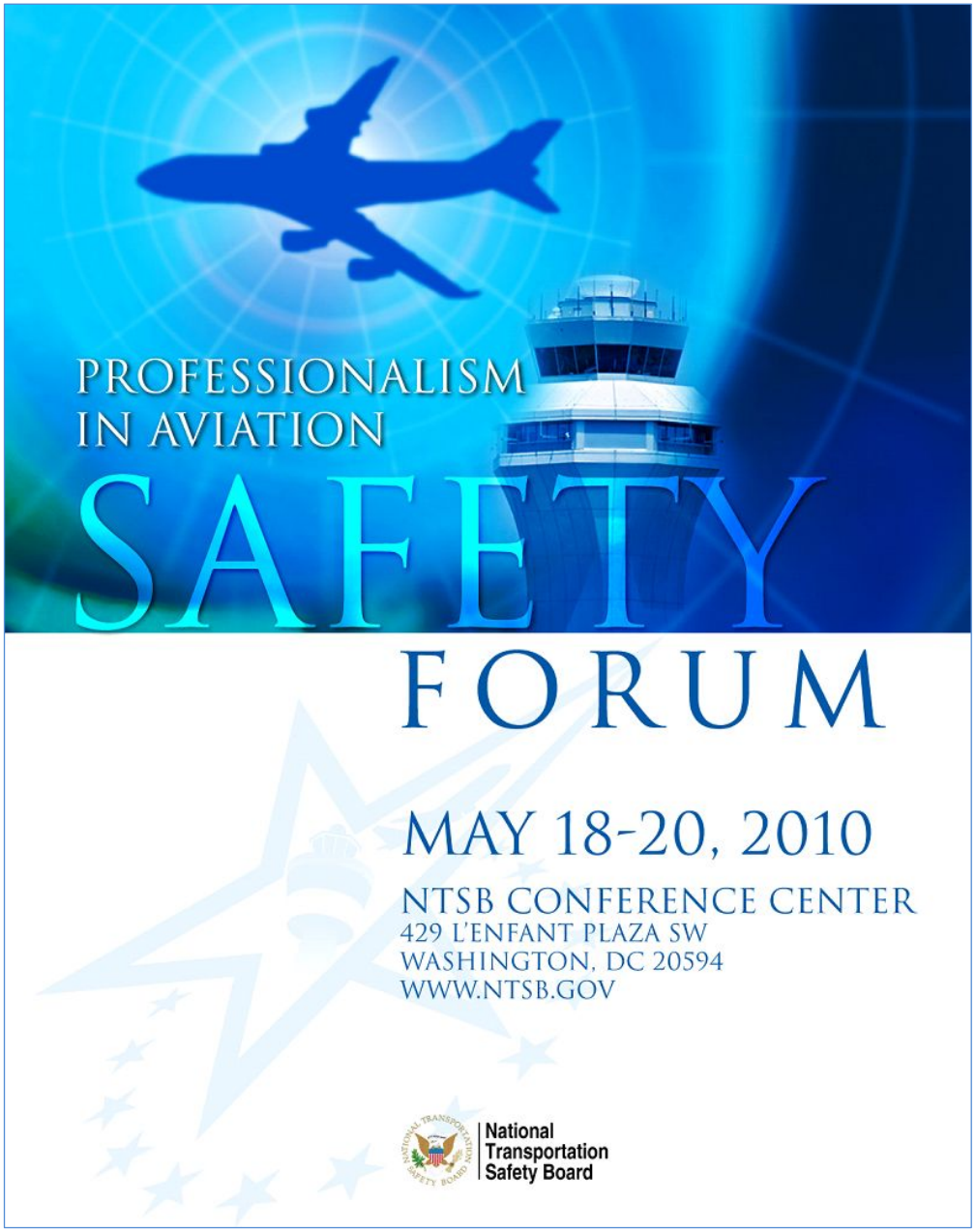
NTSB Safety Forum

Summary of Information Exchanged



Professionalism in Aviation: Ensuring Excellence in Pilot and Air Traffic Controller Performance

On May 18-20, 2010, the National Transportation Safety Board (NTSB) conducted a en banc public forum, *Professionalism in Aviation: Ensuring Excellence in Pilot and Air Traffic Controller Performance*, chaired by NTSB Chairman Deborah A.P. Hersman. Also serving on the Board of Inquiry was NTSB Vice Chairman Christopher A. Hart, and Member Robert L. Sumwalt. NTSB staff members participated as part of the forum's Technical Panel, including Dan Bartlett, Evan Byrne, Roger Cox, from the Office of Aviation Safety, and Vernon Ellingstad and Erin Gormley from the Office of Research and Engineering. This document is a high-level review of the main points of the information exchange that occurred during the 3-day forum.

Background

Recent NTSB investigations have identified pilot and controller professionalism as an issue affecting safety and the issue has been discussed in accident reports and safety recommendations have been issued. For example:

- In its report on the October, 2004 fatal accident involving Pinnacle Airlines flight 3701, the NTSB cited professionalism in the probable cause, "… the pilots' unprofessional behavior, deviation from standard operating procedures, and poor airmanship, which resulted in an in-flight emergency from which they were unable to recover." Recommendations relevant to improving professionalism were issued as a result of this investigation including addressing professional standards, Line Operations Safety Audit observations, and safety management systems.

- In its report on the October, 2004 fatal accident involving Corporate Airlines flight 5966, the NTSB concluded that, "the pilots' nonessential conversation below 10,000 feet MSL was contrary to established sterile cockpit regulations and reflected a demeanor and cockpit environment that fostered deviation from established standard procedures, crew resource management disciplines, division of duties, and professionalism, reducing the margin of safety well below acceptable limits during the accident approach and likely contributing to the pilots' degraded performance" A recommendation to reemphasize the importance of the sterile cockpit rule was issued as a result of this investigation.

- It its report on the August 2006 fatal wrong runway takeoff accident involving Comair flight 5191, the NTSB concluded that the, "flight crew's noncompliance with standard operating procedures… most likely created an atmosphere in the cockpit that enabled the crew's errors." The NTSB also concluded that the air traffic controller, "did not notice that the flight crew had stopped the airplane short of the wrong runway because, instead of monitoring the airplane's departure, he performed a lower priority-administrative task…" A contributing factor in the probable cause was the crew's nonpertinent conversation during taxi which resulted in a loss of positional awareness. As a result of this investigation a recommendation was issued on the need

to provide guidance to controllers to refrain from administrative tasks while moving aircraft are in their area of responsibility. In addition, the NTSB issued a recommendation identifying the need for training to improve controller judgment, vigilance, and safety awareness.

