Review and Evaluation of Air Traffic Controller Training at the FAA Academy

Findings and Recommendation Report in Response to Section 609(b) of the FAA Modernization and Reform Act of 2012

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Acknowledgement

The Study Team acknowledges the valuable input and assistance provided by the FAA Academy leadership and other Academy (AMA), Safety and Technical Training (AJI), and Management Services (AJG) personnel for accommodating the interview team. We also thank them for their contributions to this study through participation in planning and coordination activities, interviews and review of the draft report.

In addition, the Study Team greatly appreciates the support provided by members of the FAA AMA, AJI and AJG organizations in gathering data and documentation, and in helping the team access FAA personnel for interviews.

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Executive Summary

Public Law 112–95, cited as the "FAA Modernization and Reform Act of 2012" was enacted to amend Title 49, United States Code, to authorize appropriations for the Federal Aviation Administration (FAA) for fiscal years 2011 through 2014 to streamline programs, create efficiencies, reduce waste, improve aviation safety and capacity, provide stable funding for the national aviation system and for other purposes.

Under Section 609(b) of this Act, the FAA is required to conduct a study that focuses on the training program for developmental Air Traffic Controllers (ATCs).

The following report specifically addresses the review of the FAA's training called for under Section 609(b) of the Reauthorization Act. This study, conducted in September 2012, consists of a review and evaluation of Academy training. It is the first of two studies under section 609(b). The second, the review and evaluation of FAA facility training, will commence in January 2013 and will be included in a separate report.

This Executive Summary provides an overview of the study background and the approach used to conduct the analysis and presents the study findings and the recommendations developed by the Study Team. Most of the documentation and data collected provided by the Academy for this study are qualitative not quantitative in nature, therefore the findings reflected in this study are primarily qualitative.

Study Background and Approach

According to the Academy, the Air Traffic Division (AMA-500) delivers initial, advanced and specialized air traffic training. The division:

- Supports the FAA's safety mission through training as required by the FAA.
- Delivers supervisory/managerial and technical training to meet Air Traffic Organization (ATO) requirements.
- Administers examinations, as required.
- Provides support for Air Traffic Technical Training to meet ATO requirements.
- Supports the Airports and International Training Division by providing resources as appropriate.

The intent of this study is to present observations from the October 2012 review and evaluation of training of developmental ATCs at the FAA Academy and associated recommendations for improving AMA-500 ATC training.

For purposes of this study, developmental ATCs are defined as new air traffic controllers hired by the FAA for initial training at the FAA Academy. After initial training, developmental ATCs then continue on to FAA facilities for additional training and eventual certification as Certified Professional Controllers (CPC). Classification as "developmental" begins upon hire and lasts until the developmental obtains a CPC designation.

The considerations outlined in section 609(b) of the Act formed the basis for designing an approach to help evaluate three key areas of AMA-500 training:

1) **Roles and responsibilities**: who is accountable and responsible for oversight, processes and tasks for training under AMA-500 and who is consulted from not only an authoritative chain of command, but also from a tactical and subject matter expert perspective;

2) **Communication of roles and responsibilities**: how are roles and responsibilities and processes for training under AMA-500 are communicated, both formally and informally, and how are they documented and shared; and

3) **Accommodation of developmental ATCs**: how many developmental ATCs can the Academy accommodate in a given year and what is the relationship of the number of instructors, classrooms and simulators available and training requirements to the number of developmental ATCs that the Academy can accommodate.

Figure i shows the high-level approach to this study.

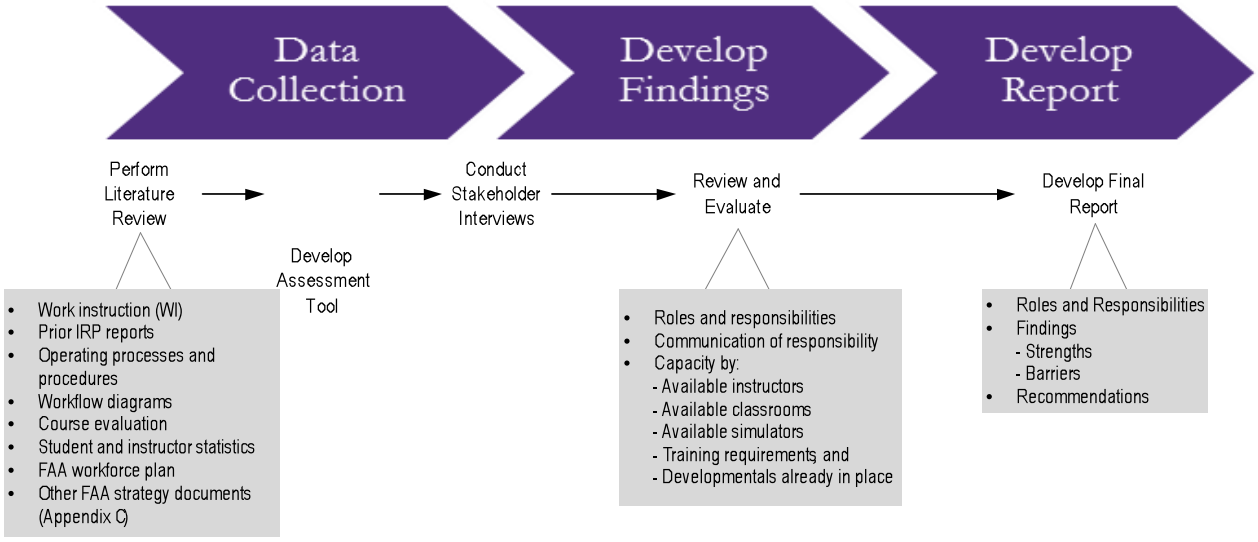

Figure i. Study Approach

Data Collection. Data collection includes both qualitative and quantitative data provided by the Academy prior to the on-site visit as well as interviews conducted during the visit to the Academy. At the start of the study, the Study Team reviewed a series of documents provided by FAA Headquarters (HQ) and the Academy including Academy Common Operating Procedures (COP) and Work Instructions (WI) around training, the Air Traffic Controller Workforce Plan (Controller Workforce Plan), results of recent Office of the Inspector General (OIG) and Independent Review Panel (IRP) studies and other relevant documentation that set the stage for the training study.

To aid in the collection of data, the Study Team developed a series of assessment questions and provided the questions to the Academy two weeks prior to the site visit. Based on the subject matter covered by the questions, the Academy and AJI's leadership recommended who should be included in interview sessions. The Study Team conducted 21 interviews during the period of October 23 – October 31, 2012 including ten AMA, eight AJI and three AJG personnel.

Develop Findings. To generate findings, the Study Team relied on documents provided by FAA HQ and the Academy as well as notes taken during on-site interviews. Initial findings were shared with the AMA and AJI personnel working on-site at the Academy through an outbrief meeting and the draft report.

Develop Report. After sharing their initial findings, the Study Team used an iterative approach to developing this report. The iterative approach included multiple drafts, collection and incorporation of comments, then development and submission of this final report.

While the Reauthorization Act language calls out roles and responsibilities "at the national level," FAA directed the Study Team to focus this study on roles and responsibilities for training at the Academy; therefore, the responses noted in this report, as well as findings and recommendations within, reflect the current Academy environment, specifically AMA-500. Regardless of the path of entry (i.e., prior experience, Air Traffic Collegiate Training Initiative (AT-CTI), general public), each developmental ATC spends time at the Academy and receives some type of training. Because the Academy is the first point of entry, the Academy is a natural starting point for reviewing and evaluating developmental ATC training. FAA facilities represent the second stage of training for developmental ATCs and will become part of a separate study. Together, the Academy study and the facilities study will roll-up to a national view whereby providing a review and evaluation of developmental ATC training at the national level.

Stakeholders

Table i shows a list of stakeholders and each stakeholder's functional role as it pertains to training developmental ATCs.

Table i. Stakeholders and Functional Roles

Air Traffic Organization (ATO): Holds responsibility for moving air traffic safely and efficiently; works with commercial and private aviation stakeholders and the military; provides guidance and support to employees— the 35,000 controllers, technicians, engineers and support personnel whose daily efforts keep aircraft moving safely through the nation's skies; sets overall direction for ATC training including training requirements.
Office of Human Resource Management (AHR): Advises and assists the FAA Administrator in directing, coordinating, communicating and ensuring the adequacy of FAA plans, programs and initiatives associated with: employment, compensation, learning and development, human capital planning, measurement and evaluation, labor and employee relations; works with ATO to set annual quota for the number ATCs required across FAA including the number of developmental ATCs.
FAA Academy (AMA): Manages the FAA Academy and oversees delivery of all training at the Academy.
FAA Academy Quality Assurance (AMA-20): Audits policies, procedures, and processes with regard to training developmental ATCs; maintains the Academy KSN, which houses all current policies, procedures and processes with regard to delivery of training; secures and maintains accreditations, as appropriate.
FAA Academy – Air Traffic Division (AMA-500): Delivers ATC training according to ATO training requirements; works with AJI-215 and AJG to assign developmental ATCs to available training seats and develop ATC course schedules; oversees contract instructors and evaluates FAA instructor performance; evaluates developmental ATC classroom and lab performance and administers testing provides subject matter expert (SME) to AJI-2, as needed.
Management Services (AJG): Develops and disseminates developmental ATC temporary hire letters and tracks developmental ATCs through the onboarding process including all security and medical clearances; works with the AMA-500, AJI-215 and facilities to identify the appropriate training track for each developmental ATC.
Safety and Technical Training (AJI): Designs, develops, updates and maintains course curriculum to meet ATO training requirements including course content, assessment tests, and evaluations; responds to and approves (or declines) course content change requests; responds to requests for information about FAA training, finances and allocates resources to the academy for controller and technician training, as well as oversee the effectiveness and performance of the provision of training in accordance with approved curriculum; finances and allocates resources to the academy for controller and technician training as well as oversee the effectiveness and

performance of the provision of training in accordance with approved curriculum.

Academy Training Delivery Team (AJI-215): Provides instructional design expertise; supports updates to existing courses per errata sheets[1]; works with AMA-500 and AJG to assign developmental ATCs to training tracks; issues course reports documenting evaluations of courses; develops ATCs course schedule and fills ATC admission quota with support from AJG and AMA-500.

Summary of Findings

AMA-500 is just one part of the overarching process for training developmental ATCs. Admittance into the Academy is based on the number of ATCs needed by FAA in accordance with the current Controller Workforce Plan (plan is updated annually). The length of training in at the Academy depends on the type of course (e.g., En Route, Tower, Basics). Once developmental ATCs leave the Academy, they move to FAA facilities for additional training (average time is two to three years).

The sections below highlight key findings of the review and evaluation of Academy training. The Study Team divided findings into Roles and Responsibilities, Communication and Accommodation of Developmental ATCs. In each section, the Study Team highlights strengths then identifies some barriers uncovered during the document reviews and interviews. The Study Team chose the term "barriers" because our review did not find any major deficiencies. However, the Study Team noted that some findings did impede the Academy's ability to carry out roles and responsibilities effectively and efficiently as well as its ability to maintain or improve communication networks and processes associated with training developmental ATCs.

Roles and Responsibilities

When reviewing and evaluating roles and responsibilities for training, the Study Team specifically sought out documentation listing stakeholders--and roles and responsibilities for each stakeholder--as well as documented processes showing interaction of stakeholders, inputs and outputs to each process step and the currency of each process, WI or description.

The Academy has a number of processes in place to carry out roles and responsibilities. Based on documentation provided by Academy personnel and notes from interviews, the Study Team concluded that the Academy has a number of processes in place to carry out roles and responsibilities including, but not limited to:

[1] Errata sheets are a means of submitting requests to change course content. Errata changes are reviewed and approved by AJI-2 then pass to AJI-215 to make approved changes.

- Accepting hired developmental ATCs into the Academy to fill the ATC training quota.
- Developing course schedules to accommodate the number of ATCs accepted into the Academy.
- Acquiring instructors (FAA employees and contractors).
- Overseeing delivery of courses and lab sessions for developmental ATCs.
- Evaluating developmental and instructor performance.
- Overseeing administration of tests and lab assessments.
- Handling other administrative duties and evaluations that support delivery of training (e.g., maintaining accreditation, addressing new training orders, addressing developmental personal needs, etc.).

The Academy most commonly documented training processes using COP or WI documents. The Academy posts COP and WI documents onto the KSN – an online tool made available across all lines of business and organizations of FAA.

Responsibilities for processes around hiring and training ATCs span across multiple organizations. While AMA-500 is responsible for training ATCs, other Academy divisions and FAA organizations also use proven processes for the successful hiring, training, and certifying of FAA ATCs. At times, the Academy uses Memorandums of Understanding (MOUs) and process diagrams when collaboration with external stakeholders is required; however, interview data and available documentation indicate that informal (i.e., undocumented) agreements around roles and responsibilities for hiring and training are used more often than documented agreements.

Individuals know their roles and responsibilities well. Regardless of the responsibility, process or activity, the individuals interviewed as part of this study know their roles and responsibilities well. In addition to having the institutional, subject matter knowledge or hands-on experience to accomplish the task, they understand the resources or equipment they need—or that are available—to them.

Barriers

Organizational Change. In January 2012, FAA released a new organizational chart that moved some roles and responsibilities for hiring and training developmental ATCs to new organizations. The reorganization also established new organizations and renamed others. While stakeholders were aware that responsibilities changed, the Study Team observed gaps in understanding of whom or what FAA organization is currently responsible for completing tasks, as well as how and when these tasks occur within the new structure. In many instances, individuals have limited visibility into whole processes, especially when the process passes back and forth through multiple FAA organizations. Reorganizations and change efforts increase levels of uncertainty around roles and responsibilities and limit the ability to be proactive and plan appropriately.

Limited visibility into the whole process. A number of processes used at the Academy cross multiple stakeholders or lines of business. This fragments roles and responsibilities within the same process and creates complex interdependencies. While this "throw it over the fence" model works for the Academy, it provides limited visibility into the decision making process and the status of inputs and outputs, especially when changes are in progress. Limited understanding of the full process can reduce the effectiveness of any change management or process improvement initiatives as well as reduce potential efficiencies.

Undocumented processes or altered processes. At the Academy, the Study Team observed that a number of processes are passed along verbally or are "trial and error" processes. This presents a risk to consistency and completeness of the process. Additionally, it can increase potential for duplication of efforts, missed steps or lost organizational knowledge.

Communication

When reviewing and evaluating communication of roles and responsibilities for training, the Study Team specifically sought out documentation showing communication networks, organizational charts, memorandums or other documentation listing who was responsible or accountable for decisions and actions as well as who was consulted or informed about decisions made or actions performed. The Study Team also evaluated the type of communication happening within the Academy and between the Academy and FAA Headquarters.

Multiple communication networks are in place. Interviews revealed that the Academy's communication networks are very active and highlight strong ties within Academy divisions. Communication networks are defined as people coming together to discuss training or training related topics, as well as a willingness, ability and authority to share information through standing meetings, emails, and verbal interactions. There appeared to be genuine camaraderie amongst AMA-500 personnel and these individuals displayed great willingness to share information amongst each other, with other stakeholders and the Study Team.

Communication is personal and frequent. Communication networks and personal relationships at the Academy support the development of personalized and frequent communication around responsibilities, processes and deliverables. One observation is that many communications around responsibilities, processes and deliverables appear to be more informal than formal in nature, which can create gaps in communication or inconsistent communication beyond the initial message recipient(s).

Barriers

Limited formal communication and documentation of communication. While the Study Team noted that communication is frequent and personnel do correspond and speak with one another, there exist communication gaps that are exacerbated by lack of documentation. This holds especially true for FAA-wide communication about current and emerging change around training

roles and responsibilities and decision-making processes for hiring and training developmental ATCs. Based on interviews, everyone was aware that changes were occurring due to the FAA reorganization, but few interviewees outside of AMA leadership understood changes taking place or the reason behind the changes. Additionally, the updates for organizational charts, processes and responsibilities are not keeping pace with changes taking place.

No overarching process to show and communicate roles and responsibilities. Because a number of responsibilities and processes rely on inputs and outputs from other parts of the Academy or FAA organizations (i.e., the "handoff" or "over the fence" points), there is no one person who owns the overarching process. Each group is highly aware of its part in the process, but the limited visibility into the whole process and lack of documented points of overlap creates a reactive instead of a proactive environment. This type of environment can hinder opportunities to build efficiencies, understand large-scale change initiatives or process improvement exercises, and can create confusion around responsibilities and accountability.

Limitations on feedback loops. Not all involved in training developmental ATCs are receiving feedback that could be helpful in maintaining roles and responsibilities creating missed opportunities for more comprehensive process analysis or process improvement efforts. The feedback loop most neglected appears to be the loop between the Academy and the facilities with regard to how well Academy training prepared developmental ATCs for site-specific training. This point was not investigated in-depth, but will be considered in the second report focused on facility training and on a separate Reauthorization Act Study on frontline managers.

Accommodation of Developmental ATCs

Concerning accommodations for developmental ATCs, the Study Team focused on documentation showing whether the Academy established standards to identify the number of developmental ATCs that can be accommodated at the Academy. Specifically, the accommodations pertained to the number of available instructors, the availability of classrooms; the number of available simulators, training requirements and the number of recently placed new personnel already in training.

Historically, the Academy has had no issues accommodating developmental ATC demands. Because the selection of developmental ATCs ties to the annual Controller Workforce Plan, the Academy directly bases its enrollment numbers on the need outlined in the Controller Workforce Plan. To date, there have been no issues with the Academy's ability to accommodate developmental ATCs; the Academy has never turned away any developmentals or canceled classes. Once the Academy knows how many developmentals it needs to accommodate it works with AJI-215 to develop the master course schedule and assign developmentals to appropriate training tracks. Some new hire classes have return developmentals ("training failures"). The Academy plans for 126 training failures annually.

The number of available instructors. The Study Team observed that the Academy, when referring to the number of instructors, separates the counts of FAA instructors from the number of

contract instructors. This is because the Academy has a specific number of Full-Time Equivalent (FTE) FAA instructors they employ on an annual basis. Currently, the Academy employs 40 total FAA instructors with a breakdown of 14 En Route, eleven Tower, 9 Terminal Basic Radar Training Facility (RTF), five Specialized and one Basics instructor. In reference to the number of contractors on-board, the Study Team noted that the Academy employs 342 contract instructors, 324 of whom are certified, and 102 remote pilots. According to interview notes, the contractors, when given enough notice, can alter the number of instructors they provide once the Academy communicates the number of developmentals in training; the number of instructors needed is contingent upon the annual ATC quota.

In the classroom, the developmental-to-instructor ratio varies depending on the course and the number of developmentals in the class. There are always two instructors per classroom with the En Route course designed with ratio of 18-to-2, and the RTF and Tower courses designed with a ratio of 24-to-2. In the simulation labs, the developmental-to-instructor ratio is much smaller due to the level of involvement needed by the instructor. For the Tower course, the medium fidelity class has a ratio of 4-to-1, and the high fidelity has a ratio of 1-to-1. For the RTF course, there is a ratio of 1-to-1 while the En Route course has a ratio of 1-to-2.

Available classroom space. The Study Team observed that the Academy used 26 classrooms for ATC courses with a breakdown of five En Route, four Tower, five RTF, six Basics and nine Specialized Training classrooms. To date, FAA and the Academy have not established any standards to identify the number of developmentals the Academy can accommodate based on classroom space. As needed, the Academy schedules courses in multiple shifts as a short-term approach to increase capacity. This multiple shift approach provides the ability to increase the number of developmentals without making physical space changes.

The number of available simulators. The Study Team noted that the number of available simulators could affect the number of developmental ATCs that the Academy can accommodate. The Study Team observed that the Academy uses 70 total simulators for ATC courses with a breakdown of 20 for En Route, 16 for Tower, 24 for RTF and 10 for Terminal Radar Approach Control Skill Enhancement Workshop (TSEW). To date, the Academy has not established any standards to identify the number of developmental ATCs the Academy can accommodate based on the number of available simulators. Of all the influential factors, AMA-500 leadership noted that the number of simulators available ultimately limits the number of developmentals the Academy can accommodate. Given enough time, however, the Academy can alter the master course schedule to accommodate additional developmentals.

Training requirements. According to several interviewees, the number of developmentals who enter the Academy is determined by the ATO based on projections in the annual Controller Workforce Plan and the number of controllers needed at the facilities; the number of developmental ATCs is not currently determined by training requirements. Training requirements, however, do influence the training material and duration of the courses. Based on the curriculum design, each

course has specific, detailed training requirements and materials for each day of the course. Academy instructors are required to follow the detailed requirements and use the materials for classroom training and simulation labs as directed by the Academy or contracts. These established standards ensure that all developmental ATCs get the same training.

The number of recently placed new personnel already in training. Since the Academy is the first step in the training process, the Academy is not directly affected by the number of new personnel (i.e., developmental ATCs) already in training. This factor, however, does have influence once developmentals pass Academy courses and move to their facility assignments. Developmentals currently in training move through the set course duration for respective training tracks with little impact on the Academy's ability to accommodate the next wave of developmentals.

Barriers

At this time, the Study Team could not identify or see any major barriers to the Academy's ability to accommodate developmental ATCs.

Summary of Recommendations

Using the construct of the Reauthorization Act and the results of the analysis performed, the Study Team developed a series of recommendations that, if implemented, will enable the FAA to address the findings generated by this study. These recommendations are intended to provide the FAA with a baseline that can be leveraged as the organization moves forward with oversight, process and organizational change initiatives. The recommendations in this report focus on addressing barriers to oversight, communication and accommodations. Some initiatives are already underway, while in other cases additional analysis will be required.

Roles and Responsibilities

Roles and responsibilities are important to hiring and training developmental ATCs because they lay out specific parameters for action and help maintain accountability and oversight within the FAA organization. When roles and responsibilities are not clear, the likelihood of confusion, frustration, duplication of effort and process lags increase.

Show the whole process. Providing start-to-finish visibility into a process improves awareness of the stakeholders, inputs and outputs of that process. The Study Team recommends that FAA develop master, high-level process flows showing decisions and touch points to improve coordination and accountability. Once full processes with touch points become visible, they also become a tool to support continuous process improvement and to pinpoint lags or gaps in the delivery of inputs and outputs. By showing the whole process, the Academy allows for greater visibility to the end goal and better alignment of one-off processes to the end goal, which builds efficiency and consistency.

Use RACI-type tools. The Study Team recommends processes be accompanied by a Responsible, Accountable, Consult and Inform (RACI) Matrix or RACI-type tool that maps key actions and decisions to responsible, accountable, consulted and informed stakeholders. On multiple occasions, the Study Team heard that the complexity of processes and the fragmentation of roles and responsibilities across multiple stakeholders in multiple locations create barriers to documentation. If the process is the same, but the owner or contributors change, the RACI Chart can be updated without changing the process to keep everyone informed. Figure ii shows a sample RACI Chart.

RACI Chart	Person				
Activity	Ann	Ben	Carlos	Dina	Ed
Define	A	R	I	I	I
Design	I	A	R	C	C
Develop	I	A	R	C	C
Test	A	I	I	R	I

R = Responsible A = Accountable C = Consult I = Inform

Figure ii. Sample RACI Chart

Capture details of the "trial and error" successes. Several times during on-site interviews, the Study Team heard references to "trial and error" processes used by personnel when documentation did not exist or when the roles and responsibilities were not defined. While the work did get accomplished, trial and error implies variation in approach and task owner, which can impede the ability to replicate success and efficiency as well as maintain consistency and accountability. Trial and error can also indicate that documented roles and responsibilities are not in alignment with assigned tasks or that resources available to fill the role or responsibility are lacking. Capturing successes can become drivers for adjusting roles and responsibilities, establishing new or changing existing processes, auditing processes or sharing best practices.

Communication

Although the Academy's communication networks are active, the Study Team recommends taking steps to better coordinate the dissemination of information around organizational goals, roles and responsibilities and ongoing changes within the organization as a whole or within individual FAA organizations that support the hiring and training of developmental ATCs.

Use plans to enhance communication. The Study Team recommends developing a communication or change management plan to communicate upcoming changes around roles and responsibilities and processes. Such plans become vehicles to share high level messaging and notice of pending changes throughout the duration of reorganizations and change initiatives. These plans can help the organization and its personnel prepare for, respond and adapt to change more efficiently. For example, a communication plan can not only reinforce drivers for change to existing

processes (e.g., a Congressional mandate, a new training requirement, IRP recommendations) but also identify whom the change will affect and key steps in the change, all of which can help FAA's training stakeholders take a more proactive approach. A proactive approach supports buy-in from stakeholders, allows more time for feedback and can help establish expectations upfront. Additionally, a communication plan can be developed to cascade to smaller parts of a larger organization while keeping the message the consistent.

Share best practices. Knowing that some processes change faster than documents and that some processes require case-by-case finesse, the Study Team recommends developing a repository of best practices that can be made readily available to anyone engaged in the process. Best practice sharing can minimize the impact of changes when formal process documents are not appropriate or feasible. Best practices also provide insight into the organization for new personnel and a way for managers to preserve institutional knowledge when personnel leave the organization. Finally, best practices offer a way for every member of the organization to contribute to collective idea sharing, innovation and process improvement.

Expand feedback loops. Unless information in course evaluations contains sensitive or personally identifiable information that cannot be shared, the Study Team recommends making course feedback available to all interested parties. From instructional designers to instructors, developmentals to managers, the more people engaged in the evaluation process, the better the pool of evaluation data becomes. In turn, the likelihood of receiving commitment to completing evaluations and garnering support for implementing recommendations improves, which can improve the quality of the data and the response rate.

Accommodation of Developmental ATCs

The Study Team observed standards for the developmental-to-instructor ratio, available classroom space, number of simulators and number of available FAA instructors; however, the Study Team recommends that the Academy more formally document these standards to provide visibility to all stakeholders associated with training developmental ATCs. The Academy should work to ensure the fixed number of developmentals that need training throughout the year, and the process for training and tracking them, remain as transparent as possible. To date, the Academy has not experienced any issues with their ability to accommodate developmental ATCs so the current process is working. While FAA requirements and quotas provide the Academy a fixed number of developmentals and course durations, greater variability at the facility level may result in increased difficulty in FAA's ability to establish overarching standards for and transparency around training and tracking developmental ATCs across all training programs and facilities, including the Academy.

Other Factors Impacting Training

While the Study Team focused on roles and responsibilities, communication and the Academy's ability to accommodate developmental ATCs, the Study Team identified some additional factors that can influence the Academy's training delivery capabilities.

Technology. Most Academy courses are built around traditional classroom-based, instructor-led courses and some high, medium and low fidelity simulation done in labs. The Academy continues to explore use of more online and mobile learning (e.g., iPads, tablets, etc.) primarily for specialized courses. Currently, less than 10% of Academy courses are web-based. As new technologies such as NextGen[2] come online, technology will become an increasingly important consideration when determining cost-effectiveness of ATC training and will need to be incorporated into an already tight training schedule. Although changes to Academy training may not be immediate, the need for new technologies to develop and deliver training will increase in the near future and will become highly influential on the Academy's ability to develop and maintain training content as well as on the ability to train developmental ATCs more effectively.

Availability of funding. Several interviewees indicated that recent budget cuts affected some AMA-500 and AJI team responsibilities such as course maintenance and updates. Previously both organizations had access to full-time contract support to help with course maintenance; however, over the past few years, these additional resources have become scarce making course maintenance and updates more challenging to complete in a timely manner.

FAA-wide ATC workforce changes. Projecting numbers of actual developmentals is a challenge because those involved in the process have to account for retirement, promotions to management positions, detail assignments, etc. While the Controller Workforce Plan tracks all of this annually, the actual hires do not fill immediate needs, but fulfill needs projected for two to three years out. Should FAA experience large deviations from Controller Workforce Plan projections, there could be a ripple effect for training capacity at the Academy.

Accreditation. The Academy currently holds three accreditations: National Education Association (NEA), the North Central Association (NCA) and International Standards Organization (ISO). Each accreditation requires specific standards including, but not limited to governance, process improvement, communication, evaluation and resources. Should any accreditation standards change, the Academy may need to make decisions that alter responsibilities or processes around the development, delivery, maintenance and evaluation of courses in order to maintain accreditation status.

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[2] Next Generation Air Transportation System (NextGen) is an umbrella term for the ongoing transformation of the National Airspace System. At its most basic level, NextGen represents an evolution from a ground-based system of air traffic control to a satellite-based system of air traffic management vital to meeting future demand, and to avoiding gridlock in the sky and at our nation's airports.

Summary

Overall, the review and evaluation of FAA Academy training for developmental ATCs indicates that Academy is meeting the ATC quota and is doing so with as little disruption to developmentals as possible. The Academy course schedule is precise and developmentals complete respective courses in allotted timeframes and transition from the Academy to the facilities as quickly as the facilities allow.

While the processes in place at the Academy allow the Academy to fulfill roles and responsibilities for training developmental ATCs, those roles and responsibilities are not always the most effective, efficient, inclusive or clear. In the coming months, the Academy personnel anticipate additional changes to roles and responsibilities and processes as the FAA reorganization continues. Any steps the Academy can take towards better tracking, clarifying, and communicating roles and responsibilities will improve the effectiveness of developmental ATC training. The Study Team identified five key characteristics of effective organizations (Figure iii), which the Study Team believes the Academy can use to help them benchmark progress towards clearly defined roles and responsibilities as well as consistent and productive communication around roles and responsibilities, both of which will support the Academy's ability to train developmental ATCs.

Key Characteristics of Effective Organizations

1. **Clear purpose:** what the team aspires to achieve (vision, mission, goals, values)
2. **Clear roles:** what each member is expected to do to achieve team goals (structure, accountabilities, skills and competencies, resources, tools)
3. **Positive relationships:** how the members work together (this requires skills in involvement, listening, feedback, valuing divers opinions, and conflict)
4. **Strong leadership:** leaders (formal and/or informal) must communicate effectively and set clear expectations and focus, recognize, motivate and hold members accountable
5. **Processes/Procedures:** processes—including

Figure iii. Characteristics of Effective Organizations

When it comes to roles and responsibilities and processes for training, the Academy should continue to define stakeholders; document and improve processes, workflows and communication networks; analyze course evaluations; and, monitor overall performance in delivering training to developmental ATCs. FAA and the Academy should also consider adopting a project management or program management approach for managing activities around hiring and training developmental ATCs. This management approach, according to several professional and academic organizations such as American Society for Training and Development (ASTD) and the Schreyer Institute for Teaching Excellence, is an industry best practice and complements the curriculum review and development and quality assurance processes already in place at the Academy. Use of project charters and work breakdown structures can support clearly defined goals, roles and responsibilities while stakeholder management plans can improve communication and outreach to engage the right people. Likewise, performance management plans help set individual expectations and align expectations with organizational goals while quality management plans and change control protocols support process and training improvements. Together, the recommendations and approaches presented in this study

provide a means to strengthen the Academy's—and in turn, the FAA's—ability to effectively train developmental ATCs.

1 Introduction

Public Law 112–95, cited as the "FAA Modernization and Reform Act of 2012" was enacted to amend Title 49, United States Code, to authorize appropriations for the Federal Aviation Administration (FAA) for fiscal years 2011 through 2014 to streamline programs, create efficiencies, reduce waste, improve aviation safety and capacity, provide stable funding for the national aviation system and for other purposes.

Under Section 609(b) of this Act, the FAA is required to conduct a study that focuses on the training program for developmental Air Traffic Controllers (ATCs). The following report specifically addresses the review of the FAA's training called for under Section 609(b) of the Reauthorization Act. This study, the review and evaluation of Academy training, is the first of two studies under section 609(b). The second study, the review and evaluation of FAA facility training, will commence in January 2013 and will be included in a separate report.

This document contains the Academy review and evaluation results and provides a series of recommendations for future consideration. **Section 1** of the report contains background information, the study's purpose and scope, and the structure of the team that completed the study. The remainder of the report consists of the following sections:

- **Section 2**: details the methodology used to conduct the analyses performed.
- **Section 3**: summarizes the findings from the study.
- **Section 4**: provides a series of recommendations to be considered in moving forward.
- **Appendices:** provide additional documentation and examples in support of report content.

1.1 Background

> **The FAA Academy trains developmental controllers using lecture, computer-based instruction, medium-fidelity simulation and high-fidelity simulation…the focus of the academy is to improve the efficiency of the training by combining proven adult learning concepts with the latest in simulation technology.**
>
> *2012 Controller Workforce Plan*

A critical element in supporting the FAA's mission to provide the safest, most efficient airspace system in the world is having the necessary complement of ATCs to manage traffic at the Nation's airports and in its airspace. Annually, the FAA issues "A Plan for the Future: A 10-Year Strategy for the Controller Workforce[3]" (Controller Workforce Plan) detailing the resources needed to keep the ATC workforce sufficiently staffed. Each year, this plan is updated to reflect changes in traffic forecasts, retirements

[3] http://www.faa.gov/air_traffic/publications/controller_staffing/media/CWP_2012.pdf

and other factors that influence the number of ATCs needed across the country. The Controller Workforce Plan is a primary driver to determining how many ATCs the FAA will hire and train each year to ensure FAA meets the national demand for ATCs. Figure 1 shows the current ATC hiring forecast.

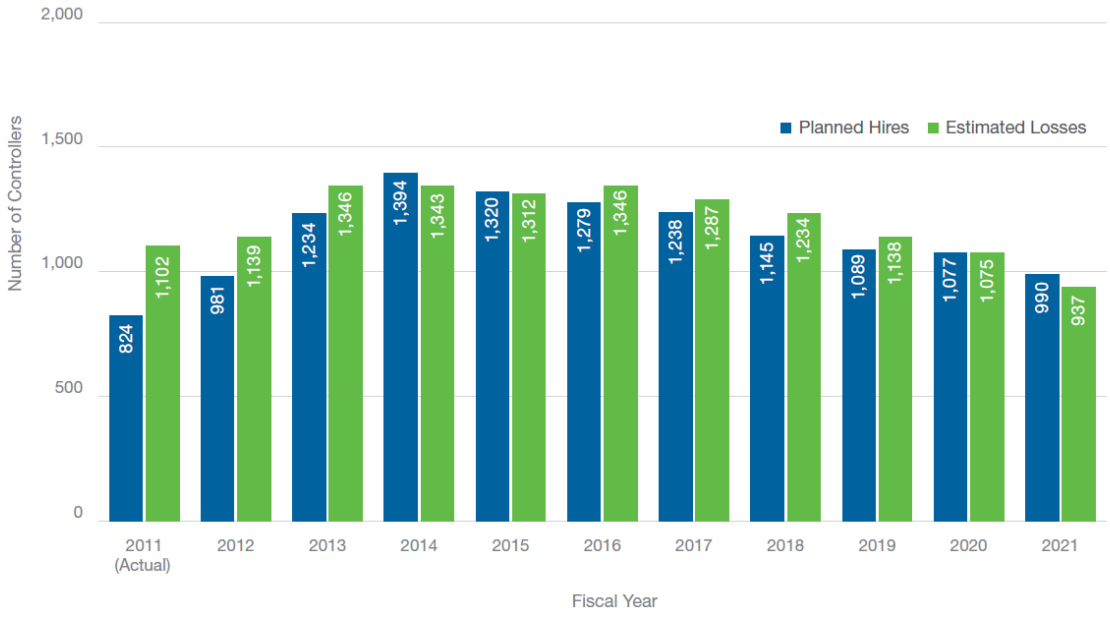


Figure 1. 2012 ATC Hiring Forecast

The FAA Academy, located in Oklahoma City, Oklahoma, is the starting point for training of all developmental ATCs. The mission of the FAA Academy is to provide quality, cost effective learning solutions to develop a highly skilled workforce for the FAA and the global community. The Academy provides training for three main occupations: ATCs, Maintenance and Electronics Personnel and Aviation Inspectors. ATCs hired by FAA to attend the Academy come through one of three paths:

- **Previous Controllers:** these individuals have prior FAA or Department of Defense (civilian or military) air traffic control experience.

- **Air Traffic-Collegiate Training Initiative (AT-CTI) Developmentals:** these individuals have successfully completed an aviation-related program of study from a school under the FAA's AT-CTI program.

- **General Public:** these individuals are not required to have prior air traffic control experience and may apply for vacancies announced by the FAA.

Those hired by FAA to enter the Academy as developmental ATCs funnel in to one of three main training tracks: Tower, Terminal Radar Approach Control (TRACON) facilities or En Route. For general public hires, an FAA Basics Course is required before entering one of the three tracks. Of new hires in Fiscal Year 2012, 275 (25%) started in the Basics Course and 426 (40%) started in the Tower track while 331 (31%) started in the En Route track and 38 (4%) entered the Introduction to Radar Control (ITR) or TRACON track. Figure 2 shows a summary of flight control. Each ATC training track focuses on one of the flight control components. Each training track is described below the figure.

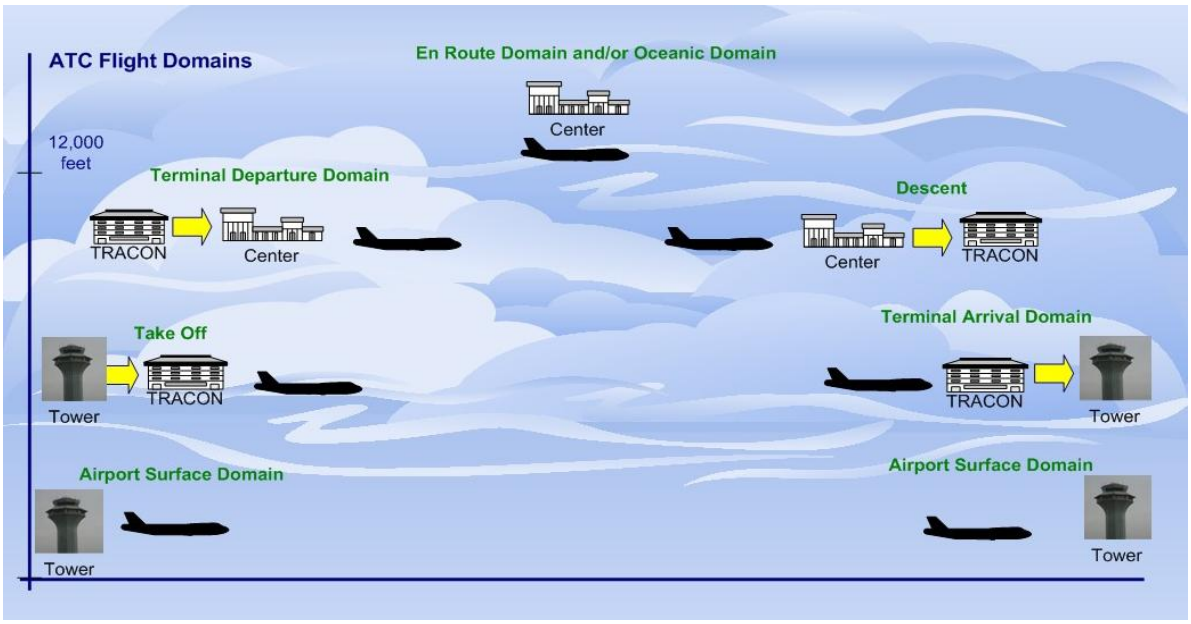


Figure 2. Summary of Flight Control

Air Traffic Basics (Basics): The Academy offers this course to developmentals who enter the Academy from the general public. This course lasts approximately 25 days and introduces air traffic control fundamentals. The Basics course is pass/fail so developmentals must pass this course in order to enter one of the other training tracks.

Tower: Tower track courses focus on air traffic management within a radius of a few miles of the airport, specifically instructing pilots during taxiing and take-off, and granting clearance for aircraft to fly. Tower courses also include training with regard to maintaining minimum separation distances between landing and departing aircraft, transferring control of aircraft to TRACON controllers when the aircraft leave their airspace and gaining control of aircraft on flights coming into their airspace. Developmentals in this track also work in simulators that replicate real air traffic control towers. Initial Tower training takes 37 days to complete. To pass the course, developmentals must successfully complete the Performance Verification (PV) in front of examiners for each control position in the tower. The examiners evaluate how well developmentals apply learning in a simulated air traffic environment. Developmentals have two opportunities to pass the PV. If a

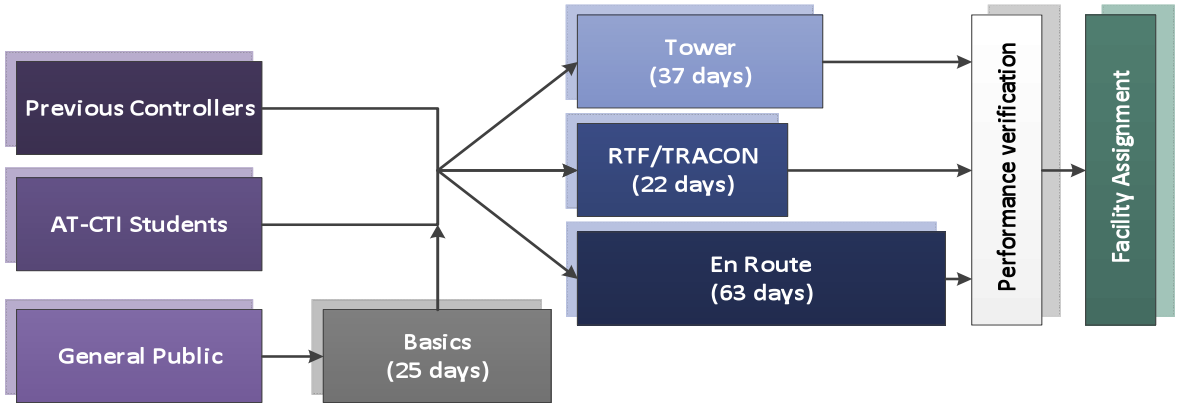
developmental ATC does not pass the PV on the second attempt, the developmentals employment with the FAA will end and he or she will exit all training.

TRACON. TRACON training occurs in two parts. Part one is a two-week ITR course targeted for new hires that have completed Basics and are being assigned to TRACON-only facilities. The IRT course provides basic terminal air traffic control information and introduces radar control keyboard entry skills in preparation for application of these skills in part two, the Terminal Basic Radar Training Course (RTF). The RTF Course[4] is geared toward developmental ATCs hired for TRACON facilities, and incorporates classroom training and simulation focused on managing traffic outside the radius managed by Towers – generally a 40-mile radius of the primary airport though this radius can vary by facility. ATCs in TRACON track learn about instructing departing and arriving flights, and granting clearance for aircraft to fly over the TRACON's airspace, and ensuring that aircraft maintain minimum separation distances between landing and departing aircraft. TRACON courses also instruct developmentals on transferring control of aircraft to tower or En Route Center controllers, and receiving control of aircraft on flights coming into their airspace. The RTF course takes 22 days to complete. At the end of the RTF course, developmental ATCs must pass a PV to continue.

En Route. En Route courses are the most detailed courses at the Academy because the Academy remains the only place developmental ATCs receive this type of training related to managing air traffic along defined routes. The course consists of classroom instruction, medium fidelity skills practices utilizing interactive computer-based instructional systems and full fidelity En Route Automation Modernization (ERAM) simulation in an En Route lab. This training is primarily oriented to procedural studies and demonstration/evaluation of control scenarios. Because of the complexity and amount of information provided in En Route courses, this course takes approximately 63 days to complete. Developmental ATCs must pass four written and six performance assessments for a total of ten evaluations with different point values totaling 100 points. Developmentals must achieve a score of 70 or higher to proceed to field (i.e., facility) training. If a developmental ATC receives less than 70, FAA terminates his or her employment.

Figure 3 shows a high-level mapping of developmental ATC training paths.

[4] Developmental ATCs who do not take the Basics Course go directly into the RTF Course.



In fiscal year (FY) 2010-2012, the Academy trained 2,700[5]developmental ATCs. Of those 2,700, 60% were Tower track, 8% were RTF/TRACON track and 32% were En Route track.

1.2 Study Purpose and Scope

Section 609(b) of the FAA Modernization and Reform Act of 2012 requires a comprehensive review and evaluation of FAA's Academy and facility training efforts. Figure 4 contains the guiding language for the Academy review and evaluation. This report specifically addresses the review of the Academy's AMA-500 Division and represents the first of two studies under section 609(b). The

b) FACILITY TRAINING PROGRAM — Not later than 1 year after the date of enactment of the Act, the Administrator shall conduct a comprehensive review and evaluation of its Academy and facility training efforts. The Administrator shall --

(1) clarify responsibility for oversight and direction of the Academy's facility training program at the national level;

(2) communicate information concerning that responsibility to facility managers; and

(3) establish standards to identify the number of developmental air traffic controllers that can be accommodated at each facility based on --

(A) the number of available on-the-job training instructors;
(B) available classrooms;
(C) the number of available simulators;
(D) training requirements; and
(E) the number of recently placed new personnel already in training.

Figure 4. Reauthorization Act Section 609(b)

second report—the review and evaluation of FAA facility training—will commence in January 2013 and will be presented separately.

[5] Source: AMA-500 interviews

While the Reauthorization Act language calls out roles and responsibilities "at the national level," FAA directed the Study Team to focus this study on roles and responsibilities for training at the Academy. Therefore, the responses noted in this report, as well as findings and recommendations within, reflect the current Academy environment, specifically AMA-500. Regardless of the path of entry (i.e., prior experience, AT-CTI, general public), each developmental ATC spends time at the Academy and receives some type of training. Because the Academy is the first point of entry, the Academy is a natural starting point for reviewing and evaluating developmental ATC training. FAA facilities represent the second stage of training for developmental ATCs and will become part of a separate study. Together, the Academy study and the facilities study will roll-up to a national view whereby providing a review and evaluation of developmental ATC training at the national level.

This study presents observations from the October 2012 review and evaluation of training of developmental ATCs at the FAA Academy and associated recommendations for improving roles and responsibilities, communication and training for developmental ATCs. For purposes of this study, the Study Team defines developmental ATCs as controllers hired by FAA and admitted to the FAA Academy for initial ATC training. After passing Academy training, they continue onto FAA facilities for additional training and eventual certification as a CPC. Classification as a developmental begins upon hire and lasts until the CPC designation is obtained.

According to the Academy, AMA-500 delivers initial, advanced and specialized air traffic training. Additionally, the division:

- Supports the FAA's safety mission through training as required by FAA.
- Delivers supervisory/managerial and technical training to meet ATO requirements.
- Administers examinations, as required.
- Provides support for Air Traffic Technical Training to meet ATO requirements.
- Supports the Airports and International Training Division by providing resources as appropriate.

The considerations outlined in section 609(b) of the Act formed the basis for designing an approach to help evaluate three key areas of AMA-500 training:

1) **Roles and Responsibilities:** who is accountable and responsible for oversight, processes and tasks for training under AMA-500 and who is consulted from not only an authoritative chain of command, but also from a tactical and subject matter expert perspective;

2) **Communication:** how are roles and responsibilities and processes for training under AMA-500 communicated, both formally and informally, and how are they documented and shared; and

3) **Accommodation of developmental ATCs:** how many developmental ATCs can the Academy accommodate in a given year and what is the relationship of the number of

instructors, classrooms and simulators available and FAA training requirements to the number of developmental ATCs that the Academy can accommodate on an annual basis.

1.3 Team Structure

In September 2012, the FAA Safety and Technical Training Organization (AJI-2) engaged an independent Study Team to support the development of a series of reports in response to the 2012 FAA Reauthorization Act. The FAA also assigned members of AMA, AMA-550, the AMA Quality Assurance Team (AMA-20), and the AJI Curriculum and Technology Group in Oklahoma City (AJI-215) to the Team. In addition, offices and representatives from the National Air Traffic Controllers Association (NATCA) and the Professional Association of Aeronautical Center Employees (PAACE), contributed their time and expertise to reviews of the draft report, and encouraged participation during the interview and report completion processes.

2 Study Approach

Figure 5 shows the approach to the Study Team used to develop this report. Additional information about the approach appears below the figure.

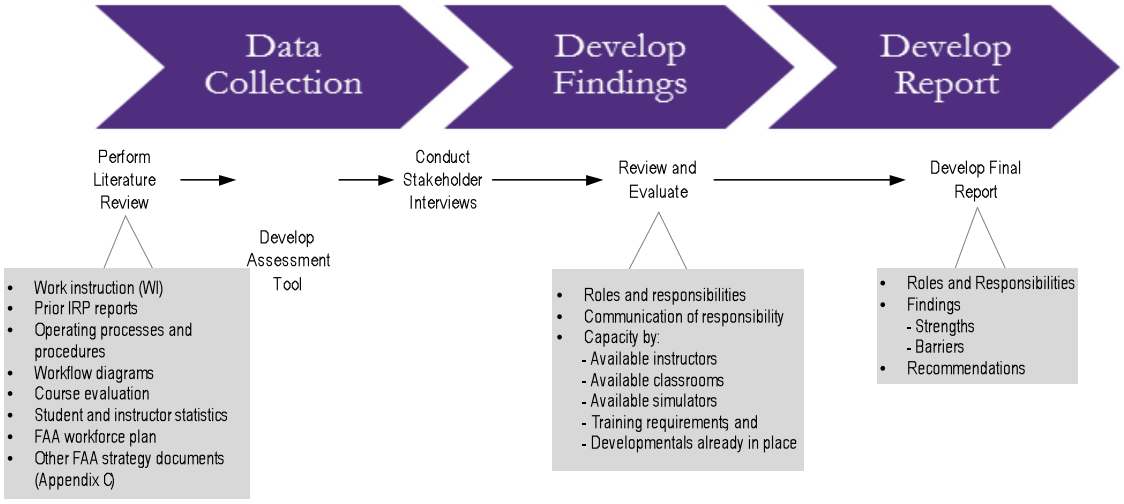


Figure 4. Study Approach.

Data Collection. Data collection includes both qualitative and quantitative data provided by the Academy prior to the on-site visit as well as interviews conducted during the visit to the Academy. At the start of the study, the Study Team reviewed documents provided by FAA HQ and the Academy including Academy COPs and WIs around training, the Controller Workforce Plan, results of recent OIG and IRP Studies and other relevant documentation that set the stage for the training study.

To aid in the collection of data, the Study Team developed a series of assessment questions. The Study Team provided the questions to the Academy two weeks prior to the site visit. Based on the

subject matter covered by the questions the Academy and AJI leadership recommended who should be included in interview sessions. The Study Team conducted 21 interviews during the period of October 23 – October 31, 2012 including ten AMA, eight AJI and three AJG personnel.

Develop Findings. To generate findings, the Study Team relied on documents provided by FAA HQ and the Academy as well as notes taken during on-site interviews. Initial findings were shared with the AMA and AJI personnel working on-site at the Academy through an outbrief meeting and the draft report.

Develop Report. After sharing their initial findings, the Study Team used an iterative approach to developing this report. The iterative approach included multiple drafts, collection and incorporation of comments, then development and submission of this final report.

2.1 Stakeholders

Table 1 shows a list of stakeholders and each stakeholder's functional role as it pertains to training developmental ATCs.

Table 1. Stakeholders and Functional Roles

Air Traffic Organization (ATO): Holds responsibility for moving air traffic safely and efficiently; works with commercial and private aviation stakeholders and the military; provides guidance and support to employees— the 35,000 controllers, technicians, engineers and support personnel whose daily efforts keep aircraft moving safely through the nation's skies; sets overall direction for ATC training including training requirements.
Office of Human Resource Management (AHR): Advises and assists the FAA Administrator in directing, coordinating, communicating and ensuring the adequacy of FAA plans, programs and initiatives associated with: employment, compensation, learning and development, human capital planning, measurement and evaluation, labor and employee relations; works with ATO to set annual quota for the number ATCs required across FAA including the number of developmental ATCs.
FAA Academy (AMA): Manages the FAA Academy and oversees delivery of all training at the Academy.
FAA Academy Quality Assurance (AMA-20): Audits policies, procedures, and processes with regard to training developmental ATCs; maintains the Academy KSN, which houses all current policies, procedures and processes with regard to delivery of training; secures and maintains accreditations, as appropriate.

FAA Academy – Air Traffic Division (AMA-500): Delivers ATC training according to ATO training requirements; works with AJI-215 and AJG to assign developmental ATCs to available training seats and develop ATC course schedules; oversees contract instructors and evaluates FAA instructor performance; evaluates developmental ATC classroom and lab performance and administers testing; provides subject matter expert (SME) to AJI-2, as needed.

Management Services (AJG): Develops and disseminates developmental ATC temporary hire letters and tracks developmental ATCs through the onboarding process including all security and medical clearances; works with the AMA-500, AJI-215 and facilities to identify the appropriate training track for each developmental ATC.

Safety and Technical Training (AJI): Designs, develops, updates and maintains course curriculum to meet ATO training requirements including course content, assessment tests, and evaluations; responds to and approves (or declines) course content change requests; responds to requests for information about FAA training; finances and allocates resources to the academy for controller and technician training as well as oversee the effectiveness and performance of the provision of training in accordance with approved curriculum.

Academy Training Delivery Team (AJI-215): Provides instructional design expertise; supports updates to existing courses per errata sheets[6]; works with AMA-500 and AJG to assign developmental ATCs to training tracks; issues course reports documenting evaluations of courses; develops ATCs course schedule and fills ATC admission quota with support from AJG and AMA-500.

2.2 On-site Interviews

The Study Team visited the FAA Academy in Oklahoma City, Oklahoma and used a series of assessment questions to conduct on-site interviews with the members of AMA, AJI and AJG. Conducting these interviews enabled the Study Team to receive information directly from personnel regarding roles and responsibilities and training within their specific environments. The visits also allowed the Study Team to evaluate the differences in responses based on division and role.

Academy and AJI selected interviewees for the Study Team based on their roles associated with their ability to answer the assessment questions or to provide insight into ATC hiring and training processes.

[6] Errata sheets are a means of submitting requests to change course content. Errata changes are reviewed and approved by AJI-1 then pass to AJI-215 to make approved changes.

Over a one-week period (October 22, 2012 to October 31, 2012) teams of interviewers ranging in size from two to five members interviewed 21 people including ten AMA personnel, nine AJI personnel (seven physically located at the Academy (AJI-215) and two located in Washington, D.C. (AJI-2)), and three AJG personnel (one physically located at the Academy and two located in Washington, D.C.).

2.3 Assessment Questions

The Study Team's assessment questions aimed to gather comprehensive information about responsibilities, communication and the Academy's ability to accommodate developmental ATCs. To obtain this comprehensive view, the Study Team divided the assessment questions into five focus areas:

1) *Roles and Responsibilities:* who has responsibility for oversight, admission and direction setting for developmental ATC training at the Academy and how and where is the information documented;

2) *Curriculum Development and Review:* who is responsible for the development, maintenance, review and evaluation of developmental ATC training and how and where are standards for training documented;

3) *Training and Facilities*: taking into consideration physical space and instructors, what are the maximum, minimum and average number of developmental ATCs that can be accommodated at the Academy, and how and where are standards for accommodation documented;

4) *Call for Training*: where do training requirements for developmental ATCs come from and how and where are they documented; and

5) *Technology*: what types of technology does the Academy use to facilitate training for developmental ATCs, how does the Academy currently incorporate new technologies and what changes in technology, if any, does the Academy anticipate in the next 5 years.

The full list of questions, including a mapping of the questions to relevant sections of Section 609(b) of the Act, is available in Appendix C.

2.4 Academy Response

In addition to individual interviews, Academy AMA-500 leadership submitted consolidated answers to the assessment questions used in each interview. In the sections below, the Study Team provides a high-level summary of AMA-500's consolidated responses to each of the assessment question categories while the Academy's full response to assessment questions is available in Appendix D.

Roles and Responsibilities

Effective January 1, 2012, the functions of AMA-500 changed making the Air Traffic Division's primary function to deliver initial, advanced and specialized air traffic training in a manner that supports the FAA's safety mission and meets training requirements issued by the ATO. In Oklahoma City, AMA-500 works with AJI. Per information provided by interviewees, AJI-2 and AJI-215 are responsible for maintaining and updating existing course content and training materials as well as participates in the process for admitting developmental ATC and determining course enrollment capacity. AMA-500 maintains COPs and AMA WI documents, including roles and responsibilities, in the FAA's KSN. Due to the ongoing reorganization across FAA, a number of roles and responsibilities for AMA-500 as well as for AJI-2, AJI-215 and AJG are still in flux and, therefore, some documented roles and responsibilities found in the KSN—and provided to the Study Team—are Overtaken By Events (OBE) and therefore no longer relevant. Often times FAA communicates roles and responsibilities, and changes to roles and responsibilities, to the Academy through meetings or through AJI-215.

Curriculum Development and Review

ATC course curriculum development is an AJI responsibility that spans across AJI, including AJI-2, AJI-215 and AJI-212. The Academy currently offers 17 courses ranging from 3 days to 63 days in duration. AJI-2, located in Washington, DC is responsible for developing new course content while instruction system designers in AJI-215 (Oklahoma City, OK) are responsible for updating existing course content. Recently, the Academy and AJI-215 have seen significant cuts to instructional system specialist (ISS) and instructional system design (ISD) contracts, which have reduced contract support for these functions creating some backlog in updates to existing courses.

ATC course reviews and evaluations cut across multiple FAA stakeholders depending on the type of review taking place and the type of instructor. For example, immediately after attending a course, course participants receive emails via an automated system to solicit feedback on the course and the instructor; this is a Level 1 course review. ISDs in AJI[7] are responsible for Level 2, or learning outcome course reviews, which attempt to measure the degree to which a course participant[8] has learned new skills. Course participants receive Level 2 reviews within 30 days of taking the course. ISDs in AJI are also responsible for Level 4 reviews aimed at determining the training's value to the organization as well as for performing course walk-throughs where auditors evaluate courses by observing a course in its entirety as delivered by FAA or contract instructors. Distribution of post-course evaluations (also called Level 3 reviews), on the other hand, is the responsibility of AMA's

[7] Per AMA-500 responses, it was not clear what sub-division within AJI was responsible for level 2 or 4 reviews or course walk-throughs.

[8] For the purpose of this report, course participants are developmental ATCs who attended the course.

Quality Assurance Team (AMA-20). Level 3 reviews usually occur three to six months after training and typically include feedback from developmental ATCs' supervisors in an attempt to determine the extent to which course participants are applying learned skills on the job. While instructors do have some access to review results on their own, Academy Course Coordinators and Course Managers take responsibility for the review and dissemination of course review data.

