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121

Title 14—AERONAUTICS AND SPACE

Chapter 1—Federal Aviation Adminis- tration, Department of Transportation

[Docket No. 10453, Amdts. Nos. 61-56, 121-91]

PART 61—CERTIFICATION: PILOTS AND FLIGHT INSTRUCTORS

PART 121—CERTIFICATION AND OP- ERATIONS: DOMESTIC, FLAG, AND SUPPLEMENTAL AIR CARRIERS AND COMMERCIAL OPERATORS OF LARGE AIRCRAFT

Training Requirements

The purpose of these amendments to Parts 61 and 121 of the Federal Aviation Regulations is to permit greater use of simulators in the conduct of training and flight checks under Appendix A to Part 61 and Appendices E and F to Part 121, and to clarify certain requirements of Subpart O of Part 121 as adopted by Amendment 121-55 (35 F.R. 84, effective February 2, 1970). These amendments are also applicable to air travel club operations governed by Part 123, and to air taxi operations using large aircraft, as provided in § 135.2.

In adopting Amendment 121-55, the FAA noted its awareness of the rapidly developing field of simulator technology, and stated that the agency would continue to explore all possibilities for translating the new technology into effective regulations to permit the safest and most effective training programs possible. Based upon FAA efforts to that end, the agency has determined that the following amendments are appropriate in the interest of safety.

(As published in the Federal Register
37 F.R. 10727 on May 27, 1972)

Currently, paragraph V(d) of Appendix A to Part 61 requires an applicant for an airline transport pilot certificate and associated class and type ratings to maneuver, in flight, to a landing with a simulated failure of 50 percent of the available powerplants. However, in the case of four-engine turbojet powered airplanes, an applicant may, under certain prescribed conditions, maneuver to a landing with the simulated failure of only the most critical powerplant, and in the case of three-engine turbojet powered airplanes, maneuver to a landing using an approved procedure that approximates the loss of two powerplants. In any case, the maneuver must be performed in flight.

Since the adoption of Amendment 121-55 the FAA has received several petitions for rule making addressed, in part, to the requirements of Paragraph V(d) of Appendix A. The Air Transport Association of America (ATA) has requested that this paragraph (as well as its companion paragraph V(d) in Appendix F to Part 121, discussed below) be amended to permit accomplishment of maneuvering to a landing with simulated failure of 50 percent of available powerplants (center and one outboard engine on three-engine airplanes) to a point on the approach where a landing is assured, in a visual simulator. With but slight variation, American Airlines, Western Air Lines, and United Air Lines (for the DC-10 only) concur with the ATA position that performance of this maneuver should be permitted in the visual simulator.

For the purpose of this amendment, qualified authority to perform this maneuver in the visual simulator has been adopted for three-engine airplanes only (all three-engine airplanes regardless of the type of powerplant), with four-engine airplanes to be dealt with in a notice of proposed rule making which will be issued soon. As adopted, paragraph V(d) of Appendix A to Part 61, requires, in the case of three-engine airplanes, that an applicant maneuver to a landing with a simulated powerplant failure based on an approved procedure that simulates the loss of two powerplants (center and one outboard engine). If the applicant performs the maneuver in a visual simulator, he must also maneuver to a landing in flight with a simulated failure of the most critical powerplant. If the applicant has received training in flight, he may maneuver at altitude with an approved procedure that approximates the loss of two powerplants provided he makes a landing to touchdown in the airplane with a simulated failure of the most critical powerplant. The FAA believes that the person conducting the check should have the option, in any case, to require the maneuver in flight, both as an aid in determining the qualification of the applicant and as a tool for spot checking the effectiveness of the transfer of learning from the simulator to the airplane.

With the development of more modern and sophisticated simulators, and the introduction into scheduled passenger service of wide bodied three-engine airplanes with engines that develop greater thrust, the FAA believes that safety will

be enhanced by permitting this maneuver to be performed, with limitation, in a visual simulator. In order to fully train and check on this maneuver in flight, some airplanes would require speeds in excess of 200 knots in the traffic pattern. In many cases on these airplanes, all three engines must be reduced to near idle thrust at approximately 700 feet in order to assure that the airplane arrives at the runway threshold at the proper threshold speed. This is due to the considerable residual thrust developed by the engines being simulated as failed and the absence of drag on the airplane that would be created if the engines were shut down. In effect the 700-foot altitude becomes the point at which the pilot is committed to land inasmuch as engine acceleration is slow when operating from a point at or near idle thrust. This increases the potential to undershoot the approach when power is reduced to idle thrust too soon, and to overshoot when reduced too late. The maneuver can be more realistically and safely demonstrated in the simulator inasmuch as the appropriate engines can be completely shut down thus eliminating the residual thrust problem.

