



BILLING CODE 4910-13-P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 61, 91, 121, and 135

[Docket No.: FAA-2014-0504; Amdt. Nos.: 61-144; 91-356; 121-382; and 135-142

RIN 2120-AJ87

Pilot Professional Development

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This action amends the requirements primarily applicable to air carriers conducting domestic, flag, and supplemental operations to enhance the professional development of pilots in those operations. This action requires air carriers conducting domestic, flag, and supplemental operations to provide new-hire pilots with an opportunity to observe flight operations and become familiar with procedures before serving as a flightcrew member in operations; to revise the upgrade curriculum; and to provide leadership and command and mentoring training for all pilots in command. This final rule will mitigate incidents of unprofessional pilot behavior and reduce pilot errors that can lead to a catastrophic event.

DATES: Effective April 27, 2020. The compliance date for the requirements in §§ 91.1063(b)(2), 121.419(c) and (g), 121.420, 121.424(b) and (g), 121.426, 121.435, and 135.3(d)(1) is April 27, 2022. The compliance date for the requirements in § 121.429 is April 27, 2023.

ADDRESSES: For information on where to obtain copies of rulemaking documents and other information related to this final rule, see “How To Obtain Additional Information” in the SUPPLEMENTARY INFORMATION section of this document.

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SUPPLEMENTARY INFORMATION:

Contents

I. Executive Summary

II. Authority for this Rulemaking

III. Background

A. Statement of the Problem

B. Related FAA Actions

C. National Transportation Safety Board Recommendations

IV. Discussion of Public Comments and Final Rule

A. General

B. Applicability

C. Effective Date and Compliance Date

D. Operations Familiarization (§ 121.435)

E. PIC Leadership and Command Training

1. General

2. Distance Instruction

F. PIC Mentoring Training

G. SIC to PIC Upgrade (§§ 121.420 and 121.426)

1. Performance-Based Curriculum

2. Revised Upgrade Curriculum Requirements

3. Upgrade Proficiency Check Requirements

4. Effect of Revised Upgrade Curriculum on Recurrent Training

H. Training for Pilots Currently Serving as PIC (§ 121.429)

- I. Recurrent PIC Leadership and Command and Mentoring Training (§§ 121.409(b) and 121.427)
- J. Leadership and Command Training and Mentoring Training for SICs Serving in Operations that Require Three or More Pilots
- K. Pilot Professional Development Committee (proposed § 121.17)
- L. Pilot Recurrent Ground Training Content and Programmed Hours (§ 121.427)
- M. Part 135 Operators and Part 91 Subpart K Program Managers Complying with Part 121, Subparts N and O
- N. Flight Simulation Training Device (FSTD) Conforming Changes
- O. SIC Training and Checking Conforming Changes
- P. Other Conforming and Miscellaneous Changes
- Q. Costs and Benefits
- R. Other Out-of-Scope Comments
- V. Regulatory Notices and Analyses
 - A. Regulatory Evaluation
 - B. Regulatory Flexibility Determination
 - C. International Trade Impact Assessment
 - D. Unfunded Mandates Assessment
 - E. Paperwork Reduction Act
 - F. International Compatibility and Cooperation
 - G. Environmental Analysis
- VI. Executive Order Determinations
 - A. Executive Order 13132, Federalism
 - B. Executive Order 13211, Regulations that Significantly Affect Energy Supply, Distribution, or Use
 - C. Executive Order 13609, Promoting International Regulatory Cooperation
 - D. Executive Order 13771, Reducing Regulation and Controlling Regulatory Costs
- VII. How to Obtain Additional Information
 - A. Rulemaking Documents
 - B. Comments Submitted to the Docket
 - C. Small Business Regulatory Enforcement Fairness Act

List of Abbreviations and Acronyms Frequently Used In This Document

AC Advisory Circular

ACSPT ARC Air Carrier Safety and Pilot Training Aviation Rulemaking Committee

AQP Advanced Qualification Program

ARC Aviation Rulemaking Committee

ATP Airline Transport Pilot

ATP-CTP Airline Transport Pilot Certification Training Program

CFR Code of Federal Regulations

CRM Crew Resource Management

FFS Full Flight Simulator

FSTD Flight Simulation Training Device

FTD Flight Training Device

InFO Information for Operators

LOFT Line-Oriented Flight Training

MLP ARC Flight Crewmember Mentoring, Leadership, and Professional Development
Aviation Rulemaking Committee

NPRM Notice of Proposed Rulemaking

OF Operations Familiarization

PIC Pilot in Command

PDSC Professional Development Steering Committee

PPDC Pilot Professional Development Committee

SAFO Safety Alert for Operators

SIC Second in Command

SOP Standard Operating Procedures

THRR ARC Flightcrew Member Training Hours Requirement Review Aviation
Rulemaking Committee

91K Part 91, subpart K of 14 CFR

I. Executive Summary

On October 7, 2016, the Federal Aviation Administration (FAA) published a notice of proposed rulemaking (NPRM) to propose amendments to requirements for air carriers and pilots operating under part 121 to enhance the professional development of part 121 pilots.¹ The proposed amendments included additional air carrier training for pilots in command (PIC), additional air carrier qualification for newly hired pilots, and a requirement for air carriers to establish and maintain a pilot professional development committee to develop, administer, and oversee formal pilot mentoring programs. The comment period for the NPRM closed on January 5, 2017, and the FAA received 44 unique comments. Only two of the comments opposed the rule, and 22 comments supported the rule without change. Twelve comments supported the rule generally but suggested changes. After review of the comments, the FAA is issuing this final rule, which contains a number of changes from the NPRM, to enhance the professional development of part 121 pilots. Table 1, Summary of Final Rule Provisions, provides additional detail regarding the final rule provisions incorporated into part 121.

Table 1. Summary of Final Rule Provisions

Provision	Summary of NPRM Provision	Major Changes from NPRM
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¹ 81 FR 69908

Provision	Summary of NPRM Provision	Major Changes from NPRM
Operations familiarization for new-hire pilots (§ 121.435)	<ul style="list-style-type: none"> • Operations familiarization must include a minimum of 2 operating cycles. A new-hire pilot completing operations familiarization must occupy the flight deck observer seat. 	<ul style="list-style-type: none"> • Adds requirement that operations familiarization may be completed during or after basic indoctrination training, but must be completed before beginning operating experience.
Upgrade training curriculum requirements (§§ 121.420 and 121.426)	<ul style="list-style-type: none"> • Upgrade ground and flight training requirements have been updated based on the qualification and experience that all upgrading pilots now have as a result of the Pilot Certification and Qualification Requirements for Air Carrier Operations rule requirements. • Leadership and command and mentoring training must be included in the upgrade curriculum. Leadership and command and mentoring training are required subjects for upgrade ground training. Leadership and command training must also be incorporated into flight training through scenario-based training. (Note: For those air carriers that use an initial curriculum to qualify pilots to serve as PICs, leadership and command and mentoring training must be provided as part of that initial curriculum (§§ 121.419 and 121.424)). 	<ul style="list-style-type: none"> • No changes.
Leadership and command and mentoring ground training for pilots currently serving as PIC (§ 121.429)	<ul style="list-style-type: none"> • All pilots currently serving as PIC must complete ground training on leadership and command and mentoring. • The Administrator may credit previous training completed by the pilot at that air carrier. 	<ul style="list-style-type: none"> • Adds limitation that the FAA will only allow credit for previous training completed within 36 calendar months prior to the effective date of the final rule.

Provision	Summary of NPRM Provision	Major Changes from NPRM
<p>Recurrent PIC leadership and command and mentoring training (§§ 121.409(b) and 121.427)</p>	<ul style="list-style-type: none"> • PICs must complete recurrent leadership and command and mentoring ground training every 36 months. • Recurrent Line-Oriented Flight Training (LOFT) must provide an opportunity for PICs to demonstrate leadership and command. 	<ul style="list-style-type: none"> • No changes.
<p>Leadership and command training for SICs serving in an operation that requires 3 or more pilots (§ 121.432)</p>	<ul style="list-style-type: none"> • SICs required to be fully qualified to act as PIC, due to serving in an operation that requires 3 or more pilots, are not required to complete leadership and command and mentoring training. 	<ul style="list-style-type: none"> • Adds requirement for these SICs to complete leadership and command training. (These SICs are not required to complete mentoring training.)
<p>Pilot recurrent ground training content and programmed hours (§ 121.427)</p>	<ul style="list-style-type: none"> • Pilot recurrent ground training has been aligned with the pilot initial ground training requirements for pilots who have completed the Airline Transport Pilot Certification Training Program (ATP-CTP). As a result, the existing content and corresponding programmed hours for recurrent ground training have been reduced. 	<ul style="list-style-type: none"> • No changes.
<p>Part 135 Operators and Part 91 Subpart K Program Managers Complying with Part 121, Subparts N and O (§§ 91.1063 and 135.3)</p>	<ul style="list-style-type: none"> • Part 135 operators and part 91 subpart K (91K) program managers complying with part 121 subparts N and O would continue to use the existing upgrade curriculum requirements and the proposed leadership and command and mentoring training would only apply to PICs serving in operations that use two or more pilots. 	<ul style="list-style-type: none"> • Adds exception for part 135 operators and part 91K program managers, that choose to comply with part 121 subparts N and O, are not required to comply with the operations familiarization required in § 121.435.

Provision	Summary of NPRM Provision	Major Changes from NPRM
<p>Flight Simulation Training Device (FSTD) Conforming Changes (Part 121, subparts N and O and appendices E, F, and H)</p>	<ul style="list-style-type: none"> • Part 121, subparts N and O and appendices E, F, and H are updated as follows: <ol style="list-style-type: none"> (1) Reflect the terminology currently used to identify FSTDs approved for use in part 121 training programs; (2) Remove references to simulation technology that no longer exists; and (3) Remove requirement for FAA certification of training and remove pilot experience prerequisites for using a Level C full flight simulator (FFS) to reflect advances in current FSTD technology. 	<p>No changes.</p>
<p>SIC Training and Checking Conforming Changes (Part 121 appendices E and F)</p>	<ul style="list-style-type: none"> • Part 121 appendices E and F are updated to align with the current 14 CFR 61.71 requirements for SICs to obtain a type rating in a part 121 training program. Initial, conversion, and transition SIC training and checking must include the few training and checking maneuvers and procedures formerly designated in appendices E and F as PIC-only. 	<ul style="list-style-type: none"> • No changes.
<p>Pilot professional development committee (PPDC) (§ 121.17)</p>	<ul style="list-style-type: none"> • Air carriers must establish and maintain a PPDC to develop, administer, and oversee formal pilot mentoring programs. The PPDC must consist of at least one management representative and one pilot representative. The PPDC must meet on a regular basis. The frequency of such meetings would be determined by the air carrier, but must occur at least annually. 	<ul style="list-style-type: none"> • Not adopted in the final rule.

Provision	Summary of NPRM Provision	Major Changes from NPRM
Other Conforming and Miscellaneous Changes	<ul style="list-style-type: none"> • Pilot transition ground training has been aligned with the pilot initial ground training for pilots who have completed the ATP-CTP. • The term used to identify the training provided to flight engineers qualifying as SICs on the same airplane type has been changed from “upgrade” to “conversion.” • Conversion ground training for flight engineers who have completed the ATP-CTP has been aligned with the pilot initial ground training for pilots who have completed the ATP-CTP. • Part 121 appendices E and F and § 121.434 are amended to allow for pictorial means for the training and checking of preflight visual inspections of the exterior and interior of the airplane. 	<ul style="list-style-type: none"> • No changes.

The cost of the rule is attributed to training requirements that will reduce the risk of unprofessional pilot behavior and help avoid situations that can lead to a catastrophic event. The estimated cost of the rule to the impacted entities is \$90.0 million over a 10-year period. When discounted using a 7-percent discount rate, the rule is estimated to result in costs of \$62.2 million over the same period. The rule will also generate cost savings to operators of \$95.5 million over a 10-year period. When discounted using a 7-percent discount rate, the rule will result in savings of \$61.2 million over the same period. The total cost and cost savings are shown in the table below.

Table 2. Comparison of Costs and Cost Savings (Millions of 2016 Dollars)

	Present Value at	Annualized at 7%	Present Value at	Annualized at 3%

	7%		3%	
Total Costs	\$62.17	\$8.29	\$76.25	\$8.24
Total Cost Savings	\$61.22	\$8.16	\$78.32	\$8.46
Net Costs	\$0.94	\$0.13	-\$2.07	-\$0.22

II. Authority for this Rulemaking

The FAA’s authority to issue rules on aviation safety is found in Title 49 of the United States Code. Subtitle I, section 106 describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the FAA’s authority. This rulemaking is promulgated under the general authority described in 49 U.S.C. 106(f) and 44701(a) and the specific authority found in section 206 of Pub. L. 111-216, the Airline Safety and Federal Aviation Administration Extension Act of 2010 (Aug. 1, 2010) (49 U.S.C. 44701 note), which directed the FAA to convene an aviation rulemaking committee (ARC) and conduct a rulemaking proceeding based on the ARC’s recommendations pertaining to mentoring, professional development, and leadership and command training for pilots serving in part 121 operations. Section 206 further required that the FAA include in leadership and command training instruction on compliance with flightcrew member duties under 14 CFR 121.542 (sterile flight deck rule).

III. Background

A. Statement of the Problem

As recognized by the National Transportation Safety Board (NTSB), the overall safety and reliability of the national airspace system demonstrates that most pilots

conduct operations with a high degree of professionalism.² Nevertheless, a problem still exists in the aviation industry with some pilots acting unprofessionally and not adhering to standard operating procedures (“SOP”), including the sterile flight deck rule.³ The NTSB has continued to cite inadequate leadership in the flight deck, pilots’ unprofessional behavior, and pilots’ failure to comply with the sterile flight deck rule as factors in multiple accidents and incidents, including Pinnacle Airlines flight 3701 and Colgan Air⁴, Inc., flight 3407.⁵

On October 14, 2004, a Pinnacle Airlines Bombardier CL-600-2B19, operating as Northwest Airlink flight 3701, crashed into a residential area about 2.5 miles from the Jefferson City Memorial Airport, Jefferson City, Missouri. During the flight, both engines flamed out after a pilot-induced aerodynamic stall and were unable to be restarted. Both pilots were killed, and the airplane was destroyed. The NTSB determined

² See Crash of Pinnacle Airlines Flight 3701, Bombardier CL-600-2B19, N8396A, Jefferson City, Missouri, October 14, 2004, Aircraft Accident Report NTSB/AAR-07/01 (Washington, DC: NTSB, 2007) (hereinafter “Aircraft Accident Report NTSB/AAR-07/01”) available at <https://www.nts.gov/investigations/AccidentReports/Pages/AAR0701.aspx>.

³ See Loss of Control on Approach, Colgan Air, Inc., Operating as Continental Connection Flight 3407, Bombardier DHC-8-400, N200WQ, Clarence Center, New York, February 12, 2009, Aircraft Accident Report NTSB/AAR-10/01 (Washington, DC: NTSB, 2010) (hereinafter “Aircraft Accident Report NTSB/AAR-10/01”) available at <https://www.nts.gov/investigations/AccidentReports/Pages/AAR1001.aspx>.

⁴ Some contributing factors to this accident were also mitigated by the following rules: Flightcrew Member Duty and Rest Requirements (77 FR 330, January 4, 2012, RIN 2120-AJ58) with a 0.5 effective mitigation; Qualification, Service, and Use of Crewmembers and Aircraft Dispatchers (78 FR 67800, November 12, 2013, RIN 2120-AJ00) with a 0.2 effective mitigation; Pilot Certification and Qualification Requirements for Air Carrier Operations (78 FR 42324, July 15, 2013, RIN 2120-AJ67) with a 0.2 effective mitigation; and Safety Management Systems for Domestic, Flag, and Supplemental Operations Certificate Holders (80 FR 1307, January 8, 2015, RIN 2120-AJ86) with a 0.05 effective mitigation.

⁵ More recently, on October 27, 2016 Eastern Airlines flight 3452, a Boeing 737-700, ran off runway 22 during the landing roll at LaGuardia Airport, Flushing, Queens, New York. The NTSB determined the probable cause of this incident was the SIC’s failure to attain the proper touchdown point and the flight crew’s failure to call for a go-around, which resulted in the airplane landing more than halfway down the runway. Contributing to the incident was the PIC’s lack of command authority. See the NTSB Aviation Incident Final Report, Incident Number DCA17IA020, available at https://www.nts.gov/investigations/Pages/2016_queens_ny.aspx. While this incident does not form a basis for the issuance of this rule, it illustrates that leadership and command training remains an important component of an effective pilot training program.

the probable causes of this accident were (1) the pilots' unprofessional behavior, deviation from SOP, and poor airmanship, which resulted in an in-flight emergency from which the pilots were unable to recover, in part because of their inadequate training; (2) the pilots' failure to prepare for an emergency landing in a timely manner; and (3) the pilots' improper management of the double engine failure checklist.

The NTSB noted that at the time of the accident, Pinnacle Airlines provided 2 hours of leadership training during second in command (SIC) to pilot in command (PIC) upgrade training with topics covering leadership authority, responsibility, and leadership styles. The NTSB also noted that after the accident and as a result of a high initial failure rate for pilots upgrading to PIC (22% failure rate in July 2004), Pinnacle revised the leadership training to 8 hours with modules on leadership, authority, and responsibility; briefing and debriefing scenarios; decision-making processes, including those during an emergency; dry run line-oriented flight training scenarios; and risk management and resource utilization. In October 2006, Pinnacle reported to the NTSB that the pass rate for pilots upgrading to PIC had improved to 92% first attempt and 95% overall.

On the evening of February 12, 2009, a Colgan Air, Inc., Bombardier DHC-8-400, operating as Continental Connection flight 3407, was on approach to Buffalo-Niagara International Airport, Buffalo, New York, when it crashed into a residence in Clarence Center, New York, about five nautical miles northeast of the airport. The two pilots, two flight attendants, all 45 passengers aboard the airplane, and one person on the ground were killed, and the airplane was destroyed by impact forces and a post-crash fire. The NTSB determined that the probable cause of this accident was the PIC's inappropriate response to the stall warning which eventually led to a stall from which the

airplane did not recover. Contributing to the accident were (1) the pilots' failure to monitor airspeed; (2) the pilots' failure to adhere to sterile flight deck procedures; (3) the PIC's failure to effectively manage the flight; and (4) Colgan Air's inadequate procedures for airspeed selection and management during approaches in icing conditions.

The NTSB noted that at the time of the accident the Colgan Air crew resource management (CRM) training was consistent with Advisory Circular (AC) 120-51E, Crew Resource Management Training and addressed command, leadership and leadership styles, communication, and decision-making. The NTSB also noted that the Colgan Air SIC to PIC upgrade training included a one-day course on leadership; however, the training focused on the administrative duties associated with becoming a PIC and did not contain significant content applicable to developing leadership skills, management oversight, and command authority. The NTSB concluded that specific leadership training for pilots upgrading to PIC would help standardize and reinforce the critical command authority skills needed by a PIC during air carrier operations.

The Airline Safety and Federal Aviation Administration Extension Act of 2010 (Pub. L. 111-216), enacted August 1, 2010, includes a number of requirements to convene advisory groups and conduct rulemakings related to the results of the NTSB investigation of the Colgan Air accident. Section 206 directs the FAA to convene an ARC to develop procedures for each part 121 air carrier pertaining to mentoring, professional development, and leadership and command training for pilots serving in part 121 operations and to issue an NPRM and final rule based on the ARC recommendations.

In accordance with sections 204, 206, and 209 of Pub. L. 111-216, the FAA chartered the Air Carrier Safety and Pilot Training (ACSPT) ARC, the Flight Crewmember Mentoring, Leadership, and Professional Development (MLP) ARC and the Flightcrew Member Training Hours Requirement Review (THRR) ARC, respectively, in September 2010. The MLP ARC provided recommendations in November 2010. At the same time as the MLP ARC worked to develop its recommendations, a number of related rulemakings required by Pub. L. 111-216 were already underway, including the Pilot Certification and Qualification Requirements for Air Carrier Operations rulemaking and the Qualification, Service, and Use of Crewmembers and Aircraft Dispatchers rulemaking.

This final rule is the culmination of the FAA's analysis of (1) the rulemaking requirements of section 206 of Pub. L. 111-216; (2) the recommendations provided by the MLP ARC, the THRR ARC, and the ACSPT ARC; (3) the part 121 pilot qualification and experience requirements provided in the Pilot Certification and Qualification Requirements for Air Carrier Operations final rule (78 FR 42324, July 15, 2013)⁶; (4) the Qualification, Service, and Use of Crewmembers and Aircraft Dispatchers final rule (78 FR 67800, November 12, 2013);⁷ (5) the current part 121 PIC role and responsibilities; and (6) the comments received in response to the NPRM. This final rule furthers the FAA's safety mission, satisfies the requirement for rulemaking in section 206 of Pub. L. 111-216, and accounts for the recent changes to pilot certification and qualifications to serve as a PIC in part 121 operations. The FAA has determined that this final rule can be

⁶ RIN 2120-AJ67

⁷ RIN 2120-AJ00

effectively implemented by air carriers and will reduce the risk of unprofessional pilot behavior and help avoid situations that can lead to a catastrophic event.⁸

B. Related FAA Actions

To promote pilot professionalism and standardization, the FAA has taken a number of actions through rulemakings and guidance. The FAA first issued the sterile flight deck rule (§ 121.542) to prohibit the performance of nonessential duties by flightcrew members during critical phases of flight, including all ground operations involving taxi, take-off and landing, and other flight operations conducted below 10,000 feet, except cruise flight (46 FR 5500, January 19, 1981). On February 12, 2014, the FAA amended the sterile flight deck rule to prohibit flightcrew members from using a personal wireless communications device or laptop computer for personal use while at their duty station while the aircraft is being operated (Prohibition on Personal Use of Electronic Devices on the Flight Deck final rule, 79 FR 8257).⁹

On January 10, 2017, the FAA issued revised AC 120-71B, Standard Operating Procedures and Pilot Monitoring Duties for Flight Deck Crewmembers, which stresses that safety in commercial operations depends on good crew performance founded on

⁸ The FAA notes that section 206 of Pub. L. 111-216 references both “flight crewmembers” and “pilots.” Section 201 of Pub. L. 111-216 states, “The term ‘flight crewmember’ has the meaning given the term ‘flightcrew member’ in part 1 of title 14, Code of Federal Regulations.” Part 1 defines “flightcrew member” as “a pilot, flight engineer, or flight navigator assigned to duty in an aircraft during flight time.” However, because section 206 uses the terms “flight crewmember” and “pilot” interchangeably, the FAA assumes that Congress intended the rulemaking requirements of this section to apply to pilots only. Further, because no accidents have been attributed to flight engineer performance and the FAA has not identified any issues related to flight engineer training or professionalism, this final rule applies to pilots only.

⁹ RIN 2120-AJ17

clear, comprehensive, and readily available SOP.¹⁰ The AC provides guidance for the design, development, implementation, evaluation, and updating of SOP, as well as guidance for training of pilot monitoring duties and integration of pilot monitoring duties into SOP.