Training and Facilities

Because the ATC quota issued by ATO through the annual Controller Workforce Plan determines the number of developmental ATCs the Academy can train, the number of developmental ATCs accommodated by the Academy varies greatly year to year. The graduation rate and the time it takes to get through Academy also vary greatly depending upon the training track selected. For academics, most classes have two instructors per class and normal class sizes vary. En Route classes typically accommodate 18 developmentals while Tower, RTF and Basics classes typically accommodate 24 developmental ATCs. For labs, the developmental to instructor ratio for medium-fidelity labs varies from two developmentals to one instructor to four developmentals to one instructor. High-fidelity labs consistently have a one to one developmental-instructor ratio with some lessons having additional instructors on hand during labs. The Academy currently has 342 instructors, 324 of whom received certification by FAA in his/her area of expertise. Approximately 40 of the 342 instructors are FAA-employed and the rest are contractors hired under the Air Traffic Control Optimum Training Solution (ATCOTS) contract. FAA requires that all instructors both, FAA FTE and contractors, receive semi-annual evaluations via the FAA Performance Management System. The number of classes taught per instructor varies by instructor. The number of classrooms and labs available at the Academy is based on the number of developmentals and, therefore, increases and decreases as the quota changes. Currently, the Academy has the following classrooms in use:

- Five En Route classrooms (minimum capacity 1 and maximum capacity 18);
- Four Tower classrooms (minimum capacity 3 and maximum capacity 24);
- Five RTF classrooms (minimum capacity 3 and maximum capacity 24);
- Six Basics classrooms (minimum capacity 1 and maximum capacity 24); and
- Nine Specialized Training classrooms (minimum capacity 1 and maximum capacity ranges from 6-24).

Call for Training

The ATO communicates all requirements for training and requests for new training to the Academy via AJI. Per interviewees, prior to the reorganization AJI-215 worked directly with the ATO to address requests and requirements for new training; currently, AJI-2 is responsible for new training requests. Change requests for existing training go to AJI-2, then AJI-2 delegates the prioritized requests to AJI-215 ISDs. This process continues to evolve as part of the reorganization.

Technology

The Academy utilizes multiple technologies to deliver ATC training, which varies based on class type. For example, Academy classrooms are designed to allow developmentals to view presentations (e.g., PowerPoint slides) and lesson plans from their desks. Projectors and Smartboards, as presented through SchoolVue distribution software, are the primary means of viewing presentations. Developmentals also perform medium fidelity simulation in the classrooms such as Tower 3D, which is a stepping-stone to high-fidelity Tower Simulation System (TSS) simulators. En Route developmentals have several e-learning modules that are similar to computer based instruction (CBI) methods used at the facilities. Developmentals use e-learning modules in class or at their own discretion. Currently, the FAA does not require any developmental ATC classes at the Academy to include online training.

When it comes to simulators, the Academy currently has two En Route simulation labs that cover ten En Route positions each, and one En Route simulation lab that covers two positions. For Tower, the Academy has 16 TSSs while RTF uses two Standard Terminal Automation Replacement System (STARS) and two Active Color Display (ACD) simulation labs, both of which cover six positions and one TSEW simulation lab that is used as part of a ten-position lab.

The Academy is currently looking into adopting a paperless training approach for courses, which includes use of mobile devices such as iPads and tablet computers. The Academy recently entered into an iPad development stage with the rationale that iPads will probably replace most paper-based training materials given to the developmentals. The Academy is also trying to make many instructor-grading forms available in paperless formats. In addition, RTF courses have included development of a terminal simulation program called Practical Radar Approach Control Training Interactive Computer Exercises (PRACTICE). PRACTICE is a standalone program on any computer, but it may also work well on iPads if FAA develops a PRACTICE iPad application.

3 Study Findings

The sections below highlight key findings of the review and evaluation of Academy training. The Study Team divided findings into Roles and Responsibilities, Communication and Accommodation of Developmental ATCs. In this section, the Study Team highlights strengths then identifies some barriers uncovered during the document reviews and interviews. The Study Team chose the term "barriers" because our review did not find any major deficiencies. However, the Study Team noted that some findings did impede the Academy's ability to carry out roles and responsibilities effectively and efficiently as well as its ability to maintain or improve communication networks and processes associated with training developmental ATCs.

3.1 Roles and Responsibilities

When reviewing and evaluating roles and responsibilities for training, the Study Team specifically sought out documentation listing stakeholders--and roles and responsibilities for each stakeholder--

as well as documented processes showing interaction of stakeholders, inputs and outputs to each process step and the currency of each process, WI or description.

The Academy has a number of processes in place to carry out roles and responsibilities. Based on documentation provided by Academy personnel and notes from interviews, the Study Team concluded that the Academy has a number of processes in place to carry out roles and responsibilities including, but not limited to:

- Accepting hired developmental ATCs into the Academy to fill the ATC training quota.
- Developing course schedules to accommodate the number of ATCs accepted into the Academy.
- Acquiring instructors (FAA employees and contractors).
- Overseeing delivery of courses and lab sessions for developmental ATCs.
- Evaluating developmental and instructor performance.
- Overseeing administration of tests and lab assessments.
- Handling other administrative duties and evaluations that support delivery of training (e.g., maintaining accreditation, addressing new training orders, addressing developmental personal needs, etc.).

The Academy most commonly documented training processes using COP or WI documents. The Academy posts COP and WI documents to the KSN – an online tool made available across all lines of business and organizations within FAA. All documents on the KSN "exist as current, in-use documents" and include a Requirements Section that indicates:

- Personnel who have roles and responsibilities associated with the process or action.
- Training or certifications, if needed by anyone engaged in the process, to complete the process or action.
- Equipment, if needed by anyone engaged in the process, to complete the process or action.
- Safety considerations.

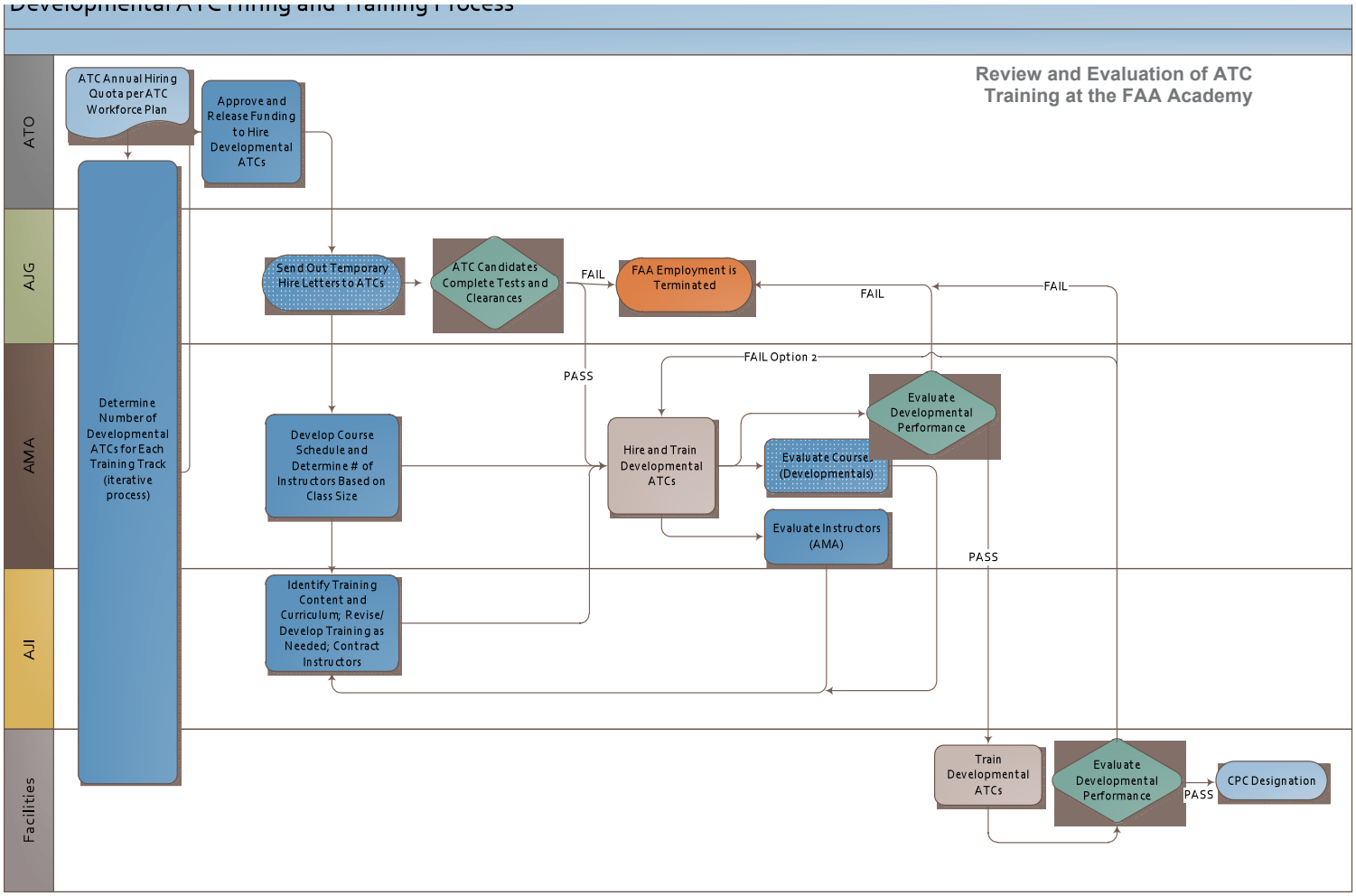
The Academy has a team of internal auditors (AMA-20) who review different AMA processes on a monthly basis. If a process has a problem but is not scheduled for a review for six months, the schedule is flexible enough to adjust needs so they can look at the problematic processes immediately. Revision numbers and dates on the first page of each COP and WI documents indicate the date of activation and edits made between revisions. Originals and all revisions are in the archived on the KSN. The first version is "revision 0" and the revision numbers go up the line from there. Appendix E shows a sample WI and Appendix F shows a listing of AMA COPs and WIs available in the Academy KSN.

Responsibilities for processes around hiring and training ATCs span across multiple divisions. While AMA-500 is responsible for training ATCs, other organizations within FAA also use proven processes for the successful hiring, training, and certifying of FAA ATCs. At times, the

Academy uses MOUs and process diagrams when collaboration with external divisions is required, however interview data and available documentation indicate that informal (i.e., undocumented) agreements around roles and responsibilities for hiring and training are used more often than documented agreements when multiple stakeholders are involved. The hiring and placement process for developmental ATCs is one such process. Using interview data, the Study Team attempted to recreate this process in a process flow diagram.

Figure 6 shows the Study Teams attempt to capture the Academy's process for hiring, placing and training developmental ATCs and highlights the number of stakeholders and decisions involved. The initial number of developmental ATCs needed by FAA comes from the ATO via the annual Controller Workforce Plan. Next, AJG works with the Finance Office to determine the "to hire" number of ATCs adjusted for attrition and retirements. The "to hire" number is communicated with a broader group from AMA-500, AJI and AJG. Once the group agrees to the number, the Academy informs branch directors about the number of instructors needed. The FAA Human Resources (HR) department sends tentative offers to developmentals while the Academy prepares class schedules based on the quota for each training track and provides the contractor (currently Raytheon) a schedule of the requirements FAA expects the contractor to meet. Classroom seats are filled when developmental ATCs pass all clearances for security and health, and accept hiring offers. The quota management and resource tool (QMART) and the Electronic Learning Management Systems (eLMS) are two tools that support the ATC hiring and training process. Pre-hire, the FAA tracks developmental ATCs and open Academy seats in QMART; post-hire, in eLMS. After the end of each course, developmental ATCs evaluate courses and AMA evaluates the instructors (both FAA instructors and contract instructors). At the end of their time at the Academy, the Academy evaluates each developmental performance (e.g., PV's). If developmental ATCs pass, they go on to facility training; if they fail, FAA terminates their employment.

Figure 5. ATC Hiring and Training Process



Individuals know their roles and responsibilities well. Regardless of the responsibility, process or activity, the individuals interviewed as part of this study know their respective roles and responsibilities well. In addition to having the institutional, subject matter knowledge or hands-on experience to accomplish the task, they understand the resources or equipment they need—or that are available-- to them. The Academy's recent accreditation by North Central Association (NCA) cited[9] "the FAA Academy is well organized with personnel roles and responsibilities well-defined." While the Study Team recognized that the Academy personnel were well organized and knew their roles, the Academy could not provide documentation for all of the processes or roles and responsibilities shared with the Study Team.

Barriers

Organizational Change. In January 2012, FAA released a new organizational chart that moved some roles and responsibilities for hiring and training developmental ATCs to new organizations. The reorganization also established new organizations and renamed others. While stakeholders were aware that responsibilities changed, the Study Team observed gaps in understanding of whom or

[9] NCA Accreditation exit briefing October 15-17, 2012.

what FAA organization is currently responsible for completing tasks, as well as how and when these tasks occur within the new structure. Academy, AJI-215, and AJI personnel interviewed by the Study Team knew things changed, but were not always clear for whom, how, or what the change entails. In many instances, individuals have limited visibility to the whole process, especially when the process passes back and forth through multiple FAA organizations.

In 2012, for example, the responsibility for curriculum development for ATC training moved from the Academy to AJI-2 in Washington, DC. Previously, the Academy would receive a tasking memorandum and work directly with the customer (ATO) to develop the training to meet customer requirement(s). According to a memorandum dated February 6, 2012[10], the "development, revision, and maintenance functions [for ATC courses] will be performed by AJI" however the memo does not specifically indicate how this immediate change influences or changes roles and responsibilities at a detailed level. As of October 2012, the changes in specific roles and responsibilities and who or what group within AJI would handle the development, revision and maintenance functions were still not available to those on-site at the Academy who worked under the AJI division.

Three interviewees remarked that in the midst of reorganizations, navigating changes in roles and responsibilities is "trial by fire," meaning that because some processes or roles and responsibilities are not documented, revised or formalized, it is up to individuals to develop a process through experimenting with what works and what does not. Additionally, the individual must try to determine what activities in the process are now being accomplished at AJI-2 versus the AJI-215 or AMA-500, especially with regard to curriculum development (this goes for existing roles and responsibilities as well as new roles and responsibilities per the 2012 reorganization). Reorganizations and change efforts increase levels of uncertainty around roles and responsibilities and limit the ability to be proactive and plan appropriately. When asked how AJI-215 personnel determine what their responsibilities are, interviewees indicated that when they are not sure, they ask their boss. (Note: the Academy only works with Academy-specific training; the Academy does not monitor or support facility training.)

[10] February 6, 2012 Memorandum from Cynthia Haley-Seikel, Acting Manager Air Traffic Curriculum Administration.

Limited visibility into the whole process. A number of processes used at the Academy cross multiple divisions or lines of business. This fragments roles and responsibilities within the same process and creates complex interdependencies. While this "throw it over the fence" model works for the Academy, it provides limited visibility into the decision making process and the status of inputs and outputs, especially when changes are in progress. Limited understanding of the full process can reduce the effectiveness of any change management or process improvement initiatives as well as reduce potential efficiencies. One example captured in interview notes pertaining to the air traffic technical training process as found in an Academy WI document AMAWI-50001[11]. Appendix E shows the full WI while Figure 7 shows the process for new course development prior to the January 2012 reorganization when the responsibility rested with divisions located at the Academy including AJI-215.

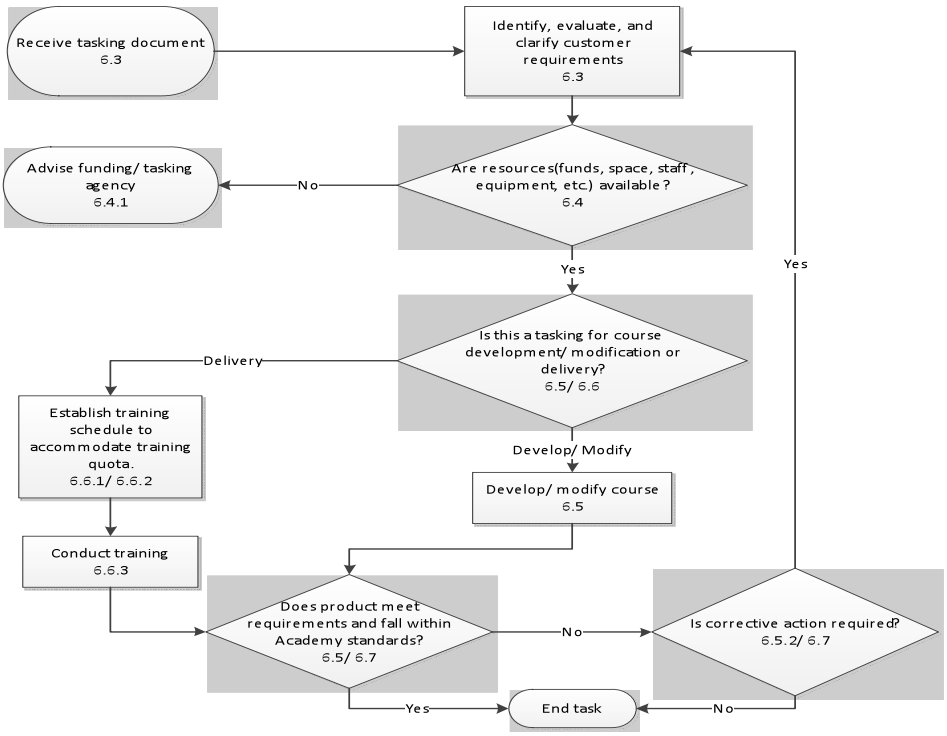


Figure 6. Air Traffic Technical Training Process

After the reorganization, AJI-2 in Washington, D.C. took over the process for course development, but did not take over the complete process. The new process with decision points was not available as of the completion of this report. When asked about the new process, Academy interviewees could not describe the processes, people, decisions or deliverables before they received the assignment or after they completed their portion of the assignment. Interviewees knew what they received and what they had to do with it and noted that when the product went "over the fence"

[11] Per Academy Work Instruction AMAWI-50001, *Air Traffic Technical Training Work Instruction (9/14/2010).*

their involvement ended. This limited visibility into how stakeholders make high-level decisions across the full process or how changes in one piece of the process influence other parts of the process inhibits planning and creates a reactive rather than proactive environment. During one interview, the Study Team asked a member of the AJI-2 team about the new course development process. The interview yielded a detailed list of process steps for course development; however, the document (available in Appendix G) did not include who was responsible for each step. Again, a process exists but it was not clear to the Study Team who is accountable for the process, who manages and contributes to the process, or how the FAA or the Academy makes the process available to others.

The Study Team discovered a similar point with the developmental ATC hiring process. Hiring developmental ATCs and placing them into seats in Academy courses involved multiple people and decisions, but no one interviewed could provide information on an integrated process to track developmental ATCs from hire to designation as a CPC. Likewise, the curriculum development and review processes had complex interdependencies and multiple independent but connected processes performed at different levels that feed into the broader course review cycle.

Undocumented processes or altered processes. At the Academy, the Study Team observed that a number of processes are passed along verbally or are "trial and error" processes. This presents a risk to consistency and completeness of the process. Additionally, it can increase potential for duplication of efforts or missed steps. Often times, the informal agreements and processes change faster than the formal ones, which make it more difficult to track efficiencies, compliance and revisions. If a new employee enters the scenario, the expectation is that the individual will use or own the process quickly, which can impede the process. Because a trial and error approach is not typically intuitive, causing the new employee learning curve to delay the process or produce errors. At the other end of the spectrum, when someone who knows the process well leaves the organization, his or her knowledge is often not captured or archived for others to use and reference causing the Academy to lose that institutional knowledge.

One example is the course scheduling process. Although the Academy's instructor and management staff are responsible for scheduling, interviews indicated there was one person (and a back-up person) responsible for managing the master schedule for classes at the Academy. The Academy tracks master developmental ATC course schedule through an elaborate and immense spreadsheet loaded with formulas and references. When a change to one course takes place, changes replicate or other sections update based on the change. The owners of the spreadsheet know what changes to make based on experience and trial and error. If that individual were to leave the Academy, the explicit knowledge of the process is at risk of being lost because the Academy did not document how to use the spreadsheet, how the formulas were developed or interdependencies within the spreadsheet.

A second example related to errata sheets, or sheets used to request and respond to requests for updates to courses. Two interviewees indicated that some instructors try to make updates to courses

or course content on their own because the changes in responsibilities for curriculum development mentioned above are not clear to them or because cuts to contract support for these types of updates have reduced the number of resources available to carryout change requests. By bypassing the formal change request process, the risk of un-validated, outdated, or incorrect content ending up in courses increases. Additionally, version control on courses becomes more challenging.

