Federal Aviation Administration Task Force
On Air Carrier Safety and Pilot Training
Report from the Air Carrier Safety and Pilot Training
Aviation Rulemaking Committee

July 31, 2011

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report was created to satisfy the Air Carrier Safety and Pilot Training (ACSPT) Aviation Rulemaking Committee (ARC) charter and section 204 of the Airline Safety and Federal Aviation Administration (FAA) Extension Act of 2010 (Pub. L. No. 111–216), which require an initial report before July 31, 2011. The intent of this document is to identify industry best practices as of July 31, 2011, comment on the current use of those best practices, and make recommendations on their continued use in the air carrier industry.

The congressional mandate describes the need for additional reporting on air carriers' and labor unions' progress in implementing non-regulatory training-related actions recommended by the FAA Administrator, as well as on air carriers' progress in developing data-sharing programs and ensuring the implementation of effective practices. Air carriers and labor unions must have the opportunity to read this report and research the 24 best practices before their progress in implementing those best practices can be evaluated. The ARC's second report will address those topics.

The ACSPT ARC members (identified in Appendix A) represent organizations with extensive experience in air carrier operations, safety, and training, encompassing a wide range of operations conducted under Title 14 Code of Federal Regulations (14 CFR) part 121. Based on FAA direction, the ARC's composition, and congressionally established timelines, the identified best practices and recommendations in this report specifically apply to air carriers operating under part 121. However, certain aspects of the identified best practices may apply to those air carriers operating outside of part 121 (for example, 14 CFR part 135 or part 91, subpart K). The ARC encourages such air carriers to review its findings and adopt those practices that may enhance the safety of their operations.

Congress tasked the ACSPT ARC to consider scalability for small air carriers. In general, the identified best practices apply to part 121 air carriers regardless of their size. The ARC recognizes that some air carriers may have unique operational considerations based on fleet size, type, or other variables. Such air carriers may develop—or already have developed—alternative means to achieve the goals identified in this report. The ARC contends that enhancing safety should take precedence over conformity with widespread industry practice when alternative practices may be more appropriate for a particular operation.

The best practices defined in this report and recommended for further consideration, including possible rulemaking, comprise a variety of robust, proven FAA-defined programs, as well as innovative programs developed by individual air carriers. Where implemented, these programs have contributed to the continued improvement of air carrier pilot training, enhanced professionalism, and provided a systematic approach within and among air carriers, to ensure the highest possible standards for air carrier operations.

For this report, a best practice is defined as a policy, procedure, or technique intended to achieve an optimum outcome for a specific goal concerning the safety and efficiency of operations. Best practices can also be defined as the most efficient and effective way of accomplishing a task and attaining a goal. They should generally be those that have consistently achieved the intended

result. Within the 4 categories defined by the ACSPT ARC charter, the ARC members identified the following 24 best practices:

Air Carrier Management Responsibilities for Flightcrew Member Education and Support

- Participate in Advanced Qualification Program (AQP)

- Integrate Crew Resource Management (CRM) and Threat and Error Management (TEM) into training and evaluations[1]

- Implement leadership and command training[1]

- Implement enhanced instructor and evaluator training[1]

- Participate in voluntary partnership programs

- Use structured pilot hiring practices

- Conduct operational coordination meetings

- Establish minimum qualifications for directors of safety and directors of training[1]

- Establish a Flight Risk Analysis Working Group (FRAWG)

- Provide standardized manuals and use distance learning

- Use simulators in pilot training[1]

Flightcrew Member Professional Standards

- Establish pilot assistance programs

- Establish a flightcrew member-initiated proficiency process

Flightcrew Member Training Standards and Performance

- Implement upset recovery training[1]

- Implement a pilot remediation strategy[1]

- Implement integrated training

- Maintain manual flying skills[1]

- Use simulator motion in training and evaluation

- Establish requalification training[1]

- Conduct jump seat observation flights by new pilots

- Implement enhanced proficiency and currency requirements[1]

Mentoring and Information Sharing Between Air Carriers

- Share safety and training information and practices

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[1] A best practice for which the ACSPT ARC recommends regulatory action.

- Participate in structured information sharing activities

- Implement Commercial Aviation Safety Team (CAST) safety enhancements

The ARC contends that the identified best practices would be instituted most effectively on a voluntary basis or through the regulatory process, so at this time it does not recommend any legislation.

These best practices demonstrate that air carriers and employee organizations have done considerable work beyond the legislative or regulatory minimums to enhance flight safety and pilot training within the U.S. air carrier industry. These practices have also enhanced safety and training programs during challenging economic times. They have contributed to the current safety record for all part 121 air carriers. The ACSPT ARC believes industry should continue to pursue "one level of safety," while ensuring implementation of best practices for all part 121 air carriers.

The U.S. air carrier industry faces significant near-term challenges. As it addresses these challenges, the industry must ensure continued progress in enhancing flight safety and pilot training. Anticipated pilot shortages and retirements will dictate a significant increase in pilot hiring. Coupled with this increase, changes in pilot demographics will present added challenges to the industry. Implementing the best practices recommended by the ACSPT ARC will help to meet those challenges. Technological advances will enhance safety in such areas as air traffic control (ATC), and will enhance training through the use of flight simulators. Application of these best practices, as well as the continued pursuit of safety enhancements within the industry, will further improve operational safety and pilot training. Vigilance and adherence to these best practices will help foster a positive safety culture.

1.0 ACSPT ARC BACKGROUND

ACSPT ARC CHARTER

SUBJ: Air Carrier Safety and Pilot Training Aviation Rulemaking Committee

1. PURPOSE. This document establishes the Air Carrier Safety and Pilot Training 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 204 of the Act, titled FAA Task Force on Air Carrier Safety and Pilot Training, requires the FAA to establish a special task force to be known as the FAA Task Force on Air Carrier Safety and Pilot Training. The duties of the task force shall include, at a minimum, evaluating best practices in the air carrier industry and providing recommendations in the following areas:

(1) Air carrier management responsibilities for flight crewmember education and support;

(2) Flight crewmember professional standards;

(3) Flight crewmember training standards and performance; and

(4) Mentoring and information sharing between air carriers.

b. Congress also required that the FAA Task Force on Air Carrier Safety and Pilot Training submit a report to Congress detailing the work of the Task Force by July 31, 2011, and again by July 31, 2012, and provide recommendations for legislative or regulatory action.

c. To carry out the FAA's safety mandate, the FAA is chartering an ARC that will accomplish the tasks required by Congress, on the same Congressional timelines, but will also develop recommendations for the FAA regarding regulatory action in those same areas.

3. OBJECTIVES AND SCOPE OF THE COMMITTEE. The Air Carrier Safety and Pilot Training 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 air carrier management responsibilities for flight crewmember education and support, professional standards, training standards and performance, as well as mentoring and information sharing between air carriers. Specifically, the ARC should consider and address:

a. Air carrier management responsibilities for flight crewmember education and support.
b. Flight crewmember professional standards.
c. Flight crewmember training standards and performance.
d. Mentoring and information sharing between air carriers.

The ARC shall consider scalability of their recommendations to address the needs of small businesses. The ARC will develop recommendations and submit them to the Associate Administrator for Aviation Safety for rulemaking consideration by July 31, 2011.

4. COMMITTEE PROCEDURES.

a. The committee provides advice and recommendations to the Associate Administrator for Aviation Safely. 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 a member 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.

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

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

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

g. The ARC shall consider scalability of their recommendations to address the needs of small businesses.

6. PUBLIC PARTICIPATION. The Air Carrier Safety and Pilot Training 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, S.W., 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 Air Carrier Safety and Pilot Training 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 two years from September 15, 2010, unless sooner terminated or extended by the Administrator.

PUBLIC LAW 111–216 SECTION 204

(a) ESTABLISHMENT.—The Administrator of the Federal Aviation Administration shall establish a special task force to be known as the FAA Task Force on Air Carrier Safety and Pilot Training (in this section referred to as the "Task Force").

(b) COMPOSITION.—The Task Force shall consist of members appointed by the Administrator and shall include air carrier representatives, labor union representatives, and aviation safety experts with knowledge of foreign and domestic regulatory requirements for flight crewmember education and training.

(c) DUTIES.—The duties of the Task Force shall include, at a minimum, evaluating best practices in the air carrier industry and providing recommendations in the following areas:

(1) Air carrier management responsibilities for flight crewmember education and support.

(2) Flight crewmember professional standards.

(3) Flight crewmember training standards and performance.

(4) Mentoring and information sharing between air carriers.

(d) REPORT.—Not later than one year after the date of enactment of this Act, and before the last day of each one-year period thereafter until termination of the Task Force, the Task Force shall submit to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report detailing—

(1) The progress of the Task Force in identifying best practices in the air carrier industry;

(2) The progress of air carriers and labor unions in implementing the best practices identified by the Task Force;

(3) Recommendations of the Task Force, if any, for legislative or regulatory actions;
H. R. 5900—11

(4) The progress of air carriers and labor unions in implementing training-related, non-regulatory actions recommended by the Administrator; and

(5) The progress of air carriers in developing specific programs to share safety data and ensure implementation of the most effective safety practices.

(e) TERMINATION.—The Task Force shall terminate on September 30, 2012.

(f) APPLICABILITY OF FEDERAL ADVISORY COMMITTEE ACT. — The Federal Advisory Committee Act (5 U.S.C. App.) shall not apply to the Task Force.

2.0 ACSPT ARC PROCESS

The initial phase of the ACSPT ARC's work involved collecting best practices in four focus areas. Because there is no universally accepted definition of a best practice, the ARC defined several characteristics of a best practice: a policy, procedure, or technique intended to achieve an optimum outcome for a specific goal concerning the safety and efficiency of operations; the most efficient and effective way to accomplish a task and attain a goal; and a practice consistently shown to achieve the intended result.

The ACSPT ARC collected information on best practices through several avenues, including surveying air carriers and trade associations, hearing presentations by subject matter experts (SME), and eliciting the ARC members' observations, based on their professional experiences. The ARC deliberately kept requests for information from outside sources general, in order to elicit candid responses that reflect what those sources believe to be best practices.

Responses to the ACSPT ARC's requests for information varied considerably in scope and depth, from endorsements of established national programs to specific meeting formats at individual air carriers. Conversely, as the ARC evaluated the responses to its queries, patterns emerged in which respondents described similar concepts in different ways. In some cases, the ARC combined similar concepts to form recommended best practices. For some of the identified best practices, air carriers need flexibility in order to tailor the practice to the size and scope of their operations.

The ACSPT ARC found it challenging to evaluate air carriers and labor unions' progress in implementing the best practices before they had been defined and distributed. Where defined programs exist (AQP, for example), data are provided. In other cases, the ARC members applied their collective expertise to assess the progress of air carriers and labor unions in implementing these best practices. This report includes the resulting analyses with the description of each best practice. Similarly, it includes any recommendations for legislative or regulatory action.

