#### U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION



Effective Date: 9-15-2010

#### SUBJ: Flight Crewmember Mentoring, Leadership and Professional Development Aviation Rulemaking Committee

1. PURPOSE. This document establishes the Flight Crewmember Mentoring, Leadership and Professional Development Aviation Rulemaking Committee (ARC) according to the Administrator's authority under Title 49 of the United States Code (49 U.S.C.), section 106(p)(5).

#### 2. BACKGROUND.

a. In August 2010, Congress enacted the "Airline Safety and Federal Aviation Administration Extension Act of 2010." Section 206 of the Act, titled "Flight Crewmember Mentoring, Professional Development, and Leadership," requires the FAA to convene an ARC to develop procedures for each part 121 air carrier to establish flight crewmember mentoring programs, establish flight crewmember professional development committees, establish or modify training programs to accommodate substantially different levels and types of flight experience, and incorporate leadership and command training for all flight crewmembers.

**b.** To carry out the FAA's safety mandate, the FAA is chartering an ARC that will develop recommendations regarding rulemaking on flight crewmember mentoring, leadership, and professional development.

**3. OBJECTIVES AND SCOPE OF THE COMMITTEE.** The Flight Crewmember Mentoring, Leadership and Professional Development ARC will provide a forum for the U.S. aviation community to discuss recommendations that will help the FAA develop requirements to ensure that air carriers establish or modify programs that address mentoring, leadership and professional development of flight crewmembers in part 121 operations. Specifically, the ARC should consider and address:

- a) Flight crewmember mentoring programs;
- b) Flight crewmember professional development committees;
- Methods to establish or modify training programs to accommodate substantially different levels and types of experience;
- d) Enhancements to upgrade training to include leadership and command training;

e) Enhancements to Recurrent Training to include leadership and command training

f) Other actions that may enhance flight crewmember professional development

The ARC will develop recommendations and submit them to the Associate Administrator for Aviation Safety for rulemaking consideration by November 15, 2010.

#### 4. COMMITTEE PROCEDURES.

**a.** The committee provides advice and recommendations to the Associate Administrator for Aviation Safety. The committee acts solely in an advisory capacity.

**b.** The committee will discuss and present information, guidance, and recommendations that the members of the committee consider relevant in addressing the objectives.

#### 5. ORGANIZATION, MEMBERSHIP, AND ADMINISTRATION.

**a.** The FAA will establish a committee representing the various parts of the industry and Government:

(1) The ARC will consist of no more than 15 individuals;

(2) The FAA will invite selected organizations and individuals to participate as members in the ARC. The ARC will include representatives from the aviation community, including pilot associations and training organizations;

(3) The FAA will identify the number of ARC members that each organization may select to participate. The Associate Administrator for Aviation Safety will then request that each organization name its representative(s). Only the representative for the organization will have authority to speak for the organization or group that he or she represents; and

(4) Active participation and commitment by members will be essential for achieving the committee objectives and for continued membership on the ARC.

**b.** The Associate Administrator for Aviation Safety will receive the committee recommendations and reports.

**c.** The Associate Administrator for Aviation Safety is the sponsor of the committee and will select an industry chair(s) from the membership of the committee. Also, the Associate Administrator will select the FAA-designated representative for the committee. Once appointed, the industry chair(s) will:

(1) Determine, in coordination with the other members of the committee, when a meeting is required;

(2) Arrange notification to all committee members of the time and place for each meeting; and

(3) Draft an agenda for each meeting and conduct the meeting.

d. A Record of Discussions of committee meetings will be kept.

e. Although not required, committee meeting quorum is desirable.

6. PUBLIC PARTICIPATION. The Flight Crewmember Mentoring, Leadership and Professional Development ARC meetings are not open to the public. Persons or organizations that are not members of this committee and are interested in attending a meeting must request and receive approval before the meeting from the industry chair(s) or the designated Federal representative.

7. AVAILABILITY OF RECORDS. Under the Freedom of Information Act, 5 U.S.C. section 522, records, reports, agendas, working papers, and other documents that are made available to or prepared for or by the committee will be available for public inspection and copying at the FAA Flight Standards Service, Air Transportation Division, AFS-200, 800 Independence Avenue, SW., Washington, DC 20591. Fees will be charged for information furnished to the public according to the fee schedule published in Title 49 of the Code of Federal Regulations part 7.

**8. PUBLIC INTEREST.** Forming the Flight Crewmember Mentoring, Leadership and Professional Development ARC is determined to be in the public interest to fulfill the performance of duties imposed on FAA by law.

**9. EFFECTIVE DATE AND DURATION.** This committee is effective upon issuance. The committee will remain in existence 90 days from September 15, 2010, unless sooner terminated or extended by the Administrator.

ndolph Babbitt Administrator

## Flight Crewmember Mentoring, Leadership and Professional Development Aviation Rulemaking Committee (MLPARC)

The following list of participants includes (2) ARC Co-Chairs, as well as 9 ARC participants, for a total of 11 ARC members. Although the ARC Co-Chairs are from ATA and ALPA, we look to them to manage the ARC as a whole. We have also included ARC members from ATA and ALPA who can concentrate on strictly representing those organizations. We will also allow an organization to submit a primary and an alternate name as the representative from that organization.

#### **ARC Co-Chairs:**

#### Air Line Pilots Association (ALPA)

John Sluys National Chair for Professional Development 1625 Massachusetts Avenue, NW Washington, DC 20036 (202) 797-4029

#### Air Transportation Association (ATA)

Possible candidate, Jim Gorman Vice President of Training, FedEx 1301 Pennsylvania Avenue, NW, Suite 1100 Washington, DC 20004 (202) 626-4000

#### **ARC Participants:**

 National Association of Flight Instructors (NAFI) EAA Aviation Center P.O. Box 3086 Oshkosh, WI 54903-3086

Jason Blair NAFI Executive Director Office 920.426.6801 jblair@eaa.org

- Represents Flight Instructor interface in raising and maintaining professional standards
- Regional Airline Association (RAA) 2025 M Street., NW Washington, DC 20036

Roger Cohen President (202) 367-1170 cohen@raa.org

#### Air Line Pilots Association (ALPA) 1625 Massachusetts Avenue, NW Washington, DC 20036

John Prater President (202) 797-4029 John.prater@alpa.org

#### 4. Air Transportation Association (ATA)

1301 Pennsylvania Avenue, NW, Suite 1100 Washington, DC 20004

James May President (202) 626-4000

#### The University Aviation Association (UAA) 3410 Skyway Drive Auburn, AL 36830-6444

Dr. David A. NewMyer President (334) 844-2434

> The University Aviation Association (UAA) is the voice of collegiate aviation education with more than 525 members, including 105 accredited colleges and universities.

#### Coalition of Airline Pilots Association (CAPA) 1101 Pennsylvania Avenue, NW Suite 6646 Washington, DC 20004

Maryanne DeMarco Executive Director (202) 756-5027

> To address safety, security, legislative and regulatory issues affecting the professional flight deck crewmember

#### Regional Air Cargo Carriers Association (RACCA) 60 Clifford Road Plymouth, MA 02360

Stan Bernstein (508) 747-1430

#### 8. Flight Safety Foundation (FSF)

601 Madison Street, Suite 300 Alexandria, Virginia U.S. 22314

(703) 739-6700

 To pursue the continuous improvement of global aviation safety as an independent, impartial and nonprofit international membership organization

#### 9. National Air Carrier Association

100 Wilson Boulevard Suite 1700 Arlington, Virginia 22209

A. Oakley Brooks President 703-358-8065

## FLIGHT CREWMEMBER MENTORING, LEADERSHIP, AND PROFESSIONAL DEVELOPMENT AVIATION RULEMAKING COMMITTEE RECOMMENDATIONS

Report from the MLP ARC

November 2, 2010

## Table of Contents

Executive Summaryiii
1.0 MLP ARC Background1
2.0 Recommendations
2.1 Flight Crewmember Mentoring Programs
2.2 Flight Crewmember Professional Development
2.3 Methods to Establish or Modify Training Programs to Accommodate Substantially Different Levels and Types of Experience
2.4 Enhancements to Upgrade Training to Include Leadership and Command Training 22
2.5 Enhancements to Recurrent Training to Include Leadership and Command Training 27
2.6 Other Actions That May Enhance Flight Crewmember Professional Development
3.0 Dissenting Report
National Air Carrier Association (NACA)
Appendix A—Members and Staff A–1
Appendix B—Attendance GraphB–1
Appendix C—Acronyms C–1
Appendix D—Generational Communications Presentation D–1
Appendix E—Decision-making in AviationE-1
Appendix F—Workplace Preferences of Millennials in the Aviation IndustryF–1
Appendix G—2010 Pilot Source StudyG-1

### Executive Summary

On September 15, 2010, the Administrator established the **Flight Crewmember Mentoring**, **Leadership and Professional Development (MLP) Aviation Rulemaking Committee** (ARC) in response to Congress enacting the *Airline Safety and Federal Aviation Administration Extension Act of 2010 (Pub. L. 111–216).* Section 206 *Flight Crewmember Mentoring*, *Professional Development and Leadership*, requires each Title 14, Code of Federal Regulations (CFR) part 121 air carrier establish flight crewmember mentoring programs, establish flight crewmember professional development committees, establish or modify training programs to accommodate substantially different levels and types of flight experience, and incorporate leadership and command training for all flight crewmembers.

The MLP ARC provided a forum for the U.S. aviation community, including representatives from the Air Line Pilots Association (ALPA), Air Transport Association (ATA), Coalition of Airline Pilots Associations (CAPA), National Air Carrier Association (NACA), National Association of Flight instructors (NAFI), Regional Airline Association (RAA), and the University Aviation Association (UAA) to craft recommendations that will help the Federal Aviation Administration (FAA) develop requirements for air carriers to establish or modify programs addressing mentoring, leadership, and professional development of flight crewmembers in part 121 operations. The MLP ARC was tasked with developing recommendations by November 15, 2010, for submittal to the Associate Administrator for Aviation Safety for rulemaking consideration.

The MLP ARC established an aggressive schedule to meet the timeline and fully deliberated these important questions. Members of the MLP ARC provided their knowledge of current programs in these areas and reached out to industry for supporting documentation of research and existing courses to establish a "best practices" baseline. In order to fulfill its charter, the members of the MLP ARC focused on a strategy to establish the competencies of the professional pilot. A professional pilot is one who has achieved a level of knowledge, skill, attitude, and behavior that assures competence in the safe and efficient operation of aviation systems for the benefit of the traveling public. A professional pilot is a specialist possessing a distinct body of knowledge gained by study, experience, and practice. The desired outcome, therefore, is a professional pilot who applies those attributes to the safe and efficient operation of aviation of aviation systems using imagination, intuition, judgment, competence, reason, ethics, integrity, and responsibility.

The MLP ARC created specific recommendations with significant detail for each of the six areas requested, all of which have overlapping elements, but specifically, the MLP ARC recommends—

- Flight crewmember mentoring programs—
  - Select and train "career mentors" for newly hired pilots, initial upgrading captains, and other specific situations that the carrier's "professional development steering committee" deems necessary, and

- Establish an air carrier mentoring program through education and training of all flight crewmembers, instructors and flight operations leaders.
- Flight crewmember professional development committees—
  - Establish a new part 119 professional development position, charged with the duties and responsibilities of professional development programs at the air carrier, and
  - Establish a professional development steering committee (PDSC) consisting of leaders of flight operations management and pilot representatives for career professional development programs specific to the air carrier to oversee all professional development programs.

# • Methods to establish or modify training programs to accommodate substantially different levels and types of experience—

- Improve and expand upon the new-hire pilot indoctrination course, specific to the air carrier and its operational environment, to include a basic understanding of the air carrier's management, the pilot's representation, and the company's professional development program, and
- Determine through the PDSC whether current flight crewmembers have a level of knowledge equivalent to the new indoctrination course and to provide gap training so that all crewmembers have a common level of knowledge.
- Enhancements to upgrade training to include leadership and command training—
  - Establish a minimum 32-hour course in leadership and command for newly upgrading captains.
- Enhancements to recurrent training to include leadership and command training-
  - Establish a 4-year cycle with continuing education on mentoring, professional development, and leadership and command skills.
- Other actions that may enhance flight crewmember professional development—
  - Provide training on leadership and command principles to all flight crewmembers,
  - Introduce leadership and command principles into the knowledge test. The practical test standards (PTS) will reflect the need for the applicant to demonstrate this knowledge during the Commercial Pilot, Certificated Flight Instructor, and Air Transport Pilot practical test.
  - Require that all pilots hired by part 121 operators be required to hold, at a minimum, a bachelor's degree. Any flight crewmember employed by a part 121 air carrier on the date of implementation to be "grandfathered" for the remainder of their career.

The members of the MLP ARC wish to thank the Administrator for the opportunity to offer our recommendations on these important questions confronting the air carrier industry. We remain available for further consultation as necessary.

Respectfully submitted,

Captain Kurt Shular MLP ARC Co-Chair Air Transport Association Captain John Sluys MLP ARC Co-Chair Air Line Pilots Association, International

## 1.0 MLP ARC Background

#### MLP ARC CHARTER

The Flight Crewmember Mentoring, Leadership and Professional Development (MLP) Aviation Rulemaking Committee (ARC) will provide a forum for the U.S. aviation community to discuss recommendations that will help the Federal Aviation Administration (FAA) develop requirements to ensure that air carriers establish or modify programs that address mentoring, leadership and professional development of flight crewmembers in Title 14, Code of Federal Regulations (CFR) part 121 operations. Specifically, the MLP ARC should consider and address—

- a) Flight crewmember mentoring programs,
- b) Flight crewmember professional development committees,
- c) Methods to establish or modify training programs to accommodate substantially different levels and types of experience,
- d) Enhancements to Upgrade Training to include leadership and command training,
- e) Enhancements to Recurrent Training to include leadership and command training, and
- f) Other actions that may enhance flight crewmember professional development.

The MLP ARC will develop recommendations and submit them to the Associate Administrator for Aviation Safety for rulemaking consideration by November 15, 2010.

# AIRLINE SAFETY AND FEDERAL AVIATION ADMINISTRATION EXTENSION ACT OF 2010 (PUB. L. 111–216) § 206

# SEC. 206. FLIGHT CREWMEMBER MENTORING, PROFESSIONAL DEVELOPMENT, AND LEADERSHIP.

(a) AVIATION RULEMAKING COMMITTEE.—

(1) IN GENERAL.—The Administrator of the Federal Aviation Administration shall convene an aviation rulemaking committee to develop procedures for each part 121 air carrier to take the following actions:

(A) Establish flight crewmember mentoring programs under which the air carrier will pair highly experienced flight crewmembers who will serve as mentor pilots and be paired with newly employed flight crewmembers. Mentor pilots should be provided, at a minimum, specific instruction on techniques for instilling and reinforcing the highest standards of technical performance, airmanship, and professionalism in newly employed flight crewmembers.

(B) Establish flight crewmember professional development committees made up of air carrier management and labor union or professional association representatives to develop, administer, and oversee formal mentoring programs of the air carrier to assist flight crewmembers to reach their maximum potential as safe, seasoned, and proficient flight crewmembers.

(C) Establish or modify training programs to accommodate substantially different levels and types of flight experience by newly employed flight crewmembers.

(D) Establish or modify training programs for second-in-command flight crewmembers attempting to qualify as pilot-in-command flight crewmembers for the first time in a specific aircraft type and ensure that such programs include leadership and command training.

(E) Ensure that recurrent training for pilots in command includes leadership and command training.

(F) Such other actions as the aviation rulemaking committee determines appropriate to enhance flight crewmember professional development.

#### DELIBERATIONS

The MLP ARC began its discussions on Wednesday, September 29, 2010, and met frequently until November 2, 2010, in an effort to meet the aggressive timeline established by the Administrator. During this period, the MLP ARC members received copies of programs for new-hire pilot indoctrination, union pilot mentoring programs, and upgrade/in-command syllabi from industry. The ARC also received a presentation from Chris Brown, SkyWest Airlines, concerning its professional development courses.

The MLP ARC also received briefings from Captain Dave Bushy, Chief Operations Officer (COO) and president, Cape Air/Nantucket Airlines; Mr. Don Skiados, President of Leadership, Communications and Training; and Mr. Phil Comstock, president of the Wilson Center for Public Research, who collectively addressed the generational differences in the pilot workforce and provided a look into the future air carrier pilot characteristics and how they communicate, interact, and prioritize their personal and professional lives. The ARC reviewed the 2010 Pilot Source Study, a research product of six air carriers and five academic institutions. The ARC also reviewed a report from Dr. Mary Niemczyk, Assistant Professor in Aeronautical Management Technology at Arizona State University, discussing the Workplace Preferences of Millennials in the Aviation Industry and Decision-making in Aviation: Developing a Qualified Workforce. These research reports provided an examination of the future aviation professional and stressed the importance for detailed regulation and structure necessary for procedural adherence in the workplace.