- In its report on the September 2007 non fatal accident involving an engine fire on American Airlines flight 1400 the NTSB discussed the flight crew's deviation from sterile cockpit procedures and concluded that, "the casual atmosphere in the cockpit before takeoff affected and set a precedent for the pilots' responses to the situations in flight and after landing, eroded the margins of safety provided by the standard operating procedures and checklists, and increased the risk to passengers and crew."

- In its report on the February 2009 fatal accident involving Colgan Airlines flight 3407, the NTSB concluded that, "the captain's failure to effectively manage the flight (1) enabled conversation that delayed checklist completion and conflicted with sterile cockpit procedures and (2) created an environment that impeded timely error detection." This factor along with the flight crew's failure to adhere to sterile cockpit procedures were among the contributing factors identified in this accident. Multiple recommendations were issued including the need to provide leadership training for upgrading captains, and the need to develop and disseminate guidance on professionalism in aircraft operations.

- In August, 2009 a fatal midair collision occurred between an air tour helicopter and a fixed-wing general aviation airplane over the Hudson River. Although the investigation is still ongoing, the investigation has determined that an air traffic controller who was working the general aviation airplane initiated a telephone conversation unrelated to his work about 2 minutes after he cleared the airplane for takeoff. In its recommendation letter issued after the accident, the NTSB noted that the controller was not fully engaged in his duties, and a recommendation was issued identifying the need to brief air traffic controllers and supervisors on the performance deficiencies evident in the circumstances of this accident and emphasize the requirement to be attentive and conscientious when performing air traffic control duties.

- In its report on the October, 2009 overflight of the destination airport involving Northwest Airlines flight 188, the NTSB noted that the pilots became distracted during the flight by a conversation during which they referenced their personal computers. The flight crew did not complete a routine frequency change and communications with air traffic control were not maintained. In addition, it was noted that air traffic controllers did not follow procedures to ensure that the flight was on the correct radio frequency, which delayed the identification of the flight as NORDO. The NTSB determined the probable cause to be "the flight crew's failure to monitor the airplane's radio and instruments and the progress of the flight after becoming distracted by conversations and activities unrelated to the operation of the flight."

- The NTSB is investigating a January, 2010, rejected takeoff and runway overrun incident involving PSA Airlines flight 2495 in Charleston, WV. Although this incident is still under investigation, the CVR transcript shows the crew involved in nonpertinent conversation during their taxi to the runway.

Forum Objectives

Following the recent investigations identifying pilot and controller professionalism as an issue affecting safety, and in particular the investigation into Colgan Airlines flight 3407, the NTSB committed to exploring the issue of professionalism in a public forum.

The forum was intended to raise awareness by promoting a forward-looking open discussion between the NTSB and invited panelists drawn from industry, labor, academia, and government on the importance of developing and reinforcing professionalism for aviation safety and the identification of best practices in this subject area. The forum spanned 3-days and to explore the areas of interest was organized into 10 panels (a detailed agenda containing links to speaker presentations is on the NTSB's website).

On May 18, following Chairman Hersman's opening remarks, and Dr. Tony Kern's keynote presentation, panels addressing the development of professionalism in pilots and air traffic controllers began, including screening and selection methods and their role in developing professional pilots, structured development of professional pilots, and developing excellence and professionalism in air traffic controllers through screening, selection, and training.

On May 19, the forum continued its focus on the development of professionalism with a panel on developing excellence through operator training. The forum then shifted focus to methods and techniques to reinforce professionalism, with panels addressing the shared responsibility to reinforce professional standards in pilots, shared responsibility to reinforce professional standards in air traffic controllers, and the captain's role in ensuring professionalism.

On May 20, the forum focused on ways to ensure excellence and professionalism with panels on ensuring effective pilot-controller communications, ensuring excellence through data and information sharing, and the role of the regulator in ensuring professionalism in aviation. The forum concluded with Chairman Hersman's closing remarks.

For additional and more detailed information, readers are encouraged to review the materials generated from this forum which are archived on the NTSB's website. A copy of the video webcast made during the 3-day forum is available by contacting the NTSB's Records Management Division at 490, L'Enfant Plaza, S.W., Washington, DC 20594, phone 800-877-6799. An online form is also available to make your request.

Key Points of Information Exchanged

The information shared by the panelists and the dialogue between those panelists and the NTSB served to achieve the NTSB's objectives. This section summarizes points discussed in each panel during the forum:

It is important to note that the following summaries of information exchanged reflect issues and needs identified by the participants and are not to be considered NTSB recommendations.

Keynote Presentation

Panelist

Tony Kern, Ed.D., President, Convergent Performance

Key information exchanged

- Experts in the aviation professional community may not all share the same definition of professionalism but can agree on what it is when they see it in practice.

- Overall, the industry is safe but it can do better to maintain the levels of professionalism that have been established. There are challenges that need to be addressed in a forward-looking manner. The industry should not accept predictable and preventable errors, and intentional noncompliance. To fight complacency in this area we need to approach every day with the attitude that we might not be good enough.

- It is possible that industry events and accidents related to professionalism is the beginning of an "infection of sloppiness." To address this we need inform and inspire; and educate and motivate to establish a culture shift in the industry.

- Professionalism is a difficult concept to define. In attempts to define an expert pilot in the USAF it was found that there are more than 40 different variations on what professionalism means in aviation. Professionalism needs to be more than compliance and competence. Codes of ethics provide good starting points and guidance to what professionalism is.

- Compliance and staying engaged in the task in a repetitive, self-regulating, and automated system like aviation can be difficult but it is critical. When individuals choose noncompliance or shoddiness, or do not engage in the task completely because it is one that they have done so many times well before, they may believe an adverse outcome of their actions simply cannot happen to them. This is wrong.

- Self-awareness and self-management skills are important to high-end professionals' performance and success. These skills can be taught and developed at a higher level. By applying these skills individuals are better able to detect and address deviations in performance (their own, others, and system) while there is an opportunity to do something about it.

- A blue threat is a business/military planning term that reflects an internal threat. A red threat is an external threat such as the environment, weather, economic situations. The blue threat is under an individual's control.

- The 3-D's, are critical: detail, diligence, and discipline. Detail is every step done correctly. Diligence is attention to detail every single time. Discipline is critical to resist temptations to deviate whether they are cultural norms, internal or external distractions.

- Apathy, complacency, boredom, preoccupation and noncompliance cause problems and have led to errors in aviation.