In response to NTSB Safety Recommendation A-06-7, the FAA issued Safety Alert for Operators (SAFO) 06004 on April 28, 2006, to emphasize the importance of sterile flight deck discipline and fatigue countermeasures, especially during approach and landing.¹¹

On July 3, 2007, the FAA issued Safety Alert for Operators (SAFO) 07006, to address procedural intentional non-compliance (PINC) because multiple accidents revealed pilots not adhering to established procedures and airplane limitations when conducting positioning flights.¹²

On April 26, 2010, the FAA issued Information for Operators (InFO) 10003, to address flight deck distractions because recent incidents and accidents revealed pilots

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http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1030486

¹¹

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo/all_safos/media/2006/safo06004.pdf

¹²Positioning flights include nonrevenue flights, flights to pick up passengers, and ferry flights for maintenance. See

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo/all_safos/media/2007/SAFO07006.pdf.

using laptop computers and mobile telephones for personal activities unrelated to the duties and responsibilities required for conduct of a safe flight.¹³

To address the significance of human performance factors such as communication, decision-making, and leadership, the FAA issued the Air Carrier and Commercial Operator Training Programs final rule requiring crew resource management (CRM) training for flightcrew members and flight attendants as well as dispatcher resource management (DRM) training for aircraft dispatchers (60 FR 65940, December 20, 1995).¹⁴ The FAA also published AC 120-51B Crew Resource Management Training and AC 121-32 Dispatch Resource Management Training to provide guidance on establishing CRM and DRM training under the broad requirement established by the final rule. The current version, AC 120-51E,¹⁵ stresses that CRM training should focus on the functioning of crewmembers as teams and should include all operational personnel. During the time since publication of the CRM final rule, the agency has revised AC 120-51 three times to address evolving research and concepts of CRM.

The FAA recognizes the need to continue to review air carrier training and qualification regulations, policies, and guidance to ensure they are current and relevant and address new technology and research. Therefore, in January 2014, the FAA chartered the Air Carrier Training ARC to provide a forum for the U.S. aviation community to

¹³

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/info/all_infos/media/2010/info10003.pdf

¹⁴ RIN 2120-AC79

¹⁵

http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/22879

continue to discuss, prioritize, and provide recommendations to the FAA concerning air carrier training.

C. National Transportation Safety Board Recommendations

This final rule addresses the following NTSB recommendations from Aircraft Accident Report NTSB/AAR-07/01 and Aircraft Accident Report NTSB/AAR-10/01 for air carriers operating under part 121:

- A-07-6: Require regional air carriers operating under 14 CFR part 121 to provide specific guidance on expectations for professional conduct to pilots who operate nonrevenue flights.
- A-10-13: Issue an advisory circular with guidance on leadership training for upgrading captains at 14 CFR part 121, 135, and 91K operators, including methods and techniques for effective leadership; professional standards of conduct; strategies for briefing and debriefing; reinforcement and correction skills; and other knowledge, skills, and abilities that are critical for air carrier operations.¹⁶
- A-10-14: Require all 14 CFR part 121, 135, and 91K operators to provide a specific course on leadership training to their upgrading captains that is consistent with the advisory circular requested in Safety Recommendation A-10-13.

¹⁶ “Captain” is an industry term that refers to the PIC.

IV. Discussion of Public Comments and Final Rule

A. General

Airbus, the Air Line Pilots Association (ALPA), NetJets Aviation (NetJets), and 16 individuals generally agreed with the proposal. Airlines for America (A4A) generally supported the proposal but provided comments on and suggested changes to specific provisions, which are discussed in more detail in the section-by-section analysis below. The International Air Transport Association generally agreed with the comments submitted by A4A except for the comments related to training of SICs serving in augmented operations, stating that A4A's position is inconsistent with existing European requirements.

The NTSB largely concurred with the overall intent of the proposal. However, the NTSB noted that neither the proposed rule nor the draft AC Leadership and Command Training for Pilots in Command addresses the content or intent of NTSB Safety Recommendation A-10-15, which recommended the development and distribution of multimedia guidance materials.¹⁷

At this time, the FAA is not developing and distributing new multimedia guidance materials on professionalism in aircraft operations. As explained in the NPRM, a prerequisite eligibility requirement for an airline transport pilot (ATP) certificate is the completion of an airline transport pilot certification training program (ATP-CTP). The

¹⁷ NTSB Recommendation A-10-15: Develop and distribute to all pilots, multimedia guidance materials on professionalism in aircraft operations that contain standards of performance for professionalism; best practices for sterile cockpit adherence; techniques for assessing and correcting pilot deviations; examples and scenarios; and a detailed review of accidents involving breakdowns in sterile cockpit and other procedures, including the Colgan Air, Inc. flight 3407 accident. Obtain the input of operators and air carrier and general aviation pilot groups in the development and distribution of these guidance materials.

ATP-CTP provides foundational knowledge in many subject areas, including professionalism. In addition to the draft ACs published in the docket, the FAA previously published AC 61-138 Airline Transport Pilot Certification Training Program. These ACs all contain references to other useful documents for the development of training. Additionally, the FAA posted these ACs for public comment and considered those comments before final publication. Therefore, the FAA believes the intent of NTSB recommendation A-10-15 has been met and that sufficient resources are already available for training on these topics. The FAA has removed NTSB recommendation A-10-15 from preamble section III.C. discussing the NTSB recommendations.

Jet Blue Airways (Jet Blue) commented that there is great value in promoting leadership, command, and mentoring training for all air carrier pilots. However, Jet Blue stated that the proposal failed to recognize other qualitative advancements such as the Advanced Qualification Program (AQP), the utilization of advanced simulation opportunities, and alternative vehicles to obtain command and leadership knowledge through operational experience. Jet Blue strongly recommended that rather than directing additional resources toward implementing regulations that duplicate existing programs and efforts, the FAA re-direct its efforts toward developing guidance for inclusion within existing AQPs and other approved programs.

As described in the NPRM, the proposal was responsive to a statutory requirement for the FAA to convene an ARC to develop procedures for air carriers pertaining to pilot mentoring, professional development, and leadership and command training and to issue an NPRM and final rule based on those recommendations. Therefore, Jet Blue's recommendation would not be consistent with the statutory

requirement. However, the FAA proposed to allow credit toward all or part of the requirements for leadership and command and mentoring training previously completed by a PIC at that air carrier. The FAA is maintaining this allowance, with modification, in the final rule. Since each air carrier's training program is unique, the FAA will evaluate each specific request for credit, including the supporting documentation, to determine if the previously provided training meets the intent of some or all of the leadership and command and mentoring training.

The Aviation Accreditation Board International (AABI) recommended that the FAA reconsider adopting the MLP ARC recommendation for including professionalism and mentoring as required subjects for new-hire pilot indoctrination training. A4A and American Airlines (American) agreed that amendments to basic indoctrination training are not needed and are appropriately addressed by recent regulatory changes.

ALPA stated that guidance should exist ensuring new hire training includes exposure to the operations of other airline departments such as dispatch, maintenance, and scheduling. ALPA stated that for leadership and command training to be effective in the flight deck, new-hires must receive training on their role in the context of the leadership and command training that PICs receive.

The FAA is not making any amendments to basic indoctrination training. As explained in the NPRM, ATP applicants must complete an ATP-CTP, which provides the foundational knowledge in several subject areas including leadership and command and professional development. The recommendation that new-hire training should include exposure to the operations of other airline departments such as dispatch, maintenance,

and scheduling is outside the scope of this rulemaking. The FAA expects each individual air carrier will determine if exposure to other airline departments is beneficial to its operation.

An individual commenter did not agree that air carriers should have to train crewmembers on professionalism and safety because this individual believed these skills should be taught before the pilot applies for an air carrier. Another individual did not agree that pilots need to be trained on how to be more professional. One individual identified as a college student opined that this proposal could be seen as an unnecessary mandate in an already extensive training curriculum. In contrast, an individual identified as an associate college professor stated that the proposal could be successful in inculcating and reinforcing the highest standards of technical performance, airmanship, and professionalism. Another individual wrote that the proposal would result in safety benefits and address the NTSB recommendations and statutory requirement for rulemaking.

As described in the NPRM, most pilots conduct operations with a high degree of professionalism. However, the NTSB has continued to cite inadequate leadership in the flight deck, pilots' unprofessional behavior, and pilots' failure to comply with the sterile flight deck rule as factors in multiple accidents and incidents. The FAA concurs with the NTSB recommendation to require leadership training for air carrier pilots and has concluded that the proposed training is warranted. With regard to a comment that the proposal should be focused on interpersonal skills and attitude management training, the FAA notes that the AC PIC Leadership and Command Training and AC 120-51 Crew Resource Management Training address these topics.

One individual commented that there should be a shorter version of training for senior pilots and that pilots from this pool can be chosen to help conduct the additional training. The FAA does not agree that there should be a shorter version of the training for senior pilots. As discussed further below, the FAA will allow credit toward all or part of the requirements for initial leadership and command and mentoring training previously completed by a PIC at that air carrier. In general, this credit will allow more senior pilots to more quickly meet new initial training requirements.

B. Applicability

In the NPRM, the FAA stated that the proposal would affect certificate holders that train and qualify pilots in accordance with part 121, including air carriers that train and qualify pilots in accordance with the provisions of current subparts N and O or under an AQP in accordance with subpart Y of part 121. Additionally, the FAA explained that the proposal affects some certificate holders conducting part 135 commuter operations¹⁸ and part 91K program managers or part 135 operators authorized to voluntarily comply with subparts N and O of part 121.

The NTSB commented that the FAA should consider expanding the scope to include additional part 135 and 91K operators. An individual identified as a private pilot suggested the proposal would be more relevant to smaller carriers, particularly part 135 carriers.

¹⁸ In accordance with 14 CFR 135.3, a certificate holder that conducts commuter operations under part 135 with airplanes in which two pilots are required by the type certification rules must comply with subparts N and O of part 121 instead of the requirements of subparts E, G, and H of part 135.

The recommendation to include additional part 135 operators and 91K program managers would exceed the scope of this rulemaking. Therefore, applicability of the final rule is as proposed.

C. Effective Date and Compliance Date

In the NPRM the FAA proposed an effective date of 60 days after publication of a final rule in the Federal Register. However, the FAA proposed a delayed compliance date of 24 months after the effective date for the proposals pertaining to operations familiarization, leadership and command training, mentoring training, the revised upgrade curriculum, and the Pilot Professional Development Committee.

A4A and American recommended a delayed compliance date of 36 months, and UPS Airlines (UPS) recommended a delayed compliance date of 48 months after the effective date for the leadership and command and mentoring training for current PICs proposed in § 121.429. A4A and American stated that training modules will need to be developed and approved, instructors trained, and committees formed within the proposed 24-month timeframe. UPS stated that it would require 24 months for training modules to be developed and approved. A4A and UPS noted that there may be several thousand PICs who will require training, which can be completed only after courseware is approved and the trainers trained. American stated that it will have over six thousand pilots who must complete training. UPS also identified other recently mandated training requirements (e.g., upset recovery) under development in part 121 operations.

The FAA concurs with the recommendation to extend the compliance date to 36 months for the leadership and command and mentoring ground training for current PICs.

As indicated by commenters, there are several thousand PICs who must complete the training by the compliance date. Additionally, the FAA understands that carriers are in various stages of compliance with training all pilots in accordance with the enhanced pilot training requirements of the Qualification, Service, and Use of Crewmembers and Aircraft Dispatchers final rule.

The FAA agrees that extending the compliance date by 12 months will provide sufficient time for carriers to develop the training, have the training approved by the FAA, train the instructors, and then complete training of all the current PICs. Further, a 36-month timeframe is consistent with the recurrent training frequency for these topics.

The compliance date for the other proposals pertaining to operations familiarization, leadership and command training, mentoring training, and the revised upgrade curriculum remains 24 months after the effective date. The effective date remains 60 days after publication in the Federal Register.

D. Operations Familiarization (§ 121.435)

The FAA proposed to require newly hired pilots to complete operations familiarization (OF) before beginning operating experience and serving as a pilot in part 121 operations for the air carrier. A newly hired pilot is a person who has no previous experience with the air carrier.¹⁹ The FAA proposed that the OF must include at least two operating cycles²⁰ during part 121 operations conducted by the air carrier while the newly

¹⁹ The FAA clarifies that a person completing conversion training after serving as a flight engineer for the air carrier is not a “newly hired pilot.” This person is completing training to serve in a new flightcrew member duty position but is not “newly hired” by the air carrier.

²⁰ Section 121.431(b) defines operating cycle as “a complete flight segment consisting of a takeoff, climb, enroute portion, descent, and a landing.”

hired pilot occupies the flight deck observer seat and uses a headset to listen to the communications between the required flightcrew members and air traffic control. The FAA proposed that the OF may occur in any airplane type operated by the air carrier in part 121 operations. In recognition that certain airplanes used in part 121 operations do not have an observer seat in the flight deck, the FAA proposed a process for an air carrier to request a deviation from the OF requirements to meet the learning objectives through another means.

A4A, AABI, American, Jet Blue, the NTSB, one individual identified as an associate college professor, and several individuals identified as college students or pilots agreed with the proposed OF. The individuals believed the OF would provide benefits such as allowing new-hires to observe SOP and real life situations.

A4A, American, and Jet Blue agreed with a minimum of two cycles. However, the NTSB believed the minimum number of operating cycles should be increased to provide the new-hire pilot with an increased opportunity to observe different operational events and crew interactions.

A4A, American, and Jet Blue agreed that that the OF can be performed in any aircraft because the processes on all fleet types are similar. However, ALPA stated that OF should be required in the aircraft type the new-hire will be scheduled to fly to enhance the benefits of the experience.

The NTSB believed some consideration should be given to the minimum experience of the crew being observed to provide increased value of the observational opportunity to new-hire pilots.

As explained in the NPRM, the objective of OF is to provide the pilot an introduction to an air carrier's operations and company procedures. Therefore, the FAA expects that this objective can be met with a minimum of two operating cycles on any airplane type operated by the air carrier in part 121 operations. The FAA also trusts that the objective of OF can be met by observation of any crew at that air carrier because all crews conducting line operations must have satisfactorily met the training and qualification standards at that air carrier. The FAA also expects that all air carrier crews follow the air carrier's SOP and conduct operations professionally regardless of whether or not they are being observed. Additionally, as explained in the NPRM, the FAA has determined this final rule will mitigate unprofessional pilot behavior.

AABI recommended that proposed § 121.432 specify that the OF should occur during or after basic indoctrination training and before operating experience. Jet Blue requested clarification in the final rule that OF can occur at any time prior to commencement of operating experience to include any point before or after aircraft qualification is obtained.

As described in the NPRM, the FAA expects OF to be completed during or soon after the completion of basic indoctrination training. The FAA did not intend that OF could be completed by college students or other pilots who are not newly hired pilots at that air carrier. The FAA is clarifying the OF requirements in a new § 121.435 to provide flexibility for OF to be completed during or after basic indoctrination training, but before beginning operating experience.

E. PIC Leadership and Command Training

1. General

In the NPRM, the FAA proposed to require all PICs serving in part 121 operations to complete leadership and command training. Specifically, the FAA proposed that this training be included during ground and flight training in the PIC upgrade curriculum (or the initial curriculum for the limited circumstance of a new-hire PIC), as well as the PIC recurrent curriculum. The FAA further proposed that all pilots qualified to serve as PIC prior to the compliance date must complete the PIC upgrade ground training on leadership and command.

The NTSB stated that the proposals for leadership training “would likely satisfy the intent” of NTSB recommendations A-10-13 and A-10-14 as they related to part 121 operations. The NTSB strongly supported the proposed requirements for leadership and command training to be included in PIC upgrade ground and flight training, as well as the proposed requirement for all current PICs to complete leadership and command training and for the training to be included in the recurrent curriculum. The NTSB also strongly supported the emphasis on scenario-based instruction during ground and flight training.

AABI and one individual generally agreed with leadership and command training for all PICs. One individual identified as a college student stated that leadership and command training conducted before future PICs enter the real flight crew environment could result in fewer accidents based on pilot decision-making errors.

A4A and American agreed that the proposal for leadership and command training should not be overly prescriptive. UPS supported the FAA's position in not requiring the leadership and command training to be separate from the upgrade syllabus.

Jet Blue strongly recommended that the FAA allow each carrier to develop leadership and command training within the existing framework of their approved training programs. Jet Blue also stated that final determination of the curriculum scope, form, and content should remain with management as approved by the FAA.

A4A and American suggested that leadership and command training for pilots upgrading from SIC to PIC should be completed "on or around the time of upgrade" instead of being required to be included in the upgrade curriculum. A4A, American, and UPS noted that under an AQP there may be a few items that are accomplished a short time after PIC upgrade/assignment in order to review and discuss lessons learned during some of the first flights as PIC.

As explained in the NPRM, the purpose of leadership and command training is to provide PICs with the leadership and command skills necessary to manage the crew (including flight attendants, if applicable), communications, workload, and decision-making in a manner that promotes professionalism and adherence to SOP. Therefore, the FAA maintains that this training must be included in the upgrade curriculum prior to a pilot serving as a PIC. However, the FAA notes that in accordance with part 121 subpart Y, air carriers using an AQP may submit for FAA approval an upgrade curriculum that includes an alternative method to conduct leadership and command training that provides an equivalent level of safety.

Ameristar believed that leadership and command training should only be required during initial PIC and upgrade training.

As explained in the NPRM, the purpose of recurrent training is to ensure that flightcrew members remain competent in the performance of their assigned duties. Therefore, the FAA maintains that recurrent leadership and command training is necessary to ensure PICs remain competent in the performance of their duties. Additionally, Pub. L. 111-216 specifically directed that recurrent training for PICs include leadership and command training.

Ameristar believed CRM and leadership training are closely tied together. Ameristar suggested that rather than having two or more regulations added, leadership and command training should be combined with CRM in § 121.404.

As described in the NPRM, the FAA agrees that leadership and command and CRM are related “soft skills.” To ensure leadership and command training is included in ground training and flight training for all appropriate curriculums, the structure of part 121 subpart N requires leadership and command training requirements to be included in multiple regulations. Therefore, the FAA does not agree that leadership and command training should be combined with CRM in § 121.404. However, the FAA agrees that leadership and command and CRM are closely related and notes that that some carriers may choose to comply with this rule by including robust leadership and command training in their CRM curricula.

Ameristar also commented that proposed §§ 121.419(c), 121.420(a)(3) and 121.427(d)(1) should not include references to § 121.542, which addresses activities that

may interfere with flight crewmember duties. Ameristar believed the inclusion of § 121.542 implies that leadership and command are only geared or weighted toward that regulation, lowering the perceived importance of other regulations. The FAA confirms that leadership and command training is not geared toward or weighted toward only § 121.542, and the reference to § 121.542 in §§ 121.419(c)(1), 121.420(b)(1) and 121.427(d)(1) results from Pub. L. 111-216, which specifically directed PIC leadership and command training to include instruction on compliance with § 121.542.

AABI recommended that the final rule state that facilitation is the preferred method for leadership and command ground training.

As described in the draft AC Leadership and Command Training for Pilots in Command published in the docket, the FAA agrees that an instructor-led facilitated discussion is an important component of leadership and command ground training. Therefore, as further explained in the section regarding PIC Leadership and Command Training – Distance Instruction, the FAA is revising proposed §§ 121.419(c)(1), 121.420(a)(3) (now, 121.420(b)(1)), and 121.427(d)(1) to specifically require facilitated discussion during leadership and command ground training.

ALPA and the NTSB encouraged minimum qualification, pilot line experience, and training requirements for the instructors who conduct leadership and command training.

The FAA does not agree that the final rule should include specific training or qualification requirements for instructors who conduct leadership and command training. Air carriers are required to provide properly qualified ground instructors to conduct the

training required by part 121 subpart N. *See* § 121.401(a)(2). Additionally, air carriers are required to provide comprehensive training of flight instructors. *See* § 121.414. Further, in accordance with § 121.401(a)(1), air carriers are required to have a training program that ensures each flight instructor is adequately trained to perform the assigned duties. Therefore, the FAA expects that each air carrier can best determine the training and qualifications necessary for its instructors to effectively conduct training under the carrier's program. However, in the associated AC Leadership and Command Training for Pilots in Command accompanying this final rule, the FAA will include suggested training topics for instructors who will conduct leadership and command training.

ALPA stated that for leadership and command training to be effective in the flight deck, new-hires must receive training on their role in the context of the leadership and command training that PICs receive.

The FAA does not agree that it is necessary to include a specific requirement for new-hires to receive training in the context of the leadership and command training that PICs receive. As explained in the NPRM, a prerequisite eligibility requirement for an ATP certificate is the completion of an ATP-CTP. The ATP-CTP provides foundational knowledge in many subject areas, including leadership and command. Additionally, basic indoctrination training is currently required to include duties and responsibilities of crewmembers and applicable portions of the carrier's manual. *See* § 121.415(a)(1). Therefore, the FAA has determined the combination of the ATP-CTP and the basic indoctrination training at the air carrier sufficiently encompasses training on leadership and command for new-hires.

ALPA contended that grading pilots based upon soft skills such as leadership and command would pose issues as pilots and their instructors come from diverse backgrounds and experiences. Therefore, ALPA stated that pass/fail grading should not be based solely on leadership and command skills unless clear, unambiguous, objective, measurable standards exist at that airline for those skills.

The FAA did not propose to evaluate leadership and command skills during a proficiency check. In accordance with § 121.401, air carriers are required to have a training program that ensures each PIC is adequately trained to perform the assigned duties. The FAA expects that air carriers will use their current processes to develop the necessary method(s) to ensure that PICs are adequately trained in leadership and command skills. The FAA will include suggested training topics in the AC Leadership and Command Training for Pilots in Command, accompanying this final rule.

2. Distance Instruction

In the NPRM, the FAA did not propose placing restrictions on distance instruction as long as the leadership and command training objectives could be satisfied. However, the FAA sought comment on whether restrictions on distance instruction are necessary to ensure the effectiveness of the leadership and command components of PIC training. The FAA also sought comment on whether the curriculum in which leadership and command training is required (e.g., PIC initial, upgrade, recurrent) constitutes a basis for differentiating any restrictions on distance instruction.

A4A, AABI, American, Jet Blue, and UPS agreed that there should not be restrictions on distance instruction. A4A, American, Jet Blue, and UPS stated that the

types and methods of training used by air carriers continue to evolve with additional software and hardware improvements. They also stated that the evolution in technology coupled with the goals of the specific training and the level/type of pilot experience at a specific airline will dictate the appropriate training format.

NetJets concurred that a major portion of the leadership and command ground instruction modules can be accomplished via distance instruction. However, NetJets believed that the decision-making exercises and discussions of positive and negative learning experiences need to be accomplished in facilitated instructor-led training sessions.

ALPA recommended limiting the leadership and command ground training administered through distance instruction methods to 50% of the total training. ALPA believed that leadership and command training would be far more effective in a classroom setting and should have an active, vibrant, hands-on training process with appropriate role-playing scenarios and having facilitated group discussions.

The NTSB believed that because of the importance of this training and its inherently interpersonal topic that the training should only be done in-person through facilitated discussion and interaction. An individual identified as an associate college professor stated that limitations on distance instruction are necessary to guarantee the success of the leadership and command training.

As described in the draft AC Leadership and Command Training for Pilots in Command published in the docket, the FAA agrees that an instructor-led facilitated discussion including practical decision-making exercises and discussion of positive and

negative leadership experiences is an important component of leadership and command ground training. The FAA has determined that a facilitated discussion can be accomplished with existing technology. With current technology, there are various systems that can be used for distance instruction: from simple presentations reviewed individually by a student to fully interactive video conferencing with instructors and students in multiple locations. There are several universities that have developed the necessary technology for students to effectively complete entire degree programs using distance instruction. However, not all distance instruction systems would be effective in conducting a facilitated discussion and meet the objectives of the leadership and command ground training. Additionally, as noted by commenters, technology continues to evolve. Therefore, the FAA does not want to impose unnecessary restrictions on the use of evolving technology which could provide enhanced capabilities in the future. Thus, the final rule does not restrict the use of distance instruction for leadership and command ground training. However, to ensure the objectives of the training are met, the FAA is specifically requiring facilitated discussion during leadership and command ground training in §§ 121.419(c), 121.420(b), and 121.427(d)(1).