#### DISCUSSION

Current 14 CFR are silent on several of the questions posed to the MLP ARC. However, a limited number of air carriers have already instituted some programs on mentoring, leadership, and professional development that address the needs identified by Congress and the MLP ARC's charter. The MPL ARC reviewed industry best practices that exemplified an excellent foundation for our discussion and we thank the air carriers and unions that provided this information.

The MLP ARC proposes the FAA create new regulations addressing the areas of mentoring, leadership, and professional development taking into consideration existing differences between generations of aviation professionals. The ARC recommends higher standards in both education and training beyond the part 121 issues brought before the ARC. The ARC's view is that the following recommendations are essential to fostering the most safety conscious, professional, educated, and trained pilot workforce necessary to meet the demands of future air transportation.

Throughout this document, the MLP ARC uses the phrase "new-hire pilot" to represent new first officers and/or new flight engineers on a pilot career track. Also, comments and recommendations concerning passenger operations may not be applicable to all-cargo operations.

## 2.0 Recommendations

#### 2.1 FLIGHT CREWMEMBER MENTORING PROGRAMS

Pub. L. 111–216 § 206(a)(1)(A) reads, "Establish flight crewmember mentoring programs under which the air carrier will pair highly experienced flight crewmembers who will serve as mentor pilots and be paired with newly employed flight crewmembers. Mentor pilots should be provided, at a minimum, specific instruction on techniques for instilling and reinforcing the highest standards of technical performance, airmanship, and professionalism in newly employed flight crewmembers."

The MLP ARC's charter includes a tasking which incorporates the prescriptive language of 206(a)(1)(A) on this subject that reads, "Specifically, the ARC should consider and address flight crewmember mentoring programs."

#### BACKGROUND

There is currently no requirement for 14 CFR part 121 air carriers to incorporate mentoring programs into air carrier training.

Mentoring refers to a personal, developmental relationship in which a more experienced or more knowledgeable person helps a less experienced or less knowledgeable person. The receiver of mentoring is traditionally referred to as a protégé. The MLP ARC was chartered to develop a flight crewmember mentoring program, as described above.

#### **DESIRED OUTCOMES**

*For the air carrier*: Create a mentoring environment and have a continual source of de-identified mentoring data on new-hire pilots for analysis, evaluation, and improvement of the mentoring program.

*For the career and flightcrew mentor*: Increase professionalism and the level of command and leadership skills by mentoring protégé pilots.

*For the protégé pilot*: Increase pilot professionalism, responsibility, and leadership/followership skills.

#### RECOMMENDATIONS

The MLP ARC recommends the creation of two mentoring programs: long-term career mentoring and flightcrew mentoring. The long-term career mentoring is accomplished by a relationship between a protégé pilot and a highly experienced senior pilot. Flightcrew mentoring is facilitated by the short-term relationship between every captain and a first officer protégé that occurs naturally with each crew pairing.

#### **Career Mentors**

The air carrier will establish a career mentoring program with incentives for respected senior pilots to volunteer their time and expertise to develop professionalism in new-hire pilots and pilots who are taking major steps in their air carrier career. Career mentors are pilots who are willing to establish a professional relationship with another pilot to educate, train, and guide them. Career mentors must be respected, seasoned pilots who volunteer to be part of the air carrier's career mentoring program. Career mentors, after being selected by the certificate holder's PDSC, will receive specialized mentoring training and annual recurrent training that emphasizes items gleaned from mentoring program data collection. Career mentors are not required to be aircraft specific. Career mentors are also not required to be seniority list pilots, but they must have recent experience with the company and the operation such as retired company pilots with ample experience.

Career mentors are paired with protégé pilots at the following career milestones: (1) new-hire pilots during their first year following initial hire, (2) operational transitions, and (3) initial captain upgrade at the air carrier for a captain's first year. The career mentor and protégé pilot will meet periodically, as determined by the PDSC.

#### New-hire Period

The first year of employment, traditionally a probationary period, will be a mentoring year. The air carrier's PDSC will determine the requirement for a probationary period and will evaluate the value and/or impact of probationary periods on productive mentoring programs.

When required by the air carrier's hiring process, the PDSC will select career mentors from the pool of trained career mentors and assign them to the new-hire pilots. Considerations for pairing should include baseline information for each pilot including, qualifications, education, and experience. Career mentors will meet with their assigned protégé pilots during the indoctrination program.

Career mentors will review protégé reports provided by captains—flightcrew mentors—who fly with new-hire pilots (see below). These protégé reports are constructive, not disciplinary. Career mentors will debrief the protégé during scheduled meetings, then these reports will be de-identified and included in a database used for trend analysis and program improvement. A summary of the reports will be used as data for industry research and professional development program enhancements.

In rare circumstances, a career mentor may receive an accumulation of negative reports on an individual protégé. After making determined efforts to correct the situation, the career mentor may decide to report serious irregularities, after notifying the protégé pilot. The career mentor will communicate with the pilot union's professional standards committee (as applicable) and, based on the situation, may make a report to the chief pilot, who will notify the PDSC about any action.

#### **Operational Transitions**

The PDSC may determine that certain operations or transitions, such as domestic to international or pilots returning to active line flying after a long absence, should have a mentoring period. After this determination, the PDSC will assign a career mentor and determine the mentoring period.

#### Initial Captain Upgrade

A pilot's initial year after upgrading to captain will be a "career mentoring year." New captains—protégé captains—will be assigned a career mentor based on a process established by the PDSC.

#### **Flightcrew Mentor**

Air carriers should establish a mentoring environment by training all captains to be flightcrew mentors. This will be accomplished by training existing captains on mentoring skills and providing the same mentoring training to new captains in the leadership and command program. Mentoring skills will be reinforced during the recurrent mentoring module. New-hire protégé pilots will also be trained in the mentoring process during their initial indoctrination.

All captains will mentor new-hire protégé pilots when paired with them and provide feedback to help each reach the highest standards of technical performance, airmanship, and professionalism.

Flightcrew mentors will complete a protégé report for every crew pairing with a new-hire protégé pilot and will send the report directly to the protégé's career mentor. The protégé reports will reflect the air carrier's professional development requirements as defined by the PDSC.

#### 2.2 FLIGHT CREWMEMBER PROFESSIONAL DEVELOPMENT

Pub. L. 111–216 § 206(a)(1)(B) reads, "Establish flight crewmember professional development committees made up of air carrier management and labor union or professional association representatives to develop, administer, and oversee formal mentoring programs of the carrier to assist flight crewmembers to reach their maximum potential as safe, seasoned, and proficient flight crew members."

The MLP ARC's charter includes a tasking which incorporates the prescriptive language of § 206(a)(1)(B) on this subject that reads in part, "Specifically, the ARC should consider and address...[F]light crewmember professional development committees."

#### BACKGROUND

Most professions require an on-going education or professional development element for continued certification. Although flight crewmembers are required to attend recurrent training or a continuing qualification course, these training programs focus on the specific aircraft and situational scenarios regarding system irregularities and/or air carrier operations. As a profession however, only certain organizations have outlined the professional requirement and/or ethical principles for air carrier pilots, such as ALPA's Code of Ethics. The 14 CFR is silent on the need to foster, educate, and train pilots on the concepts and skills required to embody professionalism in an effort to maximize safety.

#### PROBLEM

Some air carriers have realized the importance of mentoring flight crewmembers through an effective indoctrination or pilot-in-command course, but do so in a variety of ways and without a consistent curriculum and regulatory method of oversight. In addition, the 14 CFR should provide specific guidance on the responsibility of each air carrier's professional development programs. If any professionalism program is to have maximum benefit and enhancement to operational safety, it requires a partnership of all stakeholders.

#### **DESIRED OUTCOMES**

*For the air carrier:* Create a professional environment where professional development is managed, promoted, and valued.

*For the pilots:* Possess leadership and professional skills and to continually develop those skills from the new-hire pilot interview to retirement.

*For the industry:* Have a continuous source of de-identified professional development data from the air carriers for analysis, evaluation, and program improvement.

#### RECOMMENDATIONS

The MLP ARC felt it important that each air carrier have a coherent professional development plan that will instill the concepts of leadership and professionalism throughout a pilot's career. A typical pilot career has various points where the air carrier can have an impact on a pilot's professional development. Two examples are when a pilot is hired or upgrades to captain. Having in place positive programs that continually develop and cultivate professionalism will, in the ARC's view, have a profound impact on safety, standardization, professional ethics, and integrity.

#### 14 CFR Part 119 Professional Development Position

In order to standardize the industry around these programs, the MLP ARC recommends the creation of a full-time part 119 professional development position dedicated solely to the professional development program at the air carrier. The ARC also recommends that the individual who holds this position must—

- Have an Air Transport Pilot (ATP) certificate;
- Have had at least 3 years of part 121 experience as a pilot;
- Have, at a minimum, a bachelor's degree; and
- Be qualified through training, experience, and expertise.

The MLP ARC believes these responsibilities should be specifically designated to the individual professional development position:

- As related to professional development, oversee the air carrier pilot interviewing process, indoctrination program, recurrent training, leadership and command training, mentoring programs, and internship programs;
- Convene and chair quarterly meetings of the PDSC (members of which are outlined below);
- Ensure PDSC members are released from flight duty and made available;
- Network with academic and professional organizations, and training academies such as the University Aviation Association, Aviation Accreditation Board International, Women in Aviation, Organization of Black Aerospace Professionals, International Society of Women Airline Pilots;
- Provide professional development programs for flight operations management;
- Collect, assess, and share data for the purpose of improving the program;
- Develop specific initial and recurrent leadership and command training for instructors/check airmen/part 119 personnel with emphasis on recognizing and measuring knowledge, skills, and abilities; and facilitating debriefs for internal or contract training.

- Work with the training department to develop a plan to ensure instructors stay active in current line operations;
- Require senior management to be trained in leadership and command principles as they relate to flight crewmembers.

#### **Professional Development Steering Committee**

The MLP ARC recommends that in order to have a collaborative professional development program, each air carrier establishes a PDSC that meets at least quarterly. The PDSC must consist of leaders of flight operations management and pilot representatives, such as from the pilot's union, and focus on career professional development programs specific to the air carrier. The committee should include the following disciplines as they may exist at each air carrier:

- Flight Operations Professional Development representative (part 119),
- Human Factors representation from Flight Operations,
- Pilot representative of Professional Development, such as a union Professional Development chairman,
- Pilot representative of Professional Standards, Human Factors/Training, for example a union Professional Standards and/or Human Factors Training chairman, and
- A representative of Senior Flight Operations Management.

The MLP ARC has identified the following responsibilities for the PDSC:

- As they relate to professional development, develop the air carrier pilot interviewing process, indoctrination program, recurrent training, leadership and command training, mentoring programs, and internship programs;
- Provide professional development for instructors, line check pilots, and all flight operations management;
- Design and collect assessments of professional development programs, conduct program evaluations, and use the results for continual improvement of professional development programs;
- Ensure that current flight crewmembers have a common level of knowledge encompassing the complete indoctrination program;
- Provide oversight to ensure air carriers are screening new-hire pilot applicants for professional, leadership, and command skills; and
- Share de-identified data with industry and academia.

# 2.3 METHODS TO ESTABLISH OR MODIFY TRAINING PROGRAMS TO ACCOMMODATE SUBSTANTIALLY DIFFERENT LEVELS AND TYPES OF EXPERIENCE

# Pub. L. 111–216 § 206(a)(1)(C) reads, "Establish or modify training programs to accommodate substantially different levels and types of flight experience by newly employed flight crewmembers."

The MLP ARC's charter includes a tasking which incorporates the prescriptive language on this subject in § 206(a)(1)(C) reads in part, "Specifically, the ARC should consider and address...[m]ethods to establish or modify training programs to accommodate substantially different levels and types of experience."

#### BACKGROUND

The MLP ARC believes the most appropriate way to address the requirements of § 206(a)(1)(C) and the ARC's charter for accommodating substantially different levels and types of flight experience is to significantly improve air carrier indoctrination training. Because this training is the first exposure a new-hire air carrier pilot will receive from the new employer or the pilot union, the training should be comprehensive. The ARC discovered there is much variation among 14 CFR part 121 air carriers with respect to meeting or exceeding, current regulatory requirements to provide indoctrination training. Air carriers exhibiting industry best practices exceed current regulations by providing new pilots with as much as two concentrated weeks of instruction and opportunities for learning. However, other air carriers may give considerably less time to this training and cover only the basic subjects which are required by current regulations.

The MLP ARC determined the indoctrination training requirements contained in part 121 contribute to this problem because none are written in a manner to ensure new flight crewmembers receive a comprehensive education on the subjects needed for subsequent training. These subjects include an overview of management and pilot representative functions, flight operations, and professionalism. The accidents which prompted the passage of Pub. L. 111–216 into law demonstrated that these topics require longer and more thorough training to ensure new-hire pilots can demonstrate a comprehensive understanding before advancing to the next phase of their training.

Following are the pertinent sections of 14 CFR part 121 regarding indoctrination training:

§ 121.415 Crewmember and dispatcher training requirements.

(a) Each training program must provide the following ground training as appropriate to the particular assignment of the crewmember or dispatcher:

(1) Basic indoctrination ground training for newly hired crewmembers or dispatchers including 40 programmed hours of instruction, unless reduced under §121.405 or as specified in § 121.401(d), in at least the following:

(i) Duties and responsibilities of crewmembers or dispatchers, as applicable;

(ii) Appropriate provisions of the Federal Aviation Regulations;

(iii) Contents of the certificate holder's operating certificate and operations specifications (not required for flight attendants); and

(iv) Appropriate portions of the certificate holder's operating manual.

§ 121.909 Approval of Advanced Qualification Program [AQP].

(a) Approval process. Application for approval of an AQP curriculum under this subpart is made, through the FAA office responsible for approval of the certificate holder's operations specifications, to the Manager of the Advanced Qualification Program.

(b) Approval criteria. Each AQP must have separate curriculums for indoctrination, qualification, and continuing qualification (including upgrade, transition, and requalification), as specified in §§ 121.911, 121.913, and 121.915. All AQP curriculums must be based on an instructional systems development methodology. This methodology must incorporate a thorough analysis of the certificate holder's operations, aircraft, line environment and job functions. All AQP qualification and continuing qualification curriculums must integrate the training and evaluation of [crew resource management] (CRM) and technical skills and knowledge. An application for approval of an AQP curriculum may be approved if the program meets the following requirements:

§ 121.911 Indoctrination curriculum.

Each indoctrination curriculum must include the following:

(a) For newly hired persons being trained under an AQP: The certificate holder's policies and operating practices and general operational knowledge.

(b) For newly hired crewmembers and aircraft dispatchers: General aeronautical knowledge appropriate to the duty position.

(c) For instructors: The fundamental principles of the teaching and learning process; methods and theories of instruction; and the knowledge necessary to use aircraft, flight training devices, flight simulators, and other training equipment in advanced qualification curriculums, as appropriate.

(d) For evaluators: General evaluation requirements of the AQP; methods of evaluating crewmembers and aircraft dispatchers and other operations personnel, as appropriate, and policies and practices used to conduct the kinds of evaluations particular to an AQP, e.g., [line operating experience].

#### PROBLEM

These regulations have helped to foster a one-size-fits-all training curriculum at some air carriers that is inadequate for providing the type of comprehensive, informative introduction to air carrier flying needed by every new flight crewmember. Indoctrination training must address the gaps between what the pilot has learned from prior education, training, and experience, and what is needed to be proficiently flying the line at their new employer.

New-hire pilots come from a wide variety of backgrounds and types and levels of experience. These backgrounds include general aviation, corporate aviation, other air carriers, the military, or a combination. The equipment flown by new pilots before hiring also varies. Below are several theoretical examples of pilots, each holding an ATP certificate, to demonstrate the variability of knowledge and experience new-hire pilots may bring to an employer:

- A civilian flight instructor with most of the experience in single-engine or twin-engine, piston-powered aircraft operating at slow speeds, low altitudes, and in relatively uncomplicated airspace;
- An academically trained commercial certificated pilot who may also have experience such as a jet transition course, but has limited flight experience in that environment;
- A civilian helicopter pilot with just a few hundred hours of fixed-wing time, but has considerable knowledge of complex airspace and complicated aircraft systems;
- A fighter pilot with significant experience flying very complex aircraft at high speeds in demanding airspace, but no experience operating in a multi-crew environment;
- A furloughed air carrier pilot who has changed employers and has significant flight time in turboprops flying between major hub and small or non-hub airports, but no experience flying wide-body aircraft in international operations; and
- A corporate pilot with nearly all flying time in warm climates and has little experience flying in very inclement weather and in mountainous terrain.