- There is a foundational flaw in the philosophy of education and training. That is, there is an assumption that when we train someone to do something right we are simultaneously training them how not to do it. This is flawed. People need to be trained on error detection and error control, and how to deal with small mistakes that have no bad outcome but can be learned from.

- The concept that human error is inevitable may be obstructive to effecting change in this area. People need to strive for higher levels of efficiency and precision. Sometimes things need to be done perfectly just to survive. There is a primacy of individual accountability for success.

- Debriefs are an extremely valuable opportunity for improvement. They should not just be for negative events and are beneficial in the continuous improvement / continuous learning process which is an essential part of being a professional. Debriefings of performance within teams should be the expected norm rather than the exception.

- Training can be improved to address issues associated with professionalism. A career-spanning integrated personal, team, and organizational safety training program is one way to do this. It is important that courses like CRM do not remain static. Professional ethics, flight discipline, compliance, and the individual's roles and responsibilities are important areas to address. Training should address true professional development as it exists in other industries. Training should focus on the individual, the team, and the system.

- Standards of professionalism are determined at multiple levels. The regulator sets the minimum standards in regulations. Codes of ethics can establish compliance and ethics standards. The organization can also set standards of performance and behavior. Peer-to-peer accountability is important.

- Generational changes may be affecting professionalism. Research indicates that the ethics of American youth is changing. Data indicate increased levels of unethical behavior in this age group. If standards of performance and compliance are not maintained by the older individuals in the industry then it presents a poor model that may potentiate any negative ethics tendencies in the younger age group. Casual compliance will set the stage for things to get worse. We have to as a result train people coming into the aviation industry that its success relies on compliance. Ethical compromise is not acceptable where public safety is at stake.

- It is important to have alternative paths in the aviation industry for people to be routed to in the event that they are not measuring up to the performance standards required for their current position.

Screening and Selection Methods and Their Role in Developing Professional Pilots

Panelists

Judy Tarver, Vice President, FltOps.com

Kent Lovelace, Chair, Department of Aviation, University of North Dakota

Sheryl Barden, President, Aviation Personnel International

Diane Damos, Ph.D., President, Damos Aviation Services

Objective

The objective for this panel was to discuss the pilot supply, and then examine how pilots are screened and selected, to help understand the role that screening and selection methods play in the development of professionalism.

Key information exchanged

- Projected airline growth over the next fifteen years greatly exceeds projected supply of new pilots.

- There isn't a pilot shortage today, but there will be soon. There is an illusion of an abundant pool of applicants. Companies including majors hire from the same pool, so once hiring starts the pool begins to evaporate quickly.

- In the United States, pilots self-select by choosing to train and paying for it. Flight schools lose revenue if they attempt to screen or select out students.

- High school and college students (even those at aviation-oriented universities) show declining interest in a flying career. Reasons are varied but include negative media portrayals of the industry, high debt burdens, and low salaries.

- Airlines are not funding student loans or university training. A typical graduate with a $50,000 loan to pay off is facing a monthly bill of about $750. It was noted that a regional chief pilot said that his new hire pilots could afford a car or an apartment, but not both.

- There is evidence that entry level pilots from accredited aviation colleges perform better in airline training than their peers. Accreditation provides standards that go beyond technical skills to include critical thinking. It is a check on quality of the program. FAA does not get involved in accreditation except for the part 141 or part 142 school.

- Colleges are legally restricted from the kind of professional screening which an employer might use, and college financial aid sufficient to cover all costs is very constrained.

- Like other college students, aviation candidates mature as they progress through college. However, a trend among recent students is less focus and discipline. Some schools are providing ethics classes in response to the needs of incoming students.

- Screening is the process of determining if an applicant meets minimum qualification standards; selection is the process of choosing from among the screened applicants. Who is selected is very important because that person is likely to be in the profession for a long time, whether a good or poor performer.

- Valid screening criteria for pilots include technical competence, leadership, operational awareness, teamwork, initiative, how they deal with stress. Many of these characteristics are common in most jobs.

- An applicant's attitude is an important part of selection, as it is with most jobs. Interviewing is one part of selection, and employer interviewing skills must be trained. Many airlines have not done such training and don't even know it's needed.

- Airlines which hire entry level pilots need to have the right selection tools, and interviewers need better skills. Too many companies only take a cursory view of applicants. Thorough checking of an applicant's certificate history and flight time is also important in screening and selection. Applicants have falsified flying time and concealed negative events.

- Simulator checks can provide a means of verifying flight skills, but many airlines have dropped applicant simulator checks because of cost or because too many applicants fail.

- Selective corporate operators will obtain very detailed background searches when hiring pilots, but some airlines have simply hired from those who pass initial screening.

- There is adequate expertise and data to develop good pilot selection systems for feeder air carriers in the US, but many of these carriers have not chosen to do so. Other countries have set up ab initio pilot selection systems, but there is little interest in the US.

- All employment in the US by employers above a certain size must conform to legal standards known as uniform guidelines, first promulgated in 1978. The guidelines address how a selection system must be set up and what characteristics the system must have. There are additional guidelines for applicant tracking. Pilot selection systems must conform to these guidelines. Most airlines do not understand their obligations and vulnerabilities under these laws. Standardized tests are available which pass US regulations. However, personality tests are not legal for pre-employment testing in this country.

- NBAA has about 10,000 pilot members, but professionally flown private aircraft are probably a single digit percentage of total pilot employment. Corporate and business aviation is very subjective in hiring pilots, but some clients want an intensive background check of a candidate, to include multiple interviews, testing, and past performance and references.

- Performance based culture is attractive to pilots in business aviation. Pilots are rewarded for their work. Annual review for those skill sets. Promotions based on how individual has performed and potential for further development. Education is important for most clients. Can this aviator make sound critical judgments? On the other side of the world they are the decision maker and the protector of company personnel at that time. Hiring is not repetitive. Very specific for the niche they have at the moment.

- Airlines faced with a shrinking applicant pool are faced with a very hard decision: either ground flights for lack of pilots or change their selection system. When faced with a pilot shortage, some companies have dropped selection criteria and accepted applicants who pass screening only.

- The high cost of a thorough selection system is a problem for many airlines, and can be a greater burden for regional airlines. Regional airline hiring practices vary widely.

Structured Development of Professional Pilots

Panelists

Craig Bentley, Managing Director of Operations, Cape Air/Nantucket Airlines

Gary Morrison, Department Head, Regulatory Affairs, Global Ab Initio and MPL Initiatives CAE

Al Thompson, Chief Pilot, Flight Training - Simulators, Boeing Training & Flight Services

Chris Haber, Training Manager, KLM Flight Academy

Matthias Kippenberg, President, Airline Training Center Arizona

Objective

The objective for this panel was to hear from organizations that have adopted structured approaches to screening, selecting, and training pilots, to understand how this approach works to develop professionalism.

