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FEDERAL AVIATION AGENCY
BUREAU OF FLIGHT STANDARDS
Washington 25, D. C.

December 1, 1960

CIVIL AIR REGULATIONS DRAFT RELEASE NO. 60-19

SUBJECT: Proposed Revision of Part 41 of the Civil Air Regulations "Certification and Operation Rules for Scheduled Air Carrier Operations Outside the Continental Limits of the United States"

The Bureau of Flight Standards of the Federal Aviation Agency has under consideration a revision of Part 41 of the Civil Air Regulations. The reasons therefor are set forth in the explanatory statement of the attached proposal which was published today in the Federal Register as a notice of proposed rule making.

The Bureau of Flight Standards desires that all persons who will be affected by the requirements of this proposal be fully informed as to its effect upon them and is therefore circulating copies in order to afford interested persons ample opportunity to submit comments as they may desire.

Because of the large number of comments which we anticipate receiving in response to this draft release, we will be unable to acknowledge receipt of each reply. However, you may be assured that all comment will be given careful consideration.

It should be noted that comments should be submitted in duplicate to the Docket Section of the Federal Aviation Agency by March 1, 1961. Thereafter, such comments will be available in the Docket Section to all interested persons, and an additional period will be allowed for submission of further comments in response thereto. In order to insure consideration, such additional comments must be received by April 1, 1961.

Orville Becker

Director,
Bureau of Flight Standards

NOTICE OF PROPOSED RULE MAKING

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As published in the Federal Register
on December 1, 1960 (25 F.R. 12299)

FEDERAL AVIATION AGENCY

[14 CFR Part 41]

[Regulatory Docket No. 582; Draft Release No. 60-19]

CERTIFICATION AND OPERATION RULES FOR SCHEDULED AIR CARRIER OPERATIONS OUTSIDE THE CONTINENTAL LIMITS OF THE UNITED STATES

Notice of Proposed Rule Making

Pursuant to the authority delegated to me by the Administrator (14 CFR 405.27), notice is hereby given that the Federal Aviation Agency (FAA) has under consideration a proposal to revise Part 41 of the Civil Air Regulations as hereinafter set forth.

Interested persons may participate in the making of the proposed rules by submitting such written data, views, or arguments as they may desire. Communications should be submitted in duplicate to the Docket Section of the Federal Aviation Agency, Room B-316, 1711 New York Avenue NW., Washington 25, D.C. prior to March 1, 1961. Thereafter, such comments will be available in the Docket Section to all interested persons. After examination of the original comments received, interested persons may submit such additional comments in response thereto as they may desire. Such additional comments must be submitted prior to April 1, 1961. (Photostatic copies of comments on file in the Docket Section may be obtained upon payment of the cost of such copies). All original comments and additional comments in response thereto received by the dates specified for receipt thereof will be considered by the Administrator before taking action on the proposed rules. The proposals contained in this notice may be changed in the light of the comments received.

A revision of Part 41 of the Civil Air Regulations has been under consideration for some time, the last proposed revision having been circulated by the Civil Aeronautics Board in Draft Release 58-24, dated December 24, 1958 (24 F.R. 145).

While this proposal takes cognizance of those areas wherein scheduled international air carrier operations differ from those of scheduled domestic air carriers, it also recognizes the many areas in which such operations are similar, and attempts to achieve as much uniformity as is practicable between the regulations of Parts 40 and 41 in such areas.

All of the operations specifications currently issued to Part 41 air carriers contain certain rules which are substantively the same. Since these rules are standard in nature, it is appropriate to remove them from the individual operations specifications of the air carriers and incorporate them, without substantive change, in revised Part 41 as rules of general applicability. This has been done in this proposal with respect to some of the standard provisions presently contained in the operations specifications of the individual Part 41 air carriers. The Agency proposes to incorporate other such standard provisions, without substantive change, into revised Part 41 as finally adopted.

This proposal incorporates into revised Part 41 certain rules and interpretive material related to the basic regulation which heretofore have been published separately in a Civil Aeronautics Manual. In addition, it will be noted that an Appendix A has been added in this proposal which sets forth in detail the required first-aid and survival equipment approved by FAA.

Many of the provisions appearing in Draft Release 58-24 have been changed in this proposal. A number of these changes reflect pertinent amendments to the Civil Air Regulations which have been adopted since the circulation of Draft Release 58-24. Other changes are the result of evaluation of comments received in response to that draft release and reflect the current views of the Federal Aviation Agency with regard to the rules governing air carrier operations in overseas and foreign air transportation.

The differences between the provisions of this proposal and those in current Part 41 and previous Draft Release 58-24 are too numerous to be listed in their entirety. However, some significant differences reflected in this current proposal are as follows:

1. Section 41.1 *Applicability:* A provision has been added to the applicability section to make it clear that certain of the rules prescribed in the part apply to individual persons other than the air carrier itself.

2. Sections 41.19 and 41.20 *Contents and utilization of operations specifications:* Provisions have been added to § 41.19 to require basic information regarding airplanes operated by an air carrier to be included in its operations specifications. A requirement has been added to § 41.20 to insure that provisions of the operations specifications inserted in the air carrier's manual can be readily identified as such.

3. Section 41.30 *General route requirements:* This section has been clarified with respect to the showing required to obtain approval of routes.

4. Section 41.32 *Width of routes:* This section has been revised to specify, with greater particularity, widths for various approved routes.

5. Section 41.36 *En route navigational facilities:* A provision has been added to make it clear that navigational facilities on approved routes outside of controlled airspace will be specified in the air carrier operations specifications.

6. Section 41.53 *Airplane Flight Manual:* A provision has been added which will insure that when required sections of the Airplane Flight Manual are incorporated into the Air Carrier Manual they will not lose their identity.

7. Sections 41.70 and 41.90 *Transport and nontransport category airplane operating limitations:* The Agency believes that large cargo-carrying airplanes should be required by regulation to meet the same performance operating limitations standards as passenger-carrying airplanes. Such a requirement is considered necessary for the protection of the public in the vicinity of airports and also to insure the safety of the airplane and flight crew during en route flight over high terrain. Accordingly, §§ 41.70 and 41.90 have been revised by deleting those terms which limit the applicability of the current sections to passenger-carrying airplanes only.

8. Section 41.111 *Fire prevention—cargo airplanes:* This section has been added to make provisions for fire prevention applicable to cargo-only airplanes.

9. Section 41.115 *Fire precautions:* Paragraph (e) of this section brings the regulation into conformity with Part 4b of the Civil Air Regulations with respect to Class "E" compartments in cargo-only airplanes.

10. Section 41.153 *Carriage of cargo in passenger compartments:* This section has been revised to include provisions for approved bins to be located in the passenger compartment.

11. Section 41.173 *Emergency equipment for all operations:* This section reflects requirements for approval of emergency equipment. It would require first-aid kits to be approved in accordance with the applicable provisions of Appendix A.

12. Section 41.174 *Seats and safety belts for all occupants:* The provisions of this section have been revised to specify more clearly seat and safety belt requirements for occupants of air carrier airplanes. As revised, the rule would require each person on board the airplane to occupy a seat or berth with a safety belt fastened during takeoff and landing.

13. Section 41.179 *Shoulder harness:* A new provision has been added to require all airplanes to be equipped with shoulder harnesses at the pilot and flight engineer stations.

14. Sections 41.206 and 41.208 *Equipment for operations over water and uninhabited terrain:* These sections would require survival equipment for operations over water and uninhabited terrain to be approved in accordance with the applicable provisions of Appendix A.

15. Section 41.209 *Equipment for operations on which specialized means of navigation are required:* This section would require the air carrier to show that sufficient and adequate navigation equipment is provided in the aircraft to accomplish the specialized navigation required on each route.

16. Section 41.243 *Maintenance and inspection personnel duty time limitations:* This section would provide duty time limitations for maintenance and inspection personnel located within the United States, its Territories and possessions.

17. Section 41.262 *Flight navigator:* This section elaborates on the requirements for inclusion of a flight navigator in the flight crew and specifies in detail the criteria which will be used in determining when a navigator is required.

18. Section 41.265 *Flight attendant:* Considering the problems associated with evacuation, decompression, and other possible emergency situations, it is provided in this section that when more than 100 passengers are carried, the air carrier shall assign at least 3 flight attendants to serve on the aircraft.

19. Section 41.267 *Assignment of emergency evacuation functions for each crewmember:* In order to insure crew coordination and familiarity of all crewmembers with emergency functions, this section has been revised to require the air carrier to show that such functions are realistic and capable of accomplishment, and to require all such functions to be executed by all crewmembers in the course of their participation in the approved training program.

20. Sections 41.303 and 41.304 *Pilot route and airport qualification requirements:* The airport qualification requirements have been revised to provide that a pilot may be dispatched to an airport without prior entry provided initial entry is made at higher than normally authorized minimums. In addition, a pilot would be required to accomplish more stringent ground qualification procedures in order to become route and airport qualified.

21. Section 41.310 *Aircraft dispatcher qualification for duty:* The provisions of this section are similar to those currently in Part 40. In order to dispatch aircraft in his area of jurisdiction, a dispatcher would be required to make at least one round trip each 12 months over a representative route in his area.

22. Section 41.320 *Flight time limitations:* Due to the complexity of the issues inherent in flight time limitations for flight crewmembers, the Bureau is making a separate study of the current limitations and will present proposals to amend them in a separate rule making proceeding. Accordingly, the currently effective flight time limitations for flight crewmembers are retained in this proposal with the understanding that they will be the subject of a separate and subsequent proposal.

23. Section 41.356 *Admission to flight deck:* For purposes of clarification, the provisions of this section have been revised to include a definition of the term "flight deck."

24. Section 41.359 *Operations over approved routes required:* This section, the substance of which presently appears in individual operations specifications of the air carriers, has general application and is, therefore, being incorporated into Part 41, so that it may be deleted from the individual operations specifications of the air carriers.

25. Section 41.387 *Dispatching under IFR, over-the-top, or over water:* This provision eliminates the long- and short-range requirements contained in current Part 41 and provides for dispatch to destination, requiring that both destination and alternates be forecast to be above minimums at time of arrival. This provision applies the same standards as are currently applicable to Part 40 air carriers. Redispatch in flight is provided for in § 41.393.

26. Section 41.396 *Fuel supply for all operations:* The provisions of this section proposed for reciprocating and turbo-propeller-powered airplanes are considered adequate for safe operations and more realistic than present requirements in view of the related dispatch rules proposed in this revision. The fuel requirements proposed for turbo jet airplanes are the same as those currently contained in Special Civil Air Regulation No. SR–427B.

27. Section 41.397 *Factors involved in computing fuel required:* In order to clarify the issues involved in fuel planning, a provision has been added requiring consideration to be given to the possibility of having to conduct an instrument approach and climb back to altitude for flight to an alternate airport, when planning fuel requirements for operations.

This revision is proposed under the authority of Titles III and VI, and section 1102 of the Federal Aviation Act of 1958.

(72 Stat. 744–754, 775–780, and 797; 49 U.S.C. 1341–1355, 1421–1430, and 1502)

Issued in Washington, D.C., on November 25, 1960.

OSCAR BAKKE,
Director,
Bureau of Flight Standards.

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APPLICABILITY AND DEFINITIONS

§ 41.1 Applicability of this part.

The provisions of this part are applicable to the following persons:

(a) An air carrier holding a certificate of public convenience and necessity issued by the Board, when it engages in scheduled air transportation between a place in any State of the United States, or the District of Columbia, and any place in a Territory or possession of the United States; or between any place in a Territory or possession of the United States, and a place in any other Territory or possession of the United States; or between places in a Territory or possession of the United States; or between any place in the United States and any place outside thereof; or between any two places outside the United States; or between a place in the State of Alaska and any other state of the United States; or between the State of Hawaii and any other state of the United States;

(b) An Alaskan air carrier and any other air carrier holding a certificate of public convenience and necessity issued by the Board, when it engages in scheduled air carrier operations between points within the State of Alaska or the State of Hawaii; and

(c) Any airman, air agency, or other person employed or used by an air carrier in the conduct of operations subject to this part (including the operation, inspection, maintenance, and overhaul of aircraft), and any person while on board an airplane operated by an air carrier under the provisions of this part.

§ 41.2 Additional rules applicable to operations subject to this part.

Unless otherwise specified in this part or the operations specifications of the air carrier, operations subject to the provisions of this part shall be conducted in compliance with the following additional rules:

(a) *Within the United States.* Parts 43 and 60 of this chapter (Civil Air Regulations).

(b) *Over the high seas.* Part 43 of this chapter (Civil Air Regulations) and Annex 2 (Rules of the Air) to the Convention on International Civil Aviation, except where any rule of this part is more restrictive and may be followed without violating the rules of Annex 2.

(c) *Within a foreign country.* Part 43 of this chapter (Civil Air Regulations) and the air traffic rules of the foreign government and local airport rules, except where any rule of this part is more restrictive and may be followed without violating the rules of such foreign country.

§ 41.5 Definitions.

As used in this part, terms are defined as follows:

Accelerate-stop distance. Accelerate-stop distance is the distance required to accelerate an airplane to a specified speed and, assuming failure of the critical engine at the instant that speed is attained, to bring the airplane to a stop. (See the pertinent airworthiness requirements for the manner in which such distance is determined).

Administrator. The Administrator is the Administrator of the Federal Aviation Agency.

Air carrier. An air carrier is any citizen of the United States who undertakes directly, or by lease or by other arrangement, to engage in air transportation as defined in the Federal Aviation Act of 1958.

Aircraft dispatcher. An aircraft dispatcher is an individual holding a valid aircraft dispatcher certificate issued by the Administrator who exercises responsibility with the pilot in command in the operational control of each flight.

Airframe. Airframe means any and all kinds of fuselages, booms, nacelles, cowlings, fairings, empennages, airfoil surfaces, and landing gear, and all parts, accessories, or controls, of whatever description, appertaining thereto, but not including engines and propellers.

Airplane. An airplane is a power-driven fixed-wing aircraft, heavier than air, which is supported by the dynamic reaction of the air against its wings.

Airport. An airport is an area of land or water which is used, or intended for use, for the landing and takeoff of airplanes.

Alternate airport. An alternate airport is an approved airport to which a flight may proceed if a landing at the airport to which the flight was dispatched becomes inadvisable.

Appliances. Appliances are instruments, equipment, apparatus, parts, appurtenances, or accessories, of whatever description, which are used, or are capable of being or intended to be used, in the navigation, operation, or control of airplanes in flight (including communication equipment, electronic devices, and any other mechanism or mechanisms installed in or attached to airplanes during flight, but excluding parachutes), and which are not a part or parts of airframes, engines, or propellers.

Approved. Approved, when used alone or as modifying terms such as means, method, action, equipment, etc., means approved by the Administrator, or his authorized representative.

Authorized representative of the Administrator. An authorized representative of the Administrator is any employee of the Federal Aviation Agency authorized by the Administrator to perform particular duties of the Administrator under the provisions of this part.

Board. Board means the Civil Aeronautics Board.

Check airman. A check airman is an airman designated by the air carrier and approved by the Administrator to examine other airmen to determine their proficiency with respect to procedures and technique and their competence to perform their respective airman duties.

Crewmember. A crewmember is any individual assigned by an air carrier for the performance of duty on an airplane in flight.

Critical engine. The critical engine is that engine the failure of which gives the most adverse effect on the airplane flight characteristics relative to the case under consideration.

Critical-engine-failure speed, V_1 (transport category airplanes). The critical-engine-failure speed is the airplane speed used in the determination of the takeoff distance required at which the critical engine is assumed to fail. (See the pertinent airworthiness requirements for the manner in which such speed is determined.)

Director. Director means Director, Bureau of Flight Standards, Federal Aviation Agency, or his authorized representative.

Dispatch release. A dispatch release is an authorization issued by an air carrier specifying the conditions for the origination or continuance of a particular flight.

Effective length of runway—(1) *Takeoff.* The effective length of runway for takeoff as used in the takeoff operating limitations for nontransport category airplanes is the distance from the end of the runway at which the take off is started to the point at which the obstruction clearance plane associated with the other end of the runway intersects the centerline of the runway.

(2) *Landing.* The effective length of runway for landing as used in the landing operating limitations for both transport and nontransport category airplanes is the distance from the point at which the obstruction clearance plane associated with the approach end of the runway intersects the centerline of the runway to the far end thereof.

En route. En route means the entire flight from the point of origination to the point of termination, including intermediate stops.

Extended overwater operation. An extended overwater operation is an operation over water conducted at a distance in excess of 50 miles from the nearest shore line.

FAA. FAA means the Federal Aviation Agency.

Fireproof. Fireproof material means a material which will withstand heat equally well or better than steel in dimensions appropriate for the purpose for which it is to be used. When applied to material and parts used to confine fires in designated fire zones, fireproof means that the material or part will perform this function under the most severe conditions of fire and duration likely to occur in such zones.

Fire-resistant. When applied to sheet or structural members, fire-resistant material means a material which will withstand heat equally well or better than aluminum alloy in dimensions appropriate for the purpose for which it is to be used. When applied to fluid-carrying lines, this term refers to a line and fitting assembly which will perform its intended protective functions under the heat and other conditions likely to occur at the particular location.

Flame-resistant. Flame-resistant material means a material which will not support combustion to the point of propagating, beyond safe limits, a flame after the removal of the ignition source.

Flammable. Flammable fluids or gases mean those which will ignite readily or explode.

Flash-resistant. Flash-resistant material means material which will not burn violently when ignited.

Flight crewmember. A flight crewmember is a crewmember assigned to duty on an airplane as a pilot, flight navigator, or flight engineer.

Flight engineer. A flight engineer is an individual holding a valid flight engineer certificate issued by the Administrator and whose primary assigned duty during flight is to assist the pilots in the mechanical operation of an airplane.

Flight navigator. A flight navigator is an individual holding a valid flight navigator certificate issued by the Administrator and who is responsible to the pilot in command for the safe and efficient navigation of the airplane.

Flight time. Flight time is the time from the moment the airplane first moves under its own power for the purpose of flight until it comes to rest at the next point of landing (block-to-block time).

IFR. IFR is the symbol used to designate instrument flight rules.

ILS. ILS is the symbol used to designate instrument landing system.

Maximum certificated takeoff weight. Maximum certificated takeoff weight is the maximum takeoff weight prescribed by the terms of the airplane airworthiness certificate or the Airplane Flight Manual.

Minimum control speed. The minimum control speed is the minimum speed at which an airplane can be safely controlled in flight after an engine suddenly becomes inoperative. (See pertinent airworthiness requirements for the manner in which such speed is determined.)

Month. A month is that period of time extending from the first day of any month as delineated by the calendar through the last day thereof.

Night. Night is the time between the ending of evening civil twilight and the beginning of morning civil twilight as published in the American Air Almanac converted to local time for the locality concerned.

NOTE: The American Air Almanac containing the ending of evening twilight and the beginning of morning twilight tables may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D.C. Information is also available concerning such tables in the Offices of the Federal Aviation Agency or the United States Weather Bureau.

Obstruction clearance area—(1) *Takeoff.* A takeoff obstruction clearance area as used in the takeoff operating limitations for nontransport category airplanes is an area on the earth's surface defined as follows: The centerline of the obstruction clearance area in plan view shall coincide with and prolong the centerline of the runway, beginning at the point where the obstruction clearance plane intersects the centerline of the runway and proceeding to a point not less than 1,500 feet from the beginning point. Thereafter the centerline shall proceed in a path consistent with the takeoff procedure for the runway or, where such a procedure has not been established, consistent with turns of at least 4,000-foot radius until a point is reached beyond which the obstruction clearance plane clears all obstructions. The obstruction clearance area shall extend laterally for a distance of 200 feet on each side of the centerline at the point where the obstruction clearance plane intersects the runway and shall continue at this width until the end of the runway; thence it shall increase uniformly to 500 feet on each side of the centerline at a point 1,500 feet from the intersection of the

obstruction clearance plane with the runway; thereafter it shall extend laterally for a distance of 500 feet on each side of the centerline.

(2) *Landing.* A landing obstruction clearance area as used in the landing operating limitations for both transport and nontransport category airplanes is an area on the earth's surface defined as follows: The centerline of the obstruction clearance area in plan view shall coincide with and prolong the centerline of the runway, beginning at the point where the obstruction clearance plane intersects the centerline of the runway and proceeding to a point not less than 1,500 feet from the beginning point. Thereafter the centerline shall proceed in a path consistent with the instrument approach procedure for the runway or, where such a procedure has not been established, consistent with turns of at least 4,000-foot radius until a point is reached beyond which the obstruction clearance plane clears all obstructions. The obstruction clearance area shall extend laterally for a distance of 200 feet on each side of the centerline at the point where the obstruction clearance plane intersects the runway and shall continue at this width until the end of the runway; thence it shall increase uniformly to 500 feet on each side of the centerline at a point 1,500 feet from the intersection of the obstruction clearance plane with the runway; thereafter it shall extend laterally for a distance of 500 feet on each side of the centerline.

Obstruction clearance plane. An obstruction clearance plane is a plane which is tangent to or clears all obstructions within the obstruction clearance area and which slopes upward from the runway at a slope of 1:20 to the horizontal as shown in a profile view of the obstruction clearance area.

Operational control. Operational control is the exercise of authority over initiation, continuation, diversion, or termination of a flight.

Operations specifications. Operations specifications are rules of particular applicability issued by the Director to an air carrier pursuant to the provisions of this part.

Over-the-top. Over-the-top means the operation of an airplane above a layer of clouds or obscuring phenomena that is reported as "broken," "overcast," or "obscuration" and not classified as "thin" or "partial."

PAR. PAR is the symbol used to designate precision approach radar.

Pilot in command. The pilot in command is the pilot designated by the air carrier as the pilot responsible for the operation and safety of the airplane during the time defined as flight time.

Pilotage. Pilotage is navigation by means of visual reference to landmarks.

Point-of-no-return. Point-of-no-return means that point at which the airplane no longer has sufficient fuel under existing conditions to return to the point of departure or any alternate for that point.