There are other variables including the total amount of flight time in the logbook; the amount, quality, and type of formal education in aviation; the amount, quality, and type of aviation training; the time served as pilot-in-command; experience with glass cockpits; knowledge of and experience in flying highly automated aircraft; and experience flying turbine-powered aircraft.

The current 14 CFR on indoctrination need revision. Unlike prior generations of pilots who often served as flight engineers and learned a great deal about air carrier flying by observing seasoned professionals over a period of years, today's new-hire air carrier pilots often occupy the right seat of high-performance jets in very complicated airspace on their very first passenger-carrying trip.

The MLP ARC notes there is no industry standard or set of recognized best practices for providing indoctrination training. The FAA has not published an Advisory Circular (AC) on indoctrination training, although it does have one on Crew Resource Management (AC 120–51E), which contains some of the concepts that could be incorporated into such training.

Based on its findings, the MLP ARC concluded the scope and quality of indoctrination training should be significantly enhanced by all part 121 air carriers.

#### **DESIRED OUTCOMES**

*For the air carrier:* Equalize the level of knowledge, skill, attitude, and behavior for all new-hire pilots to achieve a company standard.

*For the new-hire pilots*: Possess the level of knowledge, skill, attitude, and behavior to operate safely and efficiently in an air carrier's unique operation.

#### RECOMMENDATIONS

The MLP ARC recommends that part 121 be amended to strengthen indoctrination training requirements. Industry best practices and/or a standard training template should be developed and promulgated within an existing or new AC. Indoctrination training should be tailored to the aircraft on the property and the air carrier's unique operational environment. Three subject areas should be addressed by indoctrination training: (1) an overview of air carrier management and the pilot union (as applicable); (2) flight operations; and, (3) professional development.

The PDSC must develop special indoctrination training for all pilots when special events occur in the life of the company, such as mergers or acquisitions, which insures that all pilots are operating from a standard operating procedure.

#### **Improved Indoctrination Training**

Following is a summary of the content of the three subject areas of indoctrination training, that in some degree overlap current requirements contained in part 121.

#### Air Carrier Management and Pilot Union Overview

- *Company history*—New-hire pilots should be familiarized with the company's history, successes, challenges, and opportunities. This introduction should be provided by a member of the air carrier's senior management with the goals of helping the new employee start the process of acclimating to the company and taking personal pride and responsibility for its future success.
- *Corporate culture*—Each air carrier has its own, unique culture and ways of meeting customer and employee expectations and needs. Successful air carrier cultures are very positive and provide an atmosphere which emphasizes excellence, team-building, and recognition of the contributions of its employees. The new-hire pilot should be welcomed to the company and the company's unique culture should be revealed during indoctrination training.
- *Mission statement*—Each air carrier should have a mission statement that expresses the company's goals. The statement should be known and understood by new pilots to help them better understand the role they play in their air carrier's success.
- *Code of ethics*—The company should have a code of ethics which calls on everyone in the company, from the chairman of the board to the lowest paid employee, to maintain the highest degree of integrity, excellence, and professionalism in all matters of conduct.

- *Management and departments*—New employees should meet with senior management, to include the chief executive officer, COO, and/or other senior personnel. Such a meeting can be used to give the new employee a greater understanding of the company's mission and culture and help address any questions or concerns which they may have. If one or more of these individuals cannot attend indoctrination training, as a minimum, a welcome from senior management should be video recorded and shown to these employees.
  - The company's chain of command should be described in some detail, to include each position's role, responsibility, and the names of individuals in those positions. This should include a discussion of the regional chief pilot, fleet captains, vice president of flight operations, etc. The goal of this training is to ensure new pilots understand proper protocols and know where to get guidance and assistance.
  - In addition to the flight operations department, new-hire pilots should also be given an overview of other departments that are important to the pilot including safety, in-flight (as applicable), scheduling, dispatch, human resources, training, and business and pleasure travel. Briefings by the heads of these departments or their designees should help pilots understand the functions, resources, and points of contact for each.
- *Pilot union or representative and its function (if applicable)*—Pilot unions play a key role in the new-hire pilot's work life through collective bargaining on behalf of pilots, ongoing interaction with company officials, and representation. The union and company ideally form a partnership that provides an enhanced means for both organizations to accomplish their respective goals.
  - Company and union representatives should make a joint presentation to new-hire pilots to demonstrate the partnership that exists, discuss the contract negotiation process, and describe the professionalism that company and union members should adhere to under all circumstances.
  - The complete terms and conditions of employment should be given to the new-hire pilots to help them understand the terms of wages, benefits, insurance, representation, and other components, such as collective bargaining agreement as applicable.

#### Flight Operations

The MLP ARC believes training in these topics must be given to all new-hire pilots. In the past, a few of these topics were covered only in aircraft-systems training or during Initial Operating Experience (IOE). The MLP ARC does not advocate moving these specific subjects from systems training or IOE to indoctrination, but rather, to expand on them in those phases of training. This additional training/review will allow for a greater understanding and better preparation by the new-hire pilot during aircraft systems training and IOE. Flight operations subject areas to be initially covered during indoctrination training should include the following:

- *High altitude aircraft performance*—This review should include high altitude aerodynamics, coffin corner, mach tuck, aircraft stability, and how these relate to everyday line flying. Examples would be choosing a flight level, fuel burn, Mach number transition, and turbulence considerations.
- *High altitude physiology*—This review should include the effects of high altitude flying on the body, with an emphasis on the use of oxygen above flight level 250 whenever a flight crewmember leaves the flightdeck.
- *Aircraft icing and deicing systems*—Review cold weather operations, meteorological conditions in flight and on the ground, when to use anti-icing/deicing systems, when to use deicing/anti-icing fluid, types of fluid, characteristics of fluid, and hold-over times.
- *Maintenance considerations*—Most new-hire pilots are first officers and their interaction with maintenance may be infrequent, but it is important for the first officer (or new-hire pilot) to understand all maintenance functions, the impact of maintenance on an operation, and the associated procedures. A review of the following maintenance topics should be achieved during training: approved minimum equipment list (MEL) procedures; approved configuration deviation list (CDL) procedures and impacts on performance from CDL items; handling multiple deferrals; performing a logbook write up; interaction with the maintenance operations center and line maintenance; and company procedures for write ups, both at out-stations and hubs.
- *Operations Control Center (OCC)*—The role and responsibility of the OCC to provide scheduling and dispatch services should be described in detail.
  - The services provided by dispatch, various means of communications with dispatch, such as Aircraft Addressing and Reporting System (ACARS), and partnership between the captain and dispatch needed to conduct safe flights should be explained in detail. New-hire pilots should visit the OCC, either during indoctrination training, or as soon as practical, to obtain an understanding of the center's functions, resources, and operating methods. The new-hire pilot should understand the role of dispatch, how it functions, how decisions are made concerning delays from weather or maintenance, and the nature of daily interaction between the first officer and dispatch.
- *Bidding*—Use of the scheduling system, such as the Preferential Bidding System (PBS) should be covered sufficiently so the new pilot is competent to request a schedule.
- *Weight and balance*—The new-hire pilot should understand company procedures for calculating weight and balance, be able to describe procedures if changes need to be made, and incorporate variables which may affect weight and balance.
- *Performance*—Limitations are an important aspect of aircraft performance. While aircraft-specific limitations are addressed in aircraft systems training, general limitations should be reviewed during indoctrination training including maximum takeoff weight (which may be restricted by aircraft, performance, or trip fuel burn), climb performance, MEL/CDL restrictions, mountains/terrain, and runway conditions.

- *Manuals and charts*—Thorough training on all company manuals will help the new hire pilot understand the corporate culture, safety regulations, company procedures, company dynamics, and make the transition to line flying. While the number and type of manuals varies by company, all air carriers should include the following manuals into indoctrination training:
  - Operations specifications (Op Specs). Should include a review of the contents of each section, such as A–E, and emphasize the regulatory nature of Op Specs to the air carrier.
  - Flight operations manual (FOM). Indoctrination training should cover the basics of what information can be found in the FOM and how the manual can be used as an information reference guide.
  - Ground operations manual (as applicable). New-hire pilots will have a general understanding of ground operations.
  - In-flight procedures. These documents include abnormal and emergency procedures, evacuations, briefings, and normal operations.
  - Instrument charts. It cannot be assumed that all new-hire pilots have always used the same instrument charts. A brief overview of company charts allows the new-hire pilot to review a new chart format in a relaxed setting prior to simulator training when workload is much higher.
  - Electronic Flight Bag, introduction and use (if applicable).
- *Hazardous materials*—The new-hire pilot should be trained on transporting hazardous materials in accordance with all applicable regulations.
- *Weather*—New-hire pilots should be trained on how to optimize use of radar in all appropriate situations. This includes radar tilt, gain, weather/turbulence function, a description of what the colors mean under all conditions, intensity of returns, and how to tell if precipitation is convective.
  - New-hire pilots should be taught how to recognize convective activity, and whether storms are dissipating, growing, or moving. Pilots need to know how to determine whether a storm will affect takeoff, landing or approach.
  - New-hire pilots should be taught that there are different levels of turbulence intensity (i.e., chop, light, moderate, heavy, and severe). Severe turbulence can come from wake, clear air, mountain waves, and thunderstorms, especially downwind of a storm. Pilots should be trained on how to anticipate, avoid, and/or react to these different types of turbulence. New-hire pilots should be trained on flight attendant and passenger considerations in dealing with turbulence to include selection of different altitudes to find smoother air which in turn builds on knowledge of high-altitude aerodynamics and aircraft controllability.

- The types of weather pilots have experienced prior to being hired by an air carrier can vary considerably from the weather that will be encounter with the company. Indoctrination training should anticipate this type of gap and inform the new-hire pilot of all of the various types of operating conditions and the company's specific and relevant training, procedures, and equipment. These conditions include, but are not limited to low-visibility taxi operations, Surface Movement Guidance and Control Systems, low-minimums landing operations, high-altitude weather, cold weather operations, international flying considerations (as applicable), and use of weather planning tools.
- *The decision to fly*—The fly/no-fly decision encompasses many factors, such as weather, maintenance, fatigue, duty time, performance, runway conditions, health, and experience. The new-hire pilot plays a role in this decision. While not responsible for making the ultimate fly/no-fly decision, input from the new-hire pilot may make the difference in the captain's final decision. This input is a critical factor in the safety of the air carrier.
- *Rejected takeoffs*—This training should capture the philosophy of the company's aborted-takeoff decisionmaking process.
- *International flying (if applicable)*—This training is meant to introduce the new-hire pilot to international flying in general or to supplement a company's international training program. As a minimum, a company should introduce the new-hire pilot to the following subject areas of international flying: extended-range twin-engine operations (as appropriate); oceanic flight; customs and immigrations; cultural issues; and flight and personal security.
- *Observation flights*—Observation flights in the cockpit jumpseat are valuable for introducing the new-hire pilot to operations and company procedures. These flights should be used as an integral part of the indoctrination training process helping to reinforce information learned during training and ease the transition to line operations. All air carriers should be required to provide one or more observation flights prior to IOE. Precedent for this practice is established for air carriers to provide observation flights to dispatchers (reference § 121.463).
- *Training*—An overview of the training program and types of training, such as AQP or standard; training schedule, expectations, and completion standards should be presented. The new-hire pilot now knows the expectation and can prepare accordingly. Topics should include an overview of recurrent training.
- *Safety*—All air carriers stress safety and the importance of daily performing safe operations. New-hire pilots may not be familiar with common FAA and air carrier safety programs or air carrier-specific safety procedures. A review of all FAA and company safety programs and how they relate to the new-hire pilot should be reviewed; these include Safety Management System, Aviation Safety Action Program, and Flight Operational Quality Assurance. The new-hire pilot should know how to report unsafe activity to company personnel.

- *Security*—As leaders of the air carrier, pilots are critical to air carrier security by their examples and presence. Other crew and ground employees will look to the pilot for guidance and setting the right example regarding security. As such, a pilot's understanding of air carrier security is important and proper education of air carrier security is essential in indoctrination and recurrent training. Some of the items that should be trained include:
  - Security identification display area (SIDA) rules and training. Pilots need to know what a SIDA badge is, the training required to obtain one, the access it grants, and the responsibilities associated with having the badge.
  - Air operations area (AOA). Define AOA and discuss its relationship to the SIDA. Describe the "footprint" of the aircraft and how it relates to all airports, including international.
  - Ground Security Coordinator. Identify the role and responsibility of this company position, plus how they should be contacted and under what circumstances.
  - In-Flight Security Coordinator (ISC). Identify the role and responsibilities of this duty of a captain. Demonstrate how the new-hire pilot may be called upon to help the pilot in command fulfill the obligations of that role.
  - Federal Flight Deck Officer Program. Pilots new to air carrier flying need to understand the reason for this program, that the TSA operates it, and operational considerations when flying with another pilot who is armed under this program.
  - Federal Air Marshals. New-hire pilots will understand the relationship between these law enforcement officers and cockpit security.
  - Law enforcement officers flying armed. The air carrier's procedures for handling these individuals, and the pilot's role in the process, should be covered during this training.
  - Airport security screening and the Crew Personnel Advanced Screening System.
    Pilots should understand that they are screened in similar fashion to passengers, with some differences.
  - Flight deck security. New-hire pilots should understand specific company procedures and appropriate response to various security threats.
- *Terminal safety considerations*—Review the need to always be vigilant in the terminal, regardless of whether on a trip, deadheading, or commuting. New-hire pilots should understand ramp safety considerations which include international operations (when safety vest is required), the footprint of the aircraft, painted areas for equipment, use of wing walkers, fueling precautions, and vigilance during walk around.

- *Air carrier communication procedures*—The new-hire pilot will be able to describe the communications means and methods used by the air carrier during operations to include en route communications, such as ACARS, medical assistance resources, and air traffic services.
- *Fatigue and fatigue management*—14 CFR and related guidance concerning flight and duty time should be explained to the new-hire pilots. The new-hire pilots will learn the air carrier's philosophy and policies and be able to determine whether they are legal to fly under a variety of circumstances. The new-hire pilots will also be able to explain what actions they can take to maximize rest while away from the airport.
- *Automation policies and philosophies*—Explain company's philosophy about the appropriate level of automation to use under different flight situations.

#### Professional Development

Newly employed part 121 pilots have the responsibility to improve their technical proficiency and the leadership, teamwork and mentoring skills that define the character of a professional pilot. These fundamental principles should be addressed throughout a pilot's career. While indoctrination training lays the foundational skills for the new pilot, periodic reinforcement during recurrent and upgrade training is essential.

- *Leadership and command expectations, requirements*—The carrier should introduce the basic principles of leadership and command authority. This introduction will cover 14 CFR § 91.3 and the flight operations manual, which define the authority of the captain and second-in-command and the responsibility and accountability associated with the use of "emergency authority."
- *Followership*—Not all approaches to leadership are the same. An assessment of the different styles of leadership will allow pilots to understand their own style and how different styles interact in different situations:
  - The primary role of the first officer is to support and assist the captain in the safe operation of the flight. The new-hire pilot should understand the need to maintain technical proficiency, anticipate problems, and provide relevant information on a timely basis.
  - The first officer should exercise an appropriate degree of assertiveness and be an active participant in the decisionmaking process. Captains will expect input from first officers in the decisionmaking process. This input will be based on the first officer's prior experience, judgment, and current information. The first officer must have the skills to state an opinion while still demonstrating respect for the authority and decisions of the captain.
  - Knowing when and how to escalate a discussion is a skill that every first officer must possess to be an effective crewmember. This training should discuss techniques for questioning a captain's decision, both during normal operations as well as time-critical situations relative to the captain's overall command authority.

