

**FAA MUST IMPROVE ITS CONTROLLER
TRAINING METRICS TO HELP IDENTIFY
PROGRAM NEEDS**

Federal Aviation Administration

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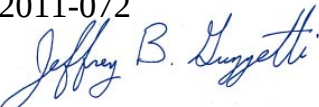
U.S. Department of
Transportation

Office of the Secretary
of Transportation
Office of Inspector General

Memorandum

Subject: **INFORMATION:** FAA Must Improve Its
Controller Training Metrics To Help Identify
Program Needs
Federal Aviation Administration
Report Number AV-2011-072

Date: March 30, 2011

From: Jeffrey B. Guzzetti 
Assistant Inspector General
for Aviation and Special Program Audits

Reply to
Attn. of: JA-10

To: Federal Aviation Administrator

The Federal Aviation Administration (FAA) plans to hire and train nearly 11,000 new air traffic controllers through fiscal year (FY) 2019 to replace the large numbers of those now retiring. As FAA begins training this influx of new hires, it must have accurate metrics on their training progress to ensure that key air traffic control facilities have enough controllers for safe and efficient operations. In 2009, at the request of Representative Jerry F. Costello, then Chairman of the House Subcommittee on Aviation, we reviewed training failures among newly hired air traffic controllers.¹ During that review, we found that FAA's reported training failure rate was not accurate and that FAA's primary source of training failure data, the National Training Database (NTD),² contained outdated and inaccurate data. Both are critical metrics for managing this important program.

This review follows up on our 2009 audit. Our audit objectives were to (1) evaluate FAA's actions to improve its system for tracking the training progress of newly hired controllers and (2) review FAA's metrics for measuring and reporting the effectiveness of its controller training program. As a part of the evaluation, we examined FAA's methodology for calculating the training attrition and completion rates of developmental (new) controllers. We conducted this

¹ OIG Report Number AV-2009-059, "Training Failures Among Newly Hired Air Traffic Controllers," June 8, 2009. OIG reports are available on our website: www.oig.dot.gov.

² The NTD is FAA's primary tool for national oversight of the controller training program. FAA uses the NTD to track the progress of developmental controllers at air traffic facilities. Originally designed to track the training time for developmental controllers, the database was expanded to capture data relating to the various categories of training attrition, including training failures.

review between November 2009 and January 2011 in accordance with government auditing standards prescribed by the Comptroller General of the United States. Exhibit A details our scope and methodology.

RESULTS IN BRIEF

FAA has improved its tracking process for new controller training over the last year. The Agency has taken a number of corrective actions to address the problems we identified in 2009 that contributed to an inaccurate training failure rate reported for newly hired controllers. These actions include establishing a new Quality Assurance Group in March 2010 to oversee NTD data collection, separately tracking new hires and veteran controllers, distinguishing between training failures and other types of attrition in the NTD, and issuing guidance to enforce data accuracy. While these actions are positive steps towards improving how it tracks the training progress of newly hired controllers, FAA continues to face challenges in identifying training program needs and measuring the overall success of the training program.

FAA's metrics for measuring the effectiveness of the controller training program do not provide a complete picture because they include controllers who have not completed their initial training. For example, if there are 100 controllers in the training program and 9 of those controllers fail or leave, FAA reports an attrition rate of 9 percent. This produces unrealistic results because some of the remaining 91 in-progress controllers may also leave the program at a later time. Eventually, all controllers in training will either be certified or leave the program, but because FAA includes all in-progress controllers in its attrition rate, it dilutes the program's actual loss and completion rates. As a result, FAA cannot rely on these data to make appropriate and timely adjustments to the program. When we assessed the number of controllers who successfully completed training against those who did not, we found a significantly higher attrition rate of 21 percent for newly hired controllers. This presents a very different picture of success compared to the 9-percent attrition rate reported by FAA for FY 2009.

Accurate training data are necessary so that FAA can adequately prepare new hires to replace retiring veteran controllers, assign new hires to the appropriate level and type of facility, and adjust its training program when warranted. Our recommendation focuses on steps FAA should take to measure and present a more complete picture of the effectiveness of its air traffic controller training program.

BACKGROUND

New air traffic controllers must complete an arduous training program that includes learning the basic concepts of air traffic control at the FAA Academy, followed by extensive facility training at their assigned location. Those controllers

who are unable to pass the training process are either (1) transferred within their assigned facilities to a new area of operation, (2) transferred to a less complex facility to begin the training process again, or (3) terminated from employment with FAA. While certification times for individual controllers may vary, FAA's goal is to have terminal candidates—who manage air traffic in the vicinity of airports—complete the training process in 2 years, and en route candidates—who manage high-altitude traffic—in 3 years.

