceanic Services. However, the Vice President for Acquisition and Business Services oversees new controller hiring and the FAA Academy training program, and the Senior Vice President for Finance oversees the development of the Controller Workforce Plan. All four offices have key roles in the controller training process.

As a result of these overlapping responsibilities, we found there is significant confusion at the facility level. Facility managers, training managers, and even Headquarters officials were unable to tell us who or what office was responsible for facility training. We recommended that FAA clarify responsibility for oversight and direction of the facility training program at the national level and communicate those roles to facility managers. FAA agreed to clarify those roles and responsibilities in the next update to its training order.

Implementing key initiatives proposed in its 2004 Controller Workforce Plan. FAA has not implemented key initiatives to improve facility training that it proposed in the 2004 Controller Workforce Plan. These include, "developing, implementing, and enforcing a policy that assigns facility training as a priority second only to

[3] OIG Report Number AV-2008-055, "Review of the Air Traffic Controller Facility Training Program," June 5, 2008. OIG reports and testimonies are available on our website: www.oig.dot.gov.

operations." This was to be accomplished by (1) placing developmental controllers only at facilities that had available training capacity, (2) requiring facility managers to suspend training only for critical operational necessities, and (3) establishing nominal "time-to-certify" metrics and holding managers accountable for achieving those targets. However, FAA never issued this policy. In its response to our draft report, FAA agreed with our recommendation to issue this guidance and stated its En Route and Terminal service units would coordinate and issue the guidance.

In addition, FAA has not comprehensively evaluated its facility training program. In its 2004 Controller Workforce Plan, FAA stated it would "conduct a thorough review of facility training to ensure it begins where the Academy ends." FAA intended for this effort to help reduce the time it takes new controllers to become CPCs. However, FAA never conducted the evaluation. We recommended that FAA follow through with this evaluation and its Controller Workforce Plan initiatives. FAA agreed to require the selected contractor for its next training support procurement to perform an initial analysis of facility training.

Including detail on the composition of the controller workforce in reports to stakeholders. While the number of controllers in training has increased significantly since 2004, FAA's reports to its stakeholders do not reflect this change. This is because FAA's Controller Workforce Plan does not differentiate between CPCs and controllers in training ("in training" includes both developmental controllers and CPC-ITs[4]). Instead, FAA only reports the total number of controllers at each location. We recommended that FAA report the number of CPCs *and* the number of controllers in training separately for each location. Differentiating those figures by location could provide Congress and the Secretary with critical data on the controller workforce and provide a benchmark for year-to-year comparisons.

FAA did not agree with our recommendation. In its response to our draft report, FAA stated that an annual snapshot of this information does not accurately portray the changing controller workforce and that the information would be of little use to readers of its Controller Workforce Plan.

We strongly believe that periodic comparisons of the controller workforce provide critical data points for Congress, the Secretary, and other stakeholders who must help ensure FAA has enough certified controllers to safely operate the National Airspace System. This is particularly important given the length of time required for new controllers to become CPCs.

[4] CPCs in training (CPC-IT) are veteran controllers who transferred from another facility and are in training to learn the procedures and airspace of their new locations.

Addressing Controller Human Factors

Addressing controller human factors issues, such as fatigue and situational awareness, is important for maintaining safe operations of the National Airspace System. In its investigation of Comair flight 5191, the National Transportation Safety Board (NTSB) expressed concerns that the lone controller on duty at the time of the accident had only slept about 2 hours before his shift (although he had 8 hours off between shifts). As a result of its investigation, the NTSB added controller fatigue to its "Most Wanted List" in 2007.

Training new controllers on human factor issues as well as technical aspects of air traffic control (such as airspace, phraseology, and procedures) will become increasingly important as FAA begins to address the large influx of new controllers.

In April 2003,[5] we reported that almost 90 percent of controller operational errors (when a controller allows two aircraft to get too close together either on the runway or in the air) were due to human factors issues rather than procedural or equipment deficiencies. Therefore, it was important that FAA develop initiatives to prevent these types of errors. In May 2007,[6] we again reported that FAA needed to focus on controller human factors issues and training to reduce the risk of runway incursions caused by controller operational errors. Our report found, however, that FAA had made little progress in this area. Since then, FAA has made some progress toward human factors initiatives, particularly with the National Air Traffic Professionalism Program (NATPRO).