Propeller. A propeller is an external device for propelling an airplane through the air, having blades mounted on a power-driven shaft, which when rotated produces by its action on the air a thrust approximately parallel to the longitudinal axis of the airplane.

Provisional airport. A provisional airport is an airport approved for use by an air carrier for the purpose of providing service to a community when the regular airport serving that community is not available.

Rating. A rating is an authorization issued with an airman certificate, and forming a part thereof, delineating special conditions, privileges, or limitations pertaining to such certificate.

Refueling airport. A refueling airport is an airport approved as an airport to which flights may be dispatched only for refueling.

Regular airport. A regular airport is an airport approved as a regular terminal or intermediate stop on an authorized route.

Route. A route is the airspace on either side of a course or courses joining those points on the surface of the earth between which an air carrier is authorized to conduct scheduled operations.

Route segment. A route segment is a portion of a route each terminus of which is identified by: (1) A continental or insular geographic location, or (2) a point at which a definite radio fix can be established.

Runway. A runway is a clearly defined area of an airport suitable for the safe landing or take-off of airplanes.

Second in command. Second in command means a pilot other than the pilot in command who is designated by the air carrier to act as second in command of an airplane.

Show. Show (or shows) means to demonstrate or prove to the satisfaction of the Administrator or his authorized representative prior to the issuance of the air carrier operating certificate and at any time thereafter upon request.

Synthetic trainer. A synthetic trainer is a device, the use of which is approved to simulate certain operating conditions.

Takeoff safety speed, V_2. The takeoff safety speed is the airplane speed used in the determination of the takeoff flight path at which the climb-out following takeoff can be safely executed with one engine inoperative and with the airplane in the takeoff configuration. (See the pertinent airworthiness requirements for the manner in which such speed is determined.)

Time in service. Time in service, as used in computing maintenance time records, is the time from the moment an airplane leaves the ground until it touches the ground at the end of a flight.

Transport category airplane. A transport category airplane is an airplane which has been type certificated in accordance with the requirements of Part 4b of this subchapter or the transport category requirements of Part 4a of this subchapter.

Type. With regard to airman qualifications, type means all airplanes of the same basic design, including all modifications thereto except those modifications which the Administrator has found result in a substantial change in characteristics pertinent to the airman concerned.

VFR. VFR is the symbol used to designate visual flight rules.

V_{S_0}. V_{S_0} is the symbol used to designate the true indicated stalling speed or the minimum steady flight speed in the landing configuration.

Week. A week is that period of time extending from the first day of any week as delineated by the calendar through the last day thereof.

Year. A year is that period of time extending from the first day of any year as delineated by the calendar through the last day thereof.

Certification Rules and Operations Specifications Requirements

§ 41.10 Certificate required.

No person subject to this part shall conduct operations without, or in violation of the terms of, an air carrier operating certificate issued by the Director.

Note: Applications, and instructions for the preparation thereof, for the issuance or amendment of air carrier operating certificates may be obtained from any FAA Air Carrier Safety District Office.

§ 41.13 Issuance of certificate.

(a) An air carrier operating certificate will be issued to an applicant having a certificate of public convenience and necessity or other appropriate economic authority issued by the Board when after investigation it is found that such applicant is properly and adequately equipped and able to conduct a safe operation in accordance with the requirements of this part and with the operations specifications provided for in this part.

Note: Certificates currently in force on the effective date of this part will be deemed to be certificates issued under this part.

(b) Whenever, upon investigation, the Director finds that the general standards of safety required for air carrier operations within Alaska, or for air carrier operations conducted pursuant to a temporary authorization issued under Title IV of the Federal Aviation Act of 1958, require or permit a deviation from any specific requirement of this part for a particular operation or class of operations for which an application for an air carrier operating certificate has been made, he may issue operations specifications prescribing requirements which deviate from the requirements of this part.

(c) An air carrier holding economic authority to engage in scheduled cargo-only operations between any of the places specified in § 41.1 (a) or (b) may, upon application, be authorized by the Director to conduct such operations in accordance with the air carrier certification and operation rules prescribed in Part 42 of this chapter (Civil Air Regulations).

§ 41.15 Display of certificate and operations specifications.

The air carrier operating certificate and operations specifications shall be available at the principal operations office of an air carrier for inspection by an authorized representative of the Administrator.

§ 41.16 Duration of certificate.

An air carrier operating certificate shall remain in effect until termination of the certificate of public convenience and necessity or other economic authorization issued by the Board to the air carrier, or until such operating certificate is surrendered, suspended, revoked, or otherwise terminated by the Administrator. After suspension or revocation it shall be returned to the Director.

§ 41.18 Operations specifications required.

(a) On and after the effective date of this part, all air carrier operations specications currently in force relating to operations subject to the provisions of this part shall cease to be a part of any air carrier operating certificate and shall be deemed to be operations specifications issued under this part. Thereafter new or amended specifications may be issued by the Director for operations subject to this part. Applications for amendments of operations specifications shall be submitted to the local FAA Air Carrier Safety District Office charged with the overall inspection of the air carrier's operations at least 15 days prior to the proposed effective dates of such amendments, unless an authorized representative of such office approves a shorter filing period.

(b) No person shall engage in or conduct any operations to which this part is applicable without, or in violation of, currently effective operations specifications issued under this part.

NOTE: Forms for initial applications for operations specifications will be furnished upon request by any FAA Air Carrier Safety District Office.

§ 41.19 Contents of operations specifications.

The operations specifications will contain the following:

(a) Types of operations authorized;

(b) Types of airplanes authorized for use;

(c) En route authorizations and limitations;

(d) Airport authorizations and limitations;

(e) Time limitation for overhauls, inspections, and checks of airframes, engines, propellers, and appliances, or standards by which such time limitations shall be determined;

(f) Procedures used to maintain control of weight and balance of airplanes;

(g) Interline equipment interchange requirements, if pertinent;

(h) A current list of all airplanes being operated by the air carrier in accordance with its operating certificate, showing the registration number, manufacturer's model, serial number, configuration including the maximum number of authorized passenger and crew seats, and whether the airplane is used in passenger or cargo operations or both, and, if the airplane is not owned by the air carrier, the name of the lessor: *Provided,* That airplanes owned by or under lease to another air carrier and being operated under an interchange agreement need not be listed if the operations specifications incorporate a reference to the agreement and to the operations specifications of such other air carrier in which the airplanes are listed; and

(i) Such additional items as the Director determines, under the enabling provisions of this part, are necessary to cover a particular situation.

§ 41.20 Utilization of operations specifications.

The air carrier shall keep its personnel informed with respect to the contents of the operations specifications and all amendments thereto applicable to the individual's duties and responsibilities. A set of specifications shall be maintained by the air carrier as a separate and complete document. Pertinent excerpts from the specifications or references thereto shall be inserted in the manual issued by the air carrier in such a manner that they do not lose their identity in any respect.

§ 41.21 Amendment of operations specifications.

Any operations specifications may be amended by the Director if he finds that safety in air transportation so requires or permits. Except in the case of an emergency requiring immediate action in respect to safety in air transportation or upon consent of the air carrier concerned, no amendment will become effective prior to thirty days after the date the air carrier has been notified of such amendment.

§ 41.22 Inspection authority.

An authorized representative of the Administrator shall be permitted at any time and place to make inspections or examinations to determine an air carrier's compliance with the requirements of the Federal Aviation Act of 1958, the Civil Air Regulations, the provisions of the air carrier's operating certificate, and the operations specifications.

§ 41.23 Operations and maintenance base and office.

Each air carrier shall, 30 days in advance of a change in the address of its principal business office, its principal operations base, or its principal maintenance base, give written notice thereof to the FAA Air Carrier Safety District Office charged with overall inspection of the air carrier's operations.

REQUIREMENTS FOR APPROVAL OF ROUTES

§ 41.30 General route requirements.

The air carrier shall show for route approvals that it is competent to conduct scheduled operations over any route or route segment to be used between any regular, provisional, or refueling airport, that the facilities and services required by §§ 41.33 through 41.38 are available and adequate for the type of operation proposed, and, for routes outside of controlled airspace, that traffic density does not constitute a hazard. Actual flight over a route or route segment will be required, unless the air carrier shows that such flight is not essential to safety, considering the availability and adequacy of airports, lighting, maintenance, communication, navigation, fueling, ground and aircraft radio facilities, and the competence of personnel to be used in the proposed operation.

§ 41.32 Width of routes.

Routes approved for operations over U.S. Federal airways or foreign airways or advisory routes (ADR's) shall have a width equal to the designated width of such airways or advisory routes. All other approved routes shall have widths specified in the air carrier's operations specifications which the carrier shows will permit a safe operation, considering terrain clearance and minimum en route altitudes, available ground and airborne navigational aids, procedures, systems and equipment, air traffic density, and air traffic control procedures.

§ 41.33 Airports.

The air carrier shall show that each regular, provisional, refueling, and alternate airport on each route is properly equipped and adequate for the type of operations to be conducted. Consideration shall be given to items such as size, surface, obstructions, facilities, public protection, lighting, navigational and communications aids, and traffic control.

NOTE: Criteria to be used are contained in appropriate Technical Standard Orders published by the FAA.

§ 41.34 Communications facilities.

The air carrier shall show that a two-way air/ground radio communication system is available at such points as will insure reliable and rapid communications under normal operating conditions over the entire route, either direct or via approved point-to-point circuits, between airplanes and the appropriate dispatch office, and between airplanes and the appropriate air traffic control unit: *Provided,* That for operations within the continental limits of the United States (excluding Alaska) such communication systems between airplanes and the appropriate dispatch office shall be independent of systems operated by the Federal Government.

§ 41.35 Weather reporting facilities.

The air carrier shall show that sufficient weather reporting services are available along the route to insure weather reports and forecasts necessary for the operation. Weather reports used to control flight movements shall be those prepared and released by the U.S. Weather Bureau, or by a source approved by the Weather Bureau, or, in foreign operations when such observations are not available, by a source found by the Director to be satisfactory. Forecasts used to control flight movements shall be prepared from such weather reports.

§ 41.36 En route navigational facilities.

The air carrier shall show that nonvisual ground aids to air navigation are available along each route, that they are so located as to permit navigation to any regular, provisional, refueling, or alternate airport within the degree of accuracy necessary for the operation involved, and that they are available for the navigation of airplanes within the degree of accuracy required for air traffic control: *Provided,* That nonvisual ground aids to navigation are not required: (a)

For day VFR operations which the air carrier shows can be conducted safely by pilotage because of the characteristics of the terrain, or for night VFR operations on routes which the air carrier shows have reliably lighted landmarks which are adequate for safe operations; or (b) on segments of routes where the use of celestial or other specialized means of navigation is approved.

NOTE: Nonvisual ground navigational aids required for approval of routes outside of controlled airspace will be specified in the air carrier operations specifications.

§ 41.37 Servicing and maintenance facilities.

The air carrier shall show that competent personnel and adequate facilities and equipment, including spare parts, supplies, and materials, are available at such points along the air carrier's routes as are necessary for the proper servicing, maintenance, repair, and inspection of airplanes and auxiliary equipment.

§ 41.38 Location of dispatch centers.

The air carrier shall show that it has a sufficient number of dispatch centers adequate for the operations to be conducted and located at such points as are necessary to insure the proper operational control of each flight.

MANUAL REQUIREMENTS

§ 41.50 Preparation of Air Carrier Manual.

The air carrier shall prepare and keep current a manual for the use and guidance of flight and ground operations personnel in the conduct of its operations.

§ 41.51 Contents of Air Carrier Manual.

(a) The manual shall contain instructions, information, and data necessary for the personnel concerned to carry out their duties and responsibilities with a high degree of safety. It shall be in a form to facilitate easy revision, and each page shall bear the date of the last revision thereof. The contents of such manual shall not be contrary to the provisions of any Federal regulations, foreign regulations where applicable, operations specifications, or the operating certificate. The manual may be in two or more separate parts, encompassing together all of the information listed below (e.g., flight operations, ground operations, maintenance, communications, etc.) to facilitate use by the personnel concerned, but each part shall contain that portion of the information listed below as is appropriate for each group of personnel:

(1) General policies;

(2) Duties and responsibilities of each crewmember and appropriate members of the ground organization;

(3) Reference to appropriate regulations prescribed by the Federal Aviation Agency;

(4) Flight dispatching and control, including procedures for coordinated dispatch;

(5) En route flight, navigational, and communication procedures, including procedures for the dispatch or continuance of flight, if any item of equipment required for the particular type of operation becomes inoperative or unserviceable en route;

(6) Appropriate information from the en route operations specifications, including for each approved route the types of airplanes authorized, their crew complement, the type of operation (i.e., VFR, IFR, day, night) and other pertinent information;

(7) Appropriate information from the airport operations specifications, including for each airport its location, its designation (i.e., regular, alternate, provisional, etc.), types of airplanes authorized, instrument approach procedures, landing and takeoff minimums, and other pertinent information;

(8) Takeoff, en route, and landing weight limitations;

(9) Procedures for familiarizing passengers with the use of emergency equipment during flight;

(10) Emergency procedures and equipment;

(11) The method of designating succession of command of flight crewmembers;

(12) Procedures for determining the usability of landing and takeoff areas and for dissemination of pertinent information to operations personnel;

(13) Procedures for operation during periods of icing, hail, thunderstorms, turbulence, or any potentially hazardous meteorological conditions;

(14) Airman training programs, including appropriate ground, flight, and emergency phases;

(15) Instructions and procedures for maintenance, repair, overhaul, and servicing;

(16) Time limitations for overhaul, inspection, and checks, of airframes, engines, propellers and appliances, or standards by which such time limitations shall be determined;

(17) Procedures for refueling airplanes, elimination of fuel contamination, protection from fire including electrostatic protection, and the supervision and protection of passengers during refueling;

(18) Inspections for airworthiness, including instructions covering procedures, standards, responsibilities, and authority of the inspection personnel;

(19) Methods and procedures for maintaining the airplane weight and center of gravity within approved limits;

(20) Pilot and dispatcher route and airport qualification procedures;

(21) Accident notification procedures; and

(22) Other data or instructions related to safety.

(b) At least one complete master copy of the manual containing all parts thereof shall be retained at the appropriate operations base of the air carrier.

§ 41.52 Distribution of Air Carrier Manual.

(a) Copies of the entire manual, or appropriate portions thereof, together with revisions thereto, shall be furnished by the Air Carrier to the following:

(1) Appropriate ground operations and maintenance personnel of the air carrier;

(2) Crewmembers; and

(3) Authorized representatives of the Administrator assigned to the air carrier.

(b) All copies of the manual shall be kept up to date.

§ 41.53 Airplane Flight Manual.

(a) The air carrier shall keep current an approved Airplane Flight Manual for each type of transport category airplane which it operates.

(b) An approved Airplane Flight Manual or a manual complying with § 41.50 and containing information required for the Airplane Flight Manual shall be carried in each transport category airplane. When sections of the required information from the Airplane Flight Manual are incorporated in the Air Carrier Manual, they shall be clearly identified as Airplane Flight Manual requirement.

AIRPLANE REQUIREMENTS

§ 41.60 General.

Airplanes shall be identified, certificated, and equipped in accordance with the applicable airworthiness requirements of the Civil Air Regulations. No air carrier shall operate any airplane in scheduled, charter, or special service operations unless such airplane meets the requirements of this part, is in an airworthy condition, is registered as a civil aircraft of the United States and carries an appropriate and currently effective certificate of airworthiness issued by the Administrator. In determining compliance with the applicable airworthiness requirements and operating limitations, an approved weight and balance control system based upon average, assumed, or estimated weights may be utilized.

§ 41.61 Airplane certification requirements.

(a) *Airplanes certificated on or before June 30, 1942.* Airplanes certificated as a basic type on or before June 30, 1942, shall either:

(1) Retain their present airworthiness certification status and meet the requirements of § 41.90, or

(2) Comply with either the performance requirements of §§ 4a.737–T through 4a.750–T of this chapter (Civil Air Regulations) or the performance requirements of §§ 4b.110 through 4b.125 of this chapter (Civil Air Regulations) and in addition shall meet the requirements of § 41.70: *Provided,* That should any type be so qualified, all airplanes of any one operator of the same or related types shall be similarly qualified and operated.

(b) *Airplanes certificated after June 30, 1942.* Airplanes certificated as a basic type after June 30, 1942, and used in passenger-carrying operations shall be certificated as transport category airplanes and shall meet the requirements of § 41.70.

§ 41.62 Airplane limitation for type of route.

All airplanes used in passenger-carrying operations shall be multiengine airplanes and shall comply with the following requirements:

(a) *Two- or three-engine airplanes.* Two- or three-engine airplanes shall not be used in passenger-carrying operations unless adequate airports are so located along the route that the airplanes will at no time be at a greater distance therefrom than one hour of flying time in still air at normal cruising speed with one engine inoperative: *Provided,* That the Director may specify distances greater or less than those set forth herein when the character of the terrain, the type of operation, or the performance of the airplanes to be used so permit or require.

(b) *Land airplanes on extended overwater routes.* Land airplanes operated on flights involving extended overwater operations shall be certificated or approved as adequate for ditching in accordance with the ditching provisions of Part 4b of this chapter (Civil Air Regulations): *Provided,* That the DC-3 and C-46 type airplanes need not be so certificated or approved.

§ 41.63 Proving tests.

(a) A type of airplane not previously proved for use in scheduled operation shall have at least 100 hours of proving tests, in addition to the airplane certification tests, accomplished under the supervision of an authorized representative of the Director. As part of the 100-hour total at least 50 hours shall be flown over authorized routes and at least 10 hours shall be flown at night.

(b) A type of airplane which has been previously proved shall be tested for at least 50 hours, of which at least 25 hours shall be flown over authorized routes, unless deviations are specifically authorized by the Director on the ground that the special circumstances of a particular case make a literal observance of the requirements of this paragraph unnecessary for safety, when the airplane:

(1) Is materially altered in design,[1] or

(2) Is to be used by an air carrier who has not previously proved such a type.

(c) During proving tests only those persons required to make the tests and those designated by the Board or the Administrator shall be carried. Mail, express, and other cargo may be carried when approved.

AIRPLANE PERFORMANCE OPERATING LIMITATIONS: TRANSPORT CATEGORY

§ 41.70 Transport category airplane operating limitations.

(a) In operating any transport category airplane not subject to (b) of this section, the provisions of this paragraph and §§ 41.71 through 41.78 shall be complied with: *Provided,* That the Director may, upon application, authorize deviations from such provisions when special circumstances of a particular case make a literal observance of the requirements unnecessary for safety. Deviations authorized will be specified in operations specifications of the air carrier.

(1) The performance data contained in the Airplane Flight Manual shall be applied in determining compliance with these provisions. Where conditions differ from those for which specific tests were made, compliance shall be determined by interpolation or by computation of the effects of changes in the specific variables where such interpolations or computations will give results substantially equaling in accuracy the results of a direct test.

(2) The airplane shall not be taken off at a weight which exceeds the allowable weight for the runway being used as determined in accordance with the takeoff runway limitation of the transport category operating rules of this part, after taking into account the temperature operating correction factors required by §§ 4a.749a–T or 4b.117 of this subchapter, and set forth in the Airplane Flight Manual for the airplane.

(b) In operating any turbine-powered transport category airplane certificated in accordance with the performance requirements of Special Civil Air Regulations Nos. SR–422, SR–422A, or SR–422B, the operating rules specified in the applicable Special Civil Air Regulation shall be complied with in lieu of §§ 41.71 through 41.78.

§ 41.71 Weight limitations.

(a) No airplane shall be taken off from any airport located at an elevation outside of the altitude range from which maximum takeoff weights have been determined, and no airplane shall depart for an airport of intended destination or have any airport specified as an alternate which is located at an elevation outside of the altitude range for which maximum landing weights have been determined.

(b) The weight of the airplane at takeoff shall not exceed the authorized maximum takeoff weight for the elevation of the airport from which the takeoff is to be made.

(c) The weight at takeoff shall be such that, allowing for normal consumption of fuel and oil in flight to the airport of intended destination, the weight on arrival will not exceed the authorized maximum landing weight for the elevation of such airport.

§ 41.72 Takeoff limitations to provide for engine failure.

No takeoff shall be made except under conditions which will permit compliance with the following requirements:

(a) It shall be possible, from any point in the takeoff up to the time of attaining the critical-engine-failure speed, to bring the airplane to a safe stop on the runway as shown by the accelerate-stop distance data.

(b) It shall be possible, if the critical engine should fail at any instant after the airplane attains the critical-engine-failure speed, to proceed with the takeoff and attain a height of 50 feet, as indicated by the takeoff path data, before passing over the end of the runway. Thereafter it shall be possible to clear all obstacles, either by at least 50 feet vertically, as shown by the takeoff path data, or by at least 200 feet horizontally within the airport boundaries and by at least 300 feet horizontally after passing beyond such boundaries. In determining the allowable deviation of the flight path in order to avoid obstacles by at least the distances above set forth, it shall be assumed that the airplane is not banked before reaching a height of 50 feet, as shown by the takeoff path data, and that a maximum bank thereafter does not exceed 15°.

(c) In applying the requirements of paragraphs (a) and (b) of this section, corrections shall be made for any gradient of the takeoff surface. To allow for wind effect, takeoff data based on still air may be corrected by not more than 50 percent of the reported wind component along the takeoff path if opposite to the direction of takeoff, and shall be corrected by not less than 150 percent of the reported wind component if in the direction of takeoff.

§ 41.73 En route limitations; all engines operating.

No airplane shall be taken off at a weight in excess of that which would permit a rate of climb (expressed in feet per minute), with all engines operating, of at least 6 V_{s_0} (when V_{s_0} is expressed in miles per hour) at an altitude of at least 1,000 feet above the elevation of the highest ground or obstruction within 10 miles on either side of the intended track. Transport category airplanes certificated under Part 4a of this subchapter are not required to comply with this section. For the purpose of this section it shall be assumed that the weight of the airplane as it proceeds along its intended track is progressively reduced by normal consumption of fuel and oil.

§ 41.74 En route limitations; one engine inoperative.