3.2 Communication

When reviewing and evaluating communication of roles and responsibilities for training, the Study Team specifically sought out documentation showing communication networks, organizational charts, memos or other documentation listing who was responsible or accountable for decisions and actions as well as who was consulted or informed about decisions made or actions performed. The Study Team also evaluated the type of communication happening within the Academy and between the Academy and FAA Headquarters. According to Katzenbach[12] (2011), "Every enterprise has an informal and formal organization. The formal consists of analyses, strategies, structures, processes, and programs—all codified in memos and charts—tools that align decisions and actions" and the informal, " consists of emerging ideas, social networks, working norms, values, peer relationships, and communities of common interest—elements that often hide beyond the boundaries of the formal." Using collective past experience and Katzenberg's description, the Study Team developed the following definitions of formal and informal communication at the Academy:

- **Formal communication**: communication that is documented and associated with responsibilities and processes or steps in processes that can be tied back to organizational goals, accountable parties, and follows an organized distribution (e.g., top-down or bottom-up in accordance with organizational charts). This also applies to use of systems or collaboration tools such as the KSN, eLMS or QMART that tracks changes to documents and processes.
- **Informal communication:** communication spread through word of mouth or casual correspondence outside of meetings, and that may bypass organized distribution and is not captured by systems, collaboration tools, memorandums, errata sheets, or other established tools. Decisions or changes in responsibilities or processes are not tracked.

Multiple communication networks are in place. Interviews revealed that multiple communication networks are very active and highlight strong ties within Academy divisions. Communication networks are defined as people coming together to discuss training or training related topics, as well as a willingness, ability and authority to share information through standing meetings, emails, and verbal interactions. There appeared to be genuine camaraderie amongst

[12] Katzenbach, J. (2011). Lead Outside the Lines. *Leadership Excellence*, *28*(10), 14. as accessed on December 8, 2012 through the American Society for Training and Development (ASTD) resource library at http://search.ebscohost.com/login.aspx?direct=true&db=l2r&AN=67121875&site=ehost-live

AMA-500 personnel and these individuals displayed great willingness to share information amongst each other, with other stakeholders and the Study Team. While this holds true for the Academy, the Study Team observed that the communication networks between the Academy divisions and the communication networks between the Academy and FAA Headquarters were not as clear and were not well documented. Within the Academy, personnel use technology such as the KSN, QMART, and eLMS systems to record information, but it is up to individuals to seek out this information of their own accord. The Study Team also observed that there is no single owner for any communication network; it is a collaborative effort focused on specific tasks or decision points in processes.

Communication is personal and frequent. Communication networks at the Academy and personal relationships support the development of personalized and frequent communication around responsibilities, processes and deliverables. One observation is that many communications around responsibilities, processes and deliverables appear to be more informal than formal in nature, which can create gaps in communication or inconsistent communication beyond the initial message recipient(s).

For example, AMA-500, AJI, AGJ, Finance and HR have bi-weekly meetings to discuss the hiring of developmental ATCs to fill Academy seats. While the personnel on the calls are in the direct conversation loop, those not on the calls must rely on second hand information. While this process currently works for the Academy, if the group dynamics change due to insertion or removal of a participant, or if a key stakeholder misses the call, the flow of communication changes.

Barriers

The "communications between stakeholders are either not formally documented or not accomplished" (IRP Report page 37)

Limited formal communication and documentation of communication. While the Study Team noted that communication is frequent and personnel do correspond and speak with one another, there exist communication gaps that are exacerbated by lack of documentation. This holds especially true for FAA-wide communication about current and emerging change around training roles and responsibilities and decision-making processes for hiring and training developmental ATCs. This observation was consistent with a September 2011 IRP Report[13]. Based on interviews, everyone was aware that changes were occurring with regard to roles and responsibilities, structure and processes due to the FAA reorganization, but few interviewees outside of AMA leadership understood changes taking place or the reason behind the changes.

[13] http://www.faa.gov/news/updates/media/IRP%20Report%20on%20Selection%20Assignment%20Training%20of%20ATCS%20FINAL%2020110922.pdf

Additionally, updates for organizational charts, processes and responsibilities are not keeping pace with changes taking place. For example, a number of WI documents, processes and organizational charts shared with the Study Team are OBE and out of date. Another example is the pending acquisition of a new learning content management system (LCMS). There are observed disconnects in understanding and communication around the timeline for acquiring the new LCMS. Interviewees at the Academy noted a two to three year timeframe for the new LCMS to come online while interviewees in AJI-2 in Washington, D.C. indicate a five to eight year timeline. These disconnects highlight the need for more direct and strategic communication around how and when new technology will be acquired and integrated into existing training for developmental ATCs. Interviewees had differing, and sometimes conflicting, ideas on how the new LCMS will change their roles and responsibilities.

No overarching process to show and communicate roles and responsibilities.
Because a number of responsibilities and processes rely on inputs and outputs from other parts of the Academy or FAA organization (i.e., the "handoff" or "over the fence" points), there is no one person who owns the overarching process. Each group is highly aware of their part in the process, but the limited visibility into the whole process and lack of documented points of overlap creates a reactive instead of a proactive environment. This type of environment can hinder opportunities to build efficiencies, understand large-scale change management initiatives or process improvement exercises, and can create confusion around responsibilities and accountability.

Limitations on feedback loops. Not all stakeholders involved in training developmental ATCs are receiving feedback that could be helpful in maintaining roles and responsibilities or to improving processes. For example, ISD interviewees stated that access to course evaluations would be helpful to them in revising courses and with instructional design. Quality Assurance interviewees indicated they see some evaluation feedback on courses and FAA instructors, but typically only when there is an issue. Feedback on contract instructors is shared only with the contracting officer and contract project manager. Additionally, the processes and responsibilities for evaluation of course content and the evaluation of instructors are two distinctly separate processes. As distinct processes, there are missed opportunities for more comprehensive process review or process improvement efforts. Finally, the feedback loop most neglected appears to be the loop between the Academy and the facilities with regard to how well Academy training prepared developmental ATCs for site-specific training. This point was not investigated in-depth, but will be considered in the second report focused on facility training and on a separate Reauthorization Act Study on frontline managers.

3.3 Accommodations for Developmental ATCs

Concerning accommodations for developmental ATCs, the Study Team focused on documentation showing whether the Academy established standards to identify the number of developmental ATCs that can be accommodated at the Academy. Specifically, the accommodations pertaining to the number of available instructors, the availability of classrooms, the number of available simulators, training requirements and the number of recently placed new personnel already in training. The

Study Team, in order to observe if standards were established, met with personnel from AJI-215, AJG and AMA-500 including the AMA-500 Branch Manager, Course Coordinators, the developer of the master course schedule. Along with the informative interviews, the Study Team received documentation to aid in the assessment. The following section provides an account of the Study Team's observations.

Historically, the Academy has had no issues accommodating developmental ATC demands. Because the selection of developmental ATCs ties to the annual Controller Workforce Plan, the Academy directly bases its enrollment numbers on the need outlined in the Plan. To date, there have been no issues with the Academy's ability to accommodate developmental ATCs; the Academy has never turned away any developmentals or canceled classes. The ATO Finance Office, in consultation with the facilities and AJI, develops a hiring plan for each FY that reflects the need outlined in the Controller Workforce Plan. The hiring plan is broken down by facility. Finance and HR then coordinate with the Academy regarding the number of new hires allowed. Once the "to hire" numbers are approved, the Academy knows how many developmentals it needs to accommodate in each course and works with AJI-215 to develop the master course schedule and assign developmentals to appropriate training tracks.

Some new hire classes have return developmentals ("training failures") that went to the facility but are not performing well so they are transferred into a new training track. For example, if a developmental decides on En Route training and does not perform well on the job, the FAA may allow him or her to return to the Academy to be trained on a new specialty, such as Tower courses. The Academy plans for 126 training failures annually, however not knowing the exact number of failures that will occur makes planning challenging.

Tables 2, 3 and 4 display historical data of the quotas and actuals pertaining to the number of developmental ATCs accommodated at the Academy. Historical data are relevant for the Study Team as they provide perspective to the levels of accommodated developmental ATCs over the past three years.

Table 2. FY12 Academy Training Summary

AMA - 500 Training Summary FY12			
Last Updated 10/18/2012			
Total # of Developmentals Who Started Academy New Hire Training in FY10 to Date (Basics Excluded)			880
Total # of AT New Hire Developmentals Currently On-Board			85
% of Failures	13.74%	Number of Failures	129
% of Withdraws	1.60%	Number of Withdraws	15

Total # of New Hires Who Started in FY12 & Successfully Completed Training to Date	795

Break-Out By Option	New Hires Who Have Complete in FY12	New Hires Currently On-Board	FY12 New Hire Quota	Unused Quota	Quota Remaining
*AT Basics	275	0	399	123	0
En Route	331	70	523	1	0
Tower Cab	426	15	480	16	0
ITR	38	0	51	13	0
Totals	1070	85	1453	153	0
*Terminal Radar	381	0	389	8	0
*TSEW	58	0	119	61	0
Specialized Developmentals	341	0	667	71	0
SGET	12	0	12	0	0
TOTAL Developmentals	1862	85	2640	293	0

***NOTE:**
Terminal Radar training is comprised of developmentals who have come from TRACON field facilities and are getting Radar training, and new hires that have gone through the Basics course then onto the ITR course before going into the RTF course. **The developmentals coming from the field are not counted towards total new hire training numbers since they are already FAA employees.**

AT Basics developmentals are not counted in the Total # of Developmentals Who Started "Academy New Hire Training in FY12 to Date" total. They are counted in the New Hires Currently On-Board total.

Table 3. FY11 Academy Training Summary

AMA - 500 Training Summary FY11

Last Updated 12/19/2011

Total # of Developmentals Who Started Academy New Hire Training in FY10 to Date (Basics Excluded)			1320
Total # of AT New Hire Developmentals Currently On-Board			0
% of Failures	5.73%	Number of Failures	57
% of Withdraws	1.61%	Number of Withdraws	16

Total # of New Hires Who Started in FY11 & Successfully Completed Training to Date	922

Break-Out By Option	New Hires Who Have Complete in FY11	New Hires Currently On-Board	FY11 New Hire Quota	Unused Quota	Quota Remaining
*AT Basics	398	0	474	74	0
EN ROUTE	238	0	279	5	0
Tower Cab	630	0	681	20	0
ITR	54	0	59	5	0
Totals	1320	0	1493	104	0
*Terminal Radar	453	0	485	30	0
*TSEW	117	0	117	0	0
Specialized Developmentals	567	0	646	79	0
TOTAL Developmentals		0			

***NOTE:**
Terminal Radar training is comprised of developmentals who have come from TRACON field facilities and are getting Radar training, and new hires that have gone through the Basics course then onto the ITR course before going into the RTF course. **The developmentals coming from the field are not counted towards total new hire training numbers since they are already FAA employees.**

AT Basics developmentals are not counted in the Total # of Developmentals Who Started "Academy New Hire Training in FY11 to Date" total. They are counted in the New Hires Currently On-Board total.

Table 4. FY10 Academy Training Study

AMA - 500 Training Summary FY10

Last Updated 1/13/2011

Total # of Developmentals Who Started Academy New Hire Training in FY10 to Date (Basics Excluded)			1524
Total # of AT New Hire Developmentals Currently On-Board			0
% of Failures	5.71%	Number of Failures	60
% of Withdraws	0.67%	Number of Withdraws	7

Total # of New Hires Who Started in FY10 & Successfully Completed Training to Date	983

Break-Out By Option	New Hires Who Have Complete in FY10	New Hires Currently On-Board	FY10 New Hire Quota	Unused Quota	Quota Remaining
*AT Basics	541	0	684	144	0
En Route	294	0	308	0	0
Tower Cab	552	0	612	7	0
ITR	137	0	156	19	0
Totals	1524	0	1760	170	0
*Terminal Radar	586	0	539	1	0
*TSEW	50	0	51	1	0
Specialized Developmentals	687	0	776	88	0
TOTAL Developmentals		0			

***NOTE:**
Terminal Radar training is comprised of developmentals who have come from TRACON field facilities and are getting Radar training, and new hires that have gone through the Basics course then onto the ITR course before going into the RTF course. **The developmentals coming from the field are not counted towards total new hire training numbers since they are already FAA employees.**

AT Basics developmentals are not counted in the Total # of Developmentals Who Started "Academy New Hire Training in FY10 to Date" total. They are counted in the New Hires Currently On-Board total.

The number of available instructors. The number of available FAA and ATCOTS instructors (i.e., contract instructors) could affect the number of developmental ATCs that the Academy can accommodate. The Study Team observed that the Academy, when referring to the number of instructors, separates the counts of FAA instructors from the number of contract instructors. This is because the Academy employs a specific number of full-time equivalent (FTE) FAA instructors on an annual basis. Currently, the Academy employs 40 total FAA instructors with broken down detail including fourteen En Route, eleven Tower, nine terminal RTF, five specialized and one Basics instructor. In reference to the number of contractors, the Academy employs 342 contract instructors, 324 of whom are certified, and 102 remote pilots. The contractors, when given enough notice, can alter the number of instructors they provide once the Academy communicates the number of instructors required; the number of instructors needed is contingent upon the annual ATC quota.

Academy interviewees indicated developmental-to-instructor ratios for classrooms and simulation labs could have an effect on the quality of the course provided if the ratio increased well beyond that to which the course was designed. In the classroom, the developmental-to-instructor ratio varies slightly depending on the course and the number of developmentals in the class. There are always two instructors per classroom with the En Route course designed with a ratio of 18-to-2, and the RTF and Tower courses designed with a ratio at 24-to-2. In the simulation labs, the developmental-to-instructor ratio is much smaller due to the instructor involvement needed. For the Tower course, the medium fidelity class has a ratio of 4-to-1, and the high fidelity has a ratio of 1-to-1. For the RTF course, there is a ratio of 1-to-1, while the En Route course has a ratio of 1-to-2.

Available classroom space. The availability of classroom space could also affect the number of developmental ATCs that the Academy can accommodate. The Study Team observed that the Academy used 26 total classrooms ATC courses with the breakdown of five En Route, four Tower, five RTF, six Basics and nine specialized training classrooms. To date, FAA and the Academy have not established any standards to identify the number of developmentals the Academy can accommodate based on classroom space. If needed, the Academy schedules courses in multiple shifts as a short-term approach to increase capacity. This multiple shift approach provides the ability to increase the number of developmentals without making physical space changes. Course managers noted that if given enough notice, the Academy could provide additional space and that the Academy always attempts to plan facility changes based on future demand.

The number of available simulators. The Study Team noted that the number of available simulators could possibly affect the number of developmental ATCs that can be accommodated at the Academy. The Study Team observed that the Academy uses 70 total simulators for ATC courses with the breakdown including 20 for En Route, 16 for Tower, 24 for RTF and 10 for TSEW. Currently, there are not any standards established to identify the number of developmental ATCs that the Academy can accommodate based on the number of available simulators. Of all the influential factors, AMA-500 leadership noted that the number of developmentals the Academy can accommodate is ultimately limited by the number of simulators available. Given enough time, however, the Academy can alter the master course schedule to accommodate additional developmentals. For instance, the Academy can run the course schedules in multiple shifts to increase training capacity, while maintaining the same number of simulators. In FY11, for example, the Academy knew they had to accommodate more developmentals so they added a lab and went to a three-shift course schedule to accommodate additional developmentals. In this instance, the number of instructors to run the simulation labs became a bigger factor than the number of simulators.

Training requirements. According to several interviewees, the ATO determines the number of developmentals who enter the Academy based on projections in the annual Controller Workforce Plan and the actual number of controllers needed at the facilities; the number of developmental ATCs is not currently determined by training requirements. Training requirements, however, do influence the training material and duration of the courses. Based on the curriculum design, each

course has specific, detailed training requirements and materials for each day of the course. Academy instructors are required to follow the detailed requirements and use the materials for classroom training and simulation labs as directed by the Academy or contracts. These established standards ensure that all developmental ATCs get the same training. Per interviewees, this consideration changes once developmentals get to facilities. The Study Team noted that pending NextGen training might create additional training requirements that are not currently a part of the Academy's core curriculum.

The number of recently placed new personnel already in training. Since the Academy is the first step in the training process, the number of new personnel (i.e., developmental ATCs) already in training does not directly affect the Academy's ability to accommodate developmentals. This factor, however, does have influence once developmentals pass Academy courses and move to their facility assignments. Developmentals currently in training move through the set course duration for respective training tracks with little impact on the Academy's ability to accommodate the next wave of developmentals. The Study Team will examine the influence of recently placed personnel in more detail during the FAA facility training review and evaluation.

Barriers

At this time, the Study Team could not identify any major barriers to the Academy's ability to accommodate developmental ATCs.

Summary

A synthesis of the information gathered during this study indicates that the relationship between the ATO and the Academy is working, but perhaps not as smoothly as it could. Interviews called attention to several instances were multiple people described the same process differently. Additionally, processes were not seen as FAA processes. For example within the training development process, there were "Academy processes" and "HQ processes." Distinguishing between Academy and HQ created impression there were separate processes instead of one process with multiple stakeholders. The barriers identified in this report, once removed or mitigated, can be instrumental in improving coordination among stakeholders and, ultimately, in improving the ability of stakeholders to carry out roles and responsibilities, communicate and move developmental ATCs through the Academy.

4 Recommendations

Using the construct of the Reauthorization Act and the results of the document reviews and interviews, the Study Team developed a series of recommendations that, if implemented, will enable FAA to address the findings generated by this study. The Study Team notes that all stakeholders interviewed during this study recognize the importance of the Academy and its impact on the FAA's ability to meet ATC workforce needs. As reorganization efforts continue, and as the FAA rolls out new changes and technologies (e.g., NextGen), roles and responsibilities and communication

processes will continue to evolve. The findings developed as part of this study provide the FAA with a baseline from which they or other independent study teams can conduct further analysis to streamline and improve developmental ATC training at the Academy. In some cases, measures to address barriers and changes are already underway; in other cases, the recommendations below involve conducting further analysis and generating best practices that the Academy can share immediately, with a goal of continuing to monitor and improve roles and responsibilities, standards, processes and communication associated with training to developmental ATCs.

4.1 Roles and Responsibilities

Roles and responsibilities are important to training because they lay out specific parameters for action and help maintain accountability and oversight within the FAA organization. When roles and responsibilities are not clear, the likelihood of confusion, frustration, duplication of effort and process lags increase.

Show the whole process. Providing start-to-finish visibility into a process improves awareness of the stakeholders, inputs and outputs of that process. The Study Team recommends that FAA develop master, high-level process flows showing decisions and touch points to improve coordination and accountability. For example, while processes exist for individual components of training development and delivery, the Study Team could not identify an owner for or documentation of the full process (actions and decisions). Once the full process with touch points is visible, it also becomes a tool to support continuous process improvement and to pinpoint lags or gaps in the delivery of inputs and outputs. By showing the whole process, the Academy allows for greater visibility to the end goal and better alignment of one-off processes to the end goal, which builds efficiency and consistency.

Use RACI-type tools. The Study Team recommends processes be accompanied by a Responsible, Accountable, Consult and Inform (RACI) Matrix or RACI-type tool that maps key actions and decisions to responsible, accountable, consulted and informed stakeholders. On multiple occasions, the Study Team heard that the complexity of processes and the fragmentation of roles and responsibilities across multiple stakeholders in multiple locations create barriers to documentation. If the process is the same, but the owner or contributors change, the RACI Chart can be updated without changing the process to keep everyone informed. Figure 8 shows a sample RACI Chart.