FAA HAS IMPROVED ITS TRACKING PROCESS FOR NEW CONTROLLER TRAINING OVER THE LAST YEAR

FAA has taken a number of actions in response to our June 2009 report to improve its tracking process for newly hired controllers in training. For example, we recommended that FAA develop a process for conducting periodic reviews to ensure that air traffic facilities complied with NTD data entry requirements and identify factors that could indicate trends or causes of training failures. In March 2010, the Technical Training Organization³ established the Quality Assurance and Reporting Group to conduct periodic reviews of NTD data collection. The group is also responsible for maintaining complete records on all aspects of new controller training, including the dedicated tracking of newly hired and veteran controllers' training progress. This was a good step toward improving the accuracy and oversight of training data within the NTD.

We also recommended that FAA develop a comprehensive definition of “training failure” and other types of training attrition and consistently apply these definitions at the 316 air traffic facilities and FAA Headquarters. This is important because we found FAA's classification process for training attrition—either due to failure or facility transfer—was too subjective. Individual managers exercised wide leeway in how they classified attrition, often citing reasons other than training failure for an employee's transfer or termination. This made it impossible to ensure that the data facility training managers entered in the NTD accurately reflected why new controllers did not successfully complete their training. FAA's actions to address this recommendation included:

- adding a new table of definitions to the NTD that distinguish between training failures and other types of training attrition and
- issuing a memorandum in March 2010 to FAA's Vice Presidents of both Terminal and En Route and Oceanic Services requesting that NTD entries be kept up to date (updated every 14 days) and more reliable (by using the NTD's data error checker).

³ FAA Air Traffic Organization, Technical Training has oversight of the air traffic controller training program.

FAA's actions were sufficient for us to close the recommendations from our prior report. However, FAA must now ensure that the training managers at Headquarters and all air traffic control facilities consistently implement these actions to ensure they accurately report new controller training data.

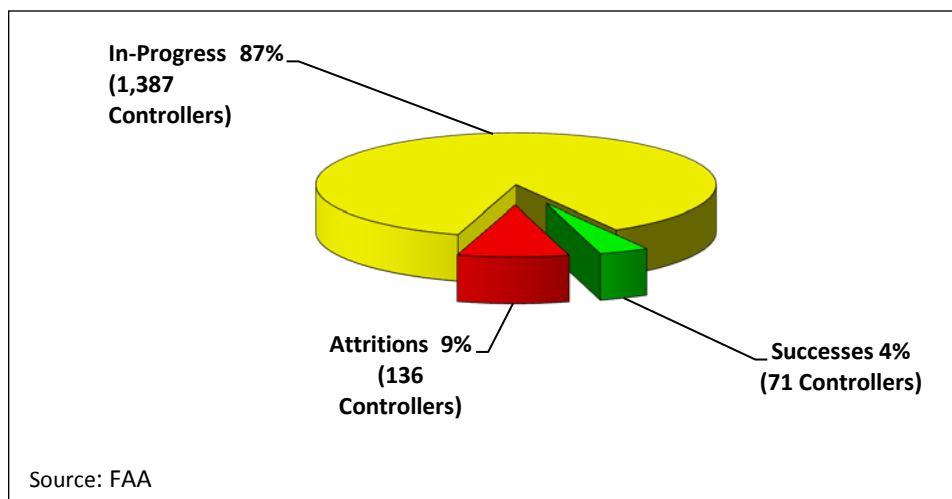
FAA'S METRICS FOR MEASURING EFFECTIVENESS DO NOT PROVIDE A COMPLETE PICTURE OF THE CONTROLLER TRAINING PROGRAM

While FAA has improved its tracking process, the current metrics for measuring the effectiveness of its controller training program do not provide a complete picture of program success because they include controllers who have not completed their initial training. As a result, FAA is not reporting an attrition rate that it can rely on to make warranted adjustments to the training program. During our review, we used alternate metrics that focused on the annual output of the training program. These showed a significantly higher FY 2009 attrition rate for new controller training than what FAA reported.

FAA's Method Understates Actual Controller Attrition

FAA measures the effectiveness of its controller training program by calculating the percentage of training attrition for the fiscal year in which the new controllers start their initial training. For example, according to FAA, as of March 2010, the attrition rate for new controllers who started their initial training in FY 2009, or the "Class Hired in FY 2009," was 9 percent, as depicted in figure 1 below.