Although no substantive changes have been made to the requirement for maneuvering to a landing with simulated powerplant failure in other than three-engine airplanes, an editorial change to paragraph V(d) has been made to accommodate this amendment (which has been placed in new paragraph V(d-1)).

This amendment also changes paragraph V(e) of Appendix A to Part 61 and paragraph V(e) of Appendix F to Part 121 which require a landing under simulated circling approach conditions, except that 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. Paragraph V(f) of the same appendices permits the rejected landing maneuver required therein to be combined with the circling approach. However, when these two provisions are taken together, it appears that the two maneuvers could be combined only when circumstances beyond the control of the pilot prevent a landing. This was not the intent of the FAA, and accordingly these provisions have been amended to permit combining of the maneuvers without restriction.

As adopted by Amendment 121-55, § 121.433(c)(1)(iii) requires a pilot in command to have satisfactorily completed recurrent flight training within the preceding 6 calendar months in the airplanes in which he serves. This requirement is in addition to the recurrent flight training required in § 121.433(c)(1)(i) for all flight crewmembers every 12 calendar months. However, as proposed in Notice 69-14 (published in the FEDERAL REGISTER on April 4, 1969, 34 F.R. 6112), the 6-month requirement for pilots in command would have applied only with respect to one of the airplanes in which the pilot served as pilot in command. Therefore, inasmuch as Amendment 121-55 was not entirely responsive

to the Notice in this regard, § 121.433(c)(1)(iii) has been amended to reflect the meaning intended in Notice 69-14.

In addition to the amendment to § 121.433(c)(1)(iii) discussed above, it is also necessary to amend § 121.434(c)(3)(iii) to implement the intended meaning of that section as adopted by Amendment 121-55. Section 121.434(c)(3)(iii) currently provides that in the case of transition training, if the certificate holder's approved training program includes a course of training in an airplane simulator under § 121.409(c), each pilot must comply with the requirements prescribed in paragraph (c)(3)(i) of § 121.434. Thus, this requirement applies to transitioning second-in-command pilots which the FAA does not believe is necessary inasmuch as these pilots have previously served in the same capacity in another airplane of the same group. Accordingly, as amended, § 121.434(c)(3)(iii) is limited to pilots in command.

One of two editorial changes made by this amendment amends the title to Appendix E by deleting the reference to programmed hours and by indicating that the appendix concerns maneuvers and procedures required for flight training.

The ATA has requested, as a companion to its requests concerning paragraph V(d) of Appendices A to Part 61 and F to Part 121, an amendment to paragraph IV(e) of Appendix E to Part 121 to permit accomplishment of maneuvering to a landing with simulated failure of 50 percent of available powerplants (center and one outboard engine on three-engine airplanes) to a point on the approach where a landing is assured, in a visual simulator for initial, transition, and upgrade training. Western Air Lines, in a similar request, has recommended that the maneuver be permitted in a visual or a nonvisual simulator.

While the FAA agrees that it is appropriate at this time to permit use of a visual simulator in the accomplishment of this maneuver, the agency believes that such authority should be granted for transition and certain upgrade training. However, for pilot in command initial training and in the case of a second-in-command pilot upgrading to pilot in command when such training in this maneuver has not previously been given in flight, training in the maneuver should be required in flight.

The ATA, Western Air Lines, and United Air Lines have requested amendments to paragraph III(e) of Appendix F to Part 121 which currently requires that both the pilot in command and the second-in-command pilot perform at least one missed approach from an ILS in flight. The requests for amendment recommend that paragraph III(e)(1) be amended to permit the missed approach from an ILS approach to be performed by a pilot in a visual simulator (United) or a nonvisual simulator (ATA), and paragraph III(e)(2) be amended to permit the required or additional missed approach by the pilot in command to be performed in a nonvisual simulator (Western).