We reviewed NATPRO in 2003. NATPRO training is designed to sharpen and maintain controllers' mental skills most closely associated with visual attention and scanning. Participants thus gain insight into how performance can be influenced by certain factors (e.g., by distraction, fatigue, and boredom) and how those factors increase the opportunity for operational errors.

FAA tested the program in FY 2003 and began providing this training at its en route centers; it will begin using NATPRO at Terminal Radar Approach Control (TRACON) facilities this year. Since we issued our report last May, FAA has provided NATPRO cadre training to representatives from 42 facilities so they can use NATPRO at their facilities. While FAA has not yet implemented NATPRO at tower facilities, where visual attention and scanning are key factors in preventing runway incursions, it plans to do so in FY 2009.

To its credit, FAA has successfully implemented an extremely important training initiative—increasing the use of training simulators at towers. Tower simulators can

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[5] OIG Report Number AV-2003-040, "Report on Operational Errors and Runway Incursions," April 3, 2003.

[6] OIG Report Number AV-2007-050, "Progress Has Been Made in Reducing Runway Incursions, but Recent Incidents Underscore the Need for Further Proactive Efforts," May 24, 2007.

improve overall facility performance by reducing runway incursions caused by controllers through enhanced initial and proficiency training. They provide controllers with a virtual replica of the tower environment, which can be used to train controllers using real-life scenarios such as day-versus-night operations, varying weather conditions, different runway configurations, or emergency situations. Results at four towers thus far indicate that simulators are valuable tools for enhancing controllers' skills and addressing human factors issues.

Simulators can also be used to model changes in airport configurations and procedures. For example, Boston Logan used a tower simulator to help establish necessary safety procedures for a newly constructed runway. FAA plans to install 12 additional simulators this year (6 at large airports and 6 at the FAA Academy) and 12 next year (at other airports). FAA needs to ensure that this important initiative remains on track to capitalize on the significant success this training has demonstrated.

Ensuring Consistency and Accuracy in Reporting and Addressing Controller Operational Errors

As FAA transitions to a new and relatively inexperienced controller workforce, it must investigate, mitigate, and accurately report operational errors. In FY 2007, there were 1,393 operational errors, up slightly from 1,338 in FY 2006. Forty-three of these were categorized as serious,[7] which is the equivalent of about 1 serious operational error every 8 days.

In 2004,[8] we reported that FAA relied on an inaccurate self-reporting system to track operational errors. FAA must obtain accurate reports of operational errors to identify trends and prevent recurrences. Yet, we found that only 20 of FAA's more than 300 air traffic control facilities had an automated system to identify operational errors. We made a series of recommendations to FAA to ensure that operational errors were accurately reported and investigated.

In response, FAA is developing an automated system—the Traffic Analysis and Review Program, or TARP—to identify when operational errors occur at TRACON facilities. FAA started deploying this system in FY 2008 with an estimated completion date for operational capabilities at all locations by the end of calendar year 2009.

Keeping this technology on track must remain a priority for FAA as it hires and trains 17,000 new controllers. We continue to receive allegations that operational errors are going unreported or in some cases intentionally misclassified. For example, in two

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[7] Serious operational errors are those incidents that FAA rates as Category A (or high risk of a collision).

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

separate investigations requested by the Office of Special Counsel, we found that operational errors were intentionally under-reported at the Dallas/Fort Worth TRACON.

In 2004, we found that operational errors were being systematically ignored (i.e., suspected events were not investigated) as a result of local management policies that appeared to be designed to deflate their numbers. In 2007, we initiated a second investigation at the Dallas TRACON and found 62 operational errors and deviations that had been intentionally misclassified as pilot errors or "non-events."

In April 2008, we issued our investigative report to FAA and made eight recommendations, which included (1) taking appropriate administrative actions against employees involved in the misclassification of operational errors; (2) conducting on-site, no-notice reviews of the facility by an entity outside of the ATO; and (3) expediting the early deployment of TARP at the facility. FAA agreed with our recommendations and began appropriate actions to address them.

FAA has also recently announced plans to create an Air Traffic Safety Action Program (ATSAP), designed to foster a voluntary, cooperative, non-punitive environment for the open reporting of safety concerns. ATSAP is modeled after similar programs used by FAA and airlines. Under ATSAP, controllers can report previously unreported events involving the loss of separation between aircraft without fear of reprisal. In theory, this provides safety information that might otherwise be unobtainable, which could help in developing corrective actions.