RACI Chart	Person				
Activity	Ann	Ben	Carlos	Dina	Ed
Define	A	R	I	I	I
Design	I	A	R	C	C
Develop	I	A	R	C	C
Test	A	I	I	R	I

R = Responsible A = Accountable C = Consult I = Inform

Figure 7. Sample RACI Chart

Capture details of the "trial and error" successes. Several time during on-site interviews, the Study Team heard references to "trial and error" processes used by personnel when documentation did not exist or when the roles and responsibilities were not defined. While the work did get accomplished, trial and error implies variation in approach and task owner, which can impede the ability to replicate success and efficiency as well as maintain consistency and accountability. Trial and error can also indicate that documented roles and responsibilities are not in alignment with assigned tasks or that resources available to fulfill the role or responsibility are lacking. Capturing successes can become drivers for adjusting roles and responsibilities, establishing new or changing existing processes, auditing processes or sharing best practices.

4.2 Communication

Although communication networks are active, the Study Team recommends taking steps to better coordinate the dissemination of information around organizational goals, roles and responsibilities and ongoing changes within the organization as a whole or within individual FAA organizations that support the hiring and training of developmental ATCs.

Use plans to enhance communication. The Study Team recommends developing a communication or change management plan to communicate upcoming changes for roles and responsibilities and processes. The large-scale changes happening at FAA, including changes to ATC training, call for such plans because these plans become a vehicle to share high level messaging around change throughout the duration of the reorganizations and other change initiatives. These plans can help the organization and its personnel prepare for, respond and adapt to change more efficiently. For example, a communication plan can not only reinforce drivers for change to existing processes (e.g., a Congressional mandate, a new training requirement, and IRP recommendations) but also identify whom the change will affect and key steps in the change, all of which can help FAA's training stakeholders take a more proactive approach towards the change. A proactive approach supports buy-in from stakeholders, allows more time for feedback and can help establish expectations upfront. Additionally, a communication plan can be developed to cascade to smaller

parts of a larger organization while keeping the message the consistent. Table 5 shows a breakdown and description of common communication plan sections.

Table 5. Sample Communication Plan Outline

Section	Description
Executive Summary	Provides an overview of the change initiative and description of the vision for the change. Most importantly, this sections outlines "why" the change is needed.
Purpose, Goals and Outcomes	Highlights the reason for the change, goals of the change including high-level timeline for the initiative and what the organization hopes to achieve through the change with; also include measurable results.
Overview of Stakeholders	Identifies who is impacted by the change and who has influence over the change and change processes.
Key Messages	Identifies main message points that the organization will use to communicate the vision for the change, key steps in the change and outcomes.
Communication Vehicles	Outlines the communication tools and media the organization will use to support delivery of key messages (e.g., web page, briefings, factsheets, emails, training, etc.).
Communications Schedule	Provides a high-level schedule that shows when the organization will deliver messages and communications, to whom, by whom and how.

For times when change happens quickly, RACI Charts can also provide a way to communicate roles and responsibilities and emerging changes.

Share best practices. Knowing that some processes change faster than documents and that some processes require case-by-case finesse, the Study Team recommends developing a repository of best practices that can be made readily available to anyone engaged in the process. Best practice sharing can minimize the impact of organizational change, especially when formal process documents are not appropriate or feasible. Best practices also provide insight into the organization for new personnel and a way for managers to preserve institutional knowledge when personnel leave the organization. Finally, best practices offer a way for every member of the organization to contribute to collective idea sharing, innovation and process improvement.

Expand feedback loops. Unless information in course evaluations contains sensitive or personally identifiable information that cannot be share, the Study Team recommends making course feedback available to all interested parties. From instructional designers to instructors, developmentals to managers, the more people engaged in the evaluation process, the better the pool of evaluation data becomes. In turn, the likelihood of receiving commitment to completing evaluations and garnering

support for implementing recommendations improves, which can improve the quality of the data and the response rate.

4.3 Accommodations for Developmental ATCs

As stated in the findings section, the Study Team sought out documentation of established standards used to identify the number of developmental ATCs that the Academy can accommodate. The Study Team observed standards for the developmental-to-instructor ratio available classroom space, number of simulators and number of available FAA instructors, however the Study Team recommends that the Academy more formally document these standards to provide visibility to all stakeholders associated with training developmental ATCs. Additionally, the Academy should work to ensure the fixed number of developmentals that need training throughout the year, as well as the process for training and tracking them, remain as transparent as possible. To date, the Academy has not experienced any issues with their ability to accommodate developmental ATC so the current process is working. While FAA requirements and quotas provide the Academy a fixed number of developmentals and fixed course duration, the Study Team foresees greater variability at the facility level. This greater variability may result in increased difficulty in FAA's ability to establish overarching standards for and transparency around training and tracking developmental ATCs across all training programs and facilities, including the Academy. Currently, the FAA uses training requirements documents, memorandums and weekly telecons involving affected organizations to promote transparency.

4.4 Other Factors Impacting Training

While the Study Team focused on roles and responsibilities, communication and the ability to accommodate developmental ATCs at the Academy, the Study Team identified some additional factors that can influence the Academy's training delivery capabilities.

Technology. Most of the Academy's courses are built around traditional classroom-based, instructor-led courses and some and high, medium and low fidelity simulation done in labs. The Academy continues to explore use of more online and mobile learning options (e.g., iPads, tablets, etc.) primarily for specialized courses. Currently, less than 10% of Academy courses are web-based. As new FAA technologies such as NextGen come online, technology will become an increasingly important consideration when determining cost-effectiveness of ATC training and will need to be incorporated into an already tight training schedule. Furthermore, government-wide policies around paper reduction and "green" initiatives" continue to influence training approaches.

Another point where the Study Team found evidence that technology may influence developmental ATC training is the acquisition and implementation of a new LCMS. The LCMS has the potential to streamline a number of the processes for developing, updating, modifying and sharing courses and course content. Observed disconnects in understanding around the timeline for acquiring the new LCMS indicate confusion in how and when new technologies will be integrated. Although changes

to Academy training may not be immediate, many interviewees anticipate the need for new technologies will increase in the near future.

Availability of funding. Several interviewees indicated that recent budget cuts affected some AMA-500 and AJI team responsibilities such as course maintenance and updates. Previously both divisions had access to full-time contract support to help with course maintenance; however, over the past few years, these additional resources have become scarce making course maintenance and updates more challenging to complete in a timely manner. Currently, ISDs are working with the Academy and AJI-2 to identify standards around how frequently to update courses and are trying to figure out how to make sure updates occur within their time and resource constraints.

FAA-wide ATC workforce changes. Projecting numbers of actual developmentals is a challenge because those involved in the hiring process have to account for retirements, promotions to management positions, detail assignments, etc. While the Controller Workforce Plan tracks all of this annually, the ATCs do not fill a billet until they become CPCs. The actual hires do not fill immediate needs, but fulfill needs projected for two to three years out. Should FAA experience large deviations from Controller Workforce Plan projections, there could be a ripple effect for training capacity at the Academy.

Accreditation. The Academy currently holds three accreditations: National Education Association (NEA), the North Central Association (NCA) and International Standards Organization (ISO). Each accreditation requires specific standards including, but not limited to governance, process improvement, communication, evaluation and resources. This said, should any accreditation standards change, the Academy may need to make decisions that alter responsibilities or processes around the development, delivery, maintenance and evaluation of courses in order to maintain accreditation status.

Summary

Overall, the review and evaluation of FAA Academy training for developmental ATCs indicates that Academy is meeting the ATC quota and is doing so with as little disruption to the developmentals as possible. The Academy's course schedule is precise and developmentals complete respective courses in allotted timeframes and transition from the Academy to the facilities as quickly as the facilities allow.

While the processes in place at the Academy allow the Academy to fulfill roles and responsibilities for training developmental ATCs, those roles and responsibilities are not always the most effective, efficient, inclusive or clear. In the coming months, the Academy's leadership and interviewees anticipate additional changes to roles

Key Characteristics of Effective Organizations

1. **Clear purpose:** what the team aspires to achieve (vision, mission, goals, values)
2. **Clear roles:** what each member is expected to do to achieve team goals (structure, accountabilities, skills and competencies, resources, tools)
3. **Positive relationships:** how the members work together (this requires skills in involvement, listening, feedback, valuing divers opinions, and conflict)
4. **Strong leadership:** leaders (formal and/or informal) must communicate effectively and set clear expectations and focus, recognize, motivate and hold members accountable

and responsibilities and processes as the FAA reorganization continues. Any steps the Academy can take towards better tracking, clarifying, and communicating roles and responsibilities will improve the effectiveness of developmental ATC training. The Study Team identified five key characteristics of effective organizations (Figure 9), which the Study Team believes the Academy can use to help them benchmark progress towards clearly defined roles and responsibilities as well as consistent and productive communication around roles and responsibilities, both of which will support the Academy's ability to train developmental ATCs.

When it comes to roles and responsibilities and processes for training, the Academy should continue to define stakeholders; document and improve processes, workflows and communication networks; analyze course evaluations; and, monitor overall performance in delivering training to developmental ATCs. FAA and the Academy should also consider adopting a project management or program management approach for managing activities around hiring and training developmental ATCs. This type of management approach, according to several professional and academic organizations such as ASTD and the Schreyer Institute for Teaching Excellence, is an industry best practice and complements the curriculum review and development and quality assurance processes already in place at the Academy. Use of project charters and work breakdown structures can support clearly defined goals, roles and responsibilities while stakeholder management plans can improve communication and outreach to engage the right people. Likewise, performance management plans help set individual expectations and align expectations with organizational goals while quality management plans and change control protocols support process and training improvements. Together, the recommendations and approaches presented in this study provide a means to strengthen the Academy's—and in turn, the FAA's—ability to effectively train developmental ATCs.

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Appendices

Appendix A – Acronyms

AHR	FAA Office of Human Resources
AJG	FAA Management Services
AJI	FAA Safety and Technical Training AMA FAA Academy
AT-CTI	Air Traffic-Collegiate Training Initiative
ATC	Air Traffic Control
ATCOTS	Air Traffic Control Optimum Training Solution
ATO	Air Traffic Organization
CBI	Computer Based Instruction
COP	Common Operating Procedure
CPC	Certified Professional Controller
eLMS	Electronic Learning Management System
ERAM	En Route Automation Modernization
FAA	Federal Aviation Administration
FTE	Fulltime Equivalent
FY	Fiscal Year
HQ	Headquarters
HR	Human Resources
IG	Inspector General
IRP	Independent Review Panel
ISD	Instructional System Design
ISS	Instructional System Specialist
ITR	Introduction to Radar Control
KSN	Knowledge Skills Network
LCMS	Learning Content Management System
MOU	Memorandum of Understanding

NATCA	National Air Traffic Controllers Association
OBE	Overtaken by Events
OIG	Office of the Inspector General
PAACE	Professional Association of Aeronautical Center Employees
PRACTICE	Practical Radar Approach Control Training Interactive Computer Exercises
PV	Performance Verification
QMART	Quota Management and Resource Tool
RTF	Terminal Basic Radar Training
SME	Subject Matter Expert
STARS	Standard Terminal Automation Replacement System
TRACON	Terminal Radar Approach Control
TSS	Tower Simulation System
WI	Work Instruction

Appendix B – List of documents and reports reviewed

As a first step in conducting this study, the Study Team conducted a multi-purpose examination of reports on air traffic control operations to gain a deeper understanding of the roles and responsibilities associated with developmental ATC training, how those roles and responsibilities are communicated, and requirements and standards for accommodating and training developmental ATCs. The table below lists the documents and reports reviewed in alphabetical order.

Title	Description
50046 CDG 08-2012	Sample Academy course design guide.
A Plan for the Future (FY12 ATC Workforce Plan)	10-Year Strategy for the Air Traffic Control Workforce 2012-2022.
Academy Accreditation	High-level overview of American Council for Education (ACE) accreditation process.
Academy Certification Status	File showing certification statistics for Academy instructors.
Academy Customer Satisfaction Report - Statistics	Report showing aggregate satisfaction rates for Academy courses by developmentals and managers.
Academy IRC Course Schedule (8/12)	2012 schedule for review of Academy Courses.
Air Traffic Office Organizational Chart	Series of organizational charts showing past and current organizational structure for the FAA Air Traffic Organization as of January 2012.
AJL takes over AMA Courses Memo	February 6, 2012 memo to Mark Woolverton, Acting Manager Air Traffic Division AMA-500 from Cynthia Haley-Seikel, Acting Manager Air Traffic Curriculum Administration notifying the Academy of a change in roles and responsibilities for ATC training curriculum development.
AMA Revise Preliminary Audit Findings	Summary of a prior AMA audit that looked at AMAWI-00019, AMAWI-00004, AMAWI-02004, and AMAWI-02005.
AMA-500 Consolidated Response to Oct 2012 Assessment Questions	AMA leadership provided brief answers to the October 2012 training review and evaluation questions (i.e., assessment questions).
AMA-500 QMS Self-Assessment/Internal Audit Finding Worksheet	Worksheet used by auditor to ask questions about topics/specific work instructions to gauge employee understanding/detailed knowledge of the topic. Employees explain in their own words what the topic means or how they use it.
AMA-500 QMS Self-Assessment/Process Finding Worksheet AMAWI-50003	Worksheet used by Academy internal auditors when evaluating Academy processes or work instructions.
AMA-500 Self-Assessment Process Schedule 2012	2012 schedule for review of Academy internal processes.
AMA-ATX MOU FINAL	Memorandum of understanding that describes the standard operating procedures between ATX-100 and AMA-500. It describes the roles and responsibilities of each organization; coordination processes for training development, programming, and execution; and the performance verification process.
AMAWI-00002 FAA Academy Training Development and Revision R-2 (Word)	FAA Work Instruction that provides the requirements for the development and revision of FAA Academy training programs and helps ensure that all development and revision of training at the FAA Academy is accomplished using a standardized process.
AMAWI-00004 Evaluation of FAA Academy Training Programs	FAA guidance for the evaluation of established training materials developed by and used for instruction by the FAA Academy, for measuring customer satisfaction of training provided and responding and reporting on those evaluations. The Quality Objective is to measure customer satisfaction, enabling improvements in the effectiveness of our training.
AMAWI-50001 Air Traffic Technical Training and memo noting move	Work instruction that speaks to the core functions of the Air Traffic Division AMA 500 of the FAA Academy as defined within functional statements.

Title	Description
AT Call for Training Process	Guidance for identifying the fiscal year AT technical training requirements to headquarters, Service Centers and facilities using the Quota Management and Resource Tool (QMART).
ATC Completion Statistics	Table of Cumulative ATC and Academy completion statistics for FY10, 11, and 12.
ATC New Hire Training Quota Report -10-11-12	Report showing Academy progress towards meeting the FY13 air traffic controller quota.
ATC Statistics for FY10, 11, and 12	Summary of Air Traffic Controller statistics for FY10 , 11 and 12 showing number and track of ATC at the academy as well as ATC quota, ATC hired, number of ATC who completed Academy training and other data relevant to ATC training at the Academy.
ATCOTS Master Field Requirements Checklist 1320.4M	Master checklist of field requirements pertaining to FAA Order 1320.4M as it pertains to the Air Traffic Control Optimum Training Solution (ATCOTS).
Course Evaluation Handbook_4.14.11[1]	Course evaluation guideline for ACE compliance for accreditation.
Course Revision Job Aid JTMS-011	Guidance for course revision with POC, responsibilities, and processes.
eLMS Screenshot	Home page screen shot of FAA eLMS, the FAA's training and learning management system where employees can take online training, register for course offerings, and view their learning histories.
FAA Academy Evaluation System Sample Report for all Post-Course Evaluations	View of the FAA Academy Evaluation System results for course 50148 (AMA-500; AMA-511).
FAA Independent Review Panel on the Selection, Assignment, and Training of Air Traffic Control Specialist (Final Report)	Report showing the findings of an Independent Review Panel convened by the FAA Administrator; report show recommendation on ATC selection, assignment and training.
FAA Order 710.65U (Feb 9 2012)	Guidance prescribing air traffic control operational responsibilities procedures and phraseology for use by personnel providing air traffic control services as they pertain to FAA Order 710.65U.
FAA Training Requirements Process	Report showing the review and assessment of training guidance documents. This report supports the long-term goal of developing a unified set of training standards for ATO Technical Training Organization.
FINAL 50148 Course Report 12-21-2010	Course Report for Initial En Route Air Traffic training including participant test scores.
FY12 AT Basics with Initial Schedule	File showing FY12 schedule, quota and seats filled for Basics and initial qualification classes at the Academy.
FY12 Basics to ITR to RFT to TSEW 10	File showing FY12 tracking of developmentals through ATC Basics, Introduction to Radar, Terminal Basic Radar and TRACON Skill Enhancement Workshop.
FY12 EnRoute Schedule 14	File showing FY12 schedule, planned seats and used seats for EnRoute courses.
FY12 Tower Schedule 15	File showing FY12 schedule for Tower basic and cab training at the Academy.
FY13 AT Basics with Initial Schedule 1	File showing FY13 schedule, quota and seats filled for Basics and initial qualification classes at the Academy.
FY13 Basics to ITR to RFT to TSEW 1	File showing FY13 tracking of developmentals through ATC Basics, Introduction to Radar, Terminal Basic Radar and TRACON Skill Enhancement Workshop.
FY13 EnRoute Schedule 1	File showing FY13 schedule, planned seats and used seats for EnRoute courses.
FY13 Specialized Quota Schedule	File showing FY13 schedule for specialized air traffic training.
FY13 Tower Schedule 1	File showing FY13 schedule for Tower basic and cab training at the Academy.
Initial Tower Cab Training (Instructor Lesson 01: Course 50046)	Participant course guide for the initial Tower Cab training.

Title	Description
Instructor, Lab Manager and Remote Pilot Operator Certification/Recertification Processes Work Instruction (AMAWI-50021)	Work instruction detailing the requirements for certifying instructors, lab managers, and RPOs in the classroom on specific positions, and in labs.
Instructor, Lab Manager and Remote Pilot Operator Evaluation Forms (AMA050021)	Sample instructor, lab manager and remote pilot operator evaluation forms used by the Academy.
List of Specialized Training courses	List of courses offered at the Academy for specialized topics.
Memo Regarding Air Traffic Technical Training Order JO 3120.4M	Chapter 2 excerpt from Training Order JO3120.4M prescribing instructions, standards and guidance for AT technical training.
NCA CASI Accreditation Evaluation Results	Checklist showing evaluations of the Academy during the NCA Accreditation review; includes comments from evaluators.
NCA CASI Accreditation Visit Exit Briefing	Exit briefing from NCA Accreditation review of the Academy.
Performing Contractor Semi-Annual Evaluations (AMAWI-50024)	Work instruction describing the processes used to document the performance of contract instructors and remote pilot operators (RPO) in Air Traffic classrooms and labs.
Report for Jackson	Report showing course hours and simulator percentages for ATC training at the Academy using data pulled from the FAA National Training Database.
Resident Courses	List of current Academy Courses; this list is under review at this time and may change in the near future.
Sample End of Course Evaluation	Sample End of Course evaluation for AMA 500; AMA511.
Sample FAA Training Change Request (ERRATA sheet)	Sheet representing the change request control sheet for revising AMA training course (curriculum, content and test questions).
Sample Post Course Evaluation Email Notification	Sample of email notifying a developmental that he/she should complete a post course evaluation.
Sample Post Course Review	Sample of Post Course Evaluation Review completed by developmentals.
Training Administration and Delivery (AMAWI-00007)	Work instruction prescribing requirements for the administration of training conducted by the FAA Academy including requirements to be used by FAA Academy personnel when preparing and delivering formal instruction on behalf of the Academy and the Sponsoring organizations; references best practices.
Training Center Inspection Checklist	FAA Training Center inspection checklist that addresses compliance with 14 CFR Part 142.

Appendix C – List of Assessment Questions Mapped to FAA Reauthorization Act 609(b) Components

1	Focus Area 1: Roles and Responsibilities	Applicability to Act
1.1	What are the Academy's national training program responsibilities? Who is directly responsible for each duty?	Sec. 609.b.1
1.2	Where are these responsibilities documented? How are the responsibilities communicated?	Sec. 609.b.2
1.3	Who is responsible for maintaining and updating course content? Training materials?	Sec. 609.b.1
1.4	Who is responsible for completing and submitting course reports? Can we see some samples of course reports?	Sec. 609.b.1
1.5	What are the roles and responsibilities of each group in relation to the Academy's annual training offerings:	Sec. 609.b.1
	o Academy Management o Division Managers o Supervisors o Course Managers o Curriculum Developers o Instructors/Subject Matter Experts o Course Evaluators o Instructional System Specialists	
1.6	Who is responsible for developmental ATC admissions and for determining course enrollment capacity?	Sec. 609.b.1
	o What are the maximum, minimum and average class sizes?	
1.7	Who is responsible for Academy communications? Is there a communications plan? How do you communicate changes to training to people outside of the FAA community (e.g., DoD)	Sec. 609.b.2
1.8	Who is responsible for maintaining the Academy's accreditation? When is the next review?	Sec. 609.b.1
1.9	Who is responsible for maintaining and updating technology used at the Academy?	Sec. 609.b.1
2	**Focus Area 2: Curriculum Development**	
2.1	Development	
2.1.1	How do you map courses to the JTA and choose tasks for training?	Sec. 609. b.2, Sec. 609.b.3.D
2.1.2	What is included in your course design guide?	Sec. 609. b.2, Sec. 609.b.3.D
2.1.3	How many courses are available at the Academy/facility? What are they?	Sec. 609.b.3
	o What are the maximum, minimum and average course lengths?	Sec. 609.b.3
2.1.4	What is the process for identifying, developing, and offering new course content? Where is the process documented?	Sec. 609. b.2, Sec. 609.b.3.D
2.1.5	Is curriculum development being affected by actual or perceived budget cuts? How?	Sec. 609.b.3.D
2.2	Review	
2.2.1	What is the refresh cycle for courses? Is it standardized? If yes, where is it documented?	Sec. 609.b.2
	o If no, how is the refresh cycle determined? What is the maximum, minimum and average refresh time for courses?	

2.2.2	How is course evaluation data collected? Where is it stored?	Sec. 609.b.1, Sec. 609.b.2
	o Who receives (or has access to) course evaluation data? Do you share feedback with instructors?	
	o Do you report out/communicate course evaluation data outside of the Academy? To whom?	
	Is it required? If yes, by whom?	
2.2.3	What is included in your course reports? How often are they completed? By whom?	Sec. 609.b.2
	o Is there a standardized format for documentation?	
2.2.4	For Academy courses, how often and for what percent of Academy courses do you administer the following evaluations:	Sec. 609.b.2
	o Level 1: Participant Reaction? o Level 2: Learning Outcomes? o Level 3: Transfer of Learning/Post-Course Evaluations? How often do you engage supervisors? o Level 4: Training Value? o Course Walk-Throughs?	
2.2.5	How often are course evaluations and developmental assessment tests updated? By whom?	Sec. 609.b.1
2.2.6	Are course evaluations being affected by actual or perceived budget cuts? How?	Sec. 609.b.1
3	**Focus Area 3: Training and Facilities**	
3.1	Developmentals	
3.1.1	How many developmental air traffic controllers (ATCs) come through the Academy monthly? Annually?	Sec. 609.b.3
3.1.2	What is the graduation rate? What is the washout rate? What is the average time to get through the Academy?	Sec. 609.b.3
3.1.3	What is the average time from completion of the course(s)/ Academy program to placement at a facility?	Sec. 609.b.3.E
3.1.4	What is the developmental-instructor ratio for training? For simulators?	Sec. 609.b.3.A, Sec. 609.b.3.C
3.1.5	Are developmentals being affected by actual or perceived budget cuts?	Sec. 609.b.3
3.1.6	Do you (have you) ever cancelled a course due to funding constraints?	Sec. 609.b.3
3.2	Instructors	
3.2.1	How many instructors are at the Academy? How many courses does each instructor teach?	Sec. 609.b.3.A
3.2.2	How often do you acquire new instructors? What is the decision process for bringing in new instructors?	Sec. 609.b.1, Sec. 609.b.3.A
3.2.3	Are there different competencies required for the instructors? (i.e., can any instructor teach any course or are they specialized?)	Sec. 609.b.3.A
3.2.4	Have standards have been established to identify the number of developmental ATCs that can be accommodated here based on the number of available instructors?	Sec. 609.b.2, Sec. 609.b.3.A
	o If yes, where are the standards documented?	

	o If no, how do you determine the training program's capacity?	
3.2.5	Are instructors required to be certified? recertified? If yes, for which courses and how often?	Sec. 609.b.3.A
3.2.6	Are instructors being affected by actual or perceived budget cuts?	Sec. 609.b.3.A
3.2.7	Do you (have you) ever cancelled a course due to lack of instructors? Due to lack of developmentals?	Sec. 609.b.3.A
3.3	Facilities	
3.3.1	How many classrooms do you have at the Academy? What are their max, min and average capacities?	Sec. 609.b.3.B
3.3.2	What standards have been established to identify the number of developmental ATCs that can be accommodated here based on available classroom space?	Sec. 609.b.3.B
	o If yes, where are the standards documented? o If no, how do you determine the training program's capacity?	
3.3.3	What standards have been established to identify the number of developmental ATCs that can be accommodated here based on the number of available simulators?	Sec. 609.b.3.C
	o If yes, where are the standards documented? o If no, how do you determine the training program's capacity?	
3.3.4	What standards have been established to identify the number of developmental ATCs that can be accommodated based on training requirements?	Sec. 609.b.3.D
	o If yes, where are the standards documented? o If no, how do you determine the training program's capacity based on requirements?	
3.3.5	Are facilities for training being affected by actual or perceived budget cuts? How?	Sec. 609.b.3.B
4	**Focus Area 4: Call for Training**	
4.1	Who is involved in needs assessments that lead to new trainings?	Sec. 609.b.1, Sec. 609.b.3.D
4.2	Where do training requirements come from (from whom and how)?	Sec. 609.b.1, Sec. 609.b.3.D
4.3	Have standards been established to identify training requirements? If yes, how are they communicated?	Sec. 609.b.2, Sec. 609.b.3.D
4.4	What is the training materials approval process? Who is involved?	Sec. 609.b.1, Sec. 609.b.3.D
5	**Focus Area 5: Technology**	
5.1	What types of technology does the Academy use to facilitate learning and collaboration? What percent of technology available for remote/online training is actually used?	Sec. 609.b.3
5.2	What type of Learning Management System(s) do you use? What are its constraints?	Sec. 609.b.2
5.3	How many simulators are on campus? What types of simulation can they perform?	Sec. 609.b.3.C

5.4	How often are simulators or simulation programs refreshed?	Sec. 609.b.3.C
5.5	What is the up time/down time of the simulators (i.e., how often they are non-functional or have technical or mechanical issues?)	Sec. 609.b.3.C
5.6	Is technology being affected by actual or perceived budget cuts?	Sec. 609.b.1
5.7	How is the Academy using mobile technology to support training (i.e., iPads, tablets, mobile devices, etc.)	Sec. 609.b.3.C
5.8	How is the Academy using CBI technology for courses? Are there plans to migrate to a new method for sharing trainings beyond the academy?	Sec. 609.b.2

Appendix D – AMA-500 Consolidated Response to Assessment Questions (italicized and in red font)

Federal Aviation Administration

FAA Reauthorization Act Training Studies

Assessment Tool

Explanation of Assessment Tool

The Assessment Tool will consist of a series of questions categorized into the five areas of focus for evaluation including Roles and Responsibilities, Curriculum Development, Training and Facilities, Call for Training, and Technology. The intent of this tool is to aid in the collection of relevant information in order to properly review and evaluate the training program based on the requirements of Section 609, of Public Law 112-95. Please note that not necessarily every question will be asked of each individual being interviewed or in the exact order presented, this Assessment Tool is intended to provide structure to the interviewing process in order for the interviewing team to gain a full picture of the five focus areas. Additionally, the final tool, based on feedback, may look different from the question included in this document. A high-level summary of information collected with the assessment tool will be included in the final report to Congress. AMAWI-00002: FAA Academy Training Development and Revision (June 2010) was a resource document used to develop assessment questions.

Date: October 26, 2012

Name: FAA Academy consolidated responses

Location: Oklahoma City, OK

Assessment Questions

1. **Focus Area 1: Roles and Responsibilities**
   1.1. What are the Academy's national training program responsibilities? Who is directly responsible for each duty?

Air Traffic Division pg. 14-15 is outdated and is appended as: Effective January 1, 2012, the functions of the Air Traffic Division changed. Please update the AMA-500 Functional Statement (page 14) to:

Air Traffic Division, AMA-500

The Air Traffic Division delivers initial, advanced, and specialized air traffic training. The division:

a. *Supports the FAA's safety mission through training as required in the Air Traffic Controller Workforce Plan.*
b. *Delivers supervisory/managerial and technical training to meet ATO requirements.*
c. *Administers examinations, as required.*
d. *Provides support for Air Traffic Technical Training to meet ATO requirements.*
e. *Supports the Airports & International Training Division by providing resources as appropriate*

1.2. Where are these responsibilities documented? How are the responsibilities communicated?
KSN AMA-QMS (Link in Column C), Work Instruction AMA-QMS-AMA-500 (Link in Column E)

1.3. Who is responsible for maintaining and updating course content? Training materials?
Academy Training Delivery Team, AJI-215, Byron W. Hull, Manager

1.4. Who is responsible for completing and submitting course reports? Can we see some samples of course reports?
Academy Training Delivery Team, AJI-215, Byron W. Hull, Manager

1.5. What are the roles and responsibilities of each group in relation to the Academy's annual training offerings (E):
Air Traffic Division detailed in AMC_AMA_AMA-500 Requirements by WI (this document is currently being updated by EJ) Link in Column E

1.5.1. Academy leadership:
1.5.2. Division managers:
1.5.3. Supervisors:
1.5.4. Course managers:
1.5.5. Curriculum developers:
1.5.6. Instructors:
1.5.7. Subject matter experts:
1.5.8. Course evaluators:
1.5.9. Instructional design specialist:

1.6. Who is responsible for developmental ATC admissions and for determining course enrollment capacity?
Academy Training Delivery Team, AJI-215

1.6.1. What are the maximum, minimum, and average class sizes?
Normal Class Sizes - En Route -18, Tower - 24, RTF - 24, Basics – 24

1.7. Who is responsible for Academy communications? Is there a communications plan? How do you communicate changes to training to people outside of the FAA community (e.g., DoD)?
The entire Division Management Team; regularly held meetings. As appropriate, or through AJI-215

1.8. Who is responsible for maintaining the Academy's accreditation? When is the next review?
AMA-1?

1.9. Who is responsible for maintaining and updating technology used at the Academy?
AMA-900 and AME-530

2. Focus Area 2: Curriculum Development

2.1. Development

2.1.1. How do you map courses to the JTA and choose tasks for training?
This is an AJI function

2.1.2. What is included in your course design guide?
Refer to ISD's in AJI

2.1.3. How many courses are available at the Academy/facility? What are they?
17, TSEW, RTF, Tower, EnRoute, Basics, Targets, National Traffic Management, Enhanced Traffic Management Coordinator, VSCS, FTA, OJTI Cadre, Common ARTS, NIDS, AT Coach, SGET, and TDLS

- What are the max, min, and average course lengths?
Maximum 63 Minimum 3

2.1.4. What is the process for identifying, developing, and offering new course content? Where is the process documented?
Where is the process documented? AJI 212

2.1.5. Is curriculum development being affected by actual or perceived budget cuts? How?
Yes, we have had contract hours reduced, ISS support

2.2. Review

2.2.1. What is the refresh cycle for courses? Is it standardized? If yes, where is it documented?
Maintenance Plan, under review at this time for possible changes.

- If no, how is the refresh cycle determined? What is the max, min and average refresh time for courses?

2.2.2. How are course evaluation data collected? Where is it stored?

AES, AMA-20 function

- Who receives (or has access to) course evaluation data? Do you share feedback with instructors?

  Course Coordinators and Managers review and make comments. Instructors have read only access.
- Do you report out/communicate course evaluation data outside of the Academy? To whom?

  We make it available to AJI.
  - Is it required? If yes, by whom?

    It is not required at this time but is made available.

2.2.3. What is included in your course reports? How often are they completed? By whom?

AJI, this is an ISD function.

- Is there a standardized format for documentation?

  AJI, this is an ISD function.

2.2.4. For Academy courses, how often/for what percent of Academy courses do you administer the following evaluations:

- Level 1: Participant reaction?

  It is done via the AES system at the end of a course.
- Level 2: learning outcomes?

  AJI, this is an ISD function.
- Level 3: Transfer of learning/post-course evaluations? How often do you engage supervisors for Level 3?

  AMA20 sends out a post course evaluation.
- Level 4: Training value?

  AJI, this is an ISD function.
- Course walk through?

  AJI, this is an ISD function.

2.2.5. How often are course evaluations and developmental assessment tests updated? By whom?

As needed or in conjunction with the maintenance schedule. The updates are done by the ISD's with SME support.

2.2.6. Are course evaluations being affected by actual or perceived budget cuts? How?

If we are talking about the course itself, then yes. We do briefing items and pen and ink changes to keep courses current.

3. Focus Area 3: Training and Facilities

3.1. Developmentals

3.1.1. How many developmental air traffic controllers (ATCs) come through the Academy monthly? Annually?

Varies greatly - FY10 Initial -1524, RTF - 586, TSEW - 50, Specialized - 687, FY11 1320/453/117/567, FY12 1049/330/58/341

3.1.2. What is the graduation rate? What is the washout rate? What is the average time to get through the Academy?

Varies Greatly En Route 63 days, Tower -36/37 days, RTF - 20 days, TSEW - 10-15 days, Basics - 25 days, Specialized - Varies

3.1.3. What is the average time from completion of the course(s)/ Academy program to placement at a facility?

Already determined prior to Academy - developmentals go to immediately after completion of last course.

3.1.4. What is the developmental-instructor ratio for training? For simulators?

For Academics most classes have 2 Instructors/class. Normal Class Sizes - En Route -18, Tower - 24, RTF - 24, Basics - 24. For mid fidelity it varies from 2-4 developmentals per instructor, in high fidelity it is always 1 to1 developmental/instructor ratio with some options having additional instructors working other control positions

3.1.5. Are developmentals being affected by actual or perceived budget cuts?

Other than as discussed in 2.1.5 and 2.2.6 as discussed above - NO

3.1.6. Do you (have you) ever cancelled a course due to funding constraints?

The Academy doesn't cancel classes, our customer ATO would make that call. We are required to meet 98% of the requested quota and we have always met that quota. Thus far NO classes have been cancelled due to funding constraints.

3.2. Instructors

3.2.1. How many instructors are at the Academy? How many courses does each instructor teach?

FAA- En RTE - 5 total/2 designated as course coordinators, Tower - 7/2, RTF - 7/2, Basics - 1/1, Specialized 6/also serve as course coordinators. Normally each instructor only teaches classes in their specialty area and normally has up to two weeks off between classes. Based on class length as mentioned in 3.1.4 an En Route Instructor may only do 3-4 classes/year, whereas a Basics Instructor may do 8-9/year. The vast majority of Academy instructors are contractors and those staffing numbers are in the attachment in column E.

3.2.2. How often do you acquire new instructors? What is the decision process for bringing in new instructors?

Instructors are replaced as attrition occurs. Selection process with a matrix developed.

3.2.3. Are there different competencies required for the instructors? (i.e., can any instructor teach any course or are they specialized?)
Normally ATC specialists are either En Route, Tower, or Terminal. Some Tower/Terminal instructors are dual qualified. We do strive for Cross Utilization of instructional staff based on their qualifications. All instructor staffing needs have been met.

3.2.4. Have standards have been established to identify the number of developmental ATCs that can be accommodated here based on the number of available instructors?
Developmental Quota is determined by ATO. The Academy in working within the ATCOTS contract which supplies the instructors as needed to meet the quota.

- If yes, where are the standards documented?
- If no, how do you determine the training program's capacity?

3.2.5. Are instructors required to be certified? recertified? If yes, for which courses and how often?
Yes per AMA WI 50021 and AMA WI 001007 Sections 4.12 and 4.22 and Appendixes 1 & 2. All instructors both FAA and Contractor are required to be evaluated semi-annually via FAA Performance Management System for FAA and AMA-WI -50024 for contractors.

3.2.6. Are instructors being affected by actual or perceived budget cuts?
Yes they are having less prep time between offerings due to reduced staffing. They are however getting the job performed in a quality manner.

3.2.7. Do you (have you) ever cancelled a course due to lack of instructors? Due to lack of developmentals?
Again the Academy doesn't cancel classes only our customer ATO. None have been cancelled due to lack of instructors. There have been some cancellations due to lack of available developmentals. AMA-500 participates in regular training telecons with ATO to discuss the training requirements for the Academy.

3.3. Facilities

3.3.1. How many classrooms do you have at the Academy? What are their max, min and average capacities?
En Route - 5; 1-12max, 4-18 max, Tower - 3; 24 max, RTF - 3; 24 max, Basics 6; 1-18 max, 5-24 max, Specialized 9: 24 max

3.3.2. What standards have been established to identify the number of developmental ATCs that can be accommodated here based on available classroom space?
NO. As quota increases classrooms are used on day/night schedules and have used before on 3 classes per day rotating through day/night shifts.

- If yes, where are the standards documented?
- If no, how do you determine the training program's capacity?

3.3.3. What standards have been established to identify the number of developmental ATCs that can be accommodated here based on the number of available simulators?
NO. Same as classrooms based on quota. SIMULATORS - En Route 2 X 10 positions, 1 X 2 positions. Tower 16 TSSs, RTF- 2 STARS and 2 ACD @ 6 each, TSEW 1 - 10 position lab.

- If yes, where are the standards documented?
- If no, how do you determine the training program's capacity?

3.3.4. What standards have been established to identify the number of developmental ATCs that can be accommodated based on training requirements?
None - # of developmentals are determined by ATO based on # of training spots needed in field facilities.

- If yes, where are the standards documented?
- If no, how do you determine the training program's capacity based on requirements?

3.3.5. Are facilities for training being affected by actual or perceived budget cuts? How?
Thus far Academy facilities have not been affected by budget cuts. We have been able to Tech Refresh our equipment as needed to this point.

4. Focus Area 4: Call for Training

4.1. Who is involved in needs assessments that lead to new trainings?
AJI (Sherry Higgins)

4.2. Where do training requirements come from (from whom and how)?
They come from ATO to AJI and then to the Academy.

4.3. Have standards been established to identify training requirements? If yes, how are they communicated?
3120.4 and Annual call for training.

4.4. What is the training materials approval process? Who is involved?
Approval comes from AJI. The ISD's.

5. Focus Area 5: Technology

5.1. What types of technology does the Academy use to facilitate learning and collaboration? What percent of technology available for remote/online training is actually used?

Classrooms are designed for developmentals to view PPTs and Lesson Plans at their desk and on Projectors/Smart boards as presented through SchoolVue distribution software. Developmentals also perform medium fidelity simulation in the classrooms such as Tower 3D that are stepping stones to the high fidelity TSS simulators. En Route developmentals have several e-learning modules that are similar to CBI that are performed in class and also provided to the developmentals to work on away from class at their own discretion. Currently there is no requirement for any online training to be performed in conjunction with any of the classes.

5.2. What type of Learning Management System(s) do you use? What are its constraints?
Developmentals test are administered and tracked using Academy developed Desktop Delivered Testing System (DDTS). No constraints have been identified.

5.3. How many simulators are on campus? What types of simulation can they perform?
SIMULATORS - En Route 2 X 10 positions, 1 X 2 positions. Tower 16 TSSs, RTF- 2 STARS and 2 ACD @ 6 each, TSEW 1 - 10 position lab.