(a) No airplane shall be taken off at a weight in excess of that which would permit a rate of climb (expressed in feet per minute), with one engine inoperative, of at least $\left(0.06 - \frac{0.08}{N}\right) V_{s_0}^2$ (when N is the number of engines installed and V_{s_0} is expressed in miles per hour) at an altitude of at least 1,000 feet above the elevation of the highest ground or obstruction within 10 miles on either side of the intended track, except that for transport category airplanes certificated under Part 4a of the Civil Air Regulations, the rate of climb shall be $0.02\ V_{s_0}^2$.

(b) As an alternative to the provisions of paragraph (a) of this section, an air carrier may utilize an approved procedure whereby its airplanes are operated at an all-engines-operating altitude such that in the event of an engine failure the airplane can continue flight to an alternate airport where a landing can be made in accordance with the provisions of § 41.78, the flight path clearing all terrain and obstructions along the route within 5 miles on either side of the intended track by at least 2,000 feet. In addition, if such a procedure is utilized, subparagraphs (1) through (6) of this paragraph shall be complied with:

[1] A type of airplane will be considered to be materially altered in design when the alterations include, but are not necessarily limited to: (a) Installation of powerplants other than the powerplants of a type similar to those with which the aircraft is certificated; (b) major alteration to the aircraft or its components which materially affects the flight characteristics.

(1) The rate of climb (as presented in the Airplane Flight Manual for the appropriate weight and altitude) used in calculating the airplane's flight path shall be diminished by an amount, in feet per minute, equal to $\left(0.06-\frac{0.08}{N}\right) V_{s_0}^2$ (when N is the number of engines installed and V_{s_0} is expressed in miles per hour) for airplanes certificated under Part 4b of this chapter (Civil Air Regulations) and by $0.02\ V_{s_0}^2$ for airplanes certificated under Part 4a of this chapter (Civil Air Regulations).

(2) The all-engines-operating altitude shall be such that, in the event the critical engine becomes inoperative at any point along the route, the flight will be capable of proceeding to a predetermined alternate airport by use of this procedure. For the purpose of determining the takeoff weight, the airplane shall be assumed to pass over the critical obstruction following engine failure at a point no closer to the critical obstruction than the nearest approved radio navigational fix: *Provided*, That a procedure established on a different basis will be approved if the air carrier shows that adequate operational safeguards exist.

(3) The airplane shall meet the provisions of paragraph (a) of this section at 1,000 feet above the airport used as an alternate in this procedure.

(4) The procedure shall include an approved method of accounting for winds and temperatures which would otherwise adversely affect the flight path.

(5) In complying with this procedure fuel jettisoning will be approved if the air carrier shows that it has an adequate training program, proper instructions are given to the flight crew, and all other precautions are taken to insure a safe procedure.

(6) The alternate airport shall be specified in the dispatch release and shall meet the provisions of § 41.390.

(c) For the purposes of this section it shall be assumed that the weight of the airplane as it proceeds along its intended track is progressively reduced by normal consumption of fuel and oil.

§ 41.75 En route limitations; two engines inoperative.

The provisions of this section shall apply only to airplanes certificated in accordance with the performance requirements of Part 4b of this chapter (Civil Air Regulations). No airplane having four or more engines shall be flown along an intended track except under the conditions of either paragraph (a) or (b) of this section.

(a) No place along the intended track shall be more than 90 minutes away from an available landing area at which a landing can be made in accordance with the requirements of § 41.78, assuming all engines to be operating at cruising power.

(b) The takeoff weight shall not be greater than that which would permit the airplane, with the two critical engines inoperative, to have a rate of climb in feet per minute equal to $0.01\ V_{s_0}^2$ (V_{s_0} being expressed in miles per hour) along all points of the route, from the point where the two engines are assumed to fail simultaneously to the landing area, either at an altitude of 1,000 feet above the elevation of the highest ground or obstruction within 10 miles on either side of the intended track or at an altitude of 5,000 feet, whichever is higher. The point where the two engines are assumed to fail shall be that point along the route which is most critical with respect to the takeoff weight. In showing compliance with this prescribed rate of climb, the following shall apply:

(1) It shall be permissible to consider that the weight of the airplane as it proceeds along its intended track is progressively reduced by normal consumption of fuel and oil with all engines operating up to the point where the two engines are assumed to fail and with two engines operating beyond that point.

(2) Where the engines are assumed to fail at an altitude above the prescribed minimum altitude, compliance with the prescribed rate of climb at the prescribed minimum altitude need not be shown during the descent from the cruising altitude to the prescribed minimum altitude if, at the end of the descent and during the subsequent portion of the flight, the prescribed rate of climb is met at the prescribed minimum altitudes. The descent shall be assumed to be along a net flight path and the rate of descent for the appropriate weight and altitude shall be assumed to be $0.01\ V_{s_0}^2$ greater than indicated by the performance information approved by the Administrator.

(3) If fuel jettisoning is provided, the airplane's weight at the point where the two engines are assumed to fail shall be considered to be not less than that which would include sufficient fuel to proceed to an available landing area at which a landing can be made in accordance with the requirements of § 41.78 and to arrive there at an altitude of at least 1,000 feet directly over the landing area.

§ 41.76 Special en route limitations.

The 10-mile lateral distance specified in §§ 41.73 through 41.75 may, for a distance of no more than 20 miles, be reduced to 5 miles, if operating VFR, or if air navigational facilities are so located as to provide a reliable and accurate identification of any high ground or obstruction located outside of such 5-mile lateral distance but within the 10-mile distance.

§ 41.77 Landing distance limitations; airport of destination.

No airplane shall be taken off at a weight in excess of that which, under the conditions stated in this part, would permit the airplane to be brought to rest at the field of intended destination within 60 percent of the effective length of the runway from a point 50 feet directly above the intersection of the obstruction clearance plane and the runway. For the purpose of this section it shall be assumed that the takeoff weight of the airplane is reduced by the weight of the fuel and oil expected to be consumed in flights to the field of intended destination.

(a) It shall be assumed that the airplane is landed on the most favorable runway and direction in still air.

(b) It shall be assumed, considering the probable wind velocity and direction, that the airplane is landed on the most suitable runway, taking due account of the ground handling characteristics of the airplane type involved and other conditions (e.g., landing aids, terrain, etc.) and allowing for the effect on the landing path and roll of not more than 50 percent of the wind component along the landing path if opposite to the direction of landing, or not less than 150 percent of the wind component if in the direction of landing.

(c) If the airport of intended destination will not permit full compliance with paragraph (b) of this section, the airplane may be taken off if an alternate airport is designated which permits compliance with § 41.78.

§ 41.78 Landing distance limitations; alternate airports.

No airport shall be designated as an alternate airport in a dispatch release unless the airplane at the weight anticipated at the time of arrival at such airport can comply with the requirements of § 41.77: *Provided*, That the airplane can be brought to rest within 70 percent of the effective length of the runway.

Airplane Performance Operating Limitations; Nontransport Category

§ 41.90 Nontransport category airplane operating limitations.

In operating any large, nontransport category airplane, the provisions of §§ 41.91 through 41.94 shall be complied with: *Provided*, That the Director may, upon application, authorize deviations from such provisions when the special circumstances of a particular case make a literal observance of the requirements unnecessary for safety. Deviations authorized will be specified in operations specifications of the air carrier. Approved performance data only shall be used in determining compliance with the provisions of §§ 41.91 through 41.94.

§ 41.91 Takeoff limitations.

No takeoff shall be made at a weight in excess of that which will permit the airplane to be brought to a safe stop within the effective length of the runway from any point during the takeoff up to the time of attaining 105 percent of minimum control speed or 115 percent of the power-off stalling speed in the takeoff configuration, whichever is the greater. In applying the requirements of this section:

(a) It may be assumed that takeoff power is used on all engines during the acceleration;

(b) Account may be taken of not more than 50 percent of the reported wind component along the takeoff path if opposite to the direction of takeoff, and account shall be taken of not less than 150 percent of the reported wind component if in the direction of the takeoff;

(c) Account shall be taken of the average runway gradient when the average gradient is greater than ½ percent. The average runway gradient is the difference

between the elevations of the end points of the runway divided by the total length.

(d) It shall be assumed that the airplane is operating in the standard atmosphere.

§ 41.92 En route limitations; one engine inoperative.

(a) No takeoff shall be made at a weight in excess of that which will permit the airplane to climb at a rate of at least 50 feet per minute with the critical engine inoperative at an altitude of at least 1,000 feet above the elevation of the highest obstacle within 5 miles on either side of the intended track or at an altitude of 5,000 feet, whichever is the higher: *Provided,* That in the alternative an air carrier may utilize a procedure whereby the airplane is operated at an altitude such that, in event of an engine failure, the airplane can clear the obstacles within 5 miles on either side of the intended track by 1,000 feet, if the air carrier shows that such a procedure can be used without impairing the safety of operation. If such a procedure is utilized, the rate of descent for the appropriate weight and altitude shall be assumed to be 50 feet per minute greater than indicated by the approved performance data. Before approving such a procedure, there will be taken into account, for the particular route, route segment, or areas concerned, the reliability of wind and weather forecasting, the location and types of aids to navigation, the prevailing weather conditions, particularly the frequency and amount of turbulence normally encountered, terrain features, air traffic control problems, and all other operational factors which affect the safety of an operation utilizing such a procedure.

(b) In applying the requirements of paragraph (a) of this section, it shall be assumed that:

(1) The critical engine is inoperative;

(2) The propeller of the inoperative engine is in the minimum drag position;

(3) The wing flaps and landing gear are in the most favorable positions;

(4) The operative engine or engines are operating at the maximum continuous power available;

(5) The airplane is operating in the standard atmosphere; and

(6) The weight of the airplane is progressively reduced by the weight of the anticipated consumption of fuel and oil.

§ 41.93 Landing distance limitations; airport of intended destination.

No takeoff shall be made at a weight in excess of that which, allowing for the anticipated weight reduction due to consumption of fuel and oil, will permit the airplane to be brought to a stop within 60 percent of the effective length of the most suitable runway at the airport of intended destination.

(a) This weight shall in no instance be greater than that permissible if the landing were to be made:

(1) On the runway with the greatest effective length in still air, and

(2) On the runway required by the probable wind, taking into account not more than 50 percent of the probable headwind component and not less than 150 percent of the probable tailwind component.

(b) In applying the requirements of this section it shall be assumed that:

(1) The airplane passes directly over the intersection of the obstruction clearance plane and the runway at a height of 50 feet in a steady gliding approach at a true indicated air speed of at least 1.3 V_{s_0};

(2) The landing is made in such a manner that it does not require any exceptional degree of skill on the part of the pilot; and

(3) The airplane is operating in the standard atmosphere.

§ 41.94 Landing distance limitations; alternate airports.

No airport shall be designated as an alternate airport in a dispatch release unless the airplane at the weight anticipated at the time of arrival at such airport can comply with the requirements of § 41.93: *Provided,* That the airplane can be brought to rest within 70 percent of the effective length of the runway.

SPECIAL AIRWORTHINESS REQUIREMENTS

§ 41.110 Fire prevention; passenger airplanes.

All airplanes used in passenger service, powered by engines rated at more than 600 horsepower each for maximum continuous operation and which have not been certificated in accordance with the provisions of Part 4b of this subchapter in effect on or after November 1, 1946, shall comply with the requirements contained in §§ 41.112 through 41.143: *Provided,* That if the Director finds that in particular models of existing airplanes literal compliance with specific items of these requirements might be extremely difficult of accomplishment and that such compliance would not contribute materially to the objective sought, he may accept such measures of compliance as he finds will effectively accomplish the basic objectives of the regulations in this part.

§ 41.111 Fire prevention; cargo airplanes.

All airplanes used in cargo-only service shall comply with the requirements contained in §§ 41.112, 41.113, 41.114, 41.115 (a), (b), (c), (d) or (e), and 41.116.

§ 41.112 Cabin interiors.

All compartments occupied or used by the crew or passengers shall comply with the following provisions:

(a) Materials shall in no case be less than flash-resistant.

(b) The wall and ceiling linings, the covering of all upholstering, floors, and furnishings shall be flame-resistant.

(c) Compartments where smoking is to be permitted shall be equipped with ash trays of the self-contained type which are completely removable. All other compartments shall be placarded against smoking.

(d) All receptacles for used towels, papers, and wastes shall be of fire-resistant material and shall incorporate covers or other provisions for containing possible fires started in the receptacles.

§ 41.113 Internal doors.

Where internal doors are equipped with louvres or other ventilating means, provision convenient to the crew shall be made for closing the flow of air through the door when such action is found necessary.

§ 41.114 Ventilation.

All passenger and crew compartments shall be suitably ventilated. Carbon monoxide concentration shall not exceed one part in 20,000 parts of air, and fuel fumes shall not be present. Where partitions between compartments are equipped with louvres or other means allowing air to flow between such compartments, provision convenient to the crew shall be made for closing the flow of air through the louvres or other means when such action is found necessary.

§ 41.115 Fire precautions.

Each compartment shall be designed so that, when used for the purpose of storing cargo or baggage, it shall comply with all of the requirements prescribed for cargo or baggage compartments. It shall include no controls, wiring, lines, equipment, or accessories the damage or failure of which would affect the safe operation of the airplane, unless such item is adequately shielded, isolated, or otherwise protected so that it cannot be damaged by movement of cargo in the compartment, and so that any breakage or failure of such item would not create a fire hazard in the compartment. Provision shall be made to prevent cargo or baggage from interfering with the functioning of the fire-protective features of the compartment. All materials used in the construction of cargo or baggage compartments, including tie-down equipment, shall be flame-resistant or better. In addition, all cargo and baggage compartments shall include provisions for safeguarding against fires according to the following classifications:

(a) *Class A.* Cargo and baggage compartments shall be classified in the "A" category if presence of a possible fire therein can be readily discernible to a member of the crew while at his station, and if all parts of the compartment are easily accessible in flight. A hand fire extinguisher shall be available for such compartment.

(b) *Class B.* Cargo and baggage compartments shall be classified in the "B" category if sufficient access is provided while in flight to enable a member of the crew to reach effectively all parts of the compartment and its contents with a hand fire extinguisher. Furthermore, the design of the compartment shall be such that, when the access provisions are being used, no hazardous quantity of smoke, flames, or extinguishing agent will enter any compartment occupied by the crew or passengers. Each compartment in this category shall be equipped with a separate system of an approved type of smoke detector or fire detector to give warning at the pilot or flight engineer station. Hand fire extinguishers shall be readily available for use in all compartments of this category. Compartments in this category shall be completely lined with fire-resistant material,

except that additional service lining of flame-resistant material may be employed.

(c) *Class C.* Cargo and baggage compartments shall be classified in the "C" category if they do not conform with the requirements for the "A" or "B" categories. Each compartment of the "C" category shall be equipped with: (1) A separate system of an approved type smoke detector or fire detector to give warning at the pilot or flight engineer station, and (2) an approved built-in fire-extinguishing system controlled from the pilot or flight engineer station. Means shall be provided to exclude hazardous quantities of smoke, flames, or extinguishing agent from entering into any compartment occupied by the crew or passengers. Ventilation and drafts shall be further controlled within each such cargo or baggage compartment to the extent that the extinguishing agent provided can control any fire which may start within the compartment. All cargo and baggage compartments of this category shall be completely lined with fire-resistant material, except that additional service lining of flame-resistant material may be employed.

(d) *Class D.* Cargo and baggage compartments shall be classified in the "D" category if they are so designed and constructed that a fire occurring therein will be completely confined without endangering the safety of the airplane or the occupants. Compliance shall be shown with the following:

(1) Means shall be provided to exclude hazardous quantities of smoke, flames, or other noxious gases from entering into any compartment occupied by the crew or passengers.

(2) Ventilation and drafts shall be controlled within each compartment so that any fire likely to occur in the compartment will not progress beyond safe limits.

NOTE: For compartments having a volume not in excess of 500 cubic feet, an airflow of not more than 1,500 cubic feet per hour is considered acceptable. For larger compartments lesser airflow may be applicable.

(3) The compartment shall be completely lined with fire-resistant material.

(4) Consideration shall be given to the effect of heat within the compartment on adjacent critical parts of the airplane.

(e) *Class E.* On airplanes used for the carriage of cargo only it shall be acceptable to classify the cabin area as a Class "E" compartment. Compliance shall be shown with the following:

(1) The compartment shall be completely lined with fire-resistant material.

(2) The compartment shall be equipped with a separate system of an approved type smoke or fire detector to give warning at the pilot or flight engineer station.

(3) Means shall be provided to shut off the ventilating airflow to or within the compartment. Controls for such means shall be accessible to the flight crew in the crew compartment.

(4) Means shall be provided to exclude hazardous quantities of smoke, flames, or noxious gases from entering the flight crew compartment.

(5) Required crew emergency exits shall remain accessible under all cargo loading conditions.

§ 41.116 Proof of compliance.

Compliance with those provisions of § 41.115 which refer to compartment accessibility, the entry of hazardous quantities of smoke or extinguishing agent into compartments occupied by the crew or passengers, and the dissipation of the extinguishing agent in category "C" compartments shall be demonstrated by tests in flight. It shall also be demonstrated during these tests that no inadvertent operation of smoke or fire detectors in adjacent or other compartments within the airplane would occur as a result of fire contained in any one compartment, either during or after extinguishment, unless the extinguishing system floods such compartments simultaneously.

§ 41.117 Propeller de-icing fluid.

If combustible fluid is used for propeller de-icing, the provisions of § 41.131 shall be complied with.

§ 41.118 Pressure cross-feed arrangements.

Pressure cross-feed lines shall not pass through portions of the airplane devoted to carrying personnel or cargo unless means are provided to permit the flight personnel to shut off the supply of fuel to these lines, or unless the lines are enclosed in a fuel- and fume-proof enclosure that is ventilated and drained to the exterior of the airplane. Such enclosures need not be used if these lines incorporate no fittings on or within the personnel or cargo areas and are suitably routed or protected to safeguard against accidental damage. Lines which can be isolated from the remainder of the fuel system by means of valves at each end shall incorporate provisions for the relief of excessive pressures that may result from exposure of the isolated line to high ambient temperatures.

§ 41.119 Location of fuel tanks.

Location of fuel tanks shall comply with the provisions of § 41.132. In addition, no portion of engine nacelle skin which lies immediately behind a major air egress opening from the engine compartment shall act as the wall of an integral tank. Fuel tanks shall be isolated from personnel compartments by means of fume- and fuel-proof enclosures.

§ 41.120 Fuel system lines and fittings.

Fuel lines shall be installed and supported in a manner that will prevent excessive vibration and will be adequate to withstand loads due to fuel pressure and accelerated flight conditions. Lines which are connected to components of the airplane between which relative motion may exist shall incorporate provisions for flexibility. Flexible connections in lines which may be under pressure and subjected to axial loading shall employ flexible hose assemblies rather than hose clamp connections. Flexible hose shall be of an acceptable type or proven suitable for the particular application.

§ 41.121 Fuel lines and fittings in designated fire zones.

Fuel lines and fittings in all designated fire zones (see § 41.131) shall comply with the provisions of § 41.134.

§ 41.122 Fuel valves.

In addition to the requirements contained in § 41.133 for shutoff means, all fuel valves shall be provided with positive stops or suitable index provisions in the "on" and "off" positions and shall be supported in such a manner that loads resulting from their operation or from accelerated flight conditions are not transmitted to the lines connected to the valve.

§ 41.123 Oil lines and fittings in designated fire zones.

Oil lines and fittings in all designated fire zones (see § 41.131) shall comply with the provisions of § 41.134.

§ 41.124 Oil valves.

Requirements of § 41.133 for shutoff means shall be complied with. Closing of oil shutoff means shall not prevent feathering the propeller, unless equivalent safety provisions are incorporated. All oil valves shall be provided with positive stops or suitable index provisions in the "on" and "off" positions, and shall be supported in such a manner that loads resulting from their operation or from accelerated flight conditions are not transmitted to the lines attached to the valve.

§ 41.125 Oil system drains.

Accessible drains shall be provided to permit safe drainage of the entire oil system and shall incorporate either a manual or automatic means for positive locking in the closed position. (See also § 41.135.)

§ 41.126 Engine breather line.

Engine breather lines shall be so arranged that condensed water vapor which may freeze and obstruct the line cannot accumulate at any point. Breathers shall discharge in a location which will not constitute a fire hazard in case foaming occurs and so that oil emitted from the line will not impinge upon the pilots' windshield. The breather shall not discharge into the engine air induction system. (See also § 41.135.)

§ 41.127 Fire walls.

All engines, auxiliary power units, fuelburning heaters, and other combustion equipment which are intended for operation in flight shall be isolated from the remainder of the airplane by means of fire walls or shrouds, or other equivalent means.

§ 41.128 Fire-wall construction.

Fire walls and shrouds shall be constructed in such a manner that no hazardous quantity of air, fluids, or flame can pass from the engine compartment to other portions of the airplane. All openings in the fire wall or shroud shall be sealed with close-fitting fireproof grommets, bushings, or fire-wall fittings. Fire walls and shrouds shall be constructed of fireproof material and

shall be protected against corrosion. The following materials have been found to comply with this requirement:

(a) Heat and corrosion resistant steel 0.015 inch thick;

(b) Low carbon steel, suitably protected against corrosion, 0.018 inch thick.

§ 41.129 Cowling.

Cowling shall be constructed and supported in such a manner as to be capable of resisting all vibration, inertia, and air loads to which it may normally be subjected. Provision shall be made to permit rapid and complete drainage of all portions of the cowling in all normal ground and flight attitudes. Drains shall not discharge in locations constituting a fire hazard. Cowling, unless otherwise specified by these regulations, shall be constructed of fire-resistant material. Those portions of the cowling which are subjected to high temperatures due to their proximity to exhaust system parts or exhaust gas impingement shall be constructed of fireproof material.

§ 41.130 Engine accessory section diaphragm.

Unless equivalent protection can be demonstrated by other means, a diaphragm shall be provided on air-cooled engines to isolate the engine power section and all portions of the exhaust system from the engine accessory compartment. This diaphragm shall comply with the provisions of § 41.128.

§ 41.131 Powerplant fire protection.

Engine accessory sections, installations where no isolation is provided between the engine and accessory compartment, also regions wherein lie auxiliary power units, fuel-burning heaters, and other combustion equipment shall be referred to as designated fire zones. Such zones shall be protected from fire by compliance with §§ 41.132 through 41.135.

§ 41.132 Flammable fluids.

No tanks or reservoirs which are a part of a system containing flammable fluids or gases shall be located in designated fire zones, except where the fluid contained, the design of the system, the materials used in the tank, the shutoff means, and all connections, lines, and controls are such as to provide equivalent safety. Not less than ½ inch of clear air space shall be provided between any tank or reservoir and a fire wall or shroud isolating a designated fire zone.

§ 41.133 Shutoff means.

Means for each individual engine shall be provided for shutting off or otherwise preventing hazardous quantities of fuel, oil, de-icer, and other flammable fluids from flowing into, within, or through any designated fire zone, except that means need not be provided to shut off flow in lines forming an integral part of an engine. In order to facilitate rapid and effective control of fires, such shutoff means shall permit an emergency operating sequence which is compatible with the emergency operation of other equipment, such as feathering the propeller. Shutoff means shall be located outside of designated fire zones, unless equivalent safety is provided (see § 41.132), and it shall be shown that no hazardous quantity of such flammable fluid will drain into any designated fire zone after shutting off has been accomplished. Adequate provisions shall be made to guard against inadvertent operation of the shutoff means and to make it possible for the crew to reopen the shutoff means after it has once been closed.

§ 41.134 Lines and fittings.

(a) All lines and fittings carrying flammable fluids in designated fire zones shall be fire resistant, except as otherwise provided in this section. If flexible hose is used, the assembly of hose and end fittings shall be of an approved type. The provisions of this paragraph need not apply to those lines and fittings which form an integral part of the engine.

(b) Vent and drain lines and their fittings shall be subject to the provisions of paragraph (a) of this section unless a failure of such line or fitting will not result in, or add to, a fire hazard.

§ 41.135 Vent and drain lines.

All vent and drain lines and fittings for same located in designated fire zones and which carry flammable fluids or gases shall comply with the provisions of § 41.134, if the Director finds that rupture or breakage of a particular drain or vent line may result in a fire hazard.

§ 41.136 Fire-extinguishing systems.

(a) Unless the air carrier shows that equivalent protection against destruction of the airplane in case of fire is provided by the use of fireproof materials in the nacelle and other components which would be subjected to flame, fire-extinguishing systems shall be provided to serve all designated fire zones.

(b) Materials in the fire-extinguishing system shall not react chemically with the extinguishing agent so as to constitute a hazard.

§ 41.137 Fire-extinguishing agents.

Extinguishing agents employed shall be methyl bromide, carbon dioxide, or any other agent which has been demonstrated to provide equivalent extinguishing action. If methyl bromide or any other toxic extinguishing agent is employed, provisions shall be made to prevent the entrance of harmful concentrations of fluid or fluid vapors into any personnel compartment either due to leakage during normal operation of the airplane or as a result of discharging the fire extinguisher on the ground or in flight when a defect exists in the extinguishing system. If a methyl bromide system is provided, the containers shall be charged with dry agent and shall be sealed by the fire-extinguisher manufacturer or any other party employing saisfactory recharging equipment. If carbon dioxide is used, it shall not be possible to discharge sufficient gas into personnel compartments to constitute a hazard from the standpoint of suffocation of the occupants.

§ 41.138 Extinguishing agent container pressure relief.

Extinguishing agent containers shall be provided with a pressure relief to prevent bursting of the container due to excessive internal pressures. The discharge line from the relief connection shall terminate outside the airplane in a location convenient for inspection on the ground. An indicator shall be provided at the discharge end of the line to provide a visual indication when the container has discharged.

§ 41.139 Extinguishing agent container compartment temperature.

Precautions shall be taken to insure that the extinguishing agent containers are installed in locations where reasonable temperatures can be maintained for effective use of the extinguishing system.

§ 41.140 Fire-extinguishing system materials

All components of fire-extinguishing systems located in designated fire zones shall be constructed of fireproof materials, except for connections which are subject to relative motion between components of the airplane, in which case they shall be of flexible fire-resistant construction so located as to minimize the possibility of failure.

§ 41.141 Fire-detector systems.

Quick-acting fire detectors shall be provided in all designated fire zones and shall be sufficient in number and location to insure the detection of fire which may occur in such zones.

§ 41.142 Fire detectors.

Fire detectors shall be constructed and installed in such a manner as to insure their ability to resist without failure, all vibration, inertia, and other loads to which they may normally be subjected. Detectors shall be unaffected by exposure to oil, water, or other fluids or fumes which may be present.

§ 41.143 Protection of other airplane components against fire.

All airplane surfaces aft of the nacelles in the region of one nacelle diameter on both sides of the nacelle centerline shall be constructed of fire-resistant material. This provision need not be applied to tail surfaces lying behind nacelles unless the dimensional configuration of the airplane is such that the tail surfaces could be affected readily by heat, flames, or sparks emanating from a designated fire zone or engine compartment of any nacelle.

§ 41.150 Control of engine rotation.

All airplanes shall be provided with means for individually stopping and restarting the rotation of any engine in flight, except that for turbine engine installations means for completely stopping the rotation need be provided only if the Director finds that rotation could jeopardize the safety of the airplane.

§ 41.151 Fuel system independence.

Airplane fuel systems shall be arranged in such manner that the failure of any one component will not result in the irrecoverable loss of power of more than one engine. A separate fuel tank need not be provided for each engine if the carrier shows that the fuel system incorporates features which provide equivalent safety.

§ 41.152 Induction system ice prevention.

Means for preventing the malfunctioning of each engine due to ice accumulation in the engine air induction system shall be provided for all airplanes.

§ 41.153 Carriage of cargo in passenger compartments.

When operating conditions require the carriage of cargo which cannot be loaded in approved cargo racks, bins, or compartments which are separate from passenger compartments, such cargo may be carried in the passenger compartment in accordance with the requirements of paragraph (a) or (b) of this section.

(a) Such cargo may be carried in approved cargo bins in the passenger compartment if such bins meet the strength and other safety provisions applicable to cargo and passenger compartments prescribed in Part 4b or other airworthiness part under which the airplane is type certificated. The combined weight of the cargo and the approved bin or compartments shall not exceed 85 percent of the load used in determining the design conditions for the structure (bin) involved.

(b) If the cargo is not carried in approved bins, it shall be carried in accordance with the following requirements:

(1) It shall be packaged or covered in a manner to avoid possible injury to passengers;

(2) It shall be properly secured in the airplane by means of safety belts or other tie-downs possessing sufficient strength to eliminate possibility of shifting under all normally anticipated flight, ground, and emergency landing conditions;

(3) It shall not be carried directly above seated passengers;

(5) It shall not be carried aft of seated passengers;

(5) It shall not impose any loads on seats or the floor structure which exceed the designed loads for those compartments; and

(6) It shall not be placed in any position which restricts the access to or use of any required emergency or regular exit or the aisle between the crew and the passenger compartments.

§ 41.154 Carriage of cargo in cargo compartments.

When cargo is carried in compartments which are so designed as to require the physical entry of a crewmember to extinguish any fire which may occur during flight, the cargo shall be so loaded as to permit ready access in flight to any part of the compartment.

INSTRUMENTS AND EQUIPMENT FOR ALL OPERATIONS

§ 41.170 Airplane instruments and equipment for all operations.

(a) Instruments and equipment required by §§ 41.171 through 41.233 shall be approved and shall be installed in accordance with the provisions of the airworthiness requirements applicable to the instruments or equipment concerned.

(b) All airspeed indicators shall be calibrated in knots, and all airspeed limitations and related information contained in the Airplane Flight Manual and pertinent placards shall be expressed in knots.

(c) The following instruments and equipment shall be in operable condition prior to takeoff, except as provided in § 41.391(b) for continuance of flight with equipment inoperative:

(1) Instruments and equipment required to comply with airworthiness requirements under which the airplane is type certificated and as required by the provisions of § 41.110 and §§ 41.150 through 41.154; and

(2) Instruments and equipment specified in §§ 41.171 through 41.179 for all operations, and the instruments and equipment specified in §§ 41.200 through 41.233 for the type of operations indicated, wherever these items are not already provided in accordance with subparagraph (1) of this paragraph.

NOTE: Instruments and equipment specified in §§ 41.171, 41.172, and 41.230 through 41.233 will be approved in accordance with one or more of the following methods:

(A) Instruments and equipment which are included as a part of the original aircraft type design.

(B) Instruments and equipment approved in accordance with applicable Technical Standard Orders and installed under original aircraft type certification, or subsequent installation in accordance with airworthiness and alteration requirements (Parts 1 and 18 of this chapter (Civil Air Regulations)).

(C) Instruments and equipment manufactured in accordance with an FAA type certificate and installed on original aircraft certification, or subsequent installation in accordance with airworthiness and alteration requirements (Parts 1 and 18 of this chapter (Civil Air Regulations)).

§ 41.171 Flight and navigational equipment for all operations.

The following flight and navigational instruments and equipment are required for all operations:

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

(b) Sensitive altimeter;

(c) Clock (sweep-second);

(d) Free-air temperature indicator;

(e) Gyroscopic bank and pitch indicator (artificial horizon);

(f) Gyroscopic rate-of-turn indicator combined with a slip-skid indicator (turn and bank indicator);

(g) Gyroscopic direction indicator (directional gyro or equivalent);

(h) Magnetic compass; and

(i) Vertical speed indicator (rate-of-climb indicator).

§ 41.172 Engine instruments for all operations.

The following engine instruments are required for all operations, except that the Director may permit or require different instrumentation for turbine-powered airplanes to provide equivalent safety:

(a) Carburetor air temperature indicator for each engine;

(b) Cylinder head temperature indicator for each air-cooled engine;

(c) Fuel pressure indicator for each engine;

(d) Fuel flowmeter or fuel mixture indicator for each engine;

(e) Means for indicating fuel quantity in each fuel tank to be used;

(f) Manifold pressure indicator for each engine;

(g) Oil pressure indicator for each engine;

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

(i) Oil-in temperature indicator for each engine;

(j) Tachometer for each engine;

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

(l) A means shall be provided for each reversible propeller on airplanes equipped with reversible propellers which will indicate to the pilots when the propeller is in reverse pitch. Such means may be actuated at any point in the reversing cycle between the normal low pitch stop position and full reverse pitch. No indication shall be given at or above the normal low pitch stop position. The source of indication shall be actuated by the propeller blade angle or be directly responsive to the propeller blade angle.

§ 41.173 Emergency equipment for all operations.

(a) *General.* The emergency equipment specified in this section is required for all operations. Emergency equipment required by paragraphs (b), (c), and (e) of this section shall be inspected by the air carrier at least every 90 days to insure that the condition and quantity thereof continues to meet the standards of original approval. All required equipment shall be readily accessible to the crew, and the method of operation shall be plainly indicated. When such equipment is carried in compartments or containers, the compartments or containers shall be marked as to contents and date of last inspection.

(b) *Hand fire extinguishers for crew, passenger, and cargo compartments.* Hand fire extinguishers of an approved type shall be provided for use in crew, passenger, and cargo compartments in accordance with the following requirements:

(1) The type and quantity of extinguishing agent shall be suitable for the type of fires likely to occur in the compartment where the extinguisher is intended to be used.

(2) At least one hand fire extinguisher shall be provided and conveniently located on the flight deck for use by the flight crew.

(3) At least one hand fire extinguisher shall be conveniently located in the passenger compartment of airplanes accommodating more than 6 but less than 31 passengers. On airplanes accommodating more than 30 but less than 61 passengers, at least 2 fire extinguishers shall be provided. On airplanes accommodating more than 60 passengers, at least 3 fire extinguishers shall be provided. None need be provided in passenger com-

partments of airplanes accommodating 6 or less persons.

NOTE: An approved type fire extinguisher is an extinguisher approved by the Underwriters' Laboratories, Inc., Factory Mutual Laboratories, Underwriters' Laboratories of Canada or any other person whose approval is acceptable to the FAA, or an extinguisher which is otherwise approved in accordance with the provisions of § 4b.18 of this chapter (Civil Air Regulations).

(c) *First-aid kits.* First-aid kits approved in accordance with the applicable provisions of Appendix A of this part shall be provided in a quantity appropriate to the number of passengers and crew accommodated in the airplane.

(d) *Crash ax.* All airplanes shall be equipped with at least one crash ax.

(e) *Means for emergency evacuation.* On all passenger-carrying airplanes, at all emergency exits which are more than 6 feet from the ground with the airplane on the ground and with the landing gear extended, means shall be provided to assist the occupants in descending from the airplane. At floor level exits approved as emergency exits, such means shall be a chute or equivalent device suitable for the rapid evacuation of passengers. During flight time this means shall be in a position for ready use: *Provided,* That the requirements of this paragraph do not apply to emergency exits over the wing where the greatest distance from the lower sill of the exit to the wing surface does not exceed 36 inches.

(f) *Interior emergency exit markings.* (1) In all passenger-carrying airplanes, all passenger emergency exits, their means of access, and their means of opening shall be marked conspicuously. The identity and location of emergency exits shall be recognizable from a distance equal to the width of the cabin. The location of the emergency exit operating handle and the instructions for opening shall be marked on or adjacent to the emergency exit and shall be readable from a distance of 30 inches by a person with normal eyesight.

(2) In all passenger-carrying airplanes for night operations, a source or sources of light, with an energy supply independent of the main lighting system, shall be installed to illuminate all passenger emergency exit markings. Such lights shall be designed to function automatically in a crash landing and to continue to function thereafter and shall also be operable manually, or shall be designed only for manual operation and also to continue to function following a crash landing. Such lights shall be turned on prior to each night takeoff and landing.

§ 41.174 Seats and safety belts for all occupants.

(a) The air carrier shall provide and make available at all times during the takeoff, en route flight, and landing of an airplane which it is operating:

(1) Either an approved seat or berth for each person aboard the airplane, except for those persons who are 2 years of age or less; and

(2) An approved safety belt attached to each seat and berth for separate use by each such person aboard the airplane, except that two persons occupying a berth may be provided with one approved safety belt to be shared by both such persons, and two persons occupying a multiple lounge or divan seat may be provided with one approved safety belt to be shared by both such persons during flight between takeoff and landing.

(b) During the takeoff and landing of an air carrier airplane, each person on board shall occupy an approved seat or berth and secure themselves with the approved safety belt attached thereto, except that a person 2 years of age or less may be held by an adult person occupying a seat or berth. A safety belt attached to a seat shall not be used by more than one person during takeoff and landing.

(c) In no event shall any required safety belt be used by more persons than the number for which it is approved.

§ 41.175 Miscellaneous equipment for all operations.

All airplanes shall have installed the following equipment:

(a) If protective fuses are used, spare fuses of a number approved for the particular airplane and appropriately described in the air carrier manual.

(b) Windshield wiper or equivalent for each pilot station.

(c) A power supply and distribution system capable of producing and distributing the load for all required instruments and equipment using an external power supply in the event of failure of any one power source or component of the power distribution system: *Provided,* That the use of common elements in the power distribution system will be approved if the air carrier shows that such elements are so designed as to be reasonably protected against malfunctioning. Engine-driven sources of energy, when used, shall be on separate engines.

NOTE: Any aircraft power and distribution systems which meet the requirements of §§ 4b.606 (a), (b), and (c); 4b.612(e); 4b.622 (a) and (b); 4b.623(c); 4b.625; and 4b.650 (b) of this chapter (Civil Air Regulations) complies with the requirements of paragraph (c) of § 41.175.

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

(e) Two independent static pressure systems, so vented to the outside atmospheric pressure that they will be least affected by air flow variation, moisture, or other foreign matter, and so installed 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, such means shall include a positive positioning control and shall be marked to indicate clearly which system is being used.

(f) Means for locking all companionway doors which separate passenger compartments from flight crew compartments. Keys for all doors which separate passenger compartments from other compartments having emergency exit provisions shall be readily available to all crewmembers. Any door which is the means of access to a required passenger emergency exit shall be placarded to indicate that it must be open during takeoff and landing. All doors which lead to compartments normally accessible to passengers and which are capable of being locked by passengers shall be provided with means for unlocking by the crew in the event of an emergency.

(g) For seaplanes only, anchor light or lights, a warning bell for signaling when not under way during fog conditions, and an anchor adequate for the size of the seaplane.

§ 41.176 Cockpit check procedure.

The air carrier shall provide for each type of airplane an approved cockpit check procedure. The approved procedures shall include all items necessary for flight crewmembers to check for safety prior to starting engines, prior to taking off, prior to landing, and in engine and systems emergencies, and shall be so designed as to obviate the necessity for a flight crewmember to rely upon his memory for items to be checked. The approved procedures shall be readily usable in the cockpit of each airplane and shall be followed by the flight crew when operating the airplane.

§ 41.177 Passenger information for all operations.

All airplanes shall be equipped with signs visible to passengers and cabin attendants to notify such persons when smoking is prohibited and when safety belts should be fastened. These signs shall be capable of on-off operation by the crew and shall be placed in the "on position" for all takeoffs and landings and when otherwise deemed necessary by the pilot in command.

§ 41.178 Exterior exit and evacuation markings for all operations.

Exterior surfaces of the airplane shall be marked to identify clearly all required emergency exits. When such exits are operable from the outside, markings shall consist of or include information indicating the method of opening.

§ 41.179 Shoulder harness.

All airplanes shall be equipped with shoulder harnesses at the pilot in command, the second in command, and flight engineer stations.

INSTRUMENTS AND EQUIPMENT FOR SPECIAL OPERATIONS

§ 41.200 Instruments and equipment for operations at night.

Each airplane operated at night shall be equipped with the following instruments and equipment in addition to those required by §§ 41.171 through 41.179:

(a) Position lights;

(b) An anti-collision light for airplanes having a maximum certificated weight of more than 12,500 pounds;

(c) Two landing lights;

(d) Two class 1 or class 1A landing flares for extended over-water operations;

(e) Instrument lights providing sufficient illumination to make all required instruments, switches, etc., easily readable, so installed that their direct rays are shielded from the flight crewmem-

bers' eyes and that no objectionable reflections are visible to them. A means of controlling the intensity of illumination shall be provided unless it is shown that nondimming instrument lights are satisfactory;

(f) An airspeed indicating system with heated pitot tube or equivalent means for preventing malfunctioning due to icing; and

(g) A sensitive altimeter.

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

Each airplane operated under IFR or over-the-top shall be equipped with the following instruments and equipment in addition to those required by §§ 41.171 through 41.179:

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

(b) A sensitive altimeter; and

(c) Instrument lights providing sufficient illumination to make all required instruments, switches, etc., easily readable, so installed that their direct rays are shielded from the flight crewmembers' eyes and that no objectionable reflections are visible to them. A means of controlling the intensity of illumination shall be provided unless it is shown that nondimming instrument lights are satisfactory.

§ 41.202 Supplemental oxygen; reciprocating-engine-powered airplanes.

(a) *General.* Except where supplemental oxygen is provided in accordance with the requirements of § 41.203, supplemental oxygen shall be furnished and used as set forth in paragraphs (b) and (c) of this section. The amount of supplemental oxygen required for a particular operation to comply with the rules in this part shall be determined on the basis of flight altitudes and flight duration consistent with the operating procedures established for each such operation and route. As used in the oxygen requirements hereinafter set forth, "cabin pressure altitude" shall mean the pressure altitude corresponding with the pressure in the cabin of the airplane, and "flight altitude" shall mean the altitude above sea level at which the airplane is operated; for airplanes not equipped with pressurized cabins, "cabin pressure altitude" and "flight altitude" shall be considered identical.

(b) *Crewmembers.* (1) At cabin pressure altitudes above 10,000 feet to and including 12,000 feet, oxygen shall be provided for, and used by, each member of the flight crew on flight deck duty, and provided for all other crewmembers, during the portion of the flight in excess of 30 minutes within this range of altitudes.

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

(3) When oxygen must be used by a flight crewmember, it shall be used continuously by such crewmember during the required periods, except when it is 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 prior to the completion of the flight shall be provided with the same amount of supplemental oxygen as is 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, such crewmember shall be considered as a passenger with regard to supplemental oxygen requirements.

(c) *Passengers.* Each air carrier shall provide a supply of oxygen approved for passenger safety in accordance with the following standards:

(1) For flights of over 30 minutes duration at cabin pressure altitudes above 8,000 feet to and including 14,000 feet, a supply of oxygen sufficient to furnish oxygen for 30 minutes to 10 percent the number of passengers carried shall be required.

(2) For flights at cabin pressure altitudes above 14,000 feet to and including 15,000 feet, a supply of oxygen sufficient to provide oxygen for the duration of the flight at such altitudes for 30 percent of the number of passengers carried shall generally be considered adequate.

(3) For flights at cabin pressure altitudes above 15,000 feet, a supply of oxygen sufficient to provide oxygen for each passenger carried during the entire flight at such altitudes shall be required.

§ 41.202–T Supplemental oxygen for sustenance; turbine-powered airplanes.

(a) *General.* When operating turbine-powered airplanes sustaining oxygen and dispensing equipment shall be furnished by the air carrier for use as set forth in this section. The amount of oxygen provided shall be at least that quantity which will be necessary to comply with paragraphs (b) and (c) of this section. The amount of sustaining and first-aid oxygen required for a particular operation to comply with the rules in this part shall be determined on the basis of cabin pressure altitudes and flight duration consistent with the operating procedures established for each such operation and route. The requirements for airplanes with pressurized cabins shall be determined on the basis of cabin pressure altitude and the assumption that a cabin pressurization failure will occur at that altitude or point of flight which is most critical from the standpoint of oxygen need, and that after such 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 permit successful termination of the flight. Following such a failure the cabin pressure altitude shall be considered to be the same as the flight altitude unless it can be shown that no probable failure of the cabin or pressurization equipment will result in a cabin pressure altitude equal to the flight altitude, under which circumstances the maximum cabin pressure altitude attained may be used as a basis for certification and/or determination of oxygen supply.

(b) *Crewmembers.* A supply of oxygen for crewmembers shall be provided in accordance with the following requirements:

(1) At cabin pressure altitudes above 10,000 feet to and including 12,000 feet, oxygen shall be provided for and used by each member of the flight crew on flight deck duty and provided for all other crewmembers during the portion of the flight in excess of 30 minutes within this range of altitudes.

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

(3) When oxygen must be used by a flight crewmember, it shall be used continuously by such crewmember during the required periods, except when it is 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 prior to the completion of the flight shall be provided with the same amount of supplemental oxygen as is 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, such crewmember shall be considered as a passenger with regard to supplemental oxygen requirements.

(c) *Passengers.* A supply of oxygen for passengers shall be provided in accordance with the following requirements:

(1) For flights at cabin pressure altitudes above 10,000 feet to and including 14,000 feet, oxygen shall be provided for the duration of flight in excess of 30 minutes for 10 percent of the number of passengers carried.

(2) For flights at cabin pressure altitudes above 14,000 feet to and including 15,000 feet, oxygen shall be provided for the duration of flight at such altitude for 30 percent of the number of passengers carried.

(3) For flights at cabin pressure altitudes above 15,000 feet, oxygen shall be provided for each occupant carried for the duration of flight at such altitude.

§ 41.203 Supplemental oxygen requirements for pressurized cabin airplanes; reciprocating-engine-powered airplanes.

When operating pressurized cabin airplanes, the air carrier shall so equip such airplanes as to permit compliance with the following requirements in the event of cabin pressurization failure:

(a) *For crewmembers.* When operating such airplanes at flight altitudes above 10,000 feet, the air carrier shall provide sufficient oxygen for all crewmembers for the duration of the flight at such altitudes: *Provided,* That not less than a 2-hour supply of oxygen shall be provided for the flight crewmembers on flight deck duty. The oxygen supply required by § 41.205 may be considered in determining the supplemental breathing supply required for flight crewmembers on flight deck duty in the event of cabin pressurization failure.

(b) *For passengers.* When operating such airplanes at flight altitudes above 8,000 feet, the air carrier shall provide the following amounts of oxygen:

(1) When an airplane is not flown at a flight altitude of over 25,000 feet, a supply of oxygen sufficient to furnish oxygen for 30 minutes to 10 percent of the number of passengers carried shall be considered adequate, 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 4 minutes.

(2) In the event that such airplane cannot descend to a flight altitude of 14,000 feet or less within 4 minutes, the following supply of oxygen shall be provided:

(i) For the duration of the flight in excess of 4 minutes at flight altitudes above 15,000 feet, a supply sufficient to comply with § 41.202(c)(3);

(ii) For the duration of the flight at flight altitudes above 14,000 feet to and including 15,000 feet, a supply sufficient to comply with § 41.202(c)(2); and

(iii) For flight at flight altitudes above 8,000 feet to and including 14,000 feet, a supply sufficient to furnish oxygen for 30 minutes to 10 percent of the number of passengers carried.

(3) When an airplane is flown at a flight altitude above 25,000 feet, sufficient oxygen shall be furnished in accordance with the following requirements to permit the airplane to descend to an appropriate flight altitude at which the flight can be safely conducted. Sufficient oxygen shall be furnished to provide oxygen for 30 minutes to 10 percent of the number of passengers carried for the duration of the flight above 8,000 feet to and including 14,000 feet and to permit compliance with § 41.202(c)(2) and (3) for flight above 14,000 feet.

(c) For purposes of this section it shall be assumed that the cabin pressurization failure will occur at a time during flight which is critical from the standpoint of oxygen need and that after such failure the airplane will descend, without exceeding its normal operating limitations, to flight altitudes permitting safe flight with respect to terrain clearance.

§ 41.203–T Supplemental oxygen for emergency descent and for first aid; turbine-powered airplanes with pressurized cabins.

(a) *General.* When operating turbine-powered airplanes with pressurized cabins, the air carrier shall furnish oxygen and dispensing equipment necessary to permit compliance with the requirements set forth in this section in the event of cabin pressurization failure.

(b) *Crewmembers.* When operating at flight altitudes above 10,000 feet, oxygen shall be provided to permit compliance with § 41.202–T except that not less than a 2-hour supply shall be provided for the flight crewmembers on flight deck duty. The oxygen required by § 41.205 may be included in determining the supply required for flight crewmembers on flight deck duty in the event of cabin pressurization failure.

(c) *Use of oxygen masks by flight crewmembers.*[1] (1) When operating at flight altitudes above 25,000 feet, one pilot at the controls of the airplane shall wear and use an oxygen mask at all times and all other flight crewmembers on flight deck duty shall be provided with oxygen masks, connected to appropriate supply terminals, which shall be worn in a manner that will permit rapid placing of the masks on their faces for use, properly secured and sealed: *Provided,* That the one pilot need not use a mask at or below 35,000 feet if all flight crewmembers on flight deck duty are provided with and are wearing in a ready position for use, a type of oxygen mask connected to appropriate supply terminals, which has been demonstrated to the satisfaction of a representative of the Administrator to be capable of being immediately placed on their faces for use, properly secured and sealed, with either hand. In demonstrating the oxygen mask, the air carrier shall show that this action can be accomplished without disturbing glasses, headphones, or other equipment worn, and without distracting or delaying the flight crewmember from proceeding with his assigned emergency procedures.

(2) Notwithstanding the provisions in subparagraph (1) of this paragraph, when operating at flight altitudes above 25,000 feet, if at any time it is necessary for one pilot to leave his station at the controls of the airplane for any reason, the remaining pilot at the controls shall don and use his oxygen mask until the other pilot has returned to his duty station.

(3) Prior to take off of a flight, each flight crewmember shall preflight his oxygen equipment to insure that the oxygen mask is functioning and fitted properly and connected to appropriate supply terminals, and that the oxygen supply is ready for use.

(d) *Use of portable oxygen equipment by cabin attendants.* Portable oxygen equipment of not less than a 15-minute oxygen supply shall be carried by each attendant during the entire time flight is conducted above 25,000 feet flight altitude, unless it is shown that sufficient portable oxygen units equipped with masks or spare outlets and masks are distributed throughout the cabin to insure immediate availability of oxygen to the cabin attendants regardless of their location at the time of cabin depressurization.

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

(1) When an airplane is certificated to operate at flight altitudes to and including 25,000 feet, and if at any point along the route to be flown the airplane can descend safely to a flight altitude of 14,000 feet or less within 4 minutes, oxygen shall be available at the rate prescribed by this part for a 30-minute period for not less than 10 percent of the number of passenger cabin occupants carried.

(2) When an airplane is operated at flight altitudes to and including 25,000 feet and cannot descend safely to a flight altitude of 14,000 feet within 4 minutes, or when an airplane is operated at flight altitudes above 25,000 feet, oxygen shall be available at the rate prescribed by this part for not less than 10 percent of the number of passenger cabin occupants carried for the duration of flight following cabin depressurization at cabin pressure altitudes above 10,000 feet to and including 14,000 feet and, as applicable, to permit compliance with § 41.202–T(c)(2) and (3), except that not less than a 10-minute supply for all passenger cabin occupants shall be provided.

(3) For first-aid treatment of occupants who for physiological reasons might require undiluted oxygen following descent from cabin pressure altitudes above 25,000 feet, a supply of oxygen in accordance with the requirements of § 4b.651(b)(4) of this chapter (Civil Air Regulations) (see § 41.204) shall be provided for 2 percent of the occupants for the duration of flight following 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 2, shall be provided. Means shall be provided to enable the cabin attendants to use this supply.

(f) *Passenger briefing.* Before flight is conducted above 25,000 feet, a crewmember shall give instructions and demonstrations to the passengers sufficient to insure that all passengers are adequately informed regarding the location and operation of the oxygen-dispensing equipment and the necessity of using oxygen in the event of cabin depressurization.

§ 41.204 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 the requirements of § 41.202 shall meet the standards established in § 4b.651 of this chapter (Civil Air Regulations) effective July 20, 1950: *Provided,* That if the air carrier shows full compliance with such standards to be impracticable, the Director may authorize such changes in these standards as he finds will provide an equivalent level of safety.

(b) *Turbine-powered airplanes.* The oxygen apparatus, the minimum rate of oxygen flow, and the supply of oxygen to comply with the requirements of §§ 41.202–T and 41.203–T shall meet the standards established in § 4b.651 of this chapter (Civil Air Regulations) effective September 1, 1958: *Provided,* That if the air carrier shows full compliance with such standards to be im-

[1] This paragraph is included in a notice of proposed rule making which is being circulated as Civil Air Regulations Draft Release No. 60–15. Whatever action is taken on DR 60–15 will be reflected in Part 41 at the time it is adopted.

practicable, the Director may authorize such changes in these standards as he finds will provide an equivalent level of safety.

§ 41.205 Protective breathing equipment for the flight crew.

(a) *Pressurized cabin airplanes.* Each required flight crewmember on flight deck duty shall have easily available at his station protective breathing equipment covering the eyes, nose, and mouth, or the nose and mouth where accessory equipment is provided to protect the eyes, to protect him from the effects of smoke, carbon dioxide, and other harmful gases. Not less than a 300-liter STPD supply of oxygen for each required flight crewmember on flight deck duty shall be provided for this purpose.

(b) *Nonpressurized cabin airplanes.* The requirement stated in paragraph (a) of this section shall apply to nonpressurized cabin airplanes if the Director finds that it is possible to obtain a dangerous concentration of smoke, carbon dioxide or other harmful gases in the flight crew compartments in any attitude of flight which might occur when the airplane is flown in accordance with either normal or emergency procedures.

§ 41.206 Equipment for extended overwater operations.

(a) The following equipment shall be required for all extended overwater operations: *Provided*, That the Director may require the carriage of all of the prescribed equipment, or any item thereof, for any operation over water, or upon application of an air carrier, permit deviation from these requirements for a particular extended overwater operation:

(1) Life vest meeting the specifications of Technical Standard Order C13 for each occupant of the airplane over 6 years of age and Technical Standard Order C13 NAS 801 for each occupant of the airplane 6 years of age and under, or other approved flotation device;

(2) Liferafts sufficient in number and of such rated capacity and buoyancy as to accommodate all occupants of the airplane;

(3) Suitable pyrotechnic signaling devices; and

(4) One portable emergency radio signaling device, capable of transmission on the appropriate emergency frequency or frequencies, which is not dependent upon the airplane power supply and which is self-buoyant and water-resistant.

(b) All required liferafts, life vests, and signaling devices shall be easily accessible in the event of a ditching without appreciable time for preparatory procedures. Life vests in pouches or containers shall be located adjacent to each seat so that each passenger may obtain and don the vest without having to leave the seat.

(c) Survival equipment approved in accordance with the applicable provisions of Appendix A of this part shall be attached to each required liferaft.

§ 41.207 Equipment for operations in icing conditions.

(a) For all operations in icing conditions each airplane shall be 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) For operations in icing conditions at night means shall be provided for illuminating or otherwise determining the formation of ice on the portions of the wings which are critical from the standpoint of ice accumulation. When illuminating means are used, such means shall be of a type which will not cause glare or reflection which would handicap crewmembers in the performance of their normal functions.

§ 41.208 Equipment for operations over frigid and tropical land areas.

Each airplane shall be equipped with the following equipment on flights for long distances over frigid or tropical land areas for which the Director finds such equipment to be necessary for search and rescue operations because of the character of the terrain to be flown over:

(a) Suitable pyrotechnic signaling devices;

(b) One approved portable emergency radio signaling device, capable of transmission on the appropriate emergency frequency or frequencies, which is not dependent upon the airplane power supply and which is self-buoyant and water-resistant; and

(c) Survival equipment approved in accordance with the applicable provisions of Appendix A of this part and adequate for the number of occupants of the airplane.

§ 41.209 Equipment for operations on which specialized means of navigation are required.

The air carrier shall show that sufficient and adequate airborne equipment is provided to permit navigation to be accomplished by the specialized method authorized for the particular route to be operated.

§ 41.210 Flight recorders.

(a) An approved flight recorder which records at least time, altitude, airspeed, vertical acceleration, and heading shall be installed in accordance with the following requirements:

(1) On all airplanes of more than 12,500 pounds maximum certificated takeoff weight which are certificated for operations above 25,000 feet altitude; and

(2) On all turbine-powered airplanes of more than 12,500 pounds maximum certificated takeoff weight.

(b) When an approved flight recorder is installed it shall be operated continuously from the instant the airplane commences the takeoff roll until it has completed the landing roll at an airport.

(c) Recorded information shall be retained by the air carrier for a period of at least 60 days. For a particular flight or series of flights, the information shall be retained for a longer period if requested by an authorized representative of the Administrator or the Civil Aeronautics Board.

RADIO EQUIPMENT

§ 41.230 Radio equipment.

Each airplane used in operations subject to this part shall be equipped with radio equipment specified for the type of operation in which it is engaged. Where two independent (separate and complete) radio systems are required by §§ 41.231 and 41.232, each system shall have an independent antenna installation: *Provided*, That where rigidly supported nonwire antennas or other antenna installations of equivalent reliability are used, only one such antenna need be provided.

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

(a) For operations conducted under VFR over routes on which navigation can be accomplished by pilotage, each airplane shall be equipped with such radio equipment as is necessary under normal operating conditions to fulfill the following functions:

(1) Communicate with at least one appropriate ground station (as specified in § 41.34) from any point on the route and with other airplanes operated by the air carrier on the route;

(2) Communicate with appropriate traffic control facilities from any point in the control zone within which flights are intended; and

(3) Receive meteorological information from any point en route by either of two independent systems. One of the means provided for compliance with this subparagraph may be employed for compliance with subparagraphs (1) and (2) of this paragraph.

(b) For all operations at night conducted under VFR over routes on which navigation can be acomplished by pilotage, each airplane shall be equipped with such radio equipment as is 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 no marker beacon receiver or ILS receiver need be provided.

§ 41.232 Radio equipment for operations under VFR over routes not navigated by pilotage or for operations under IFR or over-the-top.

(a) For operations conducted under VFR over routes on which navigation cannot be accomplished by pilotage or for operations conducted under IFR or over-the-top, each airplane shall be equipped with such radio equipment as is necessary under normal operating conditions to fulfill the functions specified in § 41.231(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, except that only one marker beacon receiver which provides 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 on routes using procedures based on automatic direction finding, only one automatic direction finding system need be installed: *Provided,* That ground facilities are so located and the airplane is so fueled that, in case of failure of the automatic direction finding equipment, the flight may proceed safely to a suitable airport which has ground radio navigational facilities whose signals may be received by the use of the remaining airplane radio systems.

(c) In those areas where transition from low frequency to very high frequency radio navigational systems is in progress, one means of satisfactorily receiving signals over each of these systems shall be considered as complying with the requirement that two independent systems be provided to receive en route or approach navigational facility signals: *Provided,* That ground facilities are so located and the airplane is so fueled that, in case of failure of either system, the flight may proceed safely to a suitable airport which has ground radio navigational facilities whose signals may be received by use of the remaining airplane radio system.

§ 41.233 Radio equipment for extended overwater operations and for certain other operations.

Each airplane shall be equipped with such radio equipment as is necessary to fulfill the functions specified in § 41.232 and, by an independent system, the functions specified in § 41.231(a)(1) for the following operations:

(a) Extended overwater operations; and

(b) Operations for which the Director finds such equipment to be necessary for search and rescue operations because of the character of the terrain to be flown over.

MAINTENANCE AND INSPECTION REQUIREMENTS

§ 41.240 Responsibility for maintenance.

Irrespective of whether the air carrier has made arrangements with any other person for the performance of maintenance and inspection functions, each air carrier shall have the primary responsibility for the airworthiness of its airplanes and required equipment.

§ 41.241 Maintenance and inspection requirements.

(a) The air carrier, or the person with whom arrangements have been made for the performance of maintenance and inspection functions, shall establish an adequate inspection organization responsible for determining that workmanship, methods employed, and material used are in conformity with the requirements of the regulations of this subchapter, with accepted standards and good practices, and that any airframe, engine, propeller, or appliance released for flight is airworthy. All maintenance, repairs, and alterations shall be accomplished in accordance with the provisions of Part 18 of this chapter (Civil Air Regulations), and the Manual and operations specifications of the air carrier.

(b) Any individual who is directly in charge of inspection, maintenance, overhaul, or repair of any airframe, engine, propeller, or appliance shall hold an appropriate airman certificate; as for example, any individual who is assigned, by the air carrier or other person performing maintenance, responsibility for the work of a shop or station which performs inspections, maintenance, repairs, alterations, or other functions affecting aircraft airworthiness, and is available for consultation and decision on matters requiring instruction or decision from higher authority than that of the individuals performing the work.

§ 41.242 Maintenance and inspection training program.

The air carrier, or the person with whom arrangements have been made for the performance of maintenance and inspection functions, shall establish and maintain a training program to insure that all maintenance and inspection personnel charged with determining the adequacy of work performed are fully informed with respect to all procedures and techniques and with new equipment introduced into service, and are competent to perform their duties.

§ 41.243 Maintenance and inspection personnel duty time limitations.

Within the United States, its Territories and possessions, all maintenance and inspection personnel shall be relieved of all duty for a period of at least 24 consecutive hours during any 7 consecutive days or equivalent thereof within any one month.

AIRMAN AND CREWMEMBER REQUIREMENTS

§ 41.260 Utilization of airman.

(a) No air carrier shall utilize an individual as an airman unless he holds an appropriate and currently effective airman certificate issued by the Administrator and is otherwise qualified for the particular operation in which he is to be utilized. An airman shall have the appropriate certificate in his personal possession while engaged in operations under this part and shall present the same for examination to any authorized representative of the Administrator upon request.

(b) No individual who has reached his 60th birthday shall be utilized or serve as a pilot on any airplane while engaged in air carrier operations.

§ 41.261 Composition of flight crew.

(a) No air carrier shall operate an airplane with less than the minimum flight crew specified in the airworthiness certificate for the type of airplane and required in this part for the type of operation.

(b) Where the provisions of this part require the performance of two or more functions for which an airman certificate is necessary, such requirement shall not be satisfied by the performance of multiple functions at the same time by any airman.

(c) Where the air carrier is authorized to operate under instrument conditions or operates airplanes of more than 12,500 pounds maximum certificated takeoff weight, the minimum pilot crew shall be 2 pilots.

(d) On flights requiring a flight navigator or flight engineer, at least one other flight crewmember shall be sufficiently qualified, so that in the event of illness or other incapacity, emergency coverage can be provided for those functions for the safe completion of the flight. An airman need not be additionally certificated to function in another airman's capacity for such emergency coverage. Qualification procedures shall be included in the training program curriculum.

§ 41.262 Flight navigator.

An airman holding a valid flight navigator certificate shall be required for flight over any area, route, or route segment outside the continental limits of the United States:

(a) When celestial navigation is necessary, or

(b) When conditions are such that other specialized means of navigation necessary for the safe conduct of the flight cannot be adequately accomplished from the pilot station. Such conditions shall be deemed to exist when reliable fixes cannot be obtained from the pilot station for any period in excess of one hour, or for any lesser period when so determined by a representative of the Administrator upon consideration of the following factors: the speed of the aircraft used by the air carrier, the normal weather conditions to be encountered, the extent of air traffic control, the amount of traffic congestion, the area of the land at destination, fuel requirements, whether sufficient fuel is carried for return to the point of departure or alternates, and whether flight is predicated upon operation beyond the point-of-no-return.

§ 41.263 Flight engineer.

An airman holding a valid flight engineer certificate shall be required on all airplanes certificated for more than 80,000 pounds maximum certificated takeoff weight. Such airman shall also be required on all 4-engine airplanes certificated for more than 30,000 pounds maximum certificated takeoff weight where the Director finds that the design of the airplane used or the type of operation is such as to require engineer personnel for the safe operation of the airplane.

§ 41.265 Flight attendant.

At least one flight attendant shall be provided by the air carrier on airplanes carrying 10 or more passengers. At least 2 flight attendants shall be provided on airplanes carrying 45 or more passengers. At least 3 flight attendants shall be provided on airplanes carrying more than 100 passengers.

§ 41.266 Aircraft dispatcher.

Each air carrier shall provide an adequate number of qualified dispatchers at each dispatch center to insure the proper operational control of each flight.

§ 41.267 Assignment of emergency evacuation functions for each crewmember.

Each air carrier shall assign to each crewmember all necessary emergency

functions each such crewmember is to perform under circumstances requiring emergency evacuation. Emergency functions shall be assigned for each type of airplane used by the air carrier and the air carrier shall show that functions so assigned are realistic and capable of accomplishment. These functions shall be described in the air carrier manual and executed by each crewmember in the course of the emergency training program conducted by the air carrier.

TRAINING PROGRAM

§ 41.280 Establishment of approved program.

(a) Each air carrier shall establish a training program sufficient to insure that each crewmember and dispatcher used by the air carrier is adequately trained to perform the duties to which he is to be assigned. The initial training phases shall be satisfactorily completed prior to serving in scheduled operations. The training program shall meet with the approval of an authorized representative of the Administrator.

(b) Each air carrier shall provide adequate ground and flight training facilities and properly qualified instructors. There also shall be provided a sufficient number of check airmen to conduct the flight checks required by this part. Such check airmen shall hold the same airmen certificates and ratings as are required for the airman being checked.

(c) The training program for each flight crewmember shall consist of appropriate ground and flight training including proper flight crew coordination and training in emergency procedures. Procedures for each flight crew function shall be standardized to the extent that each flight crewmember will know the functions for which he is responsible and the relation of those functions to those of other flight crewmembers. The initial program shall include at least the appropriate requirements specified in §§ 41.281 through 41.285.

(d) The crewmember emergency procedures training program shall include at least the requirements specified in § 41.285.

(e) The appropriate instructor, supervisor, or check airman responsible for the particular training check or flight check shall certify to the proficiency of each crewmember and dispatcher upon completion of his initial and recurrent training, and such certification shall become a part of the individual's record.