FAA must carefully ensure, however, that these programs are used to enhance safety and protect them from potential misuse. Our work on a similar program, which grants immunity to pilots who report runway incursions, found that safety information was either inaccessible or not used to resolve the cause of the reported safety issue. We also found serious lapses in FAA's and Southwest Airlines' use of a partnership program that permitted voluntary disclosure of maintenance issues. Specifically, when the carrier disclosed maintenance shortfalls, FAA did not require appropriate corrective actions. In this instance, FAA allowed aircraft that had missed critical fuselage inspection dates to continue flying without requiring them to undergo immediate inspections. FAA must ensure that similar issues do not occur with ATSAP.

I would now like to discuss these matters in further detail.

A KEY ISSUE FOR ADDRESING ATTRITION WILL BE TRAINING NEW CONTROLLERS AT THE FACILITY LEVEL

A major challenge in addressing the surge in controller attrition will be to train transferring and new (or developmental) controllers to the CPC level at their assigned locations. Facility training can take up to 3 years and is the most expensive part of new controller training. Developmental controllers and transferring veteran controllers face a demanding training process at their assigned locations. The training is conducted in stages and consists of a combination of classroom, simulation, and OJT.

After controllers complete classroom and simulation training, they begin OJT; this is conducted by a CPC who observes and instructs trainee controllers individually as they work the control position. Controllers in training achieve certification on each position as they move through the various stages. After they have certified on all positions within their assigned area, they are commissioned as a CPC at that facility.

Training new controllers to the CPC level is important for two reasons: (1) only CPCs are qualified to control traffic at *all* positions of their assigned area, and (2) only CPCs certified for at least 6 months (at their assigned location) can become OJT instructors for other new controllers. Having enough OJT instructors at all locations is a vital part of FAA's plan to hire and train 17,000 new controllers through 2017.

It is important to note that new controllers who have completed portions of training and certified on a position are partially qualified and can independently staff that position. However, controllers are not qualified CPCs until they have certified on all positions within their assigned area. In addition, using partially qualified controllers extensively to staff positions can increase the time required for them to become CPCs because, when used to staff a position, they are not training on other new positions.

FAA is taking actions at the national level to get this important program on track. For example, FAA increased the use of contractor training support from 53 facilities in 2004 to 190 facilities in 2007. Last week, we issued our report on FAA's controller facility training program—our second review of this program since 2004. We found that while FAA is making progress, many of its efforts are still in the early stages. Our report identified problems that we also reported in 2004—that the program continues to be extremely decentralized and the efficiency and quality of the training varies from one location to another. We made 12 recommendations to FAA, which include taking the following actions to achieve its goals for the controller workforce:

Clarify responsibilities for oversight and direction of the facility training program at the national level. After FAA created the ATO, it assigned national oversight responsibility for facility training to the ATO Vice President for Terminal Services and the Vice President for En Route Services. However, the Vice President for Acquisition and Business Services oversees new controller hiring and the FAA Academy training program, and the Senior Vice President for Finance oversees the development of the Controller Workforce Plan. All four offices play key roles in the controller training process.

As a result of these overlapping responsibilities, we found that there is significant confusion at the facility level. During our review, facility managers, training managers, and even Headquarters officials were unable to tell us who or what office was responsible for facility training. We recommended that FAA clarify responsibility for oversight and direction of the facility training program at the national level and communicate those roles to facility managers. FAA agreed to clarify those roles and responsibilities in the next update to its training order.

Establish realistic standards for the level of developmental controllers that facilities can accommodate. FAA plans to increase the number of developmental controllers to over 30 percent of the total controller workforce. This would be the highest percentage of developmental controllers in 15 years. In its Controller Workforce Plan, FAA estimates that the controller workforce at each facility can comprise up to 35 percent in developmental controllers and still maintain operations and training.

FAA also estimates that if facilities exceed that amount, training times would significantly increase because the number of developmental controllers would surpass training capacity. We found, however, that many facilities already meet or exceed the 35-percent level. As of April 2008, 67 facilities nationwide (over 21 percent of all FAA air traffic control facilities) exceeded that level, compared to just 22 in April 2004. This represents a 205-percent increase in just 4 years. For example, as of April 2008:

- Miami Center had 191 CPCs and 88 developmental controllers (32 percent developmental).
- Oakland Center had 168 CPCs and 83 developmental controllers (33 percent developmental).
- Las Vegas TRACON had 26 CPCs and 18 developmental controllers (41 percent developmental).

