FEDERAL AVIATION AGENCY
FLIGHT STANDARDS SERVICE
Washington 25, D. C.

August 22, 1962

CIVIL AIR REGULATIONS DRAFT RELEASE NO. 62-39

SUBJECT: Aircraft Certification and Operation Rules for Supplemental Air Carriers, Large Commercial Operators, and Certificated Route Air Carriers Engaging in Charter Flights or Other Special Services

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The Flight Standards Service of the Federal Aviation Agency has under consideration a revision of Part 42 of the Civil Air Regulations to provide aircraft certification and operation rules for supplemental air carriers, large commercial operators, and certificated route air carriers engaging in charter flights or other special services. The reasons therefore 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 Flight Standards Service 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, and in order to insure consideration should be received on or before October 23, 1962.

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Director,
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operators and will, therefore, be rescinded.

Many of the provisions appearing in Draft Release 54–5 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 the draft release. 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 operations subject to this part.

It is recognized that several outstanding draft releases pertaining to the use of aircraft simulators for pilot training and proficiency checks, and the requirements for airborne distance measuring equipment, have not been included in this proposed revision. However, upon finalization of the rules, as a result of the outstanding draft releases, the resultant new rules will be incorporated into the revised Part 42.

The differences between the provisions of this proposal and those in current Part 42 and previous Draft Release 54–5 are too numerous to be listed in their entirety. However, some significant differences reflected in this current proposal are as follows:

1. Section 42.1 *Applicability of this part.* This section is so worded as to make clear our intent that the revised part will apply to only the following operators of aircraft: Supplemental air carriers, large commercial operators, certificated route air carriers when conducting charter flights or other special services, and air carriers conducting scheduled all-cargo operations when authorized under the provisions of Part 40, 41, or 46 of this chapter (Civil Air Regulations). The title of proposed Part 42 has also been changed to more accurately describe the type of operator to which it applies.

Since the part would apply to the persons specified in § 42.1 when using aircraft, it would govern those operations conducted with helicopters as well as those conducted with airplanes. (See § 42.26 of the proposal for rules which are specifically applicable to helicopter operations.)

2. Section 42.1 *Certificate required.* Previously issued supplemental or irregular air carrier operating certificates, and large commercial operator certificates which are in force on the effective date of this proposed part would remain valid as certificate authority to conduct operations in accordance with the new part until the expiration date specified on the certificate. Thereafter, the holder of such a certificate must obtain new certificate authority issued under Part 42 as revised in order to continue aircraft operations as a supplemental air carrier, or large commercial operator.

3. Section 42.12 *Application for original certification and renewal of certificates.* In order to provide the Agency with sufficient time to determine whether an applicant for an operating certificate is properly and adequately equipped to conduct a safe operation, it is proposed to require applications to be filed with the FAA at least 60 days prior to the date of intended operation, or 60 days prior to the date on which a certificate expires in the case of applications for renewal.

4. Section 42.13 *Issuance of operating certificate.* In this section it is proposed to include provisions under which the Administrator may deny the issuance of an operating certificate to an applicant who has previously had an air carrier operating certificate or commercial operator certificate revoked, or when any person who will be in control of or have a substantial ownership interest in the applicant has previously exercised control over any other operator whose air carrier or commercial operator certificate has been revoked.

5. Section 42.16 *Duration of certificate.* In the interest of safety, a person who qualifies for, and is issued, an operating certificate required by this proposed part must continue to meet the certificate and other requirements of the part upon which initial issuance of the certificate was based. Under the provisions of this section an operating certificate issued under the proposed part may be suspended or revoked by the Administrator for any cause which, at the time of suspension or revocation, would have been grounds for denying the holder of such certificate a like certificate.

6. Sections 42.18, 42.19, 42.21 *Operations specifications.* The rules of these sections separate the operations specifications from the operating certificate, specify the contents of the operations specifications, and set forth the procedures which govern amendments to them.

All of the operations specifications currently issued under Part 42 to individual operators contain certain rules which are substantially the same. Since such rules are standard in nature, it is appropriate to remove them from the operations specifications of the individual operators and incorporate them, without substantive change, in revised Part 42 as rules of general applicability. This has been done in this proposal.

7. Section 42.22 *Inspection authority.* The scope of this proposed section is sufficiently broad to permit an authorized representative of the Administrator to inspect and examine the financial books and records of an operator. Such inspection authority is considered essential to the successful administration and enforcement of this proposed part, since the intermingling of financial and operational information of a company is such that in evaluating the safety of operations the Agency must be able to enter or approach such evaluation through information which may be available in the financial records of the company. However, the authority of § 42.22 will not be used by the Agency to duplicate any audit requirements imposed by the Civil Aeronautics Board.

8. Section 42.26 *Helicopter requirements; deviations.* This section recognizes that certain of the provisions of Part 46 of this chapter (Civil Air Regulations) which govern helicopter operations are also appropriate for helicopter operations subject to this proposed part. The provisions of this proposed part from which helicopter operations are excepted and the provisions of Part 46 which apply in lieu thereof are specified in § 42.26.

9. Section 42.27 *Management personnel required.* This section requires each operator to show that it has a sufficient number of qualified management personnel employed on a full-time basis to provide the highest degree of safety in its operations.

The rule specifies the positions such persons must occupy and requires their duties, responsibilities, and authority to be set forth in the General Policy Section of each Operator's Manual. Within 10 days after making any change in the assignment of individuals to the positions specified, the operator must notify the FAA of the change.

10. Section 42.28 *Qualification requirements for management personnel.* This section establishes minimum requirements which management personnel must meet to qualify for the positions of Director of Operations, Chief Pilot, Director of Maintenance and Airworthiness, and Director of Quality Control. These requirements are considered necessary to insure that such management personnel have qualifications commensurate with the important safety duties and responsibilities of their positions.

11. Section 42.37 *Servicing and maintenance facilities.* It will be noted that this section requires an operator to show that he has competent personnel and adequate facilities and equipment for, among other things, refueling.

12. Section 42.38 *Dispatch and flight following systems.* Each operator would be required to establish an approved dispatch system, using certificated dispatchers, or an approved flight following system. The operations specifications issued to the operator will specify which of the two systems the operator is authorized to use and the location of the dispatch or flight following centers.

13. Section 42.39 *Flight following system.* To obtain authority to use a flight following system, this section would require an operator to show that he has adequate facilities and personnel to provide flight crews and the individuals designated by the operator for operational control of the aircraft with all information necessary for the initiation and safe conduct of each flight. The operator must also show that he has a means of communication to monitor each flight's progress with respect to its departure and arrival at the point of origin and destination, including intermediate stops and any diversions therefrom, and maintenance or mechanical delays encountered at such points or stops. In addition, it must be shown that persons who perform flight following functions, and those designated by the operator for operational control of the aircraft, are capable of performing their required duties.

We believe the rules proposed herein for a flight following system will enable operators subject to this proposed revision of Part 42 to maintain better operational control of their aircraft and thus conduct safer operations.

14. Sections 42.206 and 42.208 *Equipment for extended overwater operations*

(As published in the Federal Register on August 22, 1962 (27 F.R. 8356)

FEDERAL AVIATION AGENCY

[14 CFR Part 42]

[Regulatory Docket No. 1347; Draft Release No. 62-39]

AIRCRAFT CERTIFICATION AND OPERATION RULES FOR SUPPLEMENTAL AIR CARRIERS, LARGE COMMERCIAL OPERATORS, AND CERTIFICATED ROUTE AIR CARRIERS ENGAGING IN CHARTER FLIGHTS OR OTHER SPECIAL SERVICES

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 has under consideration a proposal to revise Part 42 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 A-103, 1711 New York Avenue NW., Washington 25, D.C. All communications received on or before October 23, 1962, will be considered by the Administrator before taking action on the proposed rules. The proposals contained in this notice may be changed in light of comments received. All comments submitted will be available in the Docket Section for examination by interested persons at any time.

A revision of Part 42 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 54-5 dated February 25, 1954, (not published in FEDERAL REGISTER).

The Board's proposal took cognizance of those areas wherein supplemental or irregular air carrier operations differ from those of certificated route air carriers (scheduled). It also recognized the many areas in which such operations are similar, and attempted to achieve as much uniformity in such areas as is practicable between the provisions of Part 42 and those contained in Parts 40 and 41 of this chapter (Civil Air Regulations). Subsequent to the issuance of that draft release the safety rule making authority was transferred to the Federal Aviation Agency by the Federal Aviation Act of 1958. However, the Agency decided to postpone further action on Draft Release 54-5 pending the issuance of a revised Part 41 which would incorporate in that part rules reflecting current concepts for the certification and operation of international air carriers.

Currently effective Part 42 prescribes the certification and operating rules for large irregular or supplemental air carriers operating in interstate, overseas, or foreign air transportation. It also applies to scheduled air carriers when conducting charter flights or other special services, air carriers authorized by the Board to engage in scheduled air transportation of cargo, commercial operators operating under the authority of Part 45, and to air taxi operators operating pursuant to Special Civil Air Regulation No. SR-395A.

This proposed revision of Part 42 will apply to the following operators of aircraft: supplemental air carriers, large commercial operators, certificated route air carriers when conducting charter flights or other special services, and air carriers conducting scheduled all-cargo operations when authorized under the provisions of Part 40 or 41.

There are two basic reasons for this proposed revision of Part 42:

First, the Agency agrees with the opinion expressed in the Board's Draft Release 54-5 that the same safety standards should apply to supplemental or irregular air carriers and certificated route air carriers wherever practicable. Moreover, in those instances where the inherent differences in the types of operations require a difference, the rules should incorporate substantially equivalent safety standards. While this objective has been sought in existing regulations, differences in form and language of the parts concerned frequently led to differences in operating practices which did not achieve this objective.

Second, it is believed that the current requirements need to be restated, clarified, and in certain instances brought up to date to incorporate current practices. To accomplish this, the organization of this proposed revision of Part 42 follows the same general format as Part 40 and the recently adopted revision of Part 41. When applicable, the same wording and numbering system as appears in Part 40 and the revised Part 41 have been used. This procedure thus provides uniformity and greater ease in the understanding and administration of these regulations.

Although current Part 42 contains regulations governing both large and small aircraft operations this proposal does not contain separate rules for large and small aircraft operations. However, an air carrier conducting operations subject to this part with small aircraft may be permitted to apply for operations specifications authorizing him to conduct those operations under Part 47. When Part 47 is adopted and becomes effective, it will primarily govern small aircraft operations conducted by air taxi and commercial operators. Also, when this proposed revision of Part 42 is adopted and becomes effective it will govern large aircraft operations conducted by commercial operators. As a consequence, when Parts 47 and revised Part 42 are both effective present Part 45 will no longer be needed to govern commercial

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APPLICABILITY AND DEFINITIONS

§ 42.1 Applicability of this part.

(a) This part prescribes the rules governing:

(1) A supplemental air carrier when engaging in supplemental air transportation;

(2) A certificated route air carrier when engaging in charter flights or other special services;

(3) A certificated route air carrier when engaging in scheduled cargo-only operations authorized under the provisions of Part 40, 41, or 46 of this chapter (Civil Air Regulations); and

(4) A commercial operator when carrying persons or property in air commerce for compensation or hire in large aircraft.

NOTE: Under circumstances where it is doubtful whether the operations are for "compensation or hire," the test to be applied is whether the carriage by air is merely incidental to the operator's other business or is, in and of itself, a major enterprise for profit.

(b) The provisions of this part are also applicable to any airman or other person employed or used by an air carrier or commercial operator in the conduct of its operations subject to this part (including the operation, inspection, maintenance, and overhaul of aircraft), and any person while on board an aircraft operated by an air carrier or commercial operator under the provisions of this part.

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

Unless otherwise specified in this part or the operations specifications of the operator, 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.* 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.* 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.

§ 42.5 Definitions.

As used in this part, the terms found herein 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, or any person to whom he has delegated his authority in the matter concerned.

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.

Aircraft. Aircraft means a device that is used or intended to be used for flight in the air.

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 alernate 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 aircraft in flight (including communication equipment, electronic devices, and any other mechanism or mechanisms installed in or attached to aircraft 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.

Cargo aircraft. A cargo aircraft is an aircraft which is used for the carriage of property, cargo, or mail only.

Check airman. A check airman is an airman designated by the operator and approved by a representative of the Administrator to examine other airmen to determine their proficency with respect to procedures and technique and their competence to perform their respective airman duties.

Commercial operator. A commercial operator is a person who, for compensation or hire, engages in the carriage by aircraft in air commerce of persons or property, other than as an air carrier or foreign air carrier or under the authority of Part 375 of this title. It includes a person engaging in operations (1) as a private carrier (or contract carrier) for hire, or (2) as a common carrier on an intrastate basis.

Crewmember. A crewmember is any individual assigned by an operator for the performance of duty on an aircraft in flight.

Critical engine. Critical engine means the engine whose failure would most adversely affect the performance or handling qualities of an aircraft.

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.)

Dispatch or flight release. A dispatch or flight release is an authorization issued in accordance with the provisions of this part 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 takeoff 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 the 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.

Exclusive use of aircraft. Exclusive use of an aircraft means the sole possession, control, and use of an aircraft for flight by an operator arising from either: (a) A lease or other agreement or arrangement under which the operator is to have the right to such possession, control, and use for a period of at least 6 consecutive months from the date of such lease or other agreement or ar-

rangement; or (b) ownership of the aircraft.

Extended overwater operations. 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 aircraft 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 aircraft.

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 aircraft.