F. PIC Mentoring Training

In the NPRM, the FAA proposed to require training on mentoring skills for all PICs serving in part 121 operations to establish the mentoring environment recommended by the MLP ARC. The proposed mentoring training would include techniques for instilling and reinforcing the highest standards of technical performance, airmanship, and professionalism in newly hired pilots. The FAA proposed that this training would be included in the PIC upgrade curriculum (or the initial curriculum for the limited

circumstance of a new-hire PIC) and PIC recurrent ground training. The FAA further proposed that all pilots qualified to serve as PIC prior to the compliance date must complete the PIC upgrade ground training on mentoring skills to create a comprehensive and consistent mentoring environment.

AABI, the NTSB, and one individual generally agreed with the mentoring training for all PICs. Jet Blue stated it has had a mentoring program for all new hire pilots for several years and further believed that all PICs should undergo formal training in mentoring skills.

ALPA encouraged minimum qualification, pilot line experience, and training required for instructors who conduct mentoring training.

The FAA does not agree that the final rule should include specific training or qualification requirements for instructors who will conduct mentoring training. As discussed earlier, the FAA expects that each air carrier can best determine the training and qualifications necessary for their ground instructors to effectively conduct training under the carrier's program. However, in the associated AC Air Carrier Pilot Mentoring, the FAA will include suggested training topics for instructors who conduct mentoring training.

ALPA asserted that for PIC mentoring training to be effective, new-hires must also receive training on the role of mentoring and what is expected of them.

The FAA does not agree that a specific requirement for new-hires to receive training on the role of mentoring is necessary. As discussed earlier, the FAA has

determined the combination of the ATP-CTP and the basic indoctrination training at the air carrier sufficiently incorporates any necessary training on mentoring for new-hires.

ALPA stated that pass/fail grading should not be based solely on mentoring skills unless clear, unambiguous, objective, measurable standards exist at that airline for those skills.

As discussed earlier, the FAA expects that air carriers will use their current processes to develop the necessary method(s) to ensure that PICs are adequately trained in mentoring skills. The FAA will include suggested training topics in the AC Air Carrier Pilot Mentoring, accompanying this final rule.

ALPA recommended limiting the mentoring ground training administered through distance instruction methods to 25% of the total training. ALPA stated that PIC mentoring training must use group discussion and interactive role-playing scenarios, actual examples of effective and ineffective mentoring, and the incorporation of CRM. AABI recommended that the final rule should state that facilitation is the preferred method for mentoring ground training.

As described in the draft AC Air Carrier Pilot Mentoring published in the docket, the FAA agrees that role-playing exercises are an important component of mentoring training. The FAA also agrees that a facilitated discussion is the most appropriate method to conduct the role-playing exercises. However, as further explained in the section regarding PIC Leadership and Command Training – Distance Instruction, the FAA believes that a facilitated discussion can be accomplished with existing technology. Additionally, the FAA does not want to impose unnecessary restrictions on the use of

evolving technology which could provide enhanced capabilities in the future. Thus, the final rule does not restrict the use of distance instruction for mentoring training.

However, to ensure the objectives of the training are met the FAA is specifically requiring facilitated discussion during mentoring ground training in §§ 121.419(c), 121.420, and 121.427(d)(1).

ALPA further suggested including a definition of long-term mentoring. ALPA also suggested that mentor programs should have clearly defined boundaries, rules, and understandings between the mentor and protégé.

As described in the NPRM, the FAA did not propose long term mentoring as recommended by the MLP ARC. Therefore, the FAA is not including a definition of long-term mentoring.

G. SIC to PIC Upgrade (§§ 121.420 and 121.426)

In the NPRM, the FAA proposed to revise upgrade training requirements to account for the evolution in SIC qualification and experience requirements. *See* 81 FR at 69919. The proposed upgrade training would ensure technical knowledge and skills while focusing on the decision-making and leadership skills required of a PIC serving in part 121 operations.

Ameristar suggested the following text be added: “completed initial SIC training and has served as SIC” or similar language to avoid potential confusion in proposed § 121.400.

The FAA does not agree with the suggested revision to the definition of upgrade training in § 121.400 and is adopting the language as proposed. A pilot that has only completed initial PIC training is not eligible to complete SIC operating experience or serve as an SIC. A person cannot serve as an SIC unless that person has satisfactorily completed for that type airplane and SIC crewmember position, approved ground and flight training, a proficiency check, operating experience, and consolidation of knowledge and skills. *See* §§ 121.433, 121.434, and 121.441. Therefore, as proposed, a pilot is only eligible for upgrade training if the pilot has qualified and served as an SIC on that type airplane.

1. Performance-Based Curriculum

The FAA proposed a performance-based upgrade curriculum. The proposal removed the requirement to include all existing upgrade ground training subjects required by § 121.419(a) and the § 121.424 requirement to include all appendix E maneuvers and procedures during upgrade flight training. Instead, the proposal refocused upgrade ground and flight training to include subjects, maneuvers, and procedures specific to the duties and responsibilities the pilot will have as PIC at that air carrier. However, consistent with existing upgrade curriculum requirements, the proposed upgrade flight training continued to include rare, but high-risk scenarios. Because the FAA proposed to remove the requirement to train the entire range of § 121.419 subjects and appendix E maneuvers and procedures in upgrade training, the FAA believed that the revised upgrade ground training could be completed in less time than the programmed hours currently identified in each air carrier's approved training program, and the upgrade flight training could be

completed within the same or less time than currently identified in each air carrier's approved training program.

One individual stated that the proposed upgrade training will ensure technical skills and knowledge are facilitated while concentrating on the leadership and decision-making skills required for a professional pilot.

ALPA suggested requiring all the PIC upgrade ground and flight training that had been required before the Pilot Certification rule. ALPA opposed the FAA approving any reduction in the current upgrade flight training footprints based on the Pilot Certification rule and/or this final rule.

The FAA does not agree that upgrade training should include all the ground and flight training that had been required before the Pilot Certification rule. As explained in the NPRM, the current role served by an SIC in part 121 operations as well as the current SIC qualification requirements no longer support the foundation for upgrade training requirements in current subpart N. As further explained in the NPRM, the FAA has determined that the revised upgrade ground training can be completed in less time than the programmed hours currently identified in each air carrier's approved training program, and the upgrade flight training can be completed within the same or less time than currently identified in each air carrier's approved training program. *See* 81 FR at 69919.

ALPA recommended requiring PIC initial and upgrade ground training to include all the requirements in § 121.419(a) and (b) because that material may have been learned many years earlier.

The FAA does not agree with the suggested revision to § 121.419(c) to require PIC initial ground training to include all the requirements in § 121.419(a) and (b). As explained in the NPRM, in the Pilot Certification rule, the FAA recognized that a number of the general knowledge elements that are included in pilot initial ground training in § 121.419(a)(1) are now addressed by the ATP-CTP academic requirements. Therefore, in § 121.419(b), the Pilot Certification rule revised the part 121 initial ground training requirements by removing the generic elements for pilots who have completed the ATP-CTP. *See* 81 FR at 69923. The FAA's position has not changed; the general knowledge elements that are addressed by an ATP-CTP do not need to be repeated by a pilot during initial ground training with an air carrier.

The FAA does not agree with the suggested revision to § 121.420 to require upgrade ground training to include all the requirements in § 121.419(a) and (b). As explained in the NPRM, to serve as a pilot in part 121 operations, a pilot must satisfactorily complete recurrent ground training within 12 calendar months preceding service as a pilot. *See* §§ 121.427 and 121.433(c). Further, as explained in the NPRM, § 121.427 requires recurrent ground training to include instruction in the subjects required for initial ground training. *See* 81 FR at 69923. Therefore, the FAA does not agree that review of all the material in § 121.419(a) and (b) is warranted during upgrade training because these subjects would have been routinely reviewed during recurrent ground training.

ALPA suggested requiring all maneuvers and procedures in Appendix E to be completed during upgrade flight training.

The FAA does not agree that upgrade flight training should require all maneuvers and procedures in Appendix E to be completed. As explained in the NPRM, with the changes to SIC qualification requirements as a result of the Pilot Certification rule, an SIC will have already demonstrated technical mastery of that airplane type at the ATP certificate level when he or she begins upgrade training. The FAA does not agree that upgrading pilots would need to complete all maneuvers and procedures in Appendix E in order to demonstrate that they can meet the performance standards while simultaneously applying leadership and command skills. The final rule maintains the proposed performance-based upgrade curriculum. Among other requirements, upgrade flight training must include sufficient training to ensure the pilot has attained the knowledge and skills to proficiently operate the airplane as a PIC. As explained in the NPRM, the air carrier must determine the specific maneuvers and procedures for each airplane type considering its operational factors and authorizations and identified risks. *See* 81 FR at 69919.

ALPA suggested requiring additional/supplemental facilitated ground school and Line-Oriented Flight Training (LOFT) for leadership and command training and mentoring training when a new hire is hired directly as a PIC or upgrades to PIC within a new hire probation period. ALPA stated that this training should place emphasis on the culture of the carrier, challenges of being a new PIC at that carrier while flying with experienced SICs, resources of the carrier and union (if applicable), making the best use of being mentored by experienced PICs at that carrier, etc.

The FAA does not agree that requiring additional ground school and LOFT is warranted when a new hire is hired directly as a PIC or upgrades to PIC within a new hire

probation period. In accordance with § 121.401(a)(1), an air carrier's training program must ensure that each PIC is adequately trained to perform his or her assigned duties. Therefore, the FAA expects the training program of air carriers who hire PICs or upgrade pilots to PIC within their new hire probationary periods to include any additional training determined necessary by the air carrier to ensure the pilots are adequately trained to perform PIC duties. Additionally, § 121.436 requires a pilot to have 1,000 hours of air carrier experience before serving as a PIC in part 121 operations.

ALPA stated that guidance should exist ensuring upgrade training includes exposure to the operations of other airline departments such as dispatch, maintenance, and scheduling.

The recommendation that upgrade training should include exposure to the operations of other airline departments such as dispatch, maintenance, and scheduling is outside the scope of this rulemaking. The FAA expects each individual air carrier will determine if exposure to other airline departments is beneficial to its operation.

2. Revised Upgrade Curriculum Requirements

i. Seat Dependent and Duty Position Maneuvers and Procedures

The FAA proposed that the upgrade ground and flight training must include seat dependent maneuvers and procedures as well as duty position maneuvers and procedures. *See* 81 FR at 69920.

Ameristar questioned why seat dependent training would be required for a pilot upgrading from SIC to PIC. Ameristar recommended combining proposed § 121.420 with proposed § 121.429 without seat dependent training and duty position procedures

because these items are redundant and unnecessary. Ameristar also stated that proposed § 121.426(a)(1) and (2) are not necessary because if a pilot is being trained as a PIC, the pilot will get seat dependent training and duty position flight training without prescriptive rules.

The FAA does not agree with these comments. As explained in the NPRM, seat dependent maneuvers and procedures include the use of systems with controls that are not centrally located, or are accessible or operable from only the left or from only the right pilot seat as identified by the airplane manufacturer, air carrier, or the Administrator as seat dependent tasks. Typically, the PIC is assigned to and operates the airplane from the left seat, and the SIC is assigned to and operates the airplane from the right seat. An SIC who has been serving in the right seat of an aircraft would not know the characteristics of the left seat. Therefore, seat dependent training is required during upgrade training. As explained in the NPRM, duty position maneuvers and procedures include tasks specified by the airplane manufacturer, air carrier, or the Administrator, as PIC or SIC only tasks. A pilot serving as SIC would not have been previously trained and qualified on PIC only tasks. Therefore, duty position maneuvers and procedures are required during upgrade training.

The FAA is adopting, as proposed, the requirement that upgrade ground and flight training must include seat dependent maneuvers and procedures as well as duty position maneuvers and procedures.

ii. Leadership and Command and CRM

The FAA proposed that upgrade ground training must include leadership and command, as well as CRM. CRM training includes decision-making, authority and responsibility, and conflict resolution. The FAA also proposed that upgrade flight training must include scenario-based training structured to incorporate CRM and leadership and command. *See* 81 FR at 69920.

AABI and Jet Blue agreed that leadership and command must be demonstrated during the flight training portion of the upgrade curriculum. AABI also agreed with the requirement to incorporate leadership and command into flight training through scenario-based training.

Ameristar sought clarification on the definition of “*sufficient scenario based training incorporating CRM and leadership and command skills,*” as used in proposed §§ 121.424(b) and 121.426(a)(5).

In the final rule, the FAA maintains a performance-based upgrade curriculum, and therefore specifying standards for “sufficient scenario based training” is unnecessary in §§ 121.424(b) and 121.426(a)(5). As explained in the NPRM, the FAA has determined this approach will allow air carriers to develop a robust upgrade curriculum specific to their operations, airplane types, and identified risks. As further explained in the NPRM, scenario-based training should address specific training objectives based on technical and soft skills, may consist of full or partial flight segments, and would necessarily vary, depending on the training objectives. Additionally, the FAA has determined this scenario-based training ensures the effective integration of these “soft skills” with

technical skills. Therefore, an air carrier can combine the maneuvers and procedures in appendix E with the scenario-based training required by §§ 121.424(b) and 121.426(a)(5) as long as the training meets the objectives and requirements of both appendix E and §§ 121.424(b) and 121.426(a)(5).

The FAA recognizes that a carrier may choose to include leadership and command training in its SIC to PIC upgrade CRM curriculum that may satisfy the requirements of this final rule. If a carrier develops and conducts enhanced CRM training that includes additional instruction and facilitated discussion specifically designed to provide PICs with the necessary leadership and command skills, that carrier may meet the requirements under part 121 subpart N related to leadership and command training. The FAA will consider the training aids, devices, methods, and procedures used by the carrier as well as the content of the carrier's enhanced CRM training to determine whether the enhanced CRM training meets the requirements for leadership and command training.

iii. Mentoring

The FAA proposed that upgrade ground training must include mentoring, to include techniques for instilling and reinforcing the highest standards of technical performance, airmanship, and professionalism in newly hired pilots. *See* 81 FR at 69920.

AABI agreed with the requirement for mentoring training for pilots upgrading to PIC. ALPA stated that upgrade flight training should also include mentoring training.

The FAA does not agree that upgrade flight training should include mentoring training because it cannot be incorporated into upgrade flight training effectively. An opportunity for mentoring would have to be artificially introduced during scenario-based

flight training, which would reduce the effectiveness of that training because the scenario would no longer be realistic.

iv. Low-Altitude Windshear and Extended Envelope Flight Training

In the NPRM, the FAA proposed that upgrade flight training must continue to include training in the rare, but high risk scenarios specified in § 121.423 as well as the carrier's approved low-altitude windshear flight training program.

The FAA did not receive any comments regarding low-altitude windshear and extended envelope flight training and is adopting those requirements as proposed.

v. Additional Flight Training

The FAA also proposed that the upgrade curriculum must include sufficient flight training to ensure the pilot has attained the knowledge and skills to proficiently operate the airplane as a PIC. Under the proposed upgrade curriculum, the air carrier must determine the specific maneuvers and procedures for each airplane type considering its operational factors and authorizations, risks identified through its safety management system, and other risks identified through programs such as an Aviation Safety Action Program (ASAP), Flight Operational Quality Assurance (FOQA), and Line Operations Safety Audit (LOSA).²¹ Additionally, the FAA proposed that the training must ensure the pilot has developed the visual and psychomotor acuity necessary to operate the airplane from the seat position to be occupied while serving as PIC, typically the left pilot seat.

²¹ ASAP, FOQA, and LOSA are voluntary programs implemented by many air carriers. Analysis of the data provided by these voluntary programs has contributed to increased safety including improvements to training and operational procedures.

The FAA did not receive any comments on the proposed additional flight training during upgrade and is adopting the requirements as proposed.

3. Upgrade Proficiency Check Requirements

To ensure a proficient PIC, the FAA proposed to revise the waiver provisions for a § 121.441 proficiency check completed after upgrade ground and flight training. *See* 81 FR at 69920.

Ameristar stated that all the events in Appendix E applicable to upgrade training are waivable during the proficiency check, thereby invalidating the rationale for not allowing events to be waived on the proficiency check after upgrade training. Ameristar also commented that because compliance with either proposed § 121.441(d)(3)(i) or (ii) is allowed, compliance with § 121.441(d)(3)(i) would include upgrade training completed six months earlier making § 121.441(d)(3)(ii) unnecessary.

As explained in the NPRM, the proposed upgrade training requirements do not require pilots to complete all maneuvers and procedures in appendix E during training. Appendix E designates the airplane or FSTD, as appropriate, that may be used for maneuvers and procedures required for upgrade training in accordance with proposed § 121.426. Therefore, to ensure a proficient PIC, proficiency must be demonstrated for all maneuvers and procedures in appendix F during the proficiency check completed after upgrade training.

Proposed § 121.441(d)(3)(ii) is necessary because proposed § 121.441(d)(3)(i) does not include upgrade training completed within the previous six months. Section 121.441(d)(3)(i) applies to a pilot currently qualified for part 121 operations in a

particular type airplane and flightcrew member position. Proposed § 121.441(d)(3)(ii) applies to a pilot who has satisfactorily completed an approved training curriculum within the preceding six months, except for an upgrade training curriculum in accordance with proposed §§ 121.420 and 121.426. A pilot who has only completed upgrade training is not currently qualified for part 121 operations as PIC in that type airplane because the pilot has not completed the qualification requirements in part 121 subpart O, including the proficiency check, operating experience, consolidation of knowledge and skills and the line check. Therefore, as proposed, waiver authority is not allowed on a proficiency check for a pilot who has completed the upgrade training curriculum in accordance with proposed §§ 121.420 and 121.426.

The FAA is adopting the revised waiver provisions as proposed.

4. Effect of Revised Upgrade Curriculum on Recurrent Training

In the NPRM, the FAA explained that an air carrier may continue to reset a pilot's "base" month for recurrent flight training if the pilot satisfactorily completes the proposed upgrade flight training and proficiency check. An air carrier may only reset a pilot's base month for recurrent ground training based upon completion of upgrade ground training if the air carrier's upgrade curriculum includes all recurrent ground training requirements of § 121.427. *See* 81 FR at 69921.

The FAA did not receive any comments on this explanation.

H. Training for Pilots Currently Serving as PIC (§ 121.429)

The FAA proposed that all pilots qualified to serve as PIC prior to the compliance date must complete the PIC upgrade ground training on leadership and command and

mentoring. However, the FAA also proposed to allow credit toward all or part of the requirements for leadership and command and mentoring training for current PICs based on leadership and command and mentoring training previously completed by these PICs at that air carrier. The FAA sought comment on the proposal to allow credit, specifically:

- (1) Whether and to what extent air carriers were already providing leadership and command training and/or mentoring training for current PICs as described in the draft ACs included in the docket for the rulemaking;
- (2) Whether the previous training must have been provided as part of a training program approved by the FAA for that air carrier;
- (3) Whether the previous training must have been completed within a certain period of time prior to the effective date of the final rule;
- (4) What criteria and documentation the FAA should consider in determining whether all or part of the requirements have been met with previous training;
and
- (5) What criteria and documentation the FAA should consider in determining whether a PIC completed all or part of the previous training at that air carrier.

Comments from A4A and several air carriers indicated that numerous air carriers provide training in some or all of the items addressed in the draft ACs on leadership and command and mentoring training, and that some airlines have been providing this training for well over 20 years. Portions of the training is part of an FAA-approved

training curriculum, but some air carriers may have included this training as part of specialized carrier-specific training that is not FAA-approved.

A4A, American, and Jet Blue did not believe there should be a specific timeframe when this training should have been completed in order to be creditable. In contrast, ALPA believed credit should not be provided if the training occurred more than 24 months prior to the publication of the final rule. The NTSB strongly disagreed with the proposal to allow credit for training completed before the effective date of the final rule because that training may not be equivalent to the final rule requirements. A4A stated that whether or not the training was part of an FAA-approved training program does not negate the fact that the training took place and should not be a factor in determining if credit for the training will be allowed.

A4A, American, and UPS contended that airline records, courseware, and training module outlines are the appropriate criteria to determine the extent and subject matter of previous training and whether a PIC completed training. Jet Blue did not believe that specific criteria or documentation are necessary for the FAA to determine if all or part of the requirements have been met.

American and UPS requested that the FAA leave as much latitude as possible for establishing that training was accomplished for air carriers with long records of voluntarily covering the proposed topics.

ALPA believed that previous mentoring, leadership and command training should only be credited if effective and recent. ALPA suggested using data such as participants' critiques, LOSA, ASAP, line checks, etc. to determine if the training was effective.

ALPA also stated that proper record keeping should reflect that the pilot participated in the entire course for which credit is being sought.

An individual identified as an associate college professor stated that the FAA should allow partial credit toward the requirements for leadership and command and mentoring training for current PICs based on leadership and command and mentoring training previously completed at that air carrier.

Ameristar stated that current PICs who have completed an air carrier's CRM should not have to complete initial one-time training.

As explained in the NPRM, the FAA has determined that it is unnecessarily burdensome for PICs to complete the one-time training on leadership and command and mentoring if the PIC has previously completed training that is duplicative of the proposed requirements. As indicated by commenters, several air carriers are already providing some or all of this training. Therefore, the final rule retains the allowance for credit for training previously completed at that air carrier.

However, the FAA will only allow credit for training completed within 36 calendar months prior to the effective date of the final rule. As described in the section on Recurrent PIC Leadership and Command and Mentoring Training, leadership and command are perishable skills that require recurrent training; in the final rule, the frequency for recurrent ground training on leadership and command and mentoring for PICs remains every 36 calendar months, as proposed. Therefore, the FAA has determined it is appropriate to use the same timeframe for credit for training.

Since this training was previously voluntary, the FAA agrees with commenters that credit should be allowed even if the training was not included in the FAA-approved training program, where the air carrier has appropriate records. The FAA also agrees with commenters that curricula, training modules, and lesson plans combined with a record for an individual pilot are the appropriate documentation to allow credit for some or all of the training.

In the draft ACs, the FAA had proposed that the POI for each carrier would evaluate the carrier's request and determine whether to allow credit for some or all of the training. However, to ensure a consistent determination of whether the previous training met some or all of the requirements, the FAA is establishing a focus team, consisting of FAA subject matter experts, to evaluate all requests for credit. This process will be described in the final version of the ACs accompanying this final rule.

The FAA does not agree that if a pilot has completed CRM training at that carrier, one-time training on leadership and command and mentoring should not be required. As described in the NPRM, although CRM contains some elements of the desired leadership training, it is not designed with the express intent of aiding the PIC in assuming a leadership role in the aircraft. *See* 81 FR at 69916. CRM focuses on the use of all resources available to the pilot and the functioning of crewmembers as teams (addressing team behaviors and effectiveness), whereas the leadership and command training required in this final rule is intended for the development of the individual PIC's leadership skills, management oversight, and command authority prior to overall crewmember-integrated CRM training. CRM is also not designed to provide PICs with mentoring skills. Despite this distinction, the FAA recognizes that a carrier may choose

to include leadership and command training in its CRM curriculum that may satisfy the requirements of this final rule. If a carrier develops and conducts enhanced CRM training that includes additional instruction and facilitated discussion specifically designed to provide PICs with the necessary leadership and command skills, that carrier may seek credit for that training. The FAA will consider the training aids, devices, methods, and procedures used by the carrier as well as the content of the carrier's enhanced CRM training to determine whether the enhanced CRM training meets the requirements for leadership and command training.

I. Recurrent PIC Leadership and Command and Mentoring Training (§§ 121.409(b) and 121.427)

In the NPRM, the FAA proposed to require recurrent training on leadership and command and mentoring skills for all PICs serving in part 121 operations. The FAA proposed to require recurrent ground training on leadership and command and mentoring for PICs every 36 calendar months. The FAA also proposed to modify the requirements in § 121.409 to require that the recurrent LOFT scenario must provide each PIC an opportunity to demonstrate leadership and command.

AABI and Jet Blue agreed with the requirement for leadership and command and mentoring training for PIC recurrent training. They also agreed with the requirement that leadership and command must be demonstrated during the flight training portion of recurrent training. Several individuals also agreed with the proposal.