Most facility managers, training officers, and union officials we spoke with disagreed with FAA's estimate of an acceptable level of developmental controllers. They stated that, in order to achieve effective controller training while maintaining daily

operations, the *maximum* percentage of developmental controllers should be limited to between 20 percent and 25 percent of a facility's total controller workforce.

The difference between these estimates and FAA's maximum percentage is disconcerting, particularly since 67 facilities already exceed the FAA limit. A significant issue is that FAA's 35-percent estimate was originally intended to determine how many developmental controllers could be processed through the FAA Academy—not how many new controllers that could be trained at individual facilities. It appears, however, that FAA is using that percentage as a benchmark for all facilities.

FAA Headquarters officials we spoke with agreed that "no one size fits all" when determining how many trainees a facility can accommodate. We agree, given the various size and complexities of FAA's more than 300 facilities. We recommended that FAA re-examine its estimate and identify (by facility) how many developmental controllers facilities can realistically accommodate.

In determining this amount, we recommended that FAA consider several factors at each location, such as the availability of OJT instructors, classroom space, and simulators as well as training requirements and the number of recently placed new personnel already in training. FAA agreed to convene a working group to identify a percentage range target for developmental controllers based on facility type. FAA expects the workgroup to hold its first meeting this month.

Implement key initiatives proposed in its 2004 Controller Workforce Plan. FAA has not implemented several key initiatives relating to facility training that it first proposed in its December 2004 Controller Workforce Plan. Those included "developing, implementing and enforcing a policy that assigns facility training as a priority second only to operations." This was to be accomplished by (1) placing developmental controllers only at facilities that had available training capacity, (2) requiring facility managers to suspend training *only* for critical operational necessities, and (3) establishing nominal "time-to-certify" metrics and holding managers accountable for achieving those targets. However, FAA never issued this policy. In its response to our draft report, FAA agreed with our recommendation to issue this guidance and stated its En Route and Terminal service units would coordinate and issue the guidance.

In addition, FAA has not comprehensively evaluated its facility training program. In its 2004 Controller Workforce Plan, FAA stated it would "conduct a thorough review of facility training to ensure it begins where the Academy ends. This review will take into consideration other efficiency gains identified in this plan and will result in facility training programs tailored to meet the needs of developmental controllers of the future."

FAA intended for this effort to help reduce the time it takes new controllers to become CPCs. However, FAA never conducted the evaluation. We recommended that FAA follow through with this evaluation and its Controller Workforce Plan initiatives. FAA agreed to require the selected contractor for its next training support procurement to perform an initial analysis of facility training within 90 days of contract award.

FAA Needs To Continue Encouraging Veteran Controllers To Transfer to Higher-Level, Busier Locations

We also found that fewer veteran controllers are transferring from lower-level, less complicated facilities to higher-level, busier locations. From April 2004 to April 2008, the number of transferring veteran controllers decreased by nearly 51 percent (from 1,217 in 2004 to 597 in April 2008). As a result of the decrease in transferring veteran controllers, we found that many facilities, particularly large terminal facilities, have had to redesign their training programs.

Although en route facilities are generally the largest air traffic control facilities, their training programs have always been designed to include the training needs of the least experienced developmental controllers. This is not the case at large terminal facilities such as the Potomac, Atlanta, or Chicago TRACONs.

In the past, large terminal facilities relied primarily on experienced CPCs transferring from lower-level, less complex facilities to fill their vacancies. Prospective terminal controllers were seldom assigned to large TRACONs and towers without first learning to control air traffic at slower-paced, less complex terminal facilities. CPCs would then transfer to increasingly complex terminal facilities at higher pay scales as part of their career progression. Although CPC-ITs had to certify on each position at the new facility, they normally became certified faster than inexperienced, developmental controllers because of their previous experience in controlling air traffic. This is no longer the case, however, as developmental controllers are now increasingly being assigned *directly* to higher-level terminal facilities.