Key information exchanged

- Cape Air's gateway program includes university partners and JetBlue airlines. Similar cultures across these partners help allow this program to succeed in developing a professional pilot. Gateway programs like that of Cape Air may be

scalable, but they are unlikely to be able to provide for all the future needs of airlines and operators in the future. At present, the program has 60 students, 26 have completed internships, and they have 9 full-time pilots. The program is expected to provide between 20-25 pilots to the major airline when it is fully operational.

- One value of an 8 year gateway program is that there is time to observe a person's commitment and performance over time which allows identification of individuals who are not the type of person originally expected.

- Cape Air pilots fly single pilot and have to be a jack of all trades, and develop skills that will benefit them later in a multi-crew environment.

- Structured programs like Cape Air, KLM and Lufthansa have used the screening and selection process to hone down training candidates to the point where they have almost complete success graduating students to full flight status once they are in the program. This contrasts with a 35% washout rate at Cape Air when they were employing a traditional hiring and training program.

- The MPL licensing concept has been beta tested in several environments with positive results. The training programs supporting MPL licensing are immersion programs similar to those used in military aviation, with a very stringent set of rules governing the training. Acceptance of the MPL concept is spreading internationally through the cooperation of national regulators and aviation training organizations.

- CAE has begun an MPL program working with Transport Canada. There are four phases: core, basic, intermediate and advanced. Multi-crew and high performance aircraft training is done in the intermediate phase using advanced simulators. The advanced phase is conducted at the sponsoring airline using their aircraft and standard operating procedures.

- Academic ability and motor skills are necessary for success as a pilot going through training, but passion and enthusiasm are the most important element of professionalism. Markers of professionalism were described as being prepared every day, adequate rest, prepared for inevitable problem, lifelong learners.

- Interpersonal competence can be measured and graded in a structured program, from day one of training and throughout every training flight.

- One basic element required for a competent professional pilot is an enthusiasm and passion for what they're doing, and a good selection program will help with that. A pilot also needs motor skills and academic ability to learn systems and procedures, however passion is essential. This is true for instructors as well.

- Boeing performed MPL training with a small cadre of ab initio students from China. Only two had drivers licenses, and it was found during this beta test that there was a difficulty in taxiing because the students did not have familiarity with speed, braking, acceleration and momentum. This was overcome. The training was a success, and

Boeing plans on expanding the program but is not intending on becoming a competitor with flying schools. They expect to provide intermediate and advanced training, but not core and basic.

- At KLM, when the flying school was provided by the state, it was free to the students. It became self-subsidized, and the cost now amounts to $180,000. The starting salary is high and there are tax incentives to help pay back, and the airline provides $14,000 a year tax free. It was estimated that with normal standards of living a pilot could pay back the training loan in 8 or 9 years. The training is insured in case of early termination or a delay in hiring. The insurance fund is paid partially by KLM and partially by the banks that loan the money to the students.

- KLM is not technically an MPL program. Flight time is 150-160 hours in aircraft and 110 hours in simulator when the student is complete and starting to fly for the airline. Success rate is 99 percent and about 3 out of 1000 who entered the program washed out.

- Some MPL and ab initio training programs are paid for by the sponsoring airline and some are not, and some airlines provide partial subsidy. However, they all provide a career job at the end of the training. The strength and viability of that airline is essential.

- These programs cost money and it's a major stumbling block for good candidates here in the United States. Here there is not a good funding mechanism for this type of training. Around the world some airlines do fund this training. The KLM flight academy is a self-sustained separate line of business.

- Part of the value of structured programs is exposure to safety culture which can be ingrained during training from day one of ground school. In addition pilots in these programs may be exposed to non-punitive voluntary self-disclosure safety programs similar to what they will have at the major airline.

- A key tenet to the success of structured programs like gateway, ab initio and MPL is a rigorous selection program to ensure the process starts with a good pilot candidate with a high likelihood of success. Another critical component is a program focus from the beginning on the knowledge, skills, and abilities to operate safely in a multi-crew environment.

Developing Excellence and Professionalism in Air Traffic Controllers Through Screening, Selection, and Training

Panelists

Kate Bleckley, Personnel Research Psychologist, FAA Civil Aeronautical Medical Institute

Henry Mogilka, Assistant Division Manager, Air Traffic Training Division, FAA Academy

Gregory McGuirk, Program Coordinator, Air Traffic Management, Embry-Riddle Aeronautical University

Jennifer Allen-Tallman, CRM Program Manager, Risk Reduction Projects Group, FAA Air Traffic Organization

Don Simons, Air Traffic Manager, FAA Reagan National Air Traffic Control Tower

Objective

The objective for this panel was to examine the methods used to identify and qualify air traffic controllers, focusing on the development of professionalism and excellence.

Key information exchanged

- Initial screening for air traffic controllers is conducted using the AT-SAT computer based test. Among other things, the AT-SAT measures/evaluates spatial association ability, abstract association, and vector algebra. At this time, the AT-SAT does not measure for active listening skills. Professionalism is not directly measured using the AT-SAT, however they do measure constructs that are related to professionalism such as interpersonal tolerance and ability to focus.

- The AT-SAT is administered to all applicants that have no ATC background, i.e. college graduates with air traffic degrees and general population. Prior military applicants are not required to take the AT-SAT since the ATC skill set was previously established with the military.

- For those hires that have a four year air traffic degree and military hires, the first five weeks of the FAA Academy, Level 1, AT Academics, is waived.

- 50 percent of the applicants to FAA ATC jobs are hired under “no experience” and must attend the full FAA ATC course.

- Academy and facility personnel discuss professionalism and behavior with trainees during informal meet and greet discussions held periodically during training. Discussions are also held about safety culture. Training is done in an environment that recreates the live environment and minimizes extraneous distractions. Daily debriefings of performance occur to facilitate learning.

- ATC applicants are assigned to facilities upon initial hire with the FAA, before attending the Academy, based on the applicant’s geographical preference. Once hired applicants are trained to a Tower, TRACON, or ARTCC discipline according to the

geographical assignment. There is no consideration for assignment based on demonstrated academic or practical application performance at the Academy.

- The FAA Academy has trained 6000 controllers during the last five years in all disciplines (Tower/TRACON/ARTCC). Academy attrition averages 5 percent today which is down from 30 to 40 percent in the late 1980s.