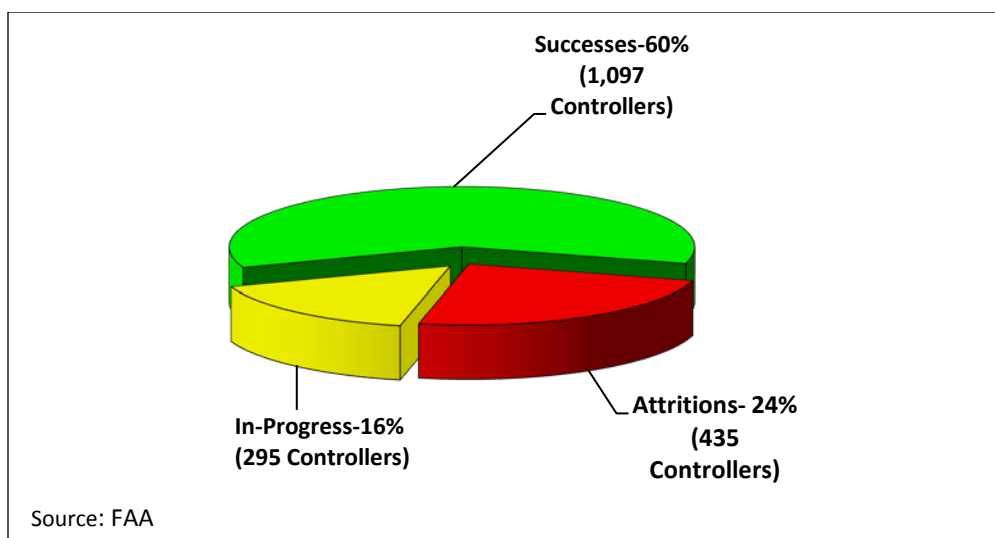
Figure 1. FAA's New Controller Training Data for "Class Hired in FY 2009"



However, figure 1 also shows that the success rate was only 4 percent while 87 percent of the controllers were still completing their initial training, which can take 2 to 3 years. While FAA's metrics show a lower reported attrition rate for new controllers, this methodology will not give a complete picture of the effectiveness of the training program until all 1,387 new, in-progress controllers complete their initial training. For the 9-percent attrition rate to be realized, FAA is assuming that all of these controllers will succeed. This is an unrealistic assumption given that, historically, it is not uncommon for newly hired controllers to leave after more than 2 years in training.

As more new hires complete their initial training, the attrition rate has historically increased. For example, we examined FAA's attrition data for all new controllers hired in FY 2007. In December 2007, FAA reported that the attrition rate for those new controllers was approximately 7 percent. In March 2010, more than 2 years later, FAA reported the attrition rate for the same "Class Hired in FY 2007" controllers was 24 percent (see figure 2). By including in-progress controllers in the training output metrics, FAA is diluting the attrition and completion rates until most of the controllers have completed training. However, waiting 2 years for most controllers to complete the training would not allow FAA to make adjustments to the program to boost controller training success.

Figure 2. FAA's New Controller Training Data for "Class Hired in FY 2007" as of March 2010