We found that where facilities are forced to redesign their training programs to accommodate directly placed new hires, it takes longer for controllers to certify as CPCs. For example:

- At the Potomac TRACON, managers historically received very few inexperienced, newly hired developmental controllers. According to those managers, most new controllers transferred to the facility from lower-level facilities and had previous experience controlling traffic. Since most of the TRACON's current new controllers are inexperienced, developmental controllers, the TRACON management is considering adding a 6- to 7-week class to review basic air traffic fundamentals. The facility manager also told us that existing minimum and

- At the Chicago TRACON, managers had to extend their facility training program by 10 weeks to accommodate the additional training needs of inexperienced, developmental controllers. This facility historically received more experienced controllers.

- At the Atlanta TRACON, managers stated that, prior to 2007, they had never trained any inexperienced, developmental controllers. As a result, managers convened a working group to redesign the facility's training program. The updated facility training order, which was released in August 2007, established new classroom and OJT training hours for developmental controllers with no prior air traffic control experience.

FAA is aware of this concern and announced a new program in January 2008 that offers a retention incentive bonus to veteran controllers at key facilities if they remain with the Agency after becoming eligible to retire. Those actions are a step in the right direction; we recommended that FAA report the preliminary results of this incentive in its next update of the Controller Workforce Plan to ensure its busiest facilities benefit from veteran controllers' valuable experience. Although FAA did not agree to publish the initial results in its Controller Workforce Plan, it did agree to provide us with the results upon request.

FAA Needs To Include Details on the Composition of the Controller Workforce in Its Reports to Stakeholders

While the number of controllers in training has increased significantly since 2004, FAA's reports to its stakeholders do not reflect this change. This is because FAA's Controller Workforce Plan does not differentiate between CPCs and controllers in training ("in training" includes both developmental controllers and CPC-ITs). Instead, FAA only reports the total number of controllers at each location. In our opinion, FAA should report the number of CPCs *and* the number of controllers in training separately for each location. Differentiating those figures by location could provide Congress and the Secretary with critical data on the current composition of the controller workforce and provide a benchmark for year-to-year comparisons.

FAA did not agree with our recommendation. In its response to our draft report, FAA stated that it does not believe that an annual snapshot of this information accurately portrays the changing controller workforce and that the information would be of little use to readers of its Controller Workforce Plan.

We strongly believe that periodic comparisons of the controller workforce provide critical data points for Congress, the Secretary, and other stakeholders who must help ensure FAA has enough certified controllers to safely operate the National Airspace

System. This is particularly important given the length of time required for new controllers to become CPCs. Training new controllers to the CPC level is important because only CPCs are qualified to control traffic at all positions of their assigned area and only CPCs can become OJT instructors for other new controllers. Having enough OJT instructors at all locations is a vital part of FAA's plan to hire and train 17,000 new controllers through 2017. In our report, we requested that FAA reconsider its position on this recommendation.

FAA MUST ADDRESS HUMAN FACTORS ISSUES AS PART OF NEW CONTROLLERS' TRAINING

Addressing controller human factors issues, such as fatigue and situational awareness, is important for maintaining safe operations of the National Airspace System. In its investigation of Comair flight 5191, the NTSB expressed concerns that the lone controller on duty at the time of the accident had only slept about 2 hours before his shift (although he had 8 hours off between shifts). As a result of its investigation, the NTSB added controller fatigue to its "Most Wanted List" in 2007.

Training new controllers on human factor issues as well as technical aspects of air traffic control (such as airspace, phraseology, and procedures) will become increasingly important as FAA begins to address the large influx of new controllers.

In April 2003, we reported that almost 90 percent of controller operational errors (when a controller allows two aircraft to get too close together either on the runway or in the air) were due to human factors issues rather than procedural or equipment deficiencies. Therefore, it was important that FAA develop initiatives to prevent theses types of errors. In May 2007, we reported that FAA still needed to focus on controller human factors issues and training to reduce the risk of runway incursions cause by controller operational errors. We found, however, that FAA had made little progress in this area. Since our report, FAA has made some progress toward human factors initiatives, particularly with NATPRO and tower simulators.

NATPRO: The National Air Traffic Professionalism Program is a human factors initiative that we reviewed in 2003. NATPRO training is designed to sharpen and maintain controllers' mental skills most closely associated with visual attention and scanning. Participants thus gain insight into how performance can be influenced by certain factors (e.g., by distraction, fatigue, and boredom) and how those factors increase the opportunity for operational errors.

FAA tested the program in FY 2003 and began providing this training at its en route centers; it will begin using NATPRO at its large TRACON facilities in FY 2008.