3.0 BEST PRACTICES

This section contains 24 best practices identified by the ACSPT ARC. For the purpose of this report, a best practice is defined as a policy, procedure, or technique intended to achieve an optimum outcome for a specific goal concerning the safety and efficiency of operations. Best practices can also be defined as the most efficient and effective way to accomplish a task and attain a goal. Best practices should generally be those that have consistently achieved the intended result. Several of the items identified as best practices are actually formal, established programs developed over many years, while others reflect more recent developments. Regardless of whether a practice is new or established, it is not enough for an air carrier or employee organization to simply state such a program exists; it must be constantly and aggressively managed to be most effective.

A safety management system (SMS) is a systematic approach to managing risk and includes the necessary organizational structures, accountabilities, policies, and procedures. The International Civil Aviation Organization (ICAO) determined that an SMS is necessary for the effective functioning of the aviation system. A properly structured and implemented SMS will not only provide safer operation for employees and customers, but should save money for the air carrier over time through improved efficiencies. Though many aspects of an SMS are similar or identical to the ACSPT ARC's best practices, the two should not be considered interchangeable. A robust SMS might encompass some, but not all, identified best practices and be considered effective. Similarly, an air carrier may have established many best practices and not have an SMS. SMS implementation will soon become mandatory, but that should not delay implementation of any of the ARC's best practices, nor should implementation of any individual best practice be assumed solely as a byproduct of SMS implementation.

ICAO established a deadline of January 1, 2009,[2] for member states' air carriers, airports, and service providers to implement an SMS—a deadline the FAA declared it could not meet. However, the FAA is working to establish SMS standards and regulatory guidance using ARC recommendations, with the goal of eventual compliance with the ICAO standard. Pub. L. 111–216 requires the FAA to issue a final rule covering SMS implementation by July 31, 2012, with full implementation for air carriers expected to require several additional years.

The following 24 best practices were identified by the ACSPT ARC.

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[2] ICAO Doc 9859, AN/474, Safety Management Manual (SMM), Second Edition—2009

3.1 AIR CARRIER MANAGEMENT RESPONSIBILITIES FOR FLIGHTCREW MEMBER EDUCATION AND SUPPORT

3.1.1 PARTICIPATE IN THE ADVANCED QUALIFICATION PROGRAM

Best Practice

The ACSPT ARC identified participation in AQP[3] as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

Commercial aviation is undergoing significant evolution, portents of which are already evident in changing pilot demographics, changing cockpit technology, and planned changes in the National Airspace System environment. This changing environment presents an ongoing challenge to maintain, if not improve training that ensures flightcrew proficiency is commensurate with safety. AQP provides a consistent structure that can accommodate change.

AQP is a voluntary alternative to the traditional air carrier training and checking program under part 121. In AQP, the FAA is authorized to approve modifications to traditional program requirements, subject to justification of an equivalent or better level of safety. Implementation of AQP at an air carrier requires a formal instructional systems design methodology to define training requirements customized to that air carrier's operation. It integrates the training and evaluation of cognitive abilities at each stage of a curriculum. CRM[4] and TEM[5] are fully integrated in the curriculum, ensuring human factors skills and technical skills are trained to meet defined proficiency standards. For evaluation purposes, pilots must demonstrate proficiency in tasks that test technical and resource/error management skills.

Air carriers participating in AQP must design and implement data collection strategies that diagnose cognitive ability and proficiency skills. Modifications to traditional program requirements must be supported by the collected performance data. For example, data may indicate that pilots demonstrated proficiency during recurrent training and in line operations in a particular maneuver that is currently required under part 121 training. In that case, AQP would provide the air carrier the ability to modify its training program, refocus the curriculum, and address a different maneuver that data shows may need additional emphasis. Monthly data collection reports must be submitted to the FAA for analysis and trend monitoring.

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[3] Advisory Circular (AC) 120–54A, Advanced Qualification Program.
http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-54A/$FILE/AC%20120-54a.pdf

[4] AC 120–51E, Crew Resource Management Training.
http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/list/AC%20120-51E/$FILE/AC120-51e.pdf

[5] Answering the Call to Action on Airline Safety and Pilot Training.
http://www.faa.gov/library/reports/media/call_to_action_Jan2010.pdf

Instructors and evaluators who rate personnel must undergo reliability training to learn to utilize explicit strategies to verify the proficiency and standardization for crew-oriented, scenario-based training and evaluation tasks. AQP encourages air carriers to use a suite of equipment matched on the basis of analysis to the training requirements at any given stage of a curriculum.
Air carriers participating in AQP must collect and analyze performance proficiency data on students, instructors, and evaluators to refine and validate their curricula. They also must continually update their programs to address threats and risks identified within their unique operations based on, for example, Line Operations Safety Audit (LOSA), Flight Operational Quality Assurance (FOQA) and Aviation Safety Action Program (ASAP) data, and changes in pilot demographics. These programs measure the effectiveness of the training in mitigating the identified threats and risks.

As previously noted, air carriers with approved AQPs are required to submit monthly reports on pilot performance data. Analysis and sharing of aggregate industry AQP data would assist the FAA and industry in identifying and addressing industry trends, and assist individual air carriers in assessing the effectiveness of their training programs against the norm. The FAA should periodically perform this aggregate data analysis in coordination with industry (pilots and carriers) and share its findings.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

As of May 10, 2011, there are currently 32 air carriers training under AQP. Ten additional air carriers have applied for AQP, had their applications signed and accepted by the FAA, and are currently developing their curricula. Currently, 16 part 121 air carriers employ 1,000 pilots or more, of which 14 are in AQP. In addition, approximately 79 percent of part 121 pilots are either training under, or have applied to train under, AQP.

Recommendations, if any, for Legislative or Regulatory Actions[6]

No regulatory action is required. Regulatory language already exists under part 121, subpart Y.

The FAA and industry (pilots and air carriers) share aggregate AQP data. Using this data, they develop analysis methods and protocols to identify and address industry trends and help individual air carriers assess the effectiveness of their training programs against the norm.

3.1.2 INTEGRATE CREW RESOURCE MANAGEMENT AND THREAT AND ERROR MANAGEMENT INTO TRAINING AND EVALUATIONS

Best Practice

The ACSPT ARC identified integration of CRM and TEM into ground and flight training and evaluation as an air carrier industry best practice.

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[6] The ARC contends that the identified best practices would be instituted most effectively on a voluntary basis or through the regulatory process, so at this time it does not recommend any legislation.

Progress in Identifying this Best Practice in the Air Carrier Industry

The study of human factors in aviation has expanded beyond the original design and features of a cockpit and how the flightcrew member interacts with it. It now includes cockpit management, professionalism, and leadership. Attention to these characteristics is an integral part of understanding flightcrew performance, which includes training and evaluations.

An important element in reducing risks in air carrier operations is a well-coordinated flightcrew that expertly uses the principles of CRM and actively engages in TEM. Most recent accidents could have been avoided had flightcrews effectively used these skills. They are essential tools that pilots need to learn and continually improve. Pilots cannot master these skills by attending a one-time course; a high level of proficiency requires continuous training, evaluation, and feedback.

Both CRM and TEM should be integrated into pilot training and evaluations, including indoctrination, initial, recurrent, requalification, initial operating experience, and line checks. The curricula should be designed not only to train flightcrew in the concepts and application, but have scenarios imbedded throughout the training and evaluation events that require the use of these skills with increased task loading and other factors. This allows the pilots to practice these skills and perform self-critiques, and for the instructors to provide feedback and assist the pilots in enhancing their skills.

Both initial and recurrent simulator training include Line Operational Simulation[7] lessons, which are full-mission[8] simulations conducted with maximum possible realism. In these training and checking sessions, information is given to instructors describing the specific CRM and TEM behaviors desired for each observed task. In addition to teaching and critiquing technical flying skills, instructors specifically look for CRM and TEM skills, debrief pilots on their performance, and provide instruction for improvement based on these behaviors.

Evaluation strategies can incorporate CRM and TEM skills. This facilitates the measurement of technical and CRM and TEM skills, which can then be used for flightcrew debriefing and training. Additionally, this data is used to measure the effectiveness of the training and evaluation programs, and to continuously improve the training curriculum to increase the line pilots' skills.

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[7] AC 120-35C, Line Operational Simulations: Line Oriented Flight Training, Special Purpose Operational Training, Line Operational Evaluation
http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/b86de77a355ea57b86256f25006d977a/$FILE/AC120-35c.pdf

[8] "A full-mission simulator (FMS) accurately simulates the aircraft and the mission environment it will operate in. The simulator will recreate sounds, motion, visual scenes, instrument presentations and all other systems in order to create a realistic flight training environment." CAE, Inc., 2008–2010, http://www.cae.com/en/military/full.mission.simulator.asp

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that integrated human factors training and evaluation is a common practice among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

Although training in the principles of CRM is currently required, the ACSPT ARC recommends the FAA take additional regulatory action to require the integration of the practical operational application of human factors principles (CRM, TEM) throughout training.

3.1.3 IMPLEMENT LEADERSHIP AND COMMAND TRAINING

Best Practice

The ACSPT ARC identified implementation of an effective captain leadership and command training program as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

Leadership and command courses vary among air carriers. Their content and format include various topics, and the courses typically last from 1 to 3 days, or are embedded in an initial or upgrade training program. In order for leadership and command training to be successful, it must be endorsed by the executive leadership of the air carrier.

A leadership and command course generally covers non-technical skills that a captain needs to perform his/her duties. This course content includes, but is not limited to leadership, professionalism expectations, company culture, captain's authority, and captain's duties and responsibilities. The information should be solicited from various sources within the company, such as other captains, chief pilots, the training and standards department, flight operations dispatch, the safety department, maintenance, and executive management.

A leadership and command training course should expose new captains to the available resources outside the cockpit. Those resources include other departments at the air carrier that can help new captains make more informed decisions as they operate their aircraft—the dispatch department, for example.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists that provides the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that leadership and command training is a common practice among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

The ACSPT ARC recommends regulatory action and associated guidance material to implement leadership and command training.

3.1.4 IMPLEMENT ENHANCED INSTRUCTOR AND EVALUATOR TRAINING

Best Practice

The ACSPT ARC identified the implementation of an enhanced instructor and evaluator training program as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

Instructor and evaluator duties include training, evaluating, and promoting standardization within the pilot group. To perform these duties, the ACSPT ARC recommends training beyond current part 121 regulatory requirements.

To adequately train and evaluate other pilots, instructors and evaluators must achieve and maintain the highest levels of proficiency and knowledge as pilots. In addition, instructors and evaluators must develop and maintain effective training and evaluation skills. It is essential that instructors and evaluators achieve and maintain a high level of standardization to promote standardization within the organization. Air carriers must foster and emphasize this standardization within the instructor and evaluator ranks during initial training, and it must be continually reinforced in recurrent training throughout instructor and evaluator tenure. By adhering to these levels of individual proficiency and standardization, instructors and evaluators establish credibility among their pilot peers. This, in turn, furthers the promotion of proficiency and standardization within the pilot group.

A portion of the instructor and evaluator staff typically performs training and evaluation duties in actual line operations, while others perform their duties in a flight simulator. This distinction necessitates instructor and evaluator training programs that are specific to the type of training and evaluation each will perform. Within the simulator group, review of industry practices indicates that some air carriers enter into contracts with individuals from outside the organization (contract instructors) to provide training, while other air carriers use pilots from within their own ranks. Regardless of the composition of the instructor and evaluator staff, enhanced instructor and evaluator training will aid in maintaining and promoting the highest levels of proficiency and standardization. This enhanced training should include a performance appraisal and observation process to measure and reinforce performance standards set for the instructors and evaluators.

The initial selection process is critical to ensuring instructors and evaluators meet high standards. This selection process should involve a multilayered approach, including recommendations, performance reviews, and evaluations. Once selected, an enhanced instructor and evaluator training program ensures that instructors and evaluators maintain a high level of proficiency and standardization. The ACSPT ARC identified many of the components of this best practice indicated in the following paragraphs.

The simulator group members should observe their peers performing instruction and evaluation duties and perform their own instruction and evaluation duties under the supervision of already qualified instructors and evaluators. Instructors and evaluators who perform their duties in actual line operations should demonstrate proficiency in evaluating pilots from both pilot seats, and should be trained in methods for identifying and managing pilot error.

All instructors and evaluators should attend annual standardization meetings to review policy and procedure changes and to discuss trends and relevant safety information. Recurrent training should include emphasis on the role of the instructor and evaluator, as well as techniques for error recognition and management.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that enhanced instructor and evaluator training is a common practice among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

The ACSPT ARC recommends the FAA consider issuing new guidance based upon the outcome of the current rulemaking for part 121 subparts N and O.

3.1.5 PARTICIPATE IN VOLUNTARY PARTNERSHIP PROGRAMS

Best Practice

The ACSPT ARC identified the development of, participation in, and management of voluntary partnership programs as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

For several years, air carriers have initiated or participated in a number of safety data programs. Each involves the collection of voluntary safety reports or the monitoring of flight data. These data can take many forms and the programs include ASAP[9], FOQA[10], and LOSA[11]. The goal of these programs is to identify safety-related problems within an air carrier's operation, including operational and procedural errors, and to develop corrective actions. The key to all of these programs is the inclination to proactively seek safety solutions, rather than wait and react to an accident or serious incident.

Human factors cause the majority of undesired outcomes in aviation, and years of aviation accident and incident analysis has shown that understanding the human factors component is key to preventing and mitigating similar events. The human factors to which people within the

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[9] AC 120–66B, Aviation Safety Action Program (ASAP).
http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/61c319d7a04907a886256c7900648358/$FILE/AC120-66B.pdf

[10] AC 120–82 Flight Operational Quality Assurance.
http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/40c02fc39c1577b686256e8a005afb0a/$FILE/AC120-82.pdf

[11] AC 120–90 Line Operation Safety Audits.
http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/013a142c839ea74086257162006cc27d/$FILE/AC%20120-90.pdf

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aviation system are subject sometimes lead to unintended errors in task management and professional judgment. They may also not deliver their practical skills at the trained and required levels every time. Ultimately, the goal is to minimize errors and the consequences of remaining errors by either monitoring or cross-checking colleagues and technical solutions.

Each program represents a significant enhancement to air carrier safety, as the air carrier and its employees take responsibility for proactively identifying and resolving safety issues. This exposes significantly more events to correction than is possible through regulatory surveillance and enforcement. As a result, these programs are likely to produce actions that will prevent accidents.

<u>ASAP</u>

ASAP encourages air carrier employees to voluntarily report safety information that may be critical to identifying potential precursors to accidents. Under ASAP, safety issues almost always are resolved through corrective action rather than through punishment or discipline. ASAP is based on a safety partnership that includes the FAA and the certificate holder, and usually includes a third party, such as the pilot's group or employee organization, if they are so represented. ASAP provides a voluntary, cooperative, remedial, and non-punitive environment for open reporting of safety concerns. Through ASAP, all parties have access to valuable information that may not otherwise be obtainable. ASAP provides timely identification of safety problems and allows for appropriate remedial action. Because of the non-punitive nature of the program, employees voluntarily disclose information, safety data that might otherwise never come to light.

One example of success in the ASAP arena is identification of fatigue in the operation. With pilots now demonstrating increased confidence in the filing and disposition of ASAP reports, air carriers are seeing an increase in reports that provide detailed information on fatigue-related issues. For example, one air carrier is holding frequent ongoing discussions using this self-disclosed data to remediate/mitigate fatigue concerns. ASAP data helped this air carrier institute a Fatigue Risk Mitigation System (FRMS). An FRMS is a data-driven process that systematically monitors and manages safety risks associated with fatigue-related error.

<u>FOQA</u>

FOQA is a voluntary safety program designed to make commercial aviation safer by allowing commercial air carriers and their pilots to share de-identified aggregate information with the FAA. FOQA collects and analyzes digital flight data generated and recorded electronically during daily flight operations. The fundamental objective of this partnership is to allow the FAA, pilots, and air carriers to cooperatively identify and mitigate safety risks. In addition, the air carrier and the FAA can monitor trends in aircraft operations and target their resources to address operational risk issues.

The value of FOQA is in the early identification of possible hazards that, when mitigated, will increase safety. A key element in FOQA is the application of corrective and follow-up action to ensure unsafe conditions are effectively and quickly remediated. Once a possible safety issue is identified through review of digital flight data, contact with the flightcrew can be made to better

understand the conditions surrounding the specific event, thereby determining what, if any, follow up action is required. While FOQA data provides the actual state of the aircraft, only through contact with the pilot can one determine why the aircraft arrived in that state. The information and insights FOQA identifies can improve safety by significantly enhancing training effectiveness, operational procedures, maintenance and engineering procedures, aircraft and systems design, and ATC procedures.

LOSA

LOSA is a structured flight observation program that uses trained observers to collect data about flightcrew behavior and situational factors on flights. The objective of a LOSA program is to identify and develop countermeasures to hazards in the operating environment and errors in the cockpit. LOSA is closely associated with the concept of TEM, which addresses the identification of threats in the cockpit and beyond, and develops management and mitigation strategies.

As ICAO notes in ICAO Document 9803, Line Operations Safety Audit:[12]

> LOSA enables operators to assess their level of resilience to systemic threats, operational risks and front-line personnel errors, thus providing a principled, data-driven approach to prioritize and implement actions to enhance safety.

By monitoring the flight from the cockpit jump seat, the observer can learn much about flightcrew behavior and the strategies flightcrews use to manage threats, errors, and undesirable states. Confidential data collection and non-jeopardy assurance for pilots are fundamental elements of the process. LOSA provides a diagnostic snapshot of strengths and weaknesses an air carrier can use to bolster its safety margins.

LOSA is complementary to FOQA and ASAP. LOSA samples all activities during normal operations and provides a unique opportunity to study flight management processes, both successful and unsuccessful, by noting the threats and problems flightcrews encounter during flight and then evaluating how they manage them. LOSA identifies examples of superior performance that can be reinforced and used as models for training. FOQA and ASAP differ from LOSA in that they are continuous programs, whereas LOSA is more of a specific project-based program. The full LOSA process—from advanced planning and observer selection and training to data collection (from several targeted or randomly selected flights), analyses, and the final report—can take between 6 and 12 months. It is generally recommended to conduct a LOSA every 3 years.

Data from one program can be cross-referenced and used to guide data collection in another. For example, ASAP reports may highlight a problem with departures at a particular airport. This information can be used to target more observations out of that airport to understand the magnitude and specifics of the problem encountered during a LOSA. Additionally, a LOSA can identify high incidences of unstable approaches, leading to procedural reviews and the

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[12] http://www.icao.int/anb/humanfactors/LUX2005/Info-Note-5-Doc9803alltext.en.pdf

specification of new approach parameters. After a procedural change is enacted, FOQA data can help track adherence to the revised procedure.

The voluntary partnership programs are founded on concepts and principles established in early safety programs, such as the Aviation Safety Reporting System, established by the FAA in 1976 and managed by the National Aeronautics and Space Administration (NASA). The effectiveness of these programs requires mutual trust and respect between the regulator, air carrier, and pilot, because reporting or monitoring is non-punitive and confidential. The programs are non-punitive in the sense that reports, observations, and flight data cannot be used for disciplinary or enforcement action against individual employees, provided their actions are not deliberate and comply with program provisions. The programs are confidential in that they protect the identities of those who participate. Stakeholders must properly manage all programs; these programs rely on voluntary participation and are trust-based.

The parties that participate in these programs—company, employee group, and regulator—agree to work together harmoniously with the common goal of attaining the highest level of air safety through consensus. By remaining voluntary, these programs attract highly motivated volunteers, typically SMEs, who are highly respected by their peers. Trust is the cornerstone of these programs, and it cannot be measured. Corporate culture plays a large role in whether the programs are used proactively and non-punitively as intended, or exist in name only. Employee groups must recognize that for the programs to be genuinely effective, they must be evaluated on their effectiveness as safety tools and cannot be used for industrial leverage.

Finally, regulatory oversight is critical, even though the programs are voluntary. The regulator has a role in ensuring the programs are used solely to enhance safety, and are established and maintained within the appropriate guidelines. Safety data supplied voluntarily by an air carrier or employee must not be used as the basis for adverse action by the regulator. Such use has a negative effect on participation and results in a loss of valuable data that—in most cases—cannot be obtained through any other means.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

As of May 10, 2011, there were 63 air carriers participating in ASAP, 41 in FOQA, and 20 in LOSA. Of the 16 part 121 air carriers employing 1,000 pilots or more, 15 participate in ASAP, 15 participate in FOQA, and 12 participate in LOSA. In addition, approximately 91 percent of part 121 pilots are employed by air carriers that participate in ASAP, 87 percent are employed by air carriers that participate in FOQA, and 61 percent are employed by air carriers that participate in LOSA.

Recommendations, if any, for Legislative or Regulatory Actions[6]

No regulatory action is required. The ACSPT ARC strongly believes the effectiveness of these partnership programs lies in the fact that they are undertaken voluntarily out of an institutional commitment to improving safety rather than to fulfill a regulatory requirement. For these programs to endure and maintain a high degree of integrity, the participating parties must maintain a trusting relationship. By not requiring these programs, participating entities maintain a vested interest in their success and effectiveness, thereby minimizing influence by any of the

parties' agendas. In addition, a cornerstone of the programs is the assurance to reporters that information provided is held in confidence and protected from misuse. This protection is currently provided by statute, and that statutory protection only applies to voluntary programs. Requiring these programs would nullify that statutory protection.