- There are currently 36 College Training Initiative Air Traffic (CTI-AT) colleges working in coordination with the FAA to award 2 and 4 year air traffic centric degrees. The FAA certifies colleges for the CTI-AT program. No guarantee is implied by the FAA or the college that an air traffic control student will be hired by the FAA. College students are able to take the FAA AT-SAT in their senior year.

- Crew resource management is a relatively new concept with the FAA ATC community. The FAA is fielding CRM using a cadre of instructors at major ATC facilities with a goal of providing initial CRM training to all controllers in the workforce. CRM follow-up training at present is provided upon request by individual ATC facilities. Workforce reaction to ATC CRM has been positive.

- Professionalism is measured by controller conduct.

- Key to professionalism is social ability resulting in teamwork. Working as a team player, considering safety each and every time they make a transmission, identifying threats, and finding ways to mitigate threats are considered having a sense of professionalism.

- Management approach to professionalism is via a demonstrated commitment to the employees, mentorship, and leading by example.

- FAA has required mandatory briefings from management to employees about incidents and acceptable behavior.

Developing Excellence Through Operator Training

Panelists

Randy Hamilton, Director of Training, Compass Airlines

Joe Burns, Managing Director, Technology and Flight Test, United Airlines

Brian Ward, Managing Director, Flight Training, FedEx Express

Paul J. Preidecker, Chief Instructor, Air Wisconsin Airlines

Objective

The objective for this panel was to focus on the methods and techniques operators use to instill and develop professionalism in pilots from day one of indoctrination training to becoming qualified on the line.

Key information exchanged

- Compass, a regional airline, has a unique advantage in selection because it has a "flow through" agreement with Delta, which allows Compass pilots to move to Delta without an interview.

- Partly because of advantageous selection, Compass' training success rate is 98%.

- Compass trains under AQP which allows for increased training intervals, but has decreased the intervals by having "touch" events with pilots four times year. Infrequent contact with pilots in training may affect the development of pilot's interpersonal skills.

- Ten attributes of professionalism were listed, of which discipline and projection of a professional image were considered only possibly trainable and maturity and emotional stability were considered not trainable.

- Hard flying skills degrade if they are not used. Part of training is to teach pilots to recognize when automation is not working.

- Line captains are asked to evaluate new pilots in their probationary year and the data is kept and reviewed.

- At FedEx, a pilot can fail a check ride as a result of poor soft skills, but only if a technical failure such as an altitude violation results from those poor skills. In many cases better monitoring or communication could have prevented the technical failure.

- FedEx trains pilots to verbalize errors which are identified. This allows errors to be identified directly and verbally until a correction is made. They are also addressing pilots' willingness to admit weaknesses and errors through a multi-faceted program. Pilots tend to be technicians and problem solvers, but not natural communicators. Training pilots to become better communicators can help offset this and improve debriefings.

- The corporate leaders must communicate safety values, but the VP of Flight Operations is the primary point of responsibility for safety culture for pilots. Also, top company leadership must empower employees, and if they remain behind "glass doors" someone else should push the safety culture.

- Even an experienced airline pilot can fail in training if he lacks self discipline, good study habits and motivation.

- Generational differences exist in the cockpit. Younger pilots show good automation skills but often lack experience.

- The airline industry has many information sharing means, both internally at airlines and externally among airlines.

- Discipline and good study habits are essential and pilots who have college degrees are likely to have learned those things, but they can also be learned outside of college.

- Professionalism is how you do your job, and the push to improve it is coming from within the airlines. There is a recent (last four years) focus on the totality of a pilot's performance and an attempt to classify training problems as high or low risk. Recurring performance problems, especially on the same airplane, are an indicator that focused training must be provided and decisions must be made about the pilot's ability to remain in the job or hit an "exit ramp." This works best when done jointly with the pilots association.

- The most professional pilots try to continuously improve and are willing to help those around them.

- Things intrude on pilots lives which affect their performance. Some pilots have been taught to compartmentalize to help prevent outside issues from affecting their performance on the job.

- More hours is not necessarily equivalent to more competency.

- There are behavioral markers available for assessing CRM performance as outlined in FAA AC 120-51E. However there are no similar tools for the industry to use in assessments of professionalism.

Shared Responsibility to Reinforce Professional Standards in Pilots

Panelists

Rick Rowe, Chief Pilot, Flight Operations, Bombardier Business Aircraft

Ed Sternstein, Chief Line Check Pilot B767-400/500, Delta Air Lines

Chris Keinath, Director of Safety, Horizon Air

John Rosenberg, Chairman, Professional Standards Committee, Air Line Pilots Association

Robert McDonnell, National Chairman, Professional Standards Committee, Allied Pilots Association

Objective

The objective for this panel was to focus on approaches used by companies and pilot associations to reinforce professionalism throughout a pilot's career.

Key information exchanged

- Adherence to Standard Operating Procedures (SOPs) should be a vital part of professionalism for business aviation. Part 91 and 135 operators can be encouraged to adopt these SOPs provided by manufacturers and part 142 training organizations, but it is not required. For these pilots, soft skills are discussed but not fully incorporated in required training.

- A leading airline teaches pilots to use company resources to back up their decisions, although pilots are the final authority. The company teaches "in command" skills in a formal class. The most important skill is what is needed to exercise good judgment. Command judgment is a part of a line check and a deficiency can be disqualifying. Special training exists to correct problems.

- A leading regional airline encourages safety with a unique corporate board safety committee. Pilot professionalism is supported by this, but also comes from the pilots themselves. Direct fleet manager involvement in pilot contact encourages pilot self-commitment, and a company/union peer-to-peer accountability system is an effective tool. Pilots are encouraged to commit to doing their very best professional job every day at work.

- Union professional standards committee members are unpaid volunteer peer-to-peer counselors who learn skills through contact with other experienced volunteers and through periodic training. They can be effective because they are not agents of the company and can prevent career-threatening action against a pilot by the company and FAA. They cannot function without cooperation from the pilot and empowerment from the chief pilot. Each airline union group must work hard to get buy-in from pilot management in order for them to be effective.

- Although professional standards pilots from airlines having established professional standards groups can teach pilots at newer airlines how to do the peer-to-peer counseling, it is up to each individual airline union group to build a working relationship with their own chief pilots.

- Most pilots know that failure to cooperate with professional standards can result in more dire consequences from company or FAA, and choose to cooperate. Problem resolution can take place with no effect on a pilot's record.

- Morale, economic pressures, and problems at home can lead to conflicts at work. Some of these external events continue to affect pilots. Not as many pilots consider the airline as a career as once did, and many have second businesses, which can be a distraction. Training for compartmentalization was done in the Navy and may be necessary for this generation of new pilots.