FAA has not, however, implemented NATPRO at towers where visual attention and scanning are key factors in preventing runway incursions. During our 2007 audit,

tower facility managers we spoke with expressed an interest in this training, but FAA had not established milestone dates for implementing NATPRO at those facilities. Since our report, FAA has provided NATPRO cadre training to representatives from 42 facilities so they can use NATPRO at their facilities. Tower facilities are required to start NATPRO training in FY 2009.

Tower Simulators: To its credit, FAA has successfully implemented an important initiative—increasing the use of training simulators at towers. Tower simulators were recently installed at four towers—Chicago O'Hare, Miami, Ontario, and Phoenix. The simulators are programmed with scenarios and occurrences exclusive to those airports, using actual aircraft with their respective call signs.

By using simulators, controllers gain inherent knowledge of a particular airport, its airspace, and application of air traffic procedures for that specific location. The simulators also have a function that writes software for additional airports; this allows controllers from surrounding facilities to utilize the simulators as well.

Figure 2. Picture of a Tower Cab Simulator

Source: FAA

Tower simulators have proven effective in training new controllers and providing proficiency training for experienced controllers. For example, at Philadelphia, we found that 70 percent (14 of the 20) runway incursions caused by controllers over a 4-year period occurred when an infrequently used runway configuration was in use. We found that this particular configuration was used only 30 percent of the time at Philadelphia. Therefore, it was difficult for controllers to maintain their proficiency on that particular configuration. According to Air Traffic officials, proficiency training using a simulator has a high potential for eliminating such errors.

The NASA Ames Research Center conducted an evaluation and found that it took 60 percent fewer days for developmental controllers to complete ground control training at the Miami tower. At Chicago O'Hare, NASA reported that it took developmental controllers 42 percent fewer days to complete ground control training.

Simulators can also be used to model changes in airport configurations and procedures. For example, Boston Logan used a tower simulator to help establish necessary safety procedures in conjunction with the use of a newly constructed runway. Likewise, NASA used a tower simulator to study several alternatives for improving runway safety at Los Angeles International Airport and to evaluate the effectiveness of adding a center-field taxiway between its parallel runways. FAA plans to install 12 additional simulators this year (6 at large airports and 6 at the FAA Academy) and 12 at other airports next year. FAA must ensure that this effort remains on track to capitalize on the significant success that this type of training has demonstrated.

Crew Resource Management (CRM): Another tool with a high potential for improving performance is CRM training. This training focuses on teamwork in the tower with an emphasis on operations. Therefore, it has the potential to reduce runway incursions through improved team performance. This initiative was originally included in FAA's 2000 National Plan for Runway Safety; yet, only three facilities have completed this training through FY 2006.

At Philadelphia, which is one of the three air traffic control towers to complete this training nationwide in FY 2006, CRM training was used to reduce runway incursions. The CRM training at Philadelphia was site-specific and geared toward open discussions that would improve teamwork, improve individual performance, and manage operational errors. According to managers at Philadelphia, CRM was extremely effective at improving overall team performance and a contributing factor in reducing controller errors. FAA needs to keep this valuable training on target. In FY 2007, nine additional tower facilities completed CRM training. FAA plans to complete CRM at 11 towers in FY 2008.

Ongoing Congressionally Requested Work Related to Controller Human Factors Issues

In response to congressional requests, we are conducting several reviews related to controller human factors issues such as controller training failures and controller fatigue factors.

Controller Training Failures: At the request of Chairman Costello, we are reviewing the rate and root causes of controller training failures (developmental controllers who fail training either at the FAA Academy or at their assigned facility). FAA reports that the overall training failure rate for FY 2007 was about 10 percent of all trainees. It is important to recognize, however, that training new controller generally takes between 2 to 3 years, and FAA did not begin increasing its hiring efforts until 2005. As a result, most newly hired controllers would likely still be in the early training phases.

At this early stage of our review, we have concerns regarding the accuracy of the database FAA uses to compile its training failure rate. For example, four of the seven facilities we have visited so far had different failure rates than those included in FAA's database. Further, we found that some facilities had failed to enter data into the national database altogether; as a result, none of their training failures were included in the national rate compiled by FAA.

Our work on this audit is ongoing, and we are reviewing possible common causes of training failures. These could include the complexity of the facility, the stage in training where the new controller failed, and the hiring source of the new controller. We plan to issue our final results later this year.