3.1.6 USE STRUCTURED PILOT HIRING PRACTICES

Best Practice

The ACSPT ARC identified the use of a "structured" approach to screening prospective pilot candidates, involving a multiphase, multidisciplinary approach as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

Several U.S. air carriers have excellent structured hiring practices that have been improved over time, and have demonstrated their value by consistently identifying the best candidates. A comprehensive hiring program offers air carriers the greatest opportunity of obtaining the best possible applicant.

Structured hiring practices include the use of a multidisciplinary, multi-step approach that employs modern technology and scientific tools to create a managed process that flags desired attributes in an equitable and unbiased manner. This hiring approach generally begins with the application process, when the employer checks applicants for all prerequisites and ensures there are no automatic disqualifiers—for example, lack of appropriate licenses and medical qualifications. Once the applicant has successfully completed the initial screening process, the employer invites the candidate for further screening and testing. This may include electronic evaluations, personal interviews, simulator evaluations, situational awareness assessments through scenario based interviews, and other variations of testing.

Many of the testing functions given throughout the screening and selection process use modern technology and scientific tools to evaluate cognition, personality, and aptitude. Employers may use devices from desktop systems to full flight simulators to evaluate flight-skill capabilities. The ability to manage people, use good judgment, communicate effectively, and work in a team environment are just as vital for success as the applicant's flying skills and technical knowledge.

The International Air Transport Association (IATA) recently published the results of an international panel of experts' efforts to define best practices. This manual, The Guidance Material and Best Practices for Pilot Aptitude Testing, is available via IATA's Web site.[13] It states:

> Professional Aptitude Testing has proven to be highly effective and efficient. If correctly implemented, it can contribute to considerable cost savings for the airline. The costs associated with implementing a functional aptitude testing

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[13] IATA, 1 June 2010, http://www.iata.org/ps/publications/Documents/pilot-aptitude-testing-guide.pdf

system are significantly lower compared to the costs of high failure rates resulting from immature selection. Benefits of sound aptitude testing include enhanced safety, lower overall training costs, higher training and operational performance success rates, a more positive working environment, reductions in labor turnover, enhancement of the reputation of the flight operations department and positive development of the air carrier's brand. An integral part of the quality assurance program within an airline includes the development and use of a pilot aptitude testing system with periodic program review and adjustments to the process. This effort will require the management of pilot-performance data as a collaborative effort between all involved parties (HR, Flight Operations, Training and Aptitude Testing).

IATA notes elsewhere in the document that, "The term Aptitude Testing is used as hypernym, overarching all areas of aptitude diagnostics (basic abilities, specific/operational abilities, social competencies and personality traits)."

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that some of their constituents use a "structured" approach to screening prospective pilot candidates, involving a multiphase, multidisciplinary approach; however, the ARC is unaware if this can be considered a common practice among all air carriers.

Recommendations, if any, for Legislative or Regulatory Actions[6]

No regulatory action is required.

3.1.7 CONDUCT OPERATIONAL COORDINATION MEETINGS

Best Practice

The ACSPT ARC identified conducting operational coordination meetings as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

Maintaining operational alignment in the air carrier industry is complex. Changes in operational procedures need to be communicated to flight operations, training, principal operations inspectors, and employee groups. Regularly scheduled operational coordination meetings serve a variety of purposes, but in every case are intended to open lines of communication and establish synergies between and within departments or other entities. These meetings should be encouraged within all air carriers, their FAA oversight entities, and their employee organizations. They are opportunities to share experiences and data to reach common outcomes on issues and events. Coordination meetings also enhance an air carrier's safety by ensuring coordination in procedures, policies, and training between departments, employee organizations, and the FAA. Soliciting input and involving all of these parties increases safety and promotes standardization. The variations include, but are not limited to:

- Standardization coordination meetings,

- Inter-flight department coordination,

- Inter-departmental coordination,

- FAA/air carrier coordination, and

- Employee organization/air carrier coordination.

Implementation of a SMS will incorporate many of the elements of this recommendation.

Standardization Coordination Meetings

Standardization coordination meetings ensure instructors and evaluators have the same understanding of procedures and apply them to training and evaluation in the same manner. These meetings include fleet management, ground instructors, simulator instructors, simulator check airmen, line check airmen, designated examiners, and FAA aircrew program managers. This provides an opportunity to review recent changes, trends, and data, while confirming a uniform understanding of procedures and policies. Instructors and evaluators share their experiences and generate valuable discussion on fleet or flight operations topics.

Inter-Flight Department Coordination

Inter-flight department coordination meetings are conducted to ensure the flight operations and flight training departments are operating in concert with each other. The goal is to discuss procedural and policy changes before implementation, thus striving to live up to the motto "We fly like we train." These meetings go one step further in standardizing procedures as much as feasible among the fleets. This gives pilots a solid procedural basis when transitioning between fleets. These meetings typically are first held at the fleet level, in which the fleet management team and instructors and evaluators discuss fleet issues and manual modifications. The meetings then expand to representatives from all fleets to discuss the applicability of those same modifications to all fleets.

This coordination extends to recurring manpower meetings to confirm appropriate staffing levels and allocation of the cadre of check airmen on a recurring basis. Other inter-flight department coordination meetings include AQP team meetings. Participants review data and consider modifications to the training program, to ensure the efficacy of the training program.

Inter-flight departmental coordination meetings can also include a meeting of the air carrier vice president's staff or flight leadership council meetings, where department leaders coordinate a variety of programs and issues.

Inter-Departmental Coordination

Inter-departmental coordination meetings are intended to ensure the flight department is working in harmony with other operational departments, including safety, maintenance, flight service, operational control (dispatch and crew scheduling), crew planning, airport services, and capacity planning. These meetings serve to standardize procedures—for example, determining whether a checklist change would impact the flight attendant duties and responsibilities—and provide flight department perspective on companywide decisions, such as considerations associated with serving a new destination.

FAA/Air Carrier Coordination

Monthly meetings with the principals at the FAA Certificate Management Office and the associated aircrew program managers keep the lines of communication open between the certificate holder and the FAA. The meetings include flight training, flight operations, and flight safety briefings. They allow for a frank discussion on trends and data, as well as updates to changes in the air carrier or the FAA.

Employee Organization/Air Carrier Coordination

An employee organization's involvement in coordination can take many forms. These can be stand-alone meetings or they can be integrated into the above meetings. Having employee organizations involved in a majority of these meetings allows the air carrier and its employees to obtain the same information. This consistent information ensures both entities are at the same starting point when creating solutions. It also creates an atmosphere of cooperation in an apolitical environment. Involvement can include groups such as the employee organization's safety committee, flight training committee, check airman committee, and aeromedical committee.

In summary, it is this group's experience that such coordination meetings aid in regulatory compliance, and provide great benefit to the air carrier's operations and its employees. These meetings promote coordination and standardization within the air carrier, as well as between the air carrier, the FAA, and employee organizations.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that operational coordination meetings are commonly practiced among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

No regulatory action is required.

3.1.8 ESTABLISH MINIMUM QUALIFICATIONS FOR DIRECTORS OF SAFETY AND DIRECTORS OF TRAINING

Best Practice

The ACSPT ARC identified establishing minimum qualifications for a director of training and director of safety as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

Part 119 of 14 CFR requires an air carrier to have qualified personnel serving full time in the following or equivalent positions: director of safety, director of operations, chief pilot, director of maintenance, and chief inspector.

Part 119 lists the qualifications for all of these positions except the director of safety. In light of the complexity and implementation of an SMS across the spectrum of air carrier operations, it is appropriate to establish a set of minimum criteria for a director of safety, including experience and education, similar to those defined for other critical positions.

Effective training tailored to an air carrier's fleet and operating environment is one of several foundational elements necessary for continued safe operations. The nature of modern training methodologies for curriculum development and delivery of the material itself is extremely dynamic. Elements like AQP, distance learning, and expanded use of full flight simulators often can effectively replace prescriptive rote training, and place far greater significance than ever before on the administration of training programs. In addition, pilots' experience levels vary more widely today than in the past, presenting the challenge of training a group of pilots with varying levels of experience and different backgrounds to the same high proficiency standards. Training programs must be integrated with other air carrier programs—such as safety data collection and scheduling—to achieve the intended benefit. It is no longer simply a matter of checking off items the FAA says must be taught, but employing a variety of data sources to help identify potential training issues , and then designing, validating, and obtaining approval for relevant changes in training content and methodology, all within the existing regulatory framework.

The ACSPT ARC reviewed the requirements of part 119, and concluded there are benefits associated with creating and defining qualifications for the individual responsible for direct oversight of an air carrier's training programs. This is consistent with other complex positions critical to the safety and effectiveness of air carrier operations. Qualifications should include specific criteria, such as professional qualifications, management experience, educational background, and training that indicate the candidate could effectively develop, maintain, and coordinate training programs and personnel. In the context of part 119, this position could be defined as a director of training, but the ARC recognizes the actual title of such a position may vary between air carriers and that the FAA's normal processes for approving air carrier management positions would accommodate variations in organization structures.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that a number of air carriers currently have specific criteria for the designated director of training and director of safety. Some air carriers—with what the ARC members believe are particularly effective safety and training programs—subscribe to the philosophy of comprehensively defining both positions' qualifications and required background.

Recommendations, if any, for Legislative or Regulatory Actions[6]

The ACSPT ARC recommends that the FAA convene a body of stakeholders for further review.

3.1.9 ESTABLISH A FLIGHT RISK ANALYSIS WORKING GROUP

Best Practice

The ACSPT ARC identified the establishment of a FRAWG as an air carrier industry best practice. A FRAWG collects and analyzes safety-related data from multiple sources, applies a formal risk assessment strategy to determine action priorities, and achieves stakeholder agreement on actions.

Progress in Identifying this Best Practice in the Air Carrier Industry

It is an industry-wide concern that training is too often prescribed as the solution to any potential safety-related threat before proper analysis is performed. Because training resources are limited, choices must be made to apply those resources to: (1) issues that are bona fide systemic areas of concern, as opposed to "one-offs," and (2) issues where training can have a positive impact. An air carrier's FRAWG is designed to address this.

FRAWG membership should include leadership representatives of the FAA, employee organizations, and the stakeholder departments, such as flight training, flight safety, and flight standards. The FRAWG reviews all available operational data sources, including but not limited to AQP, FOQA, ASAP, LOSA, and the Voluntary Disclosure Reporting Program. Additionally, industry safety information from sources like Aviation Safety Information Analysis and Sharing (ASIAS), the Flight Safety Foundation (FSF), the Air Transport Association of America, Inc. (ATA), the Regional Airline Association (RAA), the FAA, the National Transportation Safety Board, and NASA can be used as benchmarks for an air carrier's internally derived data and its training programs.

The FRAWG's review/analysis of safety-related data should follow a formal risk assessment process, in which the working group evaluates issues by likelihood of recurrence and severity of the potential outcome. Such a process prioritizes resources for higher risk issues. In addition, a FRAWG should follow a formal process to determine appropriate risk-mitigation actions in response to identified priorities. Not every identified risk can or should be mitigated by training, and training solutions are most effective when a knowledge or skill deficiency exists. If knowledge or skill gaps do not exist, the FRAWG should recommend other solutions, such as policy and procedure changes, hardware or software modifications, or other adaptations.