§ 41.281 Pilot ground training.

(a) Ground training for each pilot prior to serving as a flight crewmember shall include instruction in at least the following:

(1) The appropriate provisions of the air carrier operations specifications and appropriate provisions of the Civil Air Regulations with particular emphasis on the operation and dispatching rules and airplane operating limitations;

(2) Dispatch procedures and appropriate contents of the manuals;

(3) The duties and responsibilities of crewmembers;

(4) The type of airplane to be flown, including a study of the airplane, engines, all major components and systems, performance limitations, standard and emergency operating procedures, and appropriate contents of the approved Airplane Flight Manual;

(5) The principles and methods of determining weight and balance limitations for takeoff and landing;

(6) Navigation and use of appropriate aids to navigation, including the instrument approach facilities and procedures which the air carrier is authorized to use;

(7) Airport and airways traffic control systems and procedures, and ground control letdown procedures if pertinent to the operation;

(8) Meteorology sufficient to insure a practical knowledge of the principles of icing, fog, thunderstorms, and frontal systems;

(9) Procedures for operation in turbulent air and during periods of ice, hail, thunderstorms, and other potentially hazardous meteorological conditions; and

(10) Communications procedures including procedures to be used in the event any of the communications equipment required by this part becomes inoperative.

(b) The air carrier shall give each pilot such additional ground training as is necessary to insure qualification with respect to any new equipment, procedures, or techniques. At least once each 12 months, as a part of the training program, recurrent ground training and checks shall be provided to insure the continued proficiency of each pilot with respect to procedures, techniques, and information essential to the satisfactory performance of his duties.

§ 41.282 Pilot flight training.

(a) Flight training for each pilot prior to serving as a flight crewmember shall include at least takeoffs and landings, during day and night, and normal and emergency flight maneuvers in each type of airplane to be flown by him in scheduled operations, and flight under simulated instrument flight conditions. A pilot qualifying to serve as other than pilot in command or second in command shall demonstrate to a representative of the Administrator or to a check pilot his ability to take off and land each type of airplane in which he is to serve.

(b) Flight training for a pilot qualifying to serve as pilot in command or as second in command in a crew requiring 3 or more pilots shall include flight instruction and practice in at least the following maneuvers and procedures:

(1) In each type of airplane to be flown by him in scheduled operations:

(i) At the authorized maximum takeoff weight, takeoff using maximum takeoff power with simulated failure of the critical engine. For transport category airplanes the simulated engine failure shall be accomplished as closely as possible to the critical engine failure speed (V_1), and climb-out shall be accomplished at a speed as close as possible to the takeoff safety speed (V_2). Each pilot shall ascertain the proper values for speeds V_1 and V_2;

(ii) At the authorized maximum landing weight, flight in a 4-engine airplane, where appropriate, with the most critical combinations of 2 engines inoperative, or operating at zero thrust, utilizing appropriate climb speeds as set forth in the Airplane Flight Manual;

(iii) At the authorized maximum landing weight, simulated pull-out from the landing and approach configurations accomplished at a safe altitude with the critical engine inoperative or operating at zero thrust;

(iv) Suitable combinations of airplane weight and power less than those specified in subdivisions (i), (ii), and (iii) of this subparagraph may be employed if the performance capabilities of the airplane under the above conditions are simulated.

(2) Conduct of flight under simulated instrument conditions, utilizing all types of navigational facilities and the letdown procedures used in normal operations. If a particular type of facility is not available in the training area, such training may be accomplished in a synthetic trainer.

(c) Flight training for a pilot qualifying to serve as second in command in a crew requiring 2 pilots shall include flight instruction and practice in at least the following maneuvers and procedures:

(1) In each type of airplane to be flown by him in scheduled operation:

(i) Assigned flight duties as second in command including flight emergencies;

(ii) Taxiing;

(iii) Takeoffs and landings;

(iv) Climbs and climbing turns;

(v) Slow flight;

(vi) Approach to stall;

(vii) Engine shutdown and restart;

(viii) Takeoff and landing with simulated engine failure;

(ix) Conduct of flight under simulated instrument conditions including instrument approach at least down to circling approach minimums and missed approach procedures.

(2) Conduct of flight under simulated instrument conditions, utilizing all types of navigational facilities and the letdown procedures used in normal operations. Except for those approach procedures for which the lowest minimums are approved, all other letdown procedures may be given in a synthetic trainer which contains the radio equipment and instruments necessary to simulate other navigational and letdown procedures approved for use by the air carrier.

(d) The air carrier shall give each pilot such additional flight training as is necessary to insure qualification with respect to any new equipment, procedures, or techniques. At least once each 12 months, as a part of the training program, recurrent flight training and checks shall be provided to insure the continued proficiency of each pilot with respect to procedures, techniques, and information essential to the satisfactory performance of his duties. Where the check of the pilot in command or second in command requires actual flight, satisfactory completion of the checks required by § 41.302 or 41.305 will meet the requirements of this section

§ 41.283 Flight navigator training.

(a) The training for flight navigators shall include the applicable portions of at least subparagraphs (1) through (4) and (6) through (8) of § 41.281(a).

(b) Prior to serving as a flight crewmember, each flight navigator shall be given sufficient ground and flight training to become proficient in those duties assigned him by the air carrier. The flight training may be accomplished during scheduled flight under the supervision of a qualified flight navigator.

(c) The air carrier shall give each flight navigator such additional ground and flight training as is necessary to insure qualification with respect to any new equipment, procedures, or techniques. At least each 12 months, as a part of the training program, recurrent ground training and a flight check shall be provided to insure the continued proficiency of each flight navigator with respect to procedures, techniques, and information essential to the satisfactory performance of his duties. Such flight check may be accomplished during scheduled flight in air transportation or in a synthetic trainer in lieu of a check in flight.

§ 41.284 Flight engineer training.

(a) The training for flight engineers shall include at least the instruction specified in § 41.281(a)(1) through (5).

(b) Prior to serving as a flight crewmember each flight engineer shall be given sufficient training in flight to become proficient in those duties assigned him by the air carrier. Except for emergency procedures, the flight training may be accomplished during scheduled flight in air transportation under the supervision of a qualified flight engineer.

(c) The air carrier shall give each flight engineer such additional ground and flight training as is necessary to insure qualification with respect to any new equipment, procedures, or techniques. At least once each 12 months, as a part of the training program, recurrent ground training and a flight check shall be provided to insure the continued proficiency of each flight engineer with respect to procedures, techniques, and information essential to the satisfactory performance of his duties. Such flight check shall not be accomplished during scheduled flight in air transportation, but may be accomplished in a synthetic trainer in lieu of a check in flight.

§ 41.285 Crewmember emergency training.

(a) The training in emergency procedures shall be designed to give each crewmember appropriate individual instruction in all emergency procedures, including assignments in the event of an emergency, and proper coordination between crewmembers. At least the following subjects as appropriate to the individual crewmember shall be taught: The procedures to be followed in the event of the failure of an engine, or engines, or other airplane components or systems, emergency decompression, fire in the air or on the ground, ditching, evacuation, the location and operation of all emergency equipment, and power setting for maximum endurance and maximum range.

(b) Recurrent training in the emergency procedures required in paragraph (a) of this section shall be accomplished at intervals not to exceed 12 months. Accomplishment of such training shall be made a part of the individual's record.

(c) Synthetic trainers may be used for training of crewmembers in emergency procedures where the trainers sufficiently simulate flight operating emergency conditions for the equipment to be used.

(d)[1] All crewmembers performing duties on pressurized airplanes operated above 25,000 feet shall, as a part of their initial emergency decompression procedure training, receive instruction by means of lectures and films (or other types of demonstration) covering: respiration, hypoxia, duration of consciousness at altitude when supplemental oxygen is not supplied, gas expansion, gas bubble formation, oxygen equipment, forces and other physical phenomena of decompressions, and incidents of decompression. In addition, all flight crewmembers shall experience hypoxia of slow and rapid onset through reduction of pressure in a low pressure chamber. For hypoxia of slow onset, a pressure altitude equivalent of 20,000 plus or minus 1,000 feet shall be employed. For hypoxia of rapid onset, a pressure altitude equivalent to 29,000 plus or minus 1,000 feet shall be employed. Reduction in pressure from 8,000 to 29,000 feet shall be accomplished within not less than 10 nor more than 20 seconds, and the duration of exposure above 20,000 feet shall not exceed 3 minutes. Oxygen shall be immediately available in the chamber but shall not ordinarily be used until symptoms of hypoxia become evident. Flight crewmembers who have completed their initial emergency training at the time of adoption of this rule will be afforded a 6-month grace period following the effective date thereof to accomplish the low pressure chamber indoctrination program.

§ 41.286 Aircraft dispatcher training.

(a) The training program for aircraft dispatchers shall provide for training in their duties and responsibilities and shall include a study of the flight operation procedures, air traffic control procedures, the performance of the airplanes used by the air carrier, navigational aids and facilities, and meteorology. Particular emphasis shall be placed upon the procedures to be followed in the event of emergencies, including the alerting of proper Governmental, company, and private agencies to render maximum assistance to an airplane in distress.

(b) Each aircraft dispatcher shall, prior to initially performing the duty of an aircraft dispatcher, satisfactorily demonstrate to the supervisor or ground instructor authorized to certify to his proficiency, his knowledge of the following subjects:

(1) Contents of the air carrier operating certificate;

(2) Appropriate provisions of the air carrier operations specifications, manual, and Civil Air Regulations;

(3) Characteristics of the airplanes operated by the air carrier;

(4) Cruise control data and cruising speeds for such airplanes;

(5) Maximum authorized loads for the airplanes for the routes and airports to be used;

(6) Air carrier radio facilities;

(7) Characteristics and limitations of each type of radio and navigational facility to be used;

(8) Effect of weather conditions on airplane radio reception;

(9) Airports to be used and the general terrain over which the airplanes are to be flown;

(10) Prevailing weather phenomena;

(11) Sources of weather information available;

(12) Pertinent air traffic control procedures; and

(13) Emergency procedures.

(c) The training program shall provide such additional training as is necessary to insure that each dispatcher is qualified with respect to new equipment procedures or techniques. At least once each 12 months, as a part of the training program, recurrent training and checks shall be provided to insure the continued competence of each dispatcher with respect to the procedures, techniques, and information essential to his duties.

FLIGHT CREWMEMBER AND DISPATCHER QUALIFICATION

§ 41.300 Qualification requirements.

(a) No air carrier shall utilize any flight crewmember or dispatcher, nor shall any such airman perform the duties authorized by his airman certificate, unless he satisfactorily meets the appropriate requirements of §§ 41.280 through 41.286 and 41.301. Each pilot serving as pilot in command and each pilot serving as second in command in operations requiring 3 or more pilots shall hold appropriate airline transport pilot certificates and appropriate type ratings for the aircraft in which they serve. All other pilots shall hold at least commercial pilot certificates and instrument ratings.

(b) Check airmen shall certify as to the proficiency of each pilot being examined, as required by §§ 41.302, 41.303, and 41.305 and such certification shall become a part of the airman's record.

§ 41.301 Pilot recent experience.

No air carrier shall schedule a pilot to serve as pilot in command or second in command in scheduled air transportation unless within the preceding 90 days he has made at least 3 takeoffs and 3 landings in the airplane of the particular type on which he is to serve.

§ 41.302 Pilot checks.

(a) *Line check.* Prior to serving as pilot in command and at least once each 12 months thereafter, a pilot shall satisfactorily pass a line check in one of the types of airplanes normally to be flown

[1] This paragraph is included in a notice of proposed rule making which is being circulated as Civil Air Regulations Draft Release No. 60-15. Whatever action is taken on DR 60-15 will be reflected in Part 41 at the time it is adopted.

by him. The line check may be given at any time during the month preceding or following the month in which it becomes due. The effective date of the check, if given within the preceding or following month, shall be the same as if given within the month in which it became due. This check shall be given by a check pilot who is both qualified on the aircraft and on the route. It shall consist of at least a scheduled flight over a typical portion of the air carrier's routes to which the pilot is normally assigned and shall be of sufficient duration for the check pilot to determine whether the individual being checked satisfactorily exercises the duties and responsibilities of a pilot in command.

(b) *Proficiency check.* (1) An air carrier shall not utilize a pilot as pilot in command until he has satisfactorily demonstrated to a check pilot or a representative of the Administrator his ability to pilot and navigate airplanes to be flown by him. Thereafter, he shall not serve as pilot in command unless each 6 months he successfully completes a similar pilot proficiency check. The proficiency check may be given at any time during the month preceding or following the month in which it becomes due. The effective date of the check, if given within the preceding or following month, shall be the same as if given within the month in which it became due. Where such pilots serve in more than one airplane type, at least every other successive proficiency check shall be given in flight in the larger airplane type.

(2) The pilot proficiency check shall include at least the following:

(i) Equipment examination (oral or written), taxiing, runup, takeoff, climb, climbing turns, steep turns, maneuvers at minimum speeds, approach to stalls, propeller feathering, maneuvers with one or more engine(s) out, rapid descent and pullout, ability to tune radio, orientation, approach procedures, and emergency procedures.

(ii) The flight maneuvers specified in § 41.282(b)(1), except that the simulated engine failure during takeoff need not be accomplished at speed V_L nor at actual or simulated maximum authorized weight.

(iii) Flight maneuvers approved by the Administrator accomplished under simulated instrument conditions utilizing the navigational facilities and letdown procedures normally used by the pilot: *Provided*, That maneuvers other than those associated with approach procedures for which the lowest minimums are approved may be given in a synthetic trainer which contains the radio equipment and instruments necessary to simulate other navigational and letdown procedures approved for use by the air carrier.

(3) Subsequent to the initial pilot proficiency check, an approved course of training in an aircraft simulator, if satisfactorily completed, may be substituted at alternate 6-month intervals for the proficiency check required by subparagraph (1) of this paragraph. The air carrier shall show that the flight characteristics, performance, instrument reaction, and control loading of the applicable airplane are accurately simulated in the aircraft simulator through all ranges of normal and emergency operations in accordance with subdivisions (i) through (vii) of this subparagraph:

(i) The simulator shall represent a full-scale mockup of the cockpit interior, including normal flight crew stations and accommodations for the instructor or check airman.

(ii) The effect of changes on the basic forces and moments shall be introduced for all combinations of drag and thrust normally encountered in flight. The effect of changes in airplane attitude, power, drag, altitude, temperature, gross weight, center of gravity location, and configuration shall be included.

(iii) In response to control movement by a flight crewmember, all instrument indications involved in the simulation of the applicable airplane shall be entirely automatic in character unless otherwise specified. The rate of change of simulator instrument readings and of control forces shall correspond to the rate of change which would occur on the applicable airplane under actual flight conditions, for any given change in the applied load on the controls, in the applied power or in airplane configuration. Control forces and degree of actuating control travel shall correspond to that which would occur in the airplane under actual flight conditions.

(iv) Through the medium of instrument indication, it shall be possible to use the simulator for the training and checking of a pilot in the operational use of controls and instruments on the applicable airplane model during the simulated execution of ground operation, takeoff, landing, normal flight, unusual attitudes, navigation problems, and instrument approach procedures. In addition, the simulator shall be designed so that malfunctions of airplane engines, propellers, and primary systems may be presented and corrective action taken by the crew to cope with such emergencies.

(v) Suitable course and altitude recorders shall be included.

(vi) Communication and navigational aids of the applicable airplane shall be simulated for on-the-ground and in-flight operations.

(vii) Other airplane systems and components shall be simulated to the extent found necessary by the Administrator.

(c) Prior to serving as pilot in command in a particular type of airplane, a pilot shall have accomplished during the preceding 12 months either a proficiency check or a line check in that type of airplane.

§ 41.303 Pilot route and airport qualification requirements.

(a) An air carrier shall not utilize a pilot in command until he has been qualified for the route on which he is to serve in accordance with the provisions of this section and the appropriate instructor or check pilot has so certified.

(b) Each such pilot shall by written means demonstrate adequate knowledge concerning the subjects listed below with respect to each route to be flown and each regular provisional and refueling airport to be used.

(1) Weather characteristics, all seasons;

(2) Navigational facilities;

(3) Communication procedures;

(4) Type of en route terrain and obstruction hazards;

(5) Minimum safe flight levels;

(6) Position reporting points;

(7) Pertinent air traffic control procedures, including terminal area, arrival, departure, holding, and all types of instrument approach procedures; and

(8) Congested areas, obstructions, physical layout, and all instrument approach procedures for each regular, provisional, and refueling airport approved for the routes.

(c) A pilot in command who has not made an entry as a member of a flight crew within the preceding 12-month period at each regular, provisional, and refueling airport into which he is scheduled to fly may approach and land at such airports only if the reported weather indicates at least a ceiling 200 feet and a visibility ½ mile higher than the prescribed landing minimums at those airports. The ceiling and visibility minimums need not be increased above those applicable to the airport when used as an alternate airport. Sliding scales included in the air carrier operations specifications may not be applied to landing minimums by pilots not currently qualified at such airports.

(d) Such pilot shall not be required to meet the entry requirements of paragraph (c) of this section when:

(1) The air carrier shows that the pilot airport qualification can be accomplished by an approved pictorial means; or

(2) The air carrier notifies the Director that it intends to conduct operations at an airport in close proximity to an airport into which the pilot involved is presently qualified by entry, and the Director finds that such pilot is adequately qualified at the new airport. The Director, in making such finding, shall take into consideration at least the familiarity of the pilot with the layout, surrounding terrain, location of obstacles, and instrument approach and traffic control procedures at the new airport.

(e) On routes or route segments on which navigation must be accomplished by pilotage and on which flight is to be conducted at or below the level of the adjacent terrain which is within a horizontal distance of 25 miles on either side of the centerline of the route to be flown, the pilot shall be familiarized with such route or route segments by not less than 2 one-way trips on the flight deck over the route or route segments under VFR weather conditions to permit the qualifying pilot to observe terrain along the route.

§ 41.304 Maintenance and reestablishment of pilot route and airport qualifications for particular trips

(a) To maintain pilot route and airport qualifications, each pilot being utilized as pilot in command, within the preceding 12-month period, shall have made at least one trip on the flight deck into each airport into which he is scheduled to fly and shall have complied with

the provisions of § 41.303(e), if applicable: *Provided,* That such entry shall not be required if the air carrier shows that maintenance of pilot airport qualification can be accomplished in accordance with § 41.303(d).

(b) In order to reestablish pilot route and airport qualifications after absence from a route for a period in excess of 12 months, a pilot shall comply with the appropriate provisions of § 41.303.

§ 41.305 Proficiency checks; second in command.

(a) An air carrier shall not utilize a pilot as second in command until he has satisfactorily demonstrated to a check pilot or a representative of the Administrator his ability to pilot and navigate airplanes to be flown by him and to perform his assigned duties. Thereafter he shall not serve as second in command unless each 12 months he successfully completes a similar pilot proficiency check. The proficiency check may be given at any time during the month preceding or following the month in which it becomes due. The effective date of the check, if given within the preceding or following month, shall be the same as if given within the month in which it becomes due. Where such pilots serve in more than one airplane type, at least every other successive proficiency check shall be given in flight in the larger airplane type. The proficiency check shall include at least an oral or written equipment examination, and the procedures and flight maneuvers specified in § 41.282(c). The pilot proficiency check may be demonstrated from either the right or left pilot seat.

(b) The proficiency check for second in command of a crew requiring 3 or more pilots shall be the same as required under § 41.302(b).

(c) Subsequent to the initial pilot proficiency check, an approved course of training in an aircraft simulator which meets the requirements of § 41.302(b)(3), if satisfactorily completed, may be substituted at alternate 12-month intervals for the proficiency checks required by paragraphs (a) and (b) of this section.

(d) Satisfactory completion of the proficiency check in accordance with § 40.302(b) will also meet the requirements of this section.

§ 41.306 Flight navigator qualification for duty.

A flight navigator shall not be assigned to nor perform duties for which he is required to be certificated as a flight navigator unless, within the preceding 12-month period, he has had at least 50 hours of experience as a flight navigator, or until the air carrier or an authorized representative of the Administrator has checked such flight navigator and determined that he is familiar with all essential current navigational information pertaining to the routes to be flown and is competent with respect to the operating procedures and navigational equipment to be used. This check shall include a check in flight: *Provided,* That in the case of a flight navigator who has been previously qualified as such, the check may be accomplished in a synthetic trainer in lieu of a check in flight.

§ 41.307 Flight engineer qualification for duty.

A flight engineer shall not be assigned to nor perform duties for which he is required to be certificated as a flight engineer unless, within the preceding 6-month period, he has had at least 50 hours of experience as a flight engineer on the type of airplane on which he is to serve, or until the air carrier or an authorized representative of the Administrator has checked such flight engineer and determined that he is familiar with all essential current information and operating procedures relating to the type of airplane to which he is to be assigned and is competent with respect to such airplane. This check shall include a check in flight: *Provided,* That in the case of a flight engineer who has been previously qualified in the type airplane, the check may be accomplished in a synthetic trainer in lieu of a check in flight.

§ 41.310 Aircraft dispatcher qualification for duty.

(a) Prior to dispatching airplanes over any route or route segment, an aircraft dispatcher shall be familiar, and the air carrier shall determine that he is familiar, with all essential operating procedures for the entire route and with the airplanes to be used: *Provided,* That where he is qualified only on a portion of such route, he may dispatch airplanes, but only after coordinating with dispatchers who are qualified for the other portions of the route between the points to be served

(b) An aircraft dispatcher shall not dispatch airplanes in the area over which he is authorized to exercise dispatch jurisdiction unless within the preceding 12 months he has made at least one round trip over the particular area on the flight deck of an airplane. The trip selected for qualification purposes shall be one which includes entry into as many points as practicable but it shall not be necessary for the dispatcher to make a flight over each route in the area.