We have also reported other opportunities for FAA to reduce the time and costs associated with training new controllers. For example, in 2005, we reported[9] that FAA could reduce new controller training time and costs and improve the caliber of candidates by identifying specific coursework conducted at the FAA Academy that could be discontinued as part of Government-provided training and made a prerequisite to employment as an FAA controller.

For example, a portion of initial qualification training at the Academy includes classroom instruction on general aviation topics, such as the dissemination of weather information, traffic separation, and visual operations. Those topics are also provided as part of existing aviation programs at colleges and universities.

If those general courses were a prerequisite to employment as an FAA air traffic controller, the Academy could concentrate its resources on providing training that focuses more on FAA-specific operations and equipment. This change would ensure that new controllers begin work with a solid background in general aviation principles and still receive standardized training on FAA procedures so that they are sufficiently prepared to start OJT at their assigned facility. We estimated FAA could save between $16.8 million and $21.3 million by changing educational prerequisites for new controller prerequisites.

We recommended that FAA identify specific coursework conducted at the FAA Academy and determine if those courses could be made a prerequisite to employment as an air traffic controller. We also recommended that FAA include its results in the next update to FAA's Controller Workforce Plan. FAA has not yet addressed our recommendations.

[9] OIG Report Number AV-2006-021, "FAA Has Opportunities To Reduce Academy Training Time and Costs by Increasing Educational Requirements for Newly Hired Air Traffic Controllers," December 7, 2005.

Controller Fatigue Factors: At the request of Senator Durbin of Illinois, we are reviewing factors that could affect controller fatigue. We are focusing our efforts at Chicago O'Hare Tower, Chicago TRACON, and Chicago Center but may review other locations and FAA's national efforts based on the results of our work at Chicago.

So far, in our discussions with managers, union representatives, and staff, we have identified several factors that could contribute to controller fatigue. These include scheduling practices with minimal time between shifts, conducting OJT, working a 6-day weeks, and working an operational position for extended periods of time. We are working to determine (1) the extent to which these factors are occurring and (2) what efforts FAA is taking to address them. We plan to issue our results later this year.

FAA MUST ENSURE CONSISTENCY AND ACCURACY IN REPORTING AND ADDRESSING CONTROLLER OPERATIONAL ERRORS

As FAA transitions to a new and relatively inexperienced controller workforce, it must investigate, mitigate, and accurately report operational errors. Operational errors occur when controllers fail to maintain adequate separation between aircraft. In FY 2007, there were 1,393 operational errors, up slightly from 1,338 in FY 2006. Forty-three of these were categorized as serious, which is the equivalent of about 1 serious operational error every 8 days.

In 2004, we reported that FAA relied on an inaccurate self-reporting system to track operational errors. FAA must obtain accurate reports of operational errors to identify trends and prevent recurrences. Yet, we found that only 20 of FAA's more than 300 air traffic control facilities had an automated system to identify operational errors. We made a series of recommendations to FAA to ensure that operational errors were accurately reported and investigated.

In response, FAA took action in 2005 and began requiring management at towers and TRACONs to conduct random audits of radar data to identify potential unreported operational errors. More importantly, FAA is developing an automated system—the Traffic Analysis and Review Program, or TARP—to identify when operational errors occur at TRACON facilities. FAA started fielding this system in FY 2008 with an estimated completion date by the end of calendar year 2009.

FAA must keep this technology on track as it hires and trains 17,000 new controllers. We continue to receive allegations that operational errors are going unreported or in some cases intentionally misclassified. For example, in two separate investigations requested by the Office of Special Counsel, we found that operational errors were intentionally under-reported at the Dallas/Fort Worth TRACON.

In 2004, we found that operational errors were being systematically ignored (i.e., suspected events were not investigated) as a result of local management policies that appeared to be designed to deflate their numbers. In 2007, we initiated a second investigation at the Dallas TRACON and found 62 operational errors and deviations that had been intentionally misclassified as pilot errors or "non-events."

In April 2008, we issued our investigative report to FAA and made eight recommendations, which included (1) taking appropriate administrative actions against employees involved in the misclassification of operational errors; (2) conducting on-site, no-notice reviews of the facility by an entity outside of the Air Traffic Organization; and (3) expediting the early deployment of TARP at the facility. FAA agreed with our recommendations and began appropriate actions to address them.