The FRAWG should meet periodically to analyze all data sources, both to identify new risk-mitigation priorities and to determine if previously implemented mitigation strategies (such as training program adjustments) are effective. Implementation of an SMS will incorporate many of the elements of this recommendation.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that FRAWG is a practice in place or being developed among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

No regulatory action is required.

3.1.10 PROVIDE STANDARDIZED MANUALS AND USE DISTANCE LEARNING

Best Practices

The ACSPT ARC identified standardizing paper and electronic publications associated with company operations, specific aircraft operating information, and training materials across aircraft fleets as an air carrier industry best practice. Closely linked with the standardization of publications, the ARC has identified continuous accessibility to these publications, other reference materials and the use of distance learning as air carrier industry best practices.

Progress in Identifying these Best Practices in the Air Carrier Industry

The standardizing of paper and electronic publications and procedures between fleets is a best practice, as there are multiple human-factor advantages to be gained in the cockpit. Many part 121 air carriers and others in the industry have chosen to incorporate operating manuals and procedures with standardized layouts across fleets, providing proven safety advantages.

Transfer of training or learning between aircraft is not automatic The relationship between old knowledge and the material being learned must be made clear, or old knowledge could inhibit learning the new skill. Pilots familiar with several airplane electrical or navigation systems can use that existing knowledge to more efficiently learn a new system, particularly if the older aircraft system is more complex. This sort of experience-based learning occurs when training material has a similar layout to what the pilot has used in the past.

Information delivery begins in the training environment. Training in accessing relevant information occurs not only in initial aircraft training, but also when a pilot transitions between aircraft types. In developing a strategic information delivery plan, the air carrier must strive to group company operational manuals and aircraft-specific operating manuals in a way that maximizes the employee's ability to match patterns.

Air carriers seeking more effective methods of delivering employee training use various forms of distance learning. Air carriers and pilots have found distance learning gives employees more convenient access to necessary training materials, enabling their workforce to view those

materials as often as necessary. Another major factor in air carriers' use of distance learning is the increasingly technology savvy workforce; a new generation of professionals expects training to be available via more sophisticated channels. Distance learning is scalable to meet the needs of the air carrier, and experience has shown that air carriers can effectively present certain training topics via distance learning.

The air carrier industry recognizes that pilots have an easier experience learning the unique qualities of new aircraft when they can efficiently locate, retrieve, and process information using a consistent schema. For example, a pilot finds the transition of moving from an Airbus 320 to a Boeing 767—a significantly different aircraft—made easier by retaining many familiar skills and habits from the operation of the previous aircraft.

Standardizing procedures and publications across fleets would improve efficiency in training time and increase the trainee's knowledge retention. Any increase in knowledge retention will improve performance on the line, which will lead to a much-improved response to emergencies, when pilots and flightcrew members operate under stressful conditions.

Air carriers and other stakeholders should ensure that standardization does not hide critical airplane differences. For example, an automation-based standard operating procedure may need to be different for the Boeing 777 aircraft than for an early Boeing 757 aircraft if the former has more advanced automation features than the latter. Even with such required operating differences, it is still possible to standardize the layout of manuals to create clear similarities between markedly different aircraft types.

While automated flight features have reduced the need for continuous active input from pilots to maintain cruise flight, the need to access, retrieve, and process information has increased dramatically over the past several decades. All-weather flight operations in complex and congested airspace underscore the need for pilots to be able to quickly and efficiently retrieve critical aircraft systems information, company operational guidance, and navigation information required for safe operations. Air carriers must be proactive in designing information delivery systems that facilitate training, retention, and the use of essential flight information.

Electronic flight bags (EFB) are gaining popularity in the air carrier industry. An EFB is any electronic display device intended primarily for cockpit use. Along with company and aircraft manuals, EFBs can store and display a variety of aviation data or perform calculations for aircraft performance or fuel loading procedures. Regardless of whether an air carrier uses paper or electronic manuals, the manual content should be in a standardized format.

Regarding the continuous availability of training materials, the ACSPT ARC recommends air carriers employ advanced processes and methodologies to develop, maintain, and deploy operational and training documentation to their workforce, thus providing quick access to reference materials.

The goals of constantly improving the safety of operations, ensuring accurate information is readily available, and ensuring the content of such material is relevant and current with original equipment manufacturers, regulations, and other external sources justify upgrading these systems. Many air carriers now give flightcrew members and maintenance technicians computers, hand-held devices, or other modern tools to provide the most up-to-date and accurate information available at any time or place. This practice helps those employees better prepare for flight operations and training.

Progress of Air Carriers and Labor Unions in Implementing these Best Practices

No specific documentation exists about the number of air carriers that have implemented these best practices. It is the consensus of the ACSPT ARC members that training and flight manual standardization and accessibility and the effective use of distance learning is in place or being developed among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

No regulatory action is required.

3.1.11 USE SIMULATORS IN PILOT TRAINING

Best Practice

The ACSPT ARC identified the use of simulation in pilot training as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

For many years, the air carrier industry has used simulation for training flightcrew members. As computer technology evolved significantly in the last 10 to 15 years, so has simulation technology in aviation industry training. Because of advances in simulation technology, the industry most often prefers simulation to in-aircraft training.

Simulator training can expose flightcrew members to concentrated training scenarios that include system malfunctions (for example, loss of aircraft hydraulics), abnormal operations (for example, engine failures), and hazardous meteorological conditions (for example, wind shear and turbulence) that cannot be experienced in an aircraft without elevated risk. Additionally, many conditions, hazardous or otherwise, simply cannot be trained in an aircraft—for example, low-visibility operations and maximum crosswinds. Simulation also enables exposure to aircraft handling characteristics in adverse environmental conditions, such as icing, that otherwise would be difficult to experience due to geographical constraints and seasonal weather patterns. Simulation training reduces the demand in an already overcrowded air traffic system and substantially reduces fuel consumption and associated carbon emissions.

Air carriers and training organizations are continually seeking more fidelity and expanded use of simulation technology in their training programs. The following items are just some of the areas in which simulators could be improved to enhance their benefits to the industry:

- Aerodynamic modeling: Improved models of stall and icing effects to support upset prevention, recognition, and recovery training requirements.

- Visual modeling: Continuing increase in scene content in terms of detail, extent of coverage, resolution, and concurrency with the real world.

- Weather modeling: Realistically evolving large weather patterns. Better models of turbulence, gusts, crosswinds, and icing conditions.

- ATC modeling: Simulation of greater numbers of air and ground traffic entities, with behaviors consistent with real-world ATC procedures. The development and refinement of this technology will support Next Generation Air Transportation System type cockpit traffic displays and ATC communications correlated with traffic movement. Robust speech recognition is advancing, but the technology has not yet reached necessary levels of fidelity to meet the requirements.

- Motion modeling: Improved motion cueing algorithms to reproduce aircraft control behaviors and objective motion cueing test standards.

- Instructor aids: There will be increased focus on technology to assist instructors with delivering a consistent quality of training. This includes better instructor monitoring and assessment tools and student brief and debrief tools.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that the use of simulation in pilot training is a common practice among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

The ACSPT ARC feels that attainment of a high level of safety within the air carrier industry is supported by the optimum use of high-fidelity simulation. This level of use should be the standard. However, the ARC recognizes that some operational constraints may exist that inhibit the maximum use at some carriers. Regulations, through due process, should allow an air carrier to demonstrate an equivalent level of safety. Therefore, the ARC recommends that the FAA convene an industry panel to thoroughly study the nature of regulations that would support the above principles.

3.2 FLIGHTCREW MEMBER PROFESSIONAL STANDARDS

3.2.1 ESTABLISH PILOT ASSISTANCE PROGRAMS

Best Practice

The ACSPT ARC identified peer programs as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

These assistance programs are administered by pilots and provide support from trained peers who volunteer their time. These programs occasionally employ the services of professional practitioners in various disciplines. Pilot assistance programs do not directly address professional piloting skills such as proficiency issues. Rather, they focus on pilots' mental and physical health to ensure that factors external to the cockpit do not have an adverse impact on proficiency. Examples of these factors would be family stress, chemical dependencies, and personal conflicts with other flightcrew members.

Often, these programs employ pilot-assistance committees as umbrella groups, which contain subcommittees specializing in human-factors issues in specific disciplines. These disciplines provide guidance for pilots having difficulty with any aspect of their professional or personal lives that could affect their work. Peer volunteers are trained and available any time to address personal issues that, if left unresolved, could lead to problems both inside and outside of the cockpit, and ultimately result in decreased safety. In some instances, mental health professionals or other practitioners can be retained under specific guidelines. Confidentiality is the key element of these committees and the cornerstone for their success. Therefore, they must handle sensitive personal issues discreetly and with a high degree of dignity and respect.

Typically, there are five common pilot assistance subcommittees:

- Aeromedical committee: This committee of pilots works with experts in the field of aviation physiology and medical standards, and coordinates research into areas that over time may have a negative impact on a pilot's health. Examples include research into the effects of high-altitude radiation exposure and the long-term effects of fatigue due to flight and duty-time regulations and disrupted circadian rhythms due to long-haul intercontinental flights.

- Critical Incident Response Program (CIRP) committees: The purpose of an air carrier industry CIRP committee is to mitigate the psychological impact of an accident, incident, or other traumatic event. A CIRP strives to facilitate recovery from those events before harmful reactions affect job performance, careers, families, and health. A CIRP committee provides both pre-incident/accident training and post-incident/accident crisis-intervention services. A CIRP, comprised of trained peer volunteers, may be successful in mitigating the negative effects of stressors that can lead to post-traumatic stress disorder (PTSD) by properly counseling fellow flightcrew members who have survived a traumatic incident or accident. Mental health professionals are a resource for CIRP volunteers and may be called on when needed.

- Human Intervention and Motivation Study (HIMS) program: Pilots voluntarily staff these programs to deal with alcohol and chemical dependency. The HIMS conducted several years ago recognized that alcohol and chemical dependency are legitimate diseases, and are not only medically disqualifying, but also life threatening. Diagnosed pilots go through a chemical dependency treatment program specifically tailored to meet the needs of air carrier pilots. Through strict adherence to the program's protocols, hundreds of pilots have regained their medical certification. A key element of a HIMS program is strict monitoring by participating doctors and sponsoring pilot peers. HIMS protocols must be strictly followed as a condition of recertification. There is a degree of regulatory compliance because recovering pilots are subject to medical certification standards established by the FAA. HIMS programs must be followed with FAA oversight.

- Professional Standards committee: This committee consists of trained pilot volunteers, and provides a forum for pilots to address ethical problems or unprofessional conduct. Pilot peers address concerns about pilot behavior in the workplace, particularly regarding unprofessional conduct. With peers who understand the personal and professional challenges pilots face, Professional Standards committees help pilots reach mutually-agreed-upon resolutions to conflicts. The volunteers maintain a neutral, nonjudgmental position while working with the parties under strict confidentiality. Professional Standards committees can provide early intervention, thus preventing situations from developing that might require company discipline, and ensuring a safer and more efficient work environment.

- Pilot assistance network: This network of peer volunteers provides pilots with private, confidential help or counseling for personal problems. The issues these networks address usually are not job related, but are personal problems—such as marriage, family, and health—that could lead to distractions while flying, potentially undermining safety. The committee is comprised of a number of on-call volunteers available any time. Since its inception, this program has helped pilots manage personal problems and maintain their careers. This program complements Professional Standards committees by assisting pilots with personal issues outside the purview of professional standards.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that pilot assistance programs are a common practice among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

No regulatory action is required.

The ACSPT ARC strongly recommends that these peer programs remain voluntary. A purely voluntary program usually attracts the best peer volunteers because they employ the volunteer spirit and volunteers generally are more motivated to provide support to their fellow pilots.

Regulating these voluntary programs may negatively affect confidentiality, which is the key element of these programs. This would eliminate the privacy of peer-to-peer conversations, which is vital to the success of the programs in their current volunteer state.

3.2.2 ESTABLISH A FLIGHTCREW MEMBER-INITIATED PROFICIENCY PROCESS

Best Practice

The ACSPT ARC identified establishing a flightcrew member-initiated proficiency process as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

The skills involved in operating an air carrier aircraft are perishable. As with any complex task, proficiency is at its highest when the skills are exercised regularly, and proficiency can diminish as time passes without exercising those skills. Current proficiency regulations are intended to ensure that pilots exercise their skills periodically. If they do not, the regulations specify that pilots need refresher exercises before they can perform without supervision. When some time has passed since a pilot's skills were last exercised—but not enough time to require action—it would be beneficial for the pilot to seek an opportunity to acquire additional flight experience.

Circumstances such as infrequent flying due to seasonal shifts in flight schedules, international flights that have only two landings per rotation, a pilot maintaining reserve status, extended illnesses, and delays in the transition to flying a different aircraft after training may contribute to a perceived lack of proficiency. Based on these circumstances, pilots may desire opportunities outside their awarded monthly flying schedule to reinforce certain flying skills in which they do not feel proficient.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that flightcrew member-initiated proficiency is a voluntary practice not common among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

The ACSPT ARC recommends that the FAA convene a body of stakeholders for further review.

3.3 FLIGHTCREW MEMBER TRAINING STANDARDS AND PERFORMANCE

3.3.1 IMPLEMENT UPSET RECOVERY TRAINING

Best Practice

The ACSPT ARC identified implementation of upset prevention, recognition, and recovery training as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

An aircraft upset can occur due to environmental conditions, mechanical malfunctions, wake turbulence, or other unusual phenomenon which displaces an aircraft from its normal flight attitude. Early pilot training focused on low-energy maneuvers and stalls, however with the transition to large swept-wing aircraft and then to simulator training, training was limited to approach to stalls. Recent incidents and accidents have renewed efforts to improve training and simulation to better equip pilots with the knowledge and psychomotor skills necessary to handle these events.

Although upset training is not required by part 121 regulation, most air carriers incorporate some form of upset training in their initial and recurrent training programs including the Airplane Upset Recovery Training Aid[14]. Many of the better training events currently in place use simulation technology to its full extent, enabling the use of unplanned aircraft upsets requiring the flightcrew to practice avoidance and recovery techniques.

Industry working groups have addressed training in extended envelopes. These working groups focused on reviewing the current practices in extended envelope training to identify shortcomings in data and training media requirements. Recommendations by the FAA/Industry Stall and Stick Pusher Working Group have resulted in development of the Stall Advisory Circular, anticipated to be published in 2011.

Based on an FAA working group's efforts, the FAA recently issued Safety Alert for Operators (SAFO) 10012—Stall Recovery, Minimum Loss of Altitude[15], which discusses the terminology and procedures for "Minimal Loss of Altitude" and its recommended action.

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[14] Airplane Upset Recovery Training Aid, FAA, 12/1/2010, http://www.faa.gov/pilots/training/

[15] SAFO 10012 Possible Misinterpretation of the Practical Test Standards (PTS) Language "Minimal Loss of Altitude."
http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo/all_safos/media/2010/SAFO10012.pdf

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that upset recovery training is a common practice among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

The ACSPT ARC recommends regulatory action and guidance.

3.3.2 IMPLEMENT A PILOT REMEDIATION STRATEGY

Best Practice

The ACSPT ARC identified structured remedial training programs with detailed tracking systems as an air carrier industry best practice when dealing with pilots who demonstrate persistent training and evaluation performance deficiencies.

Progress in Identifying this Best Practice in the Air Carrier Industry

On October 27, 2006, the FAA released SAFO 06015, Remedial Training for Part 121 Pilots, encouraging air carriers to voluntarily implement remedial training for pilots with persistent performance deficiencies.[16] A well-designed remedial training strategy is most effective when implemented with a standardized and structured plan. A standardized set of events should occur after a pilot demonstrates deficient performance in a training or evaluation event. In addition, the strategy should include a structured tracking system to protect the interests of the air carrier and the individual pilots.

The purpose of the remediation strategy is to establish guidelines providing additional training to pilots who are unable to meet proficiency objectives within the air carrier's approved training program footprint. The strategy requires a system for tracking unsatisfactory performance during training events and evaluations. It also requires a remediation plan that specifies standard actions—such as remedial training and pilot review boards (PRB)—in response to the unsatisfactory performance.

Remedial training events should be customized to address the specific area of deficiency. They should be non-punitive.

Standard remedial training allowances—the amount of remedial training assigned in response to specific training failures—should be defined. Standard allowances ensure consistent limits are placed on the additional resources to be invested during remediation. These allowances should be derived through review of historical training data.

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[16] SAFO 06015 Remedial Training for Part 121 Pilots.
http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo/all_safos/media/2006/safo06015.pdf

Thresholds for repetitive or severe occurrences of unsatisfactory performance should trigger actions beyond additional remedial training, including placing the pilot in the air carrier's special tracking program, shorter intervals between recurrent training events, additional line checks, PRBs, and other appropriate forms of evaluation. Along with clearly defined thresholds for entry into special tracking, the program should define when a pilot has demonstrated persistent proficiency and is able to exit special tracking and return to normal training and checking intervals.

In cases in which a pilot has reached the threshold triggering the creation of a PRB, the PRB reviews all aspects of a pilot's training and evaluation performance, including any relevant external circumstances that may be impacting performance, to determine future actions. The PRB decides whether additional remedial training is appropriate, and if so, the amount and type of remedial training offered. The PRB may also decide to discontinue training and instead terminate the pilot's employment. PRB membership should include leaders from the appropriate departments (including but not limited to training, standards, and the chief pilot's office) and a peer advocate. The PRB should consult the deficient pilot and any instructors who trained or evaluated the pilot to gather the information needed to make a sound decision.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that pilot remediation strategy is a common practice among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

The ACSPT ARC recommends rulemaking and guidance.

3.3.3 IMPLEMENT INTEGRATED TRAINING

Best Practice

The ACSPT ARC identified an integrated systems training approach incorporating the latest technology and curriculum development techniques as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

Current regulations require both ground and flight training. Historically, ground training took the form of a lecture aided at times by a chalkboard, overhead projection, or most recently a Microsoft PowerPoint presentation. The student would open a textbook to a graph or picture of a system, listen to the instructor, and attempt to visualize the system in action. Frequently, all such ground instruction on all systems would be grouped together into several days or weeks of classroom time before the student ever saw any of the various systems in action. This separation of ground and "flight phases" frequently resulted in less-than-adequate retention of pertinent systems knowledge.

Advances in technology used for information delivery and understanding of the learning process led to the development of an integrated systems training approach. Such an approach typically includes a coordinated mix of texts, computer-based or classroom training, and instructor-led part-task training prior to flight training. After reading and/or watching computer-based or classroom modules, students are able to apply the knowledge to demonstrate practical application and proficiency skills. Integrating academic and practical training on individual aircraft systems in this way helps a student learn a system and better understand how each system, and the pilot's inputs to that system, affect the overall operation of an aircraft.

For example, to teach the operation of the aircraft electrical system effectively, some classroom time would be dedicated to studying the basic components and characteristics. For maximum effectiveness, this relatively abstract discussion of theory would immediately be followed by graphic depictions of the entire system in the specific context of the aircraft, then by practical demonstrations using advanced training devices. Such advanced exposure shows the student the real-world application of the academic presentation, illustrating how specific controls affect the operation of the components and overall system, how normal operations are conducted, and how troubleshooting procedures are developed and implemented.

This best practice is manifested in a corporate culture that recognizes and embraces advances in educational practices and supporting technologies, and demonstrates its support through this best practice. The regulatory framework must allow the flexibility to adapt curricula to changing training needs so air carriers can use that understanding of learning processes and technologies to enhance the effectiveness of training resources.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that integrated training is occurring among several of their constituents. However, the ARC is unaware if it can be considered a common practice among all air carriers.

Recommendations, if any, for Legislative or Regulatory Actions[6]

No regulatory action is required. The ACSPT ARC recommends that existing guidance should be reviewed for applicability to advances in educational practices and supporting technologies, and updated accordingly.

3.3.4 MAINTAIN MANUAL FLYING SKILLS

Best Practice

The ACSPT ARC identified having and taking the opportunity to maintain manual flying skills as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

Increased availability of advanced generation automation for control of the aircraft flight path has greatly increased the crew's ability to more accurately and precisely control the aircraft's

flight path. This, along with a desire to more effectively utilize the limited airspaces available, has led to requirements for operators to equip, train, and use this automation in place of traditional hand flying of the aircraft. Required Navigation Performance approaches, departures, sensitive noise monitoring, and Reduced Vertical Separation Minimum airspace are all examples of either discouraged or prohibited manual flying.

Manual flying, however, remains a required skill for today's aviator. In the case of automation not being available or utilized, the successful outcome of the flight depends on the proficiency of the pilot manually manipulating the flight controls. For the reasons previously discussed, the opportunities to maintain that proficiency are increasingly limited.

The operator's basic flight manual or fleet manual presents an opportunity for an air carrier to express its desire and set limitations regarding appropriate times for its pilots to maintain proficiency in manual flying.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that manual flying guidance is provided by several of their constituents. However, the ARC is unaware if it can be considered a common practice among all air carriers.

Recommendations, if any, for Legislative or Regulatory Actions[6]

The ACSPT ARC recommends that the FAA encourage air carriers to provide guidance in their operating manuals for manual flying. The ARC also encourages the FAA to do further studies.

3.3.5 USE SIMULATOR MOTION IN TRAINING AND EVALUATION

Best Practice

The ACSPT ARC identified as an air carrier industry best practice the use of flight simulation training devices (FSTD) that include full motion for training to proficiency, testing, and checking for pilot qualification air carrier events.

Progress in Identifying this Best Practice in the Air Carrier Industry

Pilot training is best accomplished in a specified sequence. Early pilot training without a motion-capable device can be an efficient way to help students master the procedures necessary to accomplish flight training tasks. This type of rote learning helps prepare students for later advanced realism training. Mastering the procedures, however, is only one step in the learning process. The training still needs to be accomplished to the established standards. Whether the pilot candidate continues to meet this standard should be determined in an environment that replicates as closely as possible what the pilot will experience while flying the line with passengers.

An example would be mastering the task of landing an aircraft. It is possible to learn and practice the steps required to perform the landing without fully replicating the actual operating environment. However, a pilot applicant should not be qualified to land an aircraft with passengers on board until he or she experiences the task and performs it to an acceptable standard in a realistic environment. Landings occur in day-to-day operations while enduring turbulence, in crosswinds, and with varying aircraft load factors, all in various visibility conditions. These effects can be cumulative and should be fully experienced in training. The same applies if something were to go wrong with the maneuver. The pilot should not experience the full dynamics of a deflated tire on landing for the first time with passengers on board. Pilots should perfect these tasks under conditions as realistically simulated as possible while under the effect of the stress that will accompany them. This environment can be replicated with current full-motion FSTDs, as long as they accurately replicate the environment the pilot will operate in.

Regarding recurrent training requirements, a pilot with years of experience flying the line may have never experienced a tire deflation on landing, an engine failure on takeoff, or any number of other situations that might occur while flying the line. Pilots should experience these maneuvers in a training environment, presented as closely as possible to the real-world maneuvers to maintain peak performance. Modern full-motion FSTDs can replicate this environment.

There are more elements to simulated flight training than just motion, including sound, visuals, and ATC. The air carrier industry should ensure these elements are as realistic as technology will allow to safely achieve a near–lifelike experience in training. Pilots should be trained to proficiency and checked in a device that replicates in-flight conditions to the greatest degree available. The overall objective is to not only train tasks, but to ensure the pilot is equipped to manage the complex operational environment of current aviation infrastructure.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that use of simulator motion in flight training and evaluating is a common practice among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

The ACSPT ARC recommends that the FAA convene a body of stakeholders for further review and harmonization with ICAO guidelines as outlined in ICAO Document 9625.

3.3.6 ESTABLISH REQUALIFICATION TRAINING

Best Practice

The ACSPT ARC identified as air carrier industry best practices the establishment of requalification training criteria based on time since last performing flightcrew member duties, requiring requalification operating experience, and requiring requalification indoctrination.

Progress in Identifying this Best Practice in the Air Carrier Industry

There are various types of training programs conducted at air carriers. Pilots new to an air carrier, commonly referred to as "new hires," typically attend a "Basic Indoctrination" training course, followed by ground and simulator (flight) training for a specific aircraft type. Once that training is complete, the pilot obtains experience in the aircraft, under the supervision of a check airman; this is called "operating experience." After becoming qualified on the given aircraft and pilot position, a pilot periodically attends recurrent training. In addition to recurrent training, a pilot has to have enough takeoffs and landings to remain current, according to 14 CFR.

A pilot becomes disqualified when he or she does not attend recurrent training or does not accomplish enough takeoffs and landings. To regain qualification, a pilot is entered into a pilot requalification training course. These courses vary greatly based on the reason for disqualification. For example, a pilot who has been out sick for 3 years will receive much more training than a pilot who has not had enough takeoffs and landings within the last 90 days. The sick pilot needs more time to relearn or refresh his or her knowledge of aircraft systems, policies, and procedures.

While current regulation requires requalification, many of the details are unspecified by regulation and left open to interpretation. Requalification programs at different air carriers and under the management of different FAA offices vary.

Requalification Criteria

The most accurate determinant of a pilot's potential loss of proficiency is the time since last performing flightcrew member duties. The training required to regain the appropriate level of knowledge and proficiency should be based on the time since the pilot last applied those skills. The training requirements are currently based on the time since the lapse occurred, which may be considerable. There are various types of requalification and numerous ways this training is accomplished. The ACSPT ARC recommends that the FAA better define some of these practices and encourage the implementation of identified best practices. The following sections elaborate on best practices for requalification prerequisites, requalification line checks/operating experience, and requalification indoctrination.

Requalification Prerequisites

Requalification prerequisites are not well defined by current regulations. Air carriers use a wide variety of standards, ranging from "time since last disqualified" to "time since last performing the duties of the flightcrew member position." This time determines the type and duration of training a pilot receives to regain qualifications. The following scenario and two examples illustrate the differences this practice can create.

> *Scenario*: An air carrier conducts recurrent training every 12 months. A pilot completes recurrent training on January 1, 2010, and flies for the last time before becoming sick on January 5, 2010.

Example I: If the requalification curriculum is based on 6 months' elapsed time since becoming disqualified, this pilot would have become disqualified on February 28, 2011 (the end of the twelfth month after January 1, 2010, plus the one grace month), and would have another 6 months (since becoming disqualified) on top of that, which in turn means the curriculum is valid until July 31, 2011.

Example II: If the particular requalification curriculum is based on 6 months' elapsed time since last performing the duties in the specific flightcrew member duty position, this pilot would not be disqualified before the next recurrent cycle, but would require the same requalification curriculum on July 5, 2010.

As seen from the above examples, there is a nearly 13–month discrepancy between the two methodologies. The conservative approach to requalification training prerequisites are more prudently based on the time since performing duties, because it more closely judges the proficiency of the pilot.

Not only should requalification prerequisites be based on time since last performing the duty as a pilot in the given seat and aircraft type, but consideration should also be given to the experience level the pilot obtained before losing qualification on the aircraft. A review of the individual's performance while completing training and operations in the aircraft type should be an additional consideration.

Requalification Line Check/Operating Experience

Unlike other qualification training curricula, requalification training does not require operating experience when line checks are required.

During qualification training, after completion of simulator training, operating experience is conducted. This allows a pilot to consolidate knowledge and skills, learned in training, in line operations while under the supervision of a qualified check airman. Upon completion of the operating experience, a line check may be conducted. A line check is a pass/fail event administered by a qualified check airman.

In some cases requalification training requires a line check with no opportunity for operating experience prior to the check. This does not allow for renewed exposure to line operations under the supervision of a qualified check airman prior to the line check. Often, it would benefit the pilot and the air carrier to conduct operating experience, as opposed to only conducting a line check.

Requalification Indoctrination

The basic indoctrination course is required only one time in a pilot's career with an air carrier. This course provides the basis for the remainder of the pilot's training, including ground and flight training. After an extended absence from the air carrier, it is prudent to add an abbreviated requalification indoctrination course for certain requalification pilots, based on the time elapsed since the pilot performed his or her duties at the air carrier. This course covers many general topics, such as security, hazardous materials, human factors, flightcrew operating manuals, and

airport/approach charts. This training program provides pilots returning from a long absence an opportunity to re-familiarize themselves with these topics.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that requalification training, as specified above, is not a common practice among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

The FAA should complete rulemaking for part 121, subparts N and O, and provide appropriate guidance material requiring requalification syllabus requirements based upon time since last performing flightcrew member duties. In cases where line checks are required for requalification, operating experience prior to the line check should be conducted.
This rulemaking should also require requalification indoctrination for pilots who have not flown for an extended period.

3.3.7 CONDUCT JUMP SEAT OBSERVATION FLIGHTS BY NEW PILOTS

Best Practice

The ACSPT ARC identified a structured new hire observation flight program as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

A new hire flight observation program is designed to give a new pilot an opportunity to observe routine line operations while riding on the cockpit jump seat. New pilots will begin the program after completion of the aircraft qualification program and prior to initial operating experience. After reporting to the crew domicile, learning how to check in for a trip, meeting the crew, and observing the dynamics of line operations on a specified minimum number of segments, the new pilot is in a better position to enter the working pilot seat, having gained familiarity with day-to-day line operations. In addition, the pilot travels in full uniform as part of the working crew. This program could include securing the aircraft for the night and experiencing firsthand the process involved in a typical layover. As the new pilot initially will fly as a first officer, it is recommended that he or she carefully observe and shadow a working first officer to gain familiarity with his or her upcoming duties.

The benefit of this program is that the new pilot can gain initial operating experience without becoming task saturated in the control seat of a new, unfamiliar environment. As part of the new pilot experience during the probationary period, the domicile chief pilot's office helps counsel the new pilot through the first year. Some pilots undergo quarterly progress interviews to review their probationary report forms, which are completed by captains on each trip.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that observation flights by new pilots are occurring at several of their constituents. However, the ARC is unaware if it can be considered a common practice among all air carriers.

Recommendations, if any, for Legislative or Regulatory Actions[6]

No regulatory action is required.

3.3.8 IMPLEMENT ENHANCED PROFICIENCY AND CURRENCY REQUIREMENTS

Best Practice

The ACSPT ARC identified enhanced proficiency and currency requirements as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

According to § 121.439(a), no certificate holder may use any person nor may any person serve as a required pilot flightcrew member, unless within the preceding 90 days that person has made at least three takeoffs and landings in the type of airplane in which that person is to serve. Any person who fails to make the three required takeoffs and landings in line operations or the simulator within any consecutive 90-day period must reestablish recency of experience (takeoff and landing currency).

If reestablishment of takeoff and landing currency is required, additional maneuvers must be completed to regain currency. As a practical matter, these maneuvers are frequently completed in a full motion simulator. As a best practice, some air carriers have recognized the potential benefit of optimizing these simulator periods, using the full scheduled time, to allow exposure to challenging maneuvers not frequently encountered in line operations, such as low-visibility approaches, engine failures, and missed approaches, in addition to the required regulatory maneuvers.

This best practice would increase these pilots' proficiency in a training environment, without placing a significant additional scheduling burden on air carriers. The pilot, check airman, and simulator resources must be available to comply with the existing requirements under § 121.439. The incremental maneuvers would merely utilize typically available time to accomplish.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that enhanced proficiency and currency requirements are not common practices among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

The ACSPT ARC recommends that the FAA convene a group of stakeholders to review modification of the existing rule.

3.4 MENTORING AND INFORMATION SHARING BETWEEN AIR CARRIERS

3.4.1 SHARE SAFETY AND TRAINING INFORMATION AND PRACTICES

Best Practice

The ACSPT ARC identified sharing of safety and training information and practices as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

Safety Alliances

Safety alliances evolved over time to match the needs of the industry, and have proven to be very effective in enhancing safety. They exist within code-sharing and industry partnerships. Although not required to contribute by current regulations, air carriers' directors of safety routinely come together to ensure robust, consistent safety performance.