Flight time. Flight time is the time from the moment the aircraft 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.

Large aircraft. A large aircraft is an aircraft of more than 12,500 pounds maximum certificated takeoff weight.

Maximum certificated takeoff weight. Maximum certificated takeoff weight is the maximum takeoff weight authorized by the terms of the aircraft airworthiness certificate or the Aircraft 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 an authorized representative of the Administrator to an operator pursuant to the provisions of this part.

Operator. An operator is an air carrier or commercial operator subject to the provisions of this part.

Over-the-top. Over-the-top means the operation of an aircraft 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.

Passenger-carrying aircraft. A passenger-carrying aircraft is an aircraft carrying any individual other than a flight crewmember or other crewmember, company employee, or an authorized government representative, or individuals accompanying shipments.

Pilot in command. The pilot in command is the pilot designated by the operator as the pilot responsible for the operation and safety of the aircraft during the times 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 aircraft 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.

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.

Route. A route is the airspace on either side of a course joining those points on the surface of the earth between which an operator engages in air transportation or air commerce.

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 takeoff of aircraft.

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

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 operator's operating certificate and at any time thereafter upon request.

Supplemental air carrier. A supplemental air carrier is an air carrier holding economic authority from the Board which authorizes it to engage in supplemental air transportation.

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 climbout 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 aircraft 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 chapter (Civil Air Regulations) or the transport category requirements of Part 4a of this chapter (Civil Air Regulations).

Type. With regard to airman qualifications, type means all aircraft 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_1}. V_{s_1} 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

§ 12.10 Certificate required.

No person shall conduct operations to which this part is applicable without, or in violation of the terms of, the operating certificate required by this section. Certificates currently in force on the effective date of this part shall be deemed to be certificates issued under this section, but shall expire on the date specified thereon.

(a) *Air carrier operating certificate.* (1) An air carrier operating certificate issued under this part is required in order to conduct operations as an air carrier in air transportation, except that a certificated route air carrier is not eligible for or required to obtain an air carrier operating certificate issued under this part to conduct charter flights or other special services. Such an air carrier must obtain authority to conduct charter flights or other special services by appropriate amendments to its operations specifications issued to it as the holder of an air carrier operating certificate issued under Part 40, 41, or 46 of this chapter (Civil Air Regulations).

Note: See § 42.24 for authorization to conduct on-route and off-route charter flights and special services.

(b) *Commercial operator certificate.* A commercial operator certificate issued under this part is required in order to engage with large aircraft in the carriage of persons or property for compensation or hire in air commerce, except that the holder of an air carrier operating certificate is not eligible for or required to obtain a commercial operator certificate to engage in such carriage.

§ 42.11 Contents of certificate.

An operating certificate issued under this part contains the name of the operator, a description of the type of operations authorized, and the date on which the certificate is issued and the date on which it terminates.

§ 42.12 Application for original certification and renewal of certificates.

(a) An application for the original issuance or renewal of an operating certificate required by this part is made on an FAA application form which may be obtained at any FAA Air Carrier District Office and is submitted at least 60 days prior to the date of intended operations or to the expiration date of the certificate in the case of an application for renewal to the FAA Air Carrier District Office in whose area the applicant proposes to establish his principal base of operations or has established such base of operations.

(b) The applicant shall also submit with the application a signed statement showing:

(1) If the applicant is a corporation:

(i) The names and addresses of all stockholders, and the amount of stock held by each; and

(ii) The names and addresses of all directors and officers; or

(2) If the applicant is not a corporation:

(i) The names and addresses of all persons having a financial interest therein and the nature and extent of such interest; and

(ii) The names and addresses of all persons who have charge of the management and control of such applicant.

(c) If there is any change in the names or addresses of the persons shown under the provisions of paragraph (b) of this section, subsequent to the filing of the application, an amended application showing the change shall be submitted within 10 days of the change. The amended application shall be sent to the FAA Air Carrier District Office for the area in which the operator's principal operations base is located.

(d) An applicant for the original issuance or renewal of a commercial operator certificate shall submit with the application:

(1) A signed statement showing the nature and scope of its intended operation, including the name of each person with whom the applicant has a contract to provide services as a commercial operator and the date and duration of each such contract.

(2) A signed statement showing assets and liabilities as of a date not exceeding 30 days prior to the date of the application and showing profit and loss for a fiscal year ending at a date not more than 30 days prior to the date of the application, with separation of items relating to applicant's commercial operator activities from other business activities of the applicant; an itemization of liabilities showing amount, names and addresses of creditors, description of nature of indebtedness, and date of incurrence of obligations; an itemization of outstanding judgments showing amounts, name and address of creditor, and description of nature of the claim; and such further financial information as may be required by the Administrator to enable him to determine that the applicant has sufficient financial resources to conduct its operations with the degree of safety required in the public interest.

§ 42.13 Issuance of operating certificate.

(a) An air carrier operating certificate or commercial operator certificate is issued to an applicant who is a citizen of the United States, if the Administrator after investigation finds that the applicant:

(1) Has such economic authority as the Board may require, and

(2) Is properly and adequately equipped and able to conduct a safe operation in accordance with the requirements of this part and the operations specifications provided for in this part.

(b) The Administrator may deny an application for an air carrier or commercial operator certificate if he finds:

(1) That an air carrier or commercial operator certificate previously issued to the applicant has been revoked; or

(2) That a person who has occupied a management position with, or exercised control with respect to, any other operator whose air carrier or commercial operator certificate has been revoked:

(i) Will be employed in a management position as specified in § 42.27, or

(ii) Will be in control of or have substantial ownership interest in the applicant's operation.

§ 42.14 Amendment of operating certificate.

(a) An operating certificate may be amended by the Administrator in accordance with section 609 of the Federal Aviation Act of 1958, and the applicable procedures of Part 408 of the Regulations

of the Administrator whenever he determines that safety in air commerce or air transportation and the public interest so require.

(b) Upon application by an operator, an authorized representative of the Administrator may amend an operating certificate if he determines that safety in air commerce or air transportation and the public interest permit such an amendment. Within 30 days after the refusal of an authorized representative of the Administrator to approve an operator's application for amendment, the operator may petition the Administrator for a review of such refusal.

(c) Applications for amendments to operating certificates shall be submitted to the local FAA Air Carrier District Office charged with the overall inspection of the operator 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.

§ 42.15 Display of certificate and operations specifications.

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

§ 42.16 Duration of certificate.

(a) An operating certificate issued under this part shall remain in effect for a period of one year, unless sooner surrendered, revoked, or otherwise terminated by order of the Administrator, but shall also terminate upon the termination of any economic authorization required by the Board. Upon suspension, revocation, or other termination, it shall be returned to the Administrator.

(b) An operating certificate issued under this part may be suspended or revoked by the Administrator for any cause which, at the time of suspension or revocation, would have been grounds for denying the holder of such certificate an application for a like certificate.

§ 42.18 Operations specifications required.

(a) On and after the effective date of this revision, all operations specifications issued pursuant to the provisions of this Part 42 prior to such date of revision, shall cease to be a part of an air carrier operating certificate or a commercial operator certificate.

(b) No person shall conduct operations subject to this part without, or in violation of, currently effective operations specifications issued under this part. Operations specifications in force on the effective date of this revision shall be deemed to be currently effective operations specifications issued under this part. Operations specifications shall terminate upon the expiration of the operating certificate issued to the operator, unless such certificate is renewed in accordance with the provisions of this part.

NOTE: Forms for initial applications for operations specifications are furnished upon request to an FAA Air Carrier District Office.

§ 42.19 Contents of operations specifications.

The operations specifications contain the following:

(a) Types of operations authorized;

(b) Types and registration numbers of airplanes authorized for use;

(c) En route authorizations and limitations, including areas of operations;

(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 aircraft;

(g) Interline equipment interchange requirements, if pertinent; and

(h) Such additional items as the Administrator determines are necessary to cover a particular situation.

§ 42.20 Utilization of operations specifications.

The operator 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 operator as a separate and complete document. Pertinent excerpts from the specifications or references thereto shall be inserted in the manual issued by the operator in such a manner that they do not lose their identity in any respect.

§ 42.21 Amendment of operations specifications.

The following procedures apply to the amendment of operations specifications issued to an operator under the provisions of this part:

(a) Upon application by the operator an authorized representative of the Administrator may amend an operations specification if he determines that safety in air commerce or air transportation and the public interest permits such an amendment;

(b) An authorized representative of the Administrator may amend an operations specification if he determines that safety in air commerce or air transportation and the public interest requires such an amendment;

(c) Except in the case of an emergency requiring immediate action with respect to safety in air commerce or air transportation, or upon consent of the operator concerned, an amendment shall not become effective prior to 30 days from the date that the operator has been notified of such amendment;

(d) Within 30 days after a notice of amendment or refusal to approve an operator's application for amendment, the operator may petition the Administrator to reconsider the amendment or refusal to amend. Except in the case of an emergency amendment, the filing of a petition for reconsideration shall stay the effectiveness of an amendment pending a decision by the Administrator;

(e) Applications for amendments of operations specifications shall be submitted to the local FAA Air Carrier District Office charged with the overall inspection of the operator'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.

§ 42.22 Inspection authority.

An authorized representative of the Administrator shall be permitted at any time and place to make inspections or examinations (including inspections and examinations of financial books and records) to determine an operator's compliance with the requirements of the Federal Aviation Act of 1958, as amended, the Civil Air Regulations, the provisions of the operator's operating certificate, and the operations specifications, or the operator's eligibility to continue to hold a certificate. Such authority shall not be exercised to duplicate any audit requirements imposed on an operator by the Civil Aeronautics Board.

§ 42.23 Operations and maintenance base and office.

Each operator 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 District Office charged with overall inspection of the operator's operations.

§ 42.24 Charter trips or other special service operations by certificated route air carriers.

(a) *On-route operations.* A certificated route air carrier holding an operating certificate and operations specifications issued pursuant to Part 40, 41, or 46 of this chapter (Civil Air Regulations) may elect to conduct charter flights or other special services over routes and into airports listed in such operations specifications under the provisions of either this part or the applicable provisions of Part 40, 41, or 46.

(b) *Off-route operations.* A certificated route air carrier holding an operating certificate and operations specifications issued pursuant to Part 40, 41, or 46 of this chapter (Civil Air Regulations) shall conduct under the provisions of this part any charter flights or other special services which involve in whole or in part off-route operations.

(c) *Special requirements.* If a scheduled air carrier conducts any charter flights or other special services under the authority of paragraphs (a) and (b) of this section, its operations specifications issued pursuant to Part 40, 41, or 46 shall be appropriately amended.

§ 42.25 Deviation authority.

(a) Contrary provisions of this part notwithstanding, the Administrator may, upon application by an operator, authorize deviations from the provisions of this part by an appropriate amendment to the operations specifications of the operator for the following:

(1) Operations conducted pursuant to a contract with the military services (primary contractor), or operations conducted for the military services pursuant to a subcontract with a primary con-

tractor if the Department of Defense certifies to the Administrator that the operation is essential to the national defense and requires the requested deviation, and the Administrator finds that the deviation is not based upon an economic advantage or convenience to either the operator or the government, or both; and

(2) Operations under conditions of an emergency necessitating the transportation of persons or supplies for the protection of life or property, if an authorized representative of the Administrator finds that such a deviation is necessary for the expeditious conduct of such operations.

(b) An operator authorized deviations under this section shall, in the conduct of operations pursuant thereto, comply with the terms, conditions, and limitations of the authorization issued. Grants of deviation authority issued pursuant to this section may be terminated at any time by the Administrator.

§ 42.26 Helicopter requirements; deviations.

(a) Persons subject to this part when conducting operations with helicopters shall comply with the provisions of this part, except those applicable to airplanes only. In lieu of those provisions applicable to airplanes only, an operator of helicopters shall comply with the following provisions of Part 46 of this chapter (Civil Air Regulations): §§ 46.70, 46.71, 46.110, 46.153, 46.170–46.178, 46.200, 46.206, 46.230, 46.231, 46.265, 46.280–46.289, 46.300–46.302, 46.381–46.412, and 46.500–46.511.

(b) An authorized representative of the Administrator may authorize a deviation from any specific requirement for helicopter operations subject to this part, if he finds that such deviation provides a substantially equivalent standard of safety.

NOTE: Deviations under this section will be authorized by the FAA Air Carrier Inspector responsible for the approval of the operator's certificate and will be specified in the operations specifications of the operator.

§ 42.27 Management personnel required.

(a) The operator shall show that it has a sufficient number of qualified management personnel to provide the highest degree of safety in its operations. Such personnel shall be employed on a full-time basis in the following positions or their equivalent:

(1) General Manager;

(2) Director of Operations, except that a person serving as General Manager may also serve as Director of Operations if qualified;

(3) Director of Maintenance and Airworthiness;

(4) Chief Pilot; and

(5) Director of Quality Control.

(b) Upon application by the operator, the Administrator may approve different positions or numbers of positions for a particular operation than those specified in paragraph (a) of this section. Such approval may be granted if the operator shows that due to the type of operation involved, number and type of aircraft used, and area of operations, it is capable of performing the operation with the highest degree of safety, under the direction of fewer or different categories of management personnel.

NOTE: When such approval is given to an operator, the title and number of positions approved are specified in the operations specifications of the operator.

(c) The duties, responsibilities, and authority of such personnel shall be set forth in the General Policy Section of the Operator's Manual. The operator shall also list in the manual the names and addresses of the individuals assigned to these positions. Within at least 10 days, the operator shall notify the FAA Air Carrier District Office charged with overall inspection of the operator of any change made in the assignment of individuals to these positions.