ALPA asserted that recurrent leadership and command and mentoring training needs to be conducted every 12 months rather than every 36 months.

As explained in the NPRM, the FAA has previously recognized that the necessary frequency for recurrent training is not the same for all subject areas and tasks. The FAA agrees that mentoring, leadership and command are perishable skills that require recurrent training. However, the FAA has determined that because these skills are used regularly during every flight they are less susceptible to degradation. Therefore, the frequency for recurrent ground training on leadership and command and mentoring for PICs is every 36 calendar months, as proposed.

Ameristar thought that requiring leadership and command training during recurrent LOFT implies that a LOFT would be required during recurrent training. Ameristar believed that distance learning should suffice for recurrent training.

The FAA proposed only to modify the existing recurrent LOFT scenario requirements in § 121.409. The FAA did not intend any implication that a LOFT would be required during recurrent training. As currently allowed, air carriers may choose to substitute LOFT that meets the requirements of § 121.409 for the recurrent proficiency check requirement specified in § 121.441, but air carriers are not required to do so.

The FAA recognizes that a carrier may choose to include leadership and command training in its recurrent CRM curriculum that may satisfy the requirements of this final rule. If a carrier develops and conducts enhanced CRM training that includes additional instruction and facilitated discussion specifically designed to provide PICs with the necessary leadership and command skills, that carrier may meet the requirements under part 121 subpart N related to leadership and command training. The FAA will consider the training aids, devices, methods, and procedures used by the carrier as well as

the content of the carrier's enhanced CRM training to determine whether the enhanced CRM training meets the requirements for leadership and command training.

J. Leadership and Command Training and Mentoring Training for SICs Serving in Operations that Require Three or More Pilots

In the NPRM, the FAA explained that it was considering requiring leadership and command training and mentoring training for SICs that serve as SIC in an operation that requires three or more pilots who are required by § 121.432(a) to be fully qualified to act as PIC of that operation (except for operating experience). The FAA sought comment on:

- (1) Whether the PIC leadership and command training should be included in the qualification requirements for pilots serving as the SIC in an augmented flightcrew;²²
- (2) Whether mentoring training should be included in the qualification requirements for pilots serving as the SIC in an augmented flightcrew;
- (3) Whether providing training in only one of the new subject areas (i.e., only leadership and command training or only mentoring training) would reduce the effectiveness of the training for these SICs; and
- (4) Whether providing training in only one of the new subject areas (i.e., only leadership and command training or only mentoring training) would reduce

²² An augmented flightcrew is a flightcrew that consists of more than the minimum number of flightcrew members required by the airplane type certificate to operate the airplane to allow a flightcrew member to be replaced by another qualified flightcrew member for inflight rest.

the effectiveness of the requirement for the SIC in an augmented flightcrew to be fully qualified to act as PIC.

A4A, American, and UPS argued that there should be no requirement for leadership and command and mentoring training for pilots serving as the SIC in an augmented crew. They stated that the PIC is there as the leader on the flight and is available to deal with requirements associated with leadership and command. They also stated that there should not be an expectation on the flight deck that anyone will mentor other than the PIC. A4A, American, and UPS noted that leadership and command training and mentoring training can be mutually exclusive so that one topic could be taught without any reduction in the SIC's effectiveness if the other topic is not taught.

Delta Air Lines commented that a full PIC command course should not be required for SICs. However, Delta stated that fundamentals of command training within established chain of command may be constructive.

ALPA stated that all SICs performing in augmented operations should receive the PIC leadership and command training and mentoring training. ALPA believed that SICs being trained in only one of the subjects would reduce the effectiveness of the SIC training and potentially their ability to be fully qualified to act as PIC in augmented operations.

Since 1970, § 121.432(a) has stated that a pilot who serves as SIC in an operation that requires three or more pilots must be fully qualified to act as PIC of that operation. In the 1970 Training Programs final rule, the FAA indicated that the qualification requirements for the assigned SIC in a crew of three or more were not limited to one

particular aspect of PIC qualification, and that the provision was intended to cover broader PIC qualification requirements.²³ The FAA's position has not changed.

Therefore, the FAA has determined that SICs who serve in an operation that requires three or more pilots must complete leadership and command training to be fully qualified to act as PIC of that operation. As described in the NPRM, the purpose of leadership and command training is to provide the skills necessary to manage the crew, communications, workload, and decision-making in a manner that promotes adherence to SOP. Since these SICs may be required to act as PIC while the assigned PIC is taking an inflight rest break, the FAA has determined these SICs need the same leadership and command skills. The FAA notes that, in accordance with § 121.401, these SICs will not be required to repeat the leadership and command training when they upgrade to PIC.

The FAA has determined these SICs do not need to complete mentoring training to be fully qualified to act as PIC of an augmented operation under § 121.432(a). As described above, the FAA is requiring mentoring training for all PICs serving in part 121 operations to establish the mentoring environment recommended by the MLP ARC. As further explained in the NPRM, the FAA has determined the increased experience requirements of the Pilot Certification rule together with the mentoring training requirement of this rule ensures every newly hired pilot is paired, on every flight, with an experienced pilot who can serve as a mentor. *See* 81 FR at 69919. Because the PIC of the augmented flight can serve as this mentor, an SIC who serves in an operation that requires three or more pilots would not ordinarily be expected to serve as a mentor to other pilots. Moreover, unlike with leadership and command skills, the PIC's mentoring

²³ *See* 35 FR 84, 87 (Jan. 3, 1970).

responsibilities during an augmented operation would not ordinarily be interrupted merely by an inflight rest period.

K. Pilot Professional Development Committee (proposed § 121.17)

In the NPRM, the FAA proposed to add a requirement for certificate holders conducting operations under part 121 to establish and maintain a pilot professional development committee (PPDC) to develop, administer, and oversee a formal pilot mentoring program. Additionally, the FAA proposed to require the PPDC to meet frequently enough to accomplish the objectives of the committee, but at least once a year. Further, the FAA proposed that the PPDC must consist of at least one management representative and at least one representative of the air carrier's pilots. The FAA proposed that the management representative must (1) have at least one year of experience serving as a PIC in part 121 operations, and (2) be qualified through training, experience, and expertise relevant to the PPDC's responsibilities. Along with the NPRM, the FAA drafted an AC that provided attributes for a PPDC to consider to develop, administer, and oversee a formal pilot mentoring program. The FAA included a copy of this document in the docket for this rulemaking and sought comments.

The FAA also sought comment on whether a PPDC and a formal pilot mentoring program are necessary in light of the FAA's proposal to require all PICs to complete mentoring training, including recurrent mentoring training. Although addressed in the "PIC Mentoring Training" discussion, by providing training on mentoring to all PICs, all newly hired SICs would be paired with a pilot who is prepared and has been trained to instill and reinforce the professionalism, skill, and knowledge expected of all pilots serving in part 121 operations.

AABI agreed with establishing a PPDC, the minimum committee composition, and the minimum meeting requirements. The NTSB strongly supported the proposed PPDC. Several individuals, many identified as college students, agreed with the mentoring program and believed it would provide benefits such as improving CRM and communications between pilots, aiding the progression of new pilots, and providing good experience for mentors.

A4A, American, Jet Blue, and UPS contended the necessity and role of the PPDC are limited considering mentoring training requirements and processes for reporting issues. A4A, American, and UPS also stated that the need for a PPDC would vary depending on factors at the airline such as size, maturity, pilot hiring parameters, training quality, and management capability.

A4A and Jet Blue stated that some of the items listed for the PPDC to consider may fall under management responsibilities. A4A, UPS, and Jet Blue stated that the draft AC must clearly highlight the difference between the role of the PPDC and that of airline management.

A4A, American, UPS, and Jet Blue also noted that several airlines already have joint committees with union/pilot representation and believed that the limited oversight proposed for the PPDC could readily be performed by these existing committees.

Jet Blue further argued that some of the proposed language may cause conflicts of interest in certain phases of the collective bargaining process as defined by the Railway Labor Act.

ALPA emphasized that it is a statutory mandate for the FAA to require a PPDC and a formal long-term mentoring program as well as mentoring for new hires during every flight. ALPA stated that the proposal did not address many issues regarding the PPDC and a formal long-term pilot mentoring program, including: selection and deselection of mentors; whether the mentors will be volunteers or will hold paid positions; impact on part 117 duty time due to mentoring; mentor qualifications; mentor initial and recurrent training; frequency and method of communication; how mentors will be assigned to new hires; mentor burn out; uncooperative new hires; length of mentoring; record keeping; minimum topics for discussion; boundaries for mentoring; roles and responsibilities of the pilot union; consequences of a mentor not adhering to the program guidelines and responsibilities; and regular feedback.

The FAA also received several other comments concerning the roles and functions of the proposed PPDC, its composition and meeting requirements, its interplay with existing labor-management structures, and the potential undue burden and costs associated with PPDC development and administration. In addition, the comments included recommendations on requirements for formal mentoring programs, the qualifications of mentors, and the scope of the mentor-mentee relationship.

The FAA agrees with some air carrier commenters that, as proposed, the PPDC could create uncertainty between the role of the PPDC and the regulatory operational and

management responsibilities of the air carrier. The FAA has determined that a formal pilot mentoring program cannot function independently from the operation of the air carrier. The development, administration, and oversight of a formal pilot mentoring program would impact many other aspects of the operation of the air carrier, such as pilot duty and rest, training, recordkeeping, “hiring” of mentors, and funding for the program. In accordance with U.S.C. 44701(b) and (d), the FAA may prescribe minimum safety standards for air carriers in consideration of the duty of an air carrier to provide service with the highest possible degree of safety in the public interest. Therefore, the responsibility for the safe operation of the air carrier, including the pilot mentoring program, ultimately remains with the air carrier.

Additionally, the FAA agrees that the need for a PPDC is limited because all PICs are required to complete mentoring training.

Lastly, in January 2015, the FAA issued the Safety Management Systems for Domestic, Flag, and Supplemental Operations for Certificate Holders final rule (SMS).²⁴ The SMS final rule was in response to (1) section 215 of Pub. L. 111-216 that directed the FAA to require all part 121 air carriers to implement an SMS, (2) NTSB recommendation A-07-10 for the FAA to require all part 121 air carriers to establish an SMS, and (3) International Civil Aviation Organization (ICAO) Annex 6, in which member states agreed to establish SMS requirements for air carriers. SMS is a comprehensive, process-oriented approach to managing safety throughout an organization. An SMS includes an organization-wide safety policy; formal methods for

²⁴ 80 FR 1308 (Jan. 8, 2015).

identifying hazards, controlling, and continually assessing risk and safety performance; and promotion of a safety culture. When systematically applied, SMS provides a set of decision-making tools that air carriers can use to improve safety. SMS stresses not only compliance with technical standards but also increased emphasis on the overall safety performance of the organization. In accordance with the SMS final rule, air carriers must have implemented an SMS that meets the requirements of 14 CFR part 5 no later than March 2018.

The FAA has thoroughly considered the MLP ARC recommendations in context with the SMS final rule, the PIC mentoring training required by this final rule, as well as the comments submitted in response to this rulemaking, and the FAA has determined that it would not be feasible or achievable for the PPDC to develop, administer, and oversee an effective formal pilot mentoring program. The FAA has determined that the goals of improving pilot airmanship, decision-making, and professionalism at each air carrier can be achieved through the PIC mentoring training required by this final rule and the use of each air carrier's SMS. The FAA is not adopting the proposal for the establishment of a PPDC.

L. Pilot Recurrent Ground Training Content and Programmed Hours (§ 121.427)

The FAA proposed to remove from the pilot recurrent ground training requirements, certain foundational knowledge elements that are no longer necessary in light of the maturity of air carrier training programs and the increase in pilot experience

and qualification.²⁵ The FAA further proposed a one hour reduction in the required minimum programmed hours for pilot recurrent ground training.

The FAA did not receive any comments regarding the proposed changes to pilot recurrent ground training content and programmed hours. Therefore, these changes are adopted as proposed.

M. Part 135 Operators and Part 91 Subpart K Program Managers Complying with Part 121, Subparts N and O

In the NPRM, the FAA explained that some part 135 operators and part 91K program managers use pilot training and qualification programs that comply with subparts N and O of part 121. However, the FAA explained that some of the proposed revisions to part 121 in the NPRM were not compatible with all part 135 and 91K operations because of differences between the requirements for minimum flight crew and pilot certification. Therefore, for part 135 operators and fractional ownership program managers who use a part 121 subparts N and O training and qualification program, the FAA proposed to retain the existing upgrade curriculum requirements and to limit the applicability of the leadership and command and mentoring training to PICs serving in operations that require two or more pilots. The FAA further explained that the remaining proposed amendments to subparts N and O of part 121 would apply to these other operators and program managers. *See* 81 FR at 69923.

²⁵ To implement the proposed amendments to recurrent ground training content for pilots, the FAA proposed revisions to § 121.427(b), that separate the recurrent ground training requirements by training population. Additionally, the FAA proposed to remove from § 121.427(b), the reference to § 121.805 because of the requirement in § 121.415(a)(3) to complete § 121.805 training.

NetJets requested that the final rule specifically note that the proposed OF requirement not apply to part 135 on-demand certificate holders or part 91, subpart K fractional ownership program managers that choose to comply with part 121 subparts N and O training and testing requirements. NetJets stated that few of its aircraft are equipped with a flight deck observer seat and would qualify for the deviation in proposed § 121.432(d).

The FAA agrees that the requirement for OF should not apply to part 135 operators or part 91K program managers that choose to comply with part 121 subparts N and O because the airplanes used in these operations are generally too small to accommodate a flight deck observer seat. Additionally, Pub. L. 111-216 and the associated MLP ARC recommendations are specifically directed at part 121 air carriers. Therefore, as adopted in §§ 91.1063(b) and 121.435(a) part 135 operators or part 91K program managers that choose to comply with part 121 subparts N and O are not required to comply with OF.

NetJets stated that in accordance with § 135.3(c), the operating experience required by § 121.434 is not applicable to NetJets because § 135.3(c) provides that certificate holders conducting part 135 operations who comply with part 121 subparts N and O requirements, instead of the part 135 subparts E, G, and H requirements, may choose to comply with the operating experience requirements of § 135.244 instead of the requirements of § 121.434. NetJets believed that, because a proficiency check of a visual inspection using pictorial means is certified by a check pilot, it is unnecessary to certify the pilot's proficiency a second time before the pilot completes operating experience.

As proposed in § 121.434(b)(3), if pictorial means was used to conduct the preflight visual inspection during the proficiency check, the pilot must demonstrate proficiency on at least one complete visual inspection of a static airplane before the completion of the operating experience required by § 121.434. The FAA did not propose any changes to § 135.244. Therefore, that requirement would only apply to a part 135 operator who complies with part 121 subparts N and O and chooses to comply with § 121.434. If the part 135 operator chooses to comply with § 135.244 instead, the requirement for the pilot to conduct the visual inspection of a static airplane during the operating experience does not apply.

The proposals to retain the existing upgrade curriculum requirements and to limit the applicability of the leadership and command and mentoring training to PICs serving in operations that require two or more pilots are adopted in the final rule for part 135 operators and fractional ownership program managers who use a part 121 subparts N and O training and qualification program.

N. Flight Simulation Training Device (FSTD) Conforming Changes

In the NPRM, the FAA proposed changes to part 121 subparts N and O and appendices E and F to reflect current terminology with respect to the use of flight simulators and other training devices. Specifically, references to visual simulators (Level A FFS) and advanced simulators (Level B, C, and D FFS) were proposed to be removed and updated to reflect current terminology and additionally, all references to simulation technology that no longer exists were removed.

American agreed with the proposed FSTD conforming changes, including the proposed change to amend Appendices E and F to allow pictorial means for the conduct of the preflight visual inspection.

Delta Air Lines commented that in both proposed Appendix E and proposed Appendix F, the maneuver/procedure categories and descriptive terminology do not match related categories and description in accordance with 14 CFR part 60, Tables A1B and B1B (Table of Tasks vs. Simulator/FTD Level). Delta also noted that in proposed Appendix E and proposed Appendix F, the “FTD” column does not reflect the maneuvers for which Flight Training Devices (FTDs), specifically level 7 FTDs, can be certified for flight training and proficiency checking as qualified in part 60, Tables A1B and B1B.

The FAA agrees with Delta’s comment that the maneuvers and procedures in Appendix E and Appendix F do not directly align with the tasks listed in part 60 Tables A1B and B1B and also do not fully address all of the FFS and FTD levels that are currently defined in part 60. Since the time the tables in Appendix E and Appendix F were originally written several years ago, other device levels within the “FFS” and “FTD” categories have been defined in the simulator qualification standards, and these tables in part 121 no longer reflect the current capabilities of all device levels which may be qualified for use in training under part 60. While the FAA agrees that Appendix E and Appendix F do not capture the capabilities of all of the available FSTD levels as currently defined in part 60, the FAA concludes that conducting extensive changes to these appendices in the final rule would exceed the scope of this rulemaking. The FAA has initiated a separate rulemaking to align the pilot training tasks and authorized FSTD

levels used in part 121 training programs to the technical FSTD qualification standards that are defined in part 60.²⁶

O. SIC Training and Checking Conforming Changes

The FAA proposed amendments to the SIC training requirements in Appendix E to part 121, amendments to the SIC proficiency check requirements in Appendix F to part 121, and an amendment to § 61.71 to clarify that a pilot obtaining a type rating within a part 121 training program must satisfactorily accomplish the same tasks and maneuvers required by § 121.424 to serve as PIC. *See* 81 FR at 69925.

The FAA did not receive any comments on these proposed amendments and is adopting them as proposed.

P. Other Conforming and Miscellaneous Changes

In the NPRM, the FAA proposed amendments to the pilot transition ground training content in § 121.419; a new term in § 121.400 to identify flight engineer to SIC training as “conversion” training instead of “upgrade” training; amendments to the ground training content in § 121.419 for flight engineer to SIC training; and an amendment to § 121.434, Appendix E to part 121, and Appendix F to part 121 to allow preflight visual inspection using pictorial means during pilot training and checking. *See* 81 FR at 69926.

²⁶ RIN 2120-AL14 Flight Simulation Training Device Usage in Training Programs. *See* the Department of Transportation semi-annual regulatory agenda at www.reginfo.gov for more information on this rulemaking.

Ameristar suggested, that because proposed Appendices E and F refer to an “approved” pictorial means for completing preflight, proposed § 121.434(b)(3) should include the term “approved.”

The FAA agrees with the suggestion, and § 121.434(b)(3) clarifies that the pictorial means must be approved. The FAA will continue to provide relief through exemptions for preflight visual inspection using pictorial means until April 27, 2021, to allow sufficient time for certificate holders to obtain approval under the regulations from their Principal Operations Inspector. The FAA did not receive any other comments on these proposed amendments and is adopting them as proposed.

Q. Costs and Benefits

The FAA received a few comments concerning the potential costs and benefits of the proposed rule. Jet Blue stated that the proposed OF requirements may delay the training of a class of 30 pilots for up to an entire calendar week, resulting in significant costs to the airline. With Jet Blue’s projected pilot hiring of 500 pilots in 2018, this delay represented a potential additional cost of \$1,718,640 per year in system staffing costs versus approximately \$245,520 for a single-day flexible addition within the existing training footprint.

As further explained in the section regarding Operations Familiarization, the FAA has revised the proposed OF requirements to clarify that OF can be completed during or after basic indoctrination training. This change reduces staffing costs.

An individual commenter stated that the proposed OF requirement would increase operating costs to the airlines, and does not help prevent the pilot shortage in the U.S.

As described in the NPRM, the intent of OF is to provide newly hired pilots with an opportunity to observe from the flight deck in a real world environment, the unique characteristics of the air carrier's operations, and the specialized processes learned during basic indoctrination training.

One individual provided positive comment on the cost savings benefits to operators. This individual further stated that the cost of \$72 million over a 10-year period is much more feasible as it balances the expected overall benefits.

Another individual noted that due to economic factors and further unknown variables, air carrier budgets could be impacted on a larger or smaller scale than what was estimated in the NPRM. One individual identified as a pilot suggested that if the savings are higher than or equal to the cost to implement, the NPRM should be implemented. This individual further calculated that even with the 10-year 7% discount rate that if the cost ends up only being about \$1 million or less of an expense to air carriers, the NPRM should still be implemented so long as the expenses are not shifted on to the pilots.

The FAA addresses the estimated costs and benefits of the rule in the Regulatory Evaluation section.

R. Other Out-of-Scope Comments

Ameristar believed § 121.436 should be amended to allow all flight time acquired in a turbojet aircraft in a part 135 operation to count towards the 1000-hour requirement of § 121.436(a)(3). Referencing proposed § 121.427(b)(4), Ameristar believed that CRM scenarios can be built into recurrent proficiency checks as well as LOFT sessions. The FAA also received several other comments concerning pilots' wages at regional air

carriers, stress and fatigue, and optimal working environment. In addition, the comments included recommendations for general aviation pilot training and qualifications, as well as a recommendation to target regulations to general aviation and other forms of transit.

These comments are out of the scope of this rulemaking. While there are many other factors that contribute to aviation accidents, Pub. L. 111-216 and this rule specifically address pilot professional development through leadership and command training and pilot mentoring. The new requirements are designed to enhance the professional development of pilots and are therefore not intended as substitutes for pilot qualifications or other pilot training regimes.

V. Regulatory Notices and Analyses

A. Regulatory Evaluation

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 and Executive Order 13563 direct that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 (Public Law 96-354) requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (Public Law 96-39 as amended) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, the Trade Agreements Act requires agencies to consider international standards and, where appropriate, that they be the basis of U.S. standards. Fourth, the Unfunded Mandates Reform Act of 1995 (Public Law 104-4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include

a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of \$100 million or more annually (adjusted for inflation with base year of 1995). This portion of the preamble summarizes the FAA's analysis of the economic impacts of this final rule. We suggest readers seeking greater detail read the full regulatory evaluation, a copy of which we have placed in the docket for this rulemaking.

In conducting these analyses, FAA has determined this final rule has benefits that justify its costs, and is a "significant regulatory action" as defined in section 3(f) of Executive Order 12866 because it raises novel policy issues contemplated under that executive order. The rule is also "significant" as defined in DOT's Regulatory Policies and Procedures. The final rule, if adopted, will not have a significant economic impact on a substantial number of small entities, will not create unnecessary obstacles to international trade, and will not impose an unfunded mandate on state, local, or tribal governments, or on the private sector.

Total Benefits and Costs of this Rule

The overall safety and reliability of the NAS demonstrates that most pilots conduct operations with a high degree of professionalism. Nevertheless, a problem still exists in the aviation industry with some pilots acting unprofessionally and not adhering to standard operating procedures ("SOP"), including the sterile flight deck rule. This rule requires:

- Operations familiarization for new-hire pilots;
- Revised ground and flight training for upgrading pilots that includes mentoring, leadership, and command training;

- Mentoring, leadership, and command ground training for current PICs;
- Mentoring, leadership, and command recurrent training for PICs; and
- Leadership and command training for certain SICs serving in an operation that requires 3 or more pilots.

The benefits of the training in the final rule include an increased level of safety from mitigation of unprofessional pilot behavior which the FAA has determined reduces pilot error that can lead to a catastrophic event. In addition, the rule responds to NTSB recommendations and satisfies the statutory requirement for a rulemaking in Public Law 111-216.

The estimated cost of the rule to air carriers is \$90.0 million over a 10-year period. When discounted using a 7-percent discount rate, the rule is estimated to result in costs of \$62.2 million over the same period. The total and annualized costs and cost savings are shown in the table below.

The rule will also generate savings to operators of \$95.5 million over a 10-year period. When discounted using a 7-percent discount rate, the rule will result in savings of \$61.2 million over the same period.

Total Costs and Cost Savings
(Millions of 2016 Dollars, 2018-2027) *

	Nominal	Present Value at 7%	Annualized at 7%	Present Value at 3%	Annualized at 3%
Total Costs	\$90.04	\$62.17	\$8.29	\$76.25	\$8.24
Total Cost Savings	\$95.53	\$61.22	\$8.16	\$78.32	\$8.46
Net Costs	-\$5.49	\$0.94	\$0.13	-\$2.07	-\$0.22

*Table values have been rounded. Totals may not add due to rounding.

More detailed benefit and cost information follows below.

Who is Potentially Affected by this Rule?

The rule applies to all part 121 air carriers (77) and, for some provisions, to part 135 operators conducting commuter operations in airplanes type certificated for two pilots and are required to use pilot training and qualification programs that comply with part 121 subparts N and O (2).²⁷

Assumptions:

- Discount Rates:²⁸ 7% and 3%
- Period of Analysis: 2018-2027
- Monetary values expressed in 2016 dollars
- Discounting calculations use 2016 as the base year

Other key assumptions used to complete the regulatory evaluation are as follows:

- Pilot Retirement Rate: 2.5%
- Pilot Attrition Rate Due to Medical Reasons: 0.5%
- Pilot Growth Rate: 0.5%
- Growth rate of SIC Pilots Qualified as PIC: 3.4% per year²⁹
- Ground Instructors Needed: 1 instructor for every 200 pilots
- Class Size: 20 pilots per class

Changes from the NPRM to the Final Rule

The final rule differs from the proposed rule in the following ways. The FAA is not requiring a pilot professional development committee (PPDC) as suggested in the

²⁷ In addition to part 135 operators conducting commuter operations, if authorized by the Administrator, part 91, subpart K (part 91K) program managers, and other part 135 operators may voluntarily comply with the training program requirements in subparts N and O of part 121 instead of the training program requirements of part 91K or part 135. Given that part 121 compliance is voluntary for part 91K program managers and part 135 operators (other than those conducting commuter operations), this pilot segment is not included in this analysis.

²⁸ Office of Management and Budget, OMB Circular No. A-4, New Guidelines for the Conduct of Regulatory Analysis, Mar. 2, 2004.

²⁹ FAA Aerospace Forecast 2017-2037. Table 5: U.S. Commercial Carriers Total Scheduled U.S. Passenger Traffic, 2016-2037. https://www.faa.gov/data_research/aviation/aerospace_forecasts/. Accessed April 2017.

NPRM. The FAA is also requiring leadership and command training for SICs serving in operations that require three or more pilots.

Benefits of this Rule

The benefits of the required training include an increased level of safety from mitigation of unprofessional pilot behavior which the FAA has determined reduces pilot error that can lead to a catastrophic event. The October 14, 2004, crash of Pinnacle Airlines flight 3701 in Jefferson City, Missouri, and the February 12, 2009, crash of Colgan Air flight 3407 near Buffalo, New York, are examples of past accidents where unprofessional pilot behavior contributed to the accident. In addition, the rule responds to National Transportation Safety Board (NTSB) recommendations and satisfies the statutory requirement for rulemaking in Public Law 111-216.

Costs of this Rule

The costs of the rule are associated with the following requirements:

- Operations familiarization for new-hire pilots;
- Revised ground and flight training for upgrading pilots that includes mentoring, leadership, and command training;
- Mentoring, leadership, and command ground training for current PICs;
- Mentoring, leadership, and command recurrent training for PICs; and
- Leadership and command training for certain SICs serving in an operation that requires 3 or more pilots

The rule has some additional conforming and miscellaneous changes that do not impact either the costs or benefits of the rule (see Sections N, O, and P of the preamble to the final rule).

Compliance Costs for the Rule by Provision (2018-2027)

Cost	Total Compliance Costs (Millions of 2016 Dollars)		
	Present Value		
	Total	7 Percent	3 Percent
New-Hire Pilot Operations Familiarization (§ 121.435)	\$6.514	\$3.962	\$5.227
Upgrade Training (§§ 121.420 and 121.426)	\$13.991	\$8.649	\$11.300
One-Time and Recurrent PIC Training (§ 121.429, § 121.409(b), and § 121.427)	\$66.391	\$47.439	\$57.095
One-Time and Recurrent SICs Qualified as PICs Training	\$3.133	\$2.108	\$2.623
Recordkeeping	\$0.009	\$0.007	\$0.008
Total	\$90.039	\$62.165	\$76.254

*Table values have been rounded. Totals may not add due to rounding.

Cost Savings of this Rule

The rule also contains cost saving benefits based on changes to ground training that are possible due to changes already implemented in the Pilot Certification Rule. The recent Pilot Certification final rule ensures technical proficiency in those subjects via other means.³⁰ These changes will lead to a reduction in the time required to complete recurrent and upgrade training and will not compromise safety.

Total and Present Values of Cost Savings (2018-2027)*

Cost Saving Benefits	Total Cost Savings (Millions of 2016 Dollars)		
	Present Value		
	Total	7 Percent	3 Percent
Recurrent Ground Training (§ 121.427)	\$67.323	\$44.068	\$55.687
Upgrade Ground Training (§ 121.420)	\$28.205	\$17.155	\$22.631
Total	\$95.529	\$61.223	\$78.318

*Table values have been rounded. Totals may not add due to rounding.

³⁰ The Pilot Certification rule requires all SIC serving in part 121 operations to hold an ATP certificate with a type rating and requires pilots to complete a minimum of 1,000 hours of relevant operational experience prior to serving as a PIC in part 121 operations. Additionally, the Pilot Certification rule requires pilots, who will serve in part 121 operations, to complete the ATP-CTP prior to ATP certification. Thus, the Pilot Certification rule requirements raise the baseline knowledge and experience level for pilots prior to serving at an air carrier. See Pilot Certification and Qualification Requirements for Air Carrier Operations; Final Rule, published by the Federal Aviation Administration on July 15, 2013 (78 FR 42324). <https://www.federalregister.gov/articles/2013/07/15/2013-16849/pilot-certification-and-qualification-requirements-for-air-carrier-operations>

Alternatives Considered:

The FAA considered an alternative proposal representing the MLP ARC recommendations as presented to the FAA. The FAA carefully considered the MLP ARC recommendations when developing the rule, and many of the recommendations are incorporated into the rule albeit with less prescriptive requirements. The main drivers of the cost differences between the MLP ARC recommendations and the final rule are the MLP ARC recommendations for a full-time professional development position, PPDC, and longer amount of time required for leadership and command training during upgrade training and during PIC recurrent training. The FAA adopts the proposed requirements, except the PPDC, as cost of the MLP ARC recommendations are substantially greater than the cost of this final rule.

B. Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (Public Law 96-354) (RFA) establishes “as a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration.” The RFA covers a wide-range of small entities, including small businesses, not-for-profit organizations, and small governmental jurisdictions.

Agencies must perform a review to determine whether a rule will have a significant economic impact on a substantial number of small entities. If the agency determines that it will, the agency must prepare a regulatory flexibility analysis as described in the RFA.

However, if an agency determines that a rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the RFA provides that the head of the agency may so certify and a regulatory flexibility analysis is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

The Small Business Administration (SBA) categorizes airlines with 1,500 or fewer employees as small businesses. Of the 77 carriers that operate under part 121, 52 had fewer than 1,500 total employees based on National Vital Information Subsystem (NVIS) data from February and November 2017. Of the two part 135 operators required to use pilot training and qualification programs that comply with part 121 subparts N and O, both have fewer than 1,500 total employees based on NVIS data. The count of pilots for the 52 small part 121 air carriers and the two small part 135 operators are shown in the table below.

Table 4: Total Number of Impacted Pilots, PICs, and SICs from Small Carriers in 2017 and 2027

Pilot Category	Year		Annual Growth
	2017	2027	
PIC	3,270	3,437	0.5%
SIC qualified as PIC	115	161	3.4%
SIC - Other	2,901	3,049	0.5%
TOTAL PILOTS	6,286	6,647	0.5%

Based on these pilot counts, the analysis used to conduct the Pilot Professional Development Regulatory Evaluation was recalculated for small air carriers only. A summary of the costs and cost savings of the rule on small air carriers is shown below.

Table 5: Total Costs and Cost Savings of the Rule for Small Carriers (2018-2027)

	Total Costs and Cost Savings (Millions of 2016 Dollars)		
	Present Value		
Costs and Cost Savings	Total	7 Percent	3 Percent
Total Costs	\$6.873	\$4.763	\$5.830
Total Cost Savings	\$6.969	\$4.457	\$5.709
Total Net Costs	-\$0.096	\$0.306	\$0.121

The total cost of the rule on small carriers, and the corresponding per small carrier cost, by provision, is shown in the table below.

Table 6: Total and per Carrier Costs of the Rule for Small Carriers by Provision (2018-2027)

Provisions	Total Compliance Costs (Millions of 2016 Dollars)		
	Total	Carriers Impacted	Per Carrier Total Cost
New-Hire SIC Operations Familiarization (§ 121.435)	\$0.28	54	\$0.005
Upgrade Training (Mentoring, Leadership, and Command for SICs or Mentoring Training for SICs qualified as PICs) (§§ 121.420 and 121.426)	\$0.61	54	\$0.011
One-Time and Recurrent PIC Training (Mentoring, Leadership, and Command) (§ 121.409(b), 121.427, and 121.429)	\$3.80	54	\$0.002
One-Time and Recurrent Training SICs Qualified as PICs (Leadership and Command)	\$0.08	54	\$0.002
Recordkeeping	\$0.001	54	\$0.000
Total	\$4.763		\$0.088

The total cost per carrier of \$88,000 for the rule, over the 10-year analysis period, implies an annual average per carrier cost of approximately \$8,800.

The FAA believes that such an economic cost is not economically significant. BTS Form 41 Financial data is available for 40 small air carriers.³¹ Operating revenues, in 2016, for 34 of the 40 carriers is reported as \$20 million or more. The remaining 6 carriers have operating revenue ranging from \$5 million to \$16 million. Based on these figures, the estimated annual average per carrier cost of the rule is less than 1% of the operating revenue where data is available.

If an agency determines that a rulemaking will not result in a significant economic impact on a substantial number of small entities, the head of the agency may so certify under section 605(b) of the RFA. Therefore, as provided in section 605(b), the FAA Administrator certifies that this rulemaking will not result in a significant economic impact on a substantial number of small entities.

C. International Trade Impact Assessment

The Trade Agreements Act of 1979 (Public Law 96-39), as amended by the Uruguay Round Agreements Act (Public Law 103-465), prohibits Federal agencies from establishing standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Pursuant to these Acts, the establishment of standards is not considered an unnecessary obstacle to the foreign commerce of the United States, so long as the standard has a legitimate domestic objective, such as the protection of safety, and does not operate in a manner that excludes imports that meet this

³¹ Bureau of Transportation Statistics Air Carrier Financial Reports (Form 41 Financial Data) Database. Schedules P-1.1 and P-1.2. <https://www.transtats.bts.gov>

objective. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards. The FAA has assessed the potential effect of this final rule and determined that it will respond to a statutorily mandated safety objective and is not considered an unnecessary obstacle to the foreign commerce of the United States.

D. Unfunded Mandates Assessment

Title II of the Unfunded Mandates Reform Act of 1995 (Public Law 104-4) requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in an expenditure of \$100 million or more (in 1995 dollars) in any one year by State, local, and tribal governments, in the aggregate, or by the private sector; such a mandate is deemed to be a “significant regulatory action.” The FAA currently uses an inflation-adjusted value of \$155 million in lieu of \$100 million. This final rule does not contain such a mandate; therefore, the requirements of Title II of the Act do not apply.

E. Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) requires that the FAA consider the impact of paperwork and other information collection burdens imposed on the public. According to the 1995 amendments to the Paperwork Reduction Act (5 CFR 1320.8(b)(2)(vi)), an agency may not collect or sponsor the collection of information, nor may it impose an information collection requirement unless it displays a currently valid Office of Management and Budget (OMB) control number.

This final rule will impose the following new information collection requirements. As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the FAA has submitted these information collection amendments to OMB for its review.

Summary: The final rule requires the development and approval of new and revised training curriculums for the following:

- Leadership and command and mentoring ground training for pilots currently serving as PIC (§ 121.429) and recurrent PIC leadership and command and mentoring training (§§ 121.409(b) and 121.427);
- Leadership and command training and recurrent leadership and command training for pilots serving as SIC in operations that require three or more pilots (§ 121.432(a));
- Upgrade training curriculum requirements (§§ 121.420 and 121.426);
- Part 121 appendix H requirements; and
- Approval of Qualification Standards Document for certificate holders using an Advanced Qualification Program (AQP) (§ 121.909).

The final rule also requires some additional recordkeeping related to maintaining records of pilots completing the following:

- Leadership and command and mentoring ground training for pilots currently serving as PIC (§ 121.429);
- Leadership and command training and recurrent leadership and command training for pilots serving as SIC in operations that require three or more pilots (§ 121.432(a));

- Recurrent PIC leadership and command and mentoring ground training (§ 121.427); and
- Operations familiarization for new-hire pilots (§ 121.435).

Public comments: The FAA did not receive any comments on the information collection requirements.

Use: This information will be used to ensure safety-of-flight by making certain that adequate training is obtained and maintained by those who operate under part 121. The FAA will review the respondents' training programs and training courseware through routine certification, inspection and surveillance of certificate holders using part 121 pilot training and qualification programs to ensure compliance and adherence to regulations and, where necessary, to take enforcement action.

Respondents (including number of): The relevant provisions of the rule apply to certificate holders using part 121 pilot training and qualification programs. As of February 2017, there were 79 such certificate holders who collectively employed 39,122 PICs and 42,227 SICs.

Frequency: The development and approval of new and revised curriculums will be a one-time occurrence for each certificate holder. The documentation regarding training in leadership and command and mentoring for current PICs will be a one-time occurrence. Similarly, the documentation regarding training in leadership and command for current SICs serving in operations that require three or more pilots will be a one-time occurrence. The documentation of operations familiarization for new-hire pilots will occur once for each new-hire pilot. The documentation of recurrent PIC leadership and

command and mentoring training will occur every three years for each PIC. The documentation of recurrent leadership and command training for SICs serving in operations that require three or more pilots will occur every three years for each such SIC.

Annual Burden Estimate: These amendments to part 121 set out prerequisites and levy requirements that must be met by certificate holders using part 121 pilot training and qualification programs and by those individuals who serve in given capacities for those certificate holders. The estimates for hours and costs are broken down by development and approval of new and revised training curriculums followed by pilot training recordkeeping.

The FAA anticipates that certificate holders will incur costs for the following groups of provisions:

- Operations familiarization for new-hire pilots (§ 121.435);
- Leadership and command and mentoring ground training for pilots currently serving as PIC (§ 121.429);
- Leadership and command training and recurrent leadership and command training for pilots serving as SIC in operations that require three or more pilots (§ 121.432(a));
- Upgrade training curriculum requirements (§§ 121.420 and 121.426);
- Recurrent PIC leadership and command and mentoring ground training (§§ 121.409(b) and 121.427);
- Part 121, appendix H requirements; and

- Approval of Qualification Standards Document for certificate holders using an AQP (§ 121.909).

1. Development and Approval of New and Revised Training Curriculums

For the development and approval of new and revised training curriculums, the FAA estimated the paperwork costs for these provisions by multiplying the hourly rate of the person responsible by the number of estimated hours to develop and submit the new or revised training curriculum. (In all cases we assume that a ground instructor would develop and submit the new or revised training curriculum, and that the ground instructor fully burdened wage is \$53 per hour.³²) We then multiplied these costs by the number of certificate holders affected by the provision.

a. Leadership and Command and Mentoring Ground Training for Pilots

Currently Serving as PIC (§ 121.429) and Recurrent PIC Leadership and Command and Mentoring Training (§§ 121.409(b) and 121.427)

Section 121.429 requires one-time development of a training course for leadership and command and mentoring for current PICs. This course must be submitted to the FAA for approval.

³² Training instructor hourly wage rate of \$36.60 multiplied by 1.435 to account for costs of employer provided benefits. Wage based on 2016 Bureau of Labor Statistics (BLS) Occupational Employment Statistics for Air Transportation Industry. (http://www.bls.gov/oes/current/naics4_481100.htm): Training and Development Specialists (13-1151). Wage multiplier from BLS, Employer costs for Employee compensation – December 2016, Table 5, Private Industry. (https://www.bls.gov/news.release/archives/ecec_03172017.pdf)

Revisions to §§ 121.409(b) and 121.427 require one-time revision to the certificate holder's approved recurrent PIC training curriculum. This revised curriculum must be submitted to the FAA for approval.

The FAA estimates a total of 40 hours of ground instructor time for development and submission of both the curriculum for current PICs and the revision to the recurrent PIC training curriculum.

Assuming 79 affected certificate holders, the FAA estimates that these provisions result in a one-time total cost of \$167,480 for all affected certificate holders.

b. Leadership and Command Training and Recurrent Leadership and Command Training for Pilots Serving as SIC in Operations that Require Three or More Pilots (§ 121.432(a))

SICs serving in operations that require three or more pilots complete the same one-time training and recurrent training in leadership and command as PICs. Therefore, no additional revisions are necessary to the training curriculums. The FAA expects that the program updates to reflect this change are minimal and are subsumed in the paperwork costs for the collective amendments made to the training provisions in this final rule.

The FAA estimates there are no costs for this provision.

c. Upgrade Training Curriculum Requirements (§§ 121.420 and 121.426)

Sections 121.420 and 121.426 require one-time revision to the certificate holder's approved SIC to PIC upgrade training curriculum. This revised curriculum must be submitted to the FAA for approval.

The FAA estimates a total of 80 hours of ground instructor time for development and submission of the revised SIC to PIC upgrade training curriculum.

Assuming 79 affected certificate holders, the FAA estimates that these provisions result in a one-time cost of \$334,960 for all affected certificate holders.

d. Part 121 Appendix H Requirements

The revision to part 121 appendix H requires one-time revision to the certificate holder's approved training program to remove the pilot experience prerequisites for using a Level C FFS during training and checking. This revised training program must be submitted to the FAA for approval. The FAA expects that the program updates to reflect this change are minimal and are subsumed in the paperwork costs for the collective amendments made to the training provisions in this final rule.

The FAA estimates there are no costs for this provision.

e. Approval of Qualification Standards Document for Certificate Holders Using an AQP (§ 121.909)

Although the final rule does not make any changes to § 121.909, when the new subparts N and O training requirements become effective, certificate holders that use an AQP must review their training programs to make sure they address the new subparts N and O requirements. It is possible that certificate holders may make a one-time revision

to their Qualifications Standards Document required by § 121.909 during this process to address the revised subparts N and O requirements.

This is a cost that only applies to certificate holders that use an AQP for pilot training because only those certificate holders must meet the § 121.909 requirements. Therefore, this provision does not apply to certificate holders who only train their pilots in accordance with subparts N and O.

For each of the 25 certificate holders with an approved AQP, the FAA estimates 3 hours of ground instructor time for development and submission of the revised Qualification Standards Document.

The FAA estimates that this provision results in one-time costs of \$3,975 across all certificate holders who train their pilots under an AQP.

2. Recordkeeping

For the pilot training recordkeeping, the FAA estimated the paperwork costs for these provisions by first multiplying the number of required entries by the estimated number of pilots affected. Second, we multiplied the total number of entries by .001 hours (the time required to make each entry). Lastly, we multiplied the total time to make all entries by the hourly rate of the person responsible for making the entries. In all cases, the FAA assumes that the person making the entries is a clerical employee with an estimated fully-burdened wage of \$29 per hour.³³

³³ The clerk hourly wage rate of \$20.29 multiplied by 1.435 to account for costs of employer provided benefits. Wage based on 2016 BLS Occupational Employment Statistics for Air Transportation Industry.

*a. Leadership and Command and Mentoring Ground Training for Pilots
Currently Serving as PIC (§ 121.429)*

A record showing compliance with this requirement for current PICs must be retained in accordance with § 121.683(a)(1). This is a one-time burden.

The FAA assumes that this cost is incurred in 2019, the year prior to the compliance date of the rule and estimates that during that year 39,515 pilots are affected and require one record. The FAA estimates 40 hours of clerical time for entry of these records.

The FAA estimates that this provision adds a one-time cost of \$ 1,160 for all affected certificate holders.

b. Leadership and Command for SICs Serving in Operations that Require Three or More Pilots (§ 121.432(a))

A record showing compliance with this requirement for SICs currently serving in operations that require three or more pilots must be retained in accordance with § 121.683(a)(1). This is a one-time burden.

The FAA assumes that the majority of this cost is incurred in the year prior to the compliance date of the rule, however new SIC pilots serving in operations that require three or more pilots will also receive this initial training. The FAA estimates that 5,498

(http://www.bls.gov/oes/current/naics4_481100.htm): Information and Record Clerks (43-4000). Wage multiplier from BLS, Employer costs for Employee compensation – December 2016, Table 5, Private Industry. (https://www.bls.gov/news.release/archives/ecec_03172017.pdf)

pilots are affected and require one record. The FAA estimates 5 hours of clerical time for entry of these records.

The FAA estimates that this provision adds a one-time cost of \$ 145 for all affected certificate holders.

c. Recurrent PIC Leadership and Command and Mentoring Ground Training (§ 121.427)

A record showing compliance with this requirement for current PICs must be retained in accordance with § 121.683(a)(1), in addition to the current recordkeeping burden approved under OMB Control Number 2120-0008.

PICs are required to complete the recurrent training every 3 years. Over the 10-year analysis period, the FAA estimates that there are 109,874 instances of PICs undergoing recurrent training involving leadership and command and mentoring. Each instance requires one record. The FAA estimates 110 hours of clerical time for entry of these records.

The FAA estimates that this provision results in costs of \$ 3,190 over the analysis period for all affected certificate holders.

d. Recurrent Leadership and Command Ground Training for SICs Serving in Operations that Require Three or More Pilots (§§ 121.427 and 121.432(a))

A record showing compliance with this requirement for SICs serving in operations that require three or more pilots must be retained in accordance with

§ 121.683(a)(1), in addition to the current recordkeeping burden approved under OMB Control Number 2120-0008.

These SICs are required to complete the recurrent training every 3 years. Over the 10-year analysis period, the FAA estimates that there are 8,267 instances of SICs undergoing recurrent training involving leadership and command. Each instance requires one record. The FAA estimates 8 hours of clerical time for entry of these records.

The FAA estimates that this provision results in costs of \$ 232 over the analysis period for all affected certificate holders.

e. Operations Familiarization for New-Hire Pilots (§ 121.435)

Section 121.435 implements a new qualification requirement for new-hire pilots to complete operations familiarization consisting of 2 operating cycles. A record showing compliance with this requirement for each new-hire pilot must be retained in accordance with § 121.683(a)(1), in addition to the current recordkeeping burden approved under OMB Control Number 2120-0008.

The FAA estimates all affected certificate holders have a total of 23,517 new-hire pilots over the analysis period. Each of the estimated 23,517 pilots affected requires one record. The FAA estimates 24 hours of clerical time for entry of these records. The FAA estimates that this provision results in costs of \$ 696 across the analysis period for all affected certificate holders.

3. Summary of Estimated Paperwork Costs

The total cost burden is \$511,838 (\$445,883 discounted at 7 percent) over the 10-year analysis period.