- Pilots' value systems, including the three D's (detail, diligence, discipline), sustain professionalism. Today's captains are the biggest influence on future captains, so their example is important.

- On rare occasion a "frequent flier' (pilot who is repeatedly routed to professional standards) wears out his welcome with professional standards. Although such individuals are still legally represented by the union, it is the company's function to deal with them. Professional standards drops out because it is not part of the legal representation process.

- In most cases, professional standards committees spend their majority of time on a very small percentage of the overall pilot group at an airline (estimated at 1 percent).

Shared Responsibility to Reinforce Professional Standards in Air Traffic Controllers

Panelists

Bill Peacock, Executive Vice President, Robinson Aviation, Inc. (RVA)

Garth Koleszar, Professional Standards Committee, Member and NATCA Facility Representative, FAA Los Angeles ARTCC

David Conley, President, FAA Managers Association

Robert Clyburn, National Chairman, Air Traffic Supervisors Committee

Kevin Stark, Air Traffic Manager, Denver ARTCC, FAA

Objective

The objective for this panel was to focus on approaches used by the FAA, contractors, and NATCA to reinforce professionalism throughout a controller's career.

Key information exchanged

- The FAA does not have a code of ethics for the ATC work force.

- The FAA does not have professional standards for the ATC work force. That is, the performance plans for the controllers or managers do not include the term professionalism. Although there is not an explicit expectation for professionalism, there is an implicit expectation that the work is done professionally.

- The FAA has a standards of conduct perceived to be a disciplinary tool for management.

- Recurrent training for controllers could be enhanced to be more realistic and applicable.

- Effective recurrent training is hindered by insufficient staffing.

- The Air Traffic Manager (ATM) sets the tone for professional performance in an ATC facility. This is considered to be the single most important factor for establishing professionalism in a facility, as this sets the tone for the management team, who in-turn communicates the tone and standards to the front line controllers.

- The adoption and application of the Air Traffic Safety Action Program (ATSAP) is required before professional standards for ATC can be developed. More than 14,000 reports have been filed in this program to date.

- ATSAP and professional standards need to be implemented fully before the NATCA/FAA contract is subject to re-negotiation in 2012.

- NATCA has a code of ethics as part of the contract with the FAA.

- Professional standards by definition do not exist in the FAA however, attributes of professionalism are already in place.

- Once a controller is certified a controller in charge (CIC), he/she no longer receives recurrent professional training.

- Professional training for ATC is “at the bottom” of the professional scale, i.e. just enough to get by.

- NATCA, in concert with the FAA, as a result of recent contract negotiations, is developing professional standards for ATC. Training competencies for facilitators in the program are being created as are procedures and steps for the program to follow. Implementation of this program is planned for fall of 2010.

- A front line manager needs to have passion for the discipline of air traffic control, be an everyday learner, acquire and develop the skills to become not just a manager but a leader. The primary motivation should not be on what kind of pay increase results from the position, but how much of a difference can be made.

- FAA Supervisors/Front Line Managers (FLM) receive initial management training and recurrent management training every 3 years. Recurrent training topics have covered performance management, team building, safety culture.

- An Air Traffic Leadership Development Program is being created. Its intent is to identify and provide support to people interested in developing their leadership competencies and skills in preparation for a formal leadership role.

- Contract ATC employee source is from qualified controllers (military/FAA).

- Contract ATC provide cash awards for superior performance for things such as perfect phraseology.

- Contract ATC screening and selection is accomplished at the ATC facility manager level.

- There is no formal program that allows cross pollination of best practices from one part of the country or facility to another. There are a lot of people doing things in the absolute best way it can be done and ways to share effective practices would be advantageous.

The Captain's Role in Ensuring Professionalism

Panelists

Ben Berman, Captain

Molly Boss, Captain

Jamie Bosworth, Captain

Ron Nielsen, Captain (retired)

John Sluys, Captain / Chairman, Professional Development Group, Air Line Pilots Association

Objective

The objective for this panel was to discuss how captain's approach their responsibilities, and how they establish a professional cockpit tone and draw out excellence in their fellow crewmembers.

Key information exchanged

- Captain's authority has eroded for a variety of reasons, including more procedures, more detailed rules, and production and economic pressures.

- Captains must learn the right balance of respecting rules and exercising independent judgment.

- Pilots from every background have some hole in their knowledge, skills or abilities which needs to be filled in.

- There is an "entitlement" generation today. If maturity is an issue, captains must address it with the person or get help from peer-to-peer counselors.

- Younger pilots who are comfortable with technology may lack social or communications skills. Articulating intentions is a vital skill, so training in this area is needed.

- Older captains at mature airlines may not welcome constructive feedback from other crew members.

- Captains must engage with first officers from the beginning of a trip in order to establish rapport and make it known that they will be responsive. This type of social skill contrasts with hard flying skills, is not a natural thing for most captains, and must be taught.

- Captains need to understand and acknowledge policies and procedures (buy-in), and companies need to invest the time and effort to be clear about why these policies and procedures exist. One airline illustrated this kind of proactive approach by collecting multiple comments from line pilots about major new procedures.

- One airline has had a leadership class for its new captains since the sixties. It is directed at captains who have been in command for 6-18 months and focuses on the role of leader. They emphasize use of the company resources and focus on the skills that the captain has or he lacks.

- Part of good captain's judgment is using company resources to resolve tricky or difficult decisions, especially when they involve security or liability to the company.

- Direct contact with and safety emphasis from CEO's and other corporate officials are good means of reinforcing safety culture within the pilot work force.

- Pilots are self-selected and are geared to self-assurance.

- Sanctimonious preaching about professionalism at a personal level will have an adverse effect on behavior. Training, practicing and enforcing strong safety culture is more subtle and more effective.

- Some captains have natural mentoring ability while others lack interest to do so. Captains who model the right behavior will have a positive influence on others and may improve their own performance at the same time.

- Operators must select out people who don't fit, then they must train decision making and find ways to transmit the safety culture.

- Avoiding decisions and deferring to the first officer may be a problem for captains at some airlines. CRM is not intended to be decision by committee, but instead tools and skills to get all the information first.

- Pilot mentoring at aviation-oriented universities is a way to build professional attitudes early, and is the objective of at least one pilot union.

- Many people equate the appearance of age (grey hair) with experience, and pilots should be expected to improve in judgment over time. However, more youthful appearing pilots have the same professional responsibilities and should be attentive to their appearance and conduct, especially in public.

- The captain's authority has eroded. SOPs script the duties and take away some of the pilot's latitude. There are production pressures to get there fast and on time. Being called into the chief pilot's office and asked why you added fuel is culture transmission not helpful to safety.

- Education is important, but a specific degree from a specific college is not. Regardless of background (military, civilian), each pilot has some hole in his knowledge, skills and abilities that needs to be filled in.

- Peers need to put the pressure on people to conform, and it can come from either seat, it is not just a captain's responsibility. Bring back to the center, set the tone from the first flight of the day. In addition, mentoring an excellent opportunity for self-correction. It has to become accepted and the standard. We have to inculcate that constructive remarks are the accepted norm.

- A regional airline captain has the same job as a mainline captain – they are both type-rated Part 121 captains. They may fly the same number of passengers a day but the regional captain does it across more flights a day.

Ensuring Effective Pilot-Controller Communications

Panelists

Charles Drew, Program Manager, NASA Aviation Safety Reporting, System / Booz Allen Hamilton

Tim Flaherty, Captain, Chairman, Air Traffic Services Group, Air Line Pilots Association

Doug Thoman, Captain / ATC Liaison, Independent Pilots Association

Steve Wallace, NATCA Representative, Miami ARTCC, FAA

Laurie Zugay, Air Traffic Manager, Tampa Air Traffic Control Tower, FAA

Objective

The objective for this panel was to identify pilot-controller communication challenges and methods to ensure that communications between pilots and controllers are effective.

Key information exchanged

- The pilot-controller communication loop is important and involves multiple links and confirmations.

- Controllers may be afraid of the technology being introduced/discussed with the NEXTGEN initiative, as they may see it as a piece of equipment that may do their job for them. There needs to be a better understanding of these issues.

- The greatest single challenge to effective pilot-controller communications is read back error. To address this at the controller-side the situation needs to be recognized first. Then it may be an issue of needing to slow down your speaking rate. It is critically important not to wait for the expected answer but to listen for the actual answer. This requires careful listening skills.

- Pilots do not receive formal training on phraseology

- New communications and procedures requirements are introduced to the FAA workforce faster than the requirements can be understood, trained to and applied.

- Equipment upgrades, such as analog to digital radios, would enhance pilot-controller communications.

- Data does not support a degradation of professionalism in pilots or controllers. Although there are reports that come into the Aviation Safety Reporting System (ASRS), there is even distribution of these reports across facilities. Confusion on the part of the flight crew was among the primary human factors issues identified, followed by distraction and workload.

- English language proficiency, radio discipline, and adherence to standard procedures would enhance pilot controller communications outside of the national airspace system (NAS).

- A generational gap may exist in the controller work force in that the younger generation of controller may not have the same level of passion for aviation outside the bounds of the job as some of the older generations.

- Cockpit familiarization for controllers and ATC familiarization for pilots would be of great benefit to effective pilot-controller communications as both groups would have a better appreciation of the requirements of the other.

- Since implementation of ATSAP, ASRS has noted that reports about air traffic issues are more descriptive and tend to be longer and more detailed than those submitted by controllers before ATSAP. In addition, reports from ATC have gone from about 1.5 percent of the total reports submitted to roughly 12.5 percent.

- Sector frequencies published on charts for ARTCC may be helpful to pilots.

Ensuring Excellence Through Data and Information Sharing

Panelists

Don Gunther, Staff Vice President Safety, Continental Airlines

Tom Longridge, Ph.D., Manager, Voluntary Safety Programs Branch, Federal Aviation Administration

Thom Mayer, Ph.D., President, Austin Digital, Inc.

Jay Pardee, Director, Office of Accident Investigation and Prevention, Federal Aviation Administration

Scott Proudfoot, Lead ATSAP Analyst, Office of Safety Programs, Air Traffic Organization, Federal Aviation Administration

Objective

The objective for this panel was to understand the role of data and information sharing in ensuring excellence, and discuss the actual and potential utility of data collection programs and to understand the complexity associated with their informed use.

Key information exchanged

- FOQA programs are jointly approved by local FAA office and the Voluntary Safety Programs Branch and approval ordinarily takes about 30 days. ASAP memoranda of understanding can usually be approved in a matter of days.

- Protections available to FAA approved FOQA and ASAP programs preclude FAA enforcement actions for most sole source events (events known because of the voluntary programs).

- 40 operators have FAA approved FOQA programs, and there are 214 ASAP MOUs. 20 of the FOQA programs are regional airlines who have come on board in the last 12 months. Most regional airlines have an ASAP program for at least one employee group.

- FAA does not approve LOSA programs and they are not reported to the FAA, but there are believed to be approximately 11 operators in the U.S. who have conducted LOSAs. These provide information resulting from direct observations in the cockpit which are not available from other data sources.

- FAA provides Web Based Analysis Tool (WBAT) that provides database and ASAP reporting system to all users who request it. The system will make automatic reports to ASRS if the operator determines to do so. 80% of operators use the WBAT tool.

- ASRS reports have increased as the number of ASAP programs have increased.

- All the programs complement one another. AQP relies on many of the voluntary data programs to drive the content of the training programs.

- The ATSAP program was initiated as an agreement between FAA and NATCA that was signed March 28, 2008. ERC has representatives from the Air Traffic Safety Oversight Service (AOV), NATCA, and the ATO; and they review reports submitted by controllers and determine a course of action to take.

- ATSAP started in Central Service Area, then to Western Service Area, and Eastern Service Area is being trained now (20-30% implemented). Full implementation expected by October 2010.

- ATSAP has accumulated over 17,000 reports since July, 2008. They include many safety events that would not be known without ATSAP. 70% of reports coming in are “unknown”, not known about prior to ATSAP.

- All ATSAP reports are collected in an on-line database. Three ERCs across the NAS each have analysts who look for trends and exchange information.

- FOQA programs process recorders to detect anomalous events (e.g., exceedences) and operational parameters. Numerical representations stored for each flight, with particular attention to counting and detecting occurrences that represent “edge of the envelope” operations.

- FOQA vendors provide their customers a standard library of events, and carriers can also customize the analyses for unique events that they specify.

- Continuing analyses of aggregate FOQA data (across flights, fleets, etc.) is essential to improving monitoring and detection of issues. Access to the data from over 6 million FOQA flights improves the algorithms.

- Airlines are exploring the possibility of rapid, automated analyses that would give pilots feedback immediately after their flights. This capability is being developed.

- FOQA data can already be used to evaluate changes of SOPs, and there is potential to combine FOQA with other sources of data to extend such evaluations.

- Implementation at a carrier requires initial agreements between the company, the union and the FAA. The most critical step is the infrastructure set up to manage the various data sources.