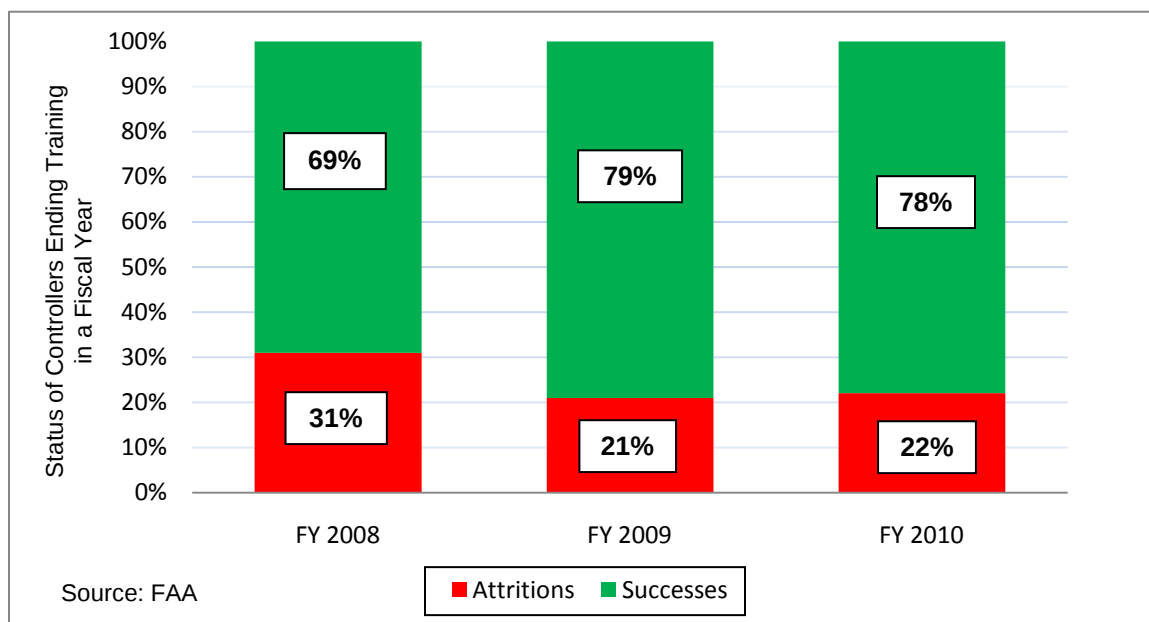


Our analysis shows that a better metric for measuring the effectiveness of the training program would be to focus on how many controllers complete their training or leave the program during a given period of time, regardless of when they were hired. We used this metric during our review and found that it gives a more complete picture of the training program results because it captures the actual success of the program over an extended period of time and eliminates the

uncertainty of in-progress controllers. Officials from Raytheon who manage the controller training program and our senior statistician also concur that this is a more realistic and comprehensive method for measuring the effectiveness of new controller training and that it is misleading to include in-progress controllers in the attrition rate calculations.

Using this approach, we analyzed the success rate of all new controllers who completed their initial training over the past 3 years, regardless of when they began their training. We grouped the controllers by the fiscal year they ended training and then identified whether they ended the training successfully or unsuccessfully. Our analysis showed that the attrition rate for the controllers who ended their initial training in FY 2009 was 21 percent, and their success rate was 79 percent (see figure 3 below). These metrics show an attrition rate more than double the 9-percent FY 2009 attrition rate reported by FAA and are comparable to the attrition rates for FY 2008 and FY 2010, which were 31 percent and 22 percent, respectively. By excluding in-progress controllers, our rate reflects the actual percentage of controllers who have been certified or left the training program. These attrition rates are a more complete and accurate measure of the effectiveness of the controller training program because they will not change as more controllers complete their training. After we discussed our results with FAA program officials, they began calculating completion and attrition rates without in-progress controllers in addition to their current calculations.

**Figure 3. OIG Analysis of FAA's Training Data
(FY 2008 - November 2009)**



CONCLUSION

The safety of the National Airspace System relies on having a fully staffed, well-trained air traffic controller workforce. To maintain the controller workforce in light of recent increases in controller retirements, FAA faces tremendous challenges in executing its plans to train nearly 11,000 new controllers over the next 10 years. Having accurate metrics to measure and report on the effectiveness of its controller training program should be a critical component of that plan. However, FAA's current metrics do not portray an accurate picture of the program's success. If the actual number of new controllers who do not complete initial training is greater than FAA anticipates, the Agency runs the risk of not maintaining a sufficient number of fully trained controllers at some of the most complex air traffic control facilities in the National Airspace System.

RECOMMENDATION

To help identify controller training program needs and provide a more accurate picture of its training program success, FAA needs to modify its training metrics by removing controllers still in training from its attrition and completion calculations. Specifically, we recommend that FAA replace its current training metrics with metrics that focus on how many controllers complete their training or leave the program during a given period of time.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We provided FAA with our draft report on February 25, 2011, and received its response on March 17, 2011. FAA concurred with our recommendation and has taken acceptable corrective actions. FAA's entire response is included at the appendix to this report.

ACTIONS REQUIRED

In accordance with Department of Transportation Order 8000.1C, we are closing the recommendation. We appreciate the courtesies and cooperation of FAA representatives during this audit. If you have any questions concerning this report, please contact me at (202) 366-0500 or Bob Romich, Program Director, at (202) 366-6478.

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cc: Anthony Williams, AAE-001
Martin Gertel, M-100

EXHIBIT A. SCOPE AND METHODOLOGY

We conducted this performance audit from November 2009 to January 2011 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained during this audit provides a reasonable basis for our findings and conclusions, based on our audit objectives. The following scope and methodology were used in conducting this review. During this audit we visited FAA Headquarters.

To evaluate the actions taken by FAA to improve the tracking of the training progress of newly hired controllers, we evaluated the current accuracy of the data contained in FAA's National Training Database (NTD). We compared the total number of new controllers in training for FY 2009 that was recorded in the NTD against the same population contained in the Federal Personnel Payroll System (FPPS). Additionally, we interviewed FAA personnel from the Office of Technical Training and Development to determine the extent of FAA's compliance with the recommendations in our June 2009 audit report, "Training Failures Among Newly Hired Air Traffic Controllers."