Summary of Estimated Paperwork Costs

Proposed Rule Requirement	Number of Records	Number of Hours	Wage	Number of Certificate Holders	Total Cost
Development and Approval of New and Revised Training Curriculums					
Leadership and command and mentoring ground training for pilots currently serving as PIC (§ 121.429) and recurrent PIC leadership and command and mentoring training (§§ 121.409(b) and 121.427)	N/A	40	\$ 53*	79	\$ 167,480
Upgrade training curriculum (§§ 121.420 and 121.426)	N/A	80	\$ 53*	79	\$ 334,960
Approval of Qualification Standards Document (§ 121.909)	N/A	3	\$ 53*	25	\$ 3,975
Recordkeeping					
Leadership and command and mentoring ground training for pilots currently serving as PIC (§ 121.429)	39,515	40	\$ 29**	N/A	\$ 1,160
Leadership and Command for SICs Serving in Operations that Require Three or More Pilots (§ 121.432(a))	5,498	5	\$29**	N/A	\$ 145
Recurrent PIC leadership and command and mentoring ground training (§ 121.427)	109,874	110	\$ 29**	N/A	\$ 3,190
Recurrent Leadership and Command Ground Training for SICs Serving in Operations that Require Three or More Pilots (§§ 121.427 and 121.432(a))	8,267	8	\$29**	N/A	\$ 232
Operations familiarization for new-hire pilots (§ 121.435)	23,517	24	\$ 29**	N/A	\$ 696

Proposed Rule Requirement	Number of Records	Number of Hours	Wage	Number of Certificate Holders	Total Cost
Total		310			\$ 511,838

*Fully burdened hourly wage for ground instructor.

**Fully burdened hourly wage for clerical employee.

F. International Compatibility and Cooperation

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to conform to International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has reviewed the corresponding ICAO Standards and Recommended Practices and has identified no differences with these proposed regulations.

G. Environmental Analysis

FAA Order 1050.1F identifies FAA actions that are categorically excluded from preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act in the absence of extraordinary circumstances. The FAA has determined this rulemaking action qualifies for the categorical exclusion identified in paragraph 5-6.6 and involves no extraordinary circumstances.

VI. Executive Order Determinations

A. Executive Order 13132, Federalism

The FAA has analyzed this final rule under the principles and criteria of Executive Order 13132, Federalism. The agency determined that this action will not have a substantial direct effect on the States, or the relationship between the Federal

Government and the States, or on the distribution of power and responsibilities among the various levels of government, and, therefore, does not have Federalism implications.

B. Executive Order 13211, Regulations that Significantly Affect Energy Supply, Distribution, or Use

The FAA analyzed this final rule under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). The agency has determined that it is not a “significant energy action” under the executive order, and it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

C. Executive Order 13609, Promoting International Regulatory Cooperation

Executive Order 13609, Promoting International Regulatory Cooperation, promotes international regulatory cooperation to meet shared challenges involving health, safety, labor, security, environmental, and other issues and to reduce, eliminate, or prevent unnecessary differences in regulatory requirements. The FAA has analyzed this action under the policies and agency responsibilities of Executive Order 13609, and has determined that this action will have no effect on international regulatory cooperation.

D. Executive Order 13771, Reducing Regulation and Controlling Regulatory Costs

This rule is not subject to the requirements of EO 13771 because this rule results in no more than *de minimis* costs or cost savings.

VII. How to Obtain Additional Information

A. Rulemaking Documents

An electronic copy of a rulemaking document may be obtained by using the Internet —

1. Search the Federal eRulemaking Portal (<http://www.regulations.gov>);
2. Visit the FAA's Regulations and Policies Web page at http://www.faa.gov/regulations_policies/ or
3. Access the Government Publishing Office's Web page at <http://www.gpo.gov/fdsys/>.

Copies may also be obtained by sending a request (identified by notice, amendment, or docket number of this rulemaking) to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue SW., Washington, DC 20591, or by calling (202) 267-9677.

B. Comments Submitted to the Docket

Comments received may be viewed by going to <http://www.regulations.gov> and following the online instructions to search the docket number for this action. Anyone is able to search the electronic form of all comments received into any of the FAA's dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.).

C. Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. A small entity with questions regarding this document, may contact its local FAA official, or the person listed under the FOR FURTHER INFORMATION CONTACT heading at the beginning of the preamble. To find out more about SBREFA on the Internet, visit http://www.faa.gov/regulations_policies/rulemaking/sbre_act/.

List of Subjects

14 CFR Part 61

Aircraft, Airmen, Aviation safety, Reporting and recordkeeping requirements.

14 CFR Part 91

Aircraft, Airmen, Aviation safety, Reporting and recordkeeping requirements.

14 CFR Part 121

Air carriers, Aircraft, Airmen, Aviation safety, Reporting and recordkeeping requirements, Safety, Transportation.

14 CFR Part 135

Aircraft, Airmen, Aviation safety, Reporting and recordkeeping requirements.

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends chapter I of title 14, Code of Federal Regulations as follows:

**PART 61—CERTIFICATION: PILOTS, FLIGHT INSTRUCTORS, AND
GROUND INSTRUCTORS**

1. The authority citation for part 61 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40113, 44701-44703, 44707, 44709-44711, 44729, 44903, 45102-45103, 45301-45302, Sec. 2307 Pub. L. 114-190, 130 Stat. 615 (49 U.S.C. 44703 note).

2. Amend § 61.71 by revising paragraph (b)(1) to read as follows:

§ 61.71 Graduates of an approved training program other than under this part:

Special rules.

* * * * *

(b) * * *

(1) Satisfactorily accomplished an approved training curriculum and a proficiency check for that airplane type that includes all the tasks and maneuvers required by §§ 121.424 and 121.441 of this chapter to serve as pilot in command in operations conducted under part 121 of this chapter; and

* * * * *

PART 91—GENERAL OPERATING AND FLIGHT RULES

3. The authority citation for part 91 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 1155, 40101, 40103, 40105, 40113, 40120, 44101, 44111, 44701, 44704, 44709, 44711, 44712, 44715, 44716, 44717, 44722, 46306, 46315, 46316, 46504, 46506-46507, 47122, 47508, 47528-47531, 47534, Pub. L. 114-190, 130 Stat. 615 (49 U.S.C. 44703 note); articles 12 and 29 of the Convention on International Civil Aviation (61 Stat. 1180), (126 Stat. 11).

4. Amend § 91.1063 by revising paragraph (b) to read as follows:

§ 91.1063 Testing and training: Applicability and terms used.

* * * * *

(b) If authorized by the Administrator, a program manager may comply with the applicable training and testing sections of part 121, subparts N and O of this chapter instead of §§ 91.1065 through 91.1107, provided that the following additional limitations and allowances apply to program managers so authorized:

(1) *Operating experience and operations familiarization.* Program managers are not required to comply with the operating experience requirements of § 121.434 or the operations familiarization requirements of § 121.435 of this chapter.

(2) *Upgrade training.* (i) Each program manager must include in upgrade ground training for pilots, instruction in at least the subjects identified in § 121.419(a) of this chapter, as applicable to their assigned duties; and, for pilots serving in crews of two or more pilots, beginning on April 27, 2022, instruction and facilitated discussion in the subjects identified in § 121.419(c) of this chapter.

(ii) Each program manager must include in upgrade flight training for pilots, flight training for the maneuvers and procedures required in § 121.424(a), (c), (e), and (f) of this chapter; and, for pilots serving in crews of two or more pilots, beginning on April 27, 2022, the flight training required in § 121.424(b) of this chapter.

(3) *Initial and recurrent leadership and command and mentoring training.* Program managers are not required to include leadership and command training in

§§ 121.409(b)(2)(ii)(B)(6), 121.419(c)(1), 121.424(b) and 121.427(d)(1) of this chapter, and mentoring training in §§ 121.419(c)(2) and 121.427(d)(1) of this chapter in initial and recurrent training for pilots in command who serve in operations that use only one pilot.

(4) *One-time leadership and command and mentoring training.* Section 121.429 of this chapter does not apply to program managers conducting operations under this subpart when those operations use only one pilot.

* * * * *

PART 121--OPERATING REQUIREMENTS: DOMESTIC, FLAG, AND SUPPLEMENTAL OPERATIONS

5. The authority citation for part 121 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40103, 40113, 40119, 41706, 42301 preceding note added by Pub. L. 112-95, sec. 412, 126 Stat. 89, 44101, 44701-44702, 44705, 44709-44711, 44713, 44716-44717, 44722, 44729, 44732; 46105; Pub. L. 111-216, 124 Stat. 2348 (49 U.S.C. 44701 note); Pub. L. 112-95, 126 Stat. 62 (49 U.S.C. 44732 note).

6. Amend § 121.400 by:

- a. Revising paragraphs (a) and (c)(3);
- b. Redesignating paragraphs (c)(4) through (11) as paragraphs (c)(5) through (12), respectively; and
- c. Adding a new paragraph (c)(4).

The revisions and addition read as follows:

§ 121.400 Applicability and terms used.

(a) This subpart prescribes the requirements applicable to each certificate holder for establishing and maintaining a training program for crewmembers, aircraft dispatchers, and other operations personnel, and for the approval and use of flight simulation training devices and training equipment in the conduct of the program.

* * * * *

(c) * * *

(3) *Upgrade training.* The training required for flightcrew members who have qualified and served as second in command on a particular airplane type, before they serve as pilot in command on that airplane.

(4) *Conversion training.* The training required for flightcrew members who have qualified and served as flight engineer on a particular airplane type, before they serve as second in command on that airplane.

* * * * *

7. Amend § 121.401 by revising paragraph (a)(4) to read as follows:

§ 121.401 Training program: General.

(a) * * *

(4) Provide enough flight instructors and approved check airmen to conduct the flight training and checks required under this part.

* * * * *

§ 121.403 [Amended]

8. Amend § 121.403(b)(4) by removing the words “airplane simulators or other training devices” and add in their place the word “FSTDs”.

9. Amend § 121.407 revising the section heading and paragraphs (a) introductory text and (b) through (e) to read as follows:

§ 121.407 Training program: Approval of flight simulation training devices.

(a) Each FSTD used to satisfy a training requirement of this part in an approved training program, must meet all of the following requirements:

* * * * *

(b) A particular FSTD may be approved for use by more than one certificate holder.

(c) A Level B or higher FFS may be used instead of the airplane to satisfy the inflight requirements of §§ 121.439 and 121.441 and appendices E and F of this part, if the FFS—

(1) Is approved under this section and meets the appropriate FFS requirements of appendix H of this part; and

(2) Is used as part of an approved program that meets the training requirements of §§ 121.424 (a) and (c), 121.426, and appendix H of this part.

(d) An FFS approved under this section must be used instead of the airplane to satisfy the pilot flight training requirements prescribed in the certificate holder's approved low-altitude windshear flight training program set forth in § 121.409(d) of this part.

(e) An FFS approved under this section must be used instead of the airplane to satisfy the pilot flight training requirements prescribed in the extended envelope training

set forth in § 121.423 of this part. Compliance with this paragraph is required no later than March 12, 2019.

10. Amend § 121.409 by:

a. Revising the section heading and paragraphs (a), (b) introductory text, (b)(1), (b)(2)(ii)(B), and (b)(2)(ii)(B)(4) and (5);

b. Adding paragraph (b)(2)(ii)(B)(6);

c. Removing the undesignated paragraph following paragraph (b)(3); and

d. Revising paragraphs (c)(1) and (2) and (d).

The revisions and addition read as follows:

§ 121.409 Training courses using flight simulation training devices.

(a) Training courses utilizing FSTDs may be included in the certificate holder's approved training program for use as provided in this section.

(b) Except for the airline transport pilot certification training program approved to satisfy the requirements of §61.156 of this chapter, a course of training in an FFS may be included for use as provided in §121.441 if that course—

(1) Provides at least 4 hours of training at the pilot controls of an FFS as well as a proper briefing before and after the training.

(2) * * *

(ii) * * *

(B) Except as provided in paragraph (b)(2)(ii)(B)(6) of this section, beginning on March 12, 2019

* * * * *

(4) Is representative of two flight segments appropriate to the operations being conducted by the certificate holder;

(5) Provides an opportunity to demonstrate workload management and pilot monitoring skills; and

(6) Beginning on April 27, 2023, provides an opportunity for each pilot in command to demonstrate leadership and command skills.

(c) * * *

(1) A course of pilot training in an FFS as provided in §121.424(d); or

(2) A course of flight engineer training in an FSTD as provided in §121.425(d).

(d) Each certificate holder required to comply with §121.358 of this part must use an approved FFS for each airplane type in each of its pilot training courses that provides training in at least the procedures and maneuvers set forth in the certificate holder's approved low-altitude windshear flight training program. The approved low-altitude windshear flight training, if applicable, must be included in each of the pilot flight training courses prescribed in §§ 121.409(b), 121.418, 121.424, 121.426, and 121.427 of this part.

§ 121.411 [Amended]

11. Amend § 121.411 in paragraphs (a)(1) and (2) and (f)(1) and (2) by removing the words “flight simulator” and adding in their place the word “FFS” and in paragraph (b)(4) by removing the word “in-flight” and adding in its place the word “inflight”.

§ 121.412 [Amended]

12. Amend § 121.412 in paragraphs (a)(1) and (2) and (f)(1) and (2) by removing the words “flight simulator” and adding in their place the word “FFS” and in paragraph (b)(4) by removing the word “in-flight” and adding in its place the word “inflight”.

§ 121.413 [Amended]

13. Amend § 121.413:

- a. In paragraphs (a)(2), (c)(7) introductory text, (c)(7)(iv), (d)(2) introductory text, (d)(2)(iv), and (f) by removing the words “flight simulator” and adding in their place the word “FFS”;
- b. In paragraph (f), by removing the words “in flight” and adding in their place the word “inflight”;
- c. In paragraphs (g) introductory text and (g)(1) by removing the words “flight simulator” and adding in their place the word “FFS”;
- c. In paragraph (g)(2) by removing the words “flight simulators” and adding in their place “FFSs”; and
- d. In paragraph (h) by removing the words “flight simulator” and adding in their place the word “FFS”.

§ 121.414 [Amended]

14. Amend § 121.414:

- a. In paragraphs (a)(2), (c)(8) introductory text, (c)(8)(iv), (d)(2) introductory text, and (d)(2)(iv) by removing the words “flight simulator” and adding in their place the word “FFS”;
- b. In paragraph (e)(3)(i), by removing the word “In-flight” and adding in its place the word “Inflight”; and
- c. In paragraph (f), by removing the words “in flight” and adding in their place the word “inflight”;
- d. In paragraphs (f), (g) introductory text, (g)(1), and (h), by removing the words “flight simulator” and adding in their place the word “FFS”.
- e. In paragraph (g)(2), by removing the words “flight simulators” and adding in their place the word “FFSs”; and
- f. In paragraph (h), by removing the words “flight simulator” and adding in their place the word “FFS”.

15. Amend § 121.415 by:

- a. Revising paragraphs (b) and (e);
- b. Redesignating paragraphs (f) through (j) as paragraphs (g) through (k),

respectively;

- c. Adding a new paragraph (f); and
- d. Revising newly redesignated paragraphs (g), (h) introductory text, (j), and (k).

The revisions and addition read as follows:

§ 121.415 Crewmember and dispatcher training program requirements.

* * * * *

(b) Each training program must provide the flight training specified in §§121.424 through 121.426, as applicable.

* * * * *

(e) Upgrade training:

(1) Upgrade training as specified in §§ 121.420 and 121.426 for a particular type airplane may be included in the training program for flightcrew members who have qualified and served as second in command pilot on that airplane; or

(2) Before April 27, 2022, upgrade training as specified in §§ 121.419 and 121.424 for a particular type airplane may be included in the training program for flightcrew members who have qualified and served as second in command pilot on that airplane.

(f) Conversion training as specified in §§ 121.419 and 121.424 for a particular type airplane may be included in the training program for flightcrew members who have qualified and served as flight engineer on that airplane.

(g) Particular subjects, maneuvers, procedures, or parts thereof specified in §§ 121.419, 121.420, 121.421, 121.422, 121.424, 121.425, and 121.426 for transition, conversion or upgrade training, as applicable, may be omitted, or the programmed hours of ground instruction or inflight training may be reduced, as provided in § 121.405.

(h) In addition to initial, transition, conversion, upgrade, recurrent and differences training, each training program must also provide ground and flight training, instruction, and practice as necessary to insure that each crewmember and aircraft dispatcher—

* * * * *

(j) Each training program must include methods for remedial training and tracking of pilots identified in the analysis performed in accordance with paragraph (i) of this section.

(k) Compliance with paragraphs (i) and (j) of this section is required no later than March 12, 2019.

§ 121.417 [Amended]

16. Amend § 121.417 in paragraph (b)(3)(ii) by removing the words “in flight” and adding in their place the word “inflight”.

17. Amend § 121.418 by revising paragraphs (a)(2) and (c) to read as follows:

§ 121.418 Differences training and related aircraft differences training.

(a) * * *

(2) Differences training for all variations of a particular type airplane may be included in initial, transition, conversion, upgrade, and recurrent training for the airplane.

* * * * *

(c) *Approved related aircraft differences training.* Approved related aircraft differences training for flightcrew members may be included in initial, transition,

conversion, upgrade and recurrent training for the base aircraft. If the certificate holder's approved training program includes related aircraft differences training in accordance with paragraph (b) of this section, the training required by §§ 121.419, 121.420, 121.424, 121.425, 121.426, and 121.427, as applicable to flightcrew members, may be modified for the related aircraft.

18. Amend § 121.419 by:

- a. Revising the section heading and paragraphs (a) introductory text and (b) introductory text;
- b. Redesignating paragraphs (c) through (e) as paragraphs (d) through (f), respectively;
- c. Adding new paragraph (c);
- d. Revising newly redesignated paragraph (f)(2); and
- e. Adding paragraph (g).

The revisions and additions read as follows:

§ 121.419 Pilots and flight engineers: Initial, transition, conversion and upgrade ground training.

(a) Except as provided in paragraph (b) of this section, initial and conversion ground training for pilots and initial and transition ground training for flight engineers, must include instruction in at least the following as applicable to their assigned duties:

* * * * *

(b) Initial and conversion ground training for pilots who have completed the airline transport pilot certification training program in § 61.156 of this chapter, and

transition ground training for pilots, must include instruction in at least the following as applicable to their assigned duties:

* * * * *

(c) Beginning on April 27, 2022, and in addition to the requirements in paragraph (a) or (b) of this section, as applicable, initial ground training for pilots in command must include instruction and facilitated discussion on the following:

(1) Leadership and command, including flightcrew member duties under § 121.542; and

(2) Mentoring, including techniques for instilling and reinforcing the highest standards of technical performance, airmanship, and professionalism in newly hired pilots.

* * * * *

(f) * * *

(2) Beginning March 12, 2019, initial programmed hours applicable to pilots as specified in paragraphs (d) and (e) of this section must include 2 additional hours.

(g) Before April 27, 2022, upgrade ground training must include either the instruction specified in paragraph (a) of this section or the instruction specified in § 121.420. Beginning on April 27, 2022, upgrade ground training must include the instruction specified in § 121.420.

19. Add § 121.420 to read as follows:

§ 121.420 Pilots: Upgrade ground training.

(a) Upgrade ground training must include instruction in at least the following subjects as applicable to the duties assigned to the pilot in command:

(1) Seat dependent procedures, as applicable;

(2) Duty position procedures, as applicable; and

(3) Crew resource management, including decision making, authority and responsibility, and conflict resolution.

(b) In addition to the requirements in paragraph (a) of this section, upgrade ground training must include instruction and facilitated discussion on the following:

(1) Leadership and command, including flightcrew member duties under § 121.542; and

(2) Mentoring, including techniques for reinforcing the highest standards of technical performance, airmanship, and professional development in newly hired pilots.

(c) Compliance date: Beginning on April 27, 2022, upgrade ground training must satisfy the requirements of this section.

§ 121.423 [Amended]

20. Amend § 121.423 in the section heading by removing the word “Pilot” and adding in its place the word “Pilots”.

21. Amend § 121.424 by:

- a. Revising the section heading and paragraph (a) introductory text;
- b. Redesignating paragraphs (b) through (e) as paragraphs (c) through (f), respectively;
- c. Adding new paragraph (b);
- d. Revising newly redesignated paragraphs (c)(1) and (3), (d) introductory text, (e) introductory text, (e)(1)(i) and (ii), and (e)(2); and
- e. Adding paragraph (g).

The revisions and additions read as follows:

§ 121.424 Pilots: Initial, transition, conversion, and upgrade flight training.

(a) Initial, transition, and conversion flight training for pilots must include the following:

* * * * *

(b) Beginning on April 27, 2022, in addition to the requirements in paragraph (a) of this section, initial flight training for pilots in command must include sufficient scenario-based training incorporating CRM and leadership and command skills, to ensure the pilot's proficiency as pilot in command. The training required by this paragraph may be completed inflight or in an FSTD.

(c) * * *

(1) That windshear maneuvers and procedures must be performed in an FFS in which the maneuvers and procedures are specifically authorized to be accomplished;

* * * * *

(3) To the extent that certain other maneuvers and procedures may be performed in an FFS, an FTD, or a static airplane as permitted in appendix E to this part.

(d) Except as permitted in paragraph (e) of this section, the initial flight training required by paragraph (a)(1) of this section must include at least the following programmed hours of inflight training and practice unless reduced under §121.405;

* * * * *

(e) If the certificate holder's approved training program includes a course of training utilizing an FFS under §121.409 (c) and (d) of this part, each pilot must successfully complete—

(1) * * *

(i) Training and practice in the FFS in at least all of the maneuvers and procedures set forth in appendix E of this part for initial flight training that are capable of being performed in an FFS; and

(ii) A proficiency check in the FFS or the airplane to the level of proficiency of a pilot in command or second in command, as applicable, in at least the maneuvers and procedures set forth in appendix F of this part that are capable of being performed in an FFS.

(2) With respect to §121.409(d) of this part, training and practice in at least the maneuvers and procedures set forth in the certificate holder's approved low-altitude

windshear flight training program that are capable of being performed in an FFS in which the maneuvers and procedures are specifically authorized.

* * * * *

(g) Before April 27, 2022, upgrade flight training must be provided in accordance with paragraphs (a), (c), (e), and (f), of this section or § 121.426. Beginning on April 27, 2022, upgrade flight training must be provided as specified in § 121.426.

22. Amend § 121.425 as follows:

- a. In paragraphs (a)(1) and (a)(2)(iii), remove the comma after the word “inflight” and remove the words “in an airplane simulator, or in a training device” and add in their place the words “or in an FSTD”;
- b. By redesignating paragraphs (b) and (c) as paragraphs (c) and (d), respectively;
- c. By designating the undesignated paragraph that follows paragraph (a)(2)(iii) as paragraph (b) and revising it;
- d. In newly redesignated paragraph (c), by removing the reference to “paragraph (c)” and adding in its place “paragraph (d)”;
- e. In newly redesignated paragraph (d) introductory text, by removing the words “airplane simulator or other training device” and adding in their place the word “FSTD” and removing the words “simulator or other training device” and adding in their place the word “FSTD”.

The revision reads as follows:

§ 121.425 Flight engineers: Initial and transition flight training.

* * * * *

(b) Flight engineers possessing a commercial pilot certificate with an instrument, category and class rating, or pilots already qualified as second in command and reverting to flight engineer, may complete the entire flight check, required by paragraph (a)(2) of this section, in an approved FFS.

* * * * *

23. Add § 121.426 to read as follows:

§ 121.426 Pilots: Upgrade flight training.

(a) Upgrade flight training for pilots must include the following:

(1) Seat dependent maneuvers and procedures, as applicable;

(2) Duty position maneuvers and procedures, as applicable;

(3) Extended envelope training set forth in § 121.423;

(4) Maneuvers and procedures set forth in the certificate holder's low altitude windshear flight training program;

(5) Sufficient scenario-based training incorporating CRM and leadership and command skills, to ensure the pilot's proficiency as pilot in command; and

(6) Sufficient training to ensure the pilot's knowledge and skill with respect to the following:

(i) The airplane, its systems and components;

(ii) Proper control of airspeed, configuration, direction, altitude, and attitude in accordance with the Airplane Flight Manual, the certificate holder's operations manual, checklists, or other approved material appropriate to the airplane type; and

(iii) Compliance with ATC, instrument procedures, or other applicable procedures.