The mainline and their affiliated regional air carriers provide a level of coordination, sharing, review and support to each other. In fact, mainline and their affiliated regional air carriers have well established processes and procedures for routine review and continuous monitoring of the partners and sharing of data and best practices to enhance the safety of all partner air carriers.

Air carrier alliances work to ensure that all network partner air carriers operate with comprehensive safety programs. These alliances spend considerable time sharing information and defining exactly what effective programs consist of to ensure inclusion in both the mainline and their affiliated regional air carriers.

The overall intent of these programs is to exceed the baseline regulatory requirements of 14 CFR by establishing and maintaining an infrastructure to effectively support one level of safety. While the partnership safety alliance structure of each mainline and affiliated regional air carrier may appear different, they have the following common elements:

- The air carriers' directors of safety meet routinely to advance safety, with the goal of continuous improvement of both the mainline and their affiliated regional air carriers.

- Participants openly share safety data and information to address real concerns.

- Participants share hazard- and risk-mitigation strategies.

- Participants share experiences and best practices on how to make safety programs more comprehensive and effective for both the mainline and their affiliated regional air carriers.

- Participants explore ways to raise the "safety bar" through collaborative problem solving.

- Participants standardize policies and procedures to allow consistent application for mainline and their affiliated regional air carriers.

- Mainline and their affiliated regional air carriers assist each other in implementation and enhancement of voluntary safety programs.

- Participants address industry guidance (SAFOs, Information for Operators (InFO), and CAST initiatives).

Within some air carrier alliances, the pilot groups have formed similar alliances to exchange information on issues of mutual concern, including safety practices.

Training Alliances

Training alliances have emerged among some mainline and their affiliated regional air carriers as a venue for exchanging information and sharing best practices to improve training programs. Directors of training from participating air carriers meet routinely to discuss issues such as:

- Sharing best practices:
    - Training department organization.
    - AQP implementation.
    - Data collection and reporting.
    - Specific maneuver training, such as stall recovery.

- Prioritizing high-interest training issues:
    - AQP—development of instructional programs and qualification standards.
    - SMS—documenting program improvement with data.

- Addressing industry guidance:
    - SAFO.
    - InFO.
    - Industry initiatives.

International Safety Alliances

Safety alliances also occur within international network alliances. For example, all mainline air carriers participate in international safety alliances through their membership in global air carrier alliances (oneworld, SkyTeam, and Star Alliance). The following table lists and compares the alliances to which mainline air carriers belong.

Category	oneworld	SkyTeam	Star Alliance
Member air carriers	14	13	27
Aircraft	2,473	1,941	4,023
Employees	311,830	316,445	402,208
Passengers/year	335.7 million	384 million	603.8 million
Daily departures	9,381	13,000	21,000

Category	oneworld	SkyTeam	Star Alliance
Number of airports	901	898	1,160
Countries served	145	169	181

Global alliance member air carriers must meet strict safety standards, including IATA Operational Safety Audit (IOSA) standards and other alliance safety requirements. All three global alliances maintain safety groups comprised of their member air carriers' directors of safety, who meet regularly to share safety information and best practices to ensure the highest levels of safety are maintained at all alliance air carriers.

In addition, pilot groups within some international alliances have formed similar alliances, to exchange information on issues of mutual concern, including safety practices.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

It is the consensus of the ACSPT ARC members that sharing safety and training information and practices is common among their constituents.

Mainline and their affiliated regional air carrier partners have fully implemented safety alliances. All mainline air carriers are participating and contributing members of global safety alliances, and are on the IOSA registry. Two mainline air carriers and their affiliated regional partners have implemented training alliances. Of those, one mainline air carrier and its affiliated regional partners have integrated the training alliance into their regional safety alliance, while the other's training alliance is separate from its safety alliance. Both approaches have been productive for the participating air carriers.

Recommendations, if any, for Legislative or Regulatory Actions[6]

No regulatory action is required.

3.4.2 PARTICIPATE IN STRUCTURED INFORMATION SHARING ACTIVITIES

Best Practice

The ACSPT ARC identified voluntary participation in structured information sharing activities as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

Trade associations and industry groups voluntarily charter and maintain formal groups, typically known as councils or committees, the sole purpose of which is to provide a venue for participants to exchange safety-related information and practices they have found beneficial in enhancing the safety of their operations.

Many groups within the industry have voluntarily developed forums that provide a venue for participants to exchange ideas and share best practices. These can be industry meetings

(for example, stakeholder groups send representatives to discuss a specific topic), trade organization meetings (for example, members of a trade association form internal committees, each with a specific focus, such as operations, training, or safety), or employee organizations (for example, an employee organization forms internal committees similar to the trade association). ATA and RAA, for example, have formally defined councils that address operations, safety, and training issues internally among their members and externally between the trade organizations. The Air Line Pilots Association, International (ALPA) and the Coalition of Airline Pilots Associations have similarly designed councils and committees.

Members of the air carrier industry understand safety should not be a basis for competition, so safety-related discussions allow for an open exchange of ideas, data, and practices. Typically, the sole purpose of such groups is to allow members to send representatives to meetings and exchange ideas outside the structure of competitive business practices. Group meetings provide an opportunity to share ideas and data on how to improve training for a given maneuver, improve procedures, or improve pilot training in general. These meetings provide opportunities to share, learn, and benchmark in an effort to avoid risk and improve the quality of training.

In addition to the previously mentioned opportunities, industry members have additional formal opportunities for information sharing. For example, FSF unites members from across the international aviation community, including air carriers, business aviation, and individual and corporate members from 150 different countries. These members can provide input on the development of various safety initiatives intended to benefit segments of the aviation community. Members and non-members alike can participate in periodic seminars or similar presentations on safety-related information.

Similarly, ALPA hosts an annual Air Safety Forum (portions of which are open to the public), which typically provides a forum for pilots, air carriers, aviation businesses, and government representatives to share safety information.

Industry members have other meeting opportunities to share data and ideas beyond the committee and association structures defined above. Some of those meeting opportunities are highlighted elsewhere in this report. Others include—

- ASIAS. The air carrier industry enables the analysis and tracking of accident precursors, as well as identification and tracking of newly identified operational risks. Directed studies, benchmarking capabilities, and CAST metrics are among the benefits of participation.

- Technical operations and training groups, including the Operations Specifications Working Group, Master Minimum Equipment List Industry Group, and the AQP Working Group.

- International working groups, including the Pacific Operations Working Group, Pacific ATC Coordination Group, IATA (Latin America, Europe, and Asia), ICAO conferences, and the FSF International Air Safety Seminar.

- IATA Safety Trend Evaluation, Analysis & Data Exchange System (STEADES). STEADES provides rates on key safety performance indicators, helping air carriers

benchmark and establish safety performance targets in accordance with ICAO requirements for SMS.

Participation in such meetings and working groups provides the opportunity to share information, improve safety and training programs, and ensure stakeholder participation in the regulatory process, with the ultimate goal of ensuring a safer air carrier industry.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that participation in structured information sharing activities is a common practice among their constituents.

Recommendations, if any, for Legislative or Regulatory Actions[6]

No regulatory action is required.

3.4.3 IMPLEMENT COMMERCIAL AVIATION SAFETY TEAM SAFETY ENHANCEMENTS

Best Practice

The ACSPT ARC identified implementation of applicable CAST safety enhancements as an air carrier industry best practice.

Progress in Identifying this Best Practice in the Air Carrier Industry

When CAST was founded in 1998, it set out to unite aviation stakeholders—including government, industry, and employee groups—to work cooperatively toward achieving the highest levels of safety for global commercial aviation. CAST accomplished its initial goal of reducing the commercial aviation fatality rate in the United States by 80 percent over a 10-year period. The ACSPT ARC recommends all stakeholders establish and maintain awareness of CAST safety enhancements, and implement the enhancements applicable to their air carriers.

CAST has evolved beyond the "forensic" approach of examining past accident data alone, and now focuses on risk prediction and mitigation strategies. Using aviation incident data, CAST can identify emerging safety threats before they result in accidents. For example, CAST derived a program to address wrong runway departures, and CAST recommendations include the installation of cockpit moving map displays and deployment of runway awareness systems.

Progress of Air Carriers and Labor Unions in Implementing this Best Practice

No specific documentation exists about the number of air carriers that have implemented this best practice. It is the consensus of the ACSPT ARC members that implementation of applicable CAST safety enhancements is occurring at several of their constituents. However, the ARC is unaware if this can be considered a common practice among all air carriers.

Recommendations, if any, for Legislative or Regulatory Actions[6]

No regulatory action is required.

APPENDIX A—ARC MEMBERS AND SUPPORTING STAFF

ACSPT ARC MEMBERS AND AFFILIATION

Capt. Warren Christie, *Committee Co-chair*

Capt. Rory Kay, *Committee Co-chair*

Mr. Charles Enders, FAA, *Designated Federal Official*

Air Line Pilots Association, International

Capt. John Rosenberg

Mr. Chris Baum

Air Transport Association of America, Inc.

Capt. Paul Morell

Mr. Chris Broom

CAE SimuFlite

Mr. Gary Morrison

Mr. Steve Hall

The Coalition of Airline Pilots Associations

Capt. Bob Coffman

Capt. John Sabel

Flight Safety Foundation

Mr. Kevin Hiatt

Regional Airline Association

Mr. Scott Foose

ARC SUPPORTING STAFF

Federal Aviation Administration

Ms. Catherine Burnett

Mr. Louis Ebersole

Mr. Robert Frenzel

Ms. Sara Mikolop

PAI Consulting

Ms. Kelly Akhund

Ms. Emily Dziedzic

Ms. Sarah O'Brien

APPENDIX B—ACRONYMS AND ABBREVIATIONS

AC	Advisory Circular
ACSPT	Air Carrier Safety and Pilot Training
ALPA	Air Line Pilots Association, International
AQP	Advanced Qualification Program
ARC	aviation rulemaking committee
ASAP	Aviation Safety Action Program
ASIAS	Aviation Safety Information Analysis and Sharing
ATA	Air Transport Association of America, Inc.
ATC	air traffic control
CAST	Commercial Aviation Safety Team
CFR	Code of Federal Regulations
CIRP	Critical Incident Response Program
CRM	Crew Resource Management
EFB	electronic flight bag
FAA	Federal Aviation Administration
FOQA	Flight Operational Quality Assurance
FRAWG	Flight Risk Analysis Working Group
FRMS	Fatigue Risk Mitigation System
FSF	Flight Safety Foundation
FSTD	flight simulation training device
HIMS	Human Intervention and Motivation Study
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
InFO	Information for Operators
IOSA	International Air Transport Association Operational Safety Audit
LOSA	Line Operations Safety Audit
NASA	National Aeronautics and Space Administration
PRB	pilot review board

PTSD   post-traumatic stress disorder

RAA   Regional Airline Association

SAFO   Safety Alert for Operators

SME   subject matter expert

SMS   safety management system

STEADES   Safety Trend Evaluation, Analysis & Data Exchange System

TEM   Threat and Error Management

U.S.C.   United States Code