FLIGHT TIME LIMITATIONS

§ 41.320 Flight time limitations for aircraft having a crew of one or two pilots

(a) A pilot may be scheduled to fly 8 hours or less during any 24 consecutive hours without a rest period during such 8 hours. If a pilot is scheduled to fly in excess of 8 hours during any 24 consecutive hours, he shall be given an intervening rest period at or before the termination of 8 scheduled hours of flight duty. Such rest period must equal at least twice the number of hours flown since the last preceding rest period and in no case will such rest period be less than 8 hours. During such rest period the pilot must be relieved of all duty with the air carrier.

(b) When a pilot has flown in excess of 8 hours during any 24 consecutive hours he must receive at least 18 hours of rest before being assigned any duty with the air carrier.

(c) A pilot shall not fly in excess of 32 hours during any 7 consecutive days. Relief from all duty for not less than 24 consecutive hours must be provided for and given to a pilot at least once during any 7 consecutive days.

(d) A pilot shall not fly as a member of the crew more than 100 hours during any one month.

(e) A pilot shall not fly as a member of the crew more than 1,000 hours in any 12-month period.

§ 41.321 Flight time limitations for aircraft having two pilots and one additional flight crewmember.

(a) A pilot may not be scheduled to fly a total of more than 12 hours during any 24 consecutive hours.

(b) When a pilot has flown 20 hours or more during any 48 consecutive hours, or 24 hours or more during any 72 consecutive hours, he must receive at least 18 hours of rest before being assigned to any duty with the air carrier. In any case each pilot shall be relieved from all duty for not less than 24 consecutive hours during any 7 consecutive days.

(c) A pilot shall not fly as a member of the flight crew more than 120 hours in any 30 consecutive days or 300 hours in any 90 consecutive days.

(d) A pilot shall not fly as a member of the flight crew more than 1,000 hours in any 12-month period.

§ 41.322 Flight time limitations for aircraft having three or more pilots and an additional flight crewmember

(a) Flight hours shall be scheduled in such a manner as to provide for adequate rest periods on the ground while the pilot is away from his base. Adequate sleeping quarters on the aircraft must be provided in all cases where a pilot is scheduled to fly more than 12 hours during any 24 consecutive hours.

(b) A pilot, upon return to his base from any flight or series of flights, shall receive a rest period of not less than twice the total number of hours flown since the last rest period at his base and during such period will not be required to perform any duty for the company. When the required rest period exceeds 7 days, that portion of the rest period in excess of 7 days may be given at any time before the pilot is again scheduled for flight duty on any route.

(c) A pilot shall not fly as a member of the flight crew more than 350 hours in any 90 consecutive days.

(d) A pilot shall not fly as a member of the flight crew more than 1,000 hours in any 12-month period.

§ 41.323 Flight time limitations for pilots not regularly assigned.

A pilot not regularly assigned as a flight crewmember for an entire month under the provisions of § 41.321 or § 41.322 must not fly in excess of 100 hours in any 30 consecutive days.

§ 41.324 Deadhead transportation.

The time spent in deadhead transportation to or from duty assignment will not be considered a part of any rest period.

§ 41.325 Other commercial flying.

A pilot shall not do other commercial flying while employed by an air carrier when such flying, in addition to that in scheduled air transportation service will exceed any flight time limitations specified herein.

§ 41.326 Flight time limitations; flight engineer.

When one flight engineer is required, the flight time limitations prescribed in § 41.321 apply. When two or more flight engineers are required, the flight time limitations prescribed in § 41.322 apply.

§ 41.327 Flight time limitations; flight navigator.

The flight time limitations prescribed in § 41.322 apply.

DUTY TIME LIMITATIONS; AIRCRAFT DISPATCHER

§ 41.340 Aircraft dispatcher daily duty time limitations.

(a) The daily duty period for an aircraft dispatcher shall commence at such time as will permit him to become thoroughly familiar with existing and anticipated weather conditions along the route prior to the dispatch of any airplane. He shall remain on duty until all airplanes dispatched by him have completed their flights, or have proceeded beyond his jurisdiction, or until he is relieved by another qualified aircraft dispatcher.

(b) Except as provided in paragraph (c) of this section, the following rules will govern the hours of duty for an aircraft dispatcher, except when circumstances or emergency conditions beyond the control of the air carrier require otherwise:

(1) *Maximum consecutive hours of duty.* No dispatcher shall be scheduled for duty as such for a period of more than 10 consecutive hours.

(2) *Maximum scheduled hours of duty in 24 consecutive hours.* If a dispatcher is scheduled for duty as such for more than 10 hours in a period of 24 hours, he shall be given a rest period of not less than 8 hours at or before the termination of 10 hours of dispatcher duty.

(3) *Dispatcher's time off.* Each aircraft dispatcher shall be relieved from all duty with the air carrier for a period of at least 24 consecutive hours during any 7 consecutive days or the equivalent thereof within any one month.

(c) At duty stations outside the continental limits of the United States designated by the Administrator, a dispatcher may be scheduled for duty for a period of more than 10 consecutive hours in a 24-hour period: *Provided,* That a dispatcher so scheduled shall be relieved from all duty with the air carrier for a period of at least 8 hours during each 24-hour period: *And provided further,* That a dispatcher so scheduled shall not be scheduled for duty for more than 40 hours in any 7 consecutive days.

FLIGHT OPERATIONS

§ 41.351 Operational control.

The air carrier shall be responsible for operational control.

(a) *Joint responsibility of aircraft dispatcher and pilot in command.* The aircraft dispatcher and the pilot in command shall be jointly responsible for the preflight planning, delay, and dispatch release of the flight in compliance with the applicable Civil Air Regulations and operations specifications.

(b) *Responsibility of dispatcher.* The aircraft dispatcher shall be responsible:

(1) For monitoring the progress of each flight and the issuance of instructions and information necessary for the continued safety of the flight.

(2) For the cancellation or redispatch of a flight if, in his opinion or in the opinion of the pilot in command, the flight cannot operate or continue to operate safely as planned or released.

(c) *Responsibility of pilot in command.* (1) The pilot in command shall during flight time be in command of the airplane and crew and shall be responsible for the safety of the passengers, crewmembers, cargo, and airplane.

(2) No pilot shall operate an airplane in a careless and reckless manner so as to endanger life or property.

NOTE: Section 41.351(c) confers on the pilot in command, with respect to matters concerning the operation of the airplane, full control and authority without limitation over all other crewmembers and their duties during flight time, whether or not he holds a valid certificate authorizing him to perform the duties and functions of such other crewmember.

§ 41.352 Operations notices.

Each air carrier shall notify the appropriate operations personnel promptly of all changes in equipment and operating procedures, including known changes in the use of navigational aids, airports, air traffic control procedures and regulations, local airport traffic control rules, and of all known hazards to flight, including icing and other potentially hazardous meteorological conditions and irregularities of ground and navigational facilities.

§ 41.353 Operations schedules.

In establishing flight operations schedules, each air carrier shall allow sufficient time for the proper servicing of airplanes at intermediate stops, and it shall consider the prevailing winds along the particular route and the cruising speed of the type of airplane to be flown which shall not exceed the specified cruising output of the airplane engines.

§ 41.354 Flight crewmembers at controls.

All required flight crewmembers when on flight deck duty shall remain at their respective stations while the airplane is taking off or landing, and while en route except when the absence of one such flight crewmember is necessary for the performance of his duties in connection with the operation of the airplane. All flight crewmembers shall keep their seat belts fastened when at their respective stations.

§ 41.355 Manipulation of controls.

No person other than a qualified pilot of the air carrier shall manipulate the flight controls during flight, except that authorized pilot safety representatives of the Administrator who are qualified on the airplane and are engaged in checking flight operations may, with the permission of the pilot in command, manipulate such controls.

§ 41.356 Admission to flight deck.

No person, other than a crewmember, may be admitted to the flight deck of an airplane except those authorized in paragraphs (a) and (b) of this section. (For the purpose of this section, the term "flight deck" means all of the area forward of the door or window required by Parts 4a and 4b of this chapter (Civil Air Regulations) to be located between the pilot compartment and the passenger compartment.)

(a) FAA air carrier inspectors while in the performance of official duties shall be admitted to the flight deck.

NOTE: Nothing contained in this paragraph shall be construed as limiting the emergency authority of the pilot in command to exclude any person from the flight deck in the interest of safety.

(b) The persons listed below may be admitted to the flight deck when authorized by the pilot in command:

(1) An employee of the Federal Government or of an air carrier or other aeronautical enterprise whose duties are such that his presence on the flight deck is necessary or advantageous to the conduct of safe air carrier operations; or

NOTE: Federal employees who deal responsibly with matters relating to air carrier safety and such air carrier employees as pilots, dispatchers, meteorologists, communication operators, and mechanics whose efficiency would be increased by familiarity with flight conditions may be considered eligible under this requirement. Employees of traffic, sales, and other air carrier departments not directly related to flight operations cannot be considered eligible unless authorized under subparagraph (2) of this paragraph.

(2) Any other person specifically authorized by the air carrier management and an authorized representative of the Administrator.

(c) All persons admitted to the flight deck shall have seats available for their use in the passenger compartment except:

(1) FAA air carrier inspectors or other authorized representatives of the Administrator engaged in checking flight operations;

(2) Air traffic controllers who have been authorized by an authorized representative of the Administrator to observe ATC procedures;

(3) Certificated airmen of the air carrier whose duties with the carrier require an airman certificate;

(4) Certificated airmen of another air carrier whose duties with such carrier require an airman certificate and who have been authorized by the air carrier concerned to make specific trips over the route;

(5) Employees of the air carrier, whose functions are directly related to the conduct or planning of flight operations or the in-flight monitoring of aircraft equipment or operating procedures, but only when their presence in the cockpit is required in the furtherance of such

functions and only when specifically authorized in writing by a responsible supervisor in the operations department of the air carrier, who is listed in the Operations Manual as having such authority; and

(6) Technical representatives of the manufacturer of the airplane or its components whose functions are directly related to the in-flight monitoring of aircraft equipment or operating procedures, but only when their presence in the cockpit is required in the furtherance of such functions and only when specifically authorized in writing by an authorized representative of the Administrator and by a responsible supervisor in the operations department of the air carrier, who is listed in the Operations Manual as having such authority.

§ 41.357 Flying equipment.

(a) *Charts.* The pilot in command shall insure that appropriate aeronautical charts containing adequate information concerning navigational aids and instrument approach procedures are aboard the airplane for each flight.

(b) *Flashlights.* Each required crewmember shall have in his possession on each flight a flashlight in good working order.

§ 41.358 Restriction or suspension of operation.

When conditions known to the air carrier exist which constitute a hazard to the conduct of safe air carrier operations, including airport and runway conditions, the air carrier shall restrict or suspend operations until such hazardous conditions are corrected.

§ 41.359 Operations over approved routes required.

Except when a deviation is necessary in accordance with § 41.360, a pilot shall not operate an air carrier airplane in scheduled air transportation over any route or route segment other than as specified in the operations specifications of the air carrier, nor operate other than in accordance with the limitations prescribed therein.

§ 41.360 Emergency decisions; pilot in command and aircraft dispatcher.

(a) In emergency situations which require immediate decision and action, the pilot in command may follow any course of action which he considers necessary under the circumstances. In such instance the pilot in command, to the extent required in the interest of safety, may deviate from prescribed operations procedures and methods, weather minimums, and the Civil Air Regulations.

(b) If an emergency situation arises during the course of a flight which requires immediate decision and action on the part of the aircraft dispatcher, and which is known to him, he shall advise the pilot in command of such situation. The aircraft dispatcher shall ascertain the decision of the pilot in command and shall cause the same to be made a matter of record. If unable to communicate with the pilot, the dispatcher shall declare an emergency and follow any course of action which he considers necessary under the circumstances.

(c) When emergency authority is exercised by the pilot in command or by the dispatcher, the appropriate air traffic control and dispatch centers shall be kept fully informed regarding the progress of the flight. A written report of any deviation shall be submitted by the individual declaring the emergency to the authorized representative of the Administrator assigned to the air carrier. Such report shall be submitted by a dispatcher within 10 days from the date of the emergency and by a pilot in command within 10 days after his return to his home base.

§ 41.361 Reporting potentially hazardous meteorological conditions and irregularities of ground and navigational facilities.

When any meteorological condition or irregularity of ground or navigational facilities is encountered in flight, the knowledge of which the pilot in command considers essential to the safety of other flights, he shall notify an appropriate ground radio station as soon as practicable. Any such information pertaining to irregularities of ground and navigational facilities shall be reported by the air carrier to the authority immediately responsible therefor.

§ 41.362 Reporting mechanical irregularities.

The pilot in command shall enter or cause to be entered in the maintenance log of the airplane all mechanical irregularities encountered during flight time. He shall, prior to each flight, ascertain the status of any irregularities entered in the log at the end of the last preceding flight.

§ 41.363 Engine failure or precautionary stoppage.

(a) Except as provided in paragraph (b) of this section, when one engine of an airplane fails or where the rotation of an engine of an airplane is stopped in flight as a precautionary measure to prevent possible damage, a landing shall be made at the nearest suitable airport in point of time where a safe landing can be effected.

(b) The pilot in command of an airplane having 4 or more engines may, if not more than one engine fails or the rotation thereof is stopped, proceed to an airport of his selection if, upon consideration of the following factors, he determines such action to be as safe a course of action as landing at the nearest suitable airport:

(1) The nature of the malfunctioning and the possible mechanical difficulties which may be encountered if flight is continued;

(2) The altitude, airplane weight, and usable fuel at the time of engine stoppage;

(3) The weather conditions en route and at possible landing points;

(4) The air traffic congestion;

(5) The type of terrain; and

(6) The familiarity of the pilot with the airport to be used.

(c) When engine rotation is stopped in flight, the pilot in command shall notify the proper ground radio station as soon as practicable and shall keep such station fully informed regarding the progress of the flight.

(d) In cases where the pilot in command selects an airport other than the nearest suitable airport in point of time, he shall, upon completion of the trip, submit a written report, in duplicate, to his operations manager setting forth his reasons for determining that the selection of an airport other than the nearest was as safe a course of action as landing at the nearest suitable airport. The operations manager shall, within 10 days after the pilot's return to his home base, furnish a copy of this report with his own comments thereon to the authorized representative of the Administrator assigned to the air carrier.

§ 41.364 Instrument approach and IFR landing procedures.

No instrument approach or IFR landing shall be conducted at an airport except in accordance with the IFR weather minimums and instrument approach procedures specified in the air carrier's operations specifications.

§ 41.365 Requirements for air carrier equipment interchange.

(a) Prior to conducting any operations pursuant to an interchange agreement authorized by the Civil Aeronautics Board, the air carrier shall show that:

(1) The procedures proposed for the conduct of such operations by the carriers involved conform with the provisions of this subchapter, and with safe operating practices;

(2) All operations personnel involved are familiar with the airplanes and equipment utilized in the interchange and with the communications and dispatching procedures to be used;

(3) All maintenance personnel involved are familiar with the airplanes and equipment, and the maintenance procedures applicable to the interchange;

(4) The flight crew and the dispatchers involved meet the appropriate route and airport qualifications; and

(5) All airplanes operated are essentially similar to those airplanes of the carrier with whom interchange is to be effected with respect to flight instruments and their arrangement and with respect to the arrangement and motion of controls critical to safety, unless the Administrator determines that adequate training programs have been established to insure that any dissimilarities which might be a potential hazard will be safely overcome by flight crew familiarization.

(b) The pertinent provisions and procedures affecting the carriers involved shall be included in their manuals.

§ 41.370 Briefing of passengers.

Each air carrier engaged in extended overwater operations shall insure that all passengers are briefed orally concerning the location and method of operation of life vests and emergency exits and the location of liferafts. The procedure to be followed in presenting this briefing shall be described in the air carrier manual. Such a briefing shall include a demonstration of the method of donning and inflating a life vest.

Where the airplane proceeds directly over water after takeoff, the briefing on location of the life vests and emergency exits shall be accomplished prior to takeoff, and the remainder of the briefing shall be accomplished as soon thereafter as practicable. Where the airplane does not proceed directly over water after takeoff, no part of the briefing need be accomplished prior to takeoff but the entire briefing shall be accomplished prior to reaching the overwater portion of the flight.

§ 41.371 Drinking and serving of alcoholic beverages.

(a) No person shall drink any alcoholic beverage aboard an air carrier airplane unless such beverage has been served to him by the air carrier operating the airplane.

(b) No air carrier shall serve any alcoholic beverage to any person aboard an air carrier airplane if such person appears to be intoxicated.

DISPATCHING RULES

§ 41.381 Necessity for dispatching authority.

No flight shall be started without specific authority from an aircraft dispatcher. Unless redispatched no flight shall be continued from an intermediate airport when weather conditions are less than those upon which the original dispatch release was based. No flight may be continued from an intermediate airport without redispatch if it has remained on the ground in excess of 6 hours.

§ 41.382 Familiarity with weather conditions.

No dispatcher shall release a flight unless he is thoroughly familiar with existing and anticipated weather conditions along the route to be flown.

§ 41.383 Facilities and services.

The dispatcher shall furnish to the pilot in command all available current reports or information pertaining to irregularities of navigational facilities and airport conditions which may affect the safety of the flight. He shall also furnish such pilot, while en route, any additional available information concerning meteorological conditions and irregularities of facilities and services which may affect the safety of the flight.

§ 41.384 Airplane equipment required for dispatch.

No airplane shall be dispatched unless it is airworthy and equipped in accordance with the provisions of § 41.170.

§ 41.385 Communications and navigational facilities required for dispatch.

No airplane shall be dispatched over any approved route or route segment unless the communications and navigational facilities required by §§ 41.34 and 41.36 for approval of such route or route segment are in satisfactory operating condition.

§ 41.386 Dispatching under VFR.

No airplane shall be dispatched for operation under VFR unless the appropriate weather reports and forecasts, or a combination thereof, indicate that the ceilings and visibilities along the route to be flown are, and will remain, at or above the minimums required for flight under VFR until the flight arrives at the airport or airports of intended landing specified in the dispatch release.

§ 41.387 Dispatching under IFR, over-the-top, or over water.

(a) An airplane shall not be dispatched for operations under IFR or over-the-top unless the appropriate weather reports and forecasts, or a combination thereof, pertaining to the airport or airports to which dispatched indicate that the ceilings and visibilities at such airports will be at or above the minimums specified in the air carrier's operations specifications at the estimated time of arrival thereat.

(b) Extended overwater operations shall be conducted at all times in accordance with the IFR requirements of this part except where the air carrier shows that such requirements are not necessary from a safety standpoint. Other overwater operations shall be conducted at all times in compliance with the IFR requirements of this part whenever the Director determines such compliance to be necessary in the interest of safety.

NOTE: Whenever extended overwater operations are authorized under VFR, or other overwater operations are required to be conducted under IFR, such authorization or requirement will be specified in the operations specifications of the air carrier.

§ 41.388 Alternate airport for departure.

(a) If the weather conditions at the airport of takeoff are below the landing minimums specified in the air carrier's operations specifications for that airport, no airplane shall be dispatched from that airport unless an alternate airport located with respect to the airport of takeoff as follows is specified in the dispatch release: *Provided*, That such alternate need not be selected if the ceiling and visibility, respectively, at the takeoff airport are at least 300 feet and one mile, 400 feet and three-quarters mile, or 500 feet and one-half mile:

(1) *Airplanes having 2 or 3 engines.* Alternate airport located at a distance no greater than one hour of flying time in still air at normal cruising speed with one engine inoperative.

(2) *Airplanes having 4 or more engines.* Alternate airport located at a distance no greater than 2 hours of flying time in still air at normal cruising speed with one engine inoperative.

(b) The alternate airport weather requirements shall be those specified in the air carrier's operations specifications.

(c) All required alternate airports shall be listed in the dispatch release.

§ 41.389 Alternate airport for destination; IFR or over-the-top.

(a) For all IFR or over-the-top operations there shall be at least one alternate airport designated for each airport of destination: *Provided*, That for flights scheduled for no more than 6 hours no alternate need be designated when, for the period 2 hours before to 2 hours after the estimated time of arrival, the ceiling at the airport to which the flight is dispatched is forecast to be at least 1,000 feet above the minimum initial approach altitude applicable to such airport and the visibility at such airport is forecast to be at least 3 miles: *Provided further*, That no alternate airport need be designated for a particular airport if the airplane carries sufficient fuel to meet the requirements of § 41.396(a)(2) or § 41.396(b)(2), as appropriate.

(b) The alternate airport weather requirements shall be those specified in the air carrier's operations specifications.

(c) All required alternate airports shall be listed in the dispatch release.

§ 41.390 Alternate airport weather minimums.

An airport shall not be specified in the dispatch release as an alternate airport unless the appropriate weather reports and forecasts, or a combination thereof, indicate that the ceilings and visibilities will be at or above the alternate minimums specified in the air carrier's operations specifications for such airport when the flight shall arrive thereat.

§ 41.391 Continuance of flight; flight hazards.

(a) No airplane shall be continued in flight toward any airport to which it has been dispatched when, in the opinion of the pilot in command or the aircraft dispatcher, the flight cannot be completed with safety, unless in the opinion of the pilot in command there is no safer procedure. In the latter event, continuation shall constitute an emergency situation as set forth in § 41.360.

(b) If any instrument or item of equipment required pursuant to the Civil Air Regulations for the particular operation being conducted becomes unserviceable en route, the pilot in command shall comply with the procedures specified in the air carrier manual for such occurrence: *Provided*, That the Director may authorize an air carrier to incorporate in its air carrier manual approved procedures for the continued operation of an airplane beyond a scheduled terminal point if the carrier shows that, in the particular circumstances of the case, literal compliance with the requirements of § 41.170(c) is not necessary in the interest of safety.

§ 41.392 Operation in icing conditions.

(a) An airplane shall not be dispatched, en route operations continued, or landing made when, in the opinion of the pilot in command or aircraft dispatcher, icing conditions are expected or encountered which might adversely affect the safety of the flight.

(b) No airplane shall take off when frost, snow, or ice is adhering to the wings, control surfaces, or propellers of the airplane.

§ 41.393 Original dispatch, redispatch, and continuance of flight.