(b) The training required by paragraph (a) of this section must be performed inflight except--

(1) That windshear maneuvers and procedures must be performed in an FFS in which the maneuvers and procedures are specifically authorized to be accomplished;

(2) That the extended envelope training required by § 121.423 must be performed in a Level C or higher FFS unless the Administrator has issued to the certificate holder a deviation in accordance with § 121.423(e); and

(3) To the extent that certain other maneuvers and procedures may be performed in an FFS, an FTD, or a static airplane as permitted in Appendix E of this part.

(c) If the certificate holder's approved training program includes a course of training utilizing an FFS under § 121.409(c) and (d), each pilot must successfully complete--

(1) With respect to § 121.409(c) -- A proficiency check in the FFS or the airplane to the level of proficiency of a pilot in command in at least the maneuvers and procedures set forth in Appendix F of this part that are capable of being performed in an FFS.

(2) With respect to § 121.409(d), training and practice in at least the maneuvers and procedures set forth in the certificate holder's approved low-altitude windshear flight training program that are capable of being performed in an FFS in which the maneuvers and procedures are specifically authorized.

(d) Compliance dates: Beginning on April 27, 2022, upgrade flight training must satisfy the requirements of this section.

24. Amend § 121.427 as follows:

- a. Revise paragraphs (a), (b)(2) and (4), and (c);
- b. Redesignate paragraphs (d) and (e) as paragraphs (e) and (f), respectively;
- c. Add new paragraph (d); and
- d. Revise newly redesignated paragraphs (e)(1)(ii), (e)(2)(ii), and (f)(1).

The revisions and additions read as follows:

§ 121.427 Recurrent training.

(a) Recurrent training must ensure that each crewmember or aircraft dispatcher is adequately trained and currently proficient with respect to the type airplane (including differences training, if applicable) and crewmember position involved.

(b) * * *

(2) Instruction as necessary in the following:

(i) For pilots, the subjects required for ground training by §§ 121.415(a)(1), (3), and (4) and 121.419(b);

(ii) For flight engineers, the subjects required for ground training by §§ 121.415(a)(1), (3), and (4) and 121.419(a);

(iii) For flight attendants, the subjects required for ground training by §§ 121.415(a)(1), (3), and (4) and 121.421(a); and

(iv) For aircraft dispatchers, the subjects required for ground training by §§ 121.415(a)(1) and (4) and 121.422(a).

* * * * *

(4) For crewmembers, CRM training and for aircraft dispatchers, DRM training. For flightcrew members, CRM training or portions thereof may be accomplished during an approved FFS line-oriented flight training (LOFT) session.

(c) Recurrent ground training for crewmembers and aircraft dispatchers must consist of at least the following programmed hours of instruction in the required subjects specified in paragraph (b) of this section unless reduced under § 121.405:

(1) For pilots –

(i) Group I reciprocating powered airplanes, 15 hours;

(ii) Group I turbopropeller powered airplanes, 19 hours; and

(iii) Group II airplanes, 24 hours.

(2) For flight engineers—

(i) Group I, reciprocating powered airplanes, 16 hours;

(ii) Group I turbopropeller powered airplanes, 20 hours; and

(iii) Group II airplanes, 25 hours.

(3) For flight attendants—

(i) Group I reciprocating powered airplanes, 4 hours;

(ii) Group I turbopropeller powered airplanes, 5 hours; and

(iii) Group II airplanes, 12 hours.

(4) For aircraft dispatchers—

(i) Group I reciprocating powered airplanes, 8 hours;

(ii) Group I turbopropeller powered airplanes, 10 hours; and

(iii) Group II airplanes, 20 hours.

(d) Recurrent ground training for pilots serving as pilot in command:

(1) Within 36 months preceding service as pilot in command, each person must complete recurrent ground training on leadership and command and mentoring. This training is in addition to the ground training required in paragraph (b) of this section and the programmed hours required in paragraph (c) of this section. This training must include instruction and facilitated discussion on the following:

(i) Leadership and command, including instruction on flightcrew member duties under § 121.542; and

(ii) Mentoring, including techniques for instilling and reinforcing the highest standards of technical performance, airmanship, and professionalism in newly hired pilots.

(2) The requirements of paragraph (d)(1) do not apply until after a pilot has completed ground training on leadership and command and mentoring, as required by §§ 121.419, 121.420 and 121.429, as applicable.

(e) * * *

(1) * * *

(ii) Flight training in an approved FFS in maneuvers and procedures set forth in the certificate holder's approved low-altitude windshear flight training program and flight training in maneuvers and procedures set forth in Appendix F of this part, or in a flight training program approved by the Administrator, except as follows--

* * * * *

(2) * * *

(ii) The flight check, other than the preflight inspection, may be conducted in an FSTD. The preflight inspection may be conducted in an airplane, or by using an approved pictorial means that realistically portrays the location and detail of preflight inspection items and provides for the portrayal of abnormal conditions. Satisfactory completion of an approved line-oriented flight training may be substituted for the flight check.

(f) * * *

(1) Compliance with the requirements identified in paragraph (e)(1)(i) of this section is required no later than March 12, 2019.

* * * * *

25. Add § 121.429 to subpart N to read as follows:

§ 121.429 Pilots in command: Leadership and command and mentoring training

(a) Beginning on April 27, 2023, no certificate holder may use a pilot as pilot in command in an operation under this part unless the pilot has completed the following ground training in accordance with the certificate holder's approved training program:

(1) Leadership and command training in § 121.419(c)(1) and mentoring training in § 121.419(c)(2); or

(2) Leadership and command training in § 121.420(b)(1) and mentoring training in § 121.420(b)(2).

(b) Credit for training provided by the certificate holder:

(1) The Administrator may credit leadership and command training and mentoring training completed by the pilot, with that certificate holder, after April 27, 2017, and prior to April 27, 2020, toward all or part of the training required by paragraph (a) of this section.

(2) In granting credit for the training required by paragraph (a) of this section, the Administrator may consider training aids, devices, methods, and procedures used by the certificate holder in voluntary leadership and command and mentoring instruction.

26. Amend § 121.431 by revising paragraph (a)(1) to read as follows:

§ 121.431 Applicability.

(a) * * *

(1) Prescribes crewmember qualifications for all certificate holders except where otherwise specified; and

* * * * *

27. Amend § 121.432 by revising paragraph (a) to read as follows:

§ 121.432 General.

(a) Except in the case of operating experience under § 121.434 and ground training for mentoring required by §§ 121.419, 121.420, 121.427, and 121.429, as applicable, a pilot who serves as second in command of an operation that requires three or more pilots must be fully qualified to act as pilot in command of that operation.

* * * * *

28. Amend § 121.433 by revising paragraphs (a)(2) and (c)(2) to read as follows:

§ 121.433 Training required.

(a) * * *

(2) Crewmembers who have qualified and served as second in command or flight engineer on a particular type airplane may serve as pilot in command or second in command, respectively, upon completion of upgrade or conversion training, as applicable, for that airplane as provided in § 121.415.

* * * * *

(c) * * *

(2) For pilots, a proficiency check as provided in §121.441 of this part may be substituted for the recurrent flight training required by this paragraph and the approved FFS course of training under §121.409(b) of this part may be substituted for alternate periods of recurrent flight training required in that airplane, except as provided in paragraphs (d) and (e) of this section.

* * * * *

29. Amend § 121.434 by revising paragraph (b)(3), adding paragraph (b)(4), and revising paragraphs (c)(1)(ii) and (c)(3)(iii) to read as follows:

§ 121.434 Operating experience, operating cycles, and consolidation of knowledge and skills.

* * * * *

(b) * * *

(3) In the case of a pilot who satisfactorily completed the preflight visual inspection of an aircraft by approved pictorial means during an initial, transition, conversion, or upgrade proficiency check, the pilot must also demonstrate proficiency to a check pilot on at least one complete preflight visual inspection of the interior and exterior of a static airplane. This demonstration of proficiency must be completed by the pilot and certified by the check pilot before the completion of operating experience.

(4) The experience must be acquired inflight during operations under this part. However, in the case of an aircraft not previously used by the certificate holder in

operations under this part, operating experience acquired in the aircraft during proving flights or ferry flights may be used to meet this requirement.

(c) * * *

(1) * * *

(ii) For a qualifying pilot in command completing initial or upgrade training specified in § 121.424 or § 121.426, be observed in the performance of prescribed duties by an FAA inspector during at least one flight leg which includes a takeoff and landing. During the time that a qualifying pilot in command is acquiring the operating experience in paragraphs (c)(1)(i) and (ii) of this section, a check pilot who is also serving as the pilot in command must occupy a pilot station. However, in the case of a transitioning pilot in command the check pilot serving as pilot in command may occupy the observer's seat, if the transitioning pilot has made at least two takeoffs and landings in the type airplane used, and has satisfactorily demonstrated to the check pilot that he is qualified to perform the duties of a pilot in command of that type of airplane.

* * * * *

(3) * * *

(iii) In the case of transition training where the certificate holder's approved training program includes a course of training in an FFS under §121.409(c), each pilot in command must comply with the requirements prescribed in paragraph (c)(3)(i) of this section for initial training.

* * * * *

30. Add § 121.435 to read as follows:

§ 121.435 Pilots: Operations Familiarization.

(a) *Applicability.* The operations familiarization requirements in paragraph (b) of this section apply to all persons newly hired by the certificate holder to serve as a pilot in part 121 operations and who began the certificate holder's basic indoctrination ground training on or after April 27, 2022. The requirements in paragraph (b) of this section also apply to all certificate holders required to comply with this subpart, except for those certificate holders operating under part 135 of this chapter that have been authorized to comply with this subpart instead of the requirements of part 135, subparts E, G, and H, pursuant to § 135.3(c), and those fractional ownership program managers operating under part 91, subpart K, of this chapter that have been authorized to comply with this subpart instead of §§ 91.1065 through 91.1107, pursuant to § 91.1063(b) of this chapter.

(b) *Operations familiarization requirements.* (1) No certificate holder may use, and no person may serve as, a pilot in operations under this part unless that person has completed the operations familiarization required by this paragraph (b). Operations familiarization may be completed during or after basic indoctrination training, but must be completed before the pilot begins operating experience under § 121.434.

(2) Operations familiarization must include at least two operating cycles conducted by the certificate holder in accordance with the operating rules of this part.

(3) All pilots completing operations familiarization must occupy the observer seat on the flight deck and have access to and use an operational headset.

(c) *Deviation.* (1) A certificate holder who operates an aircraft that does not have an observer seat on the flight deck may submit a request to the Administrator for approval of a deviation from the requirements of paragraphs (a) and (b) of this section.

(2) A request for deviation from any of the requirements in paragraphs (a) and (b) of this section must include the following information:

(i) The total number and types of aircraft operated by the certificate holder in operations under this part that do not have an observer seat on the flight deck;

(ii) The total number and types of aircraft operated by the certificate holder in operations under this part that do have an observer seat on the flight deck; and

(iii) Alternative methods for achieving the objectives of this section.

(3) A certificate holder may request an extension of a deviation issued under this section.

(4) Deviations or extensions to deviations will be issued for a period not to exceed 12 months.

31. Amend § 121.439 as follows:

- a. Revise paragraphs (a), (b) introductory text, and (b)(1);
- b. Remove and reserve paragraph (c); and
- c. Revise paragraphs (d), (e), and (f)(2)(ii).

The revisions read as follows:

§ 121.439 Pilot qualification: Recent experience.

(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 airplane in which that person is to serve. The takeoffs and landings required by this paragraph may be performed in a Level B or higher FFS approved under § 121.407 to include takeoff and landing maneuvers. In addition, any person who fails to make the three required takeoffs and landings within any consecutive 90-day period must re-establish recency of experience as provided in paragraph (b) of this section.

(b) In addition to meeting all applicable training and checking requirements of this part, a required pilot flightcrew member who has not met the requirements of paragraph (a) of this section must re-establish recency of experience as follows:

(1) Under the supervision of a check airman, make at least three takeoffs and landings in the type airplane in which that person is to serve or in a Level B or higher FFS.

* * * * *

(d) When using an FFS to accomplish any of the requirements of paragraphs (a) or (b) of this section, each required flightcrew member position must be occupied by an appropriately qualified person, and the FFS must be operated as if in a normal inflight environment without use of the repositioning features of the FFS.

(e) A check airman who observes the takeoffs and landings prescribed in paragraph (b)(1) of this section shall certify that the person being observed is proficient and qualified to perform flight duty in operations under this part and may require any additional maneuvers that are determined necessary to make this certifying statement.

(f) * * *

(2) * * *

(ii) The number of takeoffs, landings, maneuvers, and procedures necessary to maintain or re-establish recency based on review of the related aircraft, the operation, and the duty position.

* * * * *

32. Amend § 121.441 by revising paragraphs (a) introductory text, (a)(1)(i)(B), (a)(1)(ii)(B), (a)(2)(i) and (ii), and (c) through (e) to read as follows:

§ 121.441 Proficiency checks.

(a) No certificate holder may use any person nor may any person serve as a required pilot flight crewmember unless that person has satisfactorily completed either a proficiency check, or an approved FFS course of training under §121.409, as follows:

(1) * * *

(i)* * *

(B) In addition, within the preceding 6 calendar months, either a proficiency check or the approved FFS course of training.

(ii) * * *

(B) In addition, within the preceding 6 calendar months, either a proficiency check or the approved FFS course of training.

(2) * * *

(i) Within the preceding 24 calendar months either a proficiency check or the line-oriented flight training course under §121.409; and

(ii) Within the preceding 12 calendar months, either a proficiency check or any FFS training course under §121.409

* * * * *

(c) An approved FFS or FTD may be used in the conduct of a proficiency check as provided in appendix F to this part.

(d) A person giving a proficiency check may, in his or her discretion, waive any of the maneuvers or procedures for which a specific waiver authority is set forth in Appendix F of this part if the conditions in paragraphs (d)(1) through (3) of this section are satisfied:

(1) The Administrator has not specifically required the particular maneuver or procedure to be performed.

(2) The pilot being checked is, at the time of the check, employed by a certificate holder as a pilot.

(3) The pilot being checked meets one of the following conditions:

(i) The pilot is currently qualified for operations under this part in the particular type airplane and flightcrew member position.

(ii) The pilot has, within the preceding six calendar months, satisfactorily completed an approved training curriculum, except for an upgrade training curriculum in accordance with §§ 121.420 and 121.426, for the particular type airplane.

(e) If the pilot being checked fails any of the required maneuvers, the person giving the proficiency check may give additional training to the pilot during the course of the proficiency check. In addition to repeating the maneuvers failed, the person giving the proficiency check may require the pilot being checked to repeat any other maneuvers he finds are necessary to determine the pilot's proficiency. If the pilot being checked is unable to demonstrate satisfactory performance to the person conducting the check, the certificate holder may not use him nor may he serve in operations under this part until he has satisfactorily completed a proficiency check.

* * * * *

33. Revise appendix E to part 121 to read as follows:

Appendix E to Part 121—Flight Training Requirements

(a) The maneuvers and procedures required by § 121.424 for pilot initial, transition, and conversion flight training are set forth in the certificate holder's approved low-altitude windshear flight training program, § 121.423 extended envelope training, and in this appendix. The maneuvers and procedures required for upgrade training in accordance with § 121.424 are set forth in this appendix and in the certificate holder's approved low-altitude windshear flight training program and § 121.423 extended envelope training. For the maneuvers and procedures required for upgrade training in

accordance with § 121.426, this appendix designates the airplane or FSTD, as appropriate, that may be used.

(b) All required maneuvers and procedures must be performed inflight except that windshear and extended envelope training maneuvers and procedures must be performed in a full flight simulator (FFS) in which the maneuvers and procedures are specifically authorized to be accomplished. Certain other maneuvers and procedures may be performed in an FFS, an FTD, or a static airplane as indicated by the appropriate symbol in the respective column opposite the maneuver or procedure.

(c) Whenever a maneuver or procedure is authorized to be performed in an FTD, it may be performed in an FFS, and in some cases, a static airplane. Whenever the requirement may be performed in either an FTD or a static airplane, the appropriate symbols are entered in the respective columns.

(d) A Level B or higher FFS may be used instead of the airplane to satisfy the inflight requirements if the FFS is approved under § 121.407 and is used as part of an approved program that meets the requirements for an Advanced Simulation Training Program in Appendix H of this part.

(e) For the purpose of this appendix, the following symbols mean—

I = Pilot in Command (PIC) and Second in Command (SIC) initial training

T = PIC and SIC transition training

U = SIC to PIC upgrade training

C = Flight engineer (FE) to SIC conversion training

Maneuvers/Procedures	Inflight	Static airplane	FFS	FTD
As appropriate to the airplane and the operation involved, flight training for pilots must include the following maneuvers and procedures.				
I. Preflight:				
(a) Visual inspection of the exterior and interior of the airplane, the location of each item to be inspected, and the purpose for inspecting it. The visual inspection may be conducted using an approved pictorial means that realistically portrays the location and detail of visual inspection items and provides for the portrayal of normal and abnormal conditions.		I, T, U, C		
(b) Use of the prestart checklist, appropriate control system checks, starting procedures, radio and electronic equipment checks, and the selection of proper navigation and communications radio facilities and frequencies prior to flight.			I, T, U, C	
(c)(1) Before March 12, 2019, taxiing, sailing, and docking procedures in compliance with instructions issued by ATC or by the person conducting the training.	I, T, U, C			
(2) Taxiing. Beginning March 12, 2019, this maneuver includes the following:				
(i) Taxiing, sailing, and docking procedures in compliance with instructions issued by ATC or by the person conducting the training	I, T, U, C			
(ii) Use of airport diagram	I, T, U, C			

Maneuvers/Procedures	Inflight	Static airplane	FFS	FTD
(surface movement chart)				
(iii) Obtaining appropriate clearance before crossing or entering active runways	I, T, U, C			
(iv) Observation of all surface movement guidance control markings and lighting	I, T, U, C			
(d)(1) Before March 12, 2019, pre-takeoff checks that include powerplant checks			I, T, U, C	
(2) Beginning March 12, 2019, pre-takeoff procedures that include powerplant checks, receipt of takeoff clearance and confirmation of aircraft location, and FMS entry (if appropriate) for departure runway prior to crossing hold short line for takeoff			I, T, U, C	
II. Takeoffs:				
Training in takeoffs must include the types and conditions listed below but more than one type may be combined where appropriate:				
(a) Normal takeoffs which, for the purpose of this maneuver, begin when the airplane is taxied into position on the runway to be used	I, T, U, C			
(b) Takeoffs with instrument conditions simulated at or before reaching an altitude of 100' above the airport elevation			I, T, U, C	
(c)(1) Crosswind takeoffs	I, T, U, C			
(2) Beginning March 12, 2019, crosswind takeoffs including crosswind takeoffs with gusts if practicable under the existing meteorological,	I, T, U, C			

Maneuvers/Procedures	Inflight	Static airplane	FFS	FTD
airport, and traffic conditions				
(d) Takeoffs with a simulated failure of the most critical powerplant—			I, T, U, C	
(1) At a point after V1 and before V2 that in the judgment of the person conducting the training is appropriate to the airplane type under the prevailing conditions; or			I, T, U, C	
(2) At a point as close as possible after V1 when V1 and V2 or V1 and VR are identical; or			I, T, U, C	
(3) At the appropriate speed for nontransport category airplanes			I, T, U, C	
(e) Rejected takeoffs accomplished during a normal takeoff run after reaching a reasonable speed determined by giving due consideration to aircraft characteristics, runway length, surface conditions, wind direction and velocity, brake heat energy, and any other pertinent factors that may adversely affect safety or the airplane			I, T, U, C	
(f) Night takeoffs. For pilots in transition training, this requirement may be met during the operating experience required under § 121.434 by performing a normal takeoff at night when a check airman serving as PIC is occupying a pilot station	I, T, U, C			
III. Flight Maneuvers and Procedures:				
(a) Turns with and without spoilers			I, T, U, C	
(b) Tuck and Mach buffet			I, T, U, C	

Maneuvers/Procedures	Inflight	Static airplane	FFS	FTD
(c) Maximum endurance and maximum range procedures			I, T, U, C	
(d) Operation of systems and controls at the flight engineer station			I, T, U	
(e) Runaway and jammed stabilizer			I, T, U, C	
(f) Normal and abnormal or alternate operation of the following systems and procedures:				
(1) Pressurization				I, T, U, C
(2) Pneumatic				I, T, U, C
(3) Air conditioning				I, T, U, C
(4) Fuel and oil		I, T, U, C		I, T, U, C
(5) Electrical		I, T, U, C		I, T, U, C
(6) Hydraulic		I, T, U, C		I, T, U, C
(7) Flight control		I, T, U, C		I, T, U, C
(8) Anti-icing and deicing			I, T, U, C	
(9) Autopilot			I, T, U, C	
(10) Automatic or other approach aids			I, T, U, C	
(11) Stall warning devices, stall avoidance devices, and stability augmentation devices			I, T, U, C	
(12) Airborne radar devices			I, T, U, C	
(13) Any other systems, devices, or aids available			I, T, U, C	
(14) Electrical, hydraulic, flight control, and flight instrument system malfunctioning or failure		I, T, U, C		I, T, U, C
(15) Landing gear and flap systems failure or malfunction		I, T, U, C		I, T, U, C
(16) Failure of navigation or communications equipment			I, T, U, C	
(g) Flight emergency procedures that include at				

Maneuvers/Procedures	Inflight	Static airplane	FFS	FTD
least the following:				
(1) Powerplant, heater, cargo compartment, cabin, flight deck, wing, and electrical fires		I, T, U, C		I, T, U, C
(2) Smoke control		I, T, U, C		I, T, U, C
(3) Powerplant failures			I, T	U, C
(4) Fuel jettisoning		I, T, U, C		I, T, U, C
(5) Any other emergency procedures outlined in the appropriate flight manual			I, T, U, C	
(h) Steep turns in each direction. Each steep turn must involve a bank angle of 45° with a heading change of at least 180° but not more than 360°. This maneuver is not required for Group I transition training.			I, T, U, C	
(i) Stall Prevention. For the purpose of this training the approved recovery procedure must be initiated at the first indication of an impending stall (buffet, stick shaker, aural warning). Stall prevention training must be conducted in at least the following configurations:			I, T, U, C	
(1) Takeoff configuration (except where the airplane uses only a zero-flap takeoff configuration)			I, T, U, C	
(2) Clean configuration			I, T, U, C	
(3) Landing configuration			I, T, U, C	
(j) Recovery from specific flight characteristics that are peculiar to the airplane type			I, T, U, C	
(k) Instrument procedures that include the following:				
(1) Area departure and arrival			I, T, U, C	
(2) Use of navigation systems including			I, T, U, C	

Maneuvers/Procedures	Inflight	Static airplane	FFS	FTD
adherence to assigned radials				
(3) Holding			I, T, U, C	
(l) ILS instrument approaches that include the following:				
(1) Normal ILS approaches	I, T, U, C			
(2) Manually controlled ILS approaches with a simulated failure of one powerplant which occurs before initiating the final approach course and continues to touchdown or through the missed approach procedure	I		T, U, C	
(m) Instrument approaches and missed approaches other than ILS which include the following:				
(1) Nonprecision approaches that the pilot is likely to use			U, C	I, T
(2) In addition to subparagraph (1) of this paragraph, at least one other nonprecision approach and missed approach procedure that the pilot is likely to use			I, T, U, C	
In connection with paragraphs III(l) and III(m), each instrument approach must be performed according to any procedures and limitations approved for the approach facility used. The instrument approach begins when the airplane is over the initial approach fix for the approach procedure being used (or turned over to the final approach controller in the case of GCA approach) and ends when the airplane touches down on the runway or when transition to a missed approach configuration is completed				

Maneuvers/Procedures	Inflight	Static airplane	FFS	FTD
(n) Circling approaches which include the following:	I, T, U, C			
(1) That portion of the circling approach to the authorized minimum altitude for the procedure being used must be made under simulated instrument conditions	I, T, U, C			
(2) The circling approach must be made to the authorized minimum circling approach altitude followed by a change in heading and the necessary maneuvering (by visual reference) to maintain a flight path that permits a normal landing on a runway at least 90° from the final approach course of the simulated instrument portion of the approach	I, T, U, C			
(3) The circling approach must be performed without excessive maneuvering, and without exceeding the normal operating limits of the airplane. The angle of bank should not exceed 30°	I, T, U, C			
Training in the circling approach maneuver is not required if the certificate holder's manual prohibits a circling approach in weather conditions below 1000-3 (ceiling and visibility).				
(o) Zero-flap approaches. Training in this maneuver is not required for a particular airplane type if the Administrator has determined that the probability of flap extension failure on that type airplane is extremely remote due to system design. In making this determination, the Administrator determines whether training on slats only and partial flap approaches is	I, C		T, U	

Maneuvers/Procedures	Inflight	Static airplane	FFS	FTD
necessary				
(p) Missed approaches which include the following:				
(1) Missed approaches from ILS approaches			I, T, U, C	
(2) Other missed approaches				I, T, U, C
(3) Missed approaches that include a complete approved missed approach procedure				I, T, U, C
(4) Missed approaches that include a powerplant failure			I, T, U, C	
IV. Landings and Approaches to Landings:				
Training in landings and approaches to landings must include the types and conditions listed below but more than one type may be combined where appropriate:				
(a) Normal landings	I, T, U, C			
(b) Landing and go around with the horizontal stabilizer out of trim	I, C		T	U
(c) Landing in sequence from an ILS instrument approach	I		T, U, C	
(d)(1) Crosswind landing	I, T, U, C			
(2) Beginning March 12, 2019, crosswind landing, including crosswind landings with gusts if practicable under the existing meteorological, airport, and traffic conditions	I, T, U, C			
(e) Maneuvering to a landing with simulated powerplant failure, as follows:				
(1) For 3-engine airplanes, maneuvering to a landing with an approved procedure that approximates the loss of	I, C		T, U	

Maneuvers/Procedures	Inflight	Static airplane	FFS	FTD
two powerplants (center and one outboard engine)				
(2) For other multiengine airplanes, maneuvering to a landing with a simulated failure of 50 percent of available powerplants with the simulated loss of power on one side of the airplane	I, C		T, U	
(f) Landing under simulated circling approach conditions (exceptions under III(n) applicable to this requirement)	I		T, U, C	
(g) Rejected landings that include a normal missed approach procedure after the landing is rejected. For the purpose of this maneuver the landing should be rejected at approximately 50 feet and approximately over the runway threshold	I		T, U, C	
(h) Zero-flap landings if the Administrator finds that maneuver appropriate for training in the airplane	I, C		T, U	
(i) Manual reversion			I, T, U, C	
(j) Night landings. For pilots in transition training, this requirement may be met during the operating experience required under § 121.434 by performing a normal landing at night when a check airman serving as PIC is occupying a pilot station	I, T, U, C			

34. Revise appendix F to part 121 to read as follows:

Appendix F to Part 121—Proficiency Check Requirements

(a) The maneuvers and procedures required by § 121.441 for pilot proficiency checks are set forth in this appendix. Except for the equipment examination, these maneuvers and procedures must be performed inflight. Certain maneuvers and procedures may be performed in an FFS or an FTD as indicated by the appropriate symbol in the respective column opposite the maneuver or procedure.

(b) Whenever a maneuver or procedure is authorized to be performed in an FTD, it may be performed in an FFS.

(c) A Level B or higher FFS may be used instead of the airplane to satisfy the inflight requirements if the FFS is approved under § 121.407 and is used as part of an approved program that meets the requirements for an Advanced Simulation Training Program in Appendix H of this part.

(d) For the purpose of this appendix, the following symbols mean—

B = Both Pilot in Command (PIC) and Second in Command (SIC).

W = May be waived for both PIC and SIC, except during a proficiency check conducted to qualify a PIC after completing an upgrade training curriculum in accordance with §§ 121.420 and 121.426.

* = A symbol and asterisk (B* or W*) indicates that a particular condition is specified in the maneuvers and procedures column.

= When a maneuver is preceded by this symbol it indicates the maneuver may be required in the airplane at the discretion of the person conducting the check.

(e) Throughout the maneuvers and procedures prescribed in this appendix, good judgment commensurate with a high level of safety must be demonstrated. In determining

whether such judgment has been shown, the person conducting the check considers adherence to approved procedures, actions based on analysis of situations for which there is no prescribed procedure or recommended practice, and qualities of prudence and care in selecting a course of action.

	Required		Permitted		
	Simulated instrument conditions	Inflight	FFS	FTD	Waiver provisions of § 121.441(d)
Maneuvers/Procedures					
The procedures and maneuvers set forth in this appendix must be performed in a manner that satisfactorily demonstrates knowledge and skill with respect to— (1) The airplane, its systems and components; (2) Proper control of airspeed, configuration, direction, altitude, and attitude in accordance with procedures and limitations contained in the approved Airplane Flight Manual, the certificate holder's operations manual, checklists, or other approved material appropriate to the airplane type; and (3) Compliance with approach, ATC, or other applicable procedures.					
I. Preflight:					
(a) Equipment examination (oral or written). As part of the proficiency check the equipment examination must be closely coordinated with, and related to, the flight maneuvers portion but may not be given during the flight maneuvers portion. The equipment examination must cover— (1) Subjects requiring a practical knowledge of the airplane, its powerplants, systems, components, operational and performance factors; (2) Normal, abnormal, and emergency procedures, and the operations and limitations relating thereto; and (3) The appropriate provisions of the approved Airplane Flight Manual					
The person conducting the check may					

	Required		Permitted		
	Simulated instrument conditions	Inflight	FFS	FTD	Waiver provisions of § 121.441(d)
Maneuvers/Procedures					
accept, as equal to this equipment examination, an equipment examination given to the pilot in the certificate holder's ground training within the preceding 6 calendar months					
(b) Preflight inspection. The pilot must—					
(1) Conduct an actual visual inspection of the exterior and interior of the airplane, locating each item and explaining briefly the purpose for inspecting it. The visual inspection may be conducted using an approved pictorial means that realistically portrays the location and detail of visual inspection items and provides for the portrayal of normal and abnormal conditions. If a flight engineer is a required flightcrew member for the particular type airplane, the visual inspection may be waived under § 121.441(d).				B	W*
(2) Demonstrate the use of the prestart checklist, appropriate control system checks, starting procedures, radio and electronic equipment checks, and the selection of proper navigation and communications radio facilities and frequencies prior to flight				B	
(c)(1) Taxiing. Before March 12, 2019, this maneuver includes taxiing, sailing, or docking procedures in compliance with instructions issued by ATC or by the person conducting the check. SIC proficiency checks for a type rating must include taxiing. However, other SIC proficiency checks need only include taxiing to the extent practical from the seat position assigned to the SIC.		B			
(c)(2) Taxiing. Beginning March 12, 2019, this maneuver includes the following: (i) Taxiing, sailing, or docking procedures in compliance with instructions issued by ATC or by the person conducting the check. (ii) Use of airport diagram (surface movement		B			

	Required		Permitted		
	Simulated instrument conditions	Inflight	FFS	FTD	Waiver provisions of § 121.441(d)
Maneuvers/Procedures					
chart). (iii) Obtaining appropriate clearance before crossing or entering active runways. (iv) Observation of all surface movement guidance control markings and lighting. SIC proficiency checks for a type rating must include taxiing. However, other SIC proficiency checks need only include taxiing to the extent practical from the seat position assigned to the SIC.					
(d)(1) Powerplant checks. As appropriate to the airplane type			B		
(d)(2) Beginning March 12, 2019, pre-takeoff procedures that include powerplant checks, receipt of takeoff clearance and confirmation of aircraft location, and FMS entry (if appropriate), for departure runway prior to crossing hold short line for takeoff			B		
II. Takeoff:					
Takeoffs must include the types listed below, but more than one type may be combined where appropriate:					
(a) Normal. One normal takeoff which, for the purpose of this maneuver, begins when the airplane is taxied into position on the runway to be used		B*			
(b) Instrument. One takeoff with instrument conditions simulated at or before reaching an altitude of 100' above the airport elevation	B		B*		
(c)(1) Crosswind. Before March 12, 2019, one crosswind takeoff, if practicable, under the existing meteorological, airport, and traffic conditions		B*			
(c)(2) Beginning March 12, 2019, one crosswind takeoff with gusts, if practicable, under the existing meteorological, airport, and traffic conditions		B*			
#(d) Powerplant failure. One takeoff with a simulated failure of the most			B		

Maneuvers/Procedures	Required		Permitted		
	Simulated instrument conditions	Inflight	FFS	FTD	Waiver provisions of § 121.441(d)
critical powerplant—					
(1) At a point after V1 and before V2 that in the judgment of the person conducting the check is appropriate to the airplane type under the prevailing conditions;			B		
(2) At a point as close as possible after V1 when V1 and V2 or V1 and Vr are identical; or			B		
(3) At the appropriate speed for nontransport category airplanes			B		
(e) Rejected. A rejected takeoff may be performed in an airplane during a normal takeoff run after reaching a reasonable speed determined by giving due consideration to aircraft characteristics, runway length, surface conditions, wind direction and velocity, brake heat energy, and any other pertinent factors that may adversely affect safety or the airplane			B*		W
III. Instrument procedures:					
(a) Area departure and area arrival. During each of these maneuvers the pilot must—	B		B		W*
(1) Adhere to actual or simulated ATC clearances (including assigned radials); and	B		B		
(2) Properly use available navigation facilities	B		B		
Either area arrival or area departure, but not both, may be waived under § 121.441(d)					
(b) Holding. This maneuver includes entering, maintaining, and leaving holding patterns. It may be performed in connection with either area departure or area arrival	B		B		W
(c) ILS and other instrument approaches. There must be the following:					

Maneuvers/Procedures	Required		Permitted		
	Simulated instrument conditions	Inflight	FFS	FTD	Waiver provisions of § 121.441(d)
(1) At least one normal ILS approach	B		B		
(2) At least one manually controlled ILS approach with a simulated failure of one powerplant. The simulated failure should occur before initiating the final approach course and must continue to touchdown or through the missed approach procedure	B	B			
(3) At least one nonprecision approach procedure using a type of nonprecision approach procedure that the certificate holder is approved to use	B		B		
(4) At least one nonprecision approach procedure using a different type of nonprecision approach procedure than performed under subparagraph (3) of this paragraph that the certificate holder is approved to use.	B			B	
(5) For each type of EFVS operation the certificate holder is authorized to conduct, at least one instrument approach must be made using an EFVS.	B	B*			
Each instrument approach must be performed according to any procedures and limitations approved for the approach procedure used. The instrument approach begins when the airplane is over the initial approach fix for the approach procedure being used (or turned over to the final approach controller in the case of GCA approach) and ends when the airplane touches down on the runway or when transition to a missed approach configuration is completed. Instrument conditions need not be simulated below 100' above touchdown zone elevation					
(d) Circling approaches. If the certificate holder is approved for circling minimums below 1000-3 (ceiling and visibility), at least one circling approach must be made under the following conditions—			B*		W*

Maneuvers/Procedures	Required		Permitted		
	Simulated instrument conditions	Inflight	FFS	FTD	Waiver provisions of § 121.441(d)
(1) The portion of the approach to the authorized minimum circling approach altitude must be made under simulated instrument conditions	B		B*		
(2) The approach must be made to the authorized minimum circling approach altitude followed by a change in heading and the necessary maneuvering (by visual reference) to maintain a flight path that permits a normal landing on a runway at least 90° from the final approach course of the simulated instrument portion of the approach			B*		
(3) The circling approach must be performed without excessive maneuvering, and without exceeding the normal operating limits of the airplane. The angle of bank should not exceed 30°			B*		
If local conditions beyond the control of the pilot prohibit the maneuver or prevent it from being performed as required, it may be waived as provided in §121.441(d). However, the maneuver may not be waived under this provision for two successive proficiency checks. Except for a SIC proficiency check for a type rating, the circling approach maneuver is not required for a SIC if the certificate holder's manual prohibits a SIC from performing a circling approach in operations under this part.					
(e) Missed approach.					
(1) At least one missed approach from an ILS approach.			B*		
(2) At least one additional missed approach for SIC proficiency checks for a type rating and for all PIC proficiency checks.			B*		
A complete approved missed approach procedure must be accomplished at least once. At the discretion of the person conducting the check a simulated					

Maneuvers/Procedures	Required		Permitted		
	Simulated instrument conditions	Inflight	FFS	FTD	Waiver provisions of § 121.441(d)
powerplant failure may be required during any of the missed approaches. These maneuvers may be performed either independently or in conjunction with maneuvers required under Sections III or V of this appendix. At least one missed approach must be performed inflight					
IV. Inflight Maneuvers:					
(a) Steep turns. For SIC proficiency checks for a type rating and for all PIC proficiency checks, at least one steep turn in each direction must be performed. Each steep turn must involve a bank angle of 45° with a heading change of at least 180° but not more than 360°	B		B		W
(b) Stall Prevention. For the purpose of this maneuver the approved recovery procedure must be initiated at the first indication of an impending stall (buffet, stick shaker, aural warning). Except as provided below there must be at least three stall prevention recoveries as follows:	B		B		W*
(1) Takeoff configuration (except where the airplane uses only a zero-flap takeoff configuration).	B		B		
(2) Clean configuration.	B		B		
(3) Landing configuration.	B		B		
At the discretion of the person conducting the check, one stall prevention recovery must be performed in one of the above configurations while in a turn with the bank angle between 15° and 30°. Two out of the three stall prevention recoveries required by this paragraph may be waived.					
If the certificate holder is authorized to dispatch or flight release the airplane with a stall warning device inoperative the device may not be used during this maneuver					
(c) Specific flight characteristics. Recovery from specific flight			B		W

Maneuvers/Procedures	Required		Permitted		
	Simulated instrument conditions	Inflight	FFS	FTD	Waiver provisions of § 121.441(d)
characteristics that are peculiar to the airplane type					
(d) Powerplant failures. In addition to specific requirements for maneuvers with simulated powerplant failures, the person conducting the check may require a simulated powerplant failure at any time during the check			B		
V. Landings and Approaches to Landings:					
Notwithstanding the authorizations for combining and waiving maneuvers and for the use of an FFS, at least two actual landings (one to a full stop) must be made for all PIC proficiency checks, all initial SIC proficiency checks, and all SIC proficiency checks for a type rating.					
Landings and approaches to landings must include the types listed below, but more than one type may be combined where appropriate:					
(a) Normal landing		B			
(b) Landing in sequence from an ILS instrument approach except that if circumstances beyond the control of the pilot prevent an actual landing, the person conducting the check may accept an approach to a point where in his judgment a landing to a full stop could have been made		B*			
(c)(1) Crosswind landing, if practical under existing meteorological, airport, and traffic conditions		B*			
(c)(2) Beginning March 12, 2019, crosswind landing with gusts, if practical under existing meteorological, airport, and traffic conditions		B*			
(d) Maneuvering to a landing with simulated powerplant failure as follows:					
(1) In the case of 3-engine airplanes, maneuvering to a landing with an approved procedure that approximates the loss of two			B*		

	Required		Permitted		
	Simulated instrument conditions	Inflight	FFS	FTD	Waiver provisions of § 121.441(d)
Maneuvers/Procedures					
powerplants (center and one outboard engine); or					
(2) In the case of other multiengine airplanes, maneuvering to a landing with a simulated failure of 50 percent of available powerplants, with the simulated loss of power on one side of the airplane			B*		
Notwithstanding the requirements of subparagraphs (d) (1) and (2) of this paragraph, for an SIC proficiency check, except for an SIC proficiency check for a type rating, the simulated loss of power may be only the most critical powerplant. In addition, a PIC may omit the maneuver required by subparagraph (d)(1) or (d)(2) of this paragraph during a required proficiency check or FFS course of training if he satisfactorily performed that maneuver during the preceding proficiency check, or during the preceding approved FFS course of training under the observation of a check airman, whichever was completed later.					
(e) Except as provided in paragraph (f) of this section, if the certificate holder is approved for circling minimums below 1000-3 (ceiling and visibility), a landing under simulated circling approach conditions. However, when performed in an airplane, if circumstances beyond the control of the pilot prevent a landing, the person conducting the check may accept an approach to a point where, in his judgment, a landing to a full stop could have been made.			B*		
#(f) A rejected landing, including a normal missed approach procedure, that is rejected approximately 50' over the runway and approximately over the runway threshold. This maneuver may be combined with instrument, circling, or missed approach procedures, but instrument conditions need not be simulated below 100 feet above the runway			B		

Maneuvers/Procedures	Required		Permitted		
	Simulated instrument conditions	Inflight	FFS	FTD	Waiver provisions of § 121.441(d)
(g) If the certificate holder is authorized to conduct EFVS operations to touchdown and rollout, at least one instrument approach to a landing must be made using an EFVS, including the use of enhanced flight vision from 100 feet above the touchdown zone elevation to touchdown and rollout	B	B*			
(h) If the certificate holder is authorized to conduct EFVS operations to 100 feet above the touchdown zone elevation, at least one instrument approach to a landing must be made using an EFVS, including the transition from enhanced flight vision to natural vision at 100 feet above the touchdown zone elevation	B	B*			
VI. Normal and Abnormal Procedures:					
Each pilot must demonstrate the proper use of as many of the systems and devices listed below as the person conducting the check finds are necessary to determine that the person being checked has a practical knowledge of the use of the systems and devices appropriate to the airplane type:					
(a) Anti-icing and deicing systems			B		
(b) Autopilot systems			B		
(c) Automatic or other approach aid systems			B		
(d) Stall warning devices, stall avoidance devices, and stability augmentation devices			B		
(e) Airborne radar devices			B		
(f) Any other systems, devices, or aids available			B		
(g) Hydraulic and electrical system failures and malfunctions				B	
(h) Landing gear and flap systems failure or malfunction				B	
(i) Failure of navigation or communications equipment			B		

Maneuvers/Procedures	Required		Permitted		
	Simulated instrument conditions	Inflight	FFS	FTD	Waiver provisions of § 121.441(d)
VII. Emergency Procedures:					
Each pilot must demonstrate the proper emergency procedures for as many of the emergency situations listed below as the person conducting the check finds are necessary to determine that the person being checked has an adequate knowledge of, and ability to perform, such procedure:					
(a) Fire in flight			B		
(b) Smoke control			B		
(c) Rapid decompression			B		
(d) Emergency descent			B		
(e) Any other emergency procedures outlined in the approved Airplane Flight Manual			B		

35. Revise appendix H to part 121 to read as follows:

Appendix H to Part 121—Advanced Simulation

This appendix prescribes criteria for use of Level B or higher FFSs to satisfy the inflight requirements of Appendices E and F of this part and the requirements of § 121.439. The criteria in this appendix are in addition to the FFS approval requirements in § 121.407. Each FFS used under this appendix must be approved as a Level B, C, or D FFS, as appropriate.

ADVANCED SIMULATION TRAINING PROGRAM

For a certificate holder to conduct Level C or D training under this appendix all required FFS instruction and checks must be conducted under an advanced simulation

training program approved by the Administrator for the certificate holder. This program must also ensure that all instructors and check airmen used in Appendix H training and checking are highly qualified to provide the training required in the training program. The advanced simulation training program must include the following:

1. The certificate holder's initial, transition, conversion, upgrade, and recurrent FFS training programs and its procedures for re-establishing recency of experience in the FFS.

2. How the training program will integrate Level B, C, and D FFSs with other FSTDs to maximize the total training, checking, and certification functions.

3. Documentation that each instructor and check airman has served for at least 1 year in that capacity in a certificate holder's approved program or has served for at least 1 year as a pilot in command or second in command in an airplane of the group in which that pilot is instructing or checking.

4. A procedure to ensure that each instructor and check airman actively participates in either an approved regularly scheduled line flying program as a flightcrew member or an approved line observation program in the same airplane type for which that person is instructing or checking.

5. A procedure to ensure that each instructor and check airman is given a minimum of 4 hours of training each year to become familiar with the certificate holder's advanced simulation training program, or changes to it, and to emphasize their respective roles in the program. Training for instructors and check airmen must include training

policies and procedures, instruction methods and techniques, operation of FFS controls (including environmental and trouble panels), limitations of the FFS, and minimum equipment required for each course of training.

6. A special Line-Oriented Flight Training (LOFT) program to facilitate the transition from the FFS to line flying. This LOFT program must consist of at least a 4-hour course of training for each flightcrew. It also must contain at least two representative flight segments of the certificate holder's operations. One of the flight segments must contain strictly normal operating procedures from push back at one airport to arrival at another. Another flight segment must contain training in appropriate abnormal and emergency flight operations. After March 12, 2019, the LOFT must provide an opportunity for the pilot to demonstrate workload management and pilot monitoring skills.

FFS TRAINING, CHECKING AND QUALIFICATION PERMITTED

1. Level B FFS

a. Recent experience (§ 121.439).

b. Training in night takeoffs and landings (Appendix E of this part).

c. Except for EFVS operations, landings in a proficiency check (Appendix F of this part).

2. Level C and D FFS

a. Recent experience (§ 121.439).

b. All pilot flight training and checking required by this part except the following:

i. The operating experience, operating cycles, and consolidation of knowledge and skills requirements of § 121.434;

ii. The line check required by § 121.440; and

iii. The visual inspection of the exterior and interior of the airplane required by appendices E and F.

c. The practical test requirements of § 61.153(h) of this chapter, except the visual inspection of the exterior and interior of the airplane.

PART 135—OPERATING REQUIREMENTS: COMMUTER AND ON DEMAND OPERATIONS AND RULES GOVERNING PERSONS ON BOARD SUCH AIRCRAFT

36. The authority citation for part 135 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40113, 41706, 44701-44702, 44705, 44709, 44711-44713, 44715-44717, 44722, 44730, 45101-45105; Pub. L. 112-95, 126 Stat. 58 (49 U.S.C. 44730).

37. Amend § 135.3 by adding paragraph (d) to read as follows:

§ 135.3 Rules applicable to operations subject to this part.

* * * * *

(d) Additional limitations applicable to certificate holders that are required by paragraph (b) of this section or authorized in accordance with paragraph (c) of this

section, to comply with part 121, subparts N and O of this chapter instead of subparts E, G, and H of this part.

(1) *Upgrade training.* (i) Each certificate holder must include in upgrade ground training for pilots, instruction in at least the subjects identified in § 121.419(a) of this chapter, as applicable to their assigned duties; and, for pilots serving in crews of two or more pilots, beginning on April 27, 2022, instruction and facilitated discussion in the subjects identified in § 121.419(c) of this chapter.

(ii) Each certificate holder must include in upgrade flight training for pilots, flight training for the maneuvers and procedures required in § 121.424(a), (c), (e), and (f) of this chapter; and, for pilots serving in crews of two or more pilots, beginning on April 27, 2022, the flight training required in § 121.424(b) of this chapter.

(2) *Initial and recurrent leadership and command and mentoring training.* Certificate holders are not required to include leadership and command training in §§ 121.409(b)(2)(ii)(B)(6), 121.419(c)(1), 121.424(b) and 121.427(d)(1) of this chapter and mentoring training in §§ 121.419(c)(2) and 121.427(d)(1) of this chapter in initial and recurrent training for pilots in command who serve in operations that use only one pilot.

(3) *One-time leadership and command and mentoring training.* Section 121.429 of this chapter does not apply to certificate holders conducting operations under this part when those operations use only one pilot.

Issued under authority provided by 49 U.S.C. 106(f), 106(g), 44701(a), and Sec. 206 of Public Law 111-216, 124 Stat. 2348 (49 U.S.C. 44701 note) in Washington, DC, on January 13, 2020.

Steve Dickson

Administrator.

[FR Doc. 2020-01111 Filed: 2/24/2020 8:45 am; Publication Date: 2/25/2020]