- *Mentoring*—The new-hire pilot will be briefed on the air carrier's new-hire pilot mentoring program. New-hire pilots will understand there are two types of mentors: career mentor and flightcrew mentor. This program is further discussed in the mentoring section of this document.
- *CRM training*—Every air carrier should adopt a CRM model, which is the foundation for the unique CRM culture of the air carrier. Basic CRM training will establish the building blocks for good crew coordination and teamwork:
  - The training should include the latest information on threat and error management and mitigation skills. Because new pilots will come from varying flying backgrounds, and especially for those with mostly single-pilot flight experience, it is important to establish a consistent starting point.
  - Discussions of pilot flying and pilot monitoring form the foundation of good crew coordination and communication. Understanding the separation of duties leads to a standardized cockpit.
- *Responsibilities of a professional pilot*—A professional pilot is someone who does more than fly an aircraft. The pilot must be a leader; the new-hire pilot will understand that professionalism is an attitude, a persona, and a way of life. Indoctrination training can be used as an opportunity to define for the new-hire pilot what a professional pilot should be and what the company expects of all their pilots. Items the MLP ARC feels should be addressed with regards to professionalism include the following:
  - Continuing education. To be successful beyond flying skills, a pilot must have a strong basis of knowledge both inside the cockpit and out. Continuing education allows a pilot to be challenged in new ways, learn new ideas, and meet new people who will contribute to their learning. All of this creates a stronger leader, a safer employee, and a more professional pilot.
  - Public, personal behavior. The new-hire pilot will understand that a pilot represents the industry, air carrier and profession at all times, not just when they are at the airport or on the flightdeck. All actions and behaviors will reflect on the piloting profession and company and, eventually, influence their pay, benefits, and job stability.
  - Integrity. Pilots are leaders, and integrity is paramount to establishing and maintaining effective leadership.
  - Uniform. As a leader and a professional; whether on duty, deadheading, commuting, at the hotel, or off duty; a pilot must remember that, when in uniform, the pilot is representing themselves, the profession, and the company.

- *Passenger considerations*—Knowing how to deal with passengers is not an inherent skill for most pilots; it is gained through training, observation, and experience. Indoctrination training will introduce the new-hire pilot to considerations pertinent to carrying passengers. This training can be used to shape the pilot's thought process regarding passengers. Training should include consideration of passenger issues such as—
  - Safety. The passengers must be kept safe. Examples include seat belt use, weather, seat backs, tray tables, carry-on bags, listening to announcements, and electronic devices.
  - Comfort. Focus shifts from just flying to thinking about passenger needs. During turbulence, passengers should be calmed. On go-arounds and in bad weather, passengers may be nervous. In addition, the cabin temperature is an important consideration, especially when on the ground in summer.
  - Use of the public address system (PA). Many new-hire pilots have never had to address passengers on the PA. The new-hire pilots will practice making announcements to help them gain the confidence necessary to speak on the PA effectively. The new-hire pilots will understand that the professionalism displayed while using the PA is a direct reflection of the company. Announcements about weather and maintenance should be done diplomatically to avoid unnecessarily frightening passengers, such as using "rain showers," instead of "thunderstorms".
- *Roles of the operations team (coordination, communication)*—New-hire pilots will know the role, responsibilities and how to contact/interact with each of the following resources: flight attendants, dispatch, operations control center, duty pilots, maintenance, gate agents, and baggage/cargo handlers. Training will identify other resources available to the pilot, both on a daily basis and during non-normal operations.

# **2.4 ENHANCEMENTS TO UPGRADE TRAINING TO INCLUDE LEADERSHIP AND COMMAND TRAINING**

Pub. L. 111–216 § 206(a)(1)(D) reads, "Establish or modify training programs for second-in-command flight crewmembers attempting to qualify as pilot-in-command flight crewmembers for the first time in a specific aircraft type and ensure that such programs include leadership and command training." Section 206(a)(1)(E) reads, "Ensure that recurrent training for pilots-in-command includes leadership and command training."

The MPL ARC's charter includes a tasking which incorporates the prescriptive language of § 206(d)–(e) on this subject that reads, "d) Enhancements to Upgrade Training to include leadership and command training," and "e) Enhancements to Recurrent Training to include leadership and command training."

#### BACKGROUND

The MLP ARC devoted considerable time discussing the current state of air carrier command and leadership training. The MLP ARC discovered there is a wide variation among 14 CFR part 121 air carriers. Some air carriers have well-established leadership and command programs and others have no programs in place. Established programs that exemplify best practices within the industry include elements of command and leadership training such as defining captain's authority; managing resources; foundations of leadership theory; stress, fatigue and workload management; and the assessment of personal and corporate beliefs and values.

#### PROBLEM

The MLP ARC determined that command and leadership training requirements contained in part 121 were not written in such a manner to ensure that new captains will receive a comprehensive education on subjects which are foundational to command, leadership, and professionalism. These topics should be covered in considerable depth over a significant amount of time, to ensure that new captains can demonstrate a thorough understanding of these subjects while acting as a pilot-in-command at a part 121 air carrier.

#### **DESIRED OUTCOMES**

For the air carrier: Achieve the specified standard of leadership and command for all captains.

*For upgrade captains:* Possess the level of knowledge, skill, attitude, and behavior to exercise leadership by:

- Being "in command,"
- Having the requisite knowledge,
- Assessing situations and making good decisions,

- Setting a personal example,
- Managing the environment,
- Promoting the corporate mission,
- Effectively managing people, and
- Bringing out the best in others.

#### RECOMMENDATIONS

The MLP ARC reviewed the leadership and command courses at Alaska, Delta, SkyWest, and United Airlines. The MLP ARC reached a consensus opinion that all part 121 air carriers should develop and implement a "leadership and command" course for all second in-command flight crewmembers attempting to qualify as pilot-in-command flight crewmembers for the first time in a specific aircraft type.

#### Leadership and Command Program

After a review of these courses and interviews with pilots who attended, developed, or currently run these programs, the MLP ARC determined that, at a minimum, 32 hours of in-person facilitated class discussion is required to have a thorough understanding of the concepts.

A key component of the course is the ability for participants to have an open, facilitated discussion among those attending the course. Accordingly, the MLP ARC determined the course material is not suited to distance learning due to the value of the interactive group dynamic among multiple pilots. Additional items that each air carrier may deem necessary to introduce in a leadership and command course may be suitable for distance learning.

The MLP ARC recommends the specific leadership and command training be developed as a training event separate from the normal captain upgrade transition syllabus. It is recommended that each air carrier develop their course in-house to enable the air carrier to incorporate air carrier-specific course material. The 32 hours must be separated into two segments. The initial segment must be completed prior to upgrade training in order to cover the leadership and command modules of the course. The second must be completed between 6 and 18 months after completion of operating experience/IOE and should incorporate lessons learned during the new captain's initial experiences as a captain and reinforce the concepts covered in the initial leadership and command course.

Requirements of the leadership and command training would include the following leadership and command components.

#### Leadership by Being "In Command"

- Defining captain's authority, legal versus practical,
- Real world practical applications, and
- Managing available resources.

This component would define captain's authority and introduce the legal versus practical application of captain's authority. Discussion of real world scenarios would allow the pilots to apply the concepts introduced in this component to prepare them for line operations. In addition, this component would review the available resources for the captain's use and guidance on how to best manage those resources.

#### Leadership by Knowing

- Foundation of leadership theory,
- Defining professionalism, and
- Safety culture.

This component would introduce the concepts of professionalism. By completion of this component, the pilots will be able to define their ideas of professionalism and how it relates to the air carrier's expectations of the captain. A thorough review of the air carrier's safety policies and procedures should be introduced so the pilot will have an understanding of the air carrier's safety culture and the captain's role in enhancing that culture. In addition, include the foundations of leadership through one of any number of available leadership theories such as Situational Leadership Model (Hersey and Blanchard), Maslow's Hierarchy, McGregor Theory X and Theory Y, Leadership Grid (Blake and Mouton), Continuum of Leadership Behavior (Tannenbaum), Fielder's Contingency Model, Path-Goal Theory, and Action Centered Leadership (Adair).

#### Leadership by Assessment

- Assessment of each individual's leadership style,
- Reviewing industry/company accidents/incidents, and
- Assess beliefs and values (corporate and individual).

Pilots will assess their own leadership styles and be able to understand how their leadership styles can be adapted as situations warrant. The pilots will also assess their own beliefs and values and understand how those align with those of the air carrier. This component should be reinforced by reviewing industry and company accidents and incidents and how the causal factors related to those accidents and incidents relate to their leadership style.

#### Leadership by Personal Example

- Critical thinking,
- Integrity and ethics,
- Communication skill building, and
- Decisionmaking and accountability.

Each pilot will be introduced to the concepts of critical thinking, decisionmaking, accountability, and communication skill building. Personal integrity and ethics will also be discussed and incorporated into those concepts. By completion of this component, the pilot should have the tools necessary to make sound ethical decisions and be able to clearly communicate those decisions in the leadership role.

#### Leadership by Managing the Environment

- Managing the sterile cockpit,
- Automation management,
- Time management,
- Maintaining discipline in an undisciplined environment, and
- Threat and error management.

The concepts related to managing discipline in an undisciplined environment will be covered as the pilot is introduced to tools that will assist in controlling what is often a chaotic environment. The pilot will be presented with tools to assist in automation management, time management, prioritization, and threat and error management. The requirement to maintain a sterile cockpit during critical phases of flight will be stressed. By completion of this component the pilot should be prepared to maintain cockpit discipline, regardless of outside stresses, by effectively managing resources.

#### Leadership by Promoting the Corporate Mission

- Corporate culture,
- Air carrier business and economics, and
- Customer and other stakeholder service.

A review of the air carrier's corporate culture will be introduced so that pilots will understand their roles and responsibilities to the air carrier and how those roles relate to the customer as well as other corporation stakeholders. Air carrier business and economics will be covered to help the pilot gain a larger perspective of the overall air carrier economic environment.
#### Leadership by Managing People

- Conflict resolution,
- Stress management,
- Workload management; prioritization and delegation, and
- Fatigue management.

Tools for assisting the pilot in conflict resolution will be introduced, along with methods of stress management, and fatigue recognition and management. The pilot will understand ways to resolve conflict while maintaining captain's authority and encouraging a co-operative, collaborative and safe cockpit atmosphere. The pilot will also understand the effects of stress, both personal and professional, and how it can degrade performance and impede sound decisionmaking. The pilot will also understand fatigue, the cumulative effects of fatigue, fatigue mitigation techniques, and the adverse effects of fatigue on the safe operation of air carrier operations.

#### Leadership by Bringing Out the Best in Others

- Team development,
- Practical mentoring techniques,
- Diversity issues,
- Motivating others, and
- Establishing trust.

Methods for fostering an environment conducive to allowing others to excel in order to build a strong team will be discussed. Techniques for building a team atmosphere will be stressed with an emphasis on motivational techniques that will produce a cohesive crew environment. The concept of establishing trust within the crew will also be introduced. The pilot will be presented with practical mentoring techniques to provide fellow crew members with constructive guidance for personal professional development. Workplace diversity will be introduced to assist in dealing with gender, race, generational, religious, and other interpersonal issues that may cause barriers to effective team building. By the completion of this component the pilot will develop the skills necessary to be an effective team builder and leader.

During this training component, the new captains will be introduced to their assigned captain career mentors, as previously described.

### **2.5 ENHANCEMENTS TO RECURRENT TRAINING TO INCLUDE LEADERSHIP AND COMMAND TRAINING**

### Pub. L. 111–216 § 206(a)(1)(E) reads, "Ensure that recurrent training for pilots-in-command includes leadership and command training."

The ARC's charter includes a tasking which incorporates the prescriptive language of 206(a)(1)(E) on this subject that reads, "Enhancements to Recurrent Training to include leadership and command training."

#### BACKGROUND

A key inflection point in pilots' careers is their recurrent training cycle. The MLP ARC determined that there is no current regulatory requirement for leadership and command training in recurrent training.

#### **DESIRED OUTCOMES**

*For the air carrier:* To have a process where leadership and command skills are continually assessed, evaluated, and improved through recurrent training.

*For the pilots*: Continually upgrade their level of leadership and command skills through recurrent training.

#### RECOMMENDATIONS

The MLP ARC recommends that recurrent training programs are enhanced to include leadership and command training. The MLP ARC recommends that selected items from the leadership and command components be integrated into the various forms of recurrent training. The components an air carrier incorporates into recurrent training as emphasis items from year to year are left to the discretion of the PDSC. All components must be included in recurrent training at least once during a 4-year cycle. These emphasis items may be incorporated into recurrent training through any number of means to include distance learning, classroom learning, instructor pre-brief and debrief, and in the simulator environment.

The overall concepts and desired outcomes of leadership and command training will be taught, observed and debriefed in every simulator event to include transition, upgrade, and recurrent.

Special emphasis should be given to sterile cockpit procedures.

### 2.6 OTHER ACTIONS THAT MAY ENHANCE FLIGHT CREWMEMBER PROFESSIONAL DEVELOPMENT

### Section 206(a)(1)(F) reads, "Such other actions as the aviation rulemaking committee determines appropriate to enhance flight crewmember professional development."

The MLP ARC's charter includes a tasking which incorporates the prescriptive language of 206(a)(1)(F) on this subject that reads, "Other actions that may enhance crewmember professional development."

There was some debate within the MLP ARC regarding the scope and number of recommendations to be included within this section. However, the MLP ARC ultimately reached consensus on three items that came under the scope of the language in paragraph "F" of its charter:

- 1. Enhancements to knowledge tests and PTS,
- 2. Bachelor's degree requirement, and
- 3. Leadership and command training for pilots currently employed.

#### ENHANCEMENTS TO KNOWLEDGE TESTS AND PRACTICAL TEST STANDARDS

#### BACKGROUND

The MLP ARC was concerned with the wide range of experience of new-hire pilots who are starting at air carriers with varied flight times and work backgrounds. The MLP ARC discussed current air carrier hiring requirements and the 2010 Pilot Source Study, commissioned to research the success of pilots in initial training for 14 CFR part 121 operations. It analyzed the training performance of 2,156 new-hire pilots in the years 2005—2009. Six regional air carriers provided data mined from human resource and pilot training files. Five university researchers independently analyzed the data and integrated their results. The study expressed success in terms of fewer extra training events and fewer non-completions in regional air carrier training. Statistically, the best-performing pilots were those who had flight instructor certificates, graduated from collegiate-accredited flight programs, received advanced (post-private pilot certificate) pilot training in college, graduated with collegiate aviation degrees (any aviation discipline), and had between 500 and 1,000 pre-employment flight hours. Pilot source characteristics that had no significance in regional air carrier pilot training success were having a non-aviation college degree and having prior corporate pilot or air carrier pilot experience.

#### PROBLEM

Based on the data, subject matter expertise, and concepts discussed in the MLP ARC, it was determined that current licensing, knowledge, and PTS requirements are not adequate to help prospective air carrier pilots build a foundation of the concepts of professional development, leadership and command to assist in the transition to a part 121 environment.

#### **DESIRED OUTCOME**

*For pilots developing their knowledge, skill, attitude, and behavior to become professional pilots:* Attain the foundational knowledge of the concepts of professional development, leadership, and command.

#### RECOMMENDATIONS

The MLP ARC recommends that in order to ensure that an ATP pilot applicant at any part 121 air carrier has a foundational knowledge of the concepts of professional development, leadership, and command; the PTS requirements for the Commercial, Flight Instructor, and ATP certificates should incorporate these elements into the written, practical, and/or oral portions of pilot certification:

#### Air Transport Pilot Certificate

- 1. Assessment of each individual's leadership style,
- 2. Defining captain's authority, legal versus practical,
- 3. Critical thinking,
- 4. Integrity and ethics,
- 5. Foundation of leadership theory,
- 6. Managing available resources,
- 7. Conflict resolution,
- 8. Decisionmaking and accountability,
- 9. Defining professionalism,
- 10. Safety culture,
- 11. Automation management,
- 12. Stress management,
- 13. Workload management; prioritization and delegation,
- 14. Time management,
- 15. Maintaining discipline in an undisciplined environment, and
- 16. Fatigue management.

#### Commercial Pilot Certificate

- 1. Foundation of leadership theory,
- 2. Critical thinking,
- 3. Integrity and ethics,
- 4. Managing available resources,
- 5. Conflict resolution,
- 6. Decisionmaking and accountability,
- 7. Defining professionalism,
- 8. Safety culture,
- 9. Awareness of proper automation use,
- 10. Stress management,
- 11. Workload management; prioritization and delegation,
- 12. Time management,
- 13. Maintaining discipline in an undisciplined environment, and
- 14. Fatigue management.

#### Flight Instructor Certificate

- 1. Integrity and ethics,
- 2. Conflict resolution,
- 3. Decisionmaking and accountability,
- 4. Defining and instructing professional pilot behavior,
- 5. Safety culture, and
- 6. Fatigue management.