§ 42.28 Qualification requirements for management personnel.

(a) *Director of Operations.* The Director of Operations shall:

(1) Hold or have held an Airline Transport Pilot Certificate;

(2) Have had a minimum of 3 years of experience as pilot in command of large aircraft with an air carrier or commercial operator; and

(3) Be familiar with the operations manual and the Civil Air Regulations to the extent necessary to carry out his duties.

(b) *Chief Pilot.* The chief pilot shall:

(1) Hold a current Airline Transport Certificate with appropriate ratings for the type of aircraft used;

(2) Have had a minimum of 3 years experience as a pilot in command of a large aircraft with an air carrier or commercial operator; and

(3) Be thoroughly familiar with the operator's manual, operation specifications, and the provisions of this part.

(c) *Director of Maintenance and Airworthiness.* The Director of Maintenance and Airworthiness shall:

(1) Hold a mechanic certificate with either an airframe or powerplant rating, and have a minimum of 5 years of experience in the maintenance of large aircraft, one year of which shall have been in a supervisory capacity; and

(2) Be thoroughly familiar with the maintenance portions of the operator's manual and the applicable maintenance provisions of this chapter (Civil Air Regulations).

(d) *Director of Quality Control.* The Director of Quality Control shall:

(1) Hold a mechanic certificate with both airframe and powerplant ratings, and have held these ratings for at least 3 years;

(2) Have a minimum of 3 years of diversified maintenance experience on large aircraft with an air carrier, commercial operator, or certificated repair station, one year of which shall have been as a maintenance inspector; and

(3) Be thoroughly familiar with the maintenance portions of the operator's manual, and the applicable maintenance provisions of this chapter (Civil Air Regulations).

§ 42.29 Operation of small aircraft under Part 47 of this chapter.

Upon application by an air carrier conducting operations subject to this part, if an authorized representative of the Administrator finds that safety in air transportation and the public interest permits, he may issue to the air carrier operations specifications authorizing such operations to be conducted with small aircraft under Part 47 of this chapter and containing such operating limitations and requirements as he determines are necessary.

REQUIREMENTS FOR APPROVAL OF AREAS AND ROUTES

§ 42.30 General area and route requirements.

(a) *Areas.* The operator shall show that it is competent to conduct operations within the United States in accordance with the route requirements specified in paragraph (b) of this section, and in addition shall show that it is competent to conduct operations in accordance with the applicable requirements for each area outside the United States for which authorization is requested.

(b) *Routes.* The operator shall show that it is equipped and competent to conduct operations over, and use the air navigation facilities associated with, Federal airways, foreign airways, or Advisory routes (ADR) to be used. In addition, for routes outside of controlled airspace, the operator shall show that traffic density does not constitute a hazard. Actual flight over a route or route segment will be required, unless the operator shows that such flight is not essential to safety, considering the availability and adequacy of airports, lighting, maintenance, communications, navigation, fueling, ground and aircraft radio facilities, and the competence of the personnel to be used in the proposed operations.

§ 42.31 Width of routes.

Routes approved for operations over U.S. Federal airways, foreign airways, or advisory routes (ADR's) shall have a width equal to the designated width of such airways or advisory routes. In case of other approved routes, when an authorized representative of the Administrator determines it necessary he shall establish route widths taking into consideration terrain clearance, minimum en route altitudes, available ground and airborne navigational aids, air traffic density, and air traffic control procedures. In such instances, the route widths shall be specified in the operator's operations specifications.

§ 42.33 Airports.

The operator shall use only airports which are properly equipped and adequate for the type of operations to be conducted. Consideration shall be given to items such as size, surface, obstructions, facilities, lighting, navigation and communication aids, and air traffic control.

§ 42.35 Weather reporting facilities.

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. For those operations outside

the U.S. or at U.S. military airports for which such reports are not available, the weather reports may be those prepared by a source found by the Administrator to be satisfactory. Forecasts used to control flight movements shall be prepared from such weather reports.

§ 42.36 En route navigational facilities.

Operations shall not be conducted over a route unless nonvisual ground aids to air navigation are available and in operation along the route, are so located as to permit navigation to any airport of destination or alternate airport within the degree of accuracy necessary for the operation involved, and are available for the navigation of aircraft within the degree of accuracy required for air traffic control: *Provided*, That nonvisual ground aids to navigation are not required for (a) day VFR operations where the characteristics of the terrain are such that navigation can be conducted by pilotage, (b) night VFR operations on lighted airways or on other routes the Administrator has determined have reliable landmarks which are adequate for safe operations, or (c) operations on segments of routes where the use of celestial or other specialized means of navigation is approved.

§ 42.37 Servicing and maintenance facilities.

The operator shall show that competent personnel and adequate facilities and equipment, including spare parts, supplies, and materials, are available for the proper servicing, refueling, maintenance, repair, and inspection of aircraft and auxiliary equipment.

§ 42.38 Dispatch and flight following systems.

(a) *General.* The operator shall show that it has at such points within the areas in which it proposes to conduct operations either an approved dispatch system or an approved flight following system, established in accordance with the provisions of this part, which is adequate for the operations to be conducted. An operator may arrange for dispatch and flight following facilities to be provided by persons other than employees of the operator. However, in such case, the operator shall continue to have primary responsibility for operational control of each flight.

(b) *Locations.* (1) If the operator elects to use a dispatch system, it 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.

(2) If the operator elects to use a flight following system, it shall show that it has a sufficient number of flight following centers adequate for the operations to be conducted and located at such points as are necessary to insure monitoring the progress of each flight and providing the pilot with all information necessary for the safety of the flight.

NOTE: The operations specifications issued to the operator will specify which of the two systems the operator is authorized to use and the location of the centers.

§ 42.39 Flight following system.

(a) An operator using a flight following system shall show that the system:

(1) Has adequate facilities and personnel to provide the flight crews of the aircraft and the individuals designated by the operator for the operational control of the aircraft with all information necessary for the initiation and safe conduct of each flight;

(2) Has a means of communication to monitor the progress of each flight with respect to its departure and arrival at the point of origin and destination, including intermediate stops and any diversions therefrom, and maintenance or mechanical delays encountered at such points or stops.

(b) The operator shall show that the personnel specified in paragraph (a) of this section, and those designated by the operator for the operational control of the aircraft, are capable of performing their required duties.

MANUAL REQUIREMENTS

§ 42.50 Preparation of Operations Manual.

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

§ 42.51 Contents of Operations 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 responsibilties of each crewmember and appropriate members of the ground organization and management personnel;

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

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

(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 the types of aircraft authorized, their crew complement, the type of operation (i.e., VFR, IFR, day, night) and other pertinent information;

(7) Appropriate information from an airport operations specification covering instrument approach procedures, landing and takeoff minimums, and other pertinent information for any airport to be used;

(8) Takeoff, en route, and landing weight limitations; or approved means of readily determining these 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, rotors, and appliances, or standards by which such time limitations shall be determined;

(17) Procedures for refueling aircraft, 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 aircraft weight and center of gravity within approved limits;

(20) Pilot, and when appropriate, 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 operator.

§ 42.52 Distribution of Operations Manual.

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

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

(2) Crewmembers; and

(3) Authorized representatives of the Administrator assigned to the operator.

(b) Appropriate portions of the manual shall be carried aboard each aircraft at all times when away from the principal base and be available for use of ground or flight personnel.

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

§ 42.53 Aircraft Flight Manual.

(a) The operator shall keep current an approved Aircraft Flight Manual for each type of aircraft he operates.

(b) An approved Aircraft Flight Manual or a manual complying with § 42.50 and containing information required for the Aircraft Flight Manual shall be carried in each aircraft. When sections of the required information from the Aircraft Flight Manual are incorporated in the Operations Manual, they shall be clearly identified as Aircraft Flight Manual requirements.

AIRCRAFT REQUIREMENTS

§ 42.60 Aircraft requirements.

(a) *General.* Aircraft shall be identified, certificated, and equipped in accordance with the applicable airworthiness requirements of this chapter (Civil Air Regulations). No operator shall use any aircraft in operations governed by this part unless such aircraft 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.

(b) *Exclusive use of aircraft.* An operator shall not use any aircraft in operations subject to this part unless:

(1) The operator has the exclusive use of such aircraft;

(2) The aircraft is listed in the operations specifications of the operator; and

(3) The aircraft is not listed in the operations specifications of any other air carrier or commercial operator.

(c) *Notice required.* Within 10 days from the date that an operator does not have the exclusive use of an aircraft listed in its operations specifications, it shall notify the FAA Air Carrier Inspector assigned to its operations, and request an appropriate amendment deleting the aircraft from its operations specifications.

NOTE: The operator may not operate an aircraft if it does not have exclusive use thereof. However, if the operator does not have the exclusive use of any aircraft, it no longer meets the requirements of this part, and the Administrator may, in appropriate cases, take action to suspend or revoke the operator's certificate.

§ 42.61 Aircraft 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 § 42.90, or

(2) Comply with either the performance requirements of §§ 4a.737–T through 4a.750–T of Part 4a of this chapter (Civil Air Regulations) or the performance requirements of §§ 4b.110 through 4b.125 of Part 4b of this chapter (Civil Air Regulations) and in addition shall meet the requirements of § 42.70: *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, shall be certificated as transport category airplanes and shall meet the requirements of § 42.70.

(c) *Helicopters.* Helicopters shall be certificated and equipped in accordance with the requirements of §§ 46.60 through 46.231 of Part 46 of this chapter (Civil Air Regulations).

§ 42.62 Airplane limitation for type of route.

All airplanes used 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 an authorized representative of the Administrator 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 permits or requires.

(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, C–46, and Convair 340/440 type airplanes need not be so certificated or approved.

§ 42.63 Proving tests.

(a) A type of aircraft not previously approved for use by an air carrier or commercial operater shall have at least 100 hours of proving tests, in addition to the aircraft certification tests, accomplished under the supervision of an authorized representative of the Administrator. As part of the 100-hour total, at least 50 hours shall be flown in en route operation and at least 10 hours shall be flown at night.

(b) A type of aircraft which has been previously proved for use by an air carrier or commercial operator, or in the case of helicopters has been used extensively in military service, shall be tested for at least 50 hours, of which at least 25 hours shall be flown in en route operation, unless deviations are specifically authorized by an authorized representative of the Administrator 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 aircraft:

(1) Is materially altered in design, or

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

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

(c) During proving tests only those persons required to make the tests and those designated by an authorized representative of the Administrator shall be carried. Express and other cargo may be carried when approved.

AIRPLANE PERFORMANCE OPERATING LIMITATIONS; TRANSPORT CATEGORY

§ 42.70 Transport category airplane operating limitations.

(a) In operating any transport category airplane not subject to paragraph (b) of this section, the provisions of this paragraph and §§ 42.71 through 42.78 shall be complied with: *Provided,* That an authorized representative of the Administrator may authorize deviations from such provisions when special circumstances of a particular case make a literal observance of the requirements unnecessary for safety.

NOTE: Deviations authorized will be specified in operations specifications of the operator.

(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 limitations 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 chapter (Civil Air Regulations), 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 No. 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 §§ 42.71 through 42.78.

§ 42.71 Weight limitations.

(a) No airplane shall be taken off from any airport located at an elevation outside of the altitude range for 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.

§ 42.72 Takeoff limitations to provide for engine failure.

No airplane shall be taken off except under conditions which will permit compliance with the takeoff requirements of paragraphs (a) through (c) of this section.

(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.

§ 42.73 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 chapter (Civil Air Regulations) 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.

§ 42.74 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 this chapter (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 operator 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 were a landing can be made in accordance with the provisions of § 42.78, 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) 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 operator 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 operator 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 or flight release and shall meet the provisions of § 42.390.

(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.

§ 42.75 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 § 42.78, 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, subparagraphs (1) through (3) of this paragraph 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 § 42.78 and to arrive there at an altitude of at least 1,000 feet directly over the landing area.

§ 42.76 Special en route limitations.

The 10-mile lateral distance specified in §§ 42.73 through 42.75 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.

§ 42.77 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 flight to the field of intended destination.

(a) It shall be assumed that the airplane is landed on the runway with the greatest effective length 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 § 42.78.

§ 42.78 Landing distance limitations; alternate airports.

No airport shall be designated as an alternate airport in a dispatch or flight release unless the airplane at the weight anticipated at the time of arrival at such airport can comply with the requirements of § 42.77: *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

§ 42.90 Nontransport category airplane operating limitations.

In operating any nontransport category airplane, the provisions of § 42.91 shall be complied with: *Provided*, That an authorized representative of the Administrator may authorize deviations from such provisions when the special circumstances of a particular case make a literal observance of the requirements unnecessary for safety. Approved performance data only shall be used in determining compliance with the provisions of §§ 42.91 through 42.94.

NOTE: Deviations authorized will be specified in operations specifications of the operator.

§ 42.91 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 elvations of the end points of the runway divided by the total length; and

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

§ 42.92 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 operator 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 operator 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 date. Before approving such a procedure, the authorized representative of the Administrator shall take 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 wind 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.

§ 42.93 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.

§ 42.94 Landing distance limitations; alternate airports.

No airport shall be designated as an alternate airport in a dispatch or flight release unless the airplane at the weight anticipated at the time of arrival at such airport can comply with the requirements of § 42.93: *Provided*, That the airplane can be brought to rest within 70 percent of the effective length of the runway.

SPECIAL AIRWORTHINESS REQUIREMENTS

§ 42.110 Special airworthiness requirements.

All airplanes 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 chapter (Civil Air Regulations) in effect on or after November 1, 1946, shall comply with the requirements contained in §§ 42.111 through 42.154: *Pro-*

vided, That, if the representative of the Administrator finds that in particular models of existing airplanes used in cargo service, 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 of this part.

§ 42.111 Susceptibility of materials to fire.

The Administrator shall prescribe the heat conditions and testing procedures which any specific material or individual part must meet where necessary for the purpose of applying the following defined terms: fireproof, fire-resistant, flame-resistant, flash-resistant, and flammable.

§ 42.112 Cabin interiors.

All compartments occupied or used by the crew or passengers shall comply with paragraph (a) through (d) of this section.

(a) Material 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.

§ 42.113 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.

§ 42.114 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.

§ 42.115 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 fire 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 this 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 smoke detector or fire detector other than heat 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 either the "C", "D", or "E" 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 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 subparagraphs (1) through (4) of this paragraph.

(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 subparagraphs (1) through (5) of this paragraph.

(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.

§ 42.116 Proof of compliance.

Compliance with those provisions of § 42.115 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.

§ 42.117 Propeller deicing fluid.

If combustible fluid is used for propeller deicing, the provisions of § 42.131 shall be complied with.

§ 42.118 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.

§ 42.119 Location of fuel tanks.

Location of fuel tanks shall comply with the provisions of § 42.132. 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.

§ 42.120 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.

§ 42.121 Fuel lines and fittings in designated fire zones.

Fuel lines and fittings in all designated fire zones (see § 42.131) shall comply with the provisions of § 42.134.

§ 42.122 Fuel valves.

In addition to the requirements contained in § 42.133 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.

§ 42.123 Oil lines and fittings in designated fire zones.

Oil lines and fittings in all designated fire zones (see § 42 131) shall comply with the provisions of § 42.134.

§ 42.124 Oil valves.

Requirements of § 42.133 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.

§ 42.125 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 § 42.135.)

§ 42.126 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 § 42.135.)

§ 42.127 Firewalls.

All engines, auxillary 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 firewalls or shrouds, or other equivalent means.

§ 42.128 Firewall construction.

Firewalls 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 firewall or shroud shall be sealed with close-fitting fireproof grommets, bushings, or firewall fittings. Firewalls 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.

§ 42.129 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-resistent 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.

§ 42.130 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 § 42.128.

§ 42.131 Powerplant fire protections.

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 §§ 42.132 through 42.135.

§ 42.132 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 one-half inch of clear airspace shall be provided between any tank or reservoir and a fire wall or shroud isolating a designated fire zone.

§ 42.133 Shutoff means.

Means for each individual engine shall be provided for shutting off or otherwise preventing hazardous quantities of fuel, oil, deicer, 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 § 42.132), 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.

§ 42.134 Lines and fittings.

All lines and fittings for same located in designated fire zones which carry flammable fluids or gases and which are under pressure, or which attach directly to the engine, or are subject to relative motion between components, exclusive of those lines and fittings forming an integral part of the engine, shall be flexible, fire-resistant lines with fire-resistant, factory-fixed, detachable, or other approved fire-resistant ends. Lines and fittings which are not subject to pressure or to relative motion between components shall be of fire-resistant materials.

§ 42.135 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

§ 42.134, if an authorized representative of the Administrator finds that rupture or breakage of a particular drain or vent line may result in a fire hazard.

§ 42.136 Fire-extinguishing systems.

(a) Unless the operator 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.

§ 42.137 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 extinguisher 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 satisfactory 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.

§ 42.138 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.

§ 42.139 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.

§ 42.140 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.

§ 42.141 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.

§ 42.142 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.

§ 42.143 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.

§ 42.150 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 an authorized representative of the Administrator finds that rotation could jeopardize the safety of the airplane.

§ 42.151 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 operator shows that the fuel system incorporates features which provide equivalent safety.

§ 42.152 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.

§ 42.153 Carriage of cargo in passenger compartments.

Cargo shall not be carried in the passenger compartment of an airplane except as provided in either paragraph (a) or (b) of this section.

(a) Cargo carried aft of the foremost seated passengers shall be carried in an approved cargo bin. Approved cargo bins shall meet the minimum requirements of subparagraphs (1) through (8) of this paragraph.

(1) The bin shall be capable of withstanding the load factors and emergency landing conditions applicable to the passenger seats of the airplane in which the bin is installed multiplied by a factor of 1.15. The combined weight of the bin and the maximum weight of cargo which may be carried in the bin shall be used to determine this strength.

(2) The maximum weight of cargo which the bin is approved to carry and any instructions necessary to insure proper weight distribution within the bin shall be conspicuously marked on the bin.

(3) The bin shall not impose any load on the floor or other structure of the airplane which exceeds the structural load limitations of such components.

(4) The bin shall be attached to the seat tracks or to the floor structure of the airplane, and its attachments shall withstand the load factors and emergency landing conditions applicable to the passenger seats of the airplane in which the bin is installed multiplied by either the factor 1.15 or the seat attachment factor specified for the airplane, whichever is greater. The combined weight of the bin and the maximum weight of cargo which may be carried in the bin shall be used to determine this strength.

(5) The bin shall not be installed in a position which restricts access to or use of any required emergency exit, or the use of the aisle in the passenger compartment.

(6) The bin shall be fully enclosed and constructed of material which is at least flame resistant.

(7) Suitable safeguards shall be provided within the bin to prevent the cargo from shifting under emergency landing conditions.

(8) The bin shall not be installed in a position which obscures any passenger's view of the "seat belt" or "no smoking" sign, nor shall any required exit sign be blocked from view, unless an auxiliary sign or other approved means for proper notification of such passenger is provided.

(b) Cargo carried forward of the foremost seated passengers shall be carried either in approved cargo bins as specified in paragraph (a) of this section, or in accordance with the requirements of subparagraphs (1) through (5) of this paragraph.

(1) It shall be properly secured by means of safety belts or other tiedowns having sufficient strength to eliminate the possibility of shifting under all normally anticipated flight and ground conditions.

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

(3) It shall not impose any load on seats or the floor structure which exceeds the structural load limitation for those components.

(4) It shall not be located in a position which restricts the access to or use of any required emergency or regular exit, or the use of the aisle in the passenger compartment.

(5) It shall not be located in a position which obscures any passenger's view of the "seat belt" or "no smoking" sign, nor shall any required exit sign be blocked from view, unless an auxiliary sign or other approved means for proper notification of such passenger is provided.

§ 42.154 Carriage of cargo in cargo compartments.

When cargo is carried in cargo 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 a crewmember to effectively reach all parts of the compartment with the contents of a hand fire extinguisher.

INSTRUMENTS AND EQUIPMENT FOR ALL OPERATIONS

§ 42.170 Airplane instruments and equipment for all operations.

(a) Instruments and equipment required by §§ 42.171 through 42.233 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 § 42.391(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 § 42.110 and §§ 42.150 through 42.154; and

(2) Instruments and equipment specified in §§ 42.171 through 42.179 for all operations, and the instruments and equipment specified in §§ 42.200 through 42.233 for the type of operation indicated, wherever these items are not already provided in accordance with subparagraph (1) of this paragraph.

NOTE: Instruments and equipment specified in §§ 42.171, 42.172, and 42.230 through 42.233 are approved in accordance with one or more of the following:

(a) As a part of the original airplane type design;

(b) Under applicable Technical Standard Orders and installed under original airplane type certification, or subsequent installation in accordance with airworthiness and alteration requirements (Parts 1 and 18 of this chapter (Civil Air Regulations)); or

(c) Under an PAA type certificate and installed under original aircraft certification, or subsequent installation in accordance with airworthiness and alteration requirements (Parts 1 and 18 of this chapter (Civil Air Regulations)).

§ 42.171 Flight and navigational equipment for all airplane operations.

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

(a) An airspeed indicating system with heated pitot tube or equivalent means for preventing malfunction 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).

§ 42.172 Engine instruments for all airplane operations.

The following engine instruments are required for all operations, except that an authorized representative of the Administrator 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.

§ 42.173 Emergency equipment for all airplane operations.

(a) *General.* The emergency equipment specified in this section is required for all operations and shall be inspected regularly in accordance with inspection periods established in the operations specifications to insure the continued serviceability and immediate readiness of such equipment for its intended emergency purposes. 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 requirements of subparagraphs (1) through (3) of this paragraph.

(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 passengers, at least 2 fire extinguishers shall be provided. None need be provided in passenger compartments 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 PAA, or an extinguisher which is otherwise approved in accordance with the provisions of § 4b.18 of Part 4b of this chapter (Civil Air Regulations).

(c) *First-aid equipment.* Approved first-aid kits as specified in Appendix A to this part for the treatment of injuries likely to occur in flight or in minor accidents shall be provided.

NOTE: See Appendix A for type and contents of first-aid kits.

(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 immediate installation and 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, 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 de-

signed 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. When such lights require arming of the system to function automatically, the system shall be armed prior to each takeoff and landing. When such lights require manual operation to function, they shall be turned on prior to each takeoff and landing.

§ 42.174 Seats and safety belts for all occupants of airplanes.

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

(1) An approved seat or berth for each person over 2 years of age aboard the airplane, and

(2) An approved safety belt for separate use by each person over 2 years of age 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 en route flight only.

(b) During takeoff and landing of the airplane, each person on board shall occupy an approved seat or berth and secure themselves with the approved safety belt provided for the occupant of such seat or berth, 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 provided for the occupant of a seat shall not be used by more than one adult during takeoff and landing.

§ 42.175 Miscellaneous equipment for all airplanes.

If protected fuses are installed on an airplane, spare fuses of a number approved for the particular airplane and appropriately described in the air carrier manual shall be carried aboard the airplane. In addition, the following equipment shall be installed in the airplane:

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

(b) 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 operator 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 airplane power and distribution systems which meet the requirements of §§ 4b.606 (a), (b), and (c); 4b.612(c); 4b.622 (a) and (b); 4b.623(c); 4b.625; and 4b.650 (b) of this chapter (Civil Air Regulations) comply with the requirements of paragraph (c) of this section.

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

(d) Two independent static pressure systems, so vented to the ouside atmospheric pressuse that they will be least affected by airflow 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.

(e) 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.

§ 42.176 Cockpit check procedure for all airplane operations.

The operator 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 system 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 procedure shall be readily usable in the cockpit of each airplane and shall be followed by the flight crew when operating the airplane.

§ 42.177 Passenger information for all airplane operations.

All airplanes shall be equipped with signs visible to the 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.

§ 42.178 Exterior exit and evacuation markings for all airplane operations.

The 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.

§ 42.179 Shoulder harness.

All transport type airplanes certificated after January 1, 1958, 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

§ 42.200 Instruments and equipment for airplane operations at night.

Each airplane operated at night shall be equipped with the following instruments and equipment in addition to those required by §§ 42.171 through 42.179:

(a) Position lights;

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

(c) Two landing lights;

(d) 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, and a means of controlling the intensity of illumination shall be provided unless it is shown that nondimming instrument lights are satisfactory;

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

(f) A second sensitive altimeter.

§ 42.201 Instruments and equipment for airplane 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 §§ 42.171 through 42.179:

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

(b) A second 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, and a means of controlling the intensity of illumination shall be provided unless it is shown that nondimming instrument lights are satisfactory.

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

(a) *General.* Except where supplemental oxygen is provided in accordance with the requirements of § 42.203, 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 alti-

tude 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 operator 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 of 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 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.

§ 42.202–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 operator 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; and

(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.

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

When operating pressurized cabin airplanes, the operator shall so equip such airplanes as to permit compliance with the requirements of paragraphs (a) through (c) of this section in the event of cabin pressurization failure:

(a) *For crewmembers.* When operating such airplanes at flight altitudes above 10,000 feet, the operator 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 § 42.205 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 operator shall provide amounts of oxygen as required by subparagraphs (1) through (3) of this paragraph.

(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 § 42.202(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 § 42.202(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 § 42.202(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 stand-

point 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.

§ 42.203–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 operator shall furnish oxygen and dispensing equipment necessary to permit compliance with the requirements set forth in paragraphs (b) through (e) of this section in the event of cabin pressurization failure.

(b) *Crewmembers.* When operating at flight altitudes above 10,000 feet, oxygen shall be provided to permit compliance with § 42.202–T except that not less than a 2-hour supply be provided for the flight crewmembers on flight deck duty. The oxygen required by § 42.205 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) When operating at flight altitudes above 25,000 feet, each flight crewmember on flight deck duty shall be provided with an oxygen mask so designed that it is capable of being rapidly placed on the face from its ready position, properly secured, sealed, and supplying oxygen upon demand; and so designed that upon completion of the donning action the oxygen mask does not prevent the flight crewmember from being able immediately to communicate with other crewmembers over the airplane intercommunication system. When not being used at flight altitudes above 25,000 feet, the oxygen mask shall be kept at all times in a condition for ready use and so located as to be within the immediate reach at all times of the flight crewmember while at his duty station.

(2) When operating at flight altitudes above 25,000 feet, one pilot at the controls of the airplane shall at all times wear and use an oxygen mask secured, sealed, and supplying oxygen: *Provided,* That the one pilot need not wear and use an oxygen mask while at or below 35,000 feet if each flight crewmember on flight deck duty is provided with a quick-donning type of oxygen mask which the operater has demonstrated to the satisfaction of an authorized representative of the Administrator is capable of being placed on the face from its ready position, properly secured, sealed, and supplying oxygen upon demand, with one hand and within 5 seconds. The operator shall also demonstrate that the donning of the mask can be accomplished without disturbing eye glasses and without delaying the flight crewmember from proceeding with his assigned emergency duties. Upon completion of the donning action, the oxygen mask shall not prevent the flight crewmember from being able immediately to communicate with other crewmembers over the airplane intercommunication system.