5.4. How often are simulators or simulation programs refreshed? Do you need to use "workarounds" with the simulators?
As required when equipment approaches warranty expiration or end of life cycle.

5.5. What is the up time/down time of the simulators (i.e., how often they are non-functional or have technical or mechanical issues?)
AMA-500 has a contract with AME-530 to provide support for all classrooms and some SIGNAL supported labs. Their response time is 5 minutes are less and usually problems are fixed within 15-20 minutes. Labs have spare sectors in case of a serious failure that developmentals can be moved to in when technical problems arise. AMA-900 also provides support to NAS developed simulators such as ERAM, STARS, and ACD. Again their response time is very quick and most problems are resolved within 15-20 minutes with no loss of training. Simulators are scheduled for periodic maintenance that is built into the schedules to ensure that training time is not compromised. In fact En Route labs are shut down now until 11/2 for installation of updated software and required testing of the new updates. This was planned well in advance and training schedules designed to accommodate.

5.6. Is technology being affected by actual or perceived budget cuts?
No not at the present time.

5.7. How is the Academy using mobile technology to support training (i.e., iPads, tablets, mobile devices, etc.)
The Academy is entering into an iPad development stage where iPads will probably replace most paper training materials given the developmentals. Also many grading forms used by instructors may also become paperless. In addition in RTF there has been development of a terminal simulation program called

PRACTICE (Practical Radar Approach Control Training Interactive Computer Exercises) that is stand alone on any computer but may also work well on iPads if an application is developed.

5.8. How is the Academy using CBI technology for courses? Are there plans to migrate to a new method for sharing trainings beyond the Academy?

EnRoute Course 50148001 is the only academy course that uses a CBI (ERAM Computer Entries). However, completion of CBIs may be a prerequisite for taking an Academy course; such as Tower Data Link System Applications Specialist (55085). At this time there have been discussions about new methods for sharing trainings beyond the Academy but no formal developments are taking place.

Appendix E – Sample Work Instruction (WI) – *AMAWI-50001, Air Traffic Technical Training Work Instruction.*

AMC Quality Management System	AMAWI-50001	Revision 7
Title: Air Traffic Technical Training Work Instruction	DATE: 9/14/2010	Page 1 of 6

AMAWI-50001

Air Traffic Technical Training

1.0 Purpose: This work instruction speaks to the core functions of the Air Traffic Division, AMA-500 of the FAA Academy as defined within the functional statement:

1.1 The division plans, develops, maintains, and delivers initial, advanced, and specialized training. The division:

1.1.1 Supports the FAA's safety mission through the implementation of the Plan for the Future, the FAA's 10 Year Strategy for the Air Traffic Control Workforce, focusing on air traffic controller training.

1.1.2 Plans, develops, maintains, and delivers supervisory/managerial and technical training to meet the Air Traffic Organization's (ATO) requirements as tasked by the Air Traffic Controller Training and Development Division.

1.1.3 Supports the Airports & International Training Division by maintaining and delivering and/or providing resources, including subject matter experts, instructors, labs, etc.

1.2 The division has established the following quality objectives:

1.2.1 Provide best value to customers as we meet their requirements by attaining 92% in end of course evaluations and 98% in meeting negotiated tasking deadlines.

1.2.2 Value the contributions of our employees through use of the FAA Recognition Programs and holding several Question/Answer/Listening sessions annually.

1.2.3 Seek continual improvement through use of our quality management system, consistent evaluation of training by the Quality Branch, and by maintaining ISO certification.

The process objective of this work instruction is to ensure a standardization of consistent excellence for all products and services produced by the division.

Approval: _____ Date: 9/13/10
Bill Mumper
Title: Air Traffic Division Manager, AMA-500

Process owner: _____ Date: 9/13/10
Henry Mogilka
Title: Staff Manager, Air Traffic Division, AMA-501

POC: Alethia Futtrell AMA-505

Revision History		
Rev	Description of Change	Effective Date
Original	Initial Release	11/30/07
1	Signature Page change, Safety statement added	4/30/08
2	Modified to work instruction, added quality objectives	8/21/08
3	Updated and corrected functional statement in purpose. Incorporated references to the "Tasking", the "Product Configuration Management", and the "FAA Academy Development, Delivery, and Evaluation of Training" work instructions. Defined "Course Coordinator". Removal of some repetitive items contained within other documents. Converted to AMAWI Template format.	9/24/08
4	Updated reference list and the quality objective; changed ISO 9001 standard to reflect "to the current revision," corrected flow chart, added required records, amended statement of how records are maintained, and removed extraneous information.	7/27/2009
5	Updated reference list	8/28/2009
6	Updated format and reference list, amended safety and record's maintenance statements.	9/22/2009
7	Updated Signature Page and Records 8.0 with Official Files List (OFL) location.	9/14/2010

2.0 Scope: This work instruction applies to all organizations under the Air Traffic Division of the FAA Academy.

3.0 References: AMAWI-00002, FAA Academy Development and Revision
AMAWI-00007, FAA Academy Training Administration (under development)
AMAWI-50002, Air Traffic Division Product Configuration Management and Control
AMAWI-50004, Tasking Work Instruction
FAA Order 3120.4, Air Traffic Technical Training
FAA Order 7110.65, Air Traffic Control
FAA Order 7210.3, Facility Operation and Administration

4.0 Requirements:

4.1 **Personnel:** The Air Traffic Division Manager, Air Traffic Division Staff Manager, and Branch Managers jointly share in the responsibility for the execution of this process.

4.1.1 The Division Manager is responsible ensuring resources are available for providing a quality product or service to the customer.

4.1.2 Branch Managers are responsible for staffing the branches with trained and qualified personnel.

4.1.3 The Section Front-line Managers are responsible for the day-to-day operations and execution of the processes.

4.2 **Training:** There is no specific training needed to support this work instruction.

4.3 **Equipment:** The Air Traffic Division uses various classroom, lab and simulation equipment to provide air traffic technical training.

4.4 **Safety:** Hazard Prevention and Control is managed in accordance with the Mike Monroney Aeronautical Center Occupational Health and Safety Management System.

5.0 Overview: This Work Instruction describes how the Air Traffic Division provides training products and services in order to consistently meet the requirements of our customers.

5.1 Within the Air Traffic Division the "Course Coordinator" is the employee assigned the responsibility to manage the course material and is considered the subject matter expert. Many documents within the MMAC refer to this employee as the "Course Manager". This title may be misleading to individuals outside the Aeronautical Center, since they may or may not be part of the management team. Therefore, any reference to "course manager" within MMAC, FAA Academy, or Division documents, refers to this employee.

6.0 Implementation:

6.1 The Air Traffic Division supports the FAA mission and the FAA Strategy for the Air Traffic Control Workforce by temporarily assigning resources to other FAA organizations when tasked.

The Air Traffic Division supports the Airports and International Training Division, by providing subject matter experts, instructors, labs, and classrooms when available and as needed.

6.2 Customer requirements are received via a tasking document and are generally classified as either development/modification of a course of instruction or delivery of a course of instruction to students. To ensure customer focus and satisfaction, the tasking document identifies customer requirements.

6.3 The Air Traffic Division Manager receives tasking to begin development and/or delivery of a product or service. This tasking is processed in accordance with AMAWI-50004.

6.4 The Air Traffic Division Manager monitors expenditures to ensure continued funding is available for the project.

6.4.1 If resources are insufficient to meet the customer's need, the Air Traffic Division Manager will send a request to the funding agency for the project identifying the additional resources needed.

6.5 If tasking is development/modification of a course, the product is developed/modified in accordance with AMAWI-00002, AMAWI-50002 and FAA standards.

6.5.1 Manager, Air Traffic Controller Training and Development Group determines if the product meets requirements. Once the final product meets requirements:

A. The Air Traffic Division delivers the product to the customer.

B. The Air Traffic Division continues to monitor customer requirements and makes revisions to the product as necessary to meet customer requirements, FAA standards, and ISO 9001standard to the current revision.

6.5.2 If Manager, Air Traffic Controller Training and Development Group determines the product does not meet requirements, then either corrective actions are implemented or work on the product ends.

6.6 If tasking is delivery of a course of instruction:

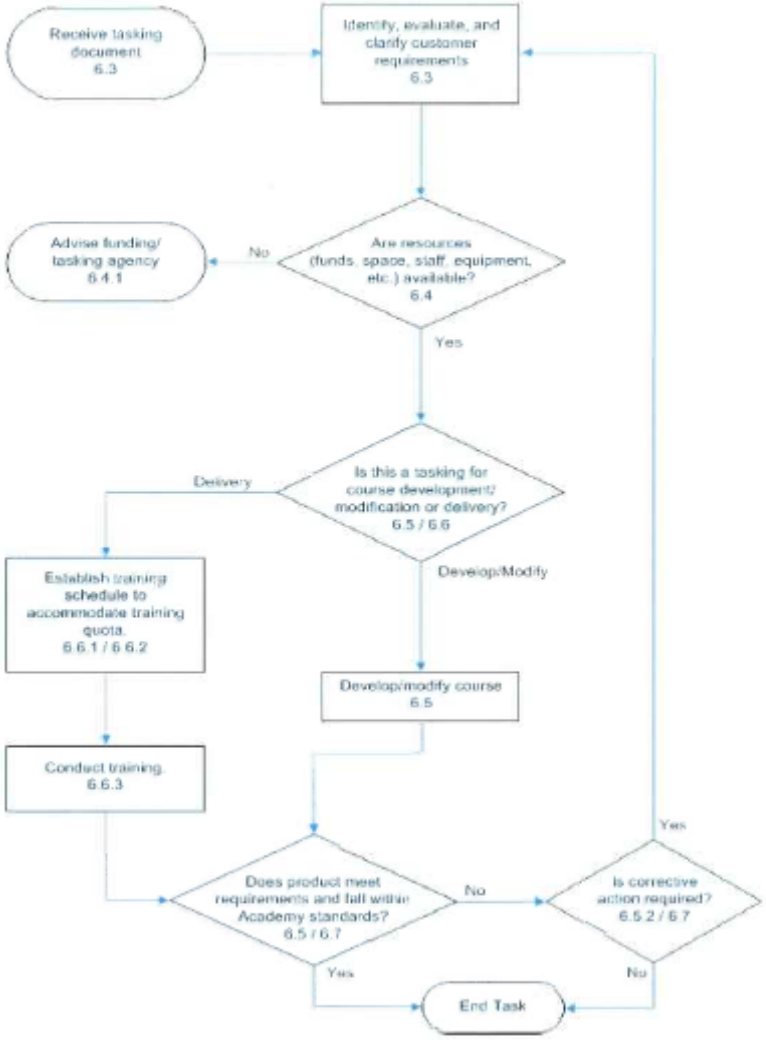
6.6.1 The training quota is established by the Air Traffic Controller Training and Development Group.

6.6.2 An accommodating training course schedule is developed by the Section assigned the task.

6.6.3 Course conduct is in accordance with AMAWI-00002, AMAWI-00007, and the assigned branch's technical training work instruction(s).

6.7 Product or service is evaluated in accordance with AMAWI-00004 with learner feedback through the Academy Evaluation System. Customer complaints or customer/learner satisfaction rating below the Academy standard is evaluated to determine validity and any corrective action required per Academy guidance.

7.0 APPENDIX A: Air Traffic Technical Training Process Flowchart



8.0 Records:

8.1 Records required are listed in the referenced work instruction for each process. OFL: 1100 1.a)

8.2 Records held by this organization are maintained using the Official Files List (OFL).

Appendix F - List of Common Operating Procedures (COP) and Work Instructions (WI) Found in the Academy Knowledge Skills Network

Document	Title	Revision	Effective Date
AMC-QMS	AMC Quality Management System Manual	4	4/29/2010
AMCOP-00001	Document Control Process	3	5/29/2009
AMCOP-00002	Management Review Process	2	10/6/2009
AMCOP-00003	Corrective and Preventive Action Process	5	10/16/2009
AMCOP-00004	Control of Nonconforming Product	4	12/2/2009
AMCOP-00005	AMC Analysis of Data Process	2	12/2/2009
AMCOP-00006	Control of Records Process	1	10/6/2009
AMCOP-00007	QMS Internal Audit Process	3	9/3/2010
AMCOP-00008	Competency, Awareness and Training Process	1	5/19/2009
AMCOP-00009	Stakeholder/Customer Feedback Process	1	10/6/2009
AMCOP-00010	CPI Lean Six Sigma Deployment Manual	0	12/13/2010
AMCWI-00001	Document Template	1	10/6/2009
AMCWI-00004	Program Director, Division and Branch Meetings	0	8/12/2008
AMAWI-00001	FAA Academy Document Control	5	5/10/2011
AMAWI-00002	FAA Academy Training Development and Revision	2	6/1/2010
AMAWI-00003	FAA Academy Product Configuration Management and Control	4	4/7/2011
AMAWI-00004	Evaluation of FAA Academy Training Programs	1	6/1/2010
AMAWI-00005	FAA Academy Nonconforming Product, Corrective and Preventive Action	2	7/31/2009
AMAWI-00007	Training Administration and Delivery	2	5/5/2011
AMAWI-00019	FAA Academy Resource Tool (ART)	0	12/8/2009
AMAWI-00020	FAA Academy Laptop Computers	0	9/27/2010
AMAWI-50026	Leadership Development Programs Coordination Process	0	12/1/2010
AMAWI-50001	Air Traffic Technical Training	7	9/14/2010
AMAWI-50002	Air Traffic Division Product Configuration Management and Control	7	9/14/2010
AMAWI-50003	AMA-500 QMS Self Assessment Work Instruction	4	9/14/2010
AMAWI-50011	Preparation and Orientation for Initial Hire Classes Work Instruction	4	4/20/2011
AMAWI-50014	Print Requests	2	9/14/2010
AMAWI-50021	Instructor, Lab Manager, and Remote Pilot Operator Certification/Recertification Processes	1	9/14/2010
AMAWI-50024	Performing Contract Semi-Annual Evaluations Work Instruction	3	2/7/2011
AMAWI-50027	Supply Checkout	1	9/14/2010
AMAWI-50028	New Employee In-processing Work Instruction	1	9/14/2010

Appendix G – Revised Course Development Process (AJI-2)

Project Planning process & requirements to size & scope the requested work							
Project	PRJ1		Current Phase	PRJ1 Phase	Status Comment	PRJ1 Status Comment	
WBS	Description	Day of week	Start Date	Duration in Calendar Days	Finish Date	Day of week	Dependency
	Stakeholders (required prior to official approval of project)			Modify Blue Cells			
1	Plan: Request to build			0			
1.1	Develop Business Case			0			Request to Build
1.2	Obtain Existing Course Materials (GFI)			0			Request to Build
1.3	Review Business Case			0			Develop Business Case
1.31	Approve Business Case			0			Review Business Case
1.4	Develop Scope Document			0			Obtain Existing Course Materials
1.5	Develop Draft Course Design Guide (derived from Scope)			0			Develop Scope Document
1.6	Develop Estimated level of effort (include gov SME involvement)			0			Develop Draft Course Design Guide
1.61	Complete SME Request Form			0			Provide total forecasted level of effort to include government
1.7	Develop Project Schedule			0			Provide total forecasted level of effort to include government
1.8	Stakeholder Review Planning Deliverables			0			Develop Project Schedule
1.81	Stakeholder Approve Project Execution			0			Stakeholder Review Planning Deliverables
	Milestone to Start Project Execution						Approve Project Execution
2	Start Project Execution			28			Milestone to Start Project Execution
2.1	Submit SME Request Form to NATCA or PASS			0			Complete SME Request Form

2.11	Project Stakeholder & Team Kick-Off Meeting			0			28 day lead time for union SME
3	Analysis			0			Milestone to Start Project Execution
3.1	Evaluate or Conduct Task & Skills Analysis (generic analysis)			0			
3.2	Evaluate or Conduct Cognitive Task Analysis			0			
3.3	Create Analysis Report			0			Task Analysis
3.31	Review Task Analysis Report			0			Create Analysis Report
3.4	Approve Training Approach			0			Review Task Analysis Report
3.5	Create Training Development Plan (for larger Initiatives)			0			Approve Training Approach
3.51	Review Training Development Plan			0			Create Training Development Plan (for Larger Initiatives)
3.52	Approve Training Development Plan			0			Review Training Development Plan
4	Design			0			Analysis
4.1	Update or Create Course Design Guide			0			
4.11	Review Course Design Guide (include 508 Compliance)			0			Update or Create Course Design Guide
4.12	Approve Course Design Guide			0			Review Course Design Guide
5	Development: eLearning Course			0			Design
5.1	Create Storyboards/Course Content			0			
5.11	Review Storyboards/Course Content			0			Create Storyboards
5.12	Approve Storyboards/Course Content			0			Review Storyboards
5.2	Develop Assessments			0			Approve Storyboards
5.21	Review Assessments			0			Develop Assessments
5.22	Approve Assessments			0			Review Assessments
5.3	Develop Alpha Version			0			Approve Assessments
5.31	Review Alpha Version/Walk Thru			0			Develop Alpha Version
5.32	Update Storyboard/Course Content/Assessments			0			Review Alpha Version

5.4	Update Alpha Version to Beta			0			Update Storyboard
5.41	Review Beta Version/Ops Try Out			0			Update Alpha Version to Beta
5.42	Update Storyboard/Course Content/Assessments			0			Review Beta Version
5.5	Update Beta Version to FCC			0			Update Storyboard
5.6	Contractor Presentation of Course			0			Update Beta Version to Walk Thru Version
5.61	Review Course Materials			0			Contractor Presentation of Course (Walk Thru)
5.62	Deliver Course Materials			0			Review Course Materials
5.7	Promote Course to FAA Staging Environment (eLMS)			0			Approve Course Materials
5.71	First Course Conduct			0			Promote Course to FAA Pre-Production Environment (eLMS)
5.72	Update FCC Version			0			Promote Course to FAA Pre-Production Environment (eLMS)
5.73	Create Course Conduct Report			0			Promote Course to FAA Pre-Production Environment (eLMS)
5.74	Deliver Updated Course Materials			0			Conduct Operational Tryout
5.75	Review and Approve Final Version			0			Review Production Ready Version
6	Implement			0			Development
6.1	Promote Course to FAA Production Environment			0			
6.2	Post Production Testing (QA)			0			Promote Course to FAA Production Environment (eLMS)
6.3	Deliver Final Products			0			Conduct First Course
10	Project Management Deliverables			0			Approve Project Execution
10.1	Project Management Plan			0			
10.2	Work Breakdown Structure			0			
10.3	Cost Management Plan			0			
10.4	Staffing Management Plan			0			
10.5	Schedule Management Plan			0			
10.6	Communications Management Plan			0			

10.7	Quality Management Plan			0			
10.8	Risk Management Plan			0			
10.9	Project Statement of Work			0			
20	Project Management Activities			0			Approve Project Execution
20.1	Kick-Off Meeting			0			
20.12	Kick-Off Meeting Notes			0			
20.2	Project Team Meetings & Notes (recurring)			0			
20.3	Stakeholder Meetings (recurring)			0			
20.4	Project Status Reporting (recurring)			0			

Appendix H – Members of the Study Team

PERSONNEL	TITLE
Hezekiah Braxton	Manager (A) Field Training Delivery Group (AJI-2)
Naval Aggarwal	Partner, Grant Thornton
Kevin Brathwaite	Project Director, Grant Thornton
Jeanette Archetto	Project Manager, Grant Thornton
Cassie Shewmaker	Business Analyst, Grant Thornton
Erin Mahony	Technical Analyst, Grant Thornton
Byron Hull	Academy Training Delivery Team Manager (AJI-215)
Jim Doskow	Branch Manager, En Route & Specialized Training (AMA-500)
Kelly Fives	Academy Quality Assurance Team (AMA-20)
Tom Adcock	National Air Traffic Controllers Association (NATCA)
Greg Bennett	Professional Association of Aeronautics Center Employees (PAACE) Representative