In response to the reporting problems identified at the Dallas TRACON, Chairman Oberstar and Chairman Costello requested that we review the accuracy and consistency of operational error reporting at other Air Traffic facilities across the Nation. Our preliminary results indicate that the incidents we found at the Dallas TRACON involving intentionally misclassified operational errors are not systemic. We have, however, identified other ways that operational errors could be intentionally misclassified that FAA will need to prevent by improving its controls over the operational error investigation and classification process. We will report our results later this year.

FAA has recently announced plans to implement ATSAP, a program designed to foster a voluntary, cooperative, non-punitive environment for the open reporting of safety concerns. ATSAP is modeled after similar programs used by FAA and airlines. Under ATSAP, controllers can report previously unreported events involving the loss of separation between aircraft without fear of reprisal. In theory, all parties would then have access to safety information that might otherwise be unobtainable in order to develop corrective actions to resolve safety issues.

FAA must carefully ensure, however, that these programs are used to enhance safety and protect them from potential misuse. Our work on a similar program, which grants immunity to pilots who report runway incursions, found that safety information was either inaccessible or not used to resolve the cause of the reported safety issue.

We also found serious lapses in FAA's and Southwest Airlines' use of a partnership program that permitted voluntary disclosure of maintenance issues. Specifically, when the carrier disclosed maintenance shortfalls, FAA did not require appropriate corrective actions. In this instance, FAA allowed aircraft that had missed critical fuselage inspection dates to continue flying without requiring them to undergo immediate inspections. FAA must ensure that similar issues do not occur with ATSAP.

FAA has also modified its severity rating system for operational errors to make the ratings more reflective of potential collisions. The new rating system is based solely on the proximity of the two aircraft. FAA believes this will provide a better means for measuring the risk of a collision from an operational error so it can focus on the most serious incidents. FAA must remain committed to finding the causes, applying remedies, and taking appropriate action for all operational errors to identify trends and prevent recurrences.

That completes my statement, Mr. Chairman. I would be happy to address any questions you or other Members of the Subcommittee may have.

EXHIBIT. PRIOR OIG REPORTS ON FAA'S CONTROLLER WORKFORCE AND RELATED ISSUES

- "Review of Reported Near Mid-Air Collisions in the New York Metropolitan Airspace," April 24, 2008, OIG Report Number AV-2008-050.
- "Progress Has Been Made in Reducing Runway Incursions, but Recent Incidents Underscore the Need for Further Proactive Efforts," May 24, 2007, OIG Report Number AV-2007-050.
- "Review of Staffing at FAA's Combined Radar Approach Control and Tower with Radar Facilities," March 16, 2007, OIG Report Number AV-2007-038.
- "FAA Continues To Make Progress in Implementing Its Controller Workforce Plan, but Further Efforts Are Needed in Several Key Areas," February 9, 2007, OIG Report Number AV-2007-032.
- "Report on the Air Traffic Organization's Management Controls Over Credit Hours," June 21, 2006, OIG Report Number AV-2006-050.
- "FAA Has Opportunities To Reduce Academy Training Time and Costs by Increasing Educational Requirements for Newly Hired Air Traffic Controllers," December 7, 2005, OIG Report Number AV-2006-021.
- "Controller Staffing: Observations on FAA's 10-Year Strategy for the Air Traffic Controller Workforce," May 26, 2005, OIG Report Number AV-2005-060.
- "Observations on FAA's Controller-Pilot Data Link Communications Program," September 30, 2004, OIG Report Number AV-2004-101.
- "Audit of Controls Over the Reporting of Operational Errors," September 20, 2004, OIG Report Number AV-2004-085.
- "Opportunities To Improve FAA's Process for Placing and Training Air Traffic Controllers in Light of Pending Retirements," June 2, 2004, OIG Report Number AV-2004-060.
- "Operational Errors and Runway Incursions," April 3, 2003, OIG Report Number AV-2003-040.
- "Despite Significant Management Focus, Further Actions Are Needed To Reduce Runway Incursions," June 26, 2001, OIG Report Number AV-2001-066.
- "Actions To Reduce Operational Errors and Deviations Have Not Been Effective," December 15, 2000, OIG Report Number AV-2001-011.
- "Follow-Up Review of FAA's Runway Safety Program," July 21, 1999, OIG Report Number AV-1999-114.
- "Runway Incursion Program," February 9, 1998, OIG Report Number AV-1998-075.

The complete text of the above reports can be found at http://www.oig.dot.gov.