#### **BACHELOR'S DEGREE REQUIREMENT**

#### BACKGROUND

The 2010 Pilot Source Study found statistically that the best performing new-hire pilots who required the fewest extra training events and had fewer non-completions in initial training were those pilots who graduated from accredited collegiate flight programs with college aviation degrees. In addition, a discussion of industry best practices in regards to pilot hiring revealed that air carriers prefer applicants who have completed a bachelor's degree program. Industry representatives related that completion of a bachelor's degree, even if it is not aviation specific, was still preferable for pilot applicants due to past experience with pilots who were able to successfully complete new-hire pilot training.

#### PROBLEM

The MLP ARC discussed whether, in order to enhance the concept of an air carrier pilot as a profession versus a trade, a bachelor's degree or equivalent military flight training, such as Warrant Officer, should be required of applicants for new-hire pilots at part 121 air carriers. Title 14 CFR does not currently require new-hire pilots to have a bachelor's degree of any type.

#### **DESIRED OUTCOME**

*For pilots aspiring to become professional pilots*: Have the educational experience that is requisite for a profession.

#### RECOMMENDATIONS

The MLP ARC recommends that all pilots hired by part 121 air carriers have a minimum of a bachelor's degree or equivalent military flight training.

To recognize the value of previous part 121 air carrier experience, pilots without bachelor's degrees who were hired at part 121 air carriers before the enactment of recommendations of the MLP ARC, should not be required to have a bachelor's degree to be considered for employment at other part 121 air carriers.

#### LEADERSHIP AND COMMAND TRAINING FOR PILOTS CURRENTLY EMPLOYED

#### BACKGROUND

The MLP ARC discussed ways to ensure that all active pilots, who did not receive indoctrination training as a new-hire pilot or leadership and command training as a new captain at their air carrier, are trained to the standards recommended by the MLP ARC in the concepts of leadership, command, and mentoring.

#### PROBLEM

Pilots who are currently flying at part 121 air carriers will not have had an opportunity to receive the MLP ARC's recommended training.

#### **DESIRED OUTCOMES**

*For the air carrier:* To have a process where professional pilot skills are continually assessed, evaluated, and improved for all pilots employed by the air carrier.

*For all pilots in an air carrier:* Possess the expected knowledge, skill, attitude and behavior of professional pilots.

#### RECOMMENDATION

The MLP ARC recommends that each air carrier's PDSC develop a process or training program to ensure that all captains are qualified in the principles of the entire leadership and command program. In addition, the MLP ARC recommends the PDSC at each air carrier develop a process or training program that ensures all pilots at an air carrier understand the entire professional development and mentoring programs.

### 3.0 Dissenting Report

#### NATIONAL AIR CARRIER ASSOCIATION (NACA)

NACA's dissenting report regarding certain recommendations of the "Flight Crewmember Mentoring, Professional Development and Leadership" Aviation Rulemaking Committee (MLP ARC).

NACA commends the Federal Aviation Administration (FAA) and all volunteers who contributed to this ARC. The ARC's mandate resulted in a compressed time schedule, and everyone dedicated a great amount of time and concern to meet this requirement. The goal of the ARC was to fulfill its mandate and increase safety at all airlines.

#### General dissenting statement:

NACA feels there should be one level of safety for all part 121 airlines. That level should be achieved by a clearly stated rule that each airline must follow. However, a needlessly prescriptive rule removes flexibility for part 121 airlines and may actually lower safety levels. FAA Administrator Randy Babbitt said, in a speech to Airline Pilots Association, that a 'one size fits all' safety strategy may actually lower safety. FAA rules should allow part 121 airlines to write policies and procedures to demonstrate how they will comply with rules; each air carrier's processes are, then, approved and monitored by FAA to ensure compliance.

The Objectives and Scope section of the ARC's mandate was meant to provide a "forum of the US aviation community" to discuss recommendations that will, then, help FAA develop requirements to ensure that part 121 air carriers establish or modify programs addressing mentoring, leadership, and professional development of flight crewmembers.

The ARC was comprised of eleven participants. Six participants were either permanent ALPA staff or ALPA members from passenger airlines. The other five participants were Regional Airline Association (RAA), National Association of Flight Instructors (NAFI), Coalition of Airline Pilots Association (CAPA), National Air Carrier Association (NACA), and University Aviation Association (UAA). National Safety Foundation was listed as a participant but did not attend or contribute. The Cargo Airline Association (CAA) had no representatives. NACA contends that the ten participants did not represent a true and balanced cross section of the U.S. aviation community.

NACA voiced its concerns throughout the ARC but does not feel its concerns were seriously considered. The validity and justification of those concerns were not appreciated and, therefore, largely dismissed. The most prevalent feeling in the ARC was: "If they think we went too far it will end up on the cutting room floor, so we should put it in the recommendations." This demonstrates the overreaching nature fostered in this ARC. The ARC divided its workload by forming three sub-groups.

The concerns of an established ALPA carrier are very different from those of a smaller airline or start up carrier. Current recommendations of the ARC do not allow for scalability. A start-up cannot reasonably comply with some of the prescriptive mandates because they will not have any "seasoned" pilots on staff. Every pilot, by definition, would have less than one year's experience. Small airlines should also be allowed to adjust the hard prescriptive recommendations to outcome-based compliance.

#### Specific dissenting statements by section:

Section 206(a)(1)(A) - NACA concurs, as long as flexibility is allowed for start-ups and small airlines, many of which do not have a safety management system, yet.

Section 206(a)(1)(B) - NACA strongly opposes the addition of a Part 119.65 position for the Flight Operations Professional Development Representative. We concur with the ARC that a professional development position is important and valid to install the MLP. NACA believes that mandating this position as a Part 119.65 position will not increase the credibility or importance of the position. Mandating it may, instead, weaken it. Keep in mind that in a speech to ALPA (August 2009) Administrator Randy Babbitt said "We cannot regulate professionalism. No matter how many rules, regulations, advisories, mandatory training sessions, voluntary training sessions — pull them all together, and it still comes down to us — and by us, I mean every pilot". At start-ups and smaller airlines, many staff wear multiple hats until the airlines' size mandates additional personnel. Many smaller airlines' director of safety also fulfills the job of director of security and may even run the internal evaluation program. This position can fall under the 119.65 Director of Operation's chain of command.

The 119.65 qualifications, as listed in this section for the 119.65 requirement, do not even seem to relate to professional development, mentoring, or leadership qualifications. They are close to the chief pilot's qualifications, with the exception of a bachelor's degree, but not necessarily in leadership or mentoring.

Section 206(a)(1)(C) - Section C of the mandate required the ARC to "establish or modify training programs to accommodate substantially different levels and types of experience." The ARC was not tasked with judging existing regulations. It concluded, however, that existing regulations contributed to the problem, so it should go outside its mandate and address them.

NACA does not believe the intent of this section was met. The solution provided by the ARC was to increase indoctrination training to cover a wider range of topics, in order to provide one level of instruction. NACA does not believe these mandated topics fulfill the established intent of this section. Nowhere does the recommendation allow for training to be adjusted for specific pilot groups; it assumes all pilot indoctrination training classes are run in the same manner. The majority view of the ARC was that all airlines perform their training at headquarters or a central location. No allowance was given for distance learning or training to proficiency.

Section 206(a)(1)(D) - NACA strongly opposes the prescribed thirty-two (32) hours of in-person, facilitated, training for leadership and command training/development. This is another example of the ARC's majority viewpoint, from a narrow base of the industry, proposing to dictate requirements for an entire industry. It was assumed by the majority of the ARC's members that centralized in-person training is possible for all airlines. Consider, however, non-scheduled airlines represented by NACA: each of these airlines has crews located all over the world on any given day, and do not have large crew bases. This mandate of thirty-two (32) hours of training for one topic, therefore, is extreme and will be quite costly to NACA carriers.

NACA does not oppose the requirement of leadership and command training and development, and several NACA carriers already have quality leadership training programs in place. We propose, however, that a specific number of training hours should not be placed in the regulation. Each carrier should be allowed to develop a leadership and command training course that best suits that carrier's needs. NACA believes that the oversight of the local Flight Standards District Office and Advisory Circular guidance is enough to establish quality programs at each carrier.

Section 206(a)(1)(E) - No objections

Section 206(a)(1)(F) – This section focused on "other actions that may enhance flight crewmember professional development".

The intent of the ARC to improve the quality of applicants and pilots in the future is admirable. But, is it legal or responsible to require a bachelor's degree or equivalent military experience? Many highly qualified and experienced applicants may be eliminated due to this requirement. NACA believes each carrier should be able to set its own hiring qualifications. With the advent of a professional development, leadership, and mentoring programs at each airline, NACA feels that higher standards, including higher education, will become corporate culture, not mandated law.

### Appendix A—Members and Staff

#### MLP ARC MEMBERS AND AFFILIATION

Kurt Shular, Air Transport Association (ATA), Committee Co-Chair

John Sluys, Air Line Pilots Association, International (ALPA), Committee Co-Chair

Steve Briner, Regional Airline Association (RAA)

Scott Foose, RAA

Bob Tapaszi, RAA

Mike Hamilton, ALPA

Jerry Wright, ALPA

John David, Coalition of Airline Pilots Associations, (CAPA)

Randy Dopp, CAPA

Wayne Mann, CAPA

George Paul, National Air Carrier Association, (NACA)

Vannakay Hurnevich, NACA

Randy DeMik, University Aviation Association, (UAA)

Guy Smith, UAA

Jason Blair, National Association of Flight Instructors (NAFI)

Donata Ziedins, ATA

#### SUPPORT STAFF

Deke Abbott, Federal Aviation Administration (FAA), Designated Federal Official (DFO)

Dean Griffith, FAA

Catherine Burnett, FAA

Judith Jameson, FAA

Louis Ebersole, FAA

Kelly Akhund, PAI Consulting

Ryan Gibson, PAI Consulting

Wendy Stanley, PAI Consulting

Davis Chung, PAI Consulting

#### PRESENTERS

Phil Comstock, Wilson Center for Public Research

Dave Bushy, Hyannis Air Service/Cape Air Airlines

Don Skiados, Leadership Communications and Training

Chris Brown, Director of Flight Operations, SkyWest Airlines

### Appendix B—Attendance Graph

#### MENTORING, LEADERSHIP AND PROFESSIONAL DEVELOPMENT AVIATION RULE MAKING COMMITTEE ATTENDANCE SHEET

The October 21, 2010 meeting was for the final report writing committee members only.

The Flight Safety Foundation (FSF) and Regional Air Cargo Carrier Association (RACCA) were invited but did not attend.

Name (first, last)	Association	9/29	9/30	10/1	10/5	10/6	10/19	10/20	10/21	11/2
Kurt Shular	ATA, Co-Chair	X	X	Х	Х	X	Х	Х	Х	Х
John Sluys	ALPA, Co-Chair	X	Х	Х	Х	X	Х	Х	Х	Х
Deke Abbott	FAA, DFO	X	X	Х	Х	Х	Х	Х	Х	Х
Steve Briner	RAA	X	X	Х	Х	Х	Х	Х		
Scott Foose	RAA	X	X							
Bob Tapaszi	RAA							Х	Х	Х
Mike Hamilton	ALPA	X	X	Х			Х	Х	Х	Х
Jerry Wright	ALPA	X	X	Х	Х	Х	Х	Х	Х	Х
John David	САРА	X	X		Х		Х	Х		Х
Randy Dopp	САРА		X	Х						
Wayne Mann	САРА				Х	Х	Х	Х		Х
George Paul	NACA						Х			Х
Vannakay Hurnevich	NACA	X	Х		Х	Х	Х	Х		Х
Randy DeMik	UAA	X	X	Х	Х	Х	Х	Х		Х
Guy Smith	UAA	X	X	Х	Х	Х	Х	Х	Х	Х
Jason Blair	NAFI	X	X		Х	Х	Х	Х		Х
Donata Ziedins	ATA				Х	Х	Х	Х		Х
Dean Griffith	FAA	X	X	Х	Х	X	Х	Х		Х

These dates do not include the meetings of the subgroups or the writing committee.

Name (first, last)	Association	9/29	9/30	10/1	10/5	10/6	10/19	10/20	10/21	11/2
Catherine Burnett	FAA						Х	Х	Х	
Judith Jameson	FAA				Х					
Louis Ebersole	FAA							Х	Х	Х
Phil Comstock	Wilson Center for Public Research					X				
Dave Bushy	Cape Air				Х					
Don Skiados	Leadership Communications and Training					X				
Kelly Akhund	PAI Consulting	X	Х	Х	Х	X	Х	Х	Х	Х
Ryan Gibson	PAI Consulting	Х	Х		Х	Х				
Wendy Stanley	PAI Consulting	X	X	X			X	Х	Х	X
Davis Chung	PAI Consulting									X

### Appendix C—Acronyms

AC	Advisory Circular
ACARS	Aircraft Addressing and Reporting System
ALPA	Air Line Pilots Association
AOA	air operations area
AQP	Advanced Qualification Program
ATA	Air Transport Association
ATP	Air Transport Pilot
CAA	Cargo Airlines Association
CAPA	Coalition of Airline Pilots Associations
CDL	configuration deviation list
CFR	Code of Federal Regulations
COO	Chief Operations Officer
CRM	crew resource management
FAA	Federal Aviation Administration
FOM	flight operations manual
IOE	Initial Operating Experience
ISC	In-Flight Security Coordinator
MEL	minimum equipment list
MLP ARC	Flight Crewmember Mentoring, Leadership and Professional Development Aviation Rulemaking Committee
NACA	National Air Carrier Association
NAFI	National Association of Flight Instructors
OCC	Operations Control Center

Op Specs	Operations specifications
PBS	Preferential Bidding System
PDSC	professional development steering committee
PTS	practical test standards
RAA	Regional Airline Association
SIDA	security identification display area
UAA	University Aviation Association

### Appendix D—Generational Communications Presentation

#### **OCTOBER 6, 2010 PRESENTATION SUMMARY**

#### Don Skiados and Phil Comstock's presentation notes

From October 6, 2010 MLP ARC Meeting

Mr. Sluys introduced two speakers for the day, Mr. Don Skiados, president of Communications and Training, and Mr. Phil Comstock, president of the Wilson Center for Public Research. Mr. Skiados gave a presentation titled "Generational Communications Presentation" on generational differences and how the actions and tendencies of each generation are diverse. He explained to the MLP ARC that the pilots of "Generation 9/11" work in groups, and it would be beneficial to mentor them in groups as well.

Mr. Skiados gave examples of the transition between generations in the United States by describing the Baby Boomer generation, Generation X, Generation Y (also known as the Millennial Generation), and Generation 9/11. Mr. Skiados asked the MLP ARC to consider how to reach every generation of pilots while writing the mentoring leadership and professional development rules. He explained that each generation is different in the way it follows and uses rules and regulations. Mr. Skiados also observed that each generation learns differently and the process of mentoring needs to be tailored to the generational differences of each pilot.

Mr. Phil Comstock began his presentation by providing the MLP ARC with statistics about modern pilots and how pilots' motivations have changed with each generation. Mr. Comstock stressed that the Generation 9/11 are asking, "What's in it for me?" He explained these pilots need an incentive for receiving mentoring and training.

Mr. Comstock then discussed the 2006 Fee for Departure Study examined fee for departure air carriers (regionals). Almost all pilots in the study came from Generation Y or Generation 9/11. The study concluded the following:

- 1. Hardly any pilots had aviation related hobbies.
- 2. Only 5 percent of pilots have military backgrounds.
- 3. Most pilots come from affluent families.
- 4. The percentage of pilots that had their Eagle Scout badge had significantly dropped.
- 5. Pilots are less different from their peers than earlier generations of pilots were.

Mr. Comstock stated he interviewed hundreds of pilots in their twenties from the Baby Boomer generation and Generation X. He noted when asked why they wanted to be pilots, they explained that they could not see themselves doing anything else. Mr. Comstock added that pilots from these generations had a passion for flying airplanes, which included an involvement in aviation outside of their profession. Mr. Comstock stated Generation Y and Generation 9/11, when interviewed about flying, explained they got into for an easy schedule and high pay. He provided an alarming trend: when asked about career plans, modern pilots explained they were planning to exit the profession in the next 5 years. Mr. Comstock added these pilots did not have any aviation hobbies outside of their profession and did not have the passion for flying that the previous generations have.