The counterpart to this requirement, paragraph III(e) of Appendix A to Part 61, requires two missed approaches, one of which must be performed in flight. It also requires that one missed approach be from an ILS approach and that one must include a complete missed approach procedure, but does not specifically require which one must be performed in flight or which one may be performed in the visual simulator, thus giving latitude in their performance. The FAA considers this latitude desirable, and paragraph III (e) of Appendix F has been amended to make Appendices A and F consistent in this regard. However, the FAA believes that the requirement that at least one missed approach should be performed in flight should be retained, as well as the requirement that a simulated powerplant failure may be required during the missed approach maneuver.

Inasmuch as the flush paragraph at the end of section V of Appendix F requiring at least two actual landings, appears to apply only to paragraph (f) thereof, another editorial change has been necessary to indicate that this provision applies to the entire paragraph, as is the case in Appendix A to Part 61. Accordingly, this amendment deletes the provision from its current location after paragraph (f) and places it at the beginning of paragraph V.

Finally, as noted previously, the FAA believes that the requirement of paragraph V(d) that a pilot maneuver to a landing with simulated powerplant failure should be amended to permit greater use of simulators with regard to three-engine airplanes. The discussion concerning paragraph V(d) of Appendix A to Part 61 is pertinent here and the amendment discussed there is adopted in Appendix F as well.

Because these amendments are relaxatory and editorial in nature and place no additional burdens on regulated persons, I find that public notice and procedure thereon are unnecessary and that good cause exists for making them effective in less than 30 days.

In consideration of the foregoing, Parts 61 and 121 of the Federal Aviation Regulations are amended, effective May 26, 1972, as follows:

1. By amending paragraph V(d); by adding a new paragraph (d-1) immediately following paragraph V(d); and by amending V(e) of Appendix A to Part 61 to read as follows:

Maneuvers/Procedures	Required in airplane		Permitted			
	Simulated instrument conditions	Inflight	Visual simulator	Nonvisual simulator	Training device	Waiver provisions of § 61.147(c)
V. Landings and Approaches to Landings:						
(d) Except in the case of three-engine airplanes, maneuvering to a landing with a simulated failure of 50 percent of the available powerplants, with the simulated loss of power on one side of the airplane. However, in the case of a four-engine turbojet powered airplane, maneuvering to a landing with a simulated failure of the most critical powerplant may be substituted therefor, if a flight instructor in an approved training program under Part 121 of this chapter certifies to the Administrator that he has observed the applicant satisfactorily perform a landing in that type airplane with a simulated failure of 50 percent of the available powerplants. The substitute maneuver may not be used if the Administrator determines that training in the two-engine-out landing maneuver provided in the training program is unsatisfactory.		X*				
(d-1) In the case of three-engine airplanes, maneuvering to a landing with an approved procedure that simulates the loss of two powerplants (center and one outboard engine). However, if an applicant satisfies the requirements of this paragraph in a visual simulator, he must, in addition, maneuver in flight to a landing with a simulated failure of the most critical powerplant. In addition, an applicant who performs the maneuvers required by this paragraph in flight and who has been trained in flight, may maneuver at altitude with an approved procedure that simulates the loss of two powerplants provided he makes a landing to touchdown in the airplane with a simulated failure of the most critical powerplant. In any case, the person conducting the check may require the applicant to perform the maneuvers required by this paragraph in flight.			X*			
(e) Except as provided in paragraph (f), a landing under simulated circling approach conditions, except that if circumstances beyond the control of the pilot prevent a landing, the FAA inspector, check pilot, or designated examiner may accept an approach to a point where in his judgment a landing to a full stop could have been made.			X*			

2. By amending § 121.433(c) (1) (III) to read as follows:

§ 121.433 Training required.

(c) * * *
(1) * * *

(III) In addition, for pilots in command he has satisfactorily completed, within the preceding 6 calendar months, recurrent flight training in addition to the recurrent flight training required in subdivision (1) of this subparagraph, in an airplane in which he serves as pilot in command in operations under this part.

3. By amending § 121.434(c) (3) (III) to read as follows:

§ 121.434 Operating experience.

(c) * * *
(3) * * *

(III) In the case of transition training where the certificate holder's approved training program includes a course of training in an airplane simulator under § 121.409(c), each pilot in command must comply with the requirements prescribed in subdivision (1) of this subparagraph for initial training.

4. By amending Appendix E to Part 121 by amending the title thereof, by amending paragraph IV(e); and by adding a new paragraph IV(e-1) immediately following paragraph IV(e), to read as follows:

APPENDIX E—Flight Training Requirements.