- Confidentiality protections are important. One large carrier reported that 95% of ASAP reports were sole source.

- Feedback to pilots on changes made because of voluntary programs (e.g., ASAP) and the results of those changes is important.

- The Call to Action suggested that major carriers assist their small carrier partners. One example was a safety summit involving a major carrier and its regional affiliates. Conducted as a shared best practices discussion.

- ASIAS is a collaborative government and industry initiative on data sharing and analysis. Intended to augment accident analyses with proactive analyses of safety data from voluntary programs.

- 30 ASIAS members all contributing ASAP data, 12 ASIAS members have active FOQA programs that have provided data for 7.2 million flights. ATSAP data will start coming to ASIAS on May 24, 2010.

- Aggregate data analysis produced by ASIAS/CAST has been sensitive to detecting deviations from standard operating procedures by identifying atypical flights from among a large set of flights. Analysis is required to determine whether the SOPs were correct or flawed, as opposed to concluding that the deviations were lack of professionalism.

- Incorporation of data from CVRs and image recorders would appear to require technologies for automated analysis that are not yet available. The typical quality of these recordings may also need higher levels of fidelity to support such automated analysis.

- Additional protections would be required to incorporate CVR-type data to voluntary programs.

- ASIAS procedures may need to be enhanced to provide more detailed fusion of data from various sources for finer grained analyses. Broader protections may need to be put in place.

- Numerous examples of success stories from voluntary data programs were reported by all of the panelists.

- Top level results from ASIAS and CAST programs have been shared with IATA, ICAO and ECAST to establish a global benefit.

- Through ATSAP, issues have been identified but funding constraints have limited the ability for immediate implementation of a solution.

- Despite economic hardship of the operators, voluntary programs have survived which attests to their value. Also, operators with these programs continue to seek innovative ways to view and use these data.

- The FAA encourages success stories in FOQA and ASAP programs to be documented. The resulting safety issues identified, corrective actions and success of those actions are shared with all offices.

- ASIAS has provided an effective venue to process industry-wide issues. Collaboration and meetings are valuable and vital in affording an opportunity for individual carriers to get together to review issues and share best practices. All data-submitting stakeholders in ASIAS can query and have access to their own data. On the aggregate level, they are given performance baseline metrics, fleet-wide performance and individual stakeholder performance.

- There are logistical challenges in implementing FOQA programs at an operator such as labor association agreements. Before implementation, work has to be done to ensure positive reception to such programs and costs of using contractors versus in-house expertise need to be considered.

- Without voluntary safety programs data contribution, there is the potential to lose awareness to 70-80 percent of total safety issues that exist in the NAS.

- A potential downside of FAA mandating voluntary safety programs is that it may adversely affect pilots' trust of these programs and their willingness to participate. FOQA may be more amenable than ASAP or LOSA, but making any of them mandatory may degrade quality and cooperation of the programs.

The Role of the Regulator in Ensuring Professionalism in Aviation

Panelists

John Duncan, Air Transportation Division Manager, Flight Standards Service, Federal Aviation Administration

Michael McCormick, Director, Terminal Safety and Operations Support, Federal Aviation Administration

Gerda Pardatscher, Seconded National Expert, Flight Crew Licensing, Rulemaking Directorate, European Aviation Safety Agency

Objective

The objective for this panel was to identify actions taken by regulatory agencies in the United States and Europe to define and set standards of professionalism and excellence.

Key information exchanged

- The FAA's Call to Action on Airline Safety and Pilot Training has generated significant activity in the industry, including 12 round table discussions with carriers and unions; 2400 special inspections; and promises of rule making action in a number of areas.

- The FAA Air Traffic Organization has announced a separate Call to Action on pilot-controller communication that will begin this year.

- The transition of European regulatory responsibilities from the JAA to EASA, begun with aircraft certification in 2002 is nearly complete. Flight crew licensing was established as an EASA responsibility in 2008.

- FAA and EASA regulators expressed the view that it was their responsibility to set standards of professionalism that are higher than minimum requirements, and also to provide support to operators to meet these higher expectations through voluntary data programs and other initiatives.

- It was suggested that markers, or measures, of professionalism could (and should) be developed that reflected "how work is done". Panelists equated "professionalism" to "airmanship".

- The Multi Crew Pilot License (MPL) has been successfully implemented in Europe and to date 60 MPL licenses have been issued. The Integrated ATP course is also used as an alternate route to licensure through ab initio programs in Europe.

- The FAA is studying the MPL and alternate methods of certification for first officers, and has received a large number of comments in response to its recent ANPRM on New Pilot Certification Requirements for Air Carrier Operations. A schedule has not yet been set for the issuance of an NPRM on certification.

- Controller credentialing includes not only initial certification, but also biannual evaluations.

- Panelists agreed with Dr. Kern's observation in his keynote address, that "multiple exit ramps" need to be available for individuals not measuring up to standards of professionalism. They suggested that these "exit ramps" were available in the current system.

- The FAA's ATO is a full participant in the FAA's Safety Management System, and a key feature is the use of Safety Risk Management Panels.

- While SMS is expected to be required of U.S. air carriers, and to address professionalism, rule making has not yet been initiated to create that requirement. Nor has SMS yet been implemented as an EASA regulation.

- Fatigue is recognized as a significant issue that is related to professionalism. The FAA intends to issue an NPRM in September 2010 for flight crews. ARC discussions have included fatigue risk management approaches as well as prescriptive time and duty limits. Discussions of fatigue regulations in Europe are at an early stage.

- FAA/NATCA discussions of fatigue have progressed, and include surveys of controllers and first line managers.

- Equivalent standards of performance and professionalism are maintained at the 253 contract control towers as in the rest of the ATO.

- There is no limit on the number of times that U.S. pilots can retake certification examinations. Conversely reexamination opportunities for air traffic controllers are limited.

- The FAA stated that it is working with the Department of Homeland Security and the Transportation Security Administration to reestablish the FAMS program, under which air traffic controllers utilized cockpit jump-seat privileges to gain familiarity with flight operations from the flight crew's perspective. No estimate was given for when the restoration of FAMS would be accomplished.

Concluding Summary

The NTSB's interest in professionalism in aviation remains high and the NTSB will continue advocacy efforts to help ensure that the recommendations previously issued that can help to improve professionalism are adopted. Our Office of Aviation Safety will continue to monitor government and industry activities to define professionalism and to create a culture of professionalism at all levels. Although the focus in this forum was on pilots and air traffic controllers, the lessons learned on professionalism in these domains are applicable to other safety-critical personnel in aviation, including maintenance technicians, flight attendants, and ramp operations personnel.