Mr. Comstock explained that air carriers whose pilots are primarily from Generation Y and Generation 9/11 (with an average age of 33 or younger) are more vulnerable to aviation accidents similar to the Colgan 3407 accident. He stated these pilots are more likely to text in the cockpit, come to work fatigued, and manipulate their schedules to maximize pay and days off. He added this generation of pilot spends time on overnights socializing on their computers instead of resting. Mr. Comstock noted this generation of pilot is not as connected to the profession and views being an air carrier pilot as a job rather than a profession, which has a negative impact on safety.

Mr. Comstock observed that the current generation of pilots in Canada and the United Kingdom is different from that in the United States. He stated they are more professional and more likely to follow aviation regulations. He added those parts of the world do not have the same generational patterns as the United States and therefore have a different safety culture.

The MLP ARC then discussed the presentations and research with Mr. Comstock and Mr. Skiados. Mr. Sluys asked how to tell someone who spends \$200,000 on flight ratings that they do not belong in aviation. Mr. Comstock stated a majority of pilots have a false perception of what a job at an air carrier is like. He explained that telling them the truth early on about flying and what the job entails would help filter out pilots that do not belong in the industry.

The MLP ARC asked whether Generation 9/11 will be able to receive mentoring or seek help from mentor pilots. Mr. Skiados explained that mentoring needed to take place in groups and in a pack mentality. He added that Generation 9/11 does everything in groups and that it was important to recognize this difference. He also noted a mentor has to be perceived as highly successful.

Mr. Comstock stated the next generation (primarily in their twenties) has spent a lot of time with grandparents and less time with parents. As a result, he explained that the current generation feels more comfortable with people in their sixties. He noted having a retired pilot or someone in their sixties who is respected and successful would be an ideal mentor for Generation 9/11. Mr. Comstock added that the current generation of pilot has great personal risk aversion. He stated telling these pilots how procedures and rules will help them protect themselves will make them more receptive to learning and mentoring. Mr. Comstock also explained that the most effective mentors for the current generation are a well-respected, successful pilot and that pilot's spouse.

Mr. Skiados explained the differences between group mentoring and one on one mentoring. He stated that one on one mentoring is very effective but may be challenging for an airline that hires thousands of pilots in a year.

Mr. Shular asked Mr. Comstock and Mr. Skiados for their thoughts about creating a committee that would oversee aviation professionals and approve or disapprove of their ability to be a professional pilot based on specific criteria. Both Mr. Comstock and Mr. Skiados agreed that a professional organization would be a great idea.

Mr. Comstock stated a problem with current pilots is their expectations of the job are unrealistic, so when they come to work they are disappointed in what they end up doing. He explained this leads to job dissatisfaction. He further noted that ALPA, CAPA, UAA, AABI, and other organizations need to improve their marketing of the profession to better reflect what the job is actually like. Mr. Comstock observed if pilots knew more about the profession before getting a job at an air carrier, there would be less attrition. Furthermore, he stated it would filter out people that do not belong in the profession. Mr. Comstock concluded this sentiment with the observation, "If you don't love the profession you will never excel at it."

Mr. Shular then asked Mr. Skiados about the MLP ARC's mentoring task. Mr. Shular suggested making it a part of the air carrier's upgrade training. He stated that captains should know they are the face of the company. A representative from UAA recommended making Mr. Skiados' presentation part of the mentoring training captains receive during upgrade training. Mr. Comstock added mentoring needs to be realistic. He stated modern pilots envision the job as a glamorous profession. This causes them to not like their job which makes them unsafe because of poor professional development.

The next topic of conversation with the two speakers was professionalism. The MLP ARC asked Mr. Skiados and Mr. Comstock if they thought the "professional certification" was possible. Mr. Skiados agreed that it is a good idea, although he stated it should not be issued by the union. This led to discussion about who is in charge, management, the union, or the FAA.

# Generational Communications

Leadership Communications & Training Don Skiados, President

## Skiados

- ALPA's Dir. Communications and Training 40 years
- Elected President of the Council on Aviation Accreditation (currently dba Aviation Accreditation Board, International or AABI)
- Elected chairman of the board, Greater Washington Society of Association Executives.
- Developed a nationwide grass-roots campaign, "Operation USA" (Unity for Safe Air Travel), which prompted the Reagan Administration to issue regulations on security screening.
- Received the International Association of Business Communicator's "Silver Inkwell Award of Excellence" for best overall communications program – Aloha Flight 243.
- Conducts media training, public speaking, and communications workshops for industry groups and associations.

## War Babies

### • The Greatest Generation

 Traditionals are the oldest generation in the workplace. (born 1930 - 1945) They are very socially and fiscally conservative. Traditionals fear that they will be replaced by younger generations. Many are still in the workforce because they enjoy working, but some are there for financial reasons. Their life experience gives them a lot to offer.

### Traditionals Communication

- Direct
- Conservative
- Newspapers
- Just the Facts
- Hard news, good or bad
- Obey the law
- High Touch

## **Baby Boomers**

 Baby Boomers are now one of the older generations at work. (born 1946-1964) They were born during the booming, optimistic times post World War II. They value hard work and long hours as the means to success and thus their work ethic is extremely important to them. Boomers need to be noticed for their hard work. When dealing with other generations Boomers need to make sure they are very upfront and specific with their instructions.

### Baby Boomer Communications

- Door mats
- Do what they are told
- Huggers
- I'm OK Your OK
- Am I OK?
- Trust the System
- Take your time and explain it to me
- High Touch

## Gen X

 Generation X is the middle generation. (born 1965-1977) They were raised by Baby Boomers who worked long hours and were the first generation to have wide spread divorce. Therefore, Generation Xers are very independent and dislike rigid schedules. They value being efficient and getting work done quickly. They have more balance between their social and work lives than their predecessors and they ushered in a more creative, open workplace.

## GEN X Communications

- First Computer Generation
- Fast Paced Communications
- Don't Trust
- Well Educated, High Level
- High Tech
- Value Quality of Life Issues

## • WHAT'S IN IT FOR THEM

## **GEN Y or Millennials**

 The next generation is the Millennials. (born 1977-1990) They are the first generation to grow up with advanced technologies and therefore are very comfortable with technology in every aspect of their lives. They also tend to be opinionated but are very creative and expect to be challenged. They have far more confidence as they grew up in very stable times.

## GEN Y – Millennials Communications

- Instantaneous communication
- News to Go (on the belt)
- What's good for our group
- More noise then ever
- Very High Tech and Touch
- Can't legislate technology away
- Use the law

## **Generation 9/11**

 The youngest generation - Generation 9/11 (born prior to 1990) has only seen the world through the prism of the 9/11 tragedy. They have grown up with wars and uncertainty and tend to view the world through that lens. They see the world with less optimism then many of the other generations.

## 9/11 Communications

- X Box, Wee, Video Games
- This is how this generation will be taught and learn in the future
- They aren't using a computer, they have become a part of the computer
- Reboot Get a do over, there is no do over in aviation
- Don't play be the rules
- Young pilots will continue to text

### Appendix E—Decision-making in Aviation

Mary Niemczyk Lee Fournet Arizona State University

### Decision-making in Aviation: Developing a Qualified Workforce

Recent research by neuroscientists has indicated that the brain, in particular the prefrontal cortex (PFC), continues to develop at least well into a person's 20s. Because the brain is malleable and shaped by external influences, it appears as though the use of modern technologies, such as cell phones, the Internet, and video games, may be affecting the 'wiring diagram' of the adolescent brain. The PFC is responsible for planning, working memory, decision-making, and problem solving, among other functions. Some studies have found that the impact of these technologies are actually delaying brain development and even stunting development impairing reasoning abilities.

Decision-making in the cockpit and in the air traffic management environment is critical to safe flight. It is therefore important that collegiate aviators have the necessary skills to perform safely within the complex flight environment. Previous research has found that providing students with examples from accident/incident scenarios enables them to improve decision-making in similar situations, however, there are many times when situations are unique and novel to these individuals. In these situations, they will have to utilize decision-making skills that allow them to develop solutions to problems they have not previously encountered. Previous research has found that decision-making skills can in fact be taught.

The focus of this study will be to examine the decision-making skills and abilities of collegiate aviation students. An intervention course focusing on decision-making and problem solving of defined and ill-defined problems will be administered to improve these skills. Assessment of decision-making skills will be conducted after the intervention to determine changes in these skills.

The transitioning of Millennial individuals into the aviation environment has been and continues to be a major concern for managers in airlines and air traffic. Along with the many differences in work ethic, these individuals are also exhibiting differences in thinking and problem-solving skills. Aviation is very dynamic with many unexpected situations occurring daily. It is, therefore, critical that individuals entering the workforce be highly prepared to contribute to the safety and advancement of all aspects of the aviation system.

### Appendix F—Workplace Preferences of Millennials in the Aviation Industry

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#### Workplace Preferences of Millennials In the Aviation Industry

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#### Abstract

Previous research has determined that each generation has its own unique attitudes, work ethics, distinct, and preferred ways of managing and being managed. Today's workplace represents the largest diversity of generations than any other time in history. The examination of generational differences among workers is a critical and underdeveloped area of investigation, particularly in aviation. The purpose of this study was to determine the work environment preferences of the Millennial generation in the aviation industry. The Work Environment Scale – Form I (Moos & Insel, 1974) was administered to 290 aviation personnel. Results of this study portray a complex combination of relationship, personal growth, and organizational structures of their ideal workplace preferences, dominated by desires for greater personal freedoms with less managerial interventions.

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**Return to Table of Contents** 

The International Journal of Applied Aviation Studies 207

#### Workplace Preferences of Millennials

#### In the Aviation Industry

Today, like no other time in the history of the United States, the workforce is comprised of the greatest number of generational cohorts. Many organizations have employees representing four generations (Zemke, Raines, & Filipczak, 1999); all may be working concurrently, however, they may not be working collaboratively. Generational cohorts tend to view the world, and the workplace, from the standpoint of their distinct life experiences (Schuman & Scott, 1989), yet they are expected to act as a team to meet the goals of the organization. Unfortunately, their differences may often lead to miscommunication, employee conflict, work ethic debates, loyalty issues, varying wants and needs in terms of compensation, and training issues. A key to organizational success is to understand the perspectives and desires of each generation and be respectful of their differences (Gravett & Throckmorton, 2007).

The examination of generational differences among workers is a critical and underdeveloped area of investigation, particularly in aviation. Ultimately, all organizations are most strongly influenced by the values and preferences of their newest generation of employees. Failure on the part of management to understand and adjust appropriately to generational differences can result in misunderstandings and miscommunications. In time, this can affect employee productivity, performance, recruitment, retention, and safety.

The most recent group entering the workforce is referred to as the millennial generation, marked by having been born in the 20<sup>th</sup> Century while entering the workforce in the 21<sup>st</sup> Century. The purpose of this study is to determine the preferred workplace characteristics of the *millennial generation* in the aviation industry.

#### Literature Review

The distinction between where one generation ends and another begins is not rigidly defined, however, experts have found that individuals can be strongly united based on enduring shared social, economic, and political events. Members of all generations are likely to experience significant events during their developmental, adolescent years. These experiences tend to strongly impact individuals and form lifelong impressions affecting their outlook on life and work (Glass, 2007; Schuman & Scott, 1989). Individuals in each generational group seem to develop similar attitudes, ambitions, and a synergy that can provide them strength in society (Zemke, Raines & Filipczak, 1999).

Although several different terms have been used to categorize the various generations, the most common appear to be: Veterans, Baby Boomers, Generation X, and Millenials (Zemke, Raines & Filipczak, 1999). Additionally, the time frames used to define each of the generations vary throughout the literature. Generationdefined characteristics may not fit some individuals as they may adopt some of the values and attitudes of the previous or subsequent generation. Classifying generational members, therefore, is not an exact science (Johnson & Wilson, 2008). Generally speaking, and for purposes of this investigation, the generations currently in the workplace include: Veterans, born between 1922 – 1943; Baby Boomers, born between 1944 – 1960; Generation Xers, born between 1961 – 1980; and, Millen-

208 Workplace Preferences of Millennials

nials, born between 1981 – 2000 (Lancaster & Stillman, 2002; Smola & Sutton, 2002; Strauss & Howe, 1997; Zemke, Raines & Filipczak, 1999).

Generations tend to form a *persona* or set of characteristics by which they are defined. These characteristics may include attitudes towards work, technology, gender roles, religion, race, and family. Their value systems may also deviate from other generations. These characteristics not only provide commonality within each generational group, but also the distinction between generational groups making each group somewhat unique. These characteristics seem to permeate the generation and become influential elements in the mind-set of its members (Schuman & Scott, 1989). Interestingly, these generational characteristics tend to remain fixed as the members age and seem to be lifelong traits (Strauss & Howe, 1997).

Each generation also tends to have distinct preferences regarding organizational business structures and behaviors (Glass, 2007). In stark contrast to previous generations, the Millennial generation is unwilling to dedicate much of their daily life to their work. They instead prefer to have more of a balance between work and their other interests (Smola & Sutton, 2002), and seem to exhibit a 'work to live', not 'live to work' attitude (Ryan, 2007).

When they are at work, however, the Millennial generation has a strong preference for structure and organization. This may be the result of inordinate amounts of time spent in the highly structured and controlled media environments of their electronic games, such as *Gameboys* and *Nintendos*. They prefer orderly work environments and dislike ambiguity of any kind. This cohort tends to prefer clear expectations and has a strong desire for a well-defined career path (Epstein & Howes, 2009). For some members, the desire for structure is so unyielding that, if it is not provided, they may quit their job and search for it at another organization (Westerman & Yamamura, 2007).

This generation is accustomed to using all types of technology, and incorporates it into many aspects of their lives. Their experience with various technologies has provided them with unprecedented freedoms, as well as immediate gratification. Unlike previous generations, Millennials are accustomed to instantaneous access to money (ATM), entertainment (iPod), information (Internet), communication (computers and smart phones), and even dating (online dating services) (Teaching the Millennials, 2007; Zemke, Raines & Filipczak, 1999). They have spent countless hours on the Internet and have hundreds of friends via social-networking sites such as *Facebook* and *MySpace*. Because they have been able to explore the world via the Internet, they tend to enjoy extensive freedoms and the desire to make their own decisions (McGlynn, 2005; Zemke, Raines & Filipczak, 1999).

This generation tends to be self-confident and may appear to have an entitlement attitude. Raised by *Baby-Boomer* parents, they were placed at the center of their families' existence during their formative years. Unlike previous generations who only received a trophy for finishing in either first, second, or third place in competitions, members of this generation received a trophy for simply being a member of the team. They are accustomed to receiving praise and accolades and having their parents being quite involved in their daily lives (Zemke, Raines & Filipczak, 1999).
Generational differences have been the force behind many societal shifts. As newer generations emerge and replace older generations, a "generational replacement" tends to occur. Society is likely to transform and begin to reflect the attitudes and values of the upcoming generation (Johnson & Wilson, 2008; Mitchell, 1995). The Millennial generation represents the second largest of the current generations, following the Baby Boomers. Approximately 81 million Americans are members of this cohort, which is about one-fourth of the entire population (US Census Bureau, 2009). Due to their size, it is almost certain that they are, and will continue to impact work environments.

The Millennial generation has recently entered the workforce and many aviation employers are wondering how to recruit, manage, motivate, and communicate with these individuals. In order to assist aviation managers and supervisors in becoming more adept in coordinating the efforts of this cohort, it is important to determine the interpersonal desires, goal orientations, supervisory methods, and organizational structures that may work best with them. The purpose of this study, therefore, was to determine the work environment preferences of the Millennial generation in the aviation industry.

### Method

### Subjects

Participants in this study held various roles within aviation, including flight student, professional pilot, air traffic controller, aviation maintenance technician, and aviation administrator. There were 290 participants, ranging in age from 18 to 27 years, with mean and median ages of 20.5 and 20.0 years, respectively. There were 219 male and 24 female respondents, with 47 respondents choosing to not indicate their gender. All participants were born and raised in the United States. Participation was voluntary and uncompensated.

### Procedures

The Work Environment Scale – Form I (WES) (Moos & Insel, 1974) was administered to individuals in various aviation entities; airlines, manufacturing, flight schools, and air traffic control facilities. The survey was paper-based. Participants were provided a written description of the study, along with the survey question booklet and response sheet. Scores were manually tabulated using a scoring template provided with the assessment materials.

### Materials

The WES – Form I provides individuals the opportunity to describe what they consider to be their expected or ideal work setting. It has been used extensively in a variety of clinical and research practices, as well as by managers and consultants attempting to determine employee workplace goals and value orientations. The instrument has shown validity in predicting outcomes in various occupational settings, including the military, education, government, and health care. It has been used extensively throughout the US and internationally and has been translated into seven languages. By design, the WES is descriptive rather than evaluative (Moos, 1994b).

