

dual antennas or a combined antenna designed for multiple operation), except that:

(1) A single operating transmitter with a standby capable of operation may be used in lieu of two operating transmitters.

(2) Single heading source information to all installations may be utilized, provided a compass comparator system is installed and operational procedures call for frequent cross-checks of all compass heading indicators by crewmembers.

The dual system may consist of either two Doppler Radar units or one Doppler Radar unit and one INS unit.

(b) At least two systems must be operational at takeoff.

(c) As determined by the Administrator and specified in the certificate holder's operations specifications, other navigational aids may be required to update the Doppler Radar for a particular operation. These may include Loran, Consol, DME, VOR, ADF, ground-based radar, and airborne weather radar. When these aids are required, the cockpit arrangement must be such that all controls are accessible to each pilot seated at his duty station.

5. *Training programs.* The initial training program for Doppler Radar and Inertial Navigation Systems must include the following:

(a) Duties and responsibilities of flight crewmembers, dispatchers, and maintenance personnel.

(b) For pilots, instruction in the following:

(1) Theory and procedures, limitations, detection of malfunctions, preflight and inflight testing, and cross-checking methods.

(2) The use of computers, an explanation of all systems, compass limitations at high latitudes, a review of navigation, flight planning, and applicable meteorology.

(3) The methods for updating by means of reliable fixes.

(4) The actual plotting of fixes.

(c) Abnormal and emergency procedures.

6. *Equipment accuracy and reliability.* (a) Each Inertial Navigation System must meet the following accuracy requirements, as appropriate:

(1) For flights up to 10 hours' duration, no greater than 2 nautical miles per hour of circular error on 95 percent of system flights completed is permitted.

(2) For flights over 10 hours' duration, a tolerance of ± 20 miles cross-track and ± 25 miles along-track on 95 percent of system flights completed is permitted.

(b) Compass heading information to the Doppler Radar must be maintained to an accuracy of $\pm 1^\circ$ and total system deviations must not exceed 2° . When free gyro techniques are used, procedures shall be utilized to ensure that an equivalent level of heading accuracy and total system deviation is attained.

(c) Each Doppler Radar System must meet accuracy requirements of ± 20 miles cross-track and ± 25 miles along-track for 95 percent of the system flights completed. Updating is permitted.

A system that does not meet the requirements of this section will be considered a failed system.

7. *Evaluation program.* (a) Approval by evaluation must be requested as a part of the application for operational approval of a Doppler Radar or Inertial Navigation System.

(b) The applicant must provide sufficient flights which show to the satisfaction of the Administrator the applicant's ability to use cockpit navigation in his operation.

(c) The Administrator bases his evaluation on the following:

(1) Adequacy of operational procedures.

(2) Operational accuracy and reliability of equipment and feasibility of the system with regard to proposed operations.

(3) Availability of terminal, gateway, area, and en route ground-based aids, if required, to support the self-contained system.

(4) Acceptability of cockpit workload.

(5) Adequacy of flight crew qualifications.

(6) Adequacy of maintenance training and availability of spare parts.

After successful completion of evaluation demonstrations, FAA approval is indicated by issuance of amended operations specifications and en route flight procedures defining the new operation. Approval is limited to those operations for which the adequacy of the equipment and the feasibility of cockpit navigation has been satisfactorily demonstrated.

[Doc. No. 10204, 37 FR 6464, Mar. 30, 1972, as amended by Amdt. 121-207, 54 FR 39293, Sept. 25, 1989]

APPENDIX H TO PART 121—ADVANCED SIMULATION

This appendix provides guidelines and a means for achieving flightcrew training in advanced airplane simulators. The requirements in this appendix are in addition to the simulator approval requirements in §121.407. Each simulator used under this appendix must be approved as a Level B, C, or D simulator, as appropriate.

ADVANCED SIMULATION TRAINING PROGRAM

For an operator to conduct Level C or D training under this appendix all required simulator instruction and checks must be conducted under an advanced simulation training program approved by the Administrator for the operator. 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.

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The advanced simulation training program must include the following:

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

2. How the training program will integrate Level B, C, and D simulators with other simulators and training devices 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 flight crewmember 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 operator's advanced simulation training program, or changes to it, and to emphasize their respective roles in the program. Training for simulator instructors and check airmen must include training policies and procedures, instruction methods and techniques, operation of simulator controls (including environmental and trouble panels), limitations of the simulator, and minimum equipment required for each course of training.

6. A special Line Oriented Flight Training (LOFT) program to facilitate the transition from the simulator 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 operator's route. 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.

LEVEL B

Training and Checking Permitted

1. Recency of experience (§ 121.439).
2. Night takeoffs and landings (Part 121, Appendix E).
3. Landings in a proficiency check without the landing on the line requirements (§ 121.441).

LEVEL C

Training and Checking Permitted

1. For all pilots, transition training between airplanes in the same group, and for a pilot in command the certification check required by § 61.153 of this chapter.

2. Upgrade to pilot-in-command training and the certification check when the pilot—

- a. Has previously qualified as second in command in the equipment to which the pilot is upgrading;
- b. Has at least 500 hours of actual flight time while serving as second in command in an airplane of the same group; and
- c. Is currently serving as second in command in an airplane in this same group.

3. Initial pilot-in-command training and the certification check when the pilot—

- a. Is currently serving as second in command in an airplane of the same group;
- b. Has a minimum of 2,500 flight hours as second in command in an airplane of the same group; and
- c. Has served as second in command on at least two airplanes of the same group.

4. For all second-in-command pilot applicants who meet the aeronautical experience requirements of § 61.159 of this chapter in the airplane, the initial and upgrade training and checking required by this part, and the certification check requirements of § 61.153 of this chapter.

LEVEL D

Training and Checking Permitted

Except for the requirements listed in the next sentence, all pilot flight training and checking required by this part and the certification check requirements of § 61.153(g) of this chapter. The line check required by § 121.440, the static airplane requirements of appendix E of this part, and the operating experience requirements of § 121.434 must still be performed in the airplane.

[Doc. No. FAA-2002-12461, 71 FR 63640, Oct. 30, 2006]

APPENDICES I-J TO PART 121

[RESERVED]

APPENDIX K TO PART 121—PERFORMANCE REQUIREMENTS FOR CERTAIN TURBOPROPELLER POWERED AIRPLANES

1. *Applicability.* This appendix specifies requirements for the following turbopropeller powered airplanes that must comply with the Airplane Performance Operating Limitations in §§ 121.189 through 121.197:

- a. After December 20, 2010, each airplane manufactured before March 20, 1997 and type certificated in the: