Part 121—Operating Requirements: Domestic, Flag, and Supplemental Operations

This change makes a correction to Amendment 121–253, Operating Requirements: Domestic, Flag, Supplemental, Commuter, and On-Demand Operations: Editorial and Terminology Changes. The correction appeared in the *Federal Register* (61 FR 9612, March 11, 1996) as Amendment 121–254; it should have read Amendment 121–253. This amendment corrects an error in a document published in the *Federal Register* on January 26, 1996 (61 FR 2608), which removed § 121.404. The FAA intended to remove the version of § 121.404 that was effective before December 20, 1995, and not the version of § 121.404 published on December 20, 1995 (60 FR 65948). Therefore, the version of § 121.404 that was published in the *Federal Register* on December 20, 1995, is reinstated.

This change also incorporates Amendment 121–254, Extended Overwater Operations With a Single Long-Range Communication System (LRCS) and a Single Long-Range Navigation System (LRNS), adopted February 20 and effective February 26, 1996. This amendment revises §§ 121.99 and 121.351.

Bold brackets enclose the most recently changed or added material. The amendment number and effective date of new material appear in bold brackets at the end of each affected section.

Page Control Chart

Remove Pages	Dated	Insert Pages	Dated
		P–1241 through P–1248	Ch. 14
Subpart E	Ch. 13	Subpart E	Ch. 14
Subpart K	Ch. 13	Subpart K	Ch. 14
Subpart N	Ch. 13	Subpart N	Ch. 14

Suggest filing this transmittal at the beginning of the FAR. It will provide a method for determining that all changes have been received as listed in the current edition of AC 00–44, Status of Federal Aviation Regulations, and a check for determining if the FAR contains the proper pages.

SUMMARY: This amendment corrects an error in a document published on January 26, 1996 (61 FR 2608), which removed § 121.404. The FAA intended to remove the version of § 121.404 that was effective before December 20, 1995, and not the revision of § 121.404 published on December 20, 1995 (60 FR 65948). Therefore, the version of § 121.404 that was published on December 20, 1995, is reinstated in this document.

FOR FURTHER INFORMATION CONTACT: Linda Williams, Office of Rulemaking (ARM–100); Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591; telephone (202) 267–9685.

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends the Federal Aviation Regulations (14 CFR part 121) effective March 11, 1996.

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

Authority: 49 U.S.C. 106(g), 40113, 40119, 44101, 44701–44702, 44705, 44709–44711, 44713, 44716–44717, 44722, 44901, 44903–44904, 44912, 46105.

Amendment 121–254

Extended Overwater Operations With a Single Long-Range Communication System (LRCS) and a Single Long-Range Navigation System (LRNS)

Adopted: February 20, 1996 **Effective: February 26, 1996**

(Published in 61 FR 7186, February 26, 1996)
(Correction in 61 FR 10430, March 13, 1996)

SUMMARY: This action revises the Federal Aviation Regulations for certain overwater operations for air carriers, commercial operators, and general aviation operators of large and of turbine-powered multiengine airplanes. It defines and clarifies requirements for using long-range navigation systems (LRNS) and long-range communication systems (LRCS) and sets forth criteria for navigation and communication equipment for certain overwater operations. Under this rule, air carriers and commercial operators are authorized to use a single LRCS and a single LRNS for extended overwater routes detailed in their operations specifications. Affected general aviation operators, who already are authorized to use a single LRCS when they have two very high frequency (VHF) communication systems, are authorized to use a single LRNS in overwater operations in the Gulf of Mexico, the Caribbean Sea, and part of the western Atlantic Ocean. This rule gives the FAA greater flexibility in responding to advances in aviation technology and changes in the operational environment and allows operators to conduct extended overwater operations without carrying unnecessary communication and navigation equipment.

FOR FURTHER INFORMATION CONTACT: Daniel V. Meier, Jr., Project Development Branch (AFS–240), Air Transportation Division, Office of Flight Standards, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591, telephone (202) 267–3749.

SUPPLEMENTARY INFORMATION:

Background

Air traffic in the Gulf of Mexico, the Caribbean Sea, and part of the western Atlantic Ocean (subsequently referred to in this document as the geographic area) has increased substantially during the last

routinely operate at higher altitudes en route, they can conduct very high frequency (VHF) communications at greater ranges from their corresponding ground facilities than their predecessors.

Advances in avionics have resulted in increasingly accurate and dependable navigation systems, using inputs from Loran C, Omega/very low frequency (VLF), inertial navigation, or reference systems (INS), and, most recently, the global positioning satellite navigation system (GPS). Each navigation system typically gives instantaneous readouts of position, ground speed, wind, and waypoint progress. Radio communication systems have enjoyed similar advances. Bulky vacuum tube units have given way to miniaturized units with transistors, precise frequency selection, and high reliability, which produce the same or greater transmitting power than older models. In addition, the proliferation of VHF communication facilities within the geographic area ensures that many routes now can be flown with a VHF communications gap of no more than 30 minutes.

The increased reliability of modern LRNS reduces navigation errors. Sophisticated flight management systems (FMS) integrate control and navigation systems of an airplane and combine several navigation inputs to provide greater position reliability. The multiple navigation inputs into an FMS increase the accuracy of the system, and its reliability when compared to earlier navigation systems which only received a single source input. If the LRNS fails on an airplane using such sophisticated equipment, navigation errors inherent in dead-reckoning procedures from the moment of the failure until the next reporting point or fix should be well within the navigational performance capability required for the route to be flown.

Just as navigation systems have experienced several enhancements, ongoing developments in data link and satellite technology also have resulted in enhanced communications. The airborne equipment that aircraft use has improved due to advances in avionics reliability and miniaturization. These smaller units mean less weight on board the airplane.

The FAA believes that the probability that an airplane would experience a failure of both its single long-range communications system (LRCS) and its single LRNS when suitable navigation aids cannot be received is minimal. Advanced technology notwithstanding, however, a single LRCS could fail during a flight segment in which the airplane is operated beyond the range of VHF radio communication equipment. Even if such a failure did occur, the increased density of other air traffic in the vicinity could provide the affected airplane with some backup VHF communications with ATC. Moreover, regardless of the number of other aircraft in the area, if the flightcrew adheres to proper operational procedures, failure of the LRNS should not lead to an increased potential for conflict between aircraft before the airplane could come into range of suitable navigation aids (e.g. non-directional beacon, very high frequency omnirange (VOR), etc.).

Because of the increased speeds and higher altitudes at which airplanes now operate, improved equipment, improved reliability, and greater accuracy of LRNS systems, the FAA has concluded that, where exposure time for a critical equipment failure is 1 hour or less, the following is true:

- The probability of a failure is less than the probability of a failure with less modern equipment;
- With the accuracy of the present equipment, operators have better knowledge of their position if a failure does occur.

All of the factors discussed above have brought about the need to update the regulations to conform current technology to the types of operations that are currently being authorized. Namely, the FAA has found that operations in the geographic area can be conducted without the burden of additional navigation and communication systems carried in the aircraft. Therefore, on a case-by-case basis, and with certain conditions and limitations, the FAA has allowed a number of operators to conduct operations in the geographic area with a single LRCS and a single LRNS. To date, such operations have had no adverse effect on safety.

by ATC. Under the exception in §91.511(d), if a route requires the use of both VHF and LRCS communication equipment, and the airplane has two VHF transmitters and two VHF receivers, then only one LRCS transmitter and one LRCS receiver is required for communications.

Air Carrier and Commercial Operations

Parts 121, 125, and 135 also require airplanes engaged in extended overwater operations to be equipped with two independent communication and two independent navigation systems. Like part 91, parts 125 and 135 require that the communication equipment be appropriate to the facilities to be used and capable of transmitting to and receiving from at least one ground facility at any place on the route. Although the regulatory language differs somewhat, part 121 contains essentially the same requirements for communication equipment. Specifically, part 121 requires two independent communication systems able to communicate, under normal operating conditions, with (1) at least one appropriate ground station from any point on the route and with (2) appropriate traffic control facilities from any point in the airspace within which the flights are intended. These communication systems also must be able to receive meteorological information from any point en route. Unlike part 91, however, parts 121, 125, and 135 do not allow the use of a single LRCS where the airplane is also equipped with two VHF radios or systems. Thus, if a route requires use of both VHF and LRCS, airplanes operating under parts 121, 125, and 135 must have two VHF radios and two LRCS.

Section 121.349(b) allows for the use of a single automatic direction finder (ADF) when two VOR navigation units are installed and VOR navigation aids are so located and the airplane is so fueled that, in the case of a failure of the ADF, the flight may proceed safely to a suitable airport by means of VOR aids. In all other cases, when use of ADF, VOR navigation equipment, or both, is needed for primary navigation, the current rules for parts 121, 125, and 135 require the airplane to be equipped with two ADF and two VOR navigation units, as appropriate.

General Discussion of the Rule

The FAA is expanding, under certain conditions, the authority for air carriers and commercial operators to amend their operations specifications to use a single LRCS and a single LRNS. The FAA has determined that, for the time being, the authority will be limited to the geographic area. This limitation is based primarily on the ready availability of navigation and communication facilities within the geographic area, which provide a crucial buffer in the event of a communication or navigation failure. In appropriate circumstances, the FAA may expand the areas in which operations with a single LRCS and a single LRNS will be permitted for part 121, 125, and 135 operators.

Aside from the current authority set forth in §§91.511(d) and 121.349(b), this rule does not change the general requirements under parts 91, 121, 125, and 135 for two VHF communication systems and two each of any appropriate navigation systems required for the route to be flown except in the geographic area. The FAA has concluded that, by maintaining these requirements, air transportation safety is not compromised.

The FAA is amending part 91 and creating operation specification authority for operators under parts 121, 125, and 135 based on the factors mentioned above and on the operator's ability to maintain two-way communications with ATC and, where appropriate, the certificate holder's dispatch office. Without such factors, ATC's ability to control airplanes in the geographic area would be adversely impacted, increasing the potential for air traffic conflicts. The flightcrew must be able to notify ATC of an LRNS failure and must be able to tell ATC whether the flightcrew can reliably fix the airplane's position using other means.

Part 91

As a result of changes in technology, the operational environment described, and experience gained with exemptions allowing a single LRNS, the FAA has concluded that part 91 operators of large and of turbojet multiengine airplanes should be able to operate safely with a single LRCS and a single LRNS in the geographic area. In conducting operations in the geographic area, these general aviation

it will provide both the FAA and the certificate holder greater flexibility in dealing with varied equipment configurations, possible reclassification of airspace operating areas, changes in navigational requirements, and changes in air traffic separation standards.

The FAA has authorized these operations in the past and has determined that controlling a VHF communication gap through operations specifications will provide an equivalent level of safety. Loss of the single LRNS still requires each operator to reliably fix the airplane's position at least once each hour if the flight is continued and to navigate within the required degree of accuracy over any authorized route.

Definition of LRNS and LRCS

In the proposal, the FAA defined an LRNS as an electronic navigation unit that is approved for use under instrument flight rules (IFR) as a primary means of navigation and has at least one source of navigational input, such as INS, Omega/very low frequency, and Loran C. In this definition, the FAA did not limit the scope of acceptable LRNS to radio-based or ground-based systems. Such nonradio, nonground-based systems as INS are included within the scope of acceptable alternatives as long as the system chosen has been approved for use under IFR. If approved, GPS or similar navigation systems also would fall within this definition. Where ADF or VOR radio navigation is impractical or unusable, the FAA interprets the current regulations to require the airplane to be equipped with two LRNS for extended overwater operations. This final rule changes this dual LRNS requirement. For parts 121, 125, and 135, authorization for a single LRNS and a single LRCS will be approved in the certificate holder's operations specifications. Since affected part 91 operators do not use operations specifications, they would be authorized to use a single LRNS, but only in the geographic area.

Although not defined in the proposal, the FAA has determined that, for clarity, LRCS, like LRNS, should be defined in the final rule. The FAA defines an LRCS as a long-range communication system that uses satellite relay, data link, high frequency, or other approved communication system which extends beyond line of sight. The FAA also has determined that the definitions for LRNS and LRCS would be better placed in part 1, Definitions and Abbreviations, for easy reference of all affected operators and to avoid the redundancy of repeating the definitions in all affected parts. Therefore, the definitions for LRCS and LRNS will be added to § 1.1, General definitions. These definitions will be added to this section, in appropriate alphabetical order, following the currently listed definition of "load factor."

Conditions and Limitations for All Operators

Because part 91 operators are not required to have operations specifications, this rule limits general aviation single LRNS operations to the geographic area. The areas of operation covered in this rule for affected general aviation operators include the Gulf of Mexico, the Caribbean Sea, and the Atlantic Ocean west of a line which extends from 44°47′00″ N / 67°00′00″ W to 39°00′00″ N / 67°00′00″ W to 38°30′00″ N /60°00′00″ W south along the 60°00′00″ W longitude line to the point where the line intersects with the northern coast of South America. This geographic area does not include the North Atlantic Minimum Navigational Performance Specifications (NAT/MNPS) airspace, where operations are governed by § 91.705 and appendix C to part 91.

Limitations for air carrier and commercial operations will be set forth in the certificate holders' operations specifications. As in the case of general aviation operations, the area of operation for air carrier and commercial operators will not include NAT/MNPS airspace. At a minimum, these operators must always comply with International Civil Aviation Organization (ICAO) requirements for the area of operations.

Discussion of Comments

On October 5, 1993, the FAA published a notice proposing to allow extended overwater operations with single LRCS and single LRNS (58 FR 51938). The FAA received six comments on the proposal. The National Business Aircraft Association, Inc. (NBAA), the Aircraft Owners and Pilots Association (AOPA), and the Air Transport Association (ATA) expressed support with recommendations. Northwest

FAA Response: This rule is intended to affect use of LRNS and LRCS for extended overwater operations. The FAA recognizes that additional updates to the rules are needed in view of advances in technology, such as GPS. Such changes will be addressed in future rulemaking initiatives.

AOPA

AOPA supported the proposal and recommended that the requirement for an LRCS be eliminated entirely for certain aircraft in flight conditions where no more than a 30-minute gap in two-way communications exists. AOPA supported its recommendation by stating that LRCS equipment is cumbersome and expensive. According to the commenter, LRCS equipment is often adversely affected by precipitation and other weather conditions. Further, in overwater areas, pilots relay transmissions to ATC through other aircraft and do not depend on their LRCS.

FAA Response: The FAA acknowledges that an LRCS has some disadvantages; however, these disadvantages are offset by the necessity for communications when an airplane is operating in extended overwater beyond the range of VHF ground-based communications. While airplanes operating in accordance with § 91.511 are not involved in the carriage of persons or cargo for compensation or hire, these airplanes nevertheless share airspace in the geographic area with air carriers which are engaged in transporting passengers and cargo. Therefore, the FAA considers it necessary for safety that all aircraft operating in the geographic area be able to communicate with ATC at all times.

ATA

The ATA supported the proposal indicating that it would provide administrative and economic relief from an unnecessary regulatory burden. Apparently in reference to the 15-day comment period however, the commenter noted that, in future proposals, the FAA must abide by the requirements of the Administrative Procedures Act (APA). Northwest echoed this comment regarding the APA.

FAA Response: In allotting the 15-day comment period, the FAA was responding to the large number of requests for relief from the aviation industry. The FAA considered it to be in the best interest of safety and the public to expedite the regulation by every means possible. The FAA did not violate any requirements of the APA, which does not require specific comment periods for rulemaking.

Northwest Airlines

Northwest Airlines suggested that the proposed rule be amended to allow operations in NAT/MNPS airspace for flights to and from SLATIN along or west of A632. According to the commenter, the area of NAT/MNPS airspace traversed by A632 is within VHF coverage except for an area of non-coverage located on either side of the mid point of A632 between Bermuda and the mainland of the U.S. The commenter asserted that this non-coverage area can be traversed within 6 minutes. Northwest further indicated that extending the boundary of the area below 27°00′00″ N from longitude 60°00′00″ N to 58°00′00″ W, would include the island of Barbados and thereby preclude any confusion regarding coverage of the total Caribbean island chain. Lastly, Northwest indicated that the coordinates describing operations under part 91 do not have the same boundaries as defined by part 91, appendix C. According to the commenter, this presents confusion to ATC with respect to the different requirements for air carrier and general aviation operations.

FAA Response: The route from SLATIN along A632 to approximate 38°30′00″ N and 67°30′00″ W is NAT/MNPS airspace and, as such, is governed by ICAO agreements which require redundant navigation and communication systems. It is not within the scope (authority) of this rule to alter those agreements. This airspace represents an extremely small part of the total geographic area considered in this rule and can be crossed in 6 minutes by a turbine-powered air transport category airplane. Airlines may operate through this airspace with one LRNS and one LRCS provided they obtain a letter of agreement with ATC. These operations have been successful in the past and the FAA does not consider it to be in the public interest for the U.S. government to file a difference with ICAO.

Aviation Consulting Firm

George Rabe & Associates, the aviation consulting firm opposed to the proposal indicated that some of the more modern communication and navigation systems are an improvement; however, some are not. Nonetheless, according to the commenter, since smaller airlines cannot afford to purchase the more expensive communication and navigation systems, they do not have the luxury of operating with enhanced accuracy and reliability provided by the more sophisticated systems. This commenter stated that the economic arguments of the proposal are not justified given that GPS is expected to bring down costs and that some operators will still conduct operations requiring the use of dual LRNS and LRCS. Moreover, according to this commenter, increased air traffic and reduced separation standards should bring forth a requirement for improved navigation safety not a reduction in safety standards. Indicating that errors are not mechanical but human, this commenter recommended maintaining the requirement for dual LRNS and LRCS and also improving training requirements.

FAA Response: The FAA realizes that cost differences exist among LRNS and LRCS equipment and that there may be some differences in accuracy; however, all equipment used for operations under this rule must meet certain standards of approval established by the FAA. These standards serve to assure that an acceptable level of safety is maintained regardless of the cost and availability of the equipment.

The safe operation of LRNS and LRCS is a part of the operators' approved training program and is assured by FAA inspection and surveillance. Knowing that mistakes in navigation occasionally will be made, the FAA established certain operational factors in the rule to minimize any potential threat to safety which may result from potential errors.

One of the major factors considered in this rule is the question of economic burden to the air transportation industry. The FAA believes that this rule will relieve the airlines of a significant cost burden. If GPS LRNS units, and subsequently approved operations, present a cost savings above other, more prevalent, systems in use today, the FAA would certainly favor such a potential.

Economic Summary

This final rule reduces costs to operators by eliminating the requirements for two LRCS and two LRNS in the Gulf of Mexico, part of the western Atlantic Ocean, and the Caribbean Sea (the geographic area). Savings will come from reduced avionics costs, reduced fuel consumption from less aircraft weight, and reduced risk of flight cancellations due to inoperative equipment.

The FAA estimates the fleet size operating in the geographic area will be approximately 158 airplanes in 1995. The FAA assumes that the size of the fleet serving the geographic area will grow by 5.5 percent annually over the 10-year period, 1995–2004. Although the fleet composition varies from jumbo jets to smaller twin-engine turboprop planes, commercial operators most often use Boeing 727's in the geographic area. In addition to the scheduled commercial fleet, general aviation and non-commercial operators operating in the geographic area will gain some relief from this rule as well. The FAA, however, does not have an accurate measure of the size of the fleet operating in the geographic area.

Each commercial operator will save approximately $17,000 per airplane in equipment costs and will reduce aircraft weight 20 pounds per airplane by eliminating one LRCS; each commercial operator will save about $36,000 per airplane in equipment costs and will reduce aircraft weight 20 pounds per airplane by eliminating one LRNS. For existing airplanes with equipment made redundant by this rule, the resulting avionics cost savings will total about $53,000 per converted airplane. The FAA also estimates that each additional pound on an airplane costs an operator an additional 15 gallons of fuel annually. Assuming a converted airplane removes two 20-pound pieces of equipment, the reduction in weight will save 600 gallons of fuel each year. Using a 1993 average jet fuel price of $.675 per gallon, the reduction in weight of 600 gallons of fuel per year will result in annual savings totaling over $400 per converted airplane.

during the first 2 years after implementation of the rule. Thereafter, the FAA assumes that one-half the airplanes added to the commercial fleet will be placed in service with only one LRCS and one LRNS. The FAA further assumes that the savings resulting from reduced fuel expenditure applies to the equipment conversion of 50 percent of the fleet converting to a single LRCS and a single LRNS.

In each of the first 2 years after the rule becomes effective, the industry will reduce avionics costs by over $2 million. Over the decade 1995–2004, the total savings in 1993 dollars for reduced avionics requirements will exceed $6.7 million. The fuel savings resulting from airplane weight reduction will add another $389,000 in reduced costs, bringing the total cost savings in 1993 dollars for this final rule to more than $7.1 million. The net discounted savings for the decade 1995–2004, will total just over $5.7 million.

The FAA has determined that no safety problem exists with the reduction in requirements for dual LRCS and dual LRNS for certain overwater operations. In the past two decades, the FAA has granted limited exemption from the requirements for dual LRCS and LRNS to certain qualified operators operating in the geographic area. No airplane operating under exemption has had an accident which can be attributed to having only one LRCS or one LRNS. During that time, the accuracy and reliability of navigation equipment has continuously improved. Thus, the FAA believes that this rule presents no degradation in aviation safety in the geographic area.

International Trade Impact Analysis

Domestic air carriers will receive a negligible cost reduction, but there will be no impact on foreign operators. Hence, this rule will have no effect on the sale of foreign aviation products or services in the U.S. or on the sale of U.S. products or services in foreign countries.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) ensures that government regulations do not needlessly and disproportionately burden small businesses. The RFA requires the FAA to review each rule that may have "a significant economic impact on a substantial number of small entities."

FAA criteria define "a substantial number" as not less than eleven nor more than one-third of the small entities subject to the rule. Among air carriers, a small entity is defined as one which owns, but does not necessarily operate, nine or fewer aircraft. The criteria define "a significant impact" as follows: $102,000 for scheduled air carriers with 60 or more seats; $57,000 for scheduled air carriers with fewer than 60 seats.

This amendment is wholly cost relieving. By eliminating the need for two LRCS and LRNS in the geographic area, the estimated cost savings to an operator is $53,000. This savings is less than the threshold amount for small, scheduled operators.

Federalism Implications

The regulations adopted herein will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this rule would not have federalism implications requiring the preparation of a Federalism Assessment.

International Civil Aviation Organization and Joint Aviation Regulations

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with ICAO Standards and Recommended Practices (SARP) to the maximum extent practicable. For this amendment, the FAA has reviewed the SARP of Annex 6, Parts I and II, applicable to international commercial air transportation operations and international general aviation operations respectively. The FAA has determined that this rule would not present any differences.

criteria of the Regulatory Flexibility Act. This rule is not significant under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979).

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends 14 CFR parts 1, 91, 121, 125, and 135 effective February 26, 1996.

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

Authority: 49 U.S.C. 106(g), 40113, 40119, 44101, 44701–44702, 44705, 44709–44711, 44713, 44716–44717, 44722, 44901, 44903–44904, 44912, 46105.

[This subpart prescribes rules for obtaining approval of routes by certificate holders conducting domestic or flag air operations.]

[(Amdt. 121–253, Eff. 2/26/96)]

§ 121.93 Route requirements: General.

(a) Each [certificate holder conducting domestic or flag operations] seeking a route approval must show—

(1) That it is able to conduct satisfactorily scheduled operations between each regular, provisional, and refueling airport over that route or route segment; and

(2) That the facilities and services required by §§ 121.97 through 121.107 are available and adequate for the proposed operation.

The Administrator approves a route outside of controlled airspace if he determines that traffic density is such that an adequate level of safety can be assured.

(b) Paragraph (a) of this section does not require actual flight over a route or route segment if the [certificate holder] shows that the flight is not essential to safety, considering the availability and adequacy of airports, lighting, maintenance, communication, navigation, fueling, ground, and airplane radio facilities, and the ability of the personnel to be used in the proposed operation.

(Amdt. 121–3, Eff. 4/1/65); [(Amdt. 121–253, Eff. 2/26/96)]

§ 121.95 Route width.

(a) Approved routes and route segments over U.S. Federal airways or foreign airways (and advisory routes in the case of [certificate holders conducting flag operations]) have a width equal to the designated width of those airways or routes. Whenever the Administrator finds it necessary to determine the width of other approved routes, he considers the following—

(1) Terrain clearance.

(2) Minimum en route altitudes.

(3) Ground and airborne navigation aids.

(4) Air traffic density.

(5) ATC procedures.

(b) Any route widths of other approved routes determined by the Administrator are specified in the [certificate holder's] operations specifications.

[(Amdt. 121–253, Eff. 2/26/96)]

§ 121.97 Airports: Required data.

(a) Each [certificate holder conducting domestic or flag operations] must show that each route it submits for approval has enough airports that are properly equipped and adequate for the proposed operation, considering such items as size, surface, obstructions, facilities, public protection, lighting, navigational and communication aids, and ATC.

(b) [Each certificate holder conducting domestic or flag operations] must show that it has an approved system for obtaining, maintaining, and distributing to appropriate personnel current aeronautical data for each airport it uses to ensure a safe operation at that airport. The aeronautical data must include the following—

(1) Airports.

(i) Facilities.

(ii) Public protection.

(iii) Navigational and communications aids.

(iv) Construction affecting takeoff, landing or ground operations.

(v) Air traffic facilities.

(2) Runways, clearways and stopways.

(i) Dimensions.

(ii) Surface.

(iii) Marking and lighting systems.

(iv) Elevation and gradient.

(3) Displaced thresholds.

(i) Location.

(ii) Dimensions.

(iii) Takeoff or landing or both.

(4) Obstacles.

(i) Those affecting takeoff and landing performance computations in accordance with subpart I of this part.

(ii) Controlling obstacles.

(5) Instrument flight procedures.

(c) If the [certificate-holding district office] charged with the overall inspection of the certificate holder's operations finds that revisions are necessary for the continued adequacy of the certificate holder's system for collection, dissemination, and usage of aeronautical data that has been granted approval, the certificate holder shall, after notification by the Flight Standards District Office, make those revisions in the system. Within 30 days after the certificate holder receives such notice, the certificate holder may file a petition to reconsider the notice with the Director, Flight Standards Service. This filing of a petition to reconsider stays the notice pending a decision by the Director of Flight Operations. However, if the Flight Standards District Office finds that there is an emergency that requires immediate action in the interest of safety in air transportation, the Director, Flight Standards Service may, upon statement of the reasons, require a change effective without stay.

(Amdt. 121–162, Eff. 9/9/80); (Amdt. 121–207, Eff. 10/25/89); [(Amdt. 121–253, Eff. 2/26/96)]

§ 121.99 Communications facilities.

[Each domestic and flag air carrier must show that a two-way radio communication system is available at points that will ensure reliable and rapid communications, under normal operating conditions over the entire route (either direct or via approved point-to-point circuits) between each airplane and the appropriate dispatch office, and between each airplane and the appropriate air traffic control unit except as specified in § 121.351(c).] For all operations by certificate holders conducting domestic operations and for certificate holders conducting flag operations in the 48 contiguous States and the District of Columbia, the communications systems between each airplane and the dispatch office must be independent of any system operated by the United States.

(Amdt. 121–253, Eff. 2/26/96); [(Amdt. 121–254, Eff. 2/26/96)]

or flag operations] may use any weather report to control flight unless—

(1) For operations within the 48 contiguous States and the District of Columbia, it was prepared by the U.S. National Weather Service or a source approved by the U.S. National Weather Service; or

(2) For operations conducted outside the 48 contiguous States and the District of Columbia, it was prepared by a source approved by the Administrator.

(c) Each [certificate holder conducting domestic or flag operations] that uses forecasts to control flight movements shall use forecasts prepared from weather reports specified in paragraph (b) of this section and from any source approved under its system adopted pursuant to paragraph (d) of this section.

(d) [Each certificate holder conducting domestic or flag operations] shall adopt and put into use an approved system for obtaining forecasts and reports of adverse weather phenomena, such as clear air turbulence, thunderstorms, and low altitude wind shear, that may affect safety of flight on each route to be flown and at each airport to be used.

(1) It shows that due to circumstances beyond its control it cannot comply by that date; and

(2) It has submitted by that date a schedule for compliance, acceptable to the Director, indicating that compliance will be achieved at the earliest practicable date.

(Amdt. 121–76, Eff. 7/20/71); (Amdt. 121–134, Eff. 6/30/77); [(Amdt. 121–253, Eff. 2/26/96)]

§ 121.103 En route navigational facilities.

(a) Except as provided in paragraph (b) of this section, each [certificate holder conducting domestic or flag operations] must show, for each proposed route, that nonvisual ground aids are—

(1) Available over the route for navigating aircraft within the degree of accuracy required for ATC; and

(2) Located to allow navigation to any regular, provisional, refueling, or alternate airport, within

(1) Day VFR operations that the [certificate holder] shows can be conducted safely by pilotage because of the characteristics of the terrain;

(2) Night VFR operations on routes that the [certificate holder] shows have reliably lighted landmarks adequate for safe operation; and

(3) Operations on route segments where the use of celestial or other specialized means of navigation is approved by the Administrator.

[(Amdt. 121–253, Eff. 2/26/96)]

nance, and preventive maintenance of airplanes and auxiliary equipment.]

[(Amdt. 121–253, Eff. 2/26/96)]

§ 121.107 Dispatch centers.

[Each certificate holder conducting domestic or flag operations must show that it has enough dispatch centers, adequate for the operations to be conducted, that are located at points necessary to ensure proper operational control of each flight.]

[(Amdt. 121–253, Eff. 2/26/96)]

§ 121.301 Applicability.

This subpart prescribes instrument and equipment requirements for all certificate holders.

§ 121.303 Airplane instruments and equipment.

(a) Unless otherwise specified, the instrument and equipment requirements of this subpart apply to all operations under this part.

(b) Instruments and equipment required by §§ 121.305 through 121.359 must be approved and installed in accordance with the airworthiness requirements applicable to them.

(c) Each airspeed indicator must be calibrated in knots, and each airspeed limitation and item of related information in the Airplane Flight Manual and pertinent placards must be expressed in knots.

(d) Except as provided in §§ 121.627(b) and 121.628, no person may take off any airplane unless the following instruments and equipment are in operable condition—

(1) Instruments and equipment required to comply with airworthiness requirements under which the airplane is type certificated and as required by §§ 121.213 through 121.283 and 121.289.

(2) Instruments and equipment specified in §§ 121.305 through [121.321, 121.359, and 121.360] for all operations, and the instruments and equipment specified in §§ 121.323 through 121.351 for the kind of operation indicated, wherever these items are not already required by paragraph (d)(1) of this section.

(Amdt. 121–44, Eff. 9/25/68); (Amdt. 121–65, Eff. 8/11/70); (Amdt. 121–114, Eff. 1/23/75); (Amdt. 121–126, Eff. 11/24/75); (Amdt. 121–122, Eff. 6/20/91); [(Amdt. 121–253, Eff. 2/26/96)]

§ 121.305 Flight and navigational equipment.

No person may operate an airplane unless it is equipped with the following flight and navigational instruments and equipment—

(a) An airspeed indicating system with heated pitot tube or equivalent means for preventing malfunctioning due to icing.

(b) A sensitive altimeter.

(c) A sweep-second hand clock (or approved equivalent).

(d) A free-air temperature indicator.

(e) A gyroscopic bank and pitch indicator (artificial horizon).

(f) A gyroscopic rate-of-turn indicator combined with an integral slip-skid indicator (turn-and-bank indicator) except that only a slip-skid indicator is required when a third attitude instrument system usable through flight attitudes of 360° of pitch and roll is installed in accordance with paragraph (j) of this section.

(g) A gyroscopic direction indicator (directional gyro or equivalent).

(h) A magnetic compass.

(i) A vertical speed indicator (rate-of-climb indicator).

(j) [On the airplanes described in this paragraph, in addition to two gyroscopic bank-and-pitch indicators (artificial horizons) for use at the pilot stations, a third such instrument that complies with the provisions of paragraph (k) of this section:

(1) On each turbojet-powered airplane.

(2) On each turbopropeller-powered airplane that is manufactured after March 20, 1997.

(3) After December 20, 2010, on each turbopropeller-powered airplane having a passenger seat configuration of 10–30 seats, that was manufactured before March 20, 1997.

[(k) When required by paragraph (j) of this section, a third gyroscopic bank-and-pitch indicator (artificial horizon) that:

(1) Is powered from a source independent of the electrical generating system;

(2) Continues reliable operation for a minimum of 30 minutes after total failure of the electrical generating system;

(3) Operates independently of any other attitude indicating system;

(4) Is operative without selection after total failure of the electrical generating system;

130, Eff. 11/26/76); (Amdt. 121–130, Eff. 10/15/92); (Amdt 121–230, Correction Eff. 4/2/93); [(Amdt. 121–251, Eff. 1/19/96)]

§ 121.307 Engine instruments.

Unless the Administrator allows or requires different instrumentation for turbine-engine-powered airplanes to provide equivalent safety, no person may conduct any operation under this part without the following engine instruments—

(a) A carburetor air temperature indicator for each engine.

(b) A cylinder head temperature indicator for each air-cooled engine.

(c) A fuel pressure indicator for each engine.

(d) A fuel flowmeter or fuel mixture indicator for each engine not equipped with an automatic altitude mixture control.

(e) A means for indicating fuel quantity in each fuel tank to be used.

(f) A manifold pressure indicator for each engine.

(g) An oil pressure indicator for each engine.

(h) An oil quantity indicator for each oil tank when a transfer or separate oil reserve supply is used.

(i) An oil-in temperature indicator for each engine.

(j) A tachometer for each engine.

(k) An independent fuel pressure warning device for each engine or a master warning device for all engines with a means for isolating the individual warning circuits from the master warning device.

(l) A device for each reversible propeller, to indicate to the pilot when the propeller is in reverse pitch, that complies with the following—

(1) The device may be actuated at any point in the reversing cycle between the normal low pitch stop position and full reverse pitch, but it may not give an indication at or above the normal low pitch stop position.

(2) The source of indication must be actuated by the propeller blade angle or be directly responsive to it.

ation the positioning of flight attendants throughout the passenger compartment during various phases of flight.

[(b) Except as provided in paragraph (c) of this section, no person may operate a passenger-carrying airplane unless each lavatory in the airplane is equipped with a built-in fire extinguisher for each disposal receptacle for towels, paper, or waste located within the lavatory. The built-in fire extinguisher must be designed to discharge automatically into each disposal receptacle upon occurrence of a fire in the receptacle.

[(c) Until December 20, 1997, a certificate holder described in § 121.2(a)(1) or (2) may operate an airplane with a passenger seat configuration of 30 or fewer seats that does not comply with the smoke detector system requirements described in paragraph (a) of this section and the fire extinguisher requirements described in paragraph (b) of this section.

[(d) After December 20, 1997, no person may operate a nontransport category airplane type certificated after December 31, 1964, with a passenger seat configuration of 10–19 seats unless that airplane complies with the smoke detector system requirements described in paragraph (a) of this section, except that the smoke detector system or equivalent must provide a warning light in the cockpit or an audio warning that would be readily detected by the flightcrew.]

Docket No. 24073 (50 FR 12733) Eff. 3/29/85

(Amdt. 121–185, Eff. 4/29/85); [(Amdt. 121–251, Eff. 1/19/96)]

§ 121.309 Emergency equipment.

(a) *General.* No person may operate an airplane unless it is equipped with the emergency equipment listed in this section and in § 121.310.

(b) Each item of emergency and flotation equipment listed in this section and in §§ 121.310, 121.339, and 121.340—

(1) Must be inspected regularly in accordance with inspection periods established in the operations specifications to ensure its condition for

tainer, must be carried in a compartment or container marked as to contents and the compartment or container, or the item itself, must be marked as to date of last inspection.

(c) *Hand fire extinguishers for crew, passenger, cargo, and galley compartments.* Hand fire extinguishers of an approved type must be provided for use in crew, passenger, cargo, and galley compartments in accordance with the following—

(1) The type and quantity of extinguishing agent must be suitable for the kinds of fires likely to occur in the compartment where the extinguisher is intended to be used and, for passenger compartments, must be designed to minimize the hazard of toxic gas concentrations.

(2) *Cargo compartments.* At least one hand fire extinguisher must be conveniently located for use in each class E cargo compartment that is accessible to crewmembers during flight.

(3) *Galley compartments.* At least one hand fire extinguisher must be conveniently located for use in each galley located in a compartment other than a passenger, cargo, or crew compartment.

(4) *Flightcrew compartment.* At least one hand fire extinguisher must be conveniently located on the flight deck for use by the flightcrew.

(5) *Passenger compartments.* Hand fire extinguishers for use in passenger compartments must be conveniently located and, when two or more are required, uniformly distributed throughout each compartment. Hand fire extinguishers shall be provided in passenger compartments as follows—

(i) For airplanes having passenger seats accommodating more than 6 but fewer than 31 passengers, at least one.

(ii) For airplanes having passenger seats accommodating more than 30 but fewer than 61 passengers, at least two.

(iii) For airplanes having passenger seats accommodating more than 60 passengers, there must be at least the following number of hand fire extinguishers—

601 or more 8

(6) Notwithstanding the requirement for uniform distribution of hand fire extinguishers as prescribed in paragraph (c)(5) of this section, for those cases where a galley is located in a passenger compartment, at least one hand fire extinguisher must be conveniently located and easily accessible for use in the galley.

(7) [At least two of the required hand fire extinguisher installed in passenger-carrying airplanes must contain Halon 1211 (bromochlorofluoromethane) or equivalent as the extinguishing agent. At least one hand fire extinguisher in the passenger compartment must contain Halon 1211 or equivalent.]

(d) *First aid and emergency medical equipment and protective gloves.*

(1) [For treatment of injuries or medical emergencies that might occur during flight time or in minor accidents each passenger-carrying airplane must have the following equipment that meets the specifications and requirements of appendix A of this part:

(i) Approved first aid kits; and

(ii) In airplanes for which a flight attendant is required, an emergency medical kit.]

(2) Pairs of protective latex gloves, or equivalent nonpermeable gloves, equal in number to the number of first aid kits on board the aircraft. These gloves must be distributed as evenly as practicable throughout the cabin of the aircraft.

(e) *Crash ax.* [Except for nontransport category airplanes type certificated after December 31, 1964, each airplane must be equipped with a crash ax.]

(f) *Megaphones.* Each passenger-carrying airplane must have a portable battery-powered megaphone or megaphones readily accessible to the crewmembers assigned to direct emergency evacuation, installed as follows—

(1) One megaphone on each airplane with a seating capacity of more than 60 and less than 100 passengers, at the most rearward location in the passenger cabin where it would be readily accessible to a normal flight attendant seat. However, the Administrator may grant a deviation from the requirements of this subparagraph if

(Amdt. 121–2, Eff. 6/7/65); (Amdt. 121–20, Eff. 6/30/66); (Amdt. 121–30, Eff. 10/24/67); (Amdt. 121–48, Eff. 7/11/69); (Amdt. 121–106, Eff. 9/19/73); (Amdt. 121–185, Eff. 4/29/85); (Amdt. 121–188, Eff. 8/1/86); (Amdt 121–230, Eff. 10/15/92); (Amdt 121–242, Eff. 12/2/94); [(Amdt. 121–251, Eff. 1/19/96)]

§ 121.310 Additional emergency equipment.

(a) *Means for emergency evacuation.* Each passenger-carrying landplane emergency exit (other than over-the-wing) that is more than 6 feet from the ground with the airplane on the ground and the landing gear extended, must have an approved means to assist the occupants in descending to the ground. The assisting means for a floor level emergency exit must meet the requirements of § 25.809(f)(1) of this chapter in effect on April 30, 1972, except that, for any airplane for which the application for the type certificate was filed after that date, it must meet the requirements under which the airplane was type certificated. An assisting means that deploys automatically must be armed during taxiing, takeoffs, and landings. However, if the Administrator finds that the design of the exit makes compliance impractical, he may grant a deviation from the requirement of automatic deployment if the assisting means automatically erects upon deployment and, with respect to required emergency exits, if an emergency evacuation demonstration is conducted in accordance with § 121.291(a). This paragraph does not apply to the rear window emergency exit of DC–3 airplanes operated with less than 36 occupants, including crewmembers and less than five exits authorized for passenger use.

(b) *Interior emergency exit marking.* The following must be complied with for each passenger-carrying airplane—

(1) Each passenger emergency exit, its means of access, and its means of opening must be conspicuously marked. The identity and location of each passenger emergency exit must be recognizable from a distance equal to the width of the cabin. The location of each passenger emergency exit must be indicated by a sign visible from that sign; and

(iii) On each bulkhead or divider that prevents fore and aft vision along the passenger cabin, to indicate emergency exits beyond and obscured by it, except that if this is not possible the sign may be placed at another appropriate location.

(2) Each passenger emergency exit marking and each locating sign must meet the following—

(i) For an airplane for which the application for the type certificate was filed prior to May 1, 1972, each passenger emergency exit marking and each locating sign must be manufactured to meet the requirements of § 25.812(b) of this chapter in effect on April 30, 1972. On these airplanes, no sign may continue to be used if its luminescence (brightness) decreases to below 100 microlamberts. The colors may be reversed if it increases the emergency illumination of the passenger compartment. However, the Administrator may authorize deviation from the two-inch background requirements if he finds that special circumstances exist that make compliance impractical and that the proposed deviation provides an equivalent level of safety.

(ii) For an airplane for which the application for the type certificate was filed on or after May 1, 1972, each passenger emergency exit marking and each locating sign must be manufactured to meet the interior emergency exit marking requirements under which the airplane was type certificated. On these airplanes, no sign may continue to be used if its luminescence (brightness) decreases to below 250 microlamberts.

(c) *Lighting for interior emergency exit markings.* [Except for nontransport category airplanes type certificated after December 31, 1964, each passenger-carrying airplane must have an emergency lighting system, independent of the main lighting system. However, sources of general cabin illumination may be common to both the emergency and the main lighting systems if the power supply to the emergency lighting system is independent of

senger aisle, is at least 0.05 footcandles; and

(3) For airplanes type certificated after January 1, 1958, after November 26, 1986, include floor proximity emergency escape path marking which meets the requirements of § 25.812(e) of this chapter in effect on November 26, 1984.

(d) *Emergency light operation.* Except for lights forming part of emergency lighting subsystems provided in compliance with § 25.812(h) of this chapter (as prescribed in paragraph (h) of this section) that serve no more than one assist means, are independent of the airplane's main emergency lighting systems, and are automatically activated when the assist means is deployed, each light required by paragraphs (c) and (h) must comply with the following—

[(1) Each light must—

(i) Be operable manually both from the flightcrew station and, for airplanes on which a flight attendant is required, from a point in the passenger compartment that is readily accessible to a normal flight attendant seat;

(ii) Have a means to prevent inadvertent operation of the manual controls; and

(iii) When armed or turned on at either station, remain lighted or become lighted upon interruption of the airplane's normal electric power.

[(2) Each light must be armed or turned on during taxiing, takeoff, and landing. In showing compliance with this paragraph a transverse vertical separation of the fuselage need not be considered.

[(3) Each light must provide the required level of illumination for at least 10 minutes at the critical ambient conditions after emergency landing.

[(4) Each light must have a cockpit control device that has an "on," "off," and "armed" position.]

(e) *Emergency exit operating handles.*

(1) For a passenger-carrying airplane for which the application for the type certificate was filed prior to May 1, 1972, the location of each passenger emergency exit operating handle, and instructions for opening the exit, must be shown

shaft, extending along at least 70 degrees of arc at a radius approximately equal to ¾ of the handle length; and

(ii) The word "open" in red letters one inch high placed horizontally near the head of the arrow.

(2) For a passenger-carrying airplane for which the application for the type certificate was filed on or after May 1, 1972, the location of each passenger emergency exit operating handle and instructions for opening the exit must be shown in accordance with the requirements under which the airplane was type certificated. On these airplanes, no operating handle or operating handle cover may continue to be used if its luminescence (brightness) decreases to below 100 microlamberts.

(f) *Emergency exit access.* [Access to emergency exits must be provided as follows for each passenger-carrying transport category airplane:]

(1) Each passageway between individual passenger areas, or leading to a Type I or Type II emergency exit, must be unobstructed and at least 20 inches wide.

(2) There must be enough space next to each Type I or Type II emergency exit to allow a crewmember to assist in the evacuation of passengers without reducing the unobstructed width of the passageway below that required in paragraph (f)(1) of this section. However, the Administrator may authorize deviation from this requirement for an airplane certificated under the provisions of part 4b of the Civil Air Regulations in effect before December 20, 1951, if he finds that special circumstances exist that provide an equivalent level of safety.

(3) There must be access from the main aisle to each Type III and Type IV exit. The access from the aisle to these exits must not be obstructed by seats, berths, or other protrusions in a manner that would reduce the effectiveness of the exit. In addition—

(i) For an airplane for which the application for the type certificate was filed prior to May 1, 1972, the access must meet the requirements of § 25.813(c) of this chapter in effect on April 30, 1972; and

§ 25.813(c) of this chapter, effective June 3, 1992.

(iv) Contrary provisions of this section notwithstanding, the Manager of the Transport Airplane Directorate, Aircraft Certification Service, Federal Aviation Administration, may authorize deviation from the requirements of paragraph (f)(3)(iii) of this section if it is determined that special circumstances make compliance impractical. Such special circumstances include, but are not limited to, the following conditions when they preclude achieving compliance with § 25.813(c)(1)(i) or (ii) without a reduction in the total number of passenger seats: emergency exits located in close proximity to each other; fixed installations such as lavatories, galleys, *etc.*; permanently mounted bulkheads; an insufficient number of seat rows ahead of or behind the exit to enable compliance without a reduction in the seat row pitch of more than one inch; or an insufficient number of such rows to enable compliance without a reduction in the seat row pitch to less than 30 inches. A request for such grant or deviation must include credible reasons as to why literal compliance with § 25.813(c)(1)(i) or (ii) is impractical and a description of the steps taken to achieve a level of safety as close to that intended by § 25.813(c)(i) or (ii) as is practical.

(v) The Manager of the Transport Airplane Directorate, Aircraft Certification Service, Federal Aviation Administration, may also authorize a compliance date later than December 3, 1992, if it is determined that special circumstances make compliance by that date impractical. A request for such grant of deviation must outline the airplanes for which compliance will be achieved by December 3, 1992, and include a proposed schedule for incremental compliance of the remaining airplanes in the operator's fleet. In addition, the request must include credible reasons why compliance cannot be achieved earlier.

(4) If it is necessary to pass through a passageway between passenger compartments to reach any required emergency exit from any seat in passenger seat, the door must have a means to latch it in open position, and the door must be latched open during each takeoff and landing. The latching means must be able to withstand the loads imposed upon it when the door is subjected to the ultimate inertia forces, relative to the surrounding structure, listed in § 25.561(b) of this chapter.

(g) *Exterior exit markings.* Each passenger emergency exit and the means of opening that exit from the outside must be marked on the outside of the airplane. There must be a 2-inch colored band outlining each passenger emergency exit on the side of the fuselage. Each outside marking, including the band, must be readily distinguishable from the surrounding fuselage area by contrast in color.

The markings must comply with the following—

(1) If the reflectance of the darker color is 15 percent or less, the reflectance of the lighter color must be at least 45 percent.

(2) If the reflectance of the darker color is greater than 15 percent, at least a 30-percent difference between its reflectance and the reflectance of the lighter color must be provided.

(3) Exits that are not in the side of the fuselage must have the external means of opening and applicable instructions marked conspicuously in red or, if red is inconspicuous against the background color, in bright chrome yellow and, when the opening means for such an exit is located on only one side of the fuselage, a conspicuous marking to that effect must be provided on the other side. "Reflectance" is the ratio of the luminous flux reflected by a body to the luminous flux it receives.

(h) *Exterior emergency lighting and escape route.*

(1) [Except for nontransport category airplanes certificated after December 31, 1964, each passenger-carrying airplane must be equipped with exterior lighting that meets the following requirements:]

(i) For an airplane for which the application for the type certificate was filed prior to May 1, 1972, the requirements of § 25.812(f) and (g) of this chapter in effect on April 30, 1972.

(i) For an airplane for which the application for the type certificate was flied prior to May 1, 1972, the requirements of § 25.803(e) of this chapter in effect on April 30, 1972.

(ii) For an airplane for which the application for the type certificate was filed on or after May 1, 1972, the slip-resistant escape route requirements under which the airplane was type certificated.

(i) *Floor level exits.* Each floor level door or exit in the side of the fuselage (other than those leading into a cargo or baggage compartment that is not accessible from the passenger cabin) that is 44 or more inches high and 20 or more inches wide, but not wider than 46 inches, each passenger ventral exit (except the ventral exits on M–404 and CV–240 airplanes), and each tail cone exit, must meet the requirements of this section for floor level emergency exits. However, the Administrator may grant a deviation from this paragraph if he finds that circumstances make full compliance impractical and that an acceptable level of safety has been achieved.

(j) *Additional emergency exits.* Approved emergency exits in the passenger compartments that are in excess of the minimum number of required emergency exits must meet all of the applicable provisions of this section except paragraphs (f)(1), (2), and (3) and must be readily accessible.

(k) [On each large passenger-carrying turbojet-powered airplane, each ventral exit and tailcone exit must be—]

(1) Designed and constructed so that it cannot be opened during flight; and

(2) Marked with a placard readable from a distance of 30 inches and installed at a conspicuous location near the means of opening the exit, stating that the exit has been designed and constructed so that it cannot be opened during flight.

(l) *Portable lights.* [No person may operate a passenger-carrying airplane unless it is equipped with flashlight stowage provisions accessible from each flight attendant seat.]

(m) Except as provided by § 121.627(c) and except for an airplane used in operations under this part on October 16, 1987, and having an emergency exit in the side of the fuselage (other than those leading into a cargo or baggage compartment that is not accessible from the passenger cabin) that is 44 inches or more high and 20 inches or more wide, but not wider than 46 inches, each passenger ventral exit (except the ventral exits on M–404 and CV–240 airplanes), and each tail cone exit, must meet the requirements of this section for floor level emergency exits. However, the Administrator may grant a deviation from this paragraph if he finds that circumstances make full compliance impractical and that an acceptable level of safety has been achieved.

(Amdt. 121–2, Eff. 6/7/65); (Amdt. 121–20, Eff. 6/30/66); (Amdt. 121–30, Eff. 10/24/67); (Amdt. 121–35, Eff. 10/24/67); (Amdt. 121–38, Eff. 1/31/68); (Amdt. 121–41, Eff. 6/20/68); (Amdt. 121–45, Eff. 2/15/69); (Amdt. 121–46, Eff. 4/23/69); (Amdt. 121–47, Eff. 7/11/69); (Amdt. 121–77, Eff. 9/25/71); (Amdt. 121–84, Eff. 5/1/72); (Amdt. 121–99, Eff. 12/31/72); (Amdt. 121–149, Eff. 12/1/78); (Amdt. 121–183, Eff. 11/26/84); (Amdt. 121–205, Eff. 7/24/89); (Amdt. 121–228, Eff. 6/3/92); [(Amdt. 121–251, Eff. 1/19/96)]

§ 121.311 Seats, safety belts, and shoulder harnesses.

(a) No person may operate an airplane unless there are available during the takeoff, en route flight, and landing—

(1) An approved seat or berth for each person on board the airplane who has reached his second birthday; and

(2) An approved safety belt for separate use by each person on board the airplane who has reached his second birthday, except that two persons occupying a berth may share one approved safety belt and two persons occupying a multiple lounge or divan seat may share one approved safety belt during en route flight only.

(b) Except as provided in this paragraph, each person on board an airplane operated under this part shall occupy an approved seat or berth with a separate safety belt properly secured about him or her during movement on the surface, takeoff, and landing. A safety belt provided for the occupant of a seat may not be used by more than one person who has reached his or her second birthday. Notwithstanding the preceding requirements, a child may—

(1) Be held by an adult who is occupying an approved seat or berth if that child has not reached his or her second birthday; or

(2) Nothwithstanding any other requirement of this chapter, occupy an approved child restraint system furnished by the certificate holder or one

(A) Seats manufactured to U.S. standards between January 1, 1981, and February 25, 1985, must bear the label: "This child restraint system conforms to all applicable Federal motor vehicle safety standards." Vest- and harness-type child restraint systems manufactured before February 26, 1985, bearing such a label are not approved for the purposes of this section;

(B) Seats manufactured to U.S. standards on or after February 26, 1985, must bear two labels—

(1) "This child restraint system conforms to all applicable Federal motor vehicle safety standards"; and

(2) "This restraint is certified for use in motor vehicles and aircraft" in red lettering;

(C) Seats that do not qualify under paragraphs (b)(2)(ii)(A) and (b)(2)(ii)(B) of this section must bear either a label showing approval of a foreign government or a label showing that the seat was manufactured under the standards of the United Nations; and

(iii) The certificate holder complies with the following requirements—

(A) The restraint system must be properly secured to an approved forward-facing seat or berth;

(B) The child must be properly secured in the restraint system and must not exceed the specified weight limit for the restraint system; and

(C) The restraint system must bear the appropriate label(s).

(c) No certificate holder may prohibit a child, if requested by the child's parent, guardian, or designated attendant, from occupying a child restraint system furnished by the child's parent, guardian, or designated attendant, provided the child holds a ticket for an approved seat or berth, or such seat or berth is otherwise made available by the certificate holder for the child's use, and the requirements contained in paragraphs (b)(2)(i) through (b)(2)(iii) of this section are met. This sec-

(e) [Except as provided in paragraphs (e)(1) through (e)(3) of this section, no certificate holder may take off or land an airplane unless each passenger seat back is in the upright position.]

(1) This paragraph does not apply to seat backs placed in other than the upright position in compliance with § 121.310(g)(3).

(2) This paragraph does not apply to seats on which cargo or persons who are unable to sit erect for a medical reason are carried in accordance with procedures in the certificate holder's manual if the seat back does not obstruct any passenger's access to the aisle or to any emergency exit.

[(3) On airplanes with no flight attendant, the certificate holder may take off or land as long as the flightcrew instructs each passenger to place his or her seat back in the upright position for takeoff and landing.]

(f) [No person may operate a transport category airplane that was type certificated after January 1, 1958, or a nontransport category airplane manufactured after March 20, 1997, unless it is equipped at each flight deck station with a combined safety belt and shoulder harness that meets the applicable requirements specified in § 25.785 of this chapter, effective March 6, 1980, except that—]

(1) Shoulder harnesses and combined safety belt and shoulder harnesses that were approved and installed before March 6, 1980, may continue to be used; and

(2) Safety belt and shoulder harness restraint systems may be designed to the inertia load factors established under the certification basis of the airplane.

(g) Each flight attendant must have a seat for takeoff and landing in the passenger compartment that meets the requirements of § 25.785 of this chapter, effective March 6, 1980, except that—

(1) Combined safety belt and shoulder harnesses that were approved and installed before March 6, 1980, may continue to be used; and

(2) Safety belt and shoulder harness restraint systems may be designed to the inertia load factors established under the certification basis of the airplane.

and landing, except that a shoulder harness that is not combined with a safety belt may be unfastened if the occupant cannot perform the required duties with the shoulder harness fastened.]

(i) At each unoccupied seat, the safety belt and shoulder harness, if installed, must be secured so as not to interfere with crewmembers in the performance of their duties or with the rapid egress of occupants in an emergency.

(Amdt. 121–30, Eff. 10/24/67); (Amdt. 121–41, Eff. 6/20/68); (Amdt. 121–75, Eff. 8/30/71); (Amdt. 121–84, Eff. 5/1/72); (Amdt. 121–133, Eff. 5/16/77); (Amdt. 121–155, Eff. 3/6/80); (Amdt. 121–157, Eff. 5/6/80); (Amdt. 121–170, Eff. 3/6/81); (Amdt. 121–177, Eff. 3/6/82); (Amdt 121–230, Eff. 10/15/92); [(Amdt. 121–251, Eff. 1/19/96)]

§ 121.312 Materials for compartment interiors.

[(a) *All interior materials; transport category airplanes and nontransport category airplanes type certificated before January 1, 1965.* Except for the materials covered by paragraph (b) of this section, all materials in each compartment of a transport category airplane, or a nontransport category airplane type certificated before January 1, 1965, used by the crewmembers and passengers, must meet the requirements of § 25.853 of this chapter in effect as follows, or later amendment thereto:

(1) *Airplane with passenger seating capacity of 20 or more.*

(i) *Manufactured after August 19, 1988, but prior to August 20, 1990.* Except as provided in paragraph (a)(3)(ii) of this section, each airplane with a passenger capacity of 20 or more and manufactured after August 19, 1988, but prior to August 20, 1990, must comply with the heat release rate testing provisions of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on August 20, 1986) (see app. L of this part), except that the total heat release over the first 2 minutes of sample exposure must not exceed 100 kilowatt minutes per square meter and the peak heat release rate must not exceed 100 kilowatts per square meter.

(2) *Substantially complete replacement of the cabin interior on or after May 1, 1972.*

(i) *Airplane for which the application for type certificate was filed prior to May 1, 1972.* Except as provided in paragraph (a)(3)(i) or (a)(3)(ii) of this section, each airplane for which the application for type certificate was filed prior to May 1, 1972, must comply with the provisions of § 25.853 in effect on April 30, 1972, regardless of passenger capacity, if there is a substantially complete replacement of the cabin interior after April 30, 1972.

(ii) *Airplane for which the application for type certificate was filed on or after May 1, 1972.* Except as provided in paragraph (a)(3)(i) or (a)(3)(ii) of this section, each airplane for which the application for type certificate was filed on or after May 1, 1972, must comply with the material requirements under which the airplane was type certificated, regardless of passenger capacity, if there is a substantially complete replacement of the cabin interior on or after that date.

(3) *Airplane type certificated after January 1, 1958, with passenger capacity of 20 or more.*

(i) *Substantially complete replacement of the cabin interior on or after March 6, 1995.* Except as provided in paragraph (a)(3)(ii) of this section, each airplane that was type certificated after January 1, 1958, and has a passenger capacity of 20 or more, must comply with the heat release rate testing provisions of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1) in effect on August 20, 1986) (see app. L of this part), if there is a substantially complete replacement of the cabin interior components identified in § 25.853(d), on or after that date, except that the total heat release over the first 2 minutes of sample exposure shall not exceed 100 kilowatt-minutes per square meter and the peak heat release rate must not exceed 100 kilowatts per square meter.

(ii) *Substantially complete replacement of the cabin interior on or after August 20, 1990.* Each airplane that was type certificated after January 1, 1958, and has a passenger capacity

(4) Contrary provisions of this section notwithstanding, the Manager of the Transport Airplane Directorate, Aircraft Certification Service, Federal Aviation Administration, may authorize deviation from the requirements of paragraph (a)(1)(i), (a)(1)(ii), (a)(3)(i), or (a)(3)(ii) of this section for specific components of the cabin interior that do not meet applicable flammability and smoke emission requirements, if the determination is made that special circumstances exist that make compliance impractical. Such grants of deviation will be limited to those airplanes manufactured within 1 year after the applicable date specified in this section and those airplanes in which the interior is replaced within 1 year of that date. A request for such grant of deviation must include a thorough and accurate analysis of each component subject to § 25.853(a–1), the steps being taken to achieve compliance, and, for the few components for which timely compliance will not be achieved, credible reasons for such noncompliance.

(5) Contrary provisions of this section notwithstanding, galley carts and galley standard containers that do not meet the flammability and smoke emission requirements of § 25.853(d) in effect March 6, 1995 (formerly § 25.853(a–1)) (see app. L of this part) may be used in airplanes that must meet the requirements of paragraphs (a)(1)(i), (a)(1)(ii), (a)(3)(i), or (a)(3)(ii) of this section, provided the galley carts or standard containers were manufactured prior to March 6, 1995.

[(b) *Seat cushions.* Seat cushions, except those on flight crewmember seats, in each compartment occupied by crew or passengers, must comply with the requirements pertaining to seat cushions in § 25.853(c) effective on November 26, 1984, on each airplane as follows:

(1) Each transport category airplane type certificated after January 1, 1958; and

(2) On or after December 20, 2010, each non-transport category airplane type certificated after December 31, 1964.

[(c) *All interior materials; airplanes type certificated in accordance with SFAR No. 41 of 14 CFR part 21.* No person may operate an airplane that 1978) (see app. L of this part).

[(d) *All interior materials; other airplanes.* For each material or seat cushion to which a requirement in paragraphs (a), (b), or (c) of this section does not apply, the material and seat cushion in each compartment used by the crewmembers and passengers must meet the applicable requirement under which the airplane was type certificated.]

(Amdt. 121–30, Eff. 10/24/67); (Amdt. 121–84, Eff. 5/1/72); (Amdt. 121–184, Eff. 11/26/84); (Amdt. 121–189, Eff. 8/20/86); (Amdt. 121–198, Eff. 9/26/88); (Amdt. 121–247, Eff. 3/6/95); [(Amdt. 121–251, Eff. 1/19/96)]

§ 121.313 Miscellaneous equipment.

No person may conduct operation unless the following equipment is installed in the airplane—

(a) If protective fuses are installed on an airplane, the number of spare fuses approved for that airplane and appropriately described in the certificate holder's manual.

(b) A windshield wiper or equivalent for each pilot station.

(c) A power supply and distribution system that meets the requirements of §§ 25.1309, 25.1331, 25.1351(a) and (b)(1) through (4), 25.1353, 25.1355, and 25.1431(b) or that is able to produce and distribute the load for the required instruments and equipment, with use of an external power supply if any one power source or component of the power distribution system fails. The use of common elements in the system may be approved if the Administrator finds that they are designed to be reasonably protected against malfunctioning. Engine-driven sources of energy, when used, must be on separate engines.

(d) A means for indicating the adequacy of the power being supplied to required flight instruments.

(e) Two independent static pressure systems, vented to the outside atmospheric pressure so that they will be least affected by air flow variation or moisture or other foreign matter, and installed so as to be airtight except for the vent. When a means is provided for transferring an instrument from its primary operating system to an alternate system, the means must include a positive position-

senger compartment from another compartment that has emergency exit provisions. The key must be readily available for each crewmember.

(h) A placard on each door that is the means of access to a required passenger emergency exit, to indicate that it must be open during takeoff and landing.

(i) A means for the crew, in an emergency to unlock each door that leads to a compartment that is normally accessible to passengers and that can be locked by passengers.

(Amdt. 121–5, Eff. 4/30/65); [(Amdt. 121–251, Eff. 1/19/96)]

§ 121.314 Cargo and baggage compartments.

(a) [Each] Class C or D compartment, as defined in § 25.857 of part 25 of this chapter, greater than 200 cubic feet in volume in a transport category airplane type certificated after January 1, 1958, must have ceiling and sidewall liner panels which are constructed of—

(1) Glass fiber reinforced resin;

(2) Materials which meet the test requirements of part 25, appendix F, part III of this chapter; or

(3) In the case of liner installations approved prior to March 20, 1989, aluminum.

(b) For compliance with this section, the term "liner" includes any design feature, such as a joint or fastener, which would affect the capability of the liner to safely contain a fire.

Docket No. 25430 (54 FR 7389) Eff. 2/17/89

(Amdt. 121–202, Eff. 3/20/89); [(Amdt. 121–253, Eff. 2/26/96)]

§ 121.315 Cockpit check procedure.

(a) Each certificate holder shall provide an approved cockpit check procedure for each type of aircraft.

(b) The approved procedures must include each item necessary for flight crewmembers to check for safety before starting engines, taking off, or

§ 121.316 Fuel tanks.

Each turbine-powered transport category airplane operated after October 30, 1991, must meet the requirements of § 25.963(e) of this Chapter in effect on October 30, 1989.

Docket No. 25614 (54 FR 40354) Eff. 9/29/89

(Amdt. 121–208, Eff. 10/30/89)

§ 121.317 Passenger information.

(a) [Except as provided in paragraph (l) of this section, no person may operate an airplane unless it is equipped with passenger information signs that meet the requirements of § 25.791 of this chapter. Except as provided in paragraph (l) of this section, the signs must be constructed so that the crewmembers can turn them on and off.

(b) [Except as provided in paragraph (l) of this section, the "Fasten Seat Belt" sign shall be turned on during any movement on the surface, for each takeoff, for each landing, and at any other time considered necessary by the pilot in command.]

(c) No person may operate an aircraft on a flight segment on which smoking is prohibited unless the "No Smoking" passenger information signs are lighted during the entire flight segment, or one or more "No Smoking" placards meeting the requirements of § 25.1541 are posted during the entire flight segment. If both the lighted signs and the placards are used, the signs must remain lighted during the entire flight segment.

Smoking is prohibited on scheduled flight segments—

(1) Between any two points within Puerto Rico, the United States Virgin Islands, the District of Columbia, or any State of the United States (other than Alaska or Hawaii) or between any two points in any one of the above-mentioned jurisdictions (other than Alaska or Hawaii);

(2) Within the State of Alaska or within the State of Hawaii; or

(3) Scheduled in the current Worldwide or North American Edition of the *Official Airline Guide* for 6 hours or less in duration and between any point listed in paragraph (c)(1) of this section

(e) No person may operate an airplane unless there is installed in each lavatory a sign or placard that reads: "Federal law provides for a penalty of up to $2,000 for tampering with the smoke detector installed in this lavatory." These signs or placards need not meet the requirements of paragraph (a) of this section.

(f) Each passenger required by § 121.311(b) to occupy a seat or berth shall fasten his or her safety belt about him or her and keep it fastened while the "Fasten Seat Belt" sign is lighted.

(g) No person may smoke while a "No Smoking" sign is lighted or if "No Smoking" placards are posted, except that the pilot in command may authorize smoking on the flight deck except during airplane movement on the surface, takeoff, or landing.

(h) No person may smoke in any airplane lavatory.

(i) No person may tamper with, disable, or destroy any smoke detector installed in any airplane lavatory.

(j) On flight segments other than those described in paragraph (c) of this section, the "No Smoking" sign must be turned on during any movement on the surface, for each takeoff, for each landing, and at any other time considered necessary by the pilot in command.

(k) [Each passenger shall comply with instructions given him or her by a crewmember regarding compliance with paragraphs (f), (g), (h), and (l) of this section.

[(l) A certificate holder may operate a non-transport category airplane type certificated after December 31, 1964, that is manufactured before December 20, 1997, if it is equipped with at least one placard that is legible to each person seated in the cabin that states "Fasten Seat Belt," and if, during any movement on the surface, for each takeoff, for each landing, and at any other time considered necessary by the pilot in command, a

§ 121.318 Public address system.

No person may operate an airplane with a seating capacity of more than 19 passengers unless it is equipped with a public address system which—

(a) Is capable of operation independent of the crewmember interphone system required by § 121.319, except for handsets, headsets, microphones, selector switches, and signaling devices;

(b) Is approved in accordance with § 21.305 of this chapter;

(c) Is accessible for immediate use from each of two flight crewmember stations in the pilot compartment;

(d) For each required floor-level passenger emergency exit which has an adjacent flight attendant seat, has a microphone which is readily accessible to the seated flight attendant, except that one microphone may serve more than one exit, provided the proximity of the exits allows unassisted verbal communication between seated flight attendants;

(e) Is capable of operation within 10 seconds by a flight attendant at each of those stations in the passenger compartment from which its use is accessible;

(f) Is audible at all passenger seats, lavatories, and flight attendant seats and work stations; and

(g) For transport category airplanes manufactured on or after November 27, 1990, meets the requirements of § 25.1423 of this chapter.

Docket No. 24995 (54 FR 43926) Eff. 10/27/89

(Amdt. 121–105, Eff. 9/8/73); (Amdt. 121–149, Eff. 12/1/78); (Amdt. 121–159, Eff. 8/31/80); (Amdt. 121–179, Eff. 10/1/82); (Amdt. 121–209, Eff. 11/27/89)

§ 121.319 Crewmember interphone system.

(a) [No] person may operate an airplane with a seating capacity of more than 19 passengers unless the airplane is equipped with a crewmember interphone system that—

by paragraph (a) of this section must be approved in accordance with § 21.305 of this chapter and meet the following requirements:

(1) [It] must provide a means of two-way communication between the pilot compartment and—

(i) Each passenger compartment; and

(ii) Each galley located on other than the main passenger deck level.

(2) It must be accessible for immediate use from each of two flight crewmember stations in the pilot compartment;

(3) It must be accessible for use from at least one normal flight attendant station in each passenger compartment;

(4) It must be capable of operation within 10 seconds by a flight attendant at those stations in each passenger compartment from which its use is accessible; and

(5) For large turbojet-powered airplanes—

(i) It must be accessible for use at enough flight attendant stations so that all floor-level emergency exits (or entryways to those exits in the case of exits located within galleys) in each passenger compartment are observable from one or more of those stations so equipped;

(ii) It must have an alerting system incorporating aural or visual signals for use by flight crewmembers to alert flight attendants and for use by flight attendants to alert flight crewmembers;

(iii) The alerting system required by paragraph (b)(5)(ii) of this section must have a means for the recipient of a call to determine whether it is a normal call or an emergency call; and

(iv) When the airplane is on the ground, it must provide a means of two-way communication between ground personnel and either of at least two flight crewmembers in the pilot compartment. The interphone system station for use by ground personnel must be so located

§ 121.321 [Reserved]

(Amdt. 121–3, Eff. 4/1/65); (Amdt. 121–155, Eff. 3/6/80)

§ 121.323 Instruments and equipment for operations at night.

No person may operate an airplane at night unless it is equipped with the following instruments and equipment in addition to those required by §§ 121.305 through 121.321—

(a) Position lights.

(b) [An anti-collision light.

(c) [Two landing lights, except that only one landing light is required for nontransport category airplanes type certificated after December 31, 1964.]

(d) Instrument lights providing enough light to make each required instrument, switch, or similar instrument, easily readable and installed so that the direct rays are shielded from the flight crewmembers' eyes and that no objectionable reflections are visible to them. There must be a means of controlling the intensity of illumination unless it is shown that nondimming instrument lights are satisfactory.

(e) An airspeed-indicating system with heated pitot tube or equivalent means for preventing malfunctioning due to icing.

(f) A sensitive altimeter.

[(Amdt. 121–251, Eff. 1/19/96)]

§ 121.325 Instruments and equipment for operations under IFR or over-the-top.

No person may operate an airplane under IFR or over-the-top conditions unless it is equipped with the following instruments and equipment, in addition to those required by §§ 121.305 through 121.321—

(a) An airspeed indicating system with heated pitot tube or equivalent means for preventing malfunctioning due to icing.

nondimming instrument lights are satisfactory.

§ 121.327 Supplemental oxygen: Reciprocating-engine-powered airplanes.

(a) *General.* Except where supplemental oxygen is provided in accordance with § 121.331, no person may operate an airplane unless supplemental oxygen is furnished and used as set forth in paragraphs (b) and (c) of this section. The amount of supplemental oxygen required for a particular operation is determined on the basis of flight altitudes and flight duration, consistent with the operation procedures established for each operation and route.

(b) *Crewmembers.*

(1) At cabin pressure altitudes above 10,000 feet up to and including 12,000 feet, oxygen must be provided for, and used by, each member of the flight crew on flight deck duty, and must be provided for other crewmembers, for that part of the flight at those altitudes that is of more than 30 minutes duration.

(2) At cabin pressure altitudes above 12,000 feet, oxygen must be provided for, and used by, each member of the flight crew on flight deck duty, and must be provided for other crewmembers, during the entire flight time at those altitudes.

(3) When a flight crewmember is required to use oxygen, he must use it continuously, except when necessary to remove the oxygen mask or other dispenser in connection with his regular duties. Standby crewmembers who are on call or are definitely going to have flight deck duty before completing the flight must be provided with an amount of supplemental oxygen equal to that provided for crewmembers on duty other than on flight deck duty. If a standby crewmember is not on call and will not be on flight deck duty during the remainder of the flight, he is considered to be a passenger for the purposes of supplemental oxygen requirements.

(c) *Passengers.* Each certificate holder shall provide a supply of oxygen, approved for passenger safety, in accordance with the following—

15,000 feet, enough oxygen for each passenger carried during the entire flight at those altitudes.

(d) For the purposes of this subpart "cabin pressure altitude" means the pressure altitude corresponding with the pressure in the cabin of the airplane, and "flight altitude" means the altitude above sea level at which the airplane is operated. For airplanes without pressurized cabins, "cabin pressure altitude" and "flight altitude" mean the same thing.

§ 121.329 Supplemental oxygen for sustenance: Turbine-engine-powered airplanes.

(a) *General.* When operating a turbine-engine-powered airplane, each certificate holder shall equip the airplane with sustaining oxygen and dispensing equipment for use as set forth in this section—

(1) The amount of oxygen provided must be at least the quantity necessary to comply with paragraphs (b) and (c) of this section.

(2) The amount of sustaining and first-aid oxygen required for a particular operation to comply with the rules in this part is determined on the basis of cabin pressure altitudes and flight duration, consistent with the operating procedures established for each operation and route.

(3) The requirements for airplanes with pressurized cabins are determined on the basis of cabin pressure altitude and the assumption that a cabin pressurization failure will occur at the altitude or point of flight that is most critical from the standpoint of oxygen need and that after the failure the airplane will descend in accordance with the emergency procedures specified in the Airplane Flight Manual, without exceeding its operating limitations, to a flight altitude that will allow successful termination of the flight.

(4) Following the failure, the cabin pressure altitude is considered to be the same as the flight altitude unless it is shown that no probable failure of the cabin or pressurization equipment will result in a cabin pressure altitude equal to the flight altitude. Under those circumstances, the maximum cabin pressure altitude attained may

be provided for other crewmembers for that part of the flight at those altitudes that is more than 30 minutes duration.

(2) At cabin pressure altitudes above 12,000 feet, oxygen must be provided for, and used by, each member of the flight crew on flight deck duty, and must be provided for other crewmembers during the entire flight at those altitudes.

(3) When a flight crewmember is required to use oxygen, he must use it continuously except when necessary to remove the oxygen mask or other dispenser in connection with his regular duties. Standby crewmembers who are on call or are definitely going to have flight deck duty before completing the flight must be provided with an amount of supplemental oxygen equal to that provided for crewmembers on duty other than on flight duty. If a standby crewmember is not on call and will not be on flight deck duty during the remainder of the flight he is considered to be a passenger for the purposes of supplemental oxygen requirements.

(c) *Passengers.* Each certificate holder shall provide a supply of oxygen for passengers in accordance with the following—

(1) For flights at cabin pressure altitudes above 10,000 feet, up to and including 14,000 feet, enough oxygen for that part of the flight at those altitudes that is of more than 30 minutes duration, for 10 percent of the passengers.

(2) For flights at cabin pressure altitudes above 14,000 feet, up to and including 15,000 feet, enough oxygen for that part of the flight at those altitudes for 30 percent of the passengers.

(3) For flights at cabin pressure altitudes above 15,000 feet, enough oxygen for each passenger carried during the entire flight at those altitudes.

§ 121.331 Supplemental oxygen requirements for pressurized cabin airplanes: Reciprocating-engine-powered airplanes.

(a) When operating a reciprocating-engine-powered airplane with a pressurized cabin, each certifi-

is that quantity of oxygen necessary for a constant rate of descent from the airplane's maximum certificated operating altitude to 10,000 feet in ten minutes and followed by 110 minutes at 10,000 feet. The oxygen required by § 121.337 may be considered in determining the supplemental breathing supply required for flight crewmembers on flight deck duty in the event of cabin pressurization failure.

(c) *For passengers.* When operating at flight altitudes above 8,000 feet, the certificate holder shall provide oxygen as follows—

(1) When an airplane is not flown at a flight altitude above flight level 250, enough oxygen for 30 minutes for 10 percent of the passengers, if at any point along the route to be flown the airplane can safely descend to a flight altitude of 14,000 feet or less within four minutes.

(2) If the airplane cannot descend to a flight altitude of 14,000 feet or less within four minutes, the following supply of oxygen must be provided—

(i) For that part of the flight that is more than four minutes duration at flight altitudes above 15,000 feet, the supply required by § 121.327(c)(3).

(ii) For that part of the flight at flight altitudes above 14,000 feet, up to and including 15,000 feet, the supply required by § 121.327(c)(2).

(iii) For flight at flight altitudes above 8,000 feet up to and including 14,000 feet, enough oxygen for 30 minutes for 10 percent of the passengers.

(3) When an airplane is flown at a flight altitude above flight level 250, enough oxygen for 30 minutes for 10 percent of the passengers for the entire flight (including emergency descent) above 8,000 feet, up to and including 14,000 feet, and to comply with § 121.327(c)(2) and (3) for flight above 14,000 feet.

(d) For the purposes of this section it is assumed that the cabin pressurization failure occurs at a time during flight that is critical from the standpoint of oxygen need and that after the failure the airplane will descend, without exceeding its normal

(a) *General.* When operating a turbine-engine-powered airplane with a pressurized cabin, the certificate holder shall furnish oxygen and dispensing equipment to comply with paragraphs (b) through (e) of this section in the event of cabin pressurization failure.

(b) *Crewmembers.* When operating at flight altitudes above 10,000 feet, the certificate holder shall supply enough oxygen to comply with § 121.329, but not less than a two-hour supply for each flight crewmember on flight deck duty. The required two hours supply is that quantity of oxygen necessary for a constant rate of descent from the airplane's maximum certificated operating altitude to 10,000 feet in ten minutes and followed by 110 minutes at 10,000 feet. The oxygen required in the event of cabin pressurization failure by § 121.337 may be included in determining the supply required for flight crewmembers on flight deck.

(c) *Use of oxygen masks by flight crewmembers.*

(1) When operating at flight altitudes above flight level 250, each flight crewmember on flight deck duty must be provided with an oxygen mask so designed that it can be rapidly placed on his face from its ready position, properly secured, sealed, and supplying oxygen upon demand; and so designed that after being placed on the face it does not prevent immediate communication between the flight crewmember and other crewmembers over the airplane intercommunication system. When it is not being used at flight altitudes above flight level 250, the oxygen mask must be kept in condition for ready use and located so as to be within the immediate reach of the flight crewmember while at his duty station.

(2) When operating at flight altitudes above flight level 250, one pilot at the controls of the airplane shall at all times wear and use an oxygen mask secured, sealed, and supplying oxygen, except that the one pilot need not wear and use an oxygen mask while at or below flight level 410 if each flight crewmember on flight deck duty has a quick-donning type of oxygen mask that the certificate holder has shown can be placed on the face from its ready position, properly secured, sealed, and supplying oxygen upon demand; and so designed that after being placed on the face it does not prevent immediate communication between the flight crewmember and other crewmembers over the airplane intercommunication system.

(3) Notwithstanding paragraph (c)(2) of this section, if for any reason at any time it is necessary for one pilot to leave his station at the controls of the airplane when operating at flight altitudes above flight level 250, the remaining pilot at the controls shall put on and use his oxygen mask until the other pilot has returned to his duty station.

(4) Before the takeoff of a flight, each flight crewmember shall personally preflight his oxygen equipment to ensure that the oxygen mask is functioning, fitted properly, and connected to appropriate supply terminals, and that the oxygen supply and pressure are adequate for use.

(d) *Use of portable oxygen equipment by cabin attendants.* Each attendant shall, during flight above flight level 250 flight altitude, carry portable oxygen equipment with at least a 15-minute supply of oxygen unless it is shown that enough portable oxygen units with masks or spare outlets and masks are distributed throughout the cabin to ensure immediate availability of oxygen to each cabin attendant, regardless of his location at the time of cabin depressurization.

(e) *Passenger cabin occupants.* When the airplane is operating at flight altitudes above 10,000 feet, the following supply of oxygen must be provided for the use of passenger cabin occupants—

(1) When an airplane certificated to operate at flight altitudes up to and including flight level 250, can at any point along the route to be flown, descend safely to a flight altitude of 14,000 feet or less within four minutes, oxygen must be available at the rate prescribed by this part for a 30-minute period for at least 10 percent of the passenger cabin occupants.

(2) When an airplane is operated at flight altitudes up to and including flight level 250 and cannot descend safely to a flight altitude of 14,000 feet within four minutes, or when an airplane is operated at flight altitudes above flight level 250, oxygen must be available at the rate prescribed by this part for not less than 10 percent of the passenger cabin occupants for the

altitudes above flight level 250, a supply of oxygen in accordance with the requirements of § 25.1443(d) must be provided for two percent of the occupants for the entire flight after cabin depressurization at cabin pressure altitudes above 8,000 feet, but in no case to less than one person. An appropriate number of acceptable dispensing units, but in no case less than two, must be provided, with a means for the cabin attendants to use this supply.

(f) *Passenger briefing.* Before flight is conducted above flight level 250, a crewmember shall instruct the passengers on the necessity of using oxygen in the event of cabin depressurization and shall point out to them the location and demonstrate the use of the oxygen-dispensing equipment.

(Amdt. 121–11, Eff. 9/30/65); (Amdt. 121–132, Eff. 2/1/77)

§ 121.335 Equipment standards.

(a) *Reciprocating-engine-powered airplanes.* The oxygen apparatus, the minimum rates of oxygen flow, and the supply of oxygen necessary to comply with § 121.327 must meet the standards established in § 4b.651 of the Civil Air Regulations as in effect on July 20, 1950, except that if the certificate holder shows full compliance with those standards to be impracticable, the Administrator may authorize any change in those standards that he finds will provide an equivalent level of safety.

(b) *Turbine-engine-powered airplanes.* The oxygen apparatus, the minimum rate of oxygen flow, and the supply of oxygen necessary to comply with §§ 121.329 and 121.333 must meet the standards established in § 4b.651 of the Civil Air Regulations as in effect on September 1, 1958, except that if the certificate holder shows full compliance with those standards to be impracticable, the Administrator may authorize any changes in those standards that he finds will provide an equivalent level of safety.

§ 121.337 Protective breathing equipment.

(a) The certificate holder shall furnish approved protective breathing equipment (PBE) meeting the

(1) *General.* The equipment must protect the flightcrew from the effects of smoke, carbon dioxide or other harmful gases or an oxygen deficient environment caused by other than an airplane depressurization while on flight deck duty and must protect crewmembers from the above effects while combatting fires on board the airplane.

(2) The equipment must be inspected regularly in accordance with inspection guidelines and the inspection periods established by the equipment manufacturer to ensure its condition for continued serviceability and immediate readiness to perform its intended emergency purposes. The inspection periods may be changed upon a showing by the certificate holder that the changes would provide an equivalent level of safety.

(3) That part of the equipment protecting the eyes must not impair the wearer's vision to the extent that a crewmember's duties cannot be accomplished and must allow corrective glasses to be worn without impairment of vision or loss of the protection required by paragraph (b)(1) of this section.

(4) The equipment, while in use, must allow the flightcrew to communicate using the airplane radio equipment and to communicate by interphone with each other while at their assigned duty stations. The equipment, while in use, must also allow crewmember interphone communications between each of two flight crewmember stations in the pilot compartment and at least one normal flight attendant station in each passenger compartment.

(5) The equipment, while in use, must allow any crewmember to use the airplane interphone system at any of the flight attendant stations referred to in paragraph (b)(4) of this section.

(6) The equipment may also be used to meet the supplemental oxygen requirements of this part provided it meets the oxygen equipment standards of § 121.335 of this part.

(7) Protective breathing gas duration and supply system equipment requirements are as follows—

from hazards in itself, in its method of operation, and in its effect upon other components.

(iii) For breathing gas systems other than chemical oxygen generators, there must be a means to allow the crew to readily determine, during flight, the quantity of breathing gas available in each source of supply.

(iv) For each chemical oxygen generator, the supply system equipment must meet the requirements of § 25.1450(b) and (c) of this chapter.

(8) [*Smoke and fume protection.*] Protective breathing equipment with a fixed or portable breathing gas supply meeting the requirements of this section must be conveniently located on the flight deck and be easily accessible for immediate use by each required flight crewmember at his or her assigned duty station.

(9) [*Fire combatting.* Except for nontransport category airplanes type certificated after December 31, 1964, protective breathing equipment with a portable breathing gas supply meeting the requirements of this section must be easily accessible and conveniently located for immediate use by crewmembers in combatting fires as follows:]

(i) One for use in each Class A, B, and E cargo compartment (as defined in § 25.857 of this chapter) that is accessible to crewmembers in the compartment during flight.

(ii) One PBE is required for each hand fire extinguisher located for use in a galley other than a galley located in a passenger, cargo, or crew compartment.

(iii) One on the flight deck, except that the Administrator may authorize another location for this PBE if special circumstances exist that make compliance impractical and the proposed deviation would provide an equivalent level of safety.

(iv) In each passenger compartment, one located within 3 feet of each hand fire extinguisher required by § 121.309 of this part, except that the Administrator may authorize a deviation allowing locations of PBE more than 3 feet from required hand fire extinguisher locations if special circumstances exist that

(i) For other than chemical oxygen generator systems, is functioning, is serviceable, fits properly (unless a universal-fit type), and is connected to supply terminals and that the breathing gas supply and pressure are adequate for use; and

(ii) For chemical oxygen generator systems, is serviceable and fits properly (unless a universal-fit type).

(2) Each item of PBE located at other than a flight crewmember duty station must be checked by a designated crewmember to ensure that each is properly stowed and serviceable, and, for other than chemical oxygen generator systems, the breathing gas supply is fully charged. Each certificate holder, in its operations manual, must designate at least one crewmember to perform those checks before he or she takes off in that airplane for his or her first flight of the day.

Docket No. 24792 (52 FR 20957) Eff. 6/3/87;

(Amdt. 121–193, Eff. 7/6/87); (Amdt. 121–204, Eff. 5/22/89); (Amdt. 121–212, Eff. 2/15/90); (Amdt. 121–218, Eff. 7/30/90); (Amdt. 121–230, Eff. 10/15/92); [(Amdt. 121–251, Eff. 1/19/96)]

§ 121.339 Emergency equipment for extended over-water operations.

(a) Except where the Administrator, by amending the operations specifications of the certificate holder, requires the carriage of all or any specific items of the equipment listed below for any over-water operation, or upon application of the certificate holder, the Administrator allows deviation for a particular extended over-water operation, no person may operate an airplane in extended over-water operations without having on the airplane the following equipment—

(1) A life preserver equipped with an approved survivor locator light, for each occupant of the airplane.

(2) Enough liferafts (each equipped with an approved survivor locator light) of a rated capacity and buoyancy to accommodate the occupants of the airplane. Unless excess rafts of enough capacity are provided, the buoyancy and seating

in use for more than 1 cumulative hour, or, when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter manufacturer under its approval. The new expiration date for replacing (or recharging) the battery must be legibly marked on the outside of the transmitter. The battery useful life (or useful life of charge)(requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.]

(b) The required life rafts, life preservers, and survival type emergency locator transmitter must be easily accessible in the event of a ditching without appreciable time for preparatory procedures. This equipment must be installed in conspicuously marked, approved locations.

(c) A survival kit, appropriately equipped for the route to be flown, must be attached to each required liferaft.

(Amdt. 121–25, Eff. 2/28/67); (Amdt. 121–53, Eff. 10/30/69); (Amdt. 121–79, Eff. 10/21/71); (Amdt. 121–93, Eff. 7/19/72); (Amdt. 121–106, Eff. 9/19/73); (Amdt. 121–149, Eff. 12/1/78); (Amdt. 121–158, Eff. 9/9/80); [(Amdt. 121–239, Eff. 6/21/94)]

§ 121.340 Emergency flotation means.

(a) [Except as provided in paragraph (b) of this section, no person may operate an airplane in any overwater operation unless it is equipped with life preservers in accordance with § 121.339(a)(1) or with an approved flotation means for each occupant. This means must be within easy reach of each seated occupant and must be readily removable from the airplane.]

(b) Upon application by the air carrier or commercial operator, the Administrator may approve the operation of an airplane over water without the life preservers or flotation means required by paragraph (a) of this section, if the air carrier or commercial operator shows that the water over which the airplane is to be operated is not such size and depth that life preservers or flotation means would be required for the survival

(a) [Except as permitted in paragraph (c)(2) of this section, unless an airplane is type certificated under the transport category airworthiness requirements relating to ice protection, or unless an airplane is a nontransport category airplane type certificated after December 31, 1964, that has the ice protection provisions that meet section 34 of appendix A of part 135 of this chapter, no person may operate an airplane in icing conditions unless it is equipped with means for the prevention or removal of ice on windshields, wings, empennage, propellers, and other parts of the airplane where ice formation will adversely affect the safety of the airplane.]

(b) No person may operate an airplane in icing conditions at night unless means are provided for illuminating or otherwise determining the formation of ice on the parts of the wings that are critical from the standpoint of ice accumulation. Any illuminating that is used must be of a type that will not cause glare or reflection that would handicap crewmembers in the performance of their duties.

[(c) *Nontransport category airplanes type certificated after December 31, 1964.* Except for an airplane that has ice protection provisions that meet section 34 of appendix A of part 135 of this chapter, or those for transport category airplane type certification, no person may operate—

(1) Under IFR into known or forecast light or moderate icing conditions;

(2) Under VFR into known light or moderate icing conditions; unless the airplane has functioning deicing anti-icing equipment protecting each propeller, windshield, wing, stabilizing or control surface, and each airspeed, altimeter, rate of climb, or flight attitude instrument system; or

(3) Into known or forecast severe icing conditions.

[(d) If current weather reports and briefing information relied upon by the pilot in command indicate that the forecast icing condition that would otherwise prohibit the flight will not be encountered during the flight because of changed weather conditions since the forecast, the restrictions in paragraph

31, 1964, that is equipped with a flight instrument pitot heating system unless the airplane is also equipped with an operable pitot heat indication system that complies with § 25.1326 of this chapter in effect on April 12, 1978.]

(Amdt. 121–175, Eff. 9/30/81); (Amdt. 121–207, Eff. 10/25/89); [(Amdt. 121–251, Eff. 1/19/96)]

§ 121.343 Flight recorders.

(a) Except as provided in paragraphs (b), (c), (d), (e) and (f) of this section, no person may operate a large airplane that is certificated for operations above 25,000 feet altitude or is turbine-engine-powered unless it is equipped with one or more approved flight recorders that record data from which the following may be determined within the ranges, accuracies, and recording intervals specified in appendix B of this part—

(1) Time;

(2) Altitude;

(3) Airspeed;

(4) Vertical acceleration;

(5) Heading; and

(6) Time of each radio transmission either to or from air traffic control.

(b) No person may operate a large airplane type certificated up to and including September 30, 1969, for operations above 25,000 feet altitude, or a turbine-engine-powered airplane certificated before the same date, unless it is equipped before May 26, 1989, with one or more approved flight recorders that utilize a digital method of recording and storing data and a method of readily retrieving that data from the storage medium. The following information must be able to be determined within the ranges, accuracies, and recording intervals specified in appendix B of this part—

(1) Time;

(2) Altitude;

(3) Airspeed;

(4) Vertical acceleration;

(5) Heading; and

(6) Time of each radio transmission either to or from air traffic control.

(c) No person may operate an airplane specified in paragraph (a) of this section that is manufactured after May 26, 1989, unless it is equipped with one or more approved flight recorders that utilize a digital method of recording and storing data and a method of readily retrieving that data from the storage medium. The following information must be able to be determined within the ranges, accuracies, and recording intervals specified in appendix B of this part—

(1) Time;

(2) Altitude;

(3) Airspeed;

(4) Vertical acceleration;

(5) Heading;

(6) Time of each radio transmission either to or from air traffic control;

(7) Pitch attitude;

(8) Roll attitude;

(9) Longitudinal acceleration;

(10) Control column or pitch control surface position; and

(11) Thrust of each engine.

(d) No person may operate an airplane specified in paragraph (b) of this section that is manufactured after May 26, 1989, as well as airplanes specified in paragraph (a) of this section that have been type certificated after September 30, 1969, unless it is equipped with one or more approved flight recorders that utilize a digital method of recording and storing data and a method of readily retrieving that data from the storage medium. The following information must be able to be determined within the ranges, accuracies, and recording intervals specified in appendix B of this part—

(1) Time;

(2) Altitude;

(3) Airspeed;

(4) Vertical acceleration;

(5) Heading;

(6) Time of each radio transmission either to or from air traffic control;

(7) Pitch attitude;

(8) Roll attitude;

(9) Longitudinal acceleration;

(10) Pitch trim position;

(11) Control column or pitch control surface position;

(12) Control wheel or lateral control surface position;

(13) Rudder pedal or yaw control surface position;

plane is complete and meets the FAA approved type design data.

(e) After October 11, 1991, no person may operate a large airplane equipped with a digital data bus and ARINC 717 digital flight data acquisition unit (DFDAU) or equivalent unless it is equipped with one or more approved flight recorders that utilize a digital method of recording and storing data and a method of readily retrieving that data from the storage medium. Any parameters specified in appendix B of this part that are available on the digital data bus must be recorded within the ranges, accuracies, resolutions, and sampling intervals specified.

(f) After October 11, 1991, no person may operate an airplane specified in paragraph (b) of this section that is manufactured after October 11, 1991, nor an airplane specified in paragraph (a) of this section that has been type certificated after September 30, 1969, and manufactured after October 11, 1991, unless it is equipped with one or more flight recorders that utilize a digital method of recording and storing data and a method of readily retrieving that data from the storage medium. The parameters specified in appendix B of the part must be recorded within the ranges, accuracies, resolutions, and sampling intervals specified.

(g) Whenever a flight recorder required by this section is installed, it must be operated continuously from the instant the airplane begins the takeoff roll until it has completed the landing roll at an airport.

(h) Except as provided in paragraph (g) of this section, and except for recorded data erased as authorized in this paragraph, each certificate holder shall keep the recorded data prescribed in paragraph (a), (b), (c), or (d) of this section, as appropriate, until the airplane has been operated for at least 25 hours of the operating time specified in § 121.359(a). A total of 1 hour of recorded data may be erased for the purpose of testing the flight recorder or the flight recorder system. Any erasure made in accordance with this paragraph must be of the oldest recorded data accumulated at the time of testing. Except as provided in paragraph (g) of this section, no record need be kept more than 60 days.

Board or the Administrator.

(j) Each flight recorder required by this section must be installed in accordance with the requirements of § 25.1459 of this chapter in effect on August 31, 1977. The correlation required by § 25.1459(c) of this chapter need be established only on one airplane of any group of airplanes—

(1) That are of the same type;

(2) On which the model flight recorder and its installation are the same; and

(3) On which there is no difference in the type design with respect to the installation of those first pilot's instruments associated with the flight recorder. The most recent instrument calibration, including the recording medium from which this calibration is derived, and the recorder correlation must be retained by the certificate holder.

(k) Each flight recorder required by this section that records the data specified in paragraph (a), (b), (c), or (d) of this section, as appropriate, must have an approved device to assist in locating that recorder under water.

[(l) No person may operate an airplane specified in paragraph (b) of this section that meets the Stage 2 noise levels of part 36 of this chapter and is subject to § 91.801(c) of this chapter unless it is equipped with one or more approved flight data recorders that utilize a digital method of recording and storing data and a method of readily retrieving that data from the storage medium. The information specified in paragraphs (c)(1) through (c)(11) of this section must be able to be determined within the ranges, accuracies and recording intervals specified in appendix B of this part. In addition—

[(1) This flight data recorder must be installed at the next heavy maintenance check after May 26, 1994, but no later than May 26, 1995. A heavy maintenance check is considered to be any time an aircraft is scheduled to be out of service for 4 or more days.

[(2) By June 23, 1994, each carrier must submit to the FAA Flight Standards Service, Air Transportation Division (AFS–200), documentation listing those airplanes covered under this paragraph and evidence that it has ordered a

Docket No. 24418 (52 FR 9656) Eff. 5/25/87

(Amdt. 121–15, Eff. 2/5/66); (Amdt. 121–29, Eff. 6/22/67); (Amdt. 121–37, Eff. 12/14/67); (Amdt. 121–66, Eff. 9/18/70); (Amdt. 121–82, Eff. 1/10/72); (Amdt. 121–130, Eff. 11/26/76); (Amdt. 121–135, Eff. 9/1/77); (Amdt. 121–143, Eff. 6/26/78); (Amdt. 121–191, Eff. 5/26/87); (Amdt. 121–197, Eff. 10/11/88); [(Amdt. 121–238, Eff. 5/24/94)]

[§ 121.344 Flight recorders: Airplanes with a passenger seat configuration of 10–30 passenger seats and a payload capacity of 7,500 pounds or less.

[No person may operate an airplane with a passenger seat configuration of 10–30 passenger seats, excluding each crewmember seat, and a payload capacity of 7,500 pounds or less unless it meets the requirements for flight recorders in § 135.152 of this chapter. A person operating an airplane with a passenger seat configuration of more than 30 passenger seats, or a payload capacity of more than 7,500 pounds shall comply with § 121.343.]

[(Amdt. 121–251, Eff. 1/19/96)]

§ 121.345 Radio equipment.

(a) No person may operate an airplane unless it is equipped with radio equipment required for the kind of operation being conducted.

(b) Where two independent (separate and complete) radio systems are required by §§ 121.347 and 121.349, each system must have an independent antenna installation except that, where rigidly supported nonwire antennas or other antenna installations of equivalent reliability are used, only one antenna is required.

(c) ATC transponder equipment installed within the time periods indicated below must meet the performance and environmental requirements of the following TSOs—

(1) *Through January 1, 1992.*

(i) Any class of TSO–C74b or any class of TSO–C74c as appropriate, provided that the

(i) Temporary installation of TSO–C74b or TSO–C74c substitute equipment, as appropriate, during maintenance of the permanent equipment;

(ii) Reinstallation of equipment after temporary removal for maintenance; or

(iii) For fleet operations, installation of equipment in a fleet aircraft after removal of the equipment for maintenance from another aircraft in the same operator's fleet.

(Amdt. 121–101, Eff. 1/26/73); (Amdt. 121–190, Eff. 4/6/87)

§ 121.347 Radio equipment for operations under VFR over routes navigated by pilotage.

(a) No person may operate an airplane under VFR over routes that can be navigated by pilotage, unless it is equipped with the radio equipment necessary under normal operating conditions to fulfill the following—

(1) Communicate with at least one appropriate ground station from any point on the route.

(2) [Communicate with appropriate traffic control facilities from any point within the lateral boundaries of the surface areas of Class B, Class C, Class D, or Class E airspace designated for an airport in which flights are intended.]

(3) Receive meteorological information from any point en route by either of two independent systems. One of the means provided to comply with this subparagraph may be used to comply with paragraphs (a)(1) and (2) of this section.

(b) No person may operate an airplane at night under VFR over routes that can be navigated by pilotage unless that airplane is equipped with the radio equipment necessary under normal operating conditions to fulfill the functions specified in paragraph (a) of this section and to receive radio navigational signals applicable to the route flown, except that a marker beacon receiver or ILS receiver is not required.

[(Amdt 121–226, Eff. 9/16/93)]

radio equipment necessary under normal operating conditions to fulfill the functions specified in § 121.347(a) and to receive satisfactorily by either of two independent systems, radio navigational signals from all primary en route and approach navigational facilities intended to be used. However, only one marker beacon receiver providing visual and aural signals and one ILS receiver need be provided. Equipment provided to receive signals en route may be used to receive signals on approach, if it is capable of receiving both signals.

(b) In the case of operation over routes on which navigation is based on low frequency radio range or automatic direction finding, only one low frequency radio range or ADF receiver need be installed if the airplane is equipped with two VOR receivers, and VOR navigational aids are so located and the airplane is so fueled that, in the case of failure of the low frequency radio range receiver or ADF receiver, the flight may proceed safely to a suitable airport, by means of VOR aids, and complete an instrument approach by use of the remaining airplane radio system.

(c) Whenever VOR navigational receivers are required by paragraph (a) or (b) of this section, at least one approved distance measuring equipment unit (DME) capable of receiving and indicating distance information from VORTAC facilities must be installed on each airplane when operated in the 50 states and the District of Columbia.

(d) If the distance measuring equipment (DME) becomes inoperative en route, the pilot shall notify ATC of that failure as soon as it occurs.

[(e) No person may operate an airplane having a passenger seat configuration of 10 to 30 seats, excluding each crewmember seat, and a payload of 7,500 pounds or less under IFR or in extended overwater operations unless it has, in addition to any other required radio communications and navigational equipment appropriate to the facilities to be used which are capable of transmitting to, and receiving from, at any place on the route to be flown, at least one ground facility, two micro-

tain other operations.

(a) [Except as provided in paragraph (c) of this section, no person may conduct an extended overwater operation unless the airplane is equipped with the radio communication equipment necessary to comply with § 121.349, an independent system that complies with § 121.347(a)(1), and two long-range navigation systems when VOR or ADF radio navigation equipment is unusable along a portion of the route.]

(b) No certificate holder conducting a flag or supplemental operation or a domestic operation within the State of Alaska may conduct an operation without the equipment specified in paragraph (a) of this section, if the Administrator finds that equipment to be necessary for search and rescue operations because of the nature of the terrain to be flown over.

[(c) Nothwithstanding the requirements of paragraph (a) of this section, installation and use of a single LRNS and a single LRCS may be authorized by the Administrator and approved in the certificate holder's operations specifications for operations and routes in certain geographic areas. The following are among the operational factors the Administrator may consider in granting an authorization: (1) the ability of the flightcrew to reliably fix the position of the airplane within the degree of accuracy required by ATC, (2) the length of the route being flown, and (3) the duration of the very high frequency communications gap.]

(Amdt. 121–253, Eff. 2/26/96); [(Amdt. 121–254, Eff. 2/26/96)]

§ 121.353 [Emergency equipment for operations over uninhabited terrain areas: Flag, supplemental, and certain domestic operations.

[Unless the airplane has the following equipment, no person may conduct a flag or supplemental operation or a domestic operation within the States of Alaska or Hawaii over an uninhabited area or any other area that (in its operations specifications) the Administrator specifies required

their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter manufacturer under its approval. The new expiration date for replacing (or recharging) the battery must be legibly marked on the outside of the transmitter. The battery useful life (or useful life of charge) requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.

(c) Enough survival kits, appropriately equipped for the route to be flown, for the number of occupants of the airplane.

(Amdt. 121–79, Eff. 10/21/71); (Amdt. 121–106, Eff. 9/19/73); (Amdt. 121–158, Eff. 9/9/80); (Amdt. 121–239, Eff. 6/21/94); [(Amdt. 121–251, Eff. 1/19/96)]

§ 121.355 Equipment for operations on which specialized means of navigation are used.

(a) No certificate holder may conduct an operation—

(1) Using Doppler Radar or an Inertial Navigation System outside the 48 contiguous States and the District of Columbia, unless such systems have been approved in accordance with appendix G to this part; or

(2) Using Doppler Radar or an Inertial Navigation System within the 48 contiguous States and the District of Columbia, or any other specialized means of navigation, unless it shows that an adequate airborne system is provided for the specialized navigation authorized for the particular operation.

(b) Notwithstanding paragraph (a) of this section, Doppler Radar and Inertial Navigation Systems, and the training programs, maintenance programs, relevant operations manual material, and minimum equipment lists prepared in accordance therewith, approved before April 29, 1972, are not required to be approved in accordance with that paragraph.

(Amdt. 121–89, Eff. 4/29/72)

the appropriate class of Mode S transponder according to the following schedule—

Date	*Required Equipage*
December 30, 1990	At least 20% of all covered airplanes, if the certificate holder operates more than 30 such airplanes.
December 30, 1991	50% of all covered airplane.
December 30, 1993	100% of all covered airplanes.

(b) Unless otherwise authorized by the Administrator, after December 31, 1995, no person may operate a passenger or combination cargo/passenger (combi) airplane that has a passenger seat configuration, excluding any pilot seat, of 10 to 30 seats unless it is equipped with an approved traffic alert and collision avoidance system. If a TCAS II system is installed, it must be capable of coordinating with TCAS units that meet TSO C–119.

(c) [The appropriate manuals required by § 121.131 shall contain the following information on the TCAS II System or TCAS I System, as appropriate, as required by this section:]

(1) Appropriate procedures for—

(i) The operation of the equipment; and

(ii) Proper flightcrew action with respect to the equipment.

(2) An outline of all input sources that must be operative for the TCAS to function properly.

Docket No. 25355 (54 FR 951) Eff. 1/10/89

(Amdt. 121–201, Eff. 2/9/89); (Amdt. 121–217, Eff. 5/9/90); (Amdt. 121–246, Eff. 12/29/94); [(Amdt. 121–251, Eff. 1/19/96)]

§ 121.357 Airborne weather radar equipment requirements.

(a) [No person may operate any transport category airplane (except C–46 type airplanes) or a nontransport category airplane certificated after December 31, 1964, unless approved airborne weather radar equipment has been installed in the airplane.]

(b) Reserved

(c) [Each person operating an airplane required to have approved airborne weather radar equipment

borne weather radar, may reasonably be expected along the route to be flown, unless the airborne weather radar equipment is in satisfactory operating condition.

(2) If the airborne weather radar becomes inoperative en route, the airplane must be operated in accordance with the approved instructions and procedures specified in the operations manual for such an event.

(d) This section does not apply to airplanes used solely within the State of Hawaii or within the State of Alaska and that part of Canada west of longitude 130 degrees W, between latitude 70 degrees N, and latitude 53 degrees N, or during any training, test, or ferry flight.

(e) Notwithstanding any other provision To obtain approval of a retrofit schedule and of this chapter, an alternate electrical power supply is not required for airborne weather radar equipment.

(Amdt. 121–18, Eff. 4/15/66); (Amdt. 121–130, Eff. 11/26/76); [(Amdt. 121–251, Eff. 1/19/96)]

§ 121.358 Low-altitude windshear system equipment requirements.

(a) *Airplanes manufactured after January 2, 1991.* No person may operate a turbine-powered airplane manufactured after January 2, 1991, unless it is equipped with either an approved airborne windshear warning and flight guidance system, an approved airborne detection and avoidance system, or an approved combination of these systems.

(b) *Airplanes manufactured before January 3, 1991.* Except as provided in paragraph (c) of this section, after January 2, 1991, no person may operate a turbine-powered airplane manufactured before January 3, 1991 unless it meets one of the following requirements as applicable.

(1) The makes/models/ series listed below must be equipped with either an approved airborne windshear warning and flight guidance system, an approved airborne detection and avoidance system, or an approved combination of these systems—

(i) A–300–600;

(ii) A–310–all series;

and Honeywell–970 digital flight guidance computer.

(2) All other turbine-powered airplanes not listed above must be equipped with as a minimum requirement, an approved airborne windshear warning system. These airplanes may be equipped with an approved airborne windshear detection and avoidance system, or an approved combination of these systems.

(c) *Extension of the compliance date.* A certificate holder may obtain an extension of the compliance date in paragraph (b) of this section if it obtains FAA approval of a retrofit schedule. To obtain approval of a retrofit schedule and show continued compliance with that schedule, a certificate holder must do the following—

(1) Submit a request for approval of a retrofit schedule by June 1, 1990, to the Flight Standards Division Manager in the region of the certificate holding district office.

(2) Show that all of the certificate holder's airplanes required to be equipped in accordance with this section will be equipped by the final compliance date established for TCAS II retrofit.

(3) Comply with its retrofit schedule and submit status reports containing information acceptable to the Administrator. The initial report must be submitted by January 2, 1991, and subsequent reports must be submitted every six months thereafter until completion of the schedule. The reports must be submitted to the certificate holder's assigned Principal Avionics Inspector.

(d) *Definitions.* For the purposes of this section the following definitions apply—

(1) "Turbine-powered airplane" includes, e.g., turbofan-, turbojet-, propfan-, and ultrahigh bypass fan-powered airplanes. The definition specifically excludes turbopropeller-power airplanes.

(2) An airplane is considered manufactured on the date the inspection acceptance records reflect that the airplane is complete and meets the FAA Approved Type Design data.

(Amdt. 121–199, Eff. 1/2/89); (Amdt. 121–216, Eff. 4/9/90)

(b) [Reserved]

(c) [The cockpit voice recorder required by paragraph (a) of this section must meet the following application standards:]

(1) The requirements of part 25 of this chapter in effect on August 31, 1977.

(2) After September 1, 1980, each recorder container must—

(i) Be either bright orange or bright yellow;

(ii) Have reflective tape affixed to the external surface to facilitate its location under water; and

(iii) Have an approved underwater locating device on or adjacent to the container which is secured in such a manner that they are not likely to be separated during crash impact, unless the cockpit voice recorder, and the flight recorder required by § 121.343, are installed adjacent to each other in such a manner that they are not likely to be separated during crash impact.

[(d) No person may operate a multiengine, turbine-powered airplane having a passenger seat configuration of 10–19 seats unless it is equipped with an approved cockpit voice recorder that:

(1) Is installed in compliance with § 23.1457(a)(1) and (2), (b), (c), (d), (e), (f), and (g); § 25.1457(a)(1) and (2), (b), (c), (d), (e), (f), and (g) of this chapter, as applicable; and

(2) Is operated continuously from the use of the checklist before the flight to completion of the final checklist at the end of the flight.

[(e) No person may operate a multiengine, turbine-powered airplane having a passenger seat configuration of 20 to 30 seats unless it is equipped with an approved cockpit voice recorder that—

(1) Is installed in compliance with § 23.1457 or § 25.1457 of this chapter, as applicable; and

(2) Is operated continuously from the use of the checklist before the flight to completion of the final checklist at the end of the flight.]

([f]) In complying with this section, an approved cockpit voice recorder having an erasure feature may(be used, so(that at any time during the operation of the recorder, information recorded more factured after October 11, 1991, or on which a cockpit voice recorder has been installed after October 11, 1991, unless it is equipped to record the uninterrupted audio signal received by a boom or mask microphone in accordance with § 25.1457(c)(5) of this chapter.

([h]) In the event of an accident or occurrence requiring immediate notification of the National Transportation Safety Board under part 830 of its regulations, which results in the termination of the flight, the certificate holder shall keep the recorded information for at least 60 days or, if requested by the Administrator or the Board, for a longer period. Information obtained from the record is used to assist in determining the cause of accidents or occurrences in connection with investigations under part 830. The Administrator does not use the record in any civil penalty or certificate action.

(Amdt. 121–20, Eff. 6/30/66); (Amdt. 121–23, Eff. 12/1/66); (Amdt. 121–32, Eff. 10/6/67); (Amdt. 121–130, Eff. 11/26/76); (Amdt. 121–135, Eff. 9/1/77); (Amdt. 121–143, Eff. 6/26/78); (Amdt. 121–197, Eff. 10/11/88); [(Amdt. 121–251, Eff. 1/19/96)]

§ 121.360 Ground proximity warning-glide slope deviation alerting system.

[(a) No person may operate a turbine-powered airplane unless it is equipped with a ground proximity warning system that meets the performance and environmental standards of TSO–C92 or incorporates TSO-approved ground proximity warning equipment.

[(b) For the ground proximity warning system required by this section, the Airplane Flight Manual shall contain—

(1) Appropriate procedures for—

(i) The use of the equipment;

(ii) Proper flightcrew action with respect to the equipment;

(iii) Deactivation for planned abnormal and emergency conditions;

(iv) Inhibition of Mode 4 warnings based on flaps being in other than the landing

tem required by this section is deactivated, an entry shall be made in the airplane maintenance record that includes the date and time of deactivation.

[(e) No person may operate a turbine-powered airplane unless it is equipped with a ground proximity warning/glide slope deviation alerting system that meets the performance and environmental TSO, using other than Warning Envelopes 1 or 3 for Warning Modes 1 and 4.]

(Amdt. 121–114, Eff. 1/23/75); (Amdt. 121–119, Eff. 6/5/75); (Amdt. 121–122, Eff. 10/13/75); (Amdt. 121–125, Eff. 11/1/75); (Amdt. 121–126, Eff. 11/24/75); (Amdt. 121–129, Eff. 8/19/76); [(Amdt. 121–251, Eff. 1/19/96)]

§ 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 training devices in the conduct of the program.

(b) For the purpose of this subpart, airplane groups are as follows—

(1) Group I. Propeller driven, including—

(i) Reciprocating powered; and

(ii) Turbopropeller powered.

(2) Group II. Turbojet powered.

(c) For the purpose of this subpart, the following terms and definitions apply—

(1) *Initial training.* The training required for crewmembers and dispatchers who have not qualified and served in the same capacity on another airplane of the same group.

(2) *Transition training.* The training required for crewmembers and dispatchers who have qualified and served in the same capacity on another airplane of the same group.

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

(4) *Differences training.* The training required for crewmembers and dispatchers who have qualified and served on a particular type airplane, when the Administrator finds differences training is necessary before a crewmember serves in the same capacity on a particular variation of that airplane.

(5) *Programmed hours.* The hours of training prescribed in this subpart which may be reduced by the Administrator upon a showing by the certificate holder that circumstances justify a lesser amount.

or functions that must be conducted in the airplane.

(Amdt. 121–55, Eff. 2/2/70); (Amdt. 121–104, Eff. 7/6/73)

§ 121.401 Training program: General.

(a) Each certificate holder shall—

(1) Establish, obtain the appropriate initial and final approval of, and provide, a training program that meets the requirements of this subpart and appendices E and F and that insures that each crewmember, aircraft dispatcher, flight instructor and check airman, and each person assigned duties for the carriage and handing of dangerous articles and magnetized materials, is adequately trained to perform his assigned duties.

(2) Provide adequate ground and flight training facilities and properly qualified ground instructors for the training required by this subpart;

(3) Provide and keep current with respect to each airplane type and, if applicable, the particular variations within that airplane type, appropriate training material, examinations, forms, instructions, and procedures for use in conducting the training and checks required by this part; and

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

(b) Whenever a crewmember or aircraft dispatcher who is required to take recurrent training, a flight check, or a competence check, takes the check or completes the training in the calendar month before or after the calendar month in which that training or check is required, he is considered to have taken or completed it in the calendar month in which it was required.

(c) Each instructor, supervisor, or check airman who is responsible for a particular ground training subject, segment of flight training, course of training, flight check, or competence check under this part shall certify as to the proficiency and knowledge of the crewmember, aircraft dispatcher, flight

not required for computerized entries.

(d) Training subjects that are applicable to more than one airplane or crewmember position and that have been satisfactorily completed in connection with prior training for another airplane or another crewmember position, need not be repeated during subsequent training other than recurrent training.

(e) A person who progresses successfully through flight training, is recommended by his instructor or a check airman, and successfully completes the appropriate flight check for a check airman or the Administrator, need not complete the programmed hours of flight training for the particular airplane. However, whenever the Administrator finds that 20 percent of the flight checks given at a particular training base during the previous six months under this paragraph are unsuccessful, this paragraph may not be used by the certificate holder at that base until the Administrator finds that the effectiveness of the flight training there has improved.

In the case of a certificate holder using a course of training permitted in § 121.409(c), the Administrator may require the programmed hours of inflight training in whole or in part, until he finds the effectiveness of the flight training has improved as provided in paragraph (e) of this section.

(Amdt. 121–55, Eff. 2/2/70); (Amdt. 121–104, Eff. 7/6/73); (Amdt. 121–143, Eff. 12/19/74); (Amdt. 121–1743 Eff. 6/26/78)

§ 121.403 Training program: Curriculum.

(a) Each certificate holder must prepare and keep current a written training program curriculum for each type of airplane with respect to dispatchers and each crewmember required for that type airplane. The curriculum must include ground and flight training required by this subpart.

(b) Each training program curriculum must include—

(1) A list of principal ground training subjects, including emergency training subjects, that are provided.

(2) A list of all the training devices, mockups, systems trainers, procedures trainers, or other training aids that the certificate holder will use.

ing devices approved under § 121.407, including approvals for particular maneuvers, procedures, or functions.

(5) The programmed hours of training that will be applied to each phase of training.

(6) A copy of each statement issued by the Administrator under § 121.405(d) for reduction of programmed hours of training.

(Amdt. 121–55, Eff. 2/2/70)

§ 121.404 [Compliance dates: Crew and dispatcher resource management training.]

[After March 19, 1998, no certificate holder may use a person as a flight crewmember, and after March 19, 1999, no certificate holder may use a person as a flight attendant or aircraft dispatcher unless that person has completed approved crew resource management (CRM) or dispatcher resource management (DRM) initial training, as applicable, with that certificate holder or with another certificate holder.]

Docket No. 19110 (53 FR 37696) Eff. 9/27/88

(Amdt. 121–199, Eff. 1/2/89); (Amdt. 121–250, Eff. 3/19/96); (Amdt. 121–253, Eff. 2/26/96); [(Amdt. 121–253 Corrected, Eff. 3/11/96)]

§ 121.405 Training program and revision: Initial and final approval.

(a) To obtain initial and final approval of a training program, or a revision to an approved training program, each certificate holder must submit to the Administrator—

(1) An outline of the proposed program or revision, including an outline of the proposed or revised curriculum, that provides enough information for a preliminary evaluation of the proposed training program or revised training program; and

(2) Additional relevant information as may be requested by the Administrator.

(b) If the proposed training program or revision complies with this subpart, the Administrator grants initial approval in writing after which the certificate

section ensures that each person that successfully completes the training is adequately trained to perform his assigned duties.

(d) In granting initial and final approval of training programs or revisions, including reductions in programmed hours specified in this subpart, the Administrator considers the training aids, devices, methods, and procedures listed in the certificate holder's curriculum as set forth in § 121.403 that increase the quality and effectiveness of the teaching-learning process.

If approval of the reduced programmed hours of training is granted, the Administrator provides the certificate holder with a statement of the basis for the approval.

(e) Whenever the Administrator finds that revisions are necessary for the continued adequacy of a training program that has been granted final approval, the certificate holder shall, after notification by the Administrator, make any changes in the program that are found necessary by the Administrator. Within 30 days after the certificate holder receives such notice, it may file a petition to reconsider the notice with the [certificate-holding district office.]* The filing of a petition to reconsider stays the notice pending a decision by the Administrator. However, if the Administrator finds that there is an emergency that requires immediate action in the interest of safety in air transportation, he may, upon a statement of the reasons, require a change effective without stay.

[(f) Each certificate holder described in § 135.3(b) and (c) of this chapter must include the material required by § 121.403 in the manual required by § 135.21 of this chapter.

[(g) The Administrator may grant a deviation to certificate holders described in § 135.3(b) and (c) of this chapter to allow reduced programmed hours of ground training required by § 121.419 if it is found that a reduction is warranted based on the certificate holder's operations and the complexity of the make, model, and series of the aircraft used.]

(Amdt. 121–55, Eff. 2/2/70); (Amdt. 121–207, Eff. 10/25/89); [(Amdt. 121–250, Eff. 3/19/96)]; [*(Amdt. 121–253, Eff. 2/26/96)]

credit CRM training received before March 19, 1999, toward all or part of the initial ground CRM training required by § 121.421.

[(c) For aircraft dispatchers, the Administrator may credit CRM training received before March 19, 1999, toward all or part of the initial ground CRM training required by § 121.422.

[(d) In granting credit for initial ground CRM or DRM training, the Administrator considers training aids, devices, methods, and procedures used by the certificate holder in a voluntary CRM or DRM program or in an AQP program that effectively meets the quality of an approved CRM or DRM initial ground training program under § 121.419, 121.421, or 121.422 as appropriate.]

[(Amdt. 121–250, Eff. 3/19/96)]

§ 121.407 Training program: Approval of airplane simulators and other training devices.

(a) Each airplane simulator and other training device that is used in a training course permitted under § 121.409, in checks required under subpart O of this part or as permitted in appendices E and F to this part must—

(1) Be specifically approved for—

(i) The certificate holder;

(ii) The type airplane and, if applicable, the particular variation within type, for which the training or check is being conducted; and

(iii) The particular maneuver, procedure, or crewmember function involved.

(2) Maintain the performance, functional, and other characteristics that are required for approval.

(3) Be modified to confirm with any modification to the airplane being simulated that results in changes to performance, functional, or other characteristics required for approval.

(4) Be given a daily functional preflight check before being used.

(5) Have a daily discrepancy log kept with each discrepancy entered in that log by the appropriate instructor or check airman at the end of each training or check flight.

the appropriate simulator 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) and appendix H of this part.

(d) An airplane simulator 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.

(Amdt. 121–55, Eff. 2/2/70); (Amdt. 121–161, Eff. 7/30/80); (Amdt. 121–199, Eff. 1/2/89)

§ 121.409 Training courses using airplane simulators and other training devices.

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

(b) A course of training in an airplane simulator 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 airplane simulator as well as a proper briefing before and after the training;

(2) Provides training in at least the procedures and maneuvers set forth in appendix F to this part; or

(3) Provides line-oriented training that—

(i) Utilizes a complete flight crew;

(ii) Includes at least the maneuvers and procedures (abnormal and emergency) that may be expected in line operations;

(iii) Is representative of the flight segment appropriate to the operations being conducted by the certificate holder; and

(4) Is given by an instructor who meets the applicable requirements of § 121.411.

The satisfactory completion of the course of training must be certified by either the Administrator or a qualified check airman.

(d) Each certificate holder required to comply with § 121.358 of this part must use an approved simulator 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, and 121.427 of this part.

(Amdt. 121–55, Eff. 2/2/70); (Amdt. 121–130, Eff. 11/26/76); (Amdt. 121–144, Eff. 6/26/78); (Amdt. 121–199, Eff. 1/2/89)

§ 121.411 Training program: Check airman and instructor qualifications.

(a) No certificate holder may use a person nor may any person serve as a flight instructor or check airman in a training program established under this subpart unless, with respect to the particular airplane type involved, that person—

(1) Holds the airman certificates and ratings that must be held in order to serve as § 121.413 a pilot in command, a flight engineer, or a flight navigator, as appropriate, in operations under this part;

(2) Has satisfactorily completed the appropriate training phases for the airplane, including recurrent training, that are required in order to serve as a pilot in command, flight engineer, or flight navigator in operations under this part;

(3) Has satisfactorily completed the appropriate proficiency or competence checks that are required in order to serve as a pilot in command, flight engineer, or flight navigator in operations under this part;

(4) Has satisfactorily completed the applicable training requirements of § 121.413;

(5) In the case of a check airman, has been approved for the airplane and the check airman duties involved; and

(6) Holds at least a Class III medical certificate. However, pilot check airmen who have passed their 60th birthday or check airmen who do not hold an appropriate medical certificate

(2) Has satisfactorily completed for a check airman or for the Administrator—

(i) Appropriate initial pilot ground training and ground training for a flight instructor as provided in § 121.413; and

(ii) A simulator flight training course in the type airplane simulator in which that person instructs as provided by § 121.409(c).

(c) Notwithstanding paragraphs (a) and (b) of this section, a person who was designated as a check airman, a flight instructor, or a simulator instructor before December 22, 1969, may continue to serve as such, with respect to the particular type airplane involved, without completing the training specified in § 121.413.

(Amdt. 121–55, Eff. 2/2/70)

§ 121.413 Check airmen and flight instructors: Initial and transition training.

(a) The initial and transition ground training for pilot check airmen must include the following—

(1) Pilot check airman duties, functions, and responsibilities.

(2) The applicable Federal Aviation Regulations and the certificate holder's policy and procedures.

(3) The appropriate methods, procedures, and techniques for conducting the required checks.

(4) Proper evaluation of pilot performance including the detection of—

(i) Improper and insufficient training; and

(ii) Personal characteristics that could adversely affect safety.

(5) The appropriate corrective action in the case of unsatisfactory checks.

(6) The approved methods, procedures, and limitations for performing the required normal, abnormal, and emergency procedures in the airplane.

(b) The initial and transition ground training for pilot flight instructors must include the following—

(1) The fundamental principles of the teaching-learning process.

(2) Teaching methods and procedures.

(3) The instructor-student relationship.

pilot seats in the required normal, abnormal, and emergency maneuvers to ensure his competence to conduct the pilot flight checks and flight training required by this part.

(2) The appropriate safety measures to be taken from either pilot seat for emergency situations that are likely to develop in training.

(3) The potential results of improper or untimely safety measures during training.

The requirements of paragraphs (c)(2) and (3) of this section may be accomplished inflight or in an approved simulator.

(d) The initial and transition ground and flight training for flight engineer and flight navigator, flight instructors and check airmen must be adequate to ensure competence to perform their assigned duties.

(Amdt. 121–55, Eff. 2/2/70)

§ 121.415 Crewmember and dispatcher training requirements.

(a) Each training program must provide the following ground training as appropriate to the particular assignment of the crewmember or dispatcher—

(1) Basic indoctrination ground training for newly hired crewmembers or dispatchers including 40 programmed hours of instruction, unless reduced under § 121.405 or as specified in § 121.401(d), in at least the following—

(i) Duties and responsibilities of crewmembers or dispatchers, as applicable;

(ii) Appropriate provisions of the Federal Aviation Regulations;

(iii) Contents of the certificate holder's operating certificate and operations specifications (not required for flight attendants); and

(iv) Appropriate portions of the certificate holder's operating manual.

(2) The initial and transition ground training specified in §§ 121.419 through 121.422, as applicable.

(3) Emergency training as specified in § 121.417 (not required for dispatchers).

airplanes of the same type operated by the certificate holder, additional training is necessary to ensure that each crewmember and dispatcher is adequately trained to perform his assigned duties.

(e) Upgrade training as specified in §§ 121.419 and 121.424 for a particular type airplane may be included in the training program for crewmembers who have qualified and served as second in command pilot or flight engineer on that airplane.

(f) Particular subjects, maneuvers, procedures or parts thereof specified in §§ 121.419 through 121.425 for transition 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.

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

(1) Remains adequately trained and currently proficient with respect to each airplane, crewmember position, and type of operation in which he serves; and

(2) Qualifies in new equipment, facilities, procedures, and techniques, including modifications to airplanes.

(Amdt. 121–55, Eff. 2/2/70); (Amdt. 121–130, Eff. 11/26/76)

§ 121.417 Crewmember emergency training.

(a) Each training program must provide the emergency training set forth in this section with respect to each airplane type, model, and configuration, each required crewmember, and each kind of operation conducted, insofar as appropriate for each crewmember and the certificate holder.

(b) Emergency training must provide the following—

(1) Instruction in emergency assignments and procedures, including coordination among crewmembers.

(2) Individual instruction in the location, function, and operation of emergency equipment including—

(i) Rapid decompression;

(ii) Fire in flight or on the surface, and smoke control procedures with emphasis on electrical equipment and related circuit breakers found in cabin areas including all galleys, service centers, lifts, lavatories and movie screens;

(iii) Ditching and other evacuations, including the evacuation of persons and their attendants, if any, who may need the assistance of another person to move expeditiously to an exit in the event of an emergency;

(iv) Illness, injury, or other abnormal situations involving passengers or crewmembers to include familiarization with the emergency medical kit; and

(v) Hijacking and other unusual situations.

(4) Review and discussion of previous aircraft accidents and incidents pertaining to actual emergency situations.

(c) Each crewmember must accomplish the following emergency training during the specified training periods, using those items of installed emergency equipment for each type of airplane in which he or she is to serve (Alternate recurrent training required by § 121.433(c) of this part may be accomplished by approved pictorial presentation or demonstration)—

(1) One-time emergency drill requirements to be accomplished during initial training. Each crewmember must perform—

(i) [At least one approved protective breathing equipment (PBE) drill in which the crewmember combats an actual or simulated fire using at least one type of installed hand fire extinguisher or approved fire extinguisher that is appropriate for the type of actual fire or simulated fire to be fought while using the type of installed PBE required by § 121.337 or approved PBE simulation device as defined by paragraph (d) of this section for combating fires aboard airplanes;]

([iii]) An emergency evacuation drill with each person egressing the airplane or approved training device using at least one type of installed emergency evacuation slide. The crewmember may either observe the airplane exits being opened in the emergency mode and the associated exit slide/raft pack being deployed and inflated, or perform the tasks resulting in the accomplishment of these actions.

(2) Additional emergency drill requirements to be accomplished during initial training and once each 24 calendar months during recurrent training. Each crewmember must—

(i) Perform the following emergency drills and operate the following equipment—

(A) Each type of emergency exit in the normal and emergency modes, including the actions and forces required in the deployment of the emergency evacuation slides;

(B) Each type of installed hand fire extinguisher:

(C) Each type of emergency oxygen system to include protective breathing equipment;

(D) Donning, use, and inflation of individual flotation means, if applicable; and

(E) Ditching, if applicable, including but not limited to, as appropriate:

(*1*) Cockpit preparation and procedures;

(*2*) Crew coordination;

(*3*) Passenger briefing and cabin preparation;

(*4*) Donning and inflation of life preservers;

(*5*) Use of life-lines; and

(*6*) Boarding of passengers and crew into raft or a slide/raft pack.

(ii) Observe the following drills—

(A) Removal from the airplane (or training device) and inflation of each type of life raft, if applicable;

(B) Transfer of each type of slide/raft pack from one door to another;

firefighting drill described by paragraph (c)(1)(i) and (c)(1)(ii) of this section, as part of a one-time training requirement of paragraphs (c)(1) or (c)(2) of this section as appropriate. Any crewmember who performs the PBE drill and the firefighting drill prescribed in paragraphs (c)(1)(i) and (c)(1)(ii) of this section after May 26m 1987, is deemed to be in compliance with this regulation upon presentation of information or documentation, in a form and manner acceptable to the Director, Flight Standards Service, showing that the appropriate drills have been accomplished.]

(e) Crewmembers who serve in operation above 25,000 feet must receive instruction in the following—

(1) Respiration.

(2) Hypoxia.

(3) Duration of consciousness without supplemental oxygen at altitude.

(4) Gas expansion.

(5) Gas bubble formation.

(6) Physical phenomena and incidents of decompression.

(f) [For the purposes of this section the following definitions apply;

[(1) *Actual fire* means an ignited combustible material, in controlled conditions, of sufficient magnitude and duration to accomplish the training objectives outlined in paragraphs (c)(1)(i) and (c)(1)(ii) of this section.

(2) *Approved fire extinguisher* means a training device that has been approved by the Administrator for use in meeting the training requirements of § 121.417(c).

(3) *Approved PBE simulation device* means a training device that has been approved by the Administrator for use in meeting the training requirements of § 121.417(c).

(4) *Combats,* in this context, means to properly fight an actual or simulated fire using an appropriate type of fire extinguisher until that fire is extinguished.

(5) *Observe* means to watch without participating actively in the drill.

(6) *PBE drill* means an emergency drill in which a crewmember demonstrates the proper use of

firefighting scenarios, such as lavatory, galley oven, and aircraft seat fires.]

(Amdt. 121–55, Eff. 2/2/70); (Amdt. 121–133, Eff. 5/16/77); (Amdt. 121–144, Eff. 2/26/78); (Amdt. 121–146, Eff. 6/22/78); (Amdt. 121–148, Eff. 9/29/78); (Amdt. 121–151, Eff. 4/23/79); (Amdt. 121–179, Eff. 10/1/82); (Amdt. 121–188, Eff. 8/1/86); (Amdt. 121–193, Eff. 7/6/87); (Amdt. 121–204, Eff. 5/22/89); (Amdt. 121–220, Eff. 12/11/90); [(Amdt. 121–234, Eff. 9/1/93)]

§ 12.418 Differences training: Crewmembers and dispatchers.

(a) Differences training for crewmembers and dispatchers must consist of at least the following as applicable to their assigned duties and responsibilities—

(1) Instruction in each appropriate subject or part thereof required for initial ground training in the airplane unless the Administrator finds that particular subjects are not necessary.

(2) Flight training in each appropriate maneuver or procedure required for initial flight training in the airplane unless the Administrator finds that particular maneuvers or procedures are not necessary.

(3) The number of programmed hours of ground and flight training determined by the Administrator to be necessary for the airplane, the operation, and the crewmember or aircraft dispatcher involved.

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

(Amdt. 121–10, Eff. 8/16/65); (Amdt. 121–24, Eff. 4/15/67); (Amdt. 121–55, Eff. 2/2/70)

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

(a) Initial, transition, and upgrade ground training for pilots and flight engineers must include instruction in at least the following as applicable to their assigned duties—

(1) General subjects—

tions;

(iv) Air traffic control systems, procedures, and phraseology;

(v) Navigation and the use of navigation aids, including instrument approach procedures;

(vi) Normal and emergency communication procedures;

(vii) [Visual cues prior to and during descent below DH or MDA;

[(viii) Approved crew resource management initial training; and]

[(ix)] Other instructions as necessary to ensure his competence.

(2) For each airplane type—

(i) A general description;

(ii) Performance characteristics;

(iii) Engines and propellers;

(iv) Major components;

(v) Major airplane systems (i.e., flight controls, electrical, hydraulic); other systems as appropriate; principles of normal, abnormal, and emergency operations; appropriate procedures and limitations;

(vi) Procedures for—

(A) Recognizing and avoiding severe weather situations;

(B) Escaping from severe weather situations, in case of advertent encounters, including low-altitude windshear, and

(C) Operating in or near thunderstorms (including best penetrating altitudes), turbulent air (including clear air turbulence), icing, hail, and other potentially hazardous meteorological conditions;

(vii) Operating limitations;

(viii) Fuel consumption and cruise control;

(ix) Flight planning;

(x) Each normal and emergency procedure; and

(xi) The approved Airplane Flight Manual.

(b) Initial ground training for pilots and flight engineers must consist of at least the following programmed hours of instruction in the required subjects specified in paragraph (a) of this section

121–55, Eff. 2/2/70); (Amdt. 121–199, Eff. 1/2/89); [(Amdt. 121–250, Eff. 3/19/96)]

§ 121.420 Flight navigators: Initial and transition ground training.

(a) Initial and transition ground training for flight navigators must include instruction in the subjects specified in § 121.419(a) as appropriate to his assigned duties and responsibilities and in the following with respect to the particular type airplane—

(1) Limitations on climb, cruise, and descent speeds.

(2) Each item of navigational equipment installed including appropriate radio, radar, and other electronic equipment.

(3) Airplane performance.

(4) Airspeed, temperature, and pressure indicating instruments or systems.

(5) Compass limitations and methods of compensation.

(6) Cruise control charts and data, including fuel consumption rates.

(7) Any other instruction as necessary to ensure his competence.

(b) Initial ground training for flight navigators must consist of at least the following programmed hours of instruction in the subjects specified in paragraph (a) of this section and in § 121.415(a) unless reduced under § 121.405—

(1) Group I airplanes—

(i) Reciprocating powered, 16 hours; and

(ii) Turbopropeller powered, 32 hours.

(2) Group II airplanes, 32 hours.

(Amdt. 121–24, Eff. 4/15/67); (Amdt. 121–55, Eff. 2/2/70)

§ 121.421 Flight attendants: Initial and transition ground training.

(a) Initial and transition ground training for flight attendants must include instruction in at least the following—

(1) General subjects—

(i) [The authority of the pilot-in-command; emphasizing physical characteristics that may have a bearing on ditching, evacuation, and inflight emergency procedures and on other related duties;

(ii) The use of both the public address system and the means of communicating with other flight crewmembers, including emergency means in the case of attempted hijacking or other unusual situations; and

(iii) Proper use of electrical galley equipment and the controls for cabin heat and ventilation.

(b) Initial and transition ground training for flight attendants must include a competence check to determine ability to perform assigned duties and responsibilities.

(c) Initial ground for flight attendants must consist of at least the following programmed hours of instruction in the subjects specified in paragraph (a) of this section and in § 121.415(a) unless reduced under—

(1) Group I airplanes—

(i) Reciprocating powered, 8 hours; and

(ii) Turbopropeller powered, 8 hours;

(2) Group II airplanes, 16 hours.

(Amdt. 121–55, Eff. 2/2/70); [(Amdt. 121–250, Eff. 3/19/96)]

§ 121.422 Aircraft dispatchers: Initial and transition ground training.

(a) Initial and transition ground training for aircraft dispatchers must include instruction in at least the following—

(1) General subjects—

(i) Use of communications systems including the characteristics of those systems and the appropriate normal and emergency procedures;

(ii) Meteorology, including various types of meteorological information and forecasts, interpretation of weather data (including forecasting of en route and terminal temperatures and other weather conditions), frontal systems, wind conditions, and use of actual and prognostic weather charts for various altitudes;

(iii) The NOTAM system;

ment (DRM) initial training.]

(2) For each airplane—

(i) A general description of the airplane emphasizing operating and performance characteristics, navigation equipment, instrument approach and communication equipment, emergency equipment and procedures, and other subjects having a bearing on dispatcher duties and responsibilities;

(ii) Flight operation procedures including procedures specified in § 121.419 (a)(2)(vi);

(iii) Weight and balance computations;

(iv) Basic airplane performance dispatch requirements and procedures;

(v) Flight planning including track selection, flight time analysis, and fuel requirements; and

(vi) Emergency procedures.

(3) Emergency procedures must be emphasized, including the alerting of proper governmental, company, and private agencies during emergencies to give maximum help to an airplane in distress.

(b) Initial and transition ground training for aircraft dispatchers must include a competence check given by an appropriate supervisor or ground instructor that demonstrates knowledge and ability with the subjects set forth in paragraph (a) of this section.

(c) Initial ground training for aircraft dispatchers must consist of at least the following programmed hours of instruction in the subjects specified in paragraph (a) of this section and in § 121.415(a) unless reduced under § 121.405—

(1) Group I airplanes—

(i) Reciprocating powered, 30 hours; and

(ii) Turbopropeller powered, 40 hours.

(2) Group II airplanes, 40 hours.

(Amdt. 121–55, Eff. 2/2/70); [(Amdt. 121–250, Eff. 3/19/96)]

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

(a) Initial, transition, and upgrade training for pilots must include flight training and practice in the maneuvers and procedures set forth in the certificate to be accomplished; and

(2) To the extent that certain maneuvers and procedures may be performed in an airplane simulator, an appropriate training device, or a static airplane as permitted in appendix E to this part.

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

(1) Group I airplanes—

(i) Reciprocating powered. Pilot in command, 10 hours; second in command, 6 hours; and

(ii) Turbopropeller powered. Pilot in command, 15 hours; second in command, 7 hours.

(2) Group II airplanes. Pilot in command, 20 hours; second in command, 10 hours.

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

(1) With respect to § 121.409(c) of this part—

(i) Training and practice in the simulator in at least all of the maneuvers and procedures set forth in appendix E to this part for initial flight training that are capable of being performed in an airplane simulator without a visual system; and

(ii) A flight check in the simulator 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 to this part that are capable of being performed in an airplane simulator without a visual system.

(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 airplane simulator in which the maneuvers and procedures are specifically authorized.

(Amdt. 121–55, Eff. 2/2/70); (Amdt. 121–199, Eff. 1/2/89)

ulator, or in a training device.

(2) A flight check that includes—

(i) Preflight inspection;

(ii) Inflight performance of assigned duties accomplished from the flight engineer station during taxi, runup, takeoff, climb, cruise, descent, approach, and landing;

(iii) Accomplishment of other functions, such as fuel management and preparation of fuel consumption records, and normal and emergency or alternate operation of all airplane flight systems, performed either inflight, in an airplane simulator, or in a training device.

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 in an approved airplane simulator.

(b) Except as permitted in paragraph (c) of this section, the initial flight training required by paragraph (a) of this section must include at least the same number of programmed hours of flight training and practice that are specified for a second in command pilot under § 121.424(c) unless reduced under § 121.405.

(c) If the certificate holder's approved training program includes a course of training utilizing an airplane simulator or other training device under § 121.409(c), each flight engineer must successfully complete in the simulator or other training device—

(1) Training and practice in at least all of the assigned duties, procedures, and functions required by paragraph (a) of this section; and

(2) A flight check to a flight engineer level of proficiency in the assigned duties, procedures, and functions.

(Amdt. 121–3, Eff. 4/1/65); (Amdt. 121–55, Eff. 2/2/70); (Amdt. 121–144, Eff. 6/26/78)

§ 121.426 Flight navigators: Initial and transition flight training.

(a) Initial and transition flight training for flight navigators must include flight training and a flight

(Amdt. 121–55, Eff. 2/2/70)

§ 121.427 Recurrent training.

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

(b) Recurrent ground training for crewmembers and dispatchers must include at least the following—

(1) A quiz or other review to determine the state of the crewmember's or dispatcher's knowledge with respect to the airplane and position involved.

(2) Instruction as necessary in the subjects required for initial ground training by § 121.415(a), as appropriate, including emergency training (not required for aircraft dispatchers).

(3) For flight attendants and dispatchers, a competence check as required by §§ 121.421(b) and 121.422(b), respectively.

[(4) Approved recurrent CRM training. For flight crewmembers, this training or portions thereof may be accomplished during an approved simulator line operational flight training (LOFT) session. The recurrent CRM training requirement does not apply until a person has completed the applicable initial CRM training required by § 121.419, 121.421, or 121.422.]

(c) Recurrent ground training for crewmembers and dispatchers must consist of at least the following programmed hours unless reduced under § 121.405—

(1) For pilots and 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.

(2) For flight navigators—

(i) Group I reciprocating powered airplanes, 12 hours;

(ii) Group I turbopropeller powered airplanes, 16 hours; and

(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 flight training for flight crewmembers must include at least the following—

(1) For pilots, flight training in an approved simulator 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 to this part, or in a flight training program approved by the Administrator, except as follows—

(i) The number of programmed inflight hours is not specified; and

(ii) Satisfactory completion of a proficiency check may be substituted for recurrent flight training as permitted in § 121.433(c).

(2) For flight engineers, flight training as provided by § 121.425(a) except as follows—

(i) The specified number of inflight hours is not required; and

(ii) The flight check, other than the preflight inspection, may be conducted in an airplane

(3) For flight navigators, enough inflight training and an inflight check to ensure competency with respect to operating procedures and navigation equipment to be used and familiarity with essential navigation information pertaining to the certificate holder's routes that require a flight navigator.

(Amdt. 121–55, Eff. 2/2/70); (Amdt. 121–80, Eff. 11/4/71); (Amdt. 121–144, Eff. 6/26/78); (Amdt. 121–199, Eff. 1/2/89); [(Amdt. 121–250, Eff. 3/19/96)]

§ 121.429 Prohibited drugs.

(a) Each certificate holder shall provide each employee performing a function listed in appendix I to this part and his or her supervisor with the training specified in that appendix.

(b) No certificate holder may use any contractor to perform a function listed in appendix I to this part unless that contractor provides each of its employees performing that function for the certificate holder and his or her supervisor with the training specified in that appendix.

Docket No. 25148 (53 FR 47057) Eff. 11/21/88

(Amdt. 121–200, Eff. 12/21/88)