### 210 Workplace Preferences of Millennials

The WES consists of three forms: the Real Form (Form R) which measures the perceptions of employees in their current work environment; the Ideal Form (Form I) which measures employees' perceptions of their ideal workplace; and the Expectations Form (Form E) which measures prospective employees' expectations about a future work setting (Moos, 1994a; Moos, 1994b). Since its development, the WES has been found to provide significant insight into employee workplace perceptions. Examples of uses include determining employee satisfaction in accounting and business organizations (Westerman & Cyr, 2004: Westerman & Simmons, 2007; Westerman & Yamamura, 2006), determining nurse's perceptions of their real and ideal work environments (Baker, Carlisle, Riley, Tapper & Dewey, 1992; Kotzer, Koepping, & LeDuc, 2006; Long, Williams, & Hollin, 1995), as well as workplace satisfaction of mental health practitioners (McRae, Prior, Silverman, & Banerjee, 2007), to name a few.

The WES consists of 10 subscales that assess three underlying sets of dimensions: Relationship, Personal Growth or Goal Orientation, and System Maintenance and Change. The Form I subscale internal consistencies (Cronbach's Alpha) and intercorrelations range from 0.55 to 0.74. Norms have been developed for each WES form and for each country of use. In total, there are 90 True/False statements, 9 items for each of the 10 subscales. Possible scores for each subscale range between 0 and 9. The WES Form- R, Form-I, and Form-E are parallel in that each has 90 items that focus on the same work setting elements but are worded appropriately to assess current, ideal, and future perspectives. The scoring keys and answer sheets are identical for each of the three forms (Moos & Insel, 1974; Moos, 1994a; Moos, 1994b).

Within each of the three dimensions are subscales assessing various aspects of the particular dimension. The Relationship dimension consists of Involvement, Coworker Cohesion, and Supervisor Support subscales. The Personal Growth and Goal Orientation dimension consists of Autonomy, Task Orientation, and Work Pressure subscales. The System Maintenance and System Change Dimension consists of Clarity, Managerial Control, Innovation, and Physical Comfort subscales (Moos & Insel, 1974; Moos, 1994a; Moos, 1994b).

### Data Analysis

Adopting the method developed by the survey developers (Moos & Insel, 1974; Moos, 1994a; Moos, 1994b), a scoring template was used to determine raw scores for each individual. Descriptive statistics for centrality and relative variation were generated from these data. The data for each individual were then summed for each of the 10 subscales. Chi-square analyses were then performed to determine which factors, if any, dominated the Millennial generation's workplace preferences.

#### Results

#### Descriptive Analysis

Subscale mean, median, modal, standard deviation and coefficient of variation (CV) values are reported in Table 1. The interpretation of the centrality measures for each subscale are explained by Moos (1989) and vary based on each subscale, e.g., *considerably below average* scores for the Involvement subscale

The International Journal of Applied Aviation Studies 211

are in the 0-3.5 range, while they are in the 0-2 range for the Innovation subscale. Interpretations for each of these statistics follows.

### Table 1

Subscale Descriptive Statistics

	Relationship		Pers Goa	onal Gro I Orienta	w/th / ation	System Maintenance / System Change			ce/	
	Involvement	Peer Cohesion	Supervisor Support	Autonomy	Task Orientation	Work Pressure	Clarity	Control	Innovation	Physical Comfort
Mean	7.7	7.4	7.3	7.3	7.8	3.6	7.0	5.4	6.4	7.1
Median	8	8	8	8	8	3	7	6	7	8
Mode	9	9	8	8	9	4	8	7	7	8
Std Dev	1.6	1.8	1.5	1.6	1.5	2.1	1.4	2.1	2.2	1.7
CV	20%	24%	21%	22%	19%	57%	20%	39%	34%	23%

### The Relationship Dimension

The first dimension measured by the WES is *Relationship*. The items on its subscales address personal relationships in the workplace, focusing on employee commitment, collegiality, and support. The three subscales of this dimension are *Involvement*, *Peer Cohesion*, and *Supervisor Support* ((Moos & Insel, 1974; Moos, 1989; Moos, 1994a; Moos, 1994b).

*Involvement Subscale*. The mean score on this subscale is 7.7, which is considered well above average, while the median and modal scores are 8 and 9, respectively. A CV of 20% indicates low relative variation within the respondents' scores.

This subscale measures the employee's commitment to their job. The items on this subscale ask respondents about their desire for challenging and interesting work, the effort they exert in performing their work, and whether employees assist each other in accomplishing tasks. Based on their responses, the survey respondents indicate that they would be highly committed to their jobs.

*Peer Cohesion.* The mean score on this subscale is 7.4, which is well above average, while the median and modal scores are 8 and 9, respectively. While a CV of 24% indicates more relative variation than the Involvement subscale, it is still relatively low.

### 212 Workplace Preferences of Millennials

This subscale measures the amount of support employees provide each other. The items on this subscale ask respondents about the depth and loyalty of the relationships people will develop within the workplace. Based on their responses, the survey respondents indicate a preference to work in a very supportive, cohesive environment.

Supervisor Support. The mean score for this subscale is 7.3, which is considered to be well above average. The median and modal scores are each 8, while the CV is 21% which is more in line with the Involvement subscale for relative score variation.

This subscale measures the extent by which management facilitates a supportive work environment. Items on this subscale ask respondents about how often supervisors compliment employee performance, provide positive feedback, and provide open lines of communication. With a well above average score, the respondents indicate a desire for a substantial amount of support and recognition from management.

### Personal Growth or Goal Orientation Dimension

This second set of WES dimensions consists of personal growth and goaloriented subscales. This dimension includes the autonomy, task orientation, and work pressure items. Overall, this set of items focuses on the ways in which an environment encourages or prevents personal growth (Moos & Insel, 1974; Moos, 1989; Moos, 1994a; Moos, 1994b).

*Autonomy.* The mean score for this subscale is 7.3, which is considered to be well above average. The median and modal scores are each 8, while its CV is 22%, again in line with the Involvement score subscale relative variation.

This subscale measures the extent by which employees' desire self-governance. Items on this subscale ask respondents about their preferred levels of empowerment in decision-making, initiative, innovation, and independence. The mean score for this subscale seems to indicate that these respondents would prefer to have a significant amount of freedom and ability to make their own decisions regarding their work.

Task Orientation. The mean score for this subscale is 7.8, which is again well above average. The median and modal scores are 8 and 9, respectively. The subscale's CV is 19%, indicating a stronger cohesion (less relative variation) within the respondents than the previous subscales. This subscale measures the levels of emphasis placed on efficiency, focus, and task completion. The mean score for this subscale indicates that the respondents would be focused on accomplishing tasks in a timely manner.

*Work Pressure.* The mean score for this subscale is 3.6, which is below average. Of the ten subscales, this average is the lowest. In concert with this ranking, its median and modal scores are 3 and 4, representing a relative direction away from the scores of the other nine subscales. Further, its CV is the largest at 57%, indicating considerable scoring diversity within the respondent group. Scores ranged from 0 to 9.

The International Journal of Applied Aviation Studies 213

This subscale assesses employees preferred levels of urgency and pressures that exist in the work environment. The mean score for this subscale indicates that this generation would prefer to work in a relaxed environment, free of most job pressures.

#### System Maintenance and System Change Dimensions

This third set of WES dimensions assesses the preferred clarity of expectations, enforcement of rules, opportunities for innovation, and comfort in the work environment. The four subscales in this dimension are Clarity, Control, Innovation, and Physical Comfort (Moos & Insel, 1974; Moos, 1989; Moos, 1994a; Moos, 1994b).

*Clarity.* The mean score for this subscale is 7.0, which is considerably above average. The median and modal scores are 7 and 8, respectively, with a CV of 20%. Whereas the median and modal scores for this subscale are lower than most of the previous subscales, its relative variation is commensurate with the previous values.

This subscale assesses the extent to which corporate rules, regulations, and job expectations need to be defined. The mean score for this subscale indicates that the respondents would prefer to have significant details regarding the expectations of their job and work environment.

*Control*. The mean score for this subscale is 5.4, which is at the high end of *average* (on this subscale, 5.5-6.0 is considered as *above average*). The median and modal scores are 6 and 7, respectively. While these scores are lower than the previous subscales, a CV of 39% (second highest) indicates a fair degree of score variation within the respondent group.

This subscale assesses the firmness with which management enforces rules and policies. The mean score for this subscale indicates that while this generation would prefer to work in an environment that enforces rules, but it does not want an overly restrictive management.

*Innovation.* The mean score for this subscale is 6.4, which is considered to be well above average. The median and modal scores are each 7, while its CV is 34%, similar in value and interpretation as the prior *Control* subscale.

This subscale measures the extent that employees are encouraged to be creative in developing new methodologies and approaches, and are allowed to test new ideas. The mean score for this subscale indicates that the respondents strongly prefer a workplace that considers personal initiative and creativity to be of value.

*Physical Comfort.* The mean score for this subscale is 7.1, which is again considerably above average. The median and modal scores are each 8, placing this subscale equivalent to the first few subscales presented above. Similarly, its CV is 23%, indicating score variation equivalency to the first subscales.

#### 214 Workplace Preferences of Millennials

This subscale measures the characteristics of the workplace that influence feelings of contentment and positive well-being. The mean score for this subscale indicates that this generation holds a strong preference for an environment that is pleasing and comfortable.

### Chi-Square Analyses

Several chi-square tests were performed to determine which of the subscales, if any, indicates dominance or weakness relative to the remaining subscales. First, the subscales were tested within their respective dimensions, and then overall across all dimensions.

When examining the three subscales within the Relationship dimension, none were found to score significantly differently than any other,  $\chi^2$  (2, N = 6505) = 4.00, p > 0.136. This indicates that the respondents view the Involvement, Coworker Cohesion, and Supervisor Support subscales equally.

An examination of the three subscales within the Personal Growth and Goal Orientation dimension reveals a highly significant weakness for the Work Pressure subscale over the Autonomy and Task Orientation subscales,  $\chi^2$  (2, N = 5444) = 484.6, *p* << 0.0001. The contribution for the Work Pressure subscale represents roughly two-thirds the total chi-square statistic, indicating a considerable dislike of workplace pressures by this group. Factoring out the Work Pressure subscale with greater preference being given to Task Orientation than Autonomy,  $\chi^2$  (1, N = 4390) = 5.263, *p* < 0.022.

An examination of the four System Maintenance and System Change subscales reveals a significant *weakness* for the Managerial Control subscale, which accounts for roughly 60% of the overall chi-square statistic,  $\chi^2$  (3, N = 7516) = 79.533, *p* << 0.001. By "weakness," we mean that the respondents as a whole scored this factor much lower than expected, thereby contributing a large chisquare statistic value. Since the respondents seemingly do not favor Managerial Control, we removed it and reanalyzed the remaining three subscale factors. Consequently, the Innovation subscale is found to be weakly regarded while the Physical Comfort demonstrates some dominance with the Clarity subscale scores about as expected,  $\chi^2$  (2, N = 5938) = 14.470, *p* < 0.001.

Finally, all ten of the subscales were compared against one another. As is indicated by the descriptive results above, the Work Pressure subscale is very weakly regarded (again, "weakly" is in terms as we describe above), accounting for over 63% of the total chi-square statistic,  $\chi^2$  (9, N = 19,464) = 644.8, *p* << 0.0001. Managerial Control assumes a distant second contributing only 11% of the overall chi-square statistic. Nonetheless, these two subscales indicate a considerable dislike for these factors by this Millennial group. In contrast, the Clarity and Innovation subscales appear to be moderately regarded whereas the remaining six subscales appear to be favored on a somewhat equal footing.

### Discussion

The purpose of this study was to determine the ideal work environment preferences of members of the Millennial generation currently in the aviation industry.

The International Journal of Applied Aviation Studies 215

The results of this study portray a complex combination of the relationship, personal growth, and organizational structure of the ideal workplace as indicated by these respondents.

Overall, results indicate that these respondents view themselves as being highly committed to their jobs, and prefer a workplace environment that is very supportive and cohesive. It appears that this generation would work best in an inclusive environment, where managers utilize a more engaged approach incorporating coaching and mentoring strategies instead of authoritative directives. Millennials prefer being treated as partners and may work best in organizations with flattened hierarchies (Earle, 2003).

Unlike many other businesses, aviation is an extremely fast-paced industry requiring many time-sensitive decisions. While Millennials want the expectations of the workplace and of their job functions communicated in explicit detail, they do not want to be micro-managed. Respondents in this study indicated that they are focused on getting their work completed in a timely manner; however, they would also like the freedom to be creative and innovative. Though this may not be appropriate in many facets of the industry, inventive ideas could actually prove to be beneficial. Novel thinking that provides new products, methodologies, and ways of doing business could advance aviation performance worldwide. Management may wish to cultivate this ingenuity and provide Millennial workers with the opportunity to utilize their creativity in looking at old problems in new ways.

Aviation is very unique in that is operationally structured on a vast array of rules, regulations, and time schedules. Without these, the industry would not be able to function as effectively, efficiently, and safely as it does. Establishment and enforcement of these requirements comes not just from management, but also from local, state, and federal governments. Although the respondents of this study indicated they prefer a work environment in which they are informed in great detail of the rules, they also want flexibility in their decision-making. This establishes an apparent conflict that aviation managers may have to confront. Previous research has found that providing members of this generation the background of why particular rules exists tends to expand their understanding and acceptance of the particular policy (Martin & Tulgan, 2006). The aviation industry could experience dire effects if the uniformity and consistency provided by rules, regulations, and schedules are not upheld. Haphazard disregard of this structure could prove disastrous; therefore, more time should be spent explaining the rationale for the rules and regulations or, perhaps by providing employees with a company website to access resources which include readily available explanations.

The aviation industry is quite dynamic and is impacted by diverse factors ranging from politics to weather to economics, to name a few. The compounding interaction of these and other issues complicated by the continuous struggle to provide good, safe products and services, while also striving for financial success, causes aviation personnel to continually feel a sense of urgency in their work. The respondents in this study expressed a strong desire to work in an environment free from such job pressures. Again, this preference is in strong opposition to the nature of the industry.

As with any group, the Millennial generation exists across a continuum of likes and dislikes. This is supported by the relatively large variances in preferences indi-

#### 216 Workplace Preferences of Millennials

cated on the *Work Pressure* and *Control* subscales (57% and 39%, respectively). Consequently, it is incorrect to conclude that all Millennial generation respondents in this study shy away from work environments in which continual demands exist. By contrast, some respondents indicated no particular discomfort with such pressures. Because of this, it may be prudent for management to appropriately screen candidates for various aviation positions.

Respondents in this investigation stated that they preferred a physical workspace that was pleasing and comfortable. Because of their concurrent desire to work in partnership with others, it may be beneficial to redesign corporate workspaces to encourage collaboration. For many employees, an organization that provides them with a workplace environment that makes them feel energized and valued can encourage them to be more productive and perhaps work longer (Earle, 2003). In a previous study focusing on workplace design, employees indicated they would work an extra hour a day and felt their companies would be more competitive if they developed a better environment in which to work (Pfeffer, 2007). For members of the millennial generation, not only would a comfortable workspace be more conducive to their preferences, but it may be advantageous for management to also provide them with mobile technologies that would allow them to work anytime, anywhere.

Results of this study tend to agree with previous investigations focusing on the characteristics of the Millennial generation. Based on these findings, it is apparent that this generation has very distinct preferences for their ideal workplace and strong expectations of their employers. They are a generation that knows what they want and are used to getting it (Epstein & Howes, 2006; Martin & Tulgan, 2002). The arrival of this generation into the aviation workplace may present some challenges, but it also provides many opportunities. Success will be achieved by those organizations that are aware of the Millennial generation's workplace preferences.

### Limitations

Potential limitations of this study may be the relatively small sample size; therefore, generalizability of the results may be restricted. This study also relied upon self-report surveys to assess the participants' work environment preferences. Consideration should be given to utilization of other data collection measures, such as interviewing respondents, as well as collecting data from managers and supervisors of this cohort.

This study is the first in a series focusing on the implications of the Millennial generation working in the aviation industry, and was meant to be exploratory in nature. Future studies will include analyses of differences between generations currently at work in the aviation industry, as well as investigating generational preferences of individuals within functional areas.

### Conclusion

The primary contribution of this investigation was the determination of the ideal workplace preferences of the Millennial generation currently in the aviation industry. Overall, results indicate that these respondents have very strong and distinct preferences for their ideal workplace. For aviation managers, it is important to un-

#### The International Journal of Applied Aviation Studies 217

derstand the uniqueness of this generation so as to allow for a smooth assimilation of these workers into the workplace.

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The International Journal of Applied Aviation Studies 219

Appendix G—2010 Pilot Source Study

# 2010 Pilot Source Study

RESULTS April 4, 2010

Flight Crewmember Mentoring, Leadership, and Professional Development Recommendations: MLP ARC Report

## CHARTER

- COMMISSIONED: February 20, 2010 at Auburn, AL in a meeting/conference call among a consortium of educators, regional airlines, and interested parties to discuss a response to the Advance Notice of Proposed Rulemaking (ANPRM), entered into the Federal Register on February 8, 2010.
- RESEARCH QUESTION: What were the characteristics of pilots who were hired by the US regional airlines between 2005 and 2009, and how did these characteristics relate to their success in regional airline training?
- ANPRM QUESTION 2A: Are aviation/pilot graduates from accredited aviation university degree programs likely to have a more solid academic knowledge base than other pilots hired for air carrier operations? Why or why not? The 2010 Pilot Source Study provides an answer to this question.



Mesa Air Group

## Mesa Airlines – Arizona State University

Captain Michael Ferverda – Senior VP of Operations – Mesa) Robert Gibbs (Training Records Supervisor – Mesa) Dr. William McCurry (Professor, Aviation Programs Coordinator – ASU) Dr. Mary Niemczyk (Assistant Professor – ASU) Trevor J. Smith (Graduate Research Assistant – ASU)

## Horizon Air – University of North Dakota

Alagka Airlines, Horizon Air. The University of North Dakota

Capt. LaMar Haugaard (Chief Pilot – Horizon) Capt. Andrew Taylor (Assistant Chief Pilot – Horizon) Kathie Hyatt (Executive Admin Assistant – Horizon) Jenni Wilson (Chief Pilot's Admin Assistant – Horizon) Caysie Duax (Training Records Specialist – Horizon) Debbie Click (Training Records Specialist – Horizon) Dr. Elizabeth Bjerke (Associate Professor – UND) Andrew Leonard (Grad Research Assistant – UND)

### Cape Air - North Shore CC





Capt. Dave Bushy (Chief Operating Officer – Cape Air)

Capt. Craig Bentley (Managing Director Ops – Cape Air)

Capt. Bill Cush (Fleet Manager Cessna 402 - Cape Air)

John Bosco (Aviation Sciences Program Coord. - NSCC)

## Atlantic Southeast Airlines – Auburn University



Capt. Charles Tutt (VP-Flight Operations – ASA) Capt. Darrin Greubel (Manager, Flight Ops & Standards – ASA)

FO Grayson Cash (Flight Operations – ASA) Dr. Ray Hamilton (Associate Professor – Auburn) Dale Watson (Director of Aviation Education – Auburn)

## **2010 Pilot Source Study** Trans States Airlines – Southern Illinois University FRANS STATES David Hayes , VP & General Counsel (Trans States) Craig M. Tompkins, VP Safety/Regulatory Compliance (Trans States) Caren Blake, Supervisor, Crew Records (Trans States) Jennifer Ray (Trans States)

John K. Voges (Asst. Professor, Chief Instructor - SIU)

Michael F. Robertson (Assistant Professor – SIU)

Dora Asingo (Grad Research Assistant – SIU) Joseph Carlini (Grad Research Assistant – SIU)

Dr. David A. NewMyer (Professor - SIU)

Flight Crewmember Mentoring, Leadership, and Professional Development Recommendations: MLP ARC Report

American Eagle – Purdue University & Embry-Riddle Aeronautical University







Capt. Jim Winkley (VP of Operations – AA) Capt. Allen Hill (Director of Flight Training – AA) Dr. Tom Carney (Professor of Aviation Technology - Purdue) Dr. Guy M. Smith (Associate Professor – ERAU) Professor Chris Meigs (Assistant Professor – ERAU) Stephanie Henderson (Graduate Research Assistant ERAU) Westley Thompson (Graduate Research Assistant ERAU)

EMBRY-RIDDLE Aeronautical University

Dr. Tim Brady (Dean – College of Aviation) Dr. Dan Macchiarella (Chair – Aeronautical Science Department) Dr. Guy M. Smith (Principal Investigator – 2010 Pilot Source Study) Professor Chris Meigs (Principal Investigator – Pilot Yield/Training Study ) Professor Antonio Cortés (Principal Investigator – 2008 Pilot Yield Study)

## **AAB**International



Peter Morton (President, Peter M. Morton Consulting Inc.) Dr. Tom Carney (President, AABI) Gary W. Kiteley (Executive Director, AABI) Ceci Shirley (Accreditation & Meeting Services Manager, AABI) Vic Bayens (Administrative Assistant, AABI) Dr. David NewMyer (President, UAA) Carolyn Williamson (Executive Director, UAA)

## **Research Team**

Arizona State University – Dr. Mary Niemczyk (Assistant Professor, Air Transportation Management )

Auburn University – Dr. Raymond A. Hamilton II (Associate Professor of Aviation Policy)

**Embry-Riddle Aeronautical University** – Dr. Guy M. Smith (Associate Professor of Aeronautical Science) **Southern Illinois University** – Dr. David A.

NewMyer (Professor of Aviation Management & Flight)

**University of North Dakota** – Dr. Elizabeth Bjerke (Associate Professor of Aviation)



### 9 Predictors (Independent Variables)

- Year Hired
- College Degree
- Aviation Degree
- AABI Flight Program
- Military
- Source of Pilot Training
- Flight Instructor
- Total Flight Hours
- Previous Experience

### 2 Outcomes (Dependent Variables)

- Extra Training Events
- Completions

For each Outcome Variable, we show:

- 1. The question
- 2. A description of the variable

For each Predictor Variable, we show:

- 1. The question
- 2. A description of the variable
- 3. The statistical test results
- 4. The research conclusion



## **OUTCOME #2: COMPLETIONS:** Did this pilot complete the training with your airline-including IOE? (N = 2156)







•Pilots who were flight instructors had fewer extra training events than pilots who were not flight instructors.

Pilots who were flight instructors had comparatively fewer incompletes

AABI F Derived Va programs meet the A Accreditati Education)	in the data AABI Progra	y those set that m for Flight	N = 2156 All Others 1540 71%	
Predictor Variable	Outcome Variable	Statistical Test	Test Statistic	Significar
AABI Flight Programs	Extra Training Events	t-Test	t = 6.09***	Yes ***p < .0
AABI Flight	Completions	Chi-Square	χ <sup>2</sup> = 16.43***	Yes *** <i>p</i> < .0

incompletes

**PILOT TRAINING:** Where did this pilot get Advanced Pilot Training (beyond Private Pilot)? (N = 2156)



Predictor Variable	Outcome Variable	Statistical Test	Test Statistic	Significant?
Source of Pilot Training	Extra Training Events	ANOVA	F = 10.39***	Yes ***p < .001
Source of Pilot Training	Completions	Chi-Square	χ <sup>2</sup> = 30.16***	Yes ***p < .001

Pilots trained in college had fewer extra training events than non-college pilots
Pilots trained in college had comparatively fewer incompletes

### **Aviation Degree:**

 Derived Variable (any degree that contained words like aviation, flight, airport, pilot, etc. - these are not all flight degrees)



Predictor Variable	Outcome Variable	Statistical Test	Test Statistic	Significant?
Aviation Degrees	Extra Training Events	t-Test	t = 1.71*	Yes * <i>p</i> < .05
Aviation Degrees	Completions	Chi-Square	$\chi^2 = 8.13^{**}$	Yes **p < .01

•Aviation Degrees produced fewer Extra Training Events

•Aviation degrees produced comparatively fewer incompletes.

### **TOTAL HOURS:**

How many Total Hours did the pilot have at the beginning of training with your airline? (N = 2150)



Predictor Variable	Outcome Variable	Statistical Test	Test Statistic	Significant?
Total Flight Hours	Extra Training Events	ANOVA	F = 3.31*	Yes *p < .05
Total Flight Hours	Completions	Chi-Square	χ <sup>2</sup> = 17.24**	Yes **p < .01

Pilots with 501 to 1000 hours had the fewest extra training events.
Pilots with 501 to 1000 hours had comparatively fewer incompletes.



### COLLEGE DEGREE:

Did this pilot have a college degree (any discipline) at the beginning of training with your airline?

ur airline?				-	
Predictor Variable	Outcome Variable	Statistical Test	Test Statistic	Significant?	
College Degree	Extra Training Events	ANOVA	F = 1.16	No	
College Degree	Completions	Chi-Square	$\chi^2 = 2.408$	No	

16.14% 11.36%

72.50%

•Having a college degree **did not produce a difference** in extra training events.

•There was no relationship between the number of incompletes and whether pilots had a college degree

**MILITARY:** What prior military experience did this pilot have? (N = 2156)

*Note: The small # of military pilots* (68) suggests that most military pilots go directly to the major airlines

Military Aviator - Pilot - RW (7)

Military Aviator - Pilot - FW (51)
 Military Aviator - Non-Pilot (18)

	a minutely restriction for st					
Predictor Variable	Outcome Variable	Statistical Test	Test Statistic	Significant?		
Military	Extra Training Events	t-Test	t = 0.42	No		
Military	Completions	Chi-Square	$\chi^2 = 0.84$	No		

 Prior military experience had no effect on the number of extra training events

•There was no relationship between the number of incompletes and prior military experience.

### PREVIOUS EXPERIENCE:

What previous corporate or airline pilot experience did this pilot have? (N = 2156)

None 1658
 Airline 350
 Corporate 148

Predictor Variable	Outcome Variable	Statistical Test	Test Statistic	Significant?
Previous Experience	Extra Training Events	ANOVA	F = 2.51	No
Previous Experience	Completions	Chi-Square	χ <sup>2</sup> = <b>4.76</b>	No

•Pilots with previous airline or corporate experience had the **same number of extra training events** as pilots with no previous experience.

•Pilots with previous airline or corporate experience had the **same proportion of incompletes** as pilots with no previous experience.

INDEPENDENT (Predictor) VARIABLE	DEPENDENT (Outcome) VARIABLE	Statistical Tests	Test Statistic	Statistically Significant?	Conclusions
FLIGHT INSTRUCTOR (Yes, No) N = 2156	EXTRA TRAINING EVENTS (Range 0-12)	t-Test	t(955) ≈ 3.987, p < .001	YES ***	Pliots who were flight instructors had fewer extra training events than pilots who were not flight instructors.
FLIGHT INSTRUCTOR (Yes, No) N = 2156	COMPLETION (Yes, No)	Chi-Square	χ <sup>2</sup> (1,1) = 9.884, p < .01	YES **	Pilots who were flight instructors had comparatively fewer incompletes.
AABI FLIGHT PROGRAM (Yes, No, or No Degree) N = 2156	EXTRA TRAINING EVENTS (Range 0-12)	t-Test	t(1545) = 6.09, p <.001	YES ***	AAE: flight programs produced fewer extra training events
AABI FLIGHT PROGRAM (Yes, No, or No Degree) N = 2156	COMPLETION (Yes, No)	Chi-Square	χ <sup>2</sup> (1,1) = 16.43, ρ <.001	YES ***	AABI flight programs produced comparatively fewer incompletes
SOURCE OF PILOT TRAINING (Military, College Degree, Non-College - Part 141 or Part 142, Non-College - Part 61) N = 2156	EXTRA TRAINING EVENTS (Range 0-12)	ANOVA	F(3,2152) = 10.39, p < .001	YES ***	Pilots trained in college had fewer extra training events than non-college pilots.
SOURCE OF PILOT TRAINING (Miltary, College Diagree, Non-College - Part 141 or Part 142, Non-College - Part 61) N = 2156	COMPLETION (Yes, No)	Chi-Square	χ <sup>2</sup> (3,1) = 30.16, ρ < .001	YES ***	Pilots trained in college had comparatively fewer incompletes.
AVIATION DEGREE (Yes, No, or No Degree) N = 2156	EXTRA TRAINING EVENTS (Range 0-12)	t-Test	t(2047) = 1.71, p < .05	YES *	Aviation Degrees produced fewer Extra Training Events
AVIATION DEGREE (Yes, No, or No Degree) N = 2155	COMPLETION (Yes, No)	Chi-Square	χ <sup>2</sup> {1,1}=8.13, ρ <.01	YES **	Aviation degrees produced comparatively fewer incompletes.
TOTAL FLIGHT HOURS (0-500 Hours, 501-1000 Hours, 1001- 1500 Hours, >1500) N = 2150	EXTRA TRAINING EVENTS (Range 0-12)	ANOVA	F(3.2145) ≈ 3.31, p < .05	YES *	Pilots with 501 to 1000 hours had the fewest extra training events.
TOTAL FLIGHT HOURS (0.500 Hours, 501-1000 Hours, 1001- 1500 Hours, >1500} N = 2150	COMPLETION (Yes, No)	Chi-Square	χ <sup>2</sup> (3,1) = 17.24, p < .01	YES **	Pilots with 501 to 1000 hours had comparatively fewer incompletes.

### 2010 Pilot Source Study -RESULTS (v2)

Addama Data Drivenity – Dr. Ulan Nervicyk (Assistant Professor of Averaus and Ulan agement) Aukern Delemarity – Dr. Rasmand A. Handiton I. (Assistant Porfessor of Averaus Andrey) Drivery Halde Aerona utral University – Dr. Start A. Starth (Assistant Porfessor Arvanus) Scalaren Bress University – D. Dravid A. Handiton (Porfessor of Averaus Measurement) E. Fright) University of Nanth Dakets – Dr. Bratter (Assistant (Assistant Arvan) Measurement (E. Fright) University of Nanth Dakets – Dr. Bratter (Januar)
INDEPENDENT (Predictor) VARIABLE	DEPENDENT (Outcome) VARIABLE	Statistical Tests	Test Statistic	Statistically Significant?	Conclusions
COLLEGE DEGREE (Associate, Bachelor's, or None) N = 2156	EXTRA TRAINING EVENTS (Range 0-12)	ANOVA	F(2,2153) = 1.16	NO	Having a college degree did not produce a difference in number of extra training events.
COLLEGE DEGREE (Associate, Bachelor's, or None) N = 2156	COMPLETION (Yes, No)	Chi-Square	χ'(2,2) = 2,41	ND	There was no relationship between the number of incompletes and whether pilots had a college degree.
MILITARY (None, Military Pilot [FW], Military Pilot [RW], Military Aviator [Non- Pilot], Military [Non- Aviator]] N = 2156	EXTRA TRAINING EVENTS (Range 0-12)	t-Test	t(262) = 0.42	NO	Prior military experience had no effect on extra training events
					Note: The small # of military pilots (68) suggests that most military pilots go to directly to the major airlines.
MILITARY (None, Military Pilot (FW), Military Pilot (RW), Military Aviator (Non- Pilot), Military (Non- Aviator)) N = 2156	COMPLETION (Yes, No)	Chi-Square	χ <sup>2</sup> (1,1) = 0.84	NO	There was no relationship between the number of incompletes and prior military experience.
					Note: The small # of military pilots (68) suggests that most military pilots go to directly to the major arilnes.
PREVIOUS EXPERIENCE [None, Previous corporate pilot, Previous airline pilot) N = 2156	EXTRA TRAINING EVENTS (Range 0-12)	ANOVA	F(2,2153) = 2.51	NO	Pilots with previous airline or corporate experience had the same number of extra training events as pilots with no previous experience.
PREVIOUS EXPERIENCE (None, Previous corporate pilot, Previous airline pilot) N = 2156	COMPLETION (Yes, No)	Chi-Square	χ <sup>2</sup> (2,1) = 4.76	NQ	Pilots with previous airline or corporate experience had the same proportion of incompletes as pilots with no previous experience.

## 2010 Pilot Source Study -RESULTS (v2)

\* = Significant

\*\* = Very Significant

\*\*\* = Exceptionally Significant

Advance State University - Dr. Mary Interrupt (Advanced Fridmann of Ammunication) Management Automn University - Dr. Harmand A. Harniston (Maccosts Professor of Ammunication) tentry Halite Ammunication University - Dr. State 14, State University Fridmann Management & Region Statement (Interlation) - Dr. State 14, New Ammunication Professor of Ammunication University of Namh Delete - Dr. Drack Halite (Namonate Professor of Amstern)