(a) Any regular, provisional, or refueling airport, the use of which is authorized for the type of airplane to be operated, may be specified as a destination for the purpose of original dispatch.

(b) An airport specified as a destination or alternate for the purpose of original dispatch may be changed en route

to another airport which is authorized for the type of airplane to be operated if the appropriate requirements of §§ 41.381 through 41.409 and § 41.70 or § 41.90 are met at the time of redispatch.

(c) No flight shall be continued to any airport to which it has been dispatched unless the weather conditions at an alternate airport specified in the dispatch release are forecast to be at or above the alternate minimums specified in the air carrier's operations specifications for such airport when the flight shall arrive thereat: *Provided*, That the dispatch release may be amended en route to include any approved alternate airport lying within the fuel range of the airplane as specified in §§ 41.396 and 41.397.

(d) When the dispatch release is amended while the airplane is en route, such amendments shall be made a matter of record.

§ 41.394 Dispatch to and from refueling and provisional airport.

(a) No aircraft dispatcher shall dispatch an airplane to a refueling or provisional airport unless such airport complies with all of the requirements of this part pertinent to regular airports.

(b) Dispatch from a refueling or provisional airport shall be accomplished in accordance with the same regulations governing dispatch from a regular airport.

§ 41.395 Takeoffs and landings at alternate airports and at airports not listed in the operations specifications.

A pilot shall not takeoff or land an airplane at an alternate airport or an airport not listed in the air carrier's operations specifications other than in accordance with the takeoff and landing minimums and conditions prescribed in the air carrier's operations specifications for such airports.

§ 41.396 Fuel supply for all operations.

(a) *Reciprocating-engine- and turbo-propeller-powered airplanes.* (1) No airplane shall be dispatched to an airport for which there is an available alternate unless it carries sufficient fuel:

(i) To fly to and land at the airport to which dispatched, and thereafter;

(ii) To fly to and land at the most distant alternate designated in the dispatch release, and thereafter;

(iii) To fly for a period of at least 30 minutes plus 15 percent of the total time required to fly at normal cruising consumption to the airports specified in subdivisions (i) and (ii) of this subparagraph or to fly for 90 minutes at normal cruising consumption, whichever is lesser.

(2) No airplane shall be dispatched to an airport for which an alternate has not been designated unless it carries sufficient fuel, considering wind and other weather conditions expected, to fly to that airport and thereafter to fly for at least 3 hours at normal cruising consumption.

(b) *Turbine-powered airplanes.* (1) A turbine-powered airplane (exclusive of turbo-propeller-powered airplanes) may be dispatched or take off only if it carries sufficient fuel, considering the wind and other weather conditions expected:

(i) To fly to and land at the next point of landing specified in the clearance, and thereafter;

(ii) To fly for a period equal to 10 percent of the total time required to fly from the point of dispatch to the next point of landing specified in the clearance, and land at such airport; and thereafter

(iii) To fly to and land at the most distant alternate airport designated for that point in the clearance, and thereafter;

(iv) To fly for a period of 30 minutes at holding speed at 1,500 feet above the alternate airport elevation under standard temperature conditions.

(2) No airplane shall be dispatched to an airport for which an alternate has not been designated unless it carries sufficient fuel, considering wind and other weather conditions expected, to fly to that point and thereafter to fly for at least 2 hours at normal cruising consumption.

(3) The Director will amend the operations specifications of an air carrier to require fuel in excess of any of the minimums specified in this paragraph if he finds that additional fuel is necessary on a particular route in the interest of safety.

§ 41.397 Factors involved in computing fuel required.

In computing the fuel required, consideration shall be given to the wind and other weather conditions forecast, traffic delays anticipated, an instrument approach and possible missed approach at destination, and any other conditions which might delay the landing of the airplane. Required fuel shall be additional to unusable fuel.

§ 41.405 Takeoff and landing weather minimums; VFR.

Irrespective of any clearance which may be obtained from air traffic control, no pilot shall take off or land an airplane under VFR when the reported ceiling or ground visibility is less than specified below: *Provided*, That where a local surface restriction to visibility exists, such as smoke, dust, or blowing snow or sand, the visibility for night operations may be reduced to one mile, if all turns after takeoff and prior to landing and all flight beyond a mile from the airport boundary can be accomplished above or outside the area so restricted.

(a) For day operations: 1,000-foot ceiling and one-mile visibility;

(b) For night operations: 1,000-foot ceiling and two-mile visibility.

§ 41.406 Takeoff and landing weather minimums; IFR.

(a) Irrespective of any clearance which may be obtained from air traffic control, no pilot shall:

(1) Take off an airplane under IFR when the reported ceiling or ground visibility is less than that specified in Part 609 of the Regulations of the Administrator or the air carrier's operations specifications for the particular airport, or

(2) Except as provided in paragraphs (c) and (d) of this section, land an airplane under IFR when the reported ceiling or ground visibility is less than that specified in Part 609 of the Regulations of the Administrator or the air carrier's operations specifications for the particular airport.

(b) Except as provided in paragraphs (c) and (d) of this section, no instrument approach procedure shall be executed when the latest reported ceiling or visibility is less than the landing minimum specified in Part 609 of this title (Regulations of the Administrator) or the air carrier's operations specifications for the particular airport.

(c) An instrument approach procedure may be executed when the latest reported ceiling or visibility, or both, is less than that specified in Part 609 of this title (Regulations of the Administrator) or the air carrier's operations specifications for landing at the particular airport, if the airport is served by ILS and GCA (PAR) in operative condition and the pilot uses one facility as the primary aid, and the other as a monitoring aid; and thereafter a landing may be made, provided the pilot in command upon reaching the authorized landing minimum altitude finds that actual weather conditions are equal to or better than the specified minimums for the primary aid.

(1) The instrument approach shall be conducted in accordance with the information provided the pilot in command from the primary aid and the applicable landing minimums shall be those prescribed in the operations specifications based on the operative components of the primary aid. When GCA (PAR) is used as a secondary aid, the procedures specified in the Radar Procedures for Air Traffic Control Towers for monitored approaches shall apply.

(2) The ILS and PAR must be aligned with the same runway and both the elevation and azimuth (or localizer and glide slope) elements of the secondary aid must be operating.

(3) The use of operational military radar (other than training units) as a secondary aid is permissible without individual authorizations.

(d) If an instrument approach procedure is initiated when the latest weather report indicates that the specified ceiling and visibility minimums exist and a later weather report indicating below minimum conditions is received after the airplane (1) is on an ILS final approach and has passed the outer marker, or (2) is on a final approach using a radio range station or comparable facility and has passed the appropriate facility and has reached the authorized landing minimum altitude, or (3) is on PAR final approach and has been turned over to the final approach controller, such ILS, Range, or PAR approach may be continued and a landing may be made, provided the pilot in command upon reaching the authorized landing minimum altitude finds that actual weather conditions are equal to or better than the minimum specified for the particular airport in Part 609 of this title (Regulations of the Administrator) or the air carrier's operations specifications.

§ 41.407 Applicability of reported weather minimums.

In the conduct of operations subject to §§ 41.405 and 41.406, the ceiling and visibility values contained in the main body of the latest weather report furnished by the U.S. Weather Bureau or a source approved by the Weather Bureau shall be the controlling criteria for VFR and IFR takeoffs and landings and for instrument approach procedures on all runways of an airport; except that when the latest report furnished by the U.S. Weather Bureau or a source approved by it, including an oral report from the control tower, contains a visibility value specified as runway visibility for a particular runway of an airport, such specified value shall be controlling for VFR and IFR landings and takeoffs and straight-in instrument approaches.

NOTE: Information reflecting the official runway visibility observations reported by the control tower operator may be obtained from the office of the U.S. Weather Bureau for the airport conserned. Such office maintains a continuous graph recording of the runway visibility shown on the visibility meter in the control tower.

§ 41.408 Flight altitude rules.

Notwithstanding the provisions of § 60.17 of the Civil Air Regulations or other rules applicable outside of the United States, no air carrier airplane shall be operated anywhere in air carrier operations below the minimums prescribed in paragraphs (a) and (b) of this section: *Provided*, That the Director may prescribe other minimum en route altitudes for any route or portion thereof where he finds, after considering the character of the terrain being traversed, the quality and quantity of meteorological service, the navigational facilities available, and other flight conditions, that the safe conduct of flight requires such other altitudes.

NOTE: Minimum en route altitudes (MEA's) prescribed by the Director for particular routes within the United States are set forth in Part 610 of this title (Regulations of the Administrator). That part also contains the mountainous terrain designated by the Administrator. Outside of the United States the minimums prescribed in paragraphs (a) and (b) of this section will govern unless higher minimums are prescribed in the air carrier's operations specifications or by the foreign country over which the airplane is being operated.

(a) *Day VFR passenger operations.* No airplane engaged in passenger operations shall be flown at an altitude less than 1,000 feet above the surface or less than 1,000 feet from any mountain, hill, or other obstruction to flight.

(b) *Night VFR or IFR operations including over-the-top.* No airplane shall be flown at an altitude less than 1,000 feet above the highest obstacle located within a horizontal distance of 5 miles from the center of the course intended to be flown or, in mountainous terrain designated by the Administrator, 2,000 feet above the highest obstacle located within a horizontal distance of 5 miles from the center of the course intended to be flown: *Provided*, That in VFR operations at night in such mountainous areas airplanes may be flown over an approved lighted airway at a minimum altitude of 1,000 feet above such obstacles.

§ 41.409 Altitude maintenance on initial approach.

When making an initial approach to a radio navigational facility under IFR, a pilot shall not descend below the pertinent minimum altitude for initial approach specified in the instrument approach procedure for such facility until arrival over the radio facility has been definitely established.

§ 41.410 Preparation of dispatch release.

A dispatch release shall be prepared for each flight between specified points from information furnished by the authorized aircraft dispatcher. This release shall be signed by the pilot in command and by the authorized aircraft dispatcher only when both believe the flight can be made with safety. The aircraft dispatcher may delegate authority to sign such release for a particular flight, but he shall not delegate the authority to dispatch.

§ 41.411 Preparation of load manifest.

The air carrier shall be responsible for the preparation and accuracy of a load manifest form prior to each takeoff. This form shall be prepared by personnel of the air carrier charged with the duty of supervising the loading of airplanes and the preparation of load manifest forms or by other qualified persons authorized by the air carrier.

REQUIRED RECORDS AND REPORTS

§ 41.501 Crewmember and dispatcher records.

Each air carrier shall maintain current records of every crewmember and aircraft dispatcher. These records shall contain such information concerning the qualifications of each such crewmember and dispatcher as is necessary to show compliance with the appropriate requirements of the regulations of this subchapter, e.g., proficiency and route checks, airplane and route qualifications, training, physical examinations, and flight time records. The disposition of any flight crewmember or aircraft dispatcher released from the employ of the air carrier, or who becomes physically or professionally disqualified, shall be indicated in these records which shall be retained by the air carrier for at least 6 months.

§ 41.502 Dispatch release form.

(a) The dispatch release may be in any form but shall contain at least the following information with respect to each flight:

(1) Identification number of the airplane to be used, and the trip number;

(2) Airport of departure, intermediate stops, destination, and alternates therefor;

(3) Minimum fuel supply; and

(4) Type of operation, e.g., IFR, VFR.

(b) The dispatch release shall contain, or have attached thereto, weather reports, available weather forecasts, or a combination thereof, for the destination, intermediate stops, and alternates specified therein which shall be the latest available at the time the dispatch release is signed. It shall include such additional weather reports and forecasts, as available, considered necessary or desirable by the pilot in command or aircraft dispatcher.

§ 41.503 Load manifest.

(a) The load manifest shall contain at least the following information with respect to the loading of an airplane at the time of takeoff:

(1) The weight of:

(i) Airplane,

(ii) Fuel and oil,

(iii) Cargo, including mail and baggage, and

(iv) Passengers;

(2) The maximum allowable weight applicable for the particular flight;

(3) The total weight computed in accordance with approved procedures; and

(4) Evidence that the airplane is loaded in accordance with an approved schedule which insures that the center of gravity is within approved limits.

(b) The load manifest shall be prepared and signed for each flight by qualified personnel of the air carrier charged with the duty of supervising the loading of the airplane and the preparation of load manifest forms, or by other qualified personnel authorized by the air carrier.

§ 41.504 Disposition of load manifest, dispatch release form, and flight plans.

Copies of the completed load manifest, or information therefrom except with respect to cargo and passenger distribution, the dispatch release form, and the flight plan shall be in the possession of the pilot in command and shall be carried in the airplane to its destination. Copies also shall be kept for at least 3 months.

§ 41.505 Maintenance records.

(a) Each air carrier shall keep at its principal maintenance base current records of the total time in service, the time since last overhaul, and the time since last inspection of all major components of the airframe, engines, propellers, and appliances.

(b) Records of total time in service may be discontinued when it has been shown that the service life of component parts is safely controlled by other means, such as inspection, overhaul, or parts retirement procedures. The Director may require the keeping of total time records for specific parts when it is found that other procedures will not safely limit the service life of such parts.

(c) An airplane component, engine, propeller, or appliance for which complete records are not available may be placed in service, provided that:

(1) It is of a type for which total time-in-service records are not required under the provisions of paragraph (b) of this section;

(2) Parts which are limited by the Director or manufacturer to a specific service time are retired and replaced by new parts; and

(3) It has been properly overhauled or rebuilt, and a record of such overhaul or

rebuilding is included in the maintenance records.

§ 41.506 Maintenance log.

A legible record shall be made in the airplane's maintenance log of the action taken in each case of reported or observed failures or malfunctions of airframes, engines, propellers, and appliances. The air carrier shall establish an approved procedure for retaining an adequate number of such records in the airplane in a place readily accessible to the flight crew and shall incorporate such procedure in the air carrier manual. The maintenance log shall contain information from which the flight crew may readily determine the time since last overhaul of the airframe and engines.

§ 41.507 Daily mechanical reports.

(a) Whenever a failure, malfunctioning, or other defect is detected in flight or on the ground in an airplane or airplane component which may reasonably be expected by the air carrier to cause a serious hazard in the operation of any airplane, a report shall be made of such failure, malfunctioning, or other defect to the authorized representative of the Administrator assigned to the air carrier. This report shall cover a 24-hour period beginning and ending at midnight, shall be submitted by 12 o'clock midnight of the following working day, or sooner if the seriousness of the malfunction or difficulty so warrants, and shall include as much of the following information as is available on the first daily report following such incidents:

(1) Type and FAA identification number of the airplane, name of air carrier, and date;

(2) Emergency procedure effected: unscheduled landing, dumping fuel, etc.;

(3) Nature of condition: fire, structural failure, etc.;

(4) Identification of part and system involved, including the type designation of the major component;

(5) Apparent cause of trouble: wear, cracks, design deficiency, personnel error, etc.;

(6) Disposition: repaired, replaced, airplane grounded, etc.; and

(7) Brief narrative summary to supply any other pertinent data required for more complete identification, determination of seriousness, corrective action, etc.

(b) These reports shall not be withheld pending accumulation of all of the information specified in paragraph (a) of this section. When additional information is obtained relative to the incident, it shall be expeditiously submitted as a supplement to the original report, reference being made to the date and place of submission of the first report.

§ 41.508 Mechanical interruption summary report.

Each air carrier shall submit regularly and promptly to the Administrator a summary report containing information on the following occurences:

(a) All interruptions to a scheduled flight, unscheduled changes of airplanes en route, and unscheduled stops and diversions from route which result from known or suspected mechanical difficulties or malfunctions.

(b) The number of engines removed prematurely because of mechanical trouble, listed by make and model of engine and the airplane type in which the engine was installed.

(c) The number of propeller featherings in flight, listed by type of propeller and type of engine and the airplane on which the propeller is installed. Propeller featherings accomplished for training, demonstration, or flight check purposes need not be reported.

§ 41.509 Alteration and repair reports.

Reports of major alterations or repairs of airframes, engines, propellers, and appliances shall be submitted to the authorized representative of the Administrator assigned to the air carrier promptly upon completion of such alterations or repairs.

§ 41.510 Maintenance release.

When an airplane is released by the maintenance organization to flight operations, a maintenance release or appropriate entry into the maintenance log certifying that the airplane is in an airworthy condition shall be prepared and signed by a maintenance inspector or a person authorized by the inspection organization prior to release of such airplane. If a maintenance release form is prepared, a copy shall be given to the pilot in command. An appropriate record shall be kept for at least 2 months.

§ 41.511 Communication records.

Each air carrier shall maintain, and retain for a period of 30 days, records of radio contacts between the air carrier and its pilots en route.

APPENDIX A—REQUIREMENTS FOR APPROVAL OF FIRST-AID AND SURVIVAL EQUIPMENT

First-aid and survival equipment which meet the following specifications and requirements are approved:

1. *First-aid kits required by § 41.173.* Each first-aid kit shall be dust and moisture proof, contain only materials which meet Federal Specifications GG-K-391a, as revised. First-aid kits shall be provided in accordance with the following requirements:

(a) No. 1 kit for airplanes of 1 to 5 persons capacity.

Adhesive bandage compresses, 1-inch (16 per unit)	1
Antiseptic swabs, 10 mm. (10 per unit)	1
Ammonia inhalants, 6 mm. (10 per unit)	1
2-inch bandage compresses (4 per unit)	1
4-inch bandage compresses (1 per unit)	1
Triangular bandage compressed, 40-inch (1 per unit)	2
Burn compound, ⅛ oz. (5 per unit) or equivalent amount of other burn remedy	1
Ophthalmic ointment, ⅛ oz. (6 per unit)	1

(b) No. 2 kit for airplanes of 6 to 25 persons capacity.[1]

Adhesive bandage compresses, 1-inch (16 per unit)	2
Antiseptic swabs, 10 mm. (10 per unit)	2
Ammonia inhalants, 6 mm, (10 per unit)	1
2-inch bandage compresses (4 per unit)	3
4-inch bandage compresses (1 per unit)	2
Triangular bandage compressed, 40-inch (1 per unit)	3
Burn compound, ⅛ oz. (6 per unit) or equivalent amount of other burn remedy	2
Ophthalmic ointment, ⅛ oz. (6 per unit)	1

(c) No. 3 kit for airplanes of 26 to 90 persons capacity.

Adhesive bandage compresses, 1-inch (16 per unit)	4
Antiseptic swabs, 10 mm. (10 per unit)	4
Ammonia inhalants, 6 mm. (10 per unit)	2
2-inch bandage compresses (4 per unit)	3
4-inch bandage compresses (1 per unit)	3
Triangular bandage compressed, 40-inch (1 per unit)	5
Burn compound, ⅛ oz. (6 per unit) or an equivalent amount of other burn remedy	2
Ophthalmic ointment, ⅛ oz. (6 per unit)	1

(d) For airplanes of more than 90 persons capacity, two No. 3 kits shall be required.

2. *Survival equipment required by § 41.206 for extended overwater operations.* The following survival equipment shall be provided on extended overwater operations for each liferaft:

1 No. 2 first-aid kit (from airplane.)
1 flashlight (from airplane).
100 doses of a motion sickness remedy.
Sunburn protective sufficient to cover the faces of 75 percent of the occupants.
3 shark repellent,
3 containers of sea marker dye,
1 canopy (for protection from the elements),
1 liferaft repair kit,
Radar reflectors (or similar device),
1 bailing bucket,
1 sea anchor,
1 signaling mirror,
1 police whistle,
1 raft knife,
Such CO_2 bottle(s) as required for initial inflation of the liferaft,
1 inflation pump,
2 oars (for other than large oval-shaped rafts),
1 magnetic compass,
1 pyrotechnic pistol and 6 cartridges or 6 day/night type flares,
5 water storage bags,
1 fishing kit,
1 book on survival appropriate for area,
1 75-foot line (250 lbs. tension strength) fitted with a floatable device at one end,
2,000 calories supply emergency food ration per occupant (Food and water supplies may be stored in a separate floatable container, and
1 sea water desalting kit for each 2 persons the liferaft is authorized to carry, or 2 pints of water per occupant,

3. *Survival equipment required by § 41.208.* When the type of operation requires more than one class of equipment it will not be necessary to carry more than one supply of items duplicated in another list. The equipment specified herein shall be carried in one or more containers and in such a location as to make it readily available in the event of forced landing and subsequent evacuation from the airplane.

(a) *Tropical land areas.* The following equipment shall be provided for operations over tropical land areas;

1 first-aid kit (from airplane),
1 flashlight (from airplane),
1 machete,
1 axe (from airplane),
Sufficient insect repellant to cover the hands and faces of all occupants,
2 pints of drinking water for each occupant,
Sufficient water purification tablets to treat 5 quarts of water per occupant,
1 waterproof box of matches,
1 magnetic compass,
1 signaling mirror,

[1] Kit No. 2 in canvas may also be used on liferafts.

1 pyrotechnic pistol and 6 cartridges or 6 day/night type flares,
1 mosquito headnet for each occupant,
1 hunting knife,
1 small-bore rifle and cartridges; or revolver and cartridges.
1 fishing kit,
1 snake-bite kit,
1 book on jungle survival,
200 feet nylon rope with strength of 250 pounds, and
500 calories supply emergency food ration per occupant.

(b) *Frigid land areas.* The following equipment shall be provided for operations over frigid land areas:

1 first-aid kit (from airplane),
1 flashlight (from airplane),
1 machete,
1 axe (from airplane),
1 mosquito headnet for each occupant,
Sufficient insect repellent to cover the hands and faces of all occupants,
1 blanket for each occupant,
2 pairs of snowshoes,
2 pairs of Arctic shoes,
2 pairs of gloves,
6 pairs of sunglasses,
1 book on Arctic survival,
1 waterproof box of matches,
1 magnetic compass,
Sufficient water purification tablets to treat 5 quarts of water per occupant,
1 signaling mirror,
1 pyrotechnic pistol and 6 cartridges; or 6 day/night type flares,
1 small bore rifle and cartridges; or revolver and cartridges,
1 hunting knife,
2,000 calories supply emergency food ration per occupant,
1 fishing kit,
200 feet nylon rope with strength of 250 pounds, and
A supply of ½ pint of drinking water per person.

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