Finally, we evaluated FAA's methodology for calculating controller training metrics. We conducted interviews with managers from the Office of Technical Training and Development to discuss the accuracy and validity of FAA's controller training attrition rate, as an indicator of the effectiveness of the new controller training program. We also developed an alternative metrics calculation (calculated by dividing unsuccessful controllers by all completions which means we do not include new controllers whose completion status is still pending) and presented both methodologies to the OIG statistician for an analysis of the statistical validity of both metrics calculations.

EXHIBIT B. MAJOR CONTRIBUTORS TO THIS REPORT

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Daniel Raville	Program Director
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APPENDIX. AGENCY COMMENTS



Federal Aviation Administration

Memorandum

Date: March 17, 2011

To: Jeffery B. Guzzetti, Assistant Inspector General for Aviation and Special Program Audits

From: Clay Foushee, Director, Audit and Evaluations, AAE-1

Subject: OIG Draft Report: FAA Must Improve Its Controller Training Metrics To Help Identify Program Needs

The FAA has successfully produced new controllers at the volume and speed described in the Controller Workforce Plan and has replaced about 25 percent of the workforce with a new generation of fully qualified controllers while maintaining high standards for certification. To help gauge if controllers are certifying at the right place and at the right time, FAA focused on developing solid and representative metrics. We continue to improve the processes for tracking and measuring training effectiveness to help ensure that facilities across the nation will have enough qualified controllers for the safe and efficient operation of the most complex airspace system in the world.

In 2010, the Office of Technical Training established a new Quality Assurance and Reporting group to oversee training metrics and evaluate how well both individual and organizational competency developed for the technical workforce, with a focus on cost, performance and people. We aggressively pursued data to establish and maintain measurable and meaningful metrics to assess performance. As a result, there are now nearly 70 reportable indicators to evaluate training performance for FAA's technical workforce. Forty of these measurements provide the agency with specific feedback on controller training.

In order to provide a comprehensive indicator of training effectiveness, FAA uses multiple metrics. In addition to the indicators detailed in the OIG report, FAA also measures the number of Certified Professional Controller (CPC) completions, the number of controller developmentals in training, the number of controller developmentals who complete various stages of training, the time to CPC certification, the on-time CPC completion rate and average on-the-job training hours. The combination of these indicators provides a more holistic perspective of controller training effectiveness than any single metric.

In addition to monthly metrics used by the training organization, there are Quarterly Business Review discussions with leadership from other air traffic control service units, such as En Route

and Terminal, to share the latest performance indicators. These reviews focus on strategies to improve the agency's training effectiveness and how the training organization can better support air traffic technical training needs. These interactions with the service organizations have been helpful in identifying the potential for FAA to continue to improve its methods for measuring training effectiveness during the hiring surge.

The following is provided in response to the OIG's recommendation:

OIG Recommendation: To help identify controller training program needs and provide a more accurate picture of its training program success, FAA needs to modify its training metrics by removing controllers still in training from its attrition and completion calculations. Specifically, we recommend that FAA replace its current training metrics with metrics that focus on how many controllers complete their training or leave the program during a given period of time.

FAA Response: Concur. The FAA needs to provide an accurate assessment of its training program success, which FAA has implemented with the combination of metrics described above. FAA recognizes the potential to further improve these metrics, and agrees that the standard recommended by the OIG report provides a useful addition to its suite of training effectiveness metrics. Prior to the issuance of this response, FAA incorporated this "Air Traffic Facility Unsuccessful Completion Rate (at completion)" indicator into the metrics program. However, measures that include controllers still in training in our attrition rates serve specific workforce planning projection and hiring purposes, and will continue to be generated as part of FAA's comprehensive suite of metrics.

The FAA currently tracks training attrition over longer time periods in order to discern both short- and long-term trends. Monitoring attrition by the fiscal year in which training began is a valid indicator that provides feedback on each fiscal-year class, but useful data is also generated by following this metric through until everyone hired in a given year completes training successfully or fails. Until then, we include those controllers still in training, but monitor the attrition rates over a 12-month time period to more accurately assess trends. We also expand this metric to assess training progress over a 24-month period to assess both completions and attrition on a biannual basis to help us determine if current hiring is sufficient to maintain adequate controller staffing levels.

We go even further and use hiring, staffing and training effectiveness data to measure longer term projections in controller staffing. These indicators provide high value in our overall training metrics suite, which are used to convey a complete picture of the overall controller training program effectiveness. The FAA intends to continue to use each of these metrics, along with the metric recommended by OIG to measure both workforce planning and training effectiveness. Actions pursuant to this recommendation are considered complete.