FLIGHT TRAINING REQUIREMENTS

Maneuvers/Procedures	Initial training				Transition training				Upgrade training						
	A/P		Simulator		A/P		Simulator		A/P		Simulator				
	Inflight	Static	Visual simulator	Nonvisual simulator	Training device	Inflight	Static	Visual simulator	Nonvisual simulator	Training device	Inflight	Static	Visual simulator	Nonvisual simulator	Training device
IV. Landings and Approaches to Landings:															
(e) In the case of multi-engine airplanes other than three-engine airplanes, maneuvering to a landing with simulated failure of 80 percent of the available powerplants. The simulated loss of power must be on one side of the airplane.	B				A	T					B	U			
(e-1) (1) Except as provided in subparagraph (2) of this paragraph, in the case of three-engine airplanes, maneuvering to a landing with an approved procedure that simulates the loss of two powerplants (center and one outboard engine).	P		S				A	T			P	S		B	U
(2) Notwithstanding the requirements of subparagraph (1) of this paragraph, flight crewmembers who satisfy those requirements to a visual simulator must also:															
(i) Maneuver at altitude in flight with an approved procedure that simulates the loss of two powerplants;															
(ii) Take in-flight training in one-engine inoperative landings; and															
(iii) In the case of a second in command upgrading to a pilot in command and who has not previously performed the maneuvers required by this paragraph in flight, meet the requirements of this paragraph applicable to initial training for pilot in command.															
In the case of flight crewmembers other than the pilot in command, perform the maneuver with the simulated loss of power of the most critical powerplant only.															

5. By amending Appendix F to Part 131 by amending paragraph III(e); by deleting the final paragraph currently appearing immediately after paragraph V(f) and placing it at the beginning of section V; by amending paragraph V(d); by adding a new paragraph V(d-1) immediately following paragraph V(d); and by amending paragraph V(e), to read as follows:

Maneuvers/Procedures	Required		Permitted			
	Simulated instrument conditions	Inflight	Visual simulator	Nonvisual simulator	Training device	Waiver provisions of 135.43(c)
# (c) Missed approach.						
(1) Each pilot must perform at least one missed approach from an ILS approach.		B*				
(2) Each pilot in command must perform at least one additional missed approach.		B*				
A complete approved missed approach procedure must be accomplished at least once. At the discretion of the person conducting the check, a simulated 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 in flight.						
V. Landings and Approaches to Landings:						
Notwithstanding the authorizations for combining and waiving maneuvers and for the use of a simulator, at least two actual landings (one to a full stop) must be made for all pilot-in-command and initial second-in-command proficiency checks. Landings and approaches to landings must include the following, but more than one type may be combined where appropriate:						
(d) Except in the case of three-engine airplanes, maneuvering to a landing with a simulated failure of 80 percent of the available powerplants, with the simulated loss of power on one side of the airplane, except that in the case of a proficiency check for other than a pilot in command the simulated loss of power may be only the most critical powerplant. This requirement may be substituted for in pilot in command recurrent (as distinguished from initial and transition) training and proficiency checks conducted in a four-engine turbojet powered airplane, by maneuvering to a landing with a simulated failure of the most critical powerplant and performance, either in an approved simulator or in flight at altitude, of the maneuver with simulated failure of 80 percent of the available powerplants unless the Administrator determines that the training in this maneuver provided by the certificate holder is unsatisfactory.		B*		B*		
(d-1) In the case of three-engine airplanes, maneuvering to a landing with an approved procedure that simulates the loss of two powerplants (center and one outboard engine). However, if a pilot satisfies the requirements of this paragraph in a visual simulator, he must, in addition, maneuver in flight to a landing with a simulated failure of the most critical powerplant. In addition a pilot who performs the maneuvers required by this paragraph in flight and who has been trained in flight, may maneuver at altitude with an approved procedure that approximates the loss of two powerplants provided he makes a landing to touchdown in the airplane in flight with a simulated failure of the most critical powerplant. In any case, the person conducting the check may require the applicant to perform the maneuvers required by this paragraph in flight.			B*			
(e) Except as provided in paragraph (f) of this section, if the certificate holder is approved for circling minimums below 1000-3, 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*			

(Secs. 313(a), 601, 602, 604, 607, Federal Aviation Act of 1958, 49 U.S.C. 1354(a), 1421, 1422, 1424, 1427; sec. 6(c), Department of Transportation Act, 49 U.S.C. 1655(c))

Issued in Washington, D.C., on May 19, 1972.

J. H. SHAFER,
Administrator.

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