(3) Notwithstanding the provisions in subparagraph (2) 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.

(4) Prior to takeoff of a flight, each flight crewmember shall personally preflight his oxygen equipment to insure that the oxygen mask is functioning, fitted properly, connected to appropriate supply terminals, and that the oxygen supply and pressure is adequate 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 § 42.202–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 Part 4b of this chapter (Civil Air Regulations) (see § 42.204) 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.

§ 42.204 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 § 42.202 shall meet the standards established in § 4b.651 of Part 4b of this chapter (Civil Air Regulations) effective July 20, 1950: *Provided,* That if the operator shows full compliance with such standards to be impracticable, an authorized representative of the Administrator 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 §§ 42.202–T and 42.203–T shall meet the standards established in § 4b.651 of Part 4b of this chapter (Civil Air Regulations) effective September 1, 1958: *Provided,* That if the operator shows full compliance with such standards to be impracticable, an authorized representative of the Administrator may authorize such changes in these standards as he finds will provide an equivalent level of safety.

§ 42.205 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 an authorized representative of the Administrator 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.

§ 42.206 Equipment for extended overwater operations; airplanes.

(a) The following equipment shall be carried on an airplane used in extended overwater operations: *Provided,* That an authorized representative of the Administrator may by amending the operations specification of an operator require the carriage of all of the prescribed equipment, or any item thereof, for any operation over water, or upon

application of an operator permit deviation from these requirements for a particular extended overwater operation:

(1) A life preserver for each occupant of the airplane;

(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 preserves, and signaling devices shall be easily accessible in the event of a ditching without appreciable time for preparatory procedures. This equipment shall be installed in conspicuously marked approved locations.

(c) Survival kit, appropriately equipped for the route to be flown, shall be attached to each required liferaft.

§ 42.207 Equipment for operations in icing conditions; airplanes.

(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.

§ 42.208 Equipment for operations over uninhabited terrain; airplanes.

The following equipment shall be carried on an airplane used in operations over uninhabited areas and other areas in which an authorized representative of the Administrator finds that such equipment is necessary for search and rescue in the event of an emergency:

(a) Suitable pyrotechnic signaling devices;

(b) 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; and

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

NOTE: When required, the areas are specified in the operations specifications of the operator.

§ 42.209 Equipment for operations on which specialized means of navigation are required; airplanes.

The operator 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.

§ 42.210 Flight recorders; airplanes.

(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 operator 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

§ 42.230 Radio equipment; airplanes.

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 §§ 42.231 through 42.233, 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.

§ 42.231 Radio equipment for operations under VFR over routes navigated by pilotage; airplanes.

(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 from any point 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 on route by either of two independent systems. One of the means of compliance provide 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 accomplished 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 to be flown, except that no marker beacon receiver or ILS receiver need be provided.

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

(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 § 42.231(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 the 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 facilities: *Provided,* That ground facilities are so located and the airplane is so fueled that, in the 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.

§ 42.233 Radio equipment for extended overwater operations and for certain other operations; airplanes.

For the following operations, each airplane shall be equipped with such radio equipment as is necessary to fulfill the functions specified in § 42.232 and, in addition, by an independent system, the functions specified in § 42.231(a)(1):

(a) Extended overwater operations; and

(b) Operations for which an authorized representative of the Administrator 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

§ 42.240 Responsibility for maintenance.

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

§ 42.241 Maintenance and inspection requirements.

(a) The operator, 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 chapter (Civil Air Regulations), 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 Maintenance portion of the operator's manual and the operations specifications of the operator.

(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.

§ 42.242 Maintenance and inspection training program.

The operator 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 the techniques and with new equipment introduced into service, and are competent to perform their duties.

§ 42.243 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.

FUEL AND OIL

§ 42.250 Aircraft fuel, oil, and other fluid servicing requirements.

(a) *Facilities to be used.* Aircraft fuel, oil, and other fluids shall be obtained from approved facilities. To be eligible for approval such facilities shall meet the requirements of subparagraphs (1) through (11) of this paragraph.

(1) Fueling hose used shall be specifically designed for aircraft fueling and shall be capable of withstanding the maximum pressures (including surge pressure) of the equipment to which it is connected.

(2) Except in under wing fuel servicing, fuel nozzles used shall be so designed or modified that the valve must be held open by hand to allow fuel to flow.

(3) Fueling nozzles shall be provided with screens to prevent contaminating particles in the fuel from entering the fuel tank.

(4) Provisions shall be made for the elimination of water and contaminants from fueling systems, fueling trucks, and fuel storage tanks.

(5) Procedures shall be established for conducting and recording the results of daily water checks made in regard to fueling systems, fueling trucks, and fuel storage tanks.

(6) Fueling facilities shall be as near zero ground potential as possible but not more than 10,000 ohms resistance as determined by proper electrical measuring equipment.

(7) At least one fully charged 50-pound CO_2 fire extinguisher or its equivalent shall be readily available during fueling or defueling operations.

(8) Procedures shall be established to prevent fire hazards as a result of spilled fuel.

(9) Aviation fueling equipment and containers shall be properly marked and color coded to denote the type and grade of fuel.

(10) Procedures shall be established to prevent water and contaminants from entering into the filler openings while servicing the airplane.

(11) Procedures shall be established for the safe servicing of aircraft with methanol, water-fuel injection solutions, and alcohol base deicing solutions, if provided.

(b) *Operating procedures.* (1) During fueling or defueling operations, no aircraft maintenance shall be performed which will provide a source of ignition for fuel or fuel vapors.

(2) If passengers remain aboard an aircraft during fueling or defueling operations, an attendant shall be present in the cabin and the passenger loading steps shall be kept in position. A "No Smoking" sign shall be displayed in the cabin.

(3) Fueling and defueling operations shall be suspended during severe lightning and electrical storms.

(4) Open flames and lighted open flame devices shall be prohibited on the passenger ramps and in other locations within 50 feet of the aircraft being fueled and defueled.

(5) The operator or the pilot in command shall sample the aircraft's fuel sumps after each fueling is completed to insure that there is no water or contamination within the fuel tank.

(6) The operator or the pilot in command shall insure that the aircraft is serviced with the proper type and grade of fuel.

(7) The operator or the pilot in command shall insure that the aircraft is serviced with the proper type and grade of lubricating oil and hydraulic fluid.

AIRMAN AND CREWMEMBER REQUIREMENTS

§ 42.260 Utilization of airman.

(a) No operator shall utilize an individual as an airman unless he holds an appropriate and currently valid airman certificate issued by the Administrator and is otherwise qualified for the particular operation in which he is to be utilized. He shall have appropriate airman and medical certificates 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 operations under this part.

§ 42.261 Composition of flight crew.

(a) No operator shall operate an aircraft with less than the minimum flight crew specified in the Aircraft Flight Manual approved for such type of aircraft and required by this part for the type of operation being conducted.

(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 operator is authorized to operate helicopters under instrument conditions, or operate any aircraft of more than 12,500 pounds maximum certificated takeoff weight, the minimum pilot flight crew shall be 2 pilots, one of whom shall be designated by the operator as pilot in command and the other as second in command.

(d) On flights requiring a 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 that function for the safe completion of the flight. A pilot need not hold a flight engineer certificate to function in the capacity of a flight engineer for such emergency coverage.

§ 42.262 Flight navigator; airplanes.

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 (including Alaska) when:

(a) An authorized representative of the Administrator determines that celestial navigation is necessary, or

(b) Other specialized means of navigation necessary to obtain a reliable fix for the safe conduct of the flight cannot be accomplished adequately from the pilot station for a period in excess of one hour: *Provided,* That upon consideration of the following factors a navigator may also be required when such specialized means of navigation are necessary for one hour or less: The speed of the aircraft used by the operator, 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.

NOTE: The routes or route segments over which a navigator is required are specified in the operations specifications of the operator.

§ 42.263 Flight engineer; airplanes.

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 an authorized representative of the Administrator determines 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.

§ 42.265 Flight attendant; airplanes.

(a) Except when authorized under the provisions of paragraph (b) of this section, the operator shall provide at least the following number of flight attendants on airplanes used in passenger operations:

(1) One flight attendant on airplanes having a seating capacity of 10 or more passengers;

(2) Two flight attendants on airplanes having a seating capacity of 45 or more passengers, and

(3) Three flight attendants on airplanes having a seating capacity of more than 100 passengers.

(b) Upon application by the operator, an authorized representative of the Administrator may approve the use of an airplane in a particular operation with a number of flight attendants less than that specified in paragraph (a) of this section. Such approval may be granted if the operator shows that due to the type of operations involved, number of passenger seats, compartments, emergency exits and equipment, or other trained flight crewmembers not on flight deck duty whose services may be used in emergencies, all safety and emergency functions and procedures established in accordance with § 42.267 for the particular type of airplane and operation are capable of being performed adequately with less flight attendants.

NOTE: When an authorized representative of the Administrator approves the use of an airplane with a number of flight attendants less than that specified in paragraph (a) of this section, the number and the particular operation for which such number is approved are specified in the operations specifications of the operator.

§ 42.266 Aircraft dispatcher.

If a dispatch system is used, the operator shall show that an adequate number of qualified dispatchers are located at each dispatch center to insure the proper operational control of each flight.

§ 42.267 Assignment of emergency and evacuation functions for each crewmember; airplanes.

Each operator of airplanes shall assign to each crewmember all necessary functions each such crewmember is to perform in emergencies and in circumstances requiring emergency evacuation. Emergency functions shall be assigned for each type of airplane used by the operator and the operator shall show that functions so assigned are realistic and capable of accomplishment. These functions shall be described in the operator's manual and the operator shall insure that all required crewmembers are given adequate training in the assigned functions in the course of their participation in the approved emergency training program prescribed in § 42.285.

TRAINING PROGRAM

§ 42.280 Establishment of approved program; airplanes.

(a) Each operator of airplanes shall establish a training program sufficient to insure that each crewmember and dispatcher used by the operator 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 operations under this part. The training program shall meet with the approval of an authorized representative of the Administrator.

(b) Each operator 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 airman certificates and ratings as 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 and recurrent program shall include at least the appropriate requirements specified in §§ 42.281 through 42.285.

(d) The crewmember emergency procedures training program shall include at least the requirements specified in § 42.285.

(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.

§ 42.281 Pilot ground training; airplanes.

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

(1) The appropriate provisions of the operator's operations specifications and appropriate provisions of this chapter (Civil Air Regulations) with particular emphasis on the operation and dispatching rules and airplanes 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 operator 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 meterological 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 operator 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.

§ 42.282 Pilot flight training; airplanes.

(a) Flight training for each pilot prior to serving as a flight crewmember on an airplane 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 operations under this part, 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 an authorized representative of the Administrator or to a check pilot his ability to takeoff 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 on an airplane in a crew requiring 3 or more pilots shall include flight instruction and practice in at least the maneuvers and procedures specified in subparagraphs (1) and (2) of this paragraph.

(1) In each type of airplane to be flown by him in operations under this part;

(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 climbout 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 pullout 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 on an airplane in a crew requiring 2 pilots shall include flight instruction and practice in at least the maneuvers and procedures specified in subparagraphs (1) and (2) of this paragraph.

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

(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; and

(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 operator.

(d) The operator shall give each person serving as pilot of an airplane 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 applicable proficiency checks required by § 42.302 or 42.305 will meet the requirements of this section.

§ 42.283 Flight navigator training; airplanes.

(a) The training for flight navigators on airplanes shall include the applicable portions of at least subparagraphs (1) through (4) and (6) through (8) of § 42.281(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 operator. The flight training may be accomplished during flights subject to this part under the supervision of a qualified flight navigator assigned as the navigation crewmember.

(c) The operator 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 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 navigator with respect to procedures, techniques, and information essential to the satisfactory performance of his duties. Such flight check may be accomplished during passenger or cargo flights under the supervision of a qualified navigator, or in a synthetic trainer in lieu of a check in flight.

§ 42.284 Flight engineer training; airplanes.

(a) The training for flight engineers on airplanes shall include at least the instruction specified in § 42.281(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 operator. Except for emergency procedures, the flight training may be accomplished during flights subject to this part under the supervision of a qualified flight engineer.

(c) The operator 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. Except for emergency procedures, such flight check may be accomplished during flights subject to this part under the supervision of a qualified flight engineer or the entire check may be accomplished in a synthetic trainer in lieu of a check in flight.

§ 42.285 Crewmember emergency training; airplanes.

(a) The training in emergency procedures for airplanes 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) All crewmembers performing duties on pressurized airplanes operated above 25,000 feet shall, as a part of their approved emergency procedure training, receive instructions by means of lectures and films covering at least: respiration, hypoxia, duration of consciousness at altitude when supplemental oxygen is not supplied, gas expansion, gas bubble formation, physical phenomena and incidents of decompression; and receive actual training and practice in the donning of the oxygen mask and operation of the oxygen equipment. In lieu of the required films, the operator may use any other equivalent means of visual presentation which, after demonstration, meets with the approval of an authorized representative of the Administrator.

§ 42.286 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 aircraft used by the operator, 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 aircraft in distress.

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

(1) Contents of the operator's operating certificate;

(2) Appropriate provisions of the operator's operations specifications, manual, and Civil Air Regulations;

(3) Characteristics of the aircraft used by the operator;

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

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

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

(7) Effect of weather conditions on aircraft radio reception;

(8) Airports to be used and the general terrain over which the aircraft are to be flown;

(9) Prevailing weather phenomena;

(10) Sources of weather information available;

(11) Pertinent air traffic control procedures; and

(12) 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

§ 42.300 Qualification requirements.

(a) An operator shall not 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 §§ 42.280 through 42.286 and 42.301, except that in the case of operations involving helicopters he shall meet the appropriate requirements of § 46.280 or § 46.289, and §§ 46.301 through 46.304 of Part 46 of this chapter (Civil Air Regulations). 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 §§ 42.302, 42.303, and 42.305 and such certification shall become a part of the individual's record.

§ 42.301 Pilot recent experience: airplanes.

An operator shall not utilize a pilot as pilot in command or second in command of an airplane in operations under this part 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.

§ 42.302 Pilot checks; airplanes.

(a) *Line check.* An operator shall not utilize a pilot as pilot in command of an airplane until he has satisfactorily passed a line check in one of the types of airplanes to be flown by him. Thereafter, he shall not serve as pilot in command unless each 12 months he successfully completes a similar line check. 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 airplane and on the route. It shall consist of at least one flight over a typical portion of the operator's routes over 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 operator shall not utilize a pilot as pilot in command of an airplane until he has satisfactorily demonstrated to a check pilot or an authorized 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, and approach procedures;

(ii) The flight maneuvers specified in § 42.282(b)(1), except that the simulated engine failure during takeoff need not be accomplished at speed V_1, nor at actual or simulated maximum authorized weight; and

(iii) Flight maneuvers approved by an authorized representative of 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 operator.

(3) Subsequent to the initial pilot proficiency check, an approved course of training in an airplane simulator, if satisfactorily completed, may be substituted at alternate 6-month intervals for the proficiency check required by subparagraph (1) of this paragraph. The operator 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 operations, takeoff, landing, normal flight, unusual attitudes, navigational 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 an authorized representative of 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.

§ 42.303 Pilot airport qualification requirements; airplanes.

(a) Except as authorized in paragraph (c) of this section, an operator shall not permit a pilot as pilot in command of an airplane in operations under this part to fly into any airport until he has been qualified in accordance with paragraph (b) of this section and the appropriate instructor or check pilot has so certified in the operator's airman records.

(b) Each such pilot shall by oral or written means demonstrate adequate knowledge concerning the subjects listed below with respect to each airport to be used.

NOTE: Those portions of the demonstration pertaining to holding procedures and instrument approach procedures may be accomplished in a synthetic trainer which contains the radio equipment and instruments necessary to simulate the type of navigational and letdown procedures approved for use by the operator at such airport.

(1) Weather characteristics, all seasons;
(2) Navigational facilities;
(3) Communication procedures;
(4) Type of terrain and obstruction hazards;
(5) Minimum safe flight levels;
(6) Pertinent air traffic control procedures, including terminal area, arrival, departure, and holding and all types of instruments approach procedures; and
(7) Congested areas, obstructions, and physical layout of each airport in the terminal area in which the pilot is to operate.

(c) A pilot in command of an airplane who has not been previously qualified under paragraph (b) of this section, or who has not made an entry at the airport to be used as a member of a flight crew within the preceding 12-month period, may approach and land at such airport only if the reported weather indicates at least a ceiling 200 feet higher and a visibility ½ mile greater than the prescribed landing minimums prescribed for such airport in Part 609 of this title. 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 operator's operations specifications may not be applied to landing minimums by pilots not currently qualified at such airports.

§ 42.304 Maintenance of pilot airport qualifications; airplanes.

To maintain pilot airport qualifications, each pilot being utilized as pilot in command of an airplane, within the preceding 12-month period, shall have made at least one entry as a member of a flight crew into each airport into which he is to operate.

§ 42.305 Proficiency checks; second in command; airplanes.

(a) An operator shall not utilize a pilot as second in command of an airplane until he has satisfactorily demonstrated to a check pilot or an authorized 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 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. The proficiency check shall include at least an oral or written equipment examination, and the procedures and flight maneuvers specified in § 42.282(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 an airplane crew requiring 3 or more pilots shall be the same as required under § 42.302(b).

(c) Subsequent to the initial pilot proficiency check, an approved course of training in an aircraft simulator which meets the requirements of § 42.302(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 § 42.302(b) will also meet the requirements of this section.

§ 42.306 Flight navigator qualification for duty; airplanes.

An operator shall not utilize a flight navigator on an airplane unless, within the preceding 12-month period, he has had at least 50 hours of experience as a flight navigator, or until the operator 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, or in a synthetic trainer which has been found satisfactory for such checks by an authorized representative of the Administrator. Such flight check may be accomplished during flights subject to this part, but the airman being checked shall not be assigned to the airplane as a required member of the flight crew.

§ 42.307 Flight engineer qualification for duty; airplanes.

An operator shall not utilize a flight engineer on an airplane 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 operator 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, but such check shall not be accomplished during flights subject to this part: *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.

§ 42.310 Aircraft dispatcher qualification for duty.

(a) Prior to dispatching an aircraft, an aircraft dispatcher shall be familiar, and the operator shall determine that he is familiar, with all essential operating procedures for the entire route to be flown and with the aircraft to be used: *Provided,* That where he is qualified only on a portion of such route, he may dispatch aircraft, but only after coordinating with dispatchers who are qualified for the other portions of the route.

(b) An aircraft dispatcher shall not dispatch aircraft in the area over which he is authorized to exercise dispatch jurisdiction unless within the preceding 12 months he has made at least a one-way qualification trip over the particular area on the flight deck of an aircraft. 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; HELICOPTERS

§ 42.315 Flight time limitations; helicopters.

An operator shall not schedule a flight crewmember for duty aloft in operations subject to this part, or in other commercial flying, if his total flight in all commercial flying will exceed the flight time limitations prescribed in § 46.320 of Part 46 of this chapter (Civil Air Regulations).

FLIGHT TIME LIMITATIONS; AIRPLANES

§ 42.317 Pilots.

The following flight time limitations are applicable to all pilots serving on airplanes:

(a) *Individual pilot limitations.* (1) A pilot may be scheduled to fly 8 hours or less during any 24 consecutive hours without a rest period during such 8 hours.

(2) A pilot shall receive 24 hours of rest before being assigned further duty when he has flown in excess of 8 hours during any 24 consecutive hours.

(3) A pilot shall be relieved from all duty for not less than 24 consecutive hours at least once during any 7 consecutive days.

(4) A pilot shall not fly as a crewmember in air carrier service more than 100 hours during any 30 consecutive days.

(5) A pilot shall not fly as a crewmember in air carrier service more than 1,000 hours in any one calendar year.

(6) A pilot shall not do other commercial flying if his total flying time for any specified period will exceed the limits of that period.

(7) Time spent in any deadhead transportation shall in no case be considered as part of a required rest period.

(b) *Airplanes having a crew of two pilots.* (1) A pilot shall not be scheduled to fly in excess of 8 hours during any 24-hour period unless he is given an intervening rest period at or before the termination of 8 scheduled hours of flight duty. Such rest period shall equal at least twice the number of hours flown since the last preceding rest period, and in no case shall such rest period be less than 8 hours. During such rest period the pilot shall be relieved of all duty with the air carrier.

(2) A pilot shall not be on duty for more than 16 hours during any 24 consecutive hours.

(c) *Airplanes having a crew of three pilots.* (1) A pilot shall not be sched-

uled for duty on flight deck in excess of 8 hours in any 24-hour period.

(2) A pilot shall not be scheduled to be aloft for more than 12 hours in any 24-hour period.

(3) A pilot shall not be on duty for more than 18 hours in any 24-hour period.

(d) *Airplanes having a crew of four pilots.* (1) A pilot shall not be scheduled for duty on the flight deck in excess of 8 hours during any 24-hour period.

(2) A pilot shall not be scheduled to be aloft for more than 16 hours in any 24-hour period.

(3) A pilot shall not be on duty for more than 20 hours during any 24-hour period.

§ 42.318 Flight engineer.

The flight time limitations prescribed in § 42.317 (a) and (b) shall apply to an airman serving as a flight engineer, except that when two or more airmen serve as flight engineers in a flight crew containing three or more pilots, the flight time limitations prescribed in § 42.317(d) shall apply in lieu of those in § 42.317(b).

§ 42.319 Overseas and international operations.

The operator may elect to use the flight time limitations of §§ 42.320 through 42.327 for operations conducted:

(a) Between a point in the Continental United States, or the State of Alaska, and any point outside thereof, or

(b) Between any two points outside the Continental United States (includes the State of Alaska), or

(c) Between two points within the State of Alaska or the State of Hawaii.

§ 42.320 General; all airmen.

(a) An airman shall not be aloft, as a member of the flight crew, more than 1,000 hours in any 12-month period.

(b) The time spent in deadhead transportation to or from duty assignment shall not be considered as part of any rest period.

(c) An airman shall not do other commercial flying while employed by an operator if his total flying time will exceed any flight time limitations specified in this part.

§ 42.321 Flight crew of two pilots and additional airmen, as required.

(a) An airman shall not be scheduled to be aloft, as a member of the flight crew, more than 12 hours during any 24 consecutive hours.

(b) When an airman has been aloft, as a member of the flight crew, 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 operator.

(c) In any case, each airman shall be relieved from all duty with the operator for not less than 24 consecutive hours during any 7 consecutive days.

(d) An airman shall not be aloft, as a member of the flight crew, more than 120 hours in any 30 consecutive days or 300 hours in any 90 consecutive days.

§ 42.322 Flight crew of three or more pilots and additional airmen, as required.

(a) An individual serving as a flight engineer, radio operator, or navigator shall not be scheduled for any duty on the flight deck more than 12 hours during any 24 consecutive hours.

(b) Flight hours shall be scheduled in such a manner as to provide for adequate rest periods on the ground while the airman is away from his principal operations base.

(c) Adequate sleeping quarters on the aircraft shall be provided in all cases where an airman is scheduled to be aloft, as a member of the flight crew, more than 12 hours during any 24 consecutive hours.

(d) An airman, upon return to his operations base from any flight or series of flights, shall receive a rest period of not less than twice the total number of hours aloft, as a member of the flight crew, since the last rest period at his principal operations base before being assigned to any further duty with the operator. 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 airman is again scheduled for flight duty.

(e) An airman shall not be aloft, as a member of the flight crew, more than 350 hours in any 90 consecutive days.

§ 42.323 Pilots serving in more than one type of flight crew.

(a) A pilot who is assigned to duty aloft for more than 20 hours in two-pilot crews in 30 consecutive days, or whose assignment is interrupted more than once in any 30 consecutive days by assignment to a crew consisting of two or more pilots and an additional crewmember, shall be governed by the provisions of § 42.317.

(b) Except for a pilot coming within the provisions of paragraph (a) of this section, a pilot who is assigned to duty aloft for more than 20 hours in two-pilot and additional crewmember crews in 30 consecutive days, or whose assignment in such crews is interrupted more than once in any 30 consecutive days by assignment to a crew consisting of three pilots and an additional flight crewmember, shall be governed by the provisions of § 42.321.

(c) A pilot to whom the provisions of paragraphs (a) and (b) of this section are not applicable, who is assigned duty aloft for a total of 20 hours or less within 30 consecutive days in two-pilot crews with or without additional flight crewmembers, shall be governed by the provisions of § 42.322.

(d) A pilot assigned to each of two-pilot, two-pilot and additional flight crewmember, and three-pilot and additional flight crewmember crews in 30 consecutive days shall be governed by the provisions of § 42.322.

DUTY TIME LIMITATIONS; AIRCRAFT DISPATCHER

§ 42.340 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 throughly familiar with existing and anticipated weather conditions along the route prior to the dispatch of any aircraft. He shall remain on duty until all aircraft dispatched by him have completed their flights, or have proceeded beyond his jurisdiction, or until he is relieved by another qualified aircraft dispatcher.

(b) The rules in subparagraphs (1) through (3) of this paragraph will govern the hours of duty for an aircraft dispatcher, except where circumstances or emergency conditions beyond the control of the operator 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 operator 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 (including Alaska), when authorized by an authorized representative of 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 operator for a period of at least 8 hours during each 24-hour period.

FLIGHT OPERATIONS

§ 42.350 Operational control; flight following system.

If an operation subject to this part is conducted with an approved flight following service:

(a) The operator shall be responsible for operational control;

(b) The pilot in command, and those members of the management personnel designated by the operator and specified in the operations manual, shall be jointly responsible for the release, continuation and diversion, or termination of a flight;

(c) The members of the management personnel designated by the operator and specified in the operations manual shall be responsible for such monitoring of the progress of each flight as may be necessary for its continued safety, and its cancellation, diversion, or delay if, in their opinion or in the opinion of the pilot in command, the flight cannot operate or continue to operate safely as planned or released; and

(d) The pilot in command shall be responsible for the preflight planning and the operation of the flight in compliance with the applicable Civil Air Regulations and operations specifications.

§ 42.351 Operational control; dispatch system.

The operator shall be responsible for operational control.

(a) *Joint responsibility of aircraft dispatcher and pilot in command.* The pilot in command, and the aircraft dispatcher, if utilized, 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 information necessary for continued safety of the flight; and

(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.

§ 42.352 Responsibility of pilots.

(a) The pilot in command shall during flight time be in command of the aircraft and crew and shall be responsible for the safety of the passengers, crewmembers, cargo, and aircraft.

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

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

§ 42.353 Operations notices.

Each operator 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.

§ 42.354 Flight crewmembers at controls.

All required flight crewmembers when on flight deck duty shall remain at their respective stations while the aircraft 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 aircraft. All flight crewmembers shall keep their seat belts fastened when at their respective stations.

§ 42.355 Manipulation of controls.

No person other than a qualified pilot of the operator shall manipulate the flight controls during flight, except that any one of the following persons may, with the permission of the pilot in command, manipulate such controls:

(a) Authorizing pilot safety representatives of the Administrator or the Board who are qualified on the aircraft and are engaged in checking flight operations; or

(b) Pilot personnel of another operator properly qualified on the aircraft and authorized by the operator of the aircraft.

§ 42.356 Admission to flight deck.

No person, other than a crewmember, may be admitted to the flight deck of an aircraft except those authorized in paragraphs (a) and (b) of this section. (For the purpose of this section, the term "flight deck" when applied to an airplane 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 and authorized representatives of the Board 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 another operator or other aeronautical enterprise whose duties are such that his presence on the flight deck is necessary or advantageous to the conduct of safe operations; or

NOTE: Federal employees who deal responsibly with matters relating to air carrier safety and such employees of the operator as pilots, dispatchers, 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 departments of the operator 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 management personnel of the operator 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 or the Board engaged in checking or observing 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 operator whose duties with the operator require an airman certificate;

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

(5) Employees of the operator 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 operator, who is listed in the Operations Manual as having such authority; and

(6) Technical representatives of the manufacturer of the aircraft 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 operator, who is listed in the Operations Manual as having such authority.

§ 42.357 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 crewmember shall have in his possession on each flight a flashlight in good working order.

§ 42.358 Restriction or suspension of operation.

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

§ 42.359 Use of cockpit check procedure.

The cockpit check procedure required by § 42.176 shall be used by the flight crew.

§ 42.360 Emergency decisions.

(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 instances, 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, or the management personnel in the case of operations conducted with a flight following service, and which is known to them, they shall advise the pilot in command of such situation. The aircraft dispatcher or the management personnel 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 or management personnel shall declare an emergency and follow any

course of action they consider necessary under the circumstances.

(c) When emergency authority is exercised, the appropriate ground radio station shall be kept fully informed regarding progress of the flight, and within the 10 days after the completion of the particular flight or upon return to the home base from operations outside the United States, a written report of any deviation shall be submitted by the individual declaring the emergency to an authorized representative of the Administrator through the director of operations.

§ 42.361 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 FAA communications station or a ground radio station as soon as practicable. Any information pertaining to irregularities of ground and navigational facilities received by an operator shall be reported to the authority directly responsible for the operation of the particular facility involved.

§ 42.362 Reporting mechanical irregularities.

The pilot in command shall enter or cause to be entered in the maintenance log of the aircraft 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.

§ 42.363 Engine failure or precautionary stoppage; airplanes.

(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 altitudes, 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 of the airplane 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 of an airplane 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 director of operations 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 operator shall, within 10 days after the pilot's return to his home base, furnish a copy of this report with the comments of the appropriate management personnel thereon to an authorized representative of the Administrator.

§ 42.364 Instrument approach and IFR landing procedures; airplanes.

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

§ 42.370 Briefing of passengers; airplanes.

(a) Prior to each takeoff, an operator engaged in passenger-carrying operations with an airplane shall insure that all passengers carried on the airplane are briefed orally concerning smoking, use of seat belts, location of the emergency exits, and the emergency evacuation procedures to be used in the event emergency evacuation of the airplane becomes necessary.

(b) Each operator engaged in extended overwater operations with an airplane 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 operator's 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 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. (See § 42.203–T for passenger briefing requirements regarding oxygen equipment.)

§ 42.371 Drinking and serving of alcoholic beverages.

(a) No person shall drink any alcoholic beverage aboard an aircraft operated under the provisions of this part unless such beverage has been served to him by the operator of the aircraft.

(b) No operator shall serve any alcoholic beverage to any person aboard its aircraft if such person appears to be intoxicated.

(c) No operator shall permit any person to board its aircraft if such person appears to be intoxicated.

(d) An operator shall report to the Administrator within 5 days any incident in which a person aboard its aircraft refuses to comply with paragraph (a) of this section, or any disturbance caused by a person who appears to be intoxicated while aboard its aircraft.

§ 42.372 Minimum altitudes for use of automatic pilot; airplanes.

(a) *En route operations.* Except as provided in paragraph (b) of this section, an automatic pilot on an airplane may only be used during en route flight operations, including climb or descent, at an altitude above the terrain not less than twice the maximum altitude loss established for the automatic pilot malfunction in the particular airplane under cruise conditions as specified in the Airplane Flight Manual for the airplane involved, or 500 feet, whichever is higher.

(b) *Approaches.* Except as provided in subparagraph (1) of this section, when using an instrument approach facility, an automatic pilot on an airplane may remain engaged down to an altitude above the terrain not less than twice the maximum altitude loss established for the automatic pilot in the particular airplane under approach conditions as specified in the Airplane Flight Manual for the airplane involved, or not less than 50 feet below the minimum ceiling approved for the facility being used, whichever is higher.

(1) *ILS approaches utilizing an approach coupler*—(i) *Under instrument flight rule weather conditions.* When the reported weather conditions are less than the basic weather conditions specified in § 60.30 of this chapter (Civil Air Regulations), an automatic pilot utilizing an approach coupler may remain engaged for ILS approaches down to an altitude above the terrain not less than 50 feet higher than the maximum altitude loss established for the automatic pilot and approach coupler in the particular airplane under approach conditions, as specified in the Airplane Flight Manual for the airplane involved.

(ii) *Under visual flight rule weather conditions.* When reported weather conditions are equal to or better than the basic VFR minimums specified in § 60.30 of this chapter (Civil Air Regulations), an automatic pilot utilizing an approach coupler may remain engaged for ILS approaches down to an altitude above the terrain not less than the maximum altitude loss established for the automatic pilot and approach coupler in the particular airplane under approach conditions as specified in the Airplane Flight Manual for the airplane involved, or 50 feet, whichever is higher.

DISPATCHING AND FLIGHT RELEASE RULES

§ 42.381 Necessity for dispatching and flight release authority; airplanes.

(a) *Flight release.* No flight shall be started unless a flight release for the flight has been executed in accordance with the provisions of § 42.503.

(b) *Dispatch authority.* If the operator uses a dispatch system a flight shall not be started without specific authority

from an aircraft dispatcher. No flight may be continued from an intermediate airport without redispatch if it has remained on the ground in excess of 6 hours.

(c) *Operations without dispatchers.* No flight shall be started without specific authority from the appropriate member of the operations management. When a flight originates at a location other than the operator's main base of operations the flight release form shall be mailed to such base prior to departure and retained in the operator's records as required by § 42.505. No flight shall be continued from an intermediate point without a new flight release if it has remained on the ground in excess of 6 hours.

§ 42.382 Familiarity with weather conditions; airplanes.

No dispatcher shall release a flight nor shall a pilot in command commence a flight unless he is thoroughly familiar with existing and anticipated weather conditions along the route to be flown.

§ 42.383 Facilities and services; airplanes.

The dispatcher shall furnish to the pilot in command or, if the operator does not use a dispatch system, the pilot in command shall obtain prior to flight, all available current reports or information pertaining to irregularities of navigational facilities and airport conditions which may affect the safety of the flight; and while en route, any additional available information concerning meteorological conditions and irregularities of facilities and services which may affect the safety of the flight.

§ 42.384 Airplane equipment required for dispatch or flight release.

No airplane shall be dispatched or released for operation unless it is airworthy and equipped in accordance with the provisions of § 42.170.

§ 42.385 Airplane communications and navigational facilities required for dispatch or flight release.

No airplane shall be dispatched or released for flight over any route or route segment unless communications and navigational facilities equivalent to those required by § 42.36 are in satisfactory operating condition.

§ 42.386 Airplane dispatching or flight release under VFR.

No airplane shall be dispatched or released for operation under VFR unless the appropriate weather reports or 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 or flight release.

§ 42.387 Dispatching or flight release under IFR, over-the-top, or over-water; airplanes.

(a) No airplane shall be dispatched or released for operation under IFR or over-the-top unless the appropriate weather reports or forecasts, or a combination thereof, pertaining to the airport or airports to which dispatched or released indicate that the ceilings and visibilities at such airports will be at or above the authorized minimums at the estimated time of arrival thereat: *Provided,* That, for flights involving extended overwater operations, airplanes may be dispatched or released for flight if the appropriate weather reports or forecasts, or a combination thereof, pertaining to the airport or airports to which dispatched or released, or to any required alternate therefor, indicate that the ceilings and visibilities at such airports will be at or above the authorized minimums at the estimated time of arrival thereat.

(b) Extended overwater operations with airplanes shall be conducted at all times in accordance with the IFR requirements of this part except where the operator shows that such requirements are not necessary from a safety standpoint. Other overwater operations shall also be conducted at all times in compliance with the IFR requirements of this part whenever an authorized representative of the Administrator 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 quirement will be specified in the operations specifications of the operator.

§ 42.388 Alternate airport for departure; airplanes.

(a) If the weather conditions at the airport of takeoff are below the landing minimums specified in the operator's operations specifications for that airport, no airplane shall be dispatched or released for flight from that airport unless an alternate airport located within the following distances from the airport of takeoff is specified in the dispatch or flight release:

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

(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 conditions shall meet the requirements specified in the operator's operations specifications.

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

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

(a) For all IFR or over-the-top operations with airplanes there shall be at least one alternate airport designated in the dispatch or flight release for each airport of destination, except as provided in subparagraphs (1) and (2) of this paragraph.

(1) If the operator uses a dispatching system, no alternate need be provided for flights scheduled for no more than 6 hours 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 or released 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.

(2) For flights outside the continental United States (excluding Alaska) over routes without an available alternate airport for a particular airport of destination, an alternate airport need not be designated, but the airplane shall carry sufficient fuel to meet the requirements of § 42.396.

(b) The alternate airport weather requirements for airplanes shall be those specified in the operator's operations specifications.

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

§ 42.390 Alternate airport weather minimums; airplanes.

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

§ 42.391 Continuance of flight; flight hazards; airplanes.

(a) No airplane shall be continued in flight toward any airport to which it has been dispatched or released when, in the opinion of the pilot in command, or the aircraft dispatcher (when a dispatching system is used), flight to that airport 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 § 42.360.

(b) If any instrument or item of equipment required for an airplane pursuant to the requirements of this chapter (Civil Air Regulations) for the particular operation being conducted becomes inoperative en route, the pilot in command shall comply with the approved procedures specified in the operator's manual for such occurrences.

§ 42.392 Operation in icing conditions; airplanes.

(a) No airplane shall be dispatched or released for flight, en route operations continued, or landing made when, in the opinion of the pilot in command, or aircraft dispatcher (when a dispatching system is used), icing conditions are expected or encountered which might adversely affect the safety of the flight.

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

§ 42.393 Original dispatch or flight release, redispatch, and amendment of dispatch or flight release; airplanes.

(a) Any airport which meets the requirements of the applicable regulations

for the type of airplane to be operated may be specified as the airport of destination for the purpose of original dispatch or flight release.

(b) An airport specified as an airport of destination or an alternate therefor may be changed en route to another airport which is safe for the type of airplane being operated, provided that the appropriate requirements of §§ 42.382 through 42.409 and § 42.70 or 42.90 are met at the time of redispatch or amendment of the flight release.

(c) No flight of an airplane shall be continued to the airport of destination to which it has been dispatched or released unless the weather conditions at an alternate airport specified in the dispatch or flight release are forecast to be at or above minimums specified in the operator's operations specifications for such airport when the flight shall arrive thereat: *Provided*, That the dispatch or flight release may be amended en route to include any approved alternate airport lying within the fuel range of the airplane as specified in §§ 42.396 and 42.397.

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

§ 42.396 Fuel supply for all operations: airplanes.

(a) *Reciprocating-engine and turbopropeller-powered airplanes.* (1) No airplane shall be dispatched or released for flight unless it carries sufficient fuel, considering the wind and other weather conditions expected, to comply with the following:

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

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

(iii) To fly for a period of at least 45 minutes at normal cruising consumption, except that, if the airplane is dispatched or released to an airport outside the continental United States (excluding Alaska), it shall carry at least 30 minutes plus 10 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 or released for flight to an airport for which an alternate is not designated under § 42.389(a)(2), 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 turbopropeller-powered airplanes) may be dispatched or released for flight or take off only if it carries sufficient fuel, considering the wind and other weather conditions expected, to comply with the requirements of paragraph (a) of this section. For operations outside the continental United States (and within Alaska), the airplane shall carry sufficient fuel:

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

(ii) To fly for a period equal to 10 percent of the total time required to fly from the airport of departure to the airport to which it is dispatched or released, and land at such airport; and thereafter;

(iii) To fly to and land at the most distant alternate airport designated in the dispatch or flight release, where such alternate is required, 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 or released to an airport for which an alternate is not designated under § 42.389(a)(2), unless it carries sufficient fuel, considering wind and other weather conditions expected, to fly to that airport and thereafter to fly for at least 2 hours at normal cruising consumption.

(3) An authorized representative of the Administrator may amend the operations specifications of the operator 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.

(c) *Additional airplane fuel requirements; all operations.* If the operator does not use a dispatch system in the conduct of the flights specified in paragraphs (a) and (b) of this section, a 5 percent increase in the fuel requirements specified in those paragraphs is required.

§ 42.397 Factors involved in computing fuel required; airplanes.

In computing the fuel required for an airplane, 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.

§ 42.405 Airplane 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 in paragraphs (a) and (b) of this section.

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

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

§ 42.406 Airplane 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 operator'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 operator'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 the Regulations of the Administrator or the operator's operations specifications for the particular airport.

(c) 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 minimums specified in the operations specifications.

(d) In addition to the increased ceiling visibility requirements prescribed in § 42.303(c), the ceiling and visibility landing minimums prescribed in the operator's operations specifications for airports shall be increased by 100 feet ceiling and ½ mile visibility whenever the pilot in command has not served 100 hours as pilot in command in operations conducted under this part, or Part 40 or 41, in the particular type of airplane being operated by him. The ceiling and visibility minimums need not be increased above those applicable to the airport when used as an alternate airport.

§ 42.407 Applicability of reported weather minimums: airplanes.

In the conduct of operations subject to §§ 42.405 and 42.406, the ceiling and visibility values contained in the main body of the latest weather report 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 weather report, 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 for such runway.

§ 42.408 Airplane flight altitude rules.

Notwithstanding the provisions of § 60.17 of Part 60 of this chapter (Civil Air Regulations) or other rules applicable outside of the United States, no airplane, except when necessary for takeoff and landing, shall be operated below the minimums prescribed in paragraphs (a) and (b) of this section: *Provided*, That the authorized representative of the Administrator 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 Administrator for particular routes within the United States are set forth in Part 610 of the 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 operator's operations specifications or by the foreign country over which the airplane is being operated.

(a) *Day VFR operations.* No airplane 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 obstacle: *And provided further*, That adherence to a flight altitude will not be required during the time a flight is proceeding in accordance with paragraph (c) of this section.

(c) *Daytime over-the-top operations below minimum en route altitudes.* Over-the-top operations with airplanes may be conducted at flight altitudes lower than the minimum en route IFR altitudes by day only and in accordance with the following provisions:

(1) Such operations shall be conducted at least 1,000 feet above the top of lower broken or overcast cloud cover;

(2) The top of the lower cloud cover shall be generally uniform and level;

(3) Flight visibility shall be at least 5 miles; and

(4) The base of any higher broken or overcast cloud cover shall be generally uniform and level and shall be at least 1,000 feet above the minimum en route IFR altitude for the route segment.

§ 42.409 Altitude maintenance on initial approach; airplanes.

(a) When making an initial approach to a radio navigational facility under IFR (excluding over-the-top conducted in accordance with the provisions of § 42.408(c)), an airplane shall not descend below the pertinent minimum altitude for initial approach specified by the Administrator for such facility until arrival over the radio facility has been definitely established.

(b) When making an initial approach on a flight being conducted in accordance with the provisions of § 42.408(c), a pilot shall not commence an instrument approach until arrival over the radio facility has definitely been established. In executing an instrument approach procedure under such circumstances, the airplane shall not be flown at an altitude lower than 1,000 feet above the top of the lower cloud cover or the minimum altitude specified by the Administrator for that portion of the instrument approach procedure being flown, whichever is the lower.

§ 42.410 Preparation of dispatch and flight release and flight plan; airplanes.

A dispatch or flight release shall be prepared for each flight between specified points. This release shall be signed by the pilot in command and, when the operator has an approved dispatch organization, it shall also be signed by the authorized aircraft dispatcher when it is believed 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.

§ 42.411 Preparation of load manifest; airplanes.

The operator 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 operator 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 operator.

§ 42.412 VFR and IFR flight plan; airplanes.

No airplane shall be taken off unless a VFR or IFR flight plan containing the appropriate information required by Part 60 of this chapter (Civil Air Regulations) is filed by the pilot in command with the nearest FAA communications station, or appropriate military station, or when outside the United States, with the appropriate authority. In the event communications facilities are not readily available, such flight plan shall be filed as soon as practicable after becoming airborne. An IFR or VFR flight plan must thereafter be in effect for all portions of the flight.

(c) When an operator's flights are operated into military airports, the arrival or completion notice required by § 60.20 of Part 60 of this chapter (Civil Air Regulations) may be filed with the appropriate airport control tower or aeronautical communication facility utilized for such airport.

REQUIRED RECORDS AND REPORTS

§ 42.501 Crewmember and dispatcher records; airplanes.

Each operator of airplanes shall maintain current records of every crewmember and aircraft dispatcher at its principal operations base or at such other location used by the operator as an authorized representative of the Administrator may approve. 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 this chapter (Civil Air Regulations); e.g., proficiency and line checks, airplane qualifications, training, physical examinations, and flight time records. The termination or other action taken in regard to any flight crewmember or aircraft dispatcher released from the employ of the operator, or who becomes physically or professionally disqualified, shall be indicated in these records which shall be retained by the operator for at least 6 months.

§ 42.502 List of aircraft.

Each aircraft shall meet the requirements of § 42.60 and be listed in the operations specifications of the operator as required by that section.

§ 42.503 Dispatch or flight release form; airplanes.

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

(1) Company or organization name;

(2) Make, model, and registration number of the airplane to be used;

(3) Flight or trip number, and date of flight;

(4) Name of each flight crewmember, flight attendant, and pilot designated as pilot in command;

(5) Airport of departure, airport or airports of destination and alternates therefor, and route;

(6) Minimum fuel supply in gallons or pounds; and

(7) Type of operation; e.g., IFR, VFR.

(b) The airplane dispatch release or flight release shall contain, or have attached thereto, weather reports, available weather forecasts, or a combination thereof, for airports of destination and alternate specified therein which shall be the latest available at the time the dispatch release or flight 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, if utilized.

§ 42.504 Load manifest; airplanes.

(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 the—

(i) Airplane,

(ii) Fuel and oil,

(iii) Cargo and baggage,
(iv) Passengers, and
(v) Crewmembers;

(2) The maximum allowable weight applicable for the particular flight which shall include:

(i) Maximum allowable takeoff weight for the runway intended to be used including corrections for altitude and gradient, and wind and temperature conditions existing at the time of takeoff;

(ii) Maximum takeoff weight considering anticipated fuel and oil consumption to permit compliance with applicable en route performance limitations;

(iii) Maximum takeoff weight considering anticipated fuel and oil consumption to permit compliance with the maximum authorized design landing weight limitations on arrival at the airport of destination; and

(iv) Maximum takeoff weight considering anticipated fuel and oil consumption to permit compliance with landing distance limitations on arrival at airport of destination and alternate(s).

NOTE: The minimum weight of subdivisions (i), (ii), (iii), and (iv) of this subparagraph less the weight of the fuel required must not exceed the maximum zero fuel weight as established in the Airplane Flight Manual.

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

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

(5) Names and addresses of passengers.

(b) The load manifest shall be prepared and signed for each flight by the pilot in command.

§ 42.505 Disposition of load manifest; dispatch, flight, and maintenance release forms; and flight plans; airplanes.

(a) The original signed load manifest, dispatch or flight release, maintenance release, and flight plan shall be in the possession of the pilot in command and shall be carried in the airplane to its destination.

(b) If a flight originates at the principal operations base of the operator, duplicate signed copies of the documents specified in paragraph (a) of this section shall be retained by the operator at the principal operations base. The pilot shall, before starting a flight at points other than the principal operations base, mail signed duplicate copies of the documents specified in paragraph (a) of this section to the principal operations base.

(c) Copies of the documents specified in paragraph (a) of this section shall be retained by the operator at its principal operations base for at least 6 months.

§ 42.506 Maintenance records: airplanes.

(a) Each operator of airplanes 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, where practicable, 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. An authorized representative of the Administrator 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 an authorized representative of the Administrator 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.

§ 42.507 Maintenance log; airplanes.

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 critical to the safety of the flight. The operator 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 operator's 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.

§ 42.508 Mechanical reliability reports; airplanes.

(a) Each operator of airplanes shall report the occurrence or detection of those failures, malfunctions, or defects specified in paragraph (b) of this section. In addition, each operator shall report any other failure, malfunction, or defect which occurs or is detected at any time in an airplane or airplane component (including airplane systems, appliances, powerplants, and propellers) used by the operator when, in the operator's opinion, such failure, malfunction, or defect has endangered or may endanger the safe operation of an airplane used by the operator. The report shall be in written form covering a period of 24 hours beginning at 0900 hours local time of each day and ending at 0900 hours local time of the next day, and shall be submitted to the Federal Aviation Agency maintenance inspector assigned to the operator by 0900 hours local time of the following day: *Provided*, That reports which are due on Saturday or Sunday may be submitted on the following Monday and in case of legal holidays on the following workday.

NOTE: Failures, malfunctions, or defects reported in accordance with the accident reporting provisions of Part 320 of the Regulations of the Civil Aeronautics Board need not be included.

(b) The operator shall report each occurrence or detection of a failure, malfunction, or defect involving:

(1) Fires during flight and whether the related fire-warning system functioned properly;

(2) Fires during flight and whether the related fire-warning system did not function properly;

(3) Fires during flight not protected by a related fire-warning system;

(4) False fire warning during flight;

(5) Engine exhaust systems which result during flight in damage to engine, adjacent structure, equipment, or components;

(6) An airplane component which results during flight in the accumulation or circulation of smoke, vapor, or toxic or noxious fumes in the crew compartment or cabin;

(7) Engine shutdown during flight due to engine flameout;

(8) Engine shutdown during flight when external damage to the engine or to the airplane structure has occurred;

(9) Engine shutdown during flight due to foreign object ingestion or icing;

(10) Engine shutdown during flight of more than one engine on an airplane;

(11) Propeller feathering system or ability of the system to control overspeeding during flight;

(12) Fuel or fuel-dumping systems affecting fuel flow or causing hazardous leakage during flight;

(13) Landing gear extension or retraction or opening or closing of landing-gear doors during flight;

(14) Break system components which result in loss of brake actuating force while the airplane is in motion on the ground;

(15) Airplane structure which requires major repair;

(16) Cracks, permanent deformation, or corrosion of airplane structure which exceed the maximum limits acceptable to the manufacturer or the Federal Aviation Agency; and

(17) Airplane components or systems which result during flight in the taking of emergency actions; except that action taken to shutdown an engine need not be reported as an emergency under this provision.

NOTE: Under the provisions of this paragraph, an airplane is in flight from the moment it leaves the surface of the earth on takeoff until it touches down at a place of landing.

(c) Reports required by paragraph (a) of this section shall be transmitted in a manner and on a form convenient to the operator's system of communication and procedure, and shall include in the first daily report as much of the following information as is available:

(1) Type and identification number of the airplane, name of the operator, date, flight number, and stage during which the incident occurred; e.g., preflight, takeoff, climb, cruise, descent, landing, inspection;

(2) Emergency procedure effected; e.g., unscheduled landing, emergency descent;

(3) Nature of condition; e.g., fire, structural failure;

(4) Identification of part and system involved, including available information pertaining to type designation of the major component and time since overhaul;

(5) Apparent cause of trouble; e.g., wear, crack, design deficiency, personnel error;

(6) Disposition; e.g., repaired, replaced, airplane grounded, part sent to manufacturer; and

(7) Brief narrative summary of other pertinent information necessary for more complete identification, determination of seriousness, and corrective action.

(d) Reports required by paragraph (a) of this section shall not be withheld pending accumulation of all information specified in paragraphs (b) and (c) of this section. When additional information is obtained relative to the incident, including any that may be furnished by the manufacturer or other outside agency, it shall be expeditiously submitted as a supplement to the first report, referencing the date and place of submission of such report.

§ 42.509 Mechanical interruption summary report; airplanes.

Each operator of airplanes shall submit regularly and promptly to the Administrator a summary report containing information on the following occurrences:

(a) All interruptions to a flight, unscheduled changes of airplanes en route, and unscheduled stops and diversions from route which result from known or suspected mechanical difficulties or malfunctions that are not required to be included in mechanical reliability reports.

(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.

§ 42.510 Alteration and repair reports; airplanes.

The operator shall report major alterations or repairs of airframes, engines, propellers, and appliances to the authorized representative of the Administrator assigned to the operator promptly upon completion of such alterations or repairs.

§ 42.511 Maintenance release; airplanes.

When an airplane is released by the maintenance organization to flight operations, a maintenance release 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 of the operator prior to release of such airplane.

§ 42.512 Communication records; aircraft.

An operator using a dispatch system shall maintain, and retain for a period of 30 days records of radio contacts between the operator and its pilots en route.

APPENDIX A—FIRST-AID KITS

Approved first-aid kits required by § 42.173 shall meet the following specifications and requirements.

(1) Each first-aid kit shall be dust and moisture proof, and contain only materials which meet Federal Specifications GG–K–391a, as revised.

(2) The type of first-aid kit and the contents thereof based upon the capacity of the airplane is as follows:

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

Contents	*No.*
Adhesive bandage compresses, 1-inch (16 per unit)	1
Antiseptic swabs, 10mm. (10 per unit)	1
Ammonia inhalants, 6mm. (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. (6 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]

Contents	*No.*
Adhesive bandage compresses, 1-inch (16 per unit)	2
Antiseptic swabs, 10 mm. (10 per unit)	2
Ammonia inhalants, 6mm. (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 over 25 persons capacity.

Contents	*No.*
Adhesive bandage compresses, 1-inch (16 per unit)	4
Antiseptic swabs, 10mm. (10 per unit)	4
Ammonia inhalants, 